Whitehaven

Blackwater North Extension Project

Appendix H
Noise and Blasting Assessment



REPORT

BLACKWATER NORTH EXTENSION PROJECT

QUEENSLAND

NOISE AND BLASTING ASSESSMENT

RWDI # 2510129

1 April 2026

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Version	Status	Date	Prepared By	Reviewed By
A	Final	1 April 2026	Roman Haverkamp	Rebecca Warren

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TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**

1 INTRODUCTION **3**

1.1 Overview of the Blackwater Mine 3

1.2 Objectives of this Assessment 3

2 PROJECT DESCRIPTION **5**

3 EXISTING NOISE ENVIRONMENT **7**

3.1 Noise-sensitive Receptors 7

3.2 Previous Noise Monitoring 10

3.2.1 Noise Monitoring Locations 10

3.2.2 Noise Monitoring Results 12

4 OPERATIONAL NOISE CRITERIA **14**

4.1 Noise Policies & Guidelines 14

4.2 Assessment Strategy 14

4.3 Environmental Authority Noise Criteria 15

4.4 Modifying Factor Adjustments 15

4.4.1 Low-frequency Noise 15

4.4.2 Tonal Noise 16

4.4.3 Impulsive Noise 16

5 OPERATIONAL NOISE ASSESSMENT **17**

5.1 Noise Modelling Methodology 17

5.1.1 Predictive Noise Model 17

5.1.2 Noise Assessment Scenarios 17

5.1.3 Meteorology 18

5.1.4 Noise Modelling Assumptions 21

5.1.5 Mobile Equipment / Fixed Plant 22

5.1.6 Equipment Sound Power Levels 26

5.1.7 Quarries 27

5.2 Proactive Noise Management 29

5.2.1 Description of Proactive Noise Management System 29

5.2.2 Application of Proactive Noise Management System 29

5.3 Operational Noise Predictions & Discussion 32

5.4 Night-time Maximum Noise Level Event Assessment 34
5.4.1 Assumptions and Methodology 34
5.4.2 Maximum Noise Level Event Predictions & Discussion 35
5.5 Low-frequency Noise Assessment 36
5.5.1 Representative Receptors 36
5.5.2 Low-frequency Noise Results 39
5.6 Cumulative Noise Assessment 39
5.6.1 Nearby Industrial Operations 40
5.6.2 Cumulative Noise Predictions 40
6 ROAD TRAFFIC NOISE 42
7 RAIL TRANSPORTATION NOISE 43
8 BLASTING ASSESSMENT 44
8.1 Introduction 44
8.2 Blast Impact Assessment Criteria 44
8.3 Prediction of Airblast Overpressure and Ground Vibration Levels 45
8.4 Blasting Minimum Compliance Distances 46
8.5 Discussion 48
9 CONCLUSION 49
10 STATEMENT OF LIMITATIONS 50
11 REFERENCES 51

LIST OF APPENDICES

Appendix A: Glossary of Acoustic Terms
Appendix B: Land Ownership Details
Appendix C: Meteorology
Appendix D: Operational Noise Predictions
Appendix E: Operational Noise Predictions - Unmitigated
Appendix F: Noise Contours
Appendix G: Night-time Maximum Noise Level Event Predictions
Appendix H: Low-frequency Noise Prediction Methodology
Appendix I: Blasting Prediction Curves & Equations

LIST OF FIGURES

Figure 1-1: Existing Blackwater Mine 4
Figure 2-1: Project General Arrangement 6
Figure 3-1: Noise-Sensitive Receptor Locations 9
Figure 3-2: Noise Monitoring Locations 11
Figure 5-1: Proposed Quarry Locations 28
Figure 5-2: LFN Zones 38
Figure 8-1: Minimum Compliance Distances for Large Production Blasts (4,500 kg MIC) 47

LIST OF TABLES

Table 3-1: Noise Monitoring Locations (EMM, 2021) 10
Table 3-2: Unattended Noise Monitoring Results (EMM, 2021) 12
Table 3-3: Attended Noise Monitoring Results (EMM, 2021) 12
Table 4-1: EA EPML00717813 Noise Criteria 15
Table 4-2: Project-specific LFN Assessment Criteria 16
Table 5-1: Noise Assessment Scenarios and Rationale 18
Table 5-2: Assessment Meteorological Parameters 20
Table 5-3: Air Temperature & Relative Humidity 21
Table 5-4: Indicative Equipment Schedule 23
Table 5-5: Indicative Equipment SWLs 26
Table 5-6: Indicative Quarry Equipment and SWLs 27
Table 5-7: Indicative Examples of Proactive Mitigation Measures (FY50, Winter) 30
Table 5-8: Indicative Proactive Mitigation Measures Implementation Frequencies 31
Table 5-9: Residual $L_{Aeq,15min}$ Noise Exceedances 33
Table 5-10: Residual Noise Exceedance Levels at Privately-owned Receptors 34
Table 5-11: Night-time Maximum Noise Level Event Sources and SWLs 35
Table 5-12: Residual $L_{A1,15min}$ Noise Exceedances 36
Table 5-13: LFN Zones & Representative Receptors 36
Table 5-14: LFN Results (Night) 39
Table 5-15: Cumulative Noise Predictions 40
Table 8-1: EA EPML00717813 Blast Criteria 44
Table 8-2: Blasting Minimum Compliance Distances 48

EXECUTIVE SUMMARY

RWDI Australia Pty Ltd (RWDI) has completed a comprehensive Noise and Blasting Assessment for the proposed Blackwater North Extension Project (the Project) at the Blackwater Mine (BWM), which seeks an amendment to Environmental Authority (EA) EPML00717813 to support extended open-cut mining operations within Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759.

The assessment has evaluated operational noise, night-time maximum noise level events, low-frequency noise (LFN), cumulative noise, and blasting impacts in accordance with EA EPML00717813 noise criteria and relevant Queensland legislation and guidelines.

Noise Criteria

EA EPML00717813 noise criteria, as summarised in **Table 1**, were used for the assessment.

Table 1: EA EPML00717813 Noise Criteria

Receptors	Noise Limits (A-weighted decibels [dBA])			
	Day $L_{Aeq,15min}$	Evening $L_{Aeq,15min}$	Night $L_{Aeq,15min}$	Night $L_{A1,15min}$
Sensitive place or Commercial place	40	40	40	45

Notes:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm – 10.00 pm; Night = 10.00 pm – 7.00 am.
2. Noise criteria do not apply to non-sensitive receptors.

In accordance with EA EPML00717813 requirements, tonal, low-frequency and impulsive noise, which have the potential to generate annoyance in the surrounding community, have also been considered.

Operational Noise Assessment

Predictive noise modelling indicated that most of the noise-sensitive receptors surrounding the BWM would comply with EA EPML00717813 $L_{Aeq,15min}$ criteria across all assessed years and operating scenarios. Residual exceedances were identified at 11 receptors, including eight privately-owned receptors and three non-sensitive industrial receptors. It is understood these receptors would be managed via commercial noise agreements with Whitehaven Blackwater (i.e. "Alternative Arrangements" under EA EPML00717813).

Table 2 provides a summary of the residual noise exceedance levels at the eight privately-owned receptors predicted to experience noise exceedances.

Table 2: Residual Noise Exceedance Levels at Privately-owned Receptors

Exceedance Category	Number of Receptors	Receptor IDs
Negligible (1-2 decibels [dB])	1	R07
Marginal (3-5 dB)	4	R03, R04, R13, R19
Significant (>5 dB)	3	R05, R06, R17

Night-time Maximum Noise Level Event Assessment

Assessment of night-time maximum noise level events against EA EPML00717813 $L_{A1,15min}$ criterion showed compliance at all but five privately-owned and non-sensitive industrial receptors, namely R05, R06, R14, R17 and R46. These receptors are subject to operational $L_{Aeq,15min}$ exceedances, and therefore expected that they would be covered by commercial noise agreements (i.e. "Alternative Arrangements" under EA EPML00717813).

Low-frequency Noise Assessment

Assessment against the *Guideline - Streamlined model conditions for petroleum activities* (Department of Environment, Science and Innovation [DESI], 2024) LFN outdoor criteria showed compliance at all receptors. The Project is therefore unlikely to generate LFN that could be perceived by the community and cause annoyance.

Cumulative Noise Assessment

To minimise background creep in the areas surrounding the Project, the assessment considered cumulative noise from the Project and nearby industries, and assessed it against the (site-specific) EA EPML00717813 noise criteria.

Cumulative noise was found to generally comply with the site-specific EA EPML00717813 noise criteria, indicating the Project would not lead to unreasonable background noise levels in the area. It is noted that day and evening exceedances are expected in north Blackwater under conservative assumptions.

Road Traffic and Rail Transportation Noise Assessment

Given that the Project does not involve any increase in public road traffic or rail movements, additional impacts from road traffic and rail transportation noise are not expected and did not warrant further assessment.

Blasting Assessment

Blasting assessment indicated that localised maximum instantaneous charge (MIC) restrictions would be required at Stewarton Pit to maintain compliance at receptor R17. Based on current blast management practices at the BWM, it is expected that airblast overpressure and ground vibration from the Project could be effectively controlled to meet all blasting criteria and minimise the risk of significant impacts at surrounding receptors.

1 INTRODUCTION

1.1 Overview of the Blackwater Mine

The Blackwater Mine (BWM) is an existing, open-cut metallurgical coal mine located approximately 20 kilometres (km) south-west of Blackwater in the Bowen Basin, Queensland.

The BWM has been in operation since 1967 and operates in accordance with, amongst other authorisations, Environmental Authority (EA) EPML00717813, granted under the *Environmental Protection Act 1994* (EP Act).

The BWM is a joint venture between Whitehaven Coal Limited (Whitehaven) (70 percent [%]), Nippon Steel Corporation (20%) and JFE Steel Corporation (10%). Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater), a wholly owned subsidiary of Whitehaven, is the operator of the BWM.

The existing BWM comprises a series of open-cut mining pits along an approximate 80-km long strike length. The BWM extracts coal using drill and blast methods, draglines, dozers and truck and shovel fleets for overburden removal and haulage. Existing infrastructure at the BWM includes two rail spurs and balloon loops from the Bauhinia Railway Line, a coal handling and preparation plant (CHPP), a thermal coal plant (TCP), product stockpiles, run-of-mine (ROM) coal stockpiles, tailings storage facility, in-pit spoil (i.e. waste rock) dumps, train load-out facilities, water management infrastructure and other supporting infrastructure (e.g. haul roads, access roads, laydown areas, electricity transmission lines, workshops and offices) (**Figure 1-1**).

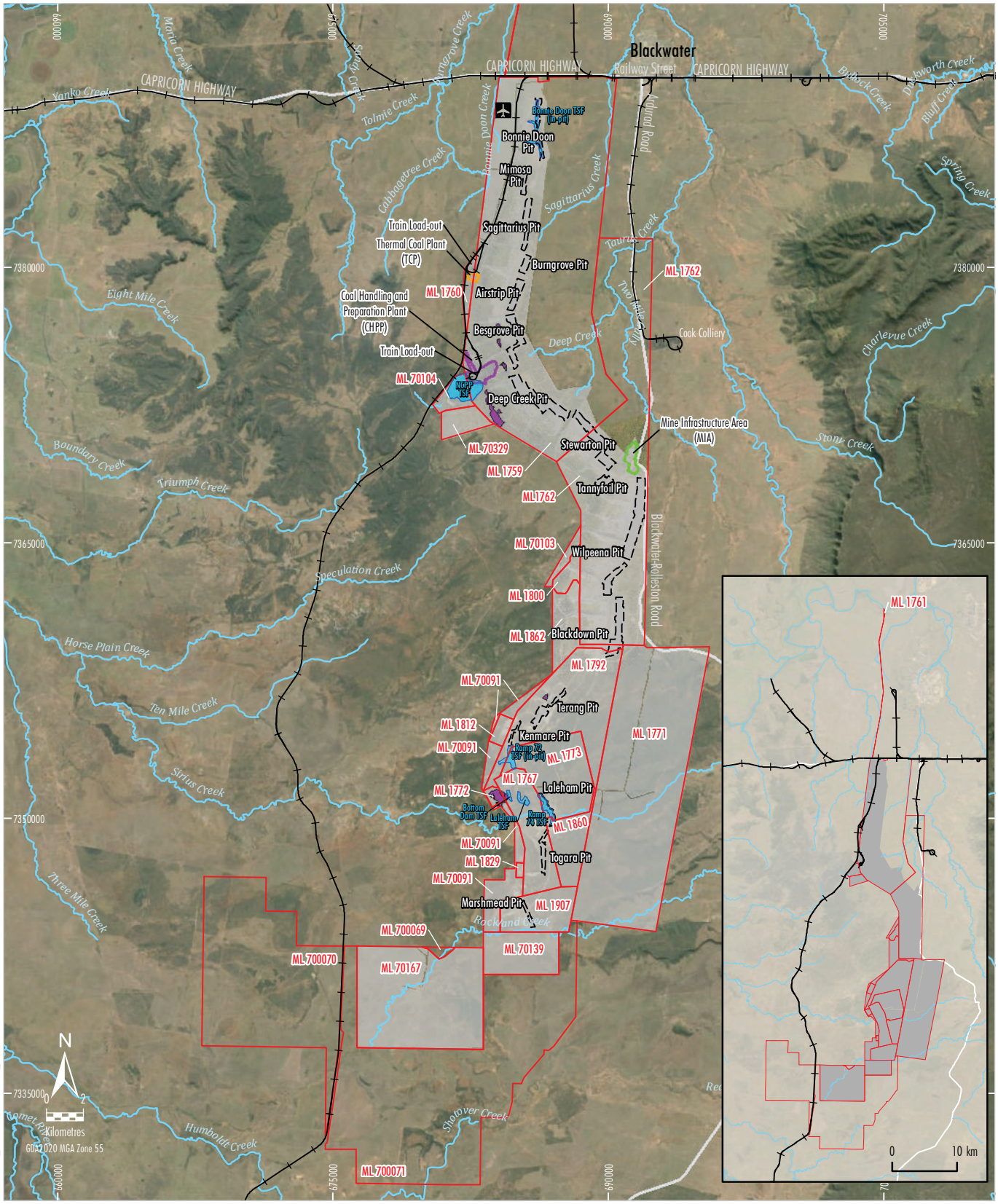
Whitehaven Blackwater proposes to develop the Blackwater North Extension Project (the Project), which would extend the current open-cut mining development at the BWM to within Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759. The Project is expected to optimise mining operations at the BWM, allowing ongoing employment and economic benefits from the BWM to the local area, region, and State of Queensland.

1.2 Objectives of this Assessment

RWDI Australia Pty Ltd (RWDI) has been commissioned to prepare a Noise and Blasting Assessment in support of the EA Amendment Application under section 226 of the EP Act. The primary objective of the assessment is to predict noise and blasting emissions associated with the Project, and assess them against relevant EA EPML00717813 noise criteria.

The assessment provides a quantitative analysis of operational noise, night-time maximum noise level events, low-frequency noise (LFN) and cumulative noise. It also identifies noise mitigation and management measures required for the Project. In addition, the assessment includes a blast analysis to determine mass of explosive requirements and minimum compliance distances.

As the Project does not introduce any additional road and rail movements beyond those currently approved, road and rail noise have been addressed qualitatively.



WHC-24-101_EA Amendment SR Noise_201A

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)
Orthophoto: Esri (2025); Whitehaven (2025)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Airport
- Approved Disturbance Footprint
- Pit
- Indicative TCP Extent
- Indicative MIA Extent
- Indicative CHPP Extent
- Tailings Storage Facility (TSF)
- Reject Stockpile

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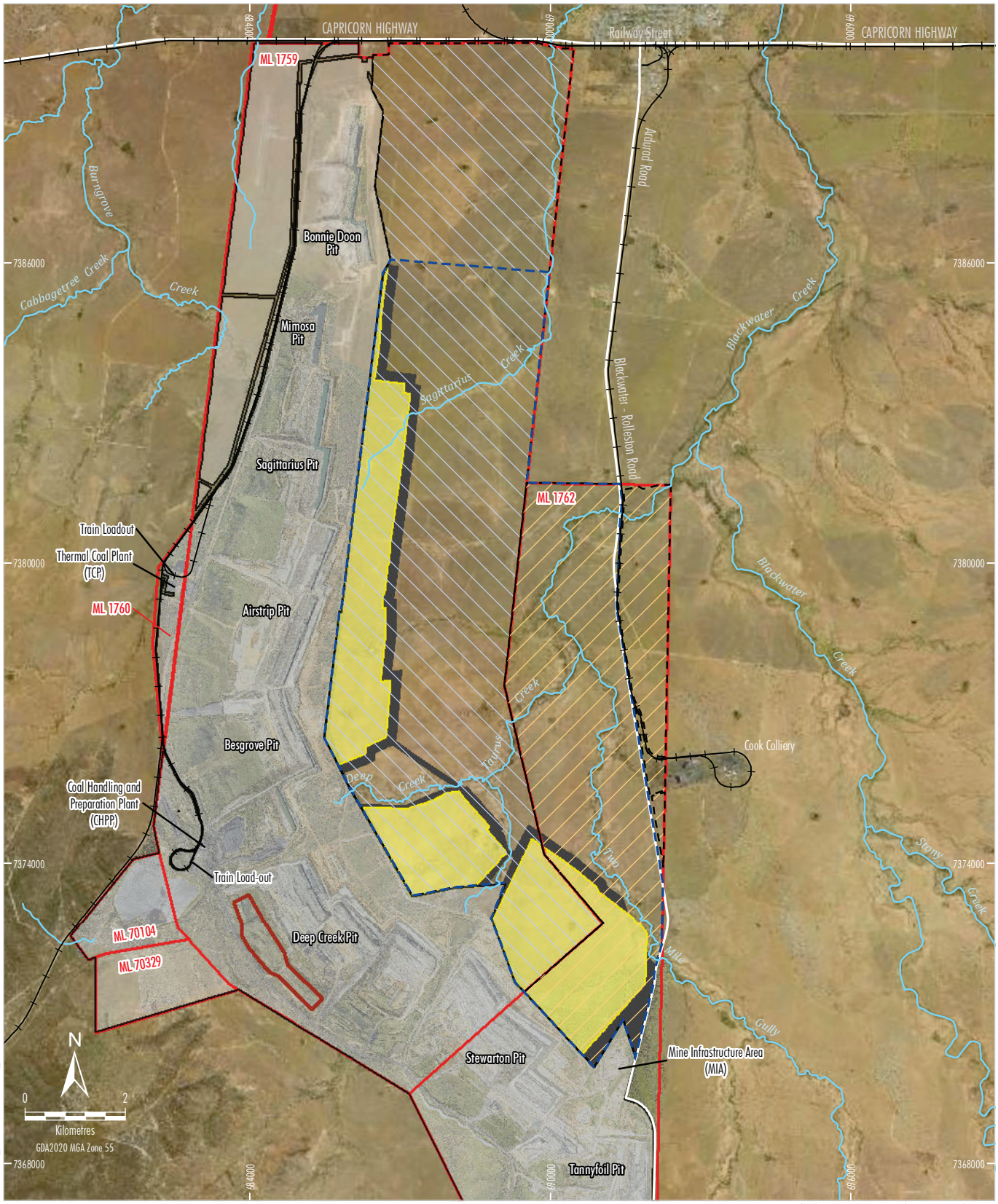
Existing Blackwater Mine

Figure 1-1

2 PROJECT DESCRIPTION

The Project would include the following activities **(**Figure 2-1**)**:

- extension of open-cut operations into SA 7 on ML1762 and SA 10 on ML1759 to allow mining of additional coal reserves to approximately 2055;
- extraction of an additional 200 million tonnes (Mt) (approximately) of ROM coal;
- continued extraction of up to 19 million tonnes per annum (Mtpa) of ROM coal;
- continued use of existing BWM infrastructure (e.g. CHPP, TCP, ROM and product coal stockpiles, train load-out, water management, tailings management and other supporting infrastructure);
- construction and operation of new water management and water storage infrastructure in support of extended mining operations;
- development of waste rock emplacement areas;
- continued co-disposal of coarse rejects with waste rock and disposal of tailings into an approved tailings storage facility or in-pit void;
- construction of semi-permanent tailings cells to be utilised for the disposal of fine rejects;
- progressive rehabilitation of the Project;
- ongoing exploration activities in the Project area; and
- other associated infrastructure, equipment and activities.



LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Approved Disturbance Footprint
- SA 7
- SA 10

Project Components[1]

- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area
- Potential Semi Permanent Tailings Cell

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)
Orthophoto: Queensland Department of Resources (2017); Whitehaven (2025)

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BLACKWATER NORTH EXTENSION PROJECT

Project General Arrangement

Note: [1] Excludes some ancillary Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

Figure 2-1

3 EXISTING NOISE ENVIRONMENT

3.1 Noise-sensitive Receptors

The assessment considers all surrounding noise-sensitive receptors potentially impacted by the Project. They include, but are not limited to, all receptor types subject to EA EPML00717813 noise criteria and defined in EA EPML00717813 as sensitive and commercial places.

EA EPML00717813 defines sensitive and commercial places as follows:

> ***Sensitive place*** *means:*
>
> *a) Any of the following:*
> - *i. a dwelling, residential allotment, mobile home or caravan park, residential marina or other residential premises; or*
> - *ii. a motel, hotel or hostel; or*
> - *iii. an educational institution; or*
> - *iv. a medical centre or hospital; or*
> - *v. a protected area; or*
> - *vi. a public park or gardens.*

> *b) Despite paragraph (a), the following places are not sensitive places:*
> - *I. subject to paragraph (c), a place that is the subject of an alternative arrangement; or*
> - *II. a mining camp (i.e. accommodation and ancillary facilities for mine employees or contractors or both, associated with the mine the subject of the environmental authority), whether or not the mining camp is located within a mining tenement that is part of the mining project the subject of the environmental authority. For example, the mining camp might be located on neighbouring land owned or leased by the same company as one of the environmental authority holders for the mining project, or a related company; or*
> - *III. a property owned or leased by one or more of the environmental authority holders, or a related company, whether or not it is subject to an alternative arrangement.*

> *c) A place that is the subject of a current alternative arrangement in relation to a particular type(s) of environmental nuisance, is not a sensitive place for the purposes of that type(s) of environmental nuisance, however remains a sensitive place for the purpose of other types of environmental nuisances.*

> ***Commercial place*** *means:*
>
> *a) A work place that is used as:*
> - *i. an office; or*
> - *ii. a place of business; or*
> - *iii. a place used for commercial purposes.*

> *b) Despite paragraph (a), the following places are not commercial places:*
> - *i. subject to paragraph (c), a place that is the subject of an alternative arrangement; or*
> - *ii. places that are part of the mining activity; or*
> - *iii. employees accommodation or public roads; or*

iv. a property owned or leased by one or more of the environmental authority holders, or a related company, whether or not it is subject to an alternative arrangement.

c) A place that is the subject of a current alternative arrangement in relation to a particular type(s) of environmental nuisance, is not a commercial place for the purposes of that type(s) of environmental nuisance, however remains a commercial place for the purpose of other types of environmental nuisances.

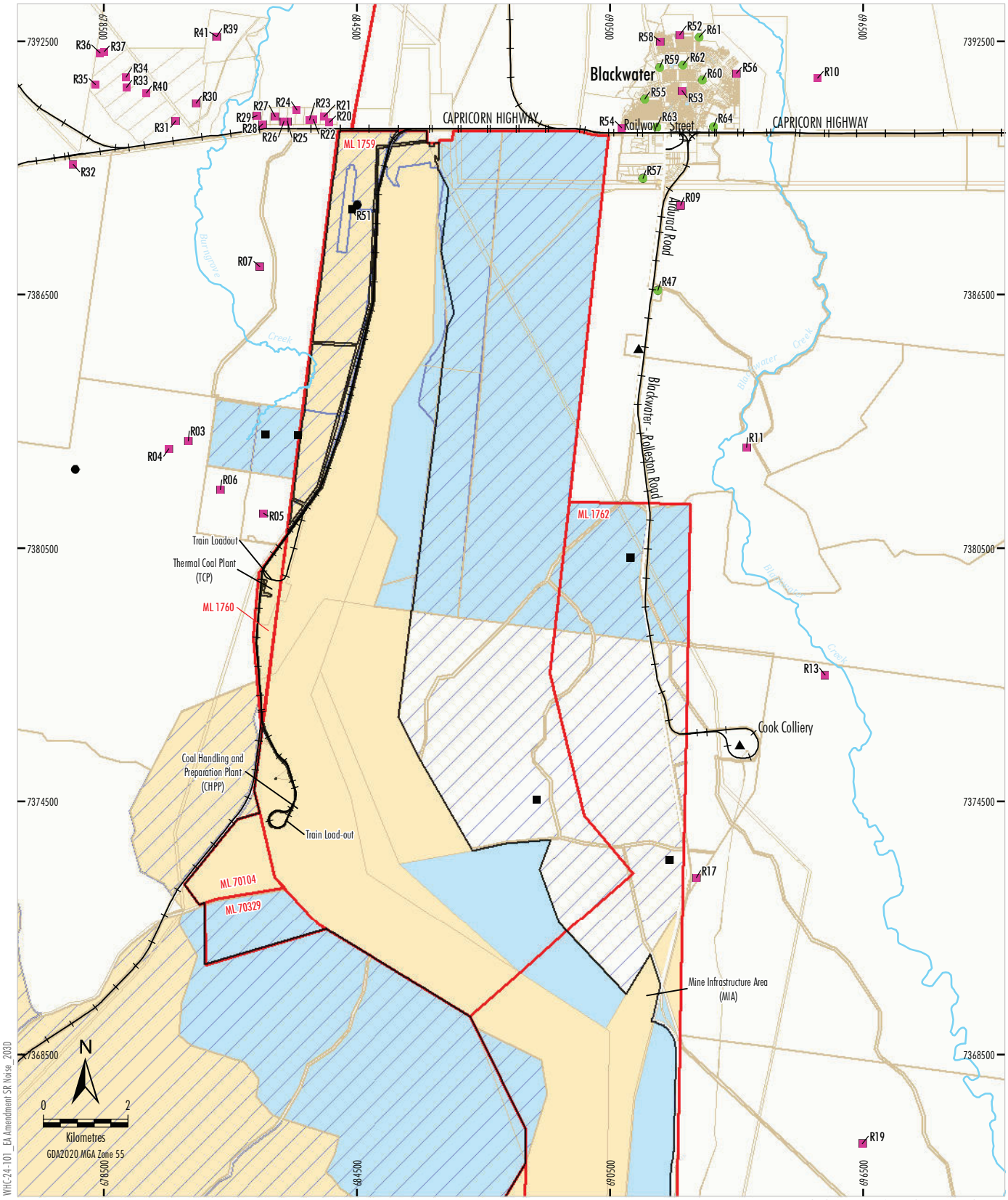
In total, 59 noise-sensitive receptors were considered and are summarised as follows:

- 39 privately-owned receptors – comprising 34 rural properties and five dwellings representative of Blackwater;
- eight other receptor types – comprising three schools, childcare, hospital, medical centre, camp accommodation and cemetery (all located in Blackwater except for the cemetery which is on the south of the Capricorn Highway); and
- 12 non-sensitive receptors (including five mine-owned residential dwellings, two privately-owned residential dwellings currently under agreements, and five commercial/industrial receptors in the surrounding rural areas).

Including all receptors within Blackwater was considered impractical; therefore, five key receptors representative of the township were strategically selected for the assessment. The representative Blackwater receptors include the dwellings potentially most impacted by the Project (i.e. receptors in the south and south-west of the township).

The mine-owned receptors and privately-owned receptors currently under agreements are not subject to EA EPML00717813 noise criteria and are included for information only.

Figure 3-1 shows all noise-sensitive receptors surrounding the Project and included in the assessment. A detailed land ownership list (with geographic coordinates) is provided in **Appendix B**.



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Lessee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

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BLACKWATER NORTH EXTENSION PROJECT

Noise-sensitive Receptors Locations

Figure 3-1

3.2 Previous Noise Monitoring

In April and May 2020, EMM Consulting Pty Ltd (EMM) conducted a baseline unattended noise monitoring survey at four receptor locations surrounding the BWM to quantify the existing noise environment, with supplementary attended measurements conducted at the four locations and a further five locations to characterise the noise environment and determine the site's noise contribution (EMM, 2021).

The details provided in this section were obtained from the noise assessment recently conducted for the BWM (SLR Consulting Australia Pty Ltd [SLR], 2023)

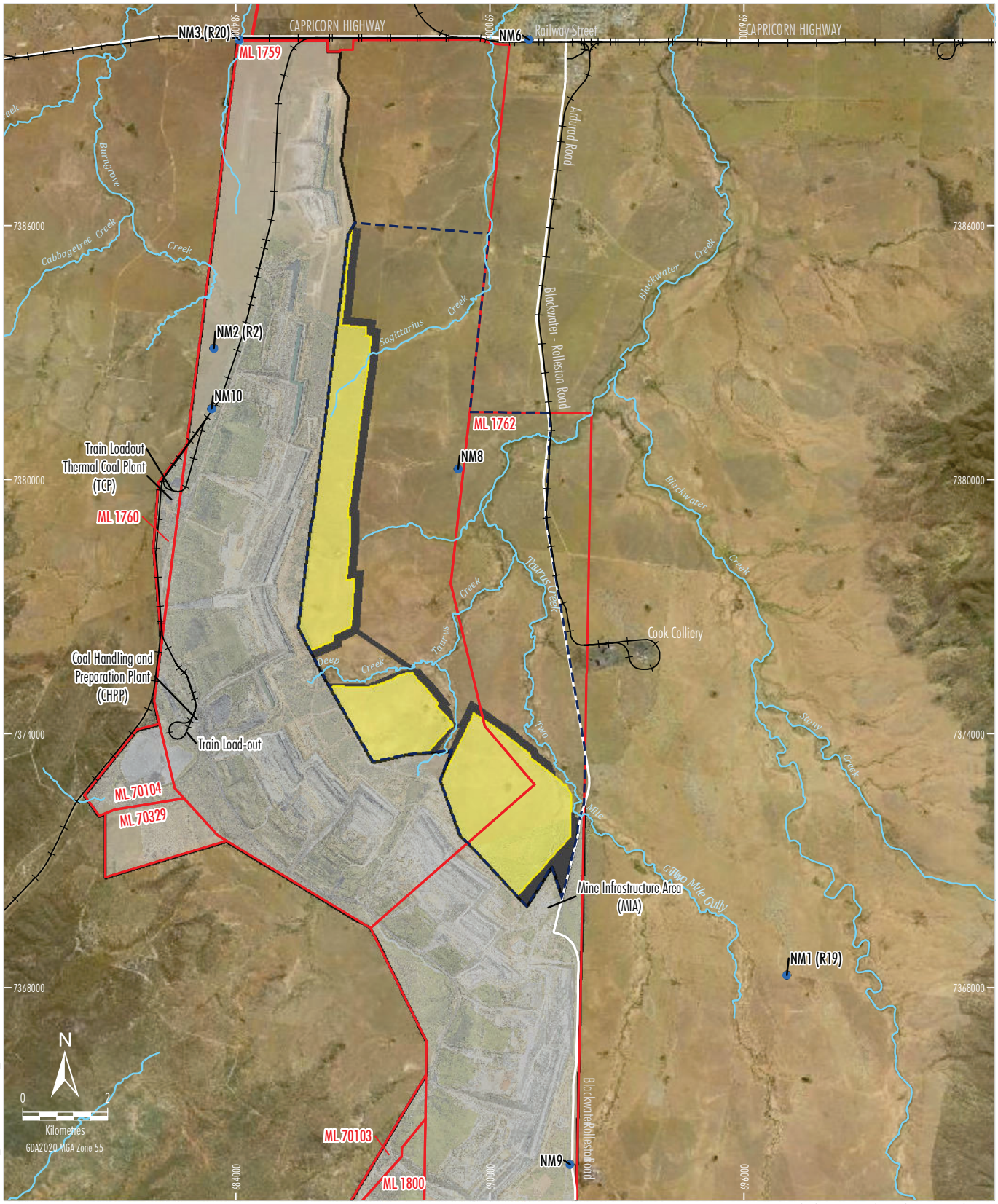
3.2.1 Noise Monitoring Locations

The monitoring locations are summarised in **Table 3-1** and presented on **Figure 3-2**.

It is noted two of the five only-attended noise monitoring locations were used by EMM for noise model verification purposes only and as such have not been discussed further in this report.

Table 3-1: Noise Monitoring Locations (EMM, 2021)

Location ID (RWDI ID)	Method	Coordinates (MGA zone 55)	
		Easting	Northing
NM1 (R19)	Unattended and attended	697016	7368303
NM2 (R2)	Unattended and attended	683482	7383106
NM3 (R20)	Unattended and attended	684074	7390392
NM6	Unattended and attended	690925	7390392
NM8	Attended	689250	7380257
NM9	Attended	691900	7363829
NM10	Attended	683428	7381676



WHC-24-101_EA Amendment SR Noise_211A

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Noise Monitoring Location
- Existing Blackwater Mine
- Project Components[1]
- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)
Orthophoto: Queensland Department of Resources (2017); Whitehaven (2025)

Note: [1] Excludes some incidental Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

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BLACKWATER NORTH EXTENSION PROJECT

Noise Monitoring Locations

Figure 3-2

3.2.2 Noise Monitoring Results

A summary of the EMM unattended noise monitoring results is provided in **Table 3-2**.

Table 3-2: Unattended Noise Monitoring Results (EMM, 2021)

Location ID (RWDI ID)	L_{A90} Noise Levels[2] (A-weighted decibels [dBA])			$L_{Aeq,Period}$ Noise Levels (dBA)			L_{A1} Noise Levels (dBA)		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
NM1 (R19)	25	32	28	40	47	46	57	55	58
NM2 (R2)	27	27	24	47	46	43	57	55	57
NM3 (R20)	30	33	27	63	59	59	79	77	82
NM6	43	42	38	68	65	64	81	79	85

Notes:

1. Day: 7.00 am – 6.00 pm Monday to Saturday, 8.00 am – 6.00 pm Sundays and public holidays; Evening: 6.00 pm – 10.00 pm; Night: 10.00 pm – 7.00 am.
2. It is understood that L_{A90} noise levels are interpreted to be Rating Background Levels (RBL).

Background noise levels (L_{A90}) at NM1, NM2 and NM3 were characteristic of a rural environment, while those at NM6 were influenced by activities occurring in and around Blackwater. The L_{Aeq} and L_{A1} noise levels at NM3 and NM6 were influenced by road traffic noise from the Capricorn Highway.

The results of the EMM attended noise measurements are summarised in **Table 3-3**.

Table 3-3: Attended Noise Monitoring Results (EMM, 2021)

Location ID (RWDI ID)	Start Date and Time	Measured Noise Levels (dBA)				BWM Contribution[1] $L_{Aeq,15min}$ (dBA)	Comments
		L_{A90}	L_{Aeq}	L_{A10}	L_{A1}		
NM1 (R19)	17/04/20 9.53am	21	27	28	37	Inaudible	BWM noise inaudible. Noise sources include occasional wind, birdsong and insects.
NM2 (R2)	17/04/20 2.02pm	34	35	37	38	<20	BWM noise occasionally audible. Mine noise includes distant engine revs (approx. 20 dBA) and horn blasts (approx. 22 dBA). Other noise sources include occasional wind, passing vehicles on Blackwater Airport Road, birdsong and insects.
NM3 (R20)	17/04/20 2.54pm	34	47	50	58	Inaudible	BWM noise inaudible. Noise sources include occasional wind, passing vehicles on Capricorn Highway, birdsong and insects.

Location ID (RWDI ID)	Start Date and Time	Measured Noise Levels (dBA)				BWM Contribution[1] $L_{Aeq,15min}$ (dBA)	Comments
		L_{A90}	L_{Aeq}	L_{A10}	L_{A1}		
NM6	20/04/20 6.30am	58	70	74	80	Inaudible	BWM noise inaudible. Noise sources include vehicles passing on Capricorn Highway, birdsong and insects.
NM8	19/04/20 4.14pm	28	31	34	37	26	BWM noise audible. Mine noise includes distant engine revs (28 dBA) and horn blasts (32 dBA). Other noise sources include wind, birdsong and insects.
NM9	19/04/20 4.47pm	42	50	46	63	42[2]	BWM noise audible. Mine noise includes engine revs (45 dBA), light vehicles on mine (49 dBA), dozer tracks (43 dBA) and horn blasts (45 dBA). Other noise sources include vehicles passing on Blackwater Rolleston Road, birdsong and insects.
NM10	19/04/20 5.42pm	47	59	54	73	42[2]	BWM noise audible. Mine noise includes engine revs (50 dBA), bucket noise (50 dBA), haul trucks (59 dBA) and horn blasts (48 dBA). Other noise sources include vehicles passing on Blackwater Airport Road, birdsong and insects

Notes:

1. BWM noise contribution was determined using in-field observations and post-analysis of data as required.
2. Although the stated BWM contribution noise level is above EA EPML00717813 noise criteria (**Table 4-1**), this noise monitoring location does not represent a noise-sensitive receptor.

Attended monitoring indicated that noise from the BWM was either inaudible or negligible at all four unattended noise measurement locations. At NM1 and NM2, the measured noise levels and observed sources were consistent with those expected in a typical rural setting. At NM3 and NM6, the acoustic environment was influenced by road traffic noise from the Capricorn Highway.

4 OPERATIONAL NOISE CRITERIA

4.1 Noise Policies & Guidelines

The relevant Queensland legislation and guidelines applicable to the Project for managing and assessing operational noise include:

- EP Act;
- *Environmental Protection Regulation 2019* (EP Regulation);
- *Environmental Protection (Noise) Policy 2019* (EPP [Noise]);
- *Ecoaccess Guideline - Planning for Noise Control Guideline* (Department of Environment and Heritage Protection [DEHP], 2016);
- *Ecoaccess Guideline for the Assessment of Low Frequency Noise* (Environmental Protection Agency [EPA], 2004);
- *Guideline – Application requirements for activities with noise impacts* (Department of Environment, Science and Innovation [DESI], 2025); and
- *Noise Measurement Manual* (NMM) (Department of Environment and Science [DES], 2020).

Additional guidance was obtained through reference to the following guideline:

- *Guideline - Streamlined model conditions for petroleum activities* (DESI, 2024).

The EP Act and subordinate legislation (EP Regulation and EPP [Noise]) set acoustic quality objectives to prevent and minimise adverse effects on environmental values of the acoustic environment, including health, wellbeing and amenity.

4.2 Assessment Strategy

As this Project is an amendment of EA EPML00717813, it is considered appropriate to assess noise levels against the criteria within. This approach is considered suitable for the Project as opposed to nominating new and more stringent criteria for the following reasons:

- The current operational constraints and mitigation/management commitments currently in place at the BWM are controlled by EA EPML00717813 noise criteria. Implementing new and more stringent criteria would not be considered practical or reasonable for an operation that has been running for many years.
- The Project would continue using the same mining methods, equipment and infrastructure as current operations, with no increase in the annual ROM coal extraction rate. Notwithstanding the extension of open-cut operations into SA 7 and SA 10, it is considered that the Project would generally not result in significant changes to overall noise emissions from the BWM.
- No noise and blast complaints were received in the last three years, which suggests that EA EPML00717813 noise criteria are effective in protecting the community's acoustics amenity.
- The BWM has been operating since 1967, and much of the surrounding community (including Blackwater) is developed largely because of the BWM.

4.3 Environmental Authority Noise Criteria

Under EA EPML00717813, Whitehaven Blackwater is required to operate in accordance with the noise conditions set out in Conditions C1-C4 and comply with the noise limits summarised in Table C1.

Conditions C1 and C2 stipulate that noise generated by the BWM must comply with the noise limits summarised in Table C1 at all surrounding sensitive and commercial places (refer to **Section 3** for definitions) so as not to cause any environmental noise nuisance.

EA EPML00717813 noise criteria are summarised in **Table 4-1**. These criteria would be used for the assessment.

Table 4-1: EA EPML00717813 Noise Criteria

Receptors	Noise Limits (dBA)			
	Day $L_{Aeq,15min}$	Evening $L_{Aeq,15min}$	Night $L_{Aeq,15min}$	Night $L_{A1,15min}$
Sensitive place or Commercial place	40	40	40	45

Notes:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm –10.00 pm; Night = 10.00 pm – 7.00 am.
2. Noise criteria do not apply to non-sensitive mine-owned receptors and privately-owned receptors currently under agreements.

4.4 Modifying Factor Adjustments

Tonal, low-frequency and impulsive noise have the potential to generate annoyance in the surrounding community and have therefore been considered in the assessment.

According to Table C1 of EA EPML00717813, noise limits apply to levels adjusted for tonal character ($L_{Aeq,15min}$ and $L_{A1,15min}$) and impulsiveness of the sound ($L_{A1,15min}$). Condition C3 also states that compliance assessment should be conducted according to the NMM, which requires consideration of tonality, impulsiveness and LFN.

4.4.1 Low-frequency Noise

An LFN assessment has been conducted to evaluate the likelihood that noise-sensitive receptors would be exposed to dominant LFN from the Project.

The *Ecoaccess Guideline for the Assessment of Low Frequency Noise* prescribes an assessment approach based on internal noise levels. Sound transmission through building envelopes can vary significantly between residences; therefore, internal noise level assessments are recommended only when investigating existing LFN issues through direct measurement. Owing to the uncertainties in sound transmission loss from structures, predicting and assessing internal noise levels during the planning phase is not feasible.

The *Guideline - Streamlined model conditions for petroleum activities*, relevant to operations of industrial sites in rural Queensland, provides guidance for assessing outdoor LFN. It specifies that LFN must not exceed the following external LFN assessment criteria simultaneously:

- 60 C-weighted decibels (dBC) measured outside the sensitive receptor; and
- the difference between the external A-weighted and C-weighted noise levels is no greater than 20 decibels (dB).

A summary of the LFN assessment criteria used for the Project is summarised in **Table 4-2**.

Table 4-2: Project-specific LFN Assessment Criteria

Guideline	LFN Assessment Criteria (External)
Guideline - Streamlined model conditions for petroleum activities	– 60 dBC; and – dBC – dBA ≤ 20 dB

Note:

1. The *Guideline - Streamlined model conditions for petroleum activities* does not specify a frequency range for its LFN criteria. Consequently, the criteria were assumed to apply across the full range potentially influenced by mining noise at receptor locations, namely 10 to 630 hertz (Hz).

The LFN criteria provided in the *Guideline - Streamlined model conditions for petroleum activities* are intended for use when conducting measurements following a valid LFN complaint lodged with the administrative authority. Given that the guideline does not specify any penalty for instances where LFN is identified, exceedances of the criteria should be interpreted as indicative of potential perception and annoyance, which may require confirmation through measurement.

4.4.2 Tonal Noise

The potential for the Project to generate tonal noise was considered in the assessment but deemed irrelevant and not assessed quantitatively in the assessment for the following reasons:

- Large-scale mining operations are not expected to generate tonal noise due to the large number of noise sources on site and the considerably large distances separating noise sources and receptors. Site noise for such operations would typically consist of a steady, broadband humming noise associated with diesel powered equipment.
- Mining equipment and plant generally do not produce tonal noise. While mechanical faults can sometimes cause certain machines to generate tonal noise, this assessment assumes that all equipment is properly maintained and operating in good working order.

4.4.3 Impulsive Noise

The potential for impulsive noise was considered but determined to be irrelevant due to the typical nature of maximum noise level events at open-cut coal mines. Therefore, impulsive noise was not addressed quantitatively in the assessment.

5 OPERATIONAL NOISE ASSESSMENT

5.1 Noise Modelling Methodology

5.1.1 Predictive Noise Model

Operational noise levels at nearby receptors were predicted using the Environmental Noise Model (ENM), a proprietary computer program from RTA Technology Pty Ltd. This modelling software is widely recognised by environmental authorities across Australia as one of the most appropriate and reliable predictive tools currently available.

Based on noise characteristics and locations of major mobile equipment/fixed plant, intervening terrain to nearby noise-sensitive receptors, and local meteorology, the computer model generates predictions of total operational $L_{Aeq,15min}$ noise levels from the Project (including the continued use of existing infrastructure and ongoing mining activities within the approved disturbance footprint) at each receptor.

The noise prediction model incorporates the following factors:

- location of all noise sources and receptor points;
- source and receptor heights;
- separation distances between sources and receptors;
- ground type across propagation paths;
- terrain and barrier attenuation; and
- meteorological effects.

5.1.2 Noise Assessment Scenarios

Noise modelling was undertaken for Financial Year 2030 (FY30), FY32, FY50 and FY55 assessment scenarios. These scenarios were selected to represent operations with the greatest potential for noise impacts on surrounding noise-sensitive receptors. Considerations included:

- proximity of active pits to nearby receptors (noting pits would also progress eastward throughout the life of the Project);
- mobile equipment operating in active pits;
- yearly fleet schedule (for entire site); and
- annual ROM coal production and overburden removal rates.

Table 5-1 provides a description of the rationale for selecting each scenario.

Table 5-1: Noise Assessment Scenarios and Rationale

Assessment Scenario	Rational
FY30	– High level of activities, that are relatively close to the north-east and north-west rural properties. – Considerable increase in total mobile fleet relative to prior years. – Considerable increase in annual overburden removal rate relative to prior years.
FY32	– High level of activities, that are relatively close to central-east rural properties. – Considerable increase in total mobile fleet relative to prior years. – Considerable increase in annual overburden removal rate. – Near-peak annual ROM coal production rate.
FY50	– High level of activities within SA 10, that are relatively close to the north-east and north-west rural properties. – High level of activities within SA 7 and SA 10, that are relatively close to central-east rural properties. – Peak annual overburden removal rate.
FY55	– High level of activities within SA 10, that are relatively close to the north-east and north-west rural properties. – High level of activities within SA 7 and SA 10, that are closest to central-east rural properties.

5.1.3 Meteorology

5.1.3.1 Effects of Meteorology on Noise Propagation

Certain meteorological conditions can increase noise levels by focusing sound-wave propagation paths at a receptor location. Such refraction of sound waves would occur during temperature inversions (atmospheric conditions where temperatures increase with height above ground level) and/or where there is a wind gradient (wind velocities increasing with height) toward the receptor.

With a wind gradient, when wind speed increases with altitude due to reduced friction away from the ground, the higher wind speeds aloft bend sound waves downward toward the ground in downwind conditions. This can result in an operation being heard much farther away.

During a temperature inversion, the air near the ground is cooler than the air above. Since sound travels faster in warmer air, the upper layers have a higher sound speed than the lower layers, which causes downward refraction of sound waves back toward the ground instead of dispersing upward. As a result, noise from an operation can be heard much farther away as sound waves are trapped and guided along the surface. This is especially prevalent on cloudless nights with little wind.

During inversion conditions, drainage flow wind, which is the localised drainage of cold air travelling in the direction of decreasing altitude, can also contribute to noise propagation. Drainage flow is a function of the local topography and is only relevant for receptors at a lower altitude relative to the site with no intervening higher ground (e.g. hills).

5.1.3.2 Prevalence of Noise-Enhancing Meteorological Conditions

The *Ecoaccess Guideline - Planning for Noise Control Guideline* requires that noise modelling of large and complex projects should consider meteorological conditions. The guideline provides a methodology for assessing the prevalence of noise-enhancing conditions and implementing them in the assessment process.

Gradient Winds

According to the *Ecoaccess Guideline - Planning for Noise Control Guideline*, wind effects need to be assessed where wind is considered significant and a feature of the area. This is the case where source-to-receptor wind speeds (at 10 metres [m] above ground level [AGL]) of 3 metres a second (m/s) or below occur for 30% of the time or more in any assessment period (day, evening and night) and season.

The guideline provides two ways to assess gradient winds:

1. using a wind rose to determine whether wind is a feature and only apply source-to-receptor winds if, and where, applicable (noting that if only source-to-receptor wind speeds of below 3 m/s exceed the threshold of occurrence then the highest wind speed below 3 m/s is used); or
2. assuming that wind is a feature of the area (foregoing the need to use a wind rose) and applying a 'maximum impact' scenario with 3 m/s source-to-receptor winds.

The first approach was adopted as it better reflects actual noise levels for assessment.

Wind roses provide representation of wind speeds in specific direction intervals (typically in 8 or 16 directions). However, the wind direction interval that enhances noise propagation is not represented in fixed angular spacing (like in a wind rose), but rather covers a much broader range centred on the source-receptor axis. In environmental noise modelling, ±45 degrees (°) around the source-receptor axis (and sometimes even wider) is often considered "downwind" for enhanced noise propagation.

In light of the above, gradient winds were processed following the more conservative methodology prescribed by the New South Wales (NSW) *Noise Policy for Industry* (NPfI) (NSW Environment Protection Authority, 2017), which accounts for these broader downwind conditions centred on the source-receptor axis. **Appendix C** provides a detailed description of the analysis and its results.

The analysis was based on data from the Bureau of Meteorology (BoM) weather station located at Blackwater Airport directly west of the site for the period January 2021 to December 2024. The BoM data is considered representative of the general surroundings.

Analysis of the BoM data following the NPfI methodology indicate that winds up to 3 m/s are not deemed significant during the day, evening or night periods, and therefore do not warrant assessment. As such, noise emissions were modelled under calm conditions, represented as 0.5 m/s winds in accordance with the NPfI.

Temperature Inversions

According to the *Ecoaccess Guideline - Planning for Noise Control Guideline*, temperature inversions should be assessed if they occur for more than 30% of the total night period during winter (June, July and August), where the night period is taken to be 6.00 pm to 7.00 am. If deemed a feature of the site, inversions should be assessed for the night period only (i.e. 10.00 pm – 7.00 am).

Given the site's location in a non-arid region, the guideline recommends assessing moderate inversions (stability category F) with a vertical temperature gradient of +3 degrees Celsius (°C) per 100 m.

The guideline also stipulates that drainage flow wind during inversions should only be considered for receptors at a lower altitude relative to the site with no intervening higher ground.

There are two options for deciding on temperature inversion parameters to be used:

1. using parameters determined by measurements and only assess inversions (including drainage flow) if deemed a feature of the site; or
2. assuming default parameters of moderate inversions combined with a 2 m/s source-to-receptor drainage flow where applicable.

The first approach was adopted: an analysis of BoM data (**Appendix C**) showed that moderate-to-strong inversions (stability categories F and G) occurred at levels relatively close to the 30% threshold (i.e. 26.8% in winter). Furthermore, a similar analysis using 2021 CALMET meteorological model data indicated that moderate-to-strong inversions exceeded the 30% occurrence threshold. Temperature inversions were therefore included in the assessment, assuming a moderate inversion strength applicable to non-arid regions.

With surrounding noise-sensitive receptors located at comparable altitudes relative to the site, drainage flow winds were not assessed, and temperature inversions were modelled with 0.5 m/s winds (representative of calm conditions) in accordance with the NPfI.

5.1.3.3 Assessment Meteorological Parameters

Based on the above analysis, meteorological conditions assumed for the assessment are summarised in **Table 5-2**. Whilst neutral conditions were assessed for the day and evening periods, noise-enhancing conditions were assumed at night.

Table 5-2: Assessment Meteorological Parameters

Assessment Period[1]	Classification	Meteorological Parameters
Day	Neutral	0.5 m/s source-to-receptor[2] wind combined with stability category D[3]
Evening	Neutral	0.5 m/s source-to-receptor[2] wind combined with stability category D[3]
Night	Noise-enhancing	0.5 m/s source-to-receptor[2] wind combined with stability category F[4]

Notes:

1. Day: 7.00 am – 6.00 pm; Evening: 6.00 pm – 10.00 pm; Night: 10.00 pm – 7.00 am.
2. Source-to-receptor wind direction was modelled using the closest direction in a 16-direction compass to the source-to-receptor direction.
3. Stability category D modelled using vertical temperature gradient of -0.5°C/100 m in accordance with the NPfI.
4. Stability category F modelled using vertical temperature gradient of 3°C/100 m.

With regards to air temperature and relative humidity, average values for winter months (which is generally taken to be the worst-case for noise transmission) were assumed in noise modelling. These are presented in **Table 5-3**.

Table 5-3: Air Temperature & Relative Humidity

Assessment Period[1]	Air Temperature (°C)	Relative Humidity (%)
Day	20.7	47.3
Evening	15.9	59.9
Night	12.5	75.3

Note:

1. Day: 7.00 am – 6.00 pm; Evening: 6.00 pm – 10.00 pm; Night: 10.00 pm – 7.00 am.

5.1.4 Noise Modelling Assumptions

Noise modelling was based on the following assumptions:

Scenarios

- As the Project operations would operate 24 hours, noise predictions were provided for the day (7.00 am - 6.00 pm), evening (6.00 pm - 10.00 pm) and night (10.00 pm - 7.00 am) periods, with consideration of different meteorology for each period.
- The noise modelling represents a 'typical worst-case' 15-minute operating period, assuming continuous operation of all mobile equipment (including campaign equipment) under normal operating conditions.
- For each noise-sensitive receptor, noise modelling considers the closest and most exposed in-pit coal loading location.
- Modelling conservatively assumes the train loading process to take place at both the CHPP and TCP simultaneously. This includes additional handling processes and a train on the rail loop.
- Both the CHPP and TCP trains were conservatively assumed to have four locomotives.

Sources

- Noise modelling includes all major mobile equipment and fixed plant expected to contribute to BWM's noise emissions as perceived by the surrounding noise-sensitive receptors. Mobile equipment and fixed plant not expected to contribute materially under any meteorological conditions have been omitted from the modelling.
- Travelling mobile equipment such as dump trucks (coal and waste rock), water carts and graders were modelled as line sources representing haul paths. For each path, the acoustic energy of trucks was evenly distributed along the length of the haul string. For water carts and graders, the energy was spread across all haul paths and allocated in proportion to the number of trucks using each path.
- All other mobile equipment (i.e. draglines, electric rope shovels, excavators, wheel loaders, dozers and drills) and infrastructure items were modelled as point sources.
- Trains on rail loops were modelled as line sources the length of the train, with the acoustic energy distributed equally across the length of the train to simulate the moving locomotives.
- Each conveyor system was modelled as a representative line source.

5.1.5 Mobile Equipment / Fixed Plant

The mobile fleet for the Project would mostly consist of equipment already used in the approved BWM operations. However, it is envisaged that the fleet could be subject to change throughout the life of the Project. For fixed plant, the Project would rely on the ongoing use of the existing BWM infrastructure, including the CHPP, TCP, ROM/product coal stockpiles, train load-out and rail infrastructure.

Table 5-4 presents an indicative list of mobile equipment and fixed plant considered for noise assessment. It is important to note that only the mobile equipment in service is included.

Table 5-4: Indicative Equipment Schedule

Equipment		Function	Equipment Quantity				Assessment Period[1]
			FY30	FY32	FY50	FY55	
Mobile Equipment							
Draglines	Marion 8200	Overburden removal	2	2	2	2	Day, Evening, Night
	Marion 8050	Overburden removal	3	3	3	3	Day, Evening, Night
	Bucyrus Erie 1370W	Overburden removal	2	2	2	2	Day, Evening, Night
Electric rope shovels	CAT 7495	Overburden loading	1	1	1	1	Day, Evening, Night
	P&H 4100	Overburden loading	1	1	1	1	Day, Evening, Night
Excavators	CAT 6040	ROM coal loading	1	1	1	1	Day, Evening, Night
	CAT 6060	Overburden loading	4	5	6	6	Day, Evening, Night
	Liebherr 9800	Overburden loading	4	5	5	5	Day, Evening, Night
Wheel Loaders	Komatsu WA1200	ROM coal loading	4	4	4	4	Day, Evening, Night
	Komatsu WA400	CHPP ROM stockpile	1	1	1	1	Day, Evening, Night
	Komatsu WA400	TCP ROM stockpile	1	1	1	1	Day, Evening, Night
Track Dozers	CAT D11	Overburden dozer fleet	12	12	18	18	Day, Evening, Night
	CAT D11	Pit support	21	23	24	24	Day, Evening, Night
	CAT D11	TCP product stockpile	2	2	2	2	Day, Evening, Night
	CAT D10	Pit support	8	9	8	8	Day, Evening, Night
Haul Trucks	Komatsu 930E	Overburden haulage	66	87.4	101	104	Day, Evening, Night

Equipment		Function	Equipment Quantity				Assessment Period[1]
			FY30	FY32	FY50	FY55	
	CAT 793	Overburden, ROM coal and parting haulage	9	13	13	13	Day, Evening, Night
	Kress 200CIII Coal Hauler	ROM coal haulage	8	8	8	8	Day, Evening, Night
Drills	-	Drill and blast	6	6	9	8	Day, Evening, Night
Water Carts	CAT 789	Haul road maintenance	5.1	5.6	5.6	5.6	Day, Evening, Night
	CAT 785	Haul road maintenance	1.7	1.9	1.9	1.9	Day, Evening, Night
Graders	CAT 24M	Haul road maintenance	6.5	7.5	7.5	7.5	Day, Evening, Night
	CAT 18M	Haul road maintenance	3.2	3.7	3.7	3.7	Day, Evening, Night
CHPP and TCP Fixed Plant							
CHPP	ROM hopper/primary crusher	ROM coal processing	1	1	1	1	Day, Evening, Night
	Secondary sizing station	ROM coal processing	1	1	1	1	Day, Evening, Night
	Coal preparation plant	ROM coal processing	1	1	1	1	Day, Evening, Night
	Stacker	Raw coal stockpile	1	1	1	1	Day, Evening, Night
	Stacker	Product coal stockpile	1[2]	1[2]	1[2]	1[2]	Day, Evening, Night
	Reclaimer	Product coal stockpile	2	2	2	2	Day, Evening, Night
	Rejects bin	Rejects	1	1	1	1	Day, Evening, Night
	Train loadout bin	Train loading	1	1	1	1	Day, Evening, Night
	Transfer station	Coal handling	3	3	3	3	Day, Evening, Night

Equipment		Function	Equipment Quantity				Assessment Period[1]
			FY30	FY32	FY50	FY55	
	Conveyor systems	Coal handling	-	-	-	-	Day, Evening, Night
TCP	ROM hopper/rotary breaker	ROM coal processing	1	1	1	1	Day, Evening, Night
	Rejects bin	Rejects	1	1	1	1	Day, Evening, Night
	Train loadout bin	Train loading	1	1	1	1	Day, Evening, Night
	Transfer station	Coal handling	2	2	2	2	Day, Evening, Night
	Conveyor systems	Coal handling	-	-	-	-	Day, Evening, Night
Rail							
Locomotives[3]		Train loading	8	8	8	8	Day, Evening, Night

Notes:

1. Day: 7.00 am – 6.00 pm; Evening: 6.00 pm – 10.00 pm; Night: 10.00 pm – 7.00 am.
2. Although two product coal stockpile stackers are operating at the CHPP, only one is assumed to be operating at a time.
3. Modelling assumes two trains (one at the CHPP and the other at the TCP) with four locomotives per train.

5.1.6 Equipment Sound Power Levels

Table 5-5 summarises the indicative sound power levels (SWLs) assumed for noise modelling.

Most of the nominated SWLs for mobile equipment are based on the noise assessment recently conducted for the BWM (SLR, 2023) and are consistent with RWDI's technical database.

It is noted that the SWLs do not reflect leading practice mining equipment for noise performance as the Project's mobile fleet and infrastructure would generally consist of the equipment already in use at the BWM.

Table 5-5: Indicative Equipment SWLs

Equipment	Model	SWL/Item (dBA)	SWL Reference
Mobile Equipment			
Draglines	Marion 8200	118	SLR (2023)
	Marion 8050	118	SLR (2023)
	Bucyrus Erie 1370W	118	SLR (2023)
Electric rope shovels	CAT 7495	123	SLR (2023)
	P&H 4100	123	SLR (2023)
Excavators	CAT 6040	118	SLR (2023)
	CAT 6060	125	SLR (2023)
	Liebherr 9800	126	SLR (2023)
Wheel Loaders	Komatsu WA1200	119	SLR (2023)
	Komatsu WA400	112	RWDI propriety database
Track Dozers	CAT D11	119	SLR (2023)
	CAT D10	116	SLR (2023)
Haul Trucks	Komatsu 930E	124	SLR (2023)
	CAT 793	119	SLR (2023)
	Kress 200CIII Coal Hauler	119	Kress (2016)
Drills	Drill	118	SLR (2023)
Water Carts	CAT 789	118	SLR (2023)
	CAT 785	118[1]	SLR (2023)
Graders	CAT 24M	116	SLR (2023)
	CAT 18M	113	SLR (2023)
CHPP and TCP Fixed Plant			
Coal preparation plant		120[2]	RWDI propriety database
Reclaimer		101	RWDI (2025)
Rejects bin		103[2]	RWDI propriety database
Rotary breaker/primary crusher		106	RWDI (2025)
Secondary sizing station		116[2]	RWDI propriety database

Equipment	Model	SWL/Item (dBA)	SWL Reference
Stacker		95	RWDI (2025)
Train loadout bin		108[2]	RWDI propriety database
Transfer station		110[2]	RWDI propriety database
Coal chute		98	RWDI propriety database
Conveyor systems		79/m[3]	RWDI (2025)
Rail			
Locomotive		102[4]	RWDI propriety database

Notes:

1. Conservatively based on CAT 789 water cart SWL.
2. Partly or wholly uncladded structure.
3. SWL per linear metre.
4. SWL per locomotive during loading process.

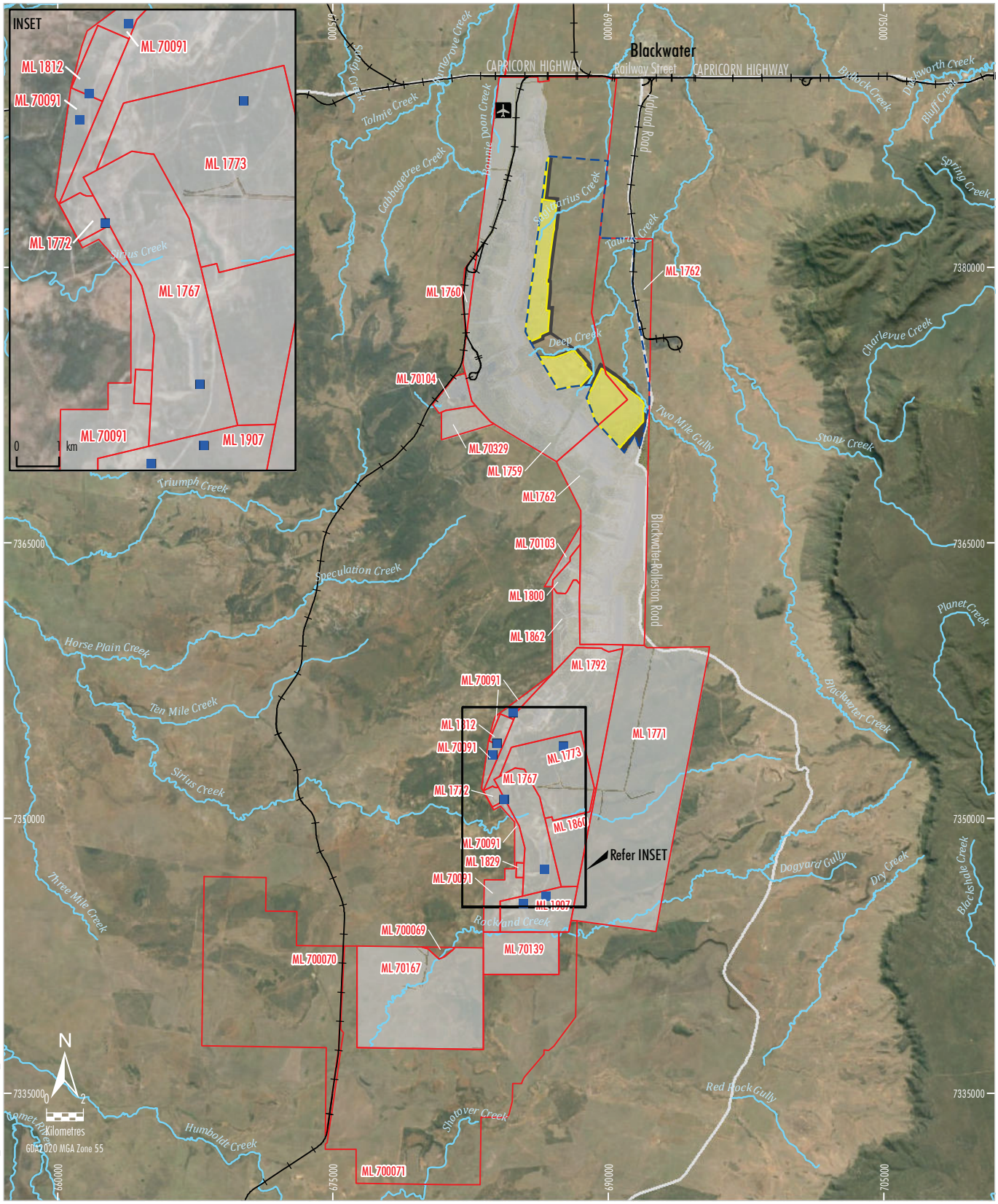
5.1.7 Quarries

It is understood that quarries would be used as part of the Project at various locations in the southern part of the BWM, in the vicinity of Laleham, Togara South and North Marshmead Pits **(Figure 5-1)**. Only one quarry would operate at any given time, with operations occurring for 12 hours per day during daytime. The equipment proposed for use at the quarries, along with their associated SWLs, are summarised in **Table 5-6**.

Table 5-6: Indicative Quarry Equipment and SWLs

Equipment	SWL/Item (dBA)	SWL Reference
100 tonne Excavator	113	RWDI (2025)
Jaw Crusher	117	RWDI (2025)
Cone Crusher	112	RWDI (2025)
Mobile Screen	109	RWDI (2025)
Trommel	109	RWDI (2025)

A sensitivity analysis was conducted and confirmed that noise generated by the quarries would not contribute to overall noise levels from the BWM at any surrounding receptors under any of the assessed scenarios. Therefore, the quarries have not been considered quantitatively in the assessment.



WHC-24-101_EA Amendment SR Noise_204A

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)
Orthophoto: Esri (2025); Whitehaven (2025)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Airport
- Approved Disturbance Footprint
- Proposed Quarry Location

Project Components[1]

- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area

Note: [1] Excludes some ancillary Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Proposed Quarry Locations

Figure 5-1

5.2 Proactive Noise Management

5.2.1 Description of Proactive Noise Management System

A proactive noise management system that would integrate predictive meteorological forecasting with real-time noise monitoring to support day-to-day operational planning would be implemented. This system would be designed to manage noise levels during periods when meteorological conditions are likely to amplify noise, therefore reduce the risk of noise-related non-compliance.

Noise-enhancing conditions would be identified through a combination of noise and meteorological data monitoring and forecasting. Noise monitoring would highlight noise level trends at a location, while meteorological data monitoring and forecasting would indicate the likelihood that these trends would persist or intensify.

The proactive noise management system would incorporate a Trigger Action Response Plan (TARP), enabling the operator to anticipate and adjust activities before potential exceedances occur. A tiered warning system would alert when noise levels from mining operations increase and approach EA EPML00717813 noise criteria. If warning trigger thresholds are exceeded, automatic alerts monitored by the Remote Operating Centre would prompt Whitehaven Blackwater to activate the TARP. Once activated, the TARP would guide the modification of mining activities to reduce intrusive noise and prevent noise exceedances.

5.2.2 Application of Proactive Noise Management System

Following initial modelling for the Project, a risk of negligible (1 dB) night-time exceedances was identified in FY50 under noise-enhancing meteorological conditions (as defined in **Table 5-2**) at receptors R20, R21, R22 and R23 located along the Capricorn Highway north-west of the site. A similar negligible (1 dB) night-time exceedance risk was also identified at receptor R11, north-east of the Project, in FY50 and FY55. For these receptors, Whitehaven Blackwater identified appropriate proactive mitigation measures that would be applied, and implementation frequencies were investigated.

5.2.2.1 Proposed Proactive Mitigation Measures

Indicative examples of proactive measures, focusing on the worst-case scenario (FY50) and season (winter), are provided in **Table 5-7**. The table also includes estimated percentages of the night period during which each mitigation measure would be required.

It is important to note that the examples of proactive measures outlined in **Table 5-7** relate specifically to the FY50 assessment scenario. While proactive mitigation would not be required for much of the Project's life (as shown in **Table 5-8**), some years may necessitate more extensive measures with higher implementation frequencies.

Table 5-7: Indicative Examples of Proactive Mitigation Measures (FY50, Winter)

Indicative Examples of Proactive Mitigation Measures	Approximate Total Site Noise Reduction	Estimated Percentage of Night Period[1,2]
R20, R21, R22 and R23 (Capricorn Highway receptors)		
Shutdown 5 haul trucks associated with the northernmost overburden fleet	1 dB	8.6 %
Shutdown 7 haul trucks associated with the northernmost overburden fleet	2 dB	10.7 %
Shutdown 8 haul trucks associated with the northernmost overburden fleet and the northernmost drill	3 dB	4.3 %
R11 (north-east rural property)		
Shutdown 7 haul trucks associated with the most exposed overburden fleet(s)	1 dB	15.2 %
Shutdown 11 haul trucks associated with the most exposed overburden fleet(s)	2 dB	6.5 %

Notes:

1. Night = 10.00 pm – 7.00 am.
2. Frequencies are based on the night period only and not the entire 24-hour period

It should be noted that, when implementing the TARP, the proactive mitigation measures outlined in **Table 5-7** are indicative examples only, and Whitehaven Blackwater may invoke other measures to maintain compliance with EA EPML00717813 noise criteria.

5.2.2.2 Implementation Frequencies

To assess whether proactive noise controls – implemented as modifications to planned operations – are feasible without impacting the overall production schedule, the periods expected to require such mitigation have been considered.

Using statistical data on local meteorological conditions from the Blackwater Airport BoM weather station (January 2021 – December 2024), along with noise predictions, an analysis was undertaken to determine how often proactive mitigation measures would be required. **Table 5-7** presents indicative seasonal frequencies of these occurrences to maintain night-time compliance at the five identified receptors. Proactive noise mitigation would also be required during the evening period, though less frequently than at night.

Table 5-8: Indicative Proactive Mitigation Measures Implementation Frequencies

Season	Night Period[1] Implementation Frequencies[2]			
	FY30	FY32	FY50	FY55
R20, R21, R22 and R23 (Capricorn Highway receptors)				
Spring	0%	0%	11.8%	0%
Summer	0%	0%	12.6%	0%
Autumn	0%	0%	21.9%	0%
Winter	0%	0%	25.1%	0%
R11 (north-east rural property)				
Spring	0%	0%	8.5%	8.1%
Summer	0%	0%	8.1%	7.7%
Autumn	0%	0%	17.1%	15.7%
Winter	0%	0%	21.7%	20.1%
All five receptors combined				
Spring	0%	0%	15.1%	8.1%
Summer	0%	0%	15.7%	7.7%
Autumn	0%	0%	27.6%	15.7%
Winter	0%	0%	32.1%	20.1%

Notes:

1. Night = 10.00 pm – 7.00 am.
2. Frequencies are based on the night period only and not the entire 24-hour period.

As shown in **Table 5-7**, proactive mitigation for the Capricorn Highway receptors would only be triggered in FY50. However, this only considers the four noise assessment scenarios. Analysis of individual noise source contributions in FY50 indicates that receptors R20 to R23 are predominantly influenced by the northernmost overburden fleet (aligned with the northern boundary of the study area). This suggests that proactive mitigation for the Capricorn Highway receptors is likely to be required in any year with substantial pit activity occurring in the northernmost area, rather than only in FY50. Conversely, proactive mitigation is generally not expected to be necessary in years when all substantial pit activities occur further south.

It is noted that pits at the north would not extend into the proposed extension areas within SA 7 and SA 10, and all pit activities in this northern area would remain within the approved disturbance footprint for the entire life of the Project.

For receptor R11, **Table 5-7** shows that proactive mitigation would be required under the FY50 and FY55 scenarios. Analysis of noise contributions suggests that it is more likely proactive mitigation would be required when a substantial number of relatively exposed overburden fleets (i.e. four or more) operate between Deep Creek Pit and Bonnie Doon Pit during the later years of the Project, when mining progresses into the proposed extension areas and closer to R11.

The proactive mitigation frequencies for the Capricorn Highway receptors (upper rows in **Table 5-7**) and for R11 (middle rows) should not be considered cumulatively, as some meteorological conditions that trigger mitigation are common between receptors (e.g. stability categories F and G with southerly wind component). The cumulative mitigation frequencies to maintain night-time compliance across all five identified receptors are presented in the lower rows of **Table 5-7**.

Whitehaven Blackwater has confirmed that the projected implementation frequencies are feasible and can be integrated into operational planning without affecting the Project schedule. The operational noise predictions are presented in **Appendix D** and discussed in **Section 5.3,** with assuming the implementation of proactive noise mitigation measures for receptor R11 in the north-east, and receptors R20, R21, R22 and R23 along the Capricorn Highway. In addition, the unmitigated operational noise predictions for these receptors are presented in **Appendix E**.

5.3 Operational Noise Predictions & Discussion

Operational $L_{Aeq,15min}$ noise predictions for all four noise assessment scenarios are presented in **Appendix D**. For each prediction, the noise level represents the assessment meteorological condition (**Section 5.1.3.3**) producing the maximum predicted value. Non-sensitive mine-owned receptors and privately-owned receptors currently under agreements are included for information only.

As described in **Section 5.2.2**, night-time noise emissions would be proactively managed to ensure compliance is achieved at receptor R11 in the north-east, and receptors R20, R21, R22 and R23 along the Capricorn Highway north-west of the site. The results presented in **Appendix D** present unmitigated noise levels, except for the Capricorn Highway receptors in FY50, and receptor R11 in FY50 and FY55, where night-time predictions include proactive mitigation.

Results indicate that noise predictions would meet EA EPML00717813 noise criteria for most of the noise-sensitive receptors. However, residual noise exceedances are found at 11 noise-sensitive receptors, including eight privately-owned receptors, as summarised in **Table 5-9**. It is understood that Whitehaven Blackwater would enter commercial noise agreements (i.e. “Alternative Arrangements” under EA EPML00717813) with these noise-sensitive receptors which may experience noise exceedances.

Figures illustrating indicative day, evening and night noise contours of EA EPML00717813 noise criteria are included in **Appendix F**. These contours represent noise levels without proactive mitigation, except in the north-east (near receptor R11) where proactive noise controls have been applied for the FY50 and FY55 night scenarios, and in the north-west (near R20, R21, R22, and R23), where proactive mitigation has been applied for the FY50 night scenario. Note that the contours are based on interpolation, and therefore **Appendix D** should be consulted for results at modelled receptors.

Table 5-9: Residual $L_{Aeq,15min}$ Noise Exceedances

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (dBA)												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Privately-Owned Residential Receptors													
R03	35	36	42	28	29	38	35	35	43	34	34	43	40/40/40
R04	35	35	42	28	29	38	34	34	42	33	33	43	40/40/40
R05	48	48	52	41	42	47	47	47	48	47	47	48	40/40/40
R06	41	41	46	33	34	42	40	40	45	40	40	44	40/40/40
R07	31	32	38	27	28	34	31	31	42	30	30	41	40/40/40
R13	33	34	38	34	34	38	38	39	43	36	37	42	40/40/40
R17	42	43	49	42	43	48	50	51	55	50	50	56	40/40/40
R19	37	38	43	38	39	44	35	35	42	34	35	42	40/40/40
Industrial Receptors													
R14	39	39	44	38	38	43	43	43	48	40	41	46	40/40/40
R46	44	45	50	44	44	51	35	35	43	43	43	48	40/40/40
R48	34	35	39	32	32	36	40	40	44	38	39	43	40/40/40

Note:

1. Noise exceedances highlighted in red.

To quantify residual noise exceedance levels, affected receptors have been classified into three exceedance categories, based on the maximum noise impact observed across all time periods and assessment scenarios. The categories are defined as follows:

- Negligible: 1-2 dB above EA EPML00717813 noise criteria.
- Marginal: 3-5 dB above EA EPML00717813 noise criteria.
- Significant: >5 dB above EA EPML00717813 noise criteria.

Table 5-10 provides a summary of the residual noise exceedance levels for the eight privately-owned receptors predicted to experience exceedances.

Table 5-10: Residual Noise Exceedance Levels at Privately-owned Receptors

Exceedance Category	Number of Receptors	Receptor IDs
Negligible (1-2 dB)	1	R07
Marginal (3-5 dB)	4	R03, R04, R13, R19
Significant (>5 dB)	3	R05, R06, R17

In addition, there are three non-sensitive industrial receptors that would potentially experience residual noise exceedances. These non-sensitive industrial receptors are Cook Colliery and associated rail loading facility (R14 and R46), as well as a resource recovery centre (R48). It is noted that the Cook Colliery and associated rail loading facility have temporarily ceased operations.

5.4 Night-time Maximum Noise Level Event Assessment

Night-time maximum noise level events associated with the Project and with the potential to cause sleep disturbance were considered in the assessment. The night-time maximum noise level event assessment was based on EA EPML00717813 $L_{A1,15min}$ noise criterion (**Table 4-1**).

5.4.1 Assumptions and Methodology

The night-time maximum noise level event SWLs adopted for the assessment are summarised in **Table 5-11**. Because no site-specific measurements were available, the assessment adopted highly conservative SWLs for impact noise generated by mobile equipment. For fixed infrastructure impact noise, the SWL reflects the upper end of the typical L_{AFmax} SWL range from comparable sites. It is noted that that $L_{A1,15min}$ SWLs are expected to be lower than L_{AFmax} SWLs; however, $L_{A1,15min}$ SWLs were conservatively assumed to be equivalent to L_{AFmax} SWLs for assessment purposes. As a result, it is expected that actual night-time maximum noise level events from the Project would a lot of the times have lower SWLs.

Table 5-11: Night-time Maximum Noise Level Event Sources and SWLs

Night-time Maximum Noise Level Event Sources	L_{AFmax} SWL[1] (dBA)
Impact noise associated with mobile equipment (draglines, electric rope shovels, excavators, track dozers, wheel loaders and haul trucks)	128
Fixed infrastructure impact noise	125

Notes:

1. $L_{A1,15min}$ SWLs were conservatively assumed to be equivalent to L_{AFmax} SWLs for assessment purposes.

The $L_{A1,15min}$ noise assessment applied the same night-time noise-enhancing meteorological conditions (**Section 5.1.3.3**) and scenario assumptions (**Section 5.1.4**) used for the $L_{Aeq,15min}$ operational noise assessment.

All potential night-time maximum noise level events were modelled in the ENM, with only the highest predicted $L_{A1,15min}$ level considered for each receptor. Because these night-time maximum noise level events would occur during ongoing operations, the highest $L_{A1,15min}$ level was added to the corresponding $L_{Aeq,15min}$ operational noise level (**Appendix D**) prior to comparison with EA EPML00717813 $L_{A1,15min}$ criterion. This approach may be conservative in some instances, as predicted $L_{Aeq,15min}$ noise emissions and night-time maximum noise level events may reflect different controlling meteorological conditions unlikely to occur simultaneously.

5.4.2 Maximum Noise Level Event Predictions & Discussion

Night-time $L_{A1,15min}$ noise predictions are presented in **Appendix G**. Non-sensitive mine-owned receptors and privately-owned receptors currently under agreements are included for information only.

Noise results indicate that night-time $L_{A1,15min}$ noise levels would comply with EA EPML00717813 $L_{A1,15min}$ criterion for most noise-sensitive receptors with applicable noise criteria (47 out of 52 receptors). However, residual $L_{A1,15min}$ exceedances are found at five noise-sensitive receptors, including three privately-owned receptors, as summarised in **Table 5-12**. These receptors were also identified as exceeding EA EPML00717813 $L_{Aeq,15min}$ criterion (**Section 5.2.2.2**) and are expected to enter commercial noise agreements with Whitehaven Blackwater (i.e. "Alternative Arrangements" under EA EPML00717813).

It is noted that the two non-sensitive industrial receptors – Cook Colliery and associated rail loading facility – have temporarily ceased operations and, by their nature, are not sensitive to sleep disturbance (i.e. they are workplaces rather than residences).

Table 5-12: Residual $L_{A1,15min}$ Noise Exceedances

Rec ID	$L_{A1,15min}$ Night-time Maximum Noise Predictions (dBA)				BWM EA $L_{A1,15min}$ Noise Criteria (dBA)
	FY30	FY32	FY50	FY55	
Privately-Owned Residential Receptors					
R05	56	50	52	52	45
R06	48	45	47	46	45
R17	50	49	56	57	45
Industrial Receptors					
R14	44	44	48	47	45
R46	51	56	44	51	45

Note:
1. Noise exceedances highlighted in red.

Results indicate that $L_{A1,15min}$ noise levels would typically emerge over predicted $L_{Aeq,15min}$ operational noise levels by 1-4 dB at most receptor locations. This is consistent with RWDI's experience from attended monitoring around open cut coal mines and is largely attributable to the high overall site SWLs.

5.5 Low-frequency Noise Assessment

An assessment was conducted to evaluate the likelihood that LFN from the Project may potentially be perceived by the community and cause annoyance.

5.5.1 Representative Receptors

For practical reasons, the LFN assessment was conducted on a selection of key privately-owned residential receptors deemed representative of various zones with similar expected LFN content.

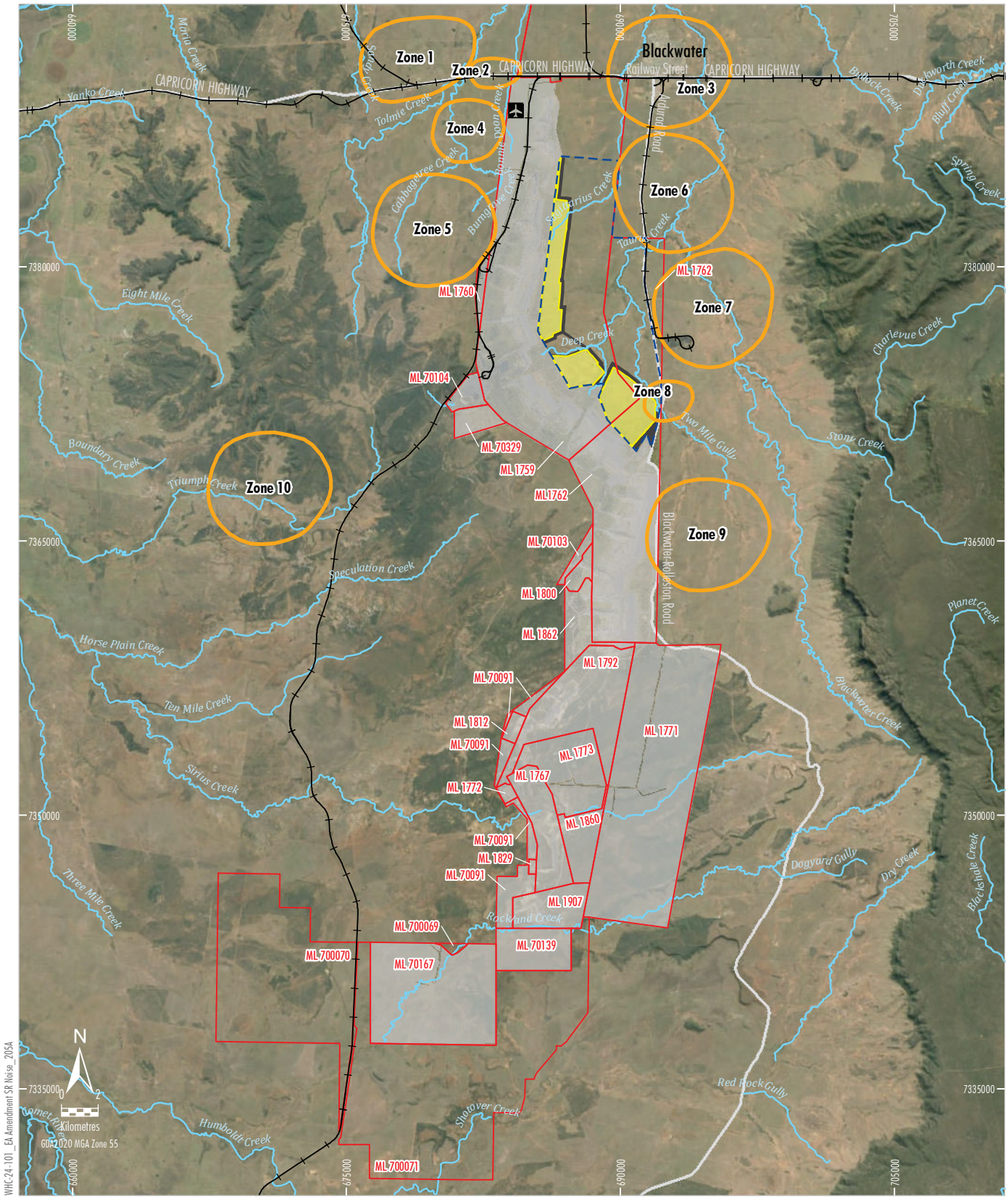
Figure 5-2 shows the location of the LFN zones. Representative receptors are included in **Table 5-13**.

The criteria used for the LFN assessment (**Table 4-2**) include the difference between C-weighted and A-weighted levels to identify the potential for an unbalanced spectrum. As noise with unbalanced spectra do not necessarily occur at the closest and most impacted receptor, receptors located further away from the Mine were also included.

Table 5-13: LFN Zones & Representative Receptors

LFN Zone	Representative Receptors	Bearing from Site
1	R40	North-west
2	R22	North-northwest
3	R53	North-east
4	R07	West

LFN Zone	Representative Receptors	Bearing from Site
5	R06	West
6	R11	East
7	R13	East
8	R17	East
9	R19	East
10	R43	West



WHC-24-101_EA Amendment SR Noise_205A

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)
Orthophoto: Esri (2025); Whitehaven (2025)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Airport
- Approved Disturbance Footprint
- LFN Zones

Project Components[1]

- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area

Note: [1] Excludes some ancillary Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

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LFN Zones

Figure 5-2

5.5.2 Low-frequency Noise Results

LFN predictions, assessed against the relevant criteria (**Table 4-2**), are summarised in **Table 5-14**. The assessment has focused on the night period where potential LFN issues are expected to be most significant due to noise-enhancing meteorological conditions. Exceedances are shown in red.

Table 5-14: LFN Results (Night)

LFN Zones	LFN Predictions (dBC)[1]				dBC – dBA[1]			
	FY30	FY32	FY50	FY55	FY30	FY32	FY50	FY55
1	50	48	53	52	18.8	20.0	17.2	17.9
2	51	49	56	54	17.7	19.0	15.5	16.5
3	47	44	51	50	16.2	17.2	15.1	16.5
4	54	52	57	56	16.6	18.5	15.8	16.3
5	60	58	60	60	14.6	16.4	15.3	15.5
6	52	50	56	56	15.6	15.8	15.5	15.7
7	53	52	57	57	15.1	15.4	14.8	15.2
8	62	61	67	68	13.2	13.6	12.5	12.0
9	58	58	58	58	15.1	13.7	16.5	16.3
10	40	40	44	44	16.4	16.9	17.6	17.3

Note:

1. The *Guideline - Streamlined model conditions for petroleum activities* is based on noise levels within the range 10 to 630 Hz.

Assessment against the *Guideline – Streamlined model conditions for petroleum activities* LFN outdoor criteria shows compliance at all zones. While Zone 8 is predicted to experience LFN above 60 dBC, the difference between the external C-weighted and A-weighted noise level is expected to remain below 20 dB, therefore demonstrating compliance.

In conclusion, the LFN assessment results suggest that the Project is unlikely to generate LFN that could be perceived by the community and cause annoyance. It is understood that Whitehaven Blackwater would conduct monitoring and implement appropriate measures should any LFN impacts be experienced by the community.

5.6 Cumulative Noise Assessment

The EPP (Noise) requires that, to the extent it is reasonable to do so, noise must be managed to prevent or minimise 'background creep'. This term refers to the gradual increase in the overall background noise level in an area, as measured and quantified under the NMM. The policy's explanatory notes (QLD Government, 2019) state that the aim is to ensure background noise does not steadily increase over time to a level that becomes unreasonable for the area.

To minimise background creep in the areas surrounding the Project, the assessment has considered cumulative noise from the Project and nearby industries, and assessed it against the (site-specific) EA EPML00717813 noise criteria. This approach would ensure background noise from all industrial operations (including the Project) is not deemed unreasonable for the area as it does not exceed the levels permitted for the approved BWM operations.

5.6.1 Nearby Industrial Operations

The Curragh Mine Complex, including the Curragh Coal Mine and Mammoth Underground Mine, located approximately 6 km north of Blackwater, was identified as the only nearby industrial operation with the potential to contribute to cumulative noise levels in the areas surrounding the Project.

While the Cook Colliery (R46) and its associated rail loading facility (R14) were included in the assessment as receptors, they have temporarily ceased operations in November 2025, and therefore were not considered as noise sources in the cumulative noise assessment. Similarly, the nearby quarry (R49) and the resource recovery centre (R48) were assessed as receptors but not treated as industrial noise sources for the cumulative assessment, as their noise emissions are not expected to affect nearby receptors.

5.6.2 Cumulative Noise Predictions

Noise impact assessments associated with the existing and future Curragh Mine Complex operations were not publicly available at the time this report was prepared. As such, the cumulative assessment relied on the consolidated Curragh Mine Complex EA EPML00643713.

In the absence of noise predictions, Curragh Mine Complex noise was conservatively assumed to just comply with the Curragh Mine Complex EA EPML00643713 noise criteria at the closest and most exposed receptors to the Curragh Mine Complex along the northern boundary of Blackwater, namely receptors R52, R56 and R59. To estimate Curragh Mine Complex noise levels at receptors closer to the BWM site, the levels at R52, R56, and R59 were adjusted to reflect the additional distance between those north Blackwater receptors and the other receptors further south.

For the cumulative assessment, the Curragh Mine Complex noise levels (adjusted where necessary) were added to the Project noise levels, based on the maximum impacts observed across all assessment scenarios. **Table 5-15** presents the resulting cumulative noise levels for receptors in areas most likely to experience cumulative impacts.

Table 5-15: Cumulative Noise Predictions

Receptor Area	$L_{Aeq,15min}$ Noise Predictions (dBA)									BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	Project[1]			Curragh Mine Complex			Cumulative			
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
North Blackwater[2]	31-32	32-33	35-36	42	42	37	42	42-43	39	40
South-west Blackwater[3]	35	36	39	36[5]	36[5]	31[5]	39	39	40	40

Receptor Area	$L_{Aeq,15min}$ Noise Predictions (dBA)									BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	Project[1]			Curragh Mine Complex			Cumulative			
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	
Capricorn Highway North-west of BWM[4]	30	30	40[6]	31[5]	31[5]	26[5]	33	34	40[6]	40

Notes:

1. Project noise levels based on the maximum noise impact observed across all assessment scenarios.
2. North Blackwater represented by receptors R52, R56 and R59.
3. South-west Blackwater represented by receptor R54.
4. Capricorn Highway north-west of the BWM represented by receptor R20.
5. Level estimated from Curragh Mine Complex noise contribution at receptors in north Blackwater, by applying conservative corrections for additional geometrical spreading, air absorption and ground effects.
6. Noise level incorporates proactive noise mitigation measures.
7. Noise exceedances highlighted in red.

As shown in **Table 5-15**, cumulative noise levels in north Blackwater may exceed EA EPML00717813 noise criteria during the day and evening periods. At these receptors, exceedances would already occur due to noise from the Curragh Mine Complex, and the Project's contribution – which is significantly lower than that of the Curragh Mine Complex – would have a negligible influence on overall cumulative levels and is not expected to contribute to background creep.

It is noted that cumulative exceedances of EA EPML00717813 noise criteria are based on the assumption that daytime and evening Curragh Mine Complex noise emissions are higher than at night. In practice (and assuming Curragh Mine Complex activities would remain consistent over the 24-hour period), this is unlikely, as night-time conditions typically enhance noise propagation and result in higher noise levels.

In south-west Blackwater and along the Capricorn Highway (north-west of the BWM), cumulative noise levels are expected to comply with EA EPML00717813 noise criteria, noting that this assumes the implementation of proactive noise mitigation for the Capricorn Highway receptors. Preliminary analysis of cumulative noise at other nearby receptors indicates that compliance would also be achieved at all other surrounding locations, including receptors in central Blackwater and rural properties along Oliffe Road.

As the Project and nearby industries would generally comply with the site-specific EA EPML00717813 noise criteria, it is possible to conclude that the Project would therefore not result in unreasonable background noise levels for the area.

6 ROAD TRAFFIC NOISE

The Project does not involve any increase in the annual ROM coal production rate, and peak operational workforce numbers would generally remain consistent with the currently approved BWM operations. It is also expected that the number of deliveries and contractors accessing the site would remain generally unchanged.

While construction activities associated with the Project would require some additional personnel, the small number of workers involved and the relatively short construction periods mean that any increase in road traffic noise would be negligible when compared with traffic noise from the approved operations and existing baseline traffic levels.

Given these considerations, further assessment of road traffic noise associated with the Project was not considered necessary, and is therefore not discussed further.

7 RAIL TRANSPORTATION NOISE

The Project does not propose any changes to the currently approved BWM coal transport rate. As with existing operations, peak coal production would generate an annual daily average of five to six laden trains to the CHPP, and an annual weekly average of two to three laden trains to the TCP.

Accordingly, an assessment of rail transportation noise associated with the Project along the rail network was not considered necessary and is not discussed further in this assessment.

8 BLASTING ASSESSMENT

8.1 Introduction

Blasting for the Project would continue in line with current practices at the BWM, occurring approximately one to three times per week. Blasts are used to break overburden and interburden, including through-seam blasting when required, typically at depths between 6 m and 65 m. Depending on operational needs, blasting may take place on any day of the week during daylight hours. The primary explosive used is ammonium nitrate-fuel oil (ANFO), which is the most commonly used blasting agent in the Queensland mining industry.

An assessment was conducted to evaluate potential impacts from blasting activities within the proposed open-cut extension area on nearby receptors and public infrastructure (including roadways, railways, water pipelines and electricity transmission lines).

8.2 Blast Impact Assessment Criteria

Under EA EPML00717813, blasting activities must comply with the vibration and airblast overpressure criteria outlined in Tables C2 and C3 of EA EPML00717813 (summarised in **Table 8-1)**. According to Conditions C5 and C7, those criteria must be achieved at all surrounding sensitive and commercial places (refer to **Section 3** for definitions) so as not to cause any environmental noise nuisance.

The criteria summarised in **Table 8-1** are adopted as human comfort noise and vibration criteria for all identified receptors, with the exception of non-sensitive receptors. It is noted that EA EPML00717813 blast criteria are more stringent than the building damage criteria; therefore, achieving compliance with the human comfort criteria would ensure compliance with the building damage criteria.

Table 8-1: EA EPML00717813 Blast Criteria

Receptors	Parameter	Blast Criteria
All receptors (except non-sensitive receptors)	Ground vibration	5 millimetres per second (mm/s) peak particle velocity[1] (PPV) for nine out of ten consecutive blasts and not greater than 10 mm/s PPV at any time
	Airblast overpressure	115 dBL Peak (dB [Linear peak]) for nine out of ten consecutive blasts and not greater than 120 dBL Peak at any time

Note:

1. PPV corresponds with vector peak particle velocity (VPPV) as per the *Guideline – Noise and Vibration from Blasting* (DES, 2022) .

8.3 Prediction of Airblast Overpressure and Ground Vibration Levels

Airblast overpressure and ground vibration levels from blasting are related to the "scaled distance" from the blast, which is defined as:

- Scaled distance $= \frac{D}{W^{1/3}}$ for airblast overpressure; and
- Scaled distance $= \frac{D}{W^{1/2}}$ for ground vibration,

where D is the distance from the blast in m and W is the maximum instantaneous charge (MIC) of explosive in kilograms (kg) of ANFO equivalent.

Predictive curves relating scaled distance to overpressure and ground vibration levels were developed using blast monitoring data collected across multiple sites, typically at distances between 2 km and 7 km. RWDI has used data from over 7,600 blast records from operations in the Hunter Valley, NSW, to derive these relationships. Those predictive curves allow for the prediction of not the mean level of overpressure or vibration, as in a standard "site law" or Australian Standard (AS) 2187.2, but the 95th percentile value, representing the level which would be exceeded by only 5% of blasts, given the inherent variability in overpressure or vibration for the same scaled distance. It is also noted that the predictive curves have shown general consistency with monitoring records at various sites across Australia.

The underlying datasets, together with the derived prediction curves (valid for distances up to 10 km), are presented in **Appendix I**.

For airblast overpressure, the data is best represented by a curvilinear relationship with the logarithm of scaled distance:

- Overpressure (dB) = 201.1 – 62.313 log(SD) + 10.79 (log[SD])^2

where SD is the scaled distance for overpressure.

For ground vibration, the relationship was found to be linear when expressed in terms of the logarithm of PPV:

- Log(PPV) = 3.015 - 1.4359 log(SD)

where SD is the scaled distance for vibration.

These equations were applied to predict airblast overpressure and ground vibration levels for the blasting assessment.

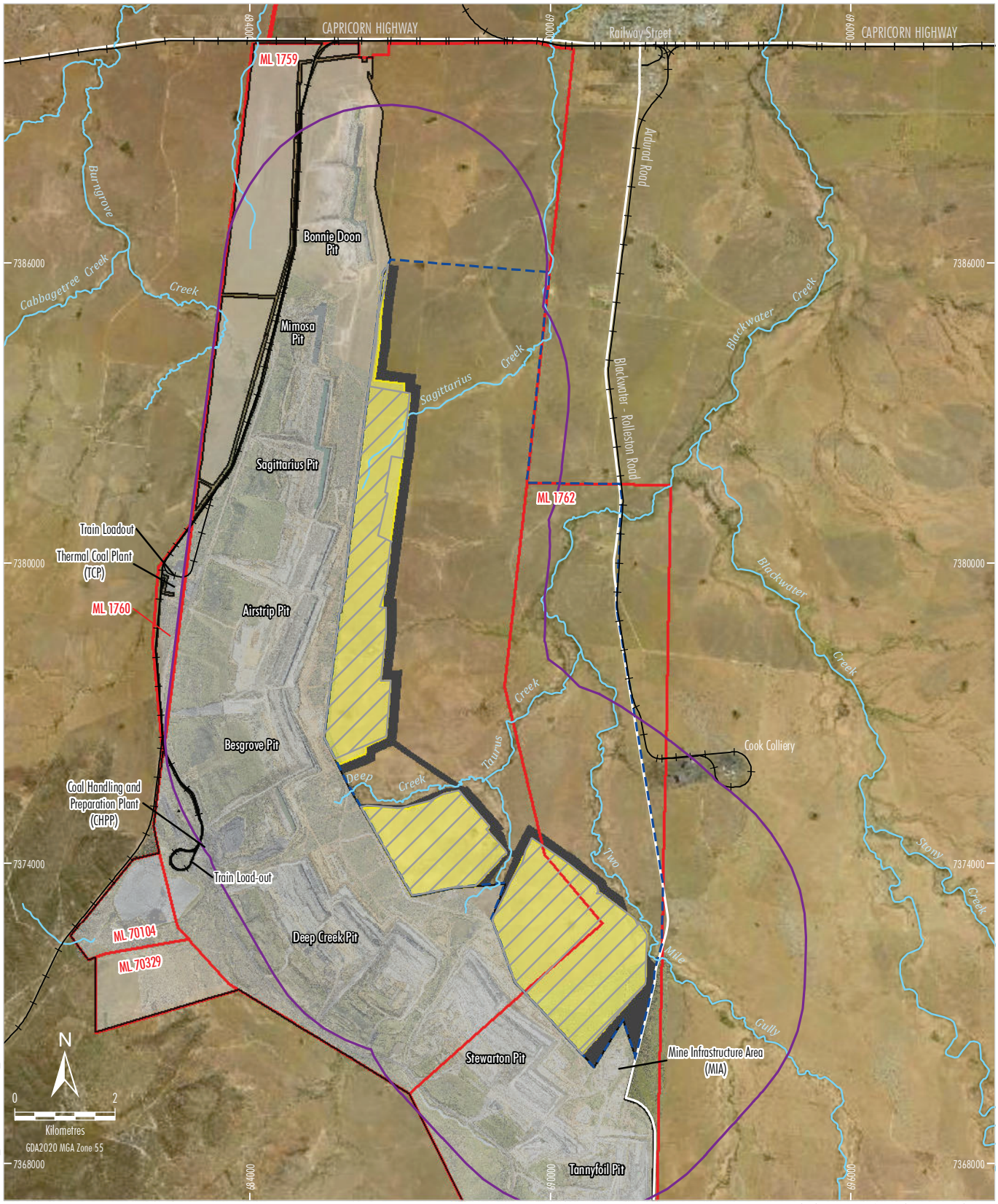
8.4 Blasting Minimum Compliance Distances

Blast design parameters and shot sizes would vary throughout the life of the Project, influenced by factors such as blast application, coal seam depth, and open-cut bench configuration. Assuming that any blast size may be required within the proposed blasting areas, minimum offset distances to achieve compliance were established for three representative blast types. The assessment adopted MICs consistent with the upper range of those typical used at the BWM:

- pre-split blast: MIC of 550 kg;
- coal blast: MIC of 1,000 kg; and
- production blast: MIC of 4,500 kg.

Compliance distances, relative to the proposed blasting areas, are provided in **Table 8-2**.

Figure 8-1 shows the proposed blasting areas and the minimum compliance distances for large production blasts at the BWM (4,500 kg MIC). For receptors, the minimum compliance distances are based on the controlling criterion, namely the human comfort airblast overpressure criterion.



LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Approved Disturbance Footprint
- Proposed Blasting Areas
- Minimum Compliance Distances (MIC 4500kg)
- Receptors

Project Components[1]

- Study Area
- Proposed Open Cut Extension
- Proposed Infrastructure Area

Note: [1] Excludes some ancillary Project components such as water management, access tracks, topsoil stockpiles, power supply, temporary offices, and other ancillary works and construction disturbance.

Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2025)
Orthophoto: Queensland Department of Resources (2017); Whitehaven (2025)

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BLACKWATER NORTH EXTENSION PROJECT

Minimum Compliance Distances for Large Production Blasts (4,500 kg MIC)

Figure 8-1

Table 8-2: Blasting Minimum Compliance Distances

Receptors	Parameter	Blasting Criteria	Required Distance to Comply (m)		
			550 kg MIC	1,000 kg MIC	4,500 kg MIC
Human Comfort					
All receptors (except non-sensitive receptors)	Ground vibration	5 mm/s VPPV	962	1,297	2,752
	Airblast overpressure	115 dBL (Peak)	1,580	1,929	3,184

8.5 Discussion

Most receptors are located outside the minimum compliance distances identified in **Table 8-2**; however, receptor R17, situated approximately 630 m from the proposed blasting areas, lies within the minimum compliance distance for all three blast types. To achieve compliance at R17, the MIC for blasts at the closest point within the Stewarton Pit blasting area would likely need to be limited to 35 kg.

For other pits within the proposed blasting areas, typical blasting activities are expected to comply with receptor criteria without restrictions. However, it is anticipated that MIC limitations may be necessary should very large production blasts exceeding 7,300 kg MIC be used at Deep Creek Pit.

Notwithstanding the above, based on blast management practices currently implemented at the BWM, it is expected that airblast overpressure and ground vibration from the Project can be effectively controlled to meet all blasting criteria and minimise the risk of significant impacts at surrounding receptors.

9 CONCLUSION

This assessment has evaluated the potential noise and blasting impacts associated with the Project against EA EPML00717813 and with reference to the relevant Queensland legislation and guidelines.

The key findings are summarised below:

- The operational noise assessment has indicated that the majority of surrounding noise-sensitive receptors would comply with EA EPML00717813 $L_{Aeq,15min}$ noise criteria under all assessed scenarios. Residual exceedances were identified at 11 receptors, including eight privately-owned receptors and three non-sensitive industrial receptors; however, these receptors are expected to be subject to commercial noise agreements with Whitehaven Blackwater (i.e. "Alternative Arrangements" under EA EPML00717813).
- The assessment has assumed a proactive noise management system – including predictive meteorological forecasting, real-time noise monitoring, and a TARP – would be implemented to maintain ongoing compliance at receptors along the Capricorn Highway north-west of the site, and at receptor R11 to the north-east of the site. Analysis of implementation frequencies has confirmed that these proactive measures are feasible and can be integrated into operational planning without affecting the Project schedule.
- The assessment of night-time maximum noise level events has predicted compliance at all but five receptors, including three privately-owned receptors and two non-sensitive industrial receptors. These receptors are among the receptors subject to $L_{Aeq,15min}$ operational noise exceedances, and are expected to enter commercial noise agreements with Whitehaven Blackwater (i.e. "Alternative Arrangements" under EA EPML00717813).
- The LFN assessment results suggest that the Project is unlikely to generate LFN that could be perceived by the community and cause annoyance.
- The cumulative noise assessment has confirmed that the Project together with nearby industries would generally comply with the site-specific EA EPML00717813 noise criteria, indicating the Project would not lead to unreasonable background noise levels in the area. It is noted that day and evening exceedances are expected in north of Blackwater under conservative assumptions. Such exceedances are attributable to existing Curragh Mine Complex noise contributions, with the Project's contribution being generally negligible and not materially influencing cumulative levels.
- Given that the Project does not involve any increase in public road traffic or rail movements, additional impacts from road traffic and rail transportation noise are not expected and did not warrant further assessment.
- The blasting assessment has indicated that localised MIC restrictions would be required at Stewarton Pit to maintain compliance at receptor R17. Based on current blast management practices at the BWM, it is expected that airblast overpressure and ground vibration from the Project can be effectively controlled to meet all blasting criteria and minimise the risk of significant impacts at surrounding receptors.

10 STATEMENT OF LIMITATIONS

This report entitled *Blackwater North Extension Project – Noise and Blasting Assessment*, dated 1 April 2026, was prepared by RWDI Australia Pty Ltd ("RWDI") for Whitehaven Coal Limited ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

11 REFERENCES

Department of Environment and Heritage Protection (2016) *Ecoaccess Guideline - Planning for Noise Control Guideline*

Department of Environment and Science (2020) *Noise Measurement Manual*

Department of Environment and Science (2022) *Guideline – Noise and Vibration from Blasting*

Department of Environment, Science and Innovation (2024) *Guideline - Streamlined model conditions for petroleum activities*

Department of Environment, Science and Innovation (2025) *Guideline – Application requirements for activities with noise impacts*

EMM Consulting Pty Ltd (2021) *B180329_R5_Northern baseline noise levels_v.01*

Environmental Protection Agency (2004) *Ecoaccess Guideline for the Assessment of Low Frequency Noise*

NSW Environment Protection Authority (2017) *Noise Policy for Industry*

QLD Government (2019) *Environmental Protection (Noise) Policy 2019 – Explanatory notes for SL 2019 No. 154*

RWDI (2025) *Maules Creek Coal Mine Continuation Project – Noise and Blasting Assessment*

SLR Consulting Australia Pty Ltd (2023) *Blackwater Mine – North Extension Project – Noise and Vibration Impact Assessment*

Wilkinson Murray Pty Limited (2016) *Bulga Village Noise Audit – Final Report*

APPENDIX A

GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

L_{AFmax} – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The noise level which is exceeded for 1 percent (%) of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

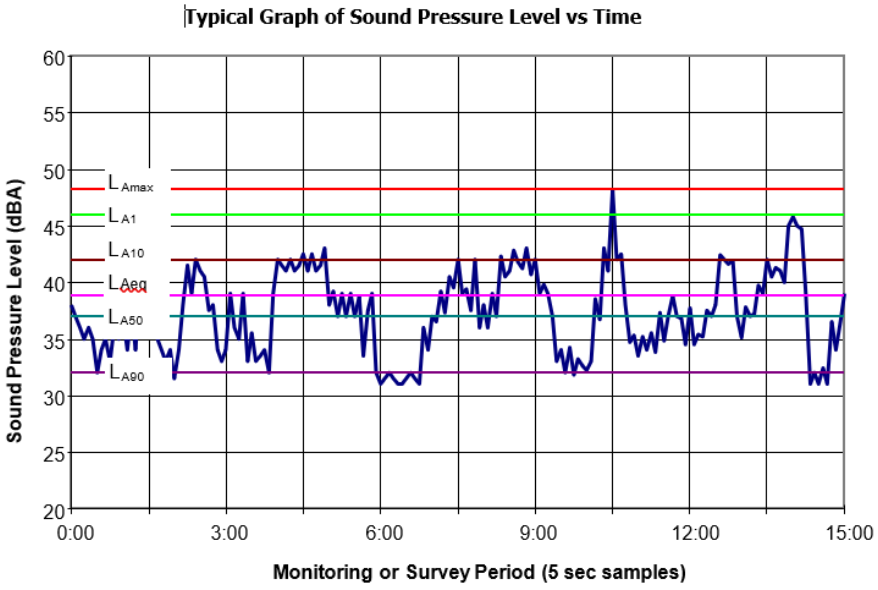
L_{A10} – The noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (day, evening and night) for each day. It is determined by calculating the 10th percentile (lowest 10%) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is, therefore, a RBL value for each period – day, evening and night.



APPENDIX B

LAND OWNERSHIP DETAILS

Table B-1: Privately-owned Residential Receptors

Rec ID	Landholder	Coordinates (GDA 2020 / MGA zone 55)	
		Easting	Northing
Privately-owned Residential Receptors			
R03	Tolmies Creek Homestead (HS)	680506	7383036
R04	Tolmies Creek HS	680046	7382848
R05	Ausbute HS	682295	7381314
R06	-	681271	7381884
R07	Burngrove HS	682199	7387165
R09	Minyango HS	692174	7388618
R10	Cardona HS	695420	7391637
R11	Tantallon HS	693741	7382883
R13	Yarrawonga HS	695598	7377492
R17	Retreat HS	692554	7372690
R19	Tannyfoil HS	696492	7366393
R20	-	683854	7390585
R21	-	683725	7390717
R22	-	683471	7390656
R23	-	683386	7390637
R24	-	683088	7390869
R25	-	682852	7390613
R26	-	682776	7390604
R27	-	682564	7390721
R28	-	682268	7390548
R29	-	682136	7390744
R30	Tulloch Ard HS	680696	7391034
R31	-	680210	7390623
R32	Maryvale HS	677776	7389581
R33	Malamy HS	679048	7391412
R34	Malamy HS	679029	7391655
R35	Sherborne HS	678311	7391482
R36	-	678413	7392228
R37	-	678517	7392258
R39	-	681182	7392608
R40	-	679512	7391279
R41	-	681184	7392609
R42	Monash HS	669266	7367221

Rec ID	Landholder	Coordinates (GDA 2020 / MGA zone 55)	
		Easting	Northing
Privately-owned Residential Receptors			
R43	-	670323	7368118
R52	Generic Blackwater Town - North	692157	7392658
R53	Generic Blackwater Town - Centre	692206	7391333
R54	Generic Blackwater Town – South-west	690784	7390455
R55	Generic Blackwater Town - East	693500	7391743
R56	Generic Blackwater Town – North-west	691688	7392501

Table B-2: Other Receptor Types

Rec ID	Description	Coordinates (GDA 2020 / MGA zone 55)	
		Easting	Northing
Other Receptor Types			
R57	Blackwater Hospital	691683	7391888
R58	Medical centre	692697	7391586
R59	Blackwater North State School	692620	7392600
R60	Blackwater State High School	692235	7391939
R61	Blackwater State School	691617	7390472
R62	C&K Childcare Centre	691330	7391139
R47	Blackwater Lawn Cemetery	691633	7386604
R63	Camp Accommodation	692964	7390493

Table B-3: Non-sensitive Receptors

Rec ID	Landholder	Coordinates (GDA 2020 / MGA zone 55)	
		Easting	Northing
Mine-owned Receptors			
R01	Whitehaven Coal Limited (Whitehaven)	682332	7383198
R02	Whitehaven	683118	7383184
R12	Whitehaven	690992	7380267
R50	Blackwater Mine (BWM) Airport	684514	7388628
R51	BWM Airport caretaker	684398	7388526
Privately-owned Receptors Currently Under Agreements			
R15	Taurus HS	688762	7374534
R16	Stewerton HS	691913	7373114
Commercial/Industrial Receptors			
R14	Qcoal (Cook Colliery - north)	693576	7375833
R46	Qcoal (Cook Colliery - south)	692423	7363643
R48	Resource recovery centre	691184	7385223
R49	Quarry	677837	7382368
R64	Blackwater Water Treatment Plant	691286	7389259

APPENDIX C

METEOROLOGY

C.1 Assessment of Gradient Winds

For each season and assessment period (i.e. day, evening, night), the following process was followed:

1. Convert sigma-theta observations from raw data into Pasquill-Gifford (PG) stability categories using the sigma-theta methodology prescribed in the *Noise Policy for Industry* (NPfI) (New South Wales Environment Protection Authority, 2017). We assumed a surface roughness of 0.1 metres (m).
2. Cull out any data with PG stability category other than A, B, C or D and winds greater than 3 metres per second (m/s) (where winds are rounded to one decimal place).
3. Group all wind directions into a 16-direction wind compass (22.5 degree (°) angle per direction), with North ranging 348.75° – 11.25°.
4. For each of the above 16 directions, add the four closest directions (2 x 22.5° arcs on either side) to generate 16 totals (112.5° angle per direction).
5. Divide the number of entries in each of the 16 totals over base data (for each season and assessment period individually) to establish a percentage of occurrence.
6. Assess percentage of occurrence against occurrence threshold of 30%. If a source-to-receptor wind is found to occur for 30% or more (rounded to one decimal place), a 3 m/s light wind in the direction in question is considered a feature of the area.

Table C-1 summarises percentages of occurrence for the worst-case seasons, noting the frequencies are conservative in that they consider all winds within a 112.5° angle. Results indicate that all winds up to 3 m/s are below the 30% threshold and are thus not considered a feature of the area.

Table C-1: Frequencies of Occurrence – Gradient Winds

Wind Direction	Day	Evening	Night
N	10.3%	1.7%	3.1%
NNE	11.6%	2.9%	6.3%
NE	12.1%	4.1%	8.1%
ENE	11.3%	4.6%	8.9%
E	11.3%	5.3%	8.9%
ESE	11.7%	5.0%	7.3%
SE	12.3%	5.0%	6.0%
SSE	11.7%	4.8%	5.7%
S	11.5%	4.9%	4.6%
SSW	10.8%	4.2%	4.2%
SW	9.8%	3.4%	3.7%
WSW	8.4%	2.2%	2.3%
W	6.7%	1.2%	1.2%
WNW	6.6%	0.6%	0.4%
NW	8.0%	0.7%	0.4%
NNW	8.7%	0.9%	0.9%

C.2 Assessment of Temperature Inversions

For each season, the following process was followed:

1. Convert sigma-theta observations from raw data into PG stability categories using the sigma-theta methodology prescribed in the NPfI. We assumed a surface roughness of 0.1 m.
2. For the night-time period 6.00 pm – 7.00 am, cull out any data with PG stability category other than F or G.
3. Divide the number of resultant samples over the total night-time data (including all PG stability categories [A-G]), for each season individually, to establish a percentage of occurrence.
4. Assess percentage of occurrence (rounded to one decimal place) against 30% threshold of occurrence.

Table C-2 summarises frequencies of occurrence of moderate-to-strong temperature inversions for each season. Inversions are found to be below but relatively close to the 30% threshold of occurrence (i.e. 26.8% in winter).

Table C-2: Frequencies of Occurrence - Temperature Inversions

Spring	Summer	Autumn	Winter
16.5%	15.7%	22.2%	26.8%

APPENDIX D

OPERATIONAL NOISE PREDICTIONS

Table D-1: Operational Noise Predictions - Privately-owned Residential Receptors

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (A-weighted decibel [dBA])												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Privately-owned Residential Receptors													
R03	35	36	42	28	29	38	35	35	43	34	34	43	40/40/40
R04	35	35	42	28	29	38	34	34	42	33	33	43	40/40/40
R05	48	48	52	41	42	47	47	47	48	47	47	48	40/40/40
R06	41	41	46	33	34	42	40	40	45	40	40	44	40/40/40
R07	31	32	38	27	28	34	31	31	42	30	30	41	40/40/40
R09	31	31	35	29	29	32	36	37	40	34	34	38	40/40/40
R10	26	26	29	23	24	26	29	29	33	26	27	31	40/40/40
R11	32	33	38	31	32	35	37	38	40[2]	37	37	40[2]	40/40/40
R13	33	34	38	34	34	38	38	39	43	36	37	42	40/40/40
R17	42	43	49	42	43	48	50	51	55	50	50	56	40/40/40
R19	37	38	43	38	39	44	35	35	42	34	35	42	40/40/40
R20	28	29	33	27	28	31	30	30	40[2]	28	28	38	40/40/40
R21	28	29	33	27	28	30	30	30	40[2]	28	28	38	40/40/40
R22	28	29	34	28	28	31	30	31	40[2]	28	28	38	40/40/40
R23	28	29	34	28	28	31	30	31	40[2]	28	28	38	40/40/40
R24	28	29	34	27	28	30	30	30	40	28	28	38	40/40/40
R25	28	29	34	27	28	31	29	30	40	28	28	38	40/40/40
R26	28	29	34	27	28	31	29	30	40	27	28	38	40/40/40

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (A-weighted decibel [dBA])												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Privately-owned Residential Receptors													
R27	28	28	34	27	27	30	29	30	40	27	28	38	40/40/40
R28	28	28	34	26	27	31	29	30	40	27	27	37	40/40/40
R29	27	28	33	26	26	30	29	29	39	26	26	37	40/40/40
R30	27	28	33	26	27	30	28	29	38	27	27	36	40/40/40
R31	27	28	33	26	27	30	28	28	38	27	27	36	40/40/40
R32	27	27	33	25	25	30	27	28	36	25	26	36	40/40/40
R33	27	27	32	25	25	29	27	28	36	26	26	35	40/40/40
R34	27	27	32	25	25	29	27	27	36	26	26	35	40/40/40
R35	27	27	32	24	25	29	27	27	36	25	26	35	40/40/40
R36	26	27	31	24	25	28	27	27	35	25	26	34	40/40/40
R37	26	27	31	24	25	28	27	27	35	25	26	34	40/40/40
R39	26	27	31	25	26	29	28	28	37	26	27	35	40/40/40
R40	27	27	32	25	26	29	27	28	37	26	27	35	40/40/40
R41	26	27	31	25	26	29	28	28	37	26	27	35	40/40/40
R42	20	20	26	15	16	26	20	20	27	20	21	27	40/40/40
R43	20	20	25	15	16	24	21	22	28	21	21	28	40/40/40
R52	27	27	30	24	25	27	32	32	35	30	30	34	40/40/40
R53	28	29	31	25	26	28	33	34	37	31	31	35	40/40/40
R54	30	30	33	27	28	30	35	36	39	32	33	37	40/40/40
R55	26	27	29	23	24	27	30	30	34	26	27	31	40/40/40

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (A-weighted decibel [dBA])												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Privately-owned Residential Receptors													
R56	27	28	30	26	26	28	32	33	36	30	31	34	40/40/40

Notes:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm – 10.00 pm; Night = 10.00 pm – 7.00 am.
2. Noise level incorporates proactive noise mitigation measures.
3. Noise exceedances highlighted in red.

Table D-2: Operational Noise Predictions - Other Receptor Types

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (dBA)												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Other Receptor Types[2]													
R57	28	28	31	25	25	28	33	33	36	31	31	35	40/40/40
R58	27	27	30	22	22	26	31	31	35	27	28	32	40/40/40
R59	27	27	30	22	23	26	31	32	35	29	29	33	40/40/40
R60	28	28	31	24	24	27	32	33	36	30	31	34	40/40/40
R61	29	30	33	27	27	30	35	35	39	32	33	36	40/40/40
R62	29	29	32	26	26	29	34	35	38	32	32	36	40/40/40
R47[3]	33	33		31	31		38	39		36	37		40/40/40
R63	26	26	29	23	24	28	32	32	35	27	28	32	40/40/40

Notes:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm to 10.00 pm; Night = 10.00 pm – 7.00 am.

2. Other receptor types include: three schools, a childcare, hospital, medical centre, camp accommodation and a cemetery (all located in Blackwater except for the cemetery).
3. Assumed not in use at night.

Table D-3: Operational Noise Predictions – Non-sensitive Receptors

Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (dBA)												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Mine-owned Receptors													
R01	41	41	47	30	30	40	35	35	43	34	34	42	n/a[2]
R02	47	47	52	30	30	41	35	36	43	35	35	42	n/a[2]
R12	38	39	43	36	37	41	41	42	46	41	41	47	n/a[2]
R50	29	30	36	28	29	33	32	32	42	29	30	40	n/a[2]
R51	30	30	36	29	29	33	32	32	42	29	30	39	n/a[2]
Privately-owned Receptors Currently Under Agreements													
R15	43	43	49	45	46	50	52	53	57	61	61	62	n/a[2]
R16	42	43	50	43	44	48	50	50	56	52	53	58	n/a[2]
Commercial/Industrial Receptors													
R14	39	39	44	38	38	43	43	43	48	40	41	46	40/40/40
R46	44	45	50	44	44	51	35	35	43	43	43	48	40/40/40
R48	34	35	39	32	32	36	40	40	44	38	39	43	40/40/40
R49	28	29	36	22	22	29	29	29	39	30	31	39	40/40/40
R64	31	31	34	28	29	31	36	37	40	34	34	38	40/40/40

Notes:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm – 10.00 pm; Night = 10.00 pm – 7.00 am.
2. Mine-owned receptors and privately-owned receptors current under agreements are not subject to noise criteria and are included for information only.
3. Noise exceedances highlighted in red.

APPENDIX E

OPERATIONAL NOISE PREDICTIONS - UNMITIGATED

Table E-4: Unmitigated Operational Noise Predictions

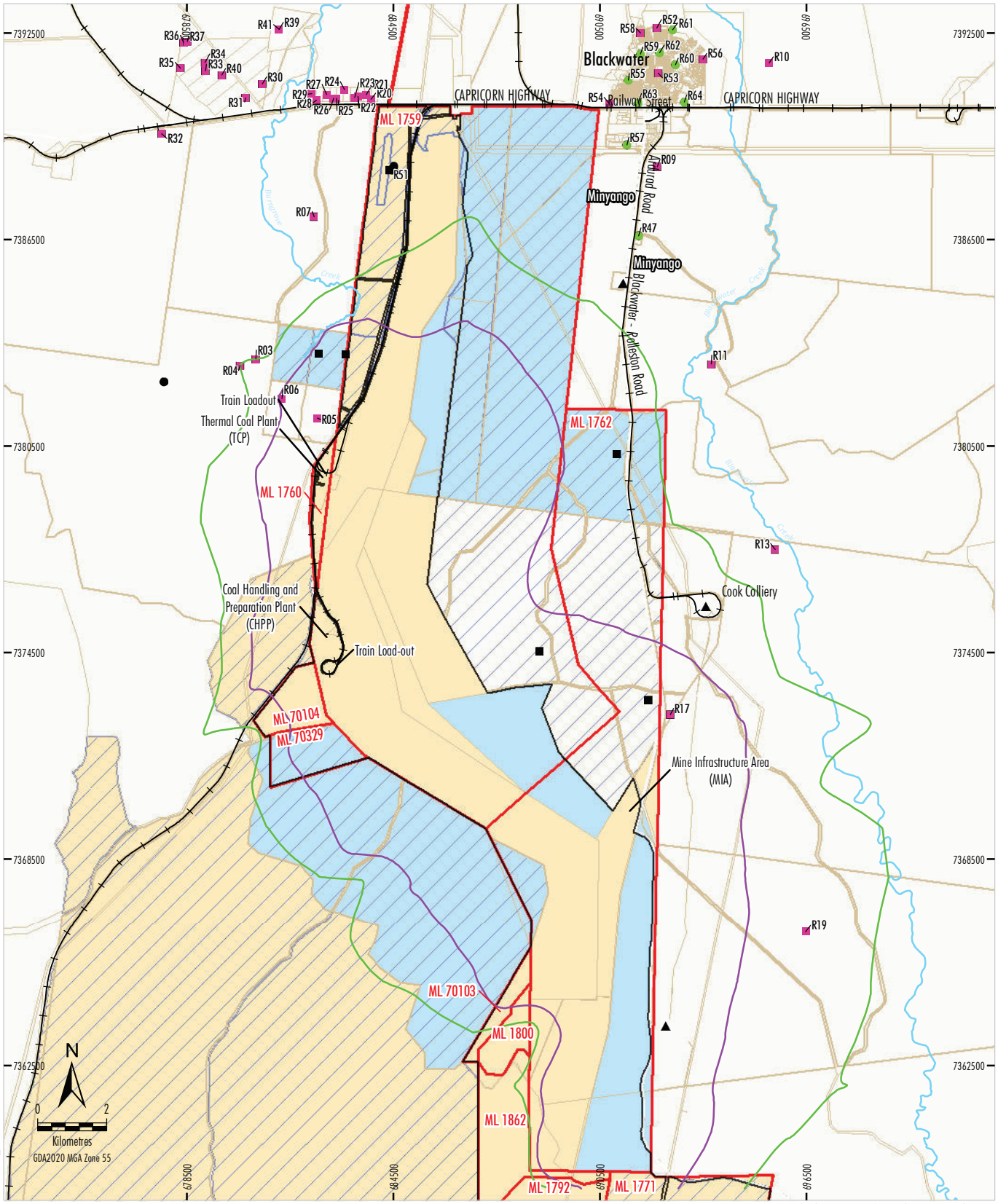
Rec ID	$L_{Aeq,15min}$ Operational Noise Predictions (dBA)												BWM EA $L_{Aeq,15min}$ Noise Criteria (dBA)
	FY30			FY32			FY50			FY55			
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	
Privately-owned Residential Receptors													
R11	32	33	38	31	32	35	37	38	41	37	37	41	40/40/40
R20	28	29	33	27	28	31	30	30	41	28	28	38	40/40/40
R21	28	29	33	27	28	30	30	30	41	28	28	38	40/40/40
R22	28	29	34	28	28	31	30	31	41	28	28	38	40/40/40
R23	28	29	34	28	28	31	30	31	41	28	28	38	40/40/40

Note:

1. Day = 7.00 am – 6.00 pm; Evening = 6.00 pm – 10.00 pm; Night = 10.00 pm – 7.00 am.

APPENDIX F

NOISE CONTOURS



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

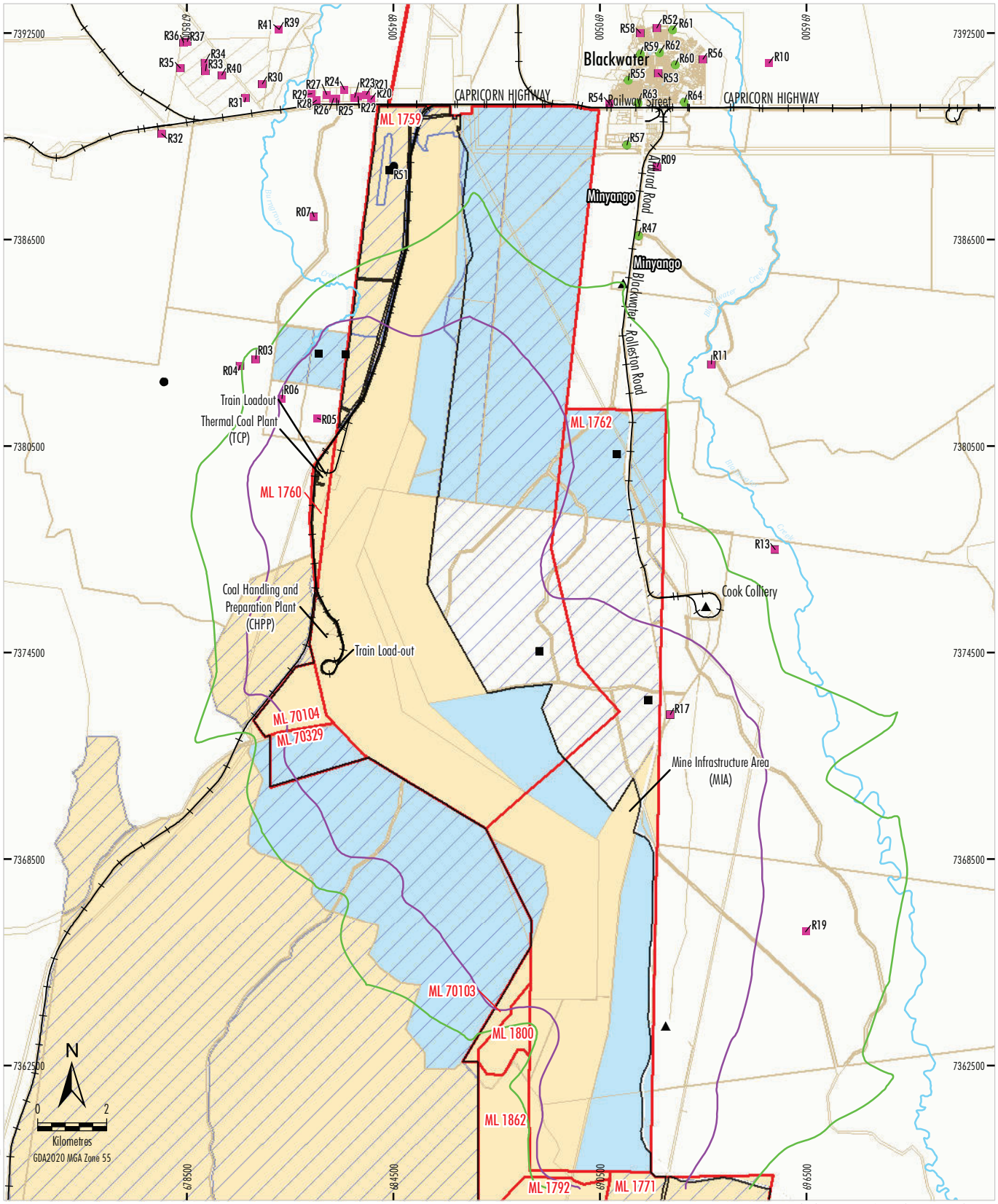
Noise Contour (Day)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Day)
FY 2030

Figure F-1



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

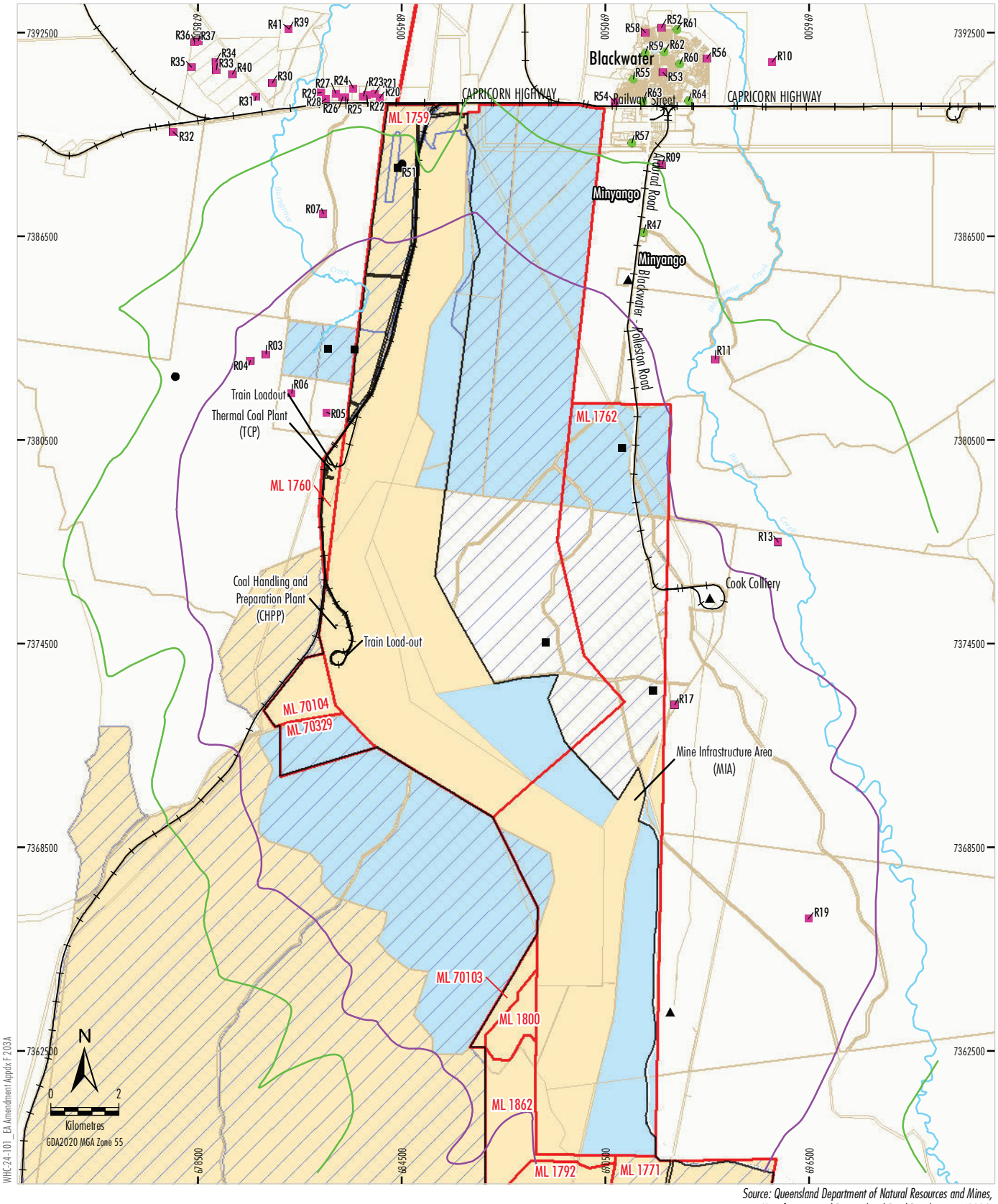
Noise Contour (Eve)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Eve) FY 2030

Figure F-2



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

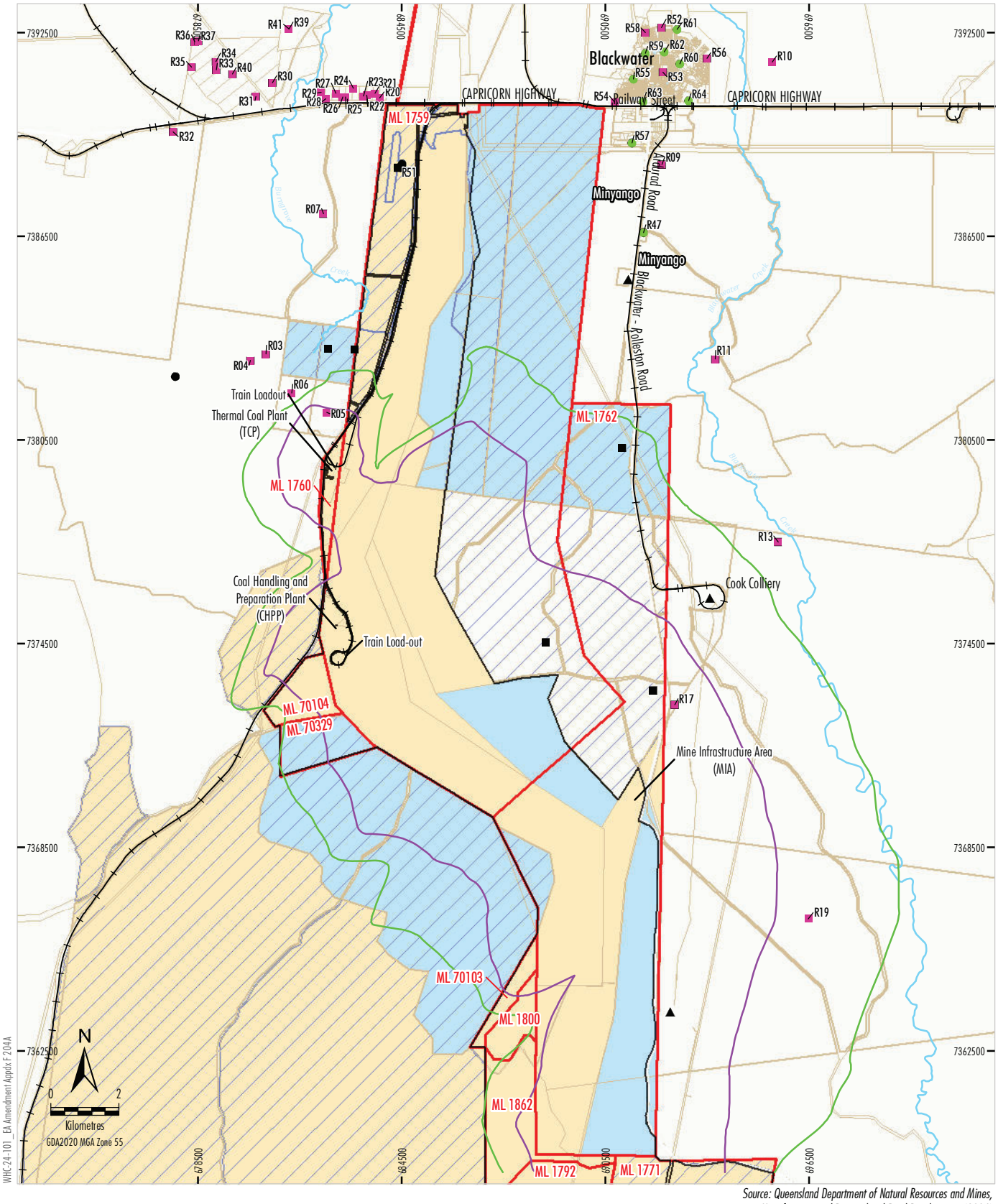
Noise Contour (Night)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Night) FY 2030

Figure F-3



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

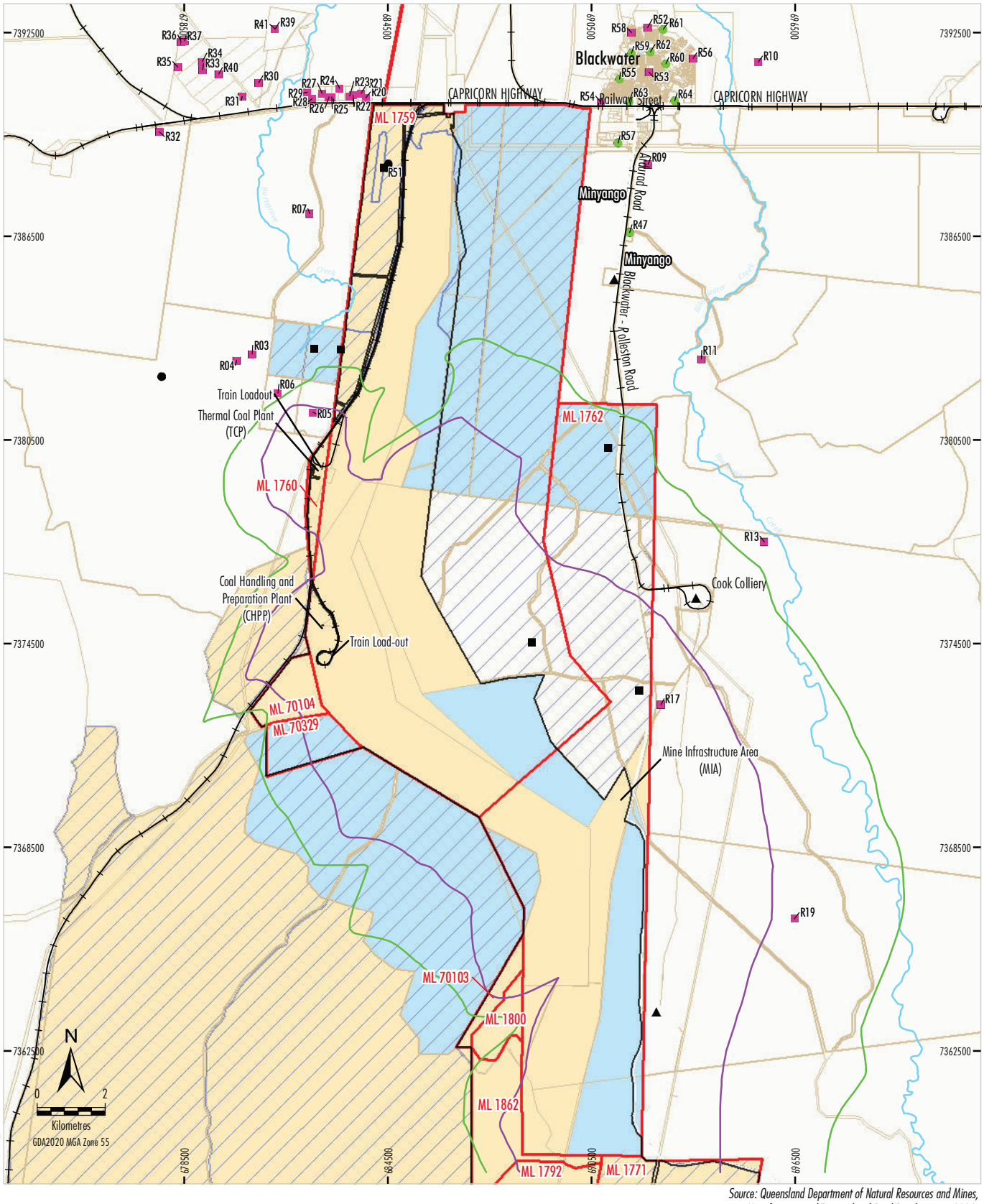
Noise Contour (Day)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Day)
FY 2032

Figure F-4



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

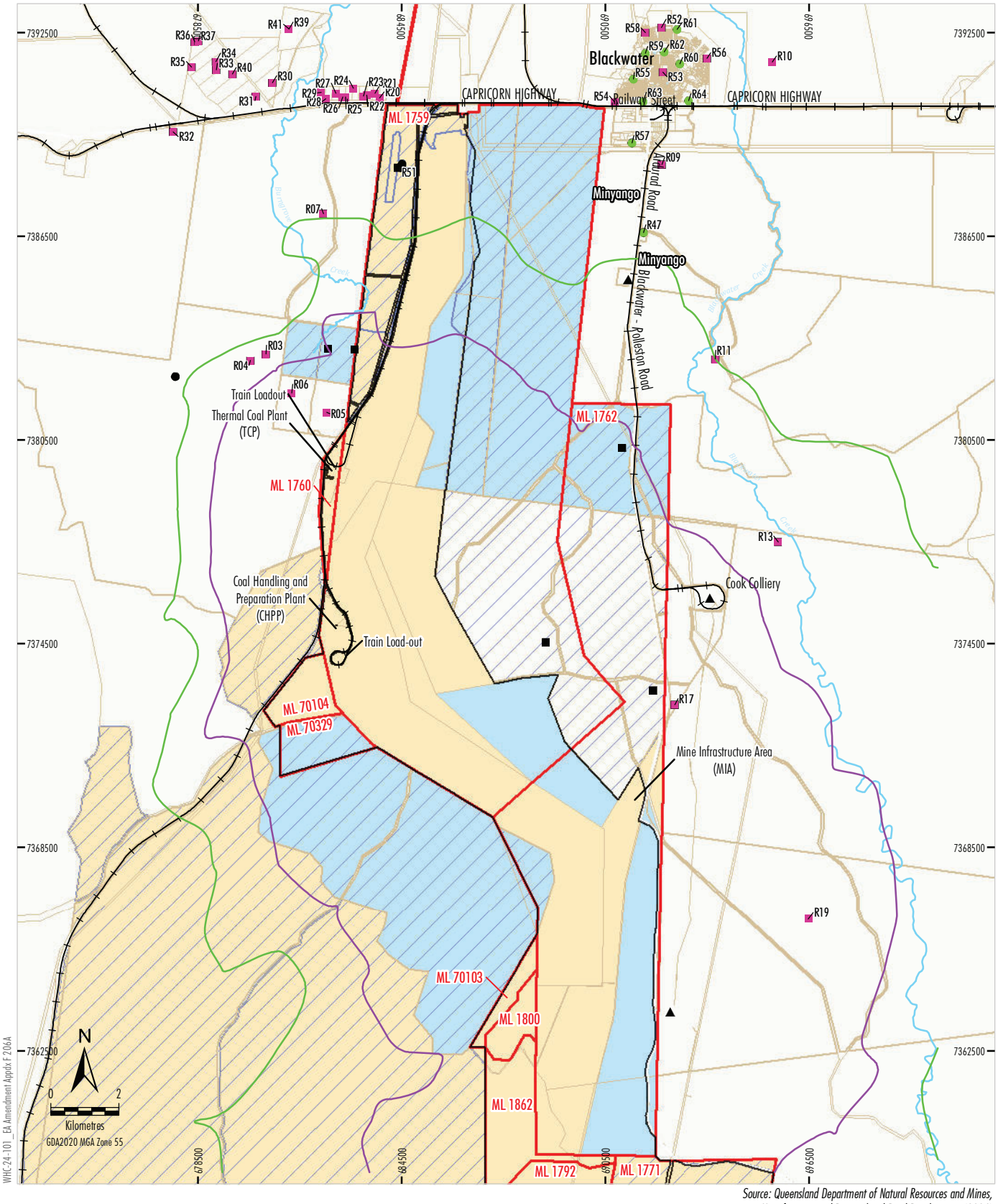
Noise Contour (Eve)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Eve) FY 2032

Figure F-5



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

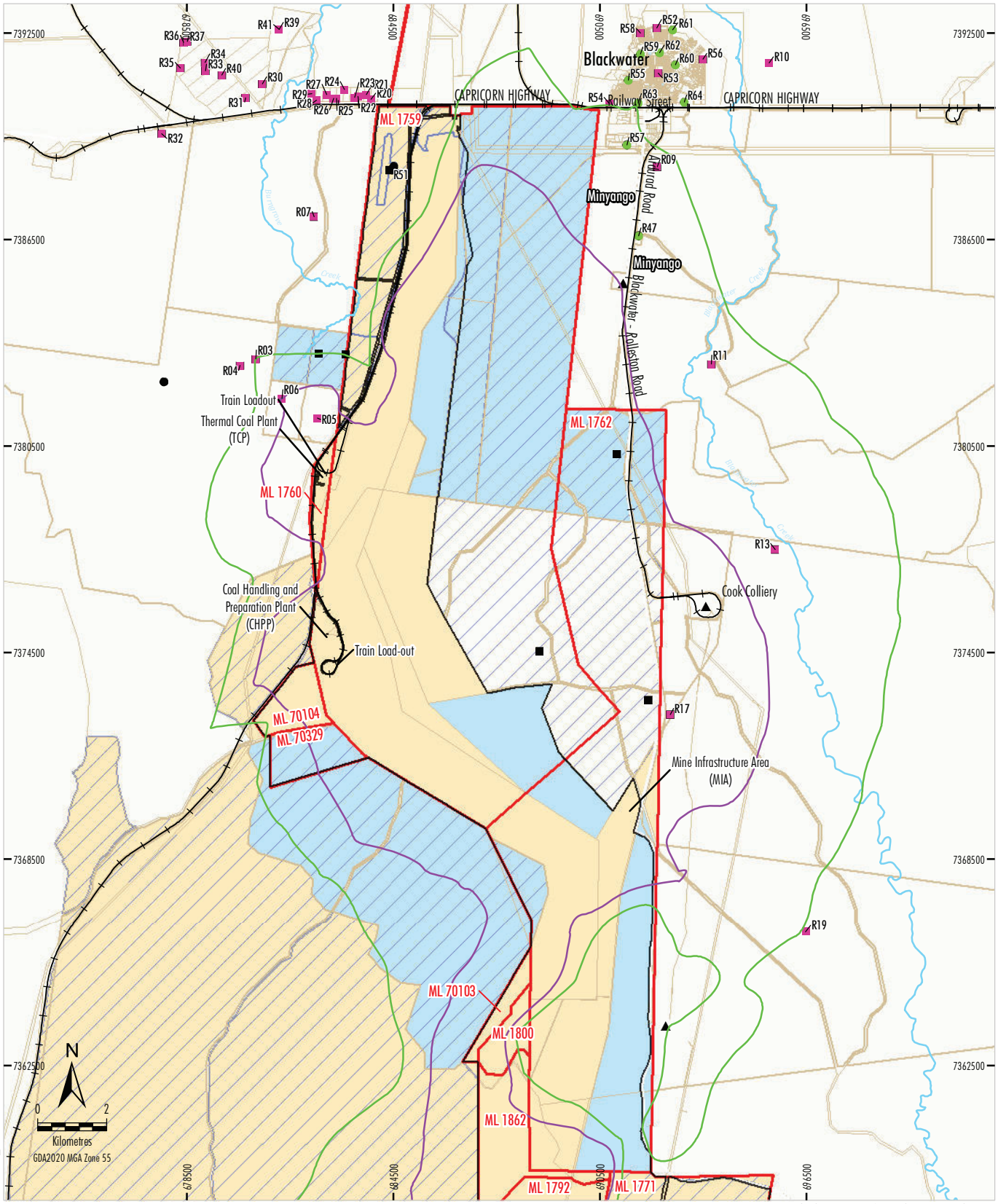
Noise Contour (Night)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Night) FY 2032

Figure F-6



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

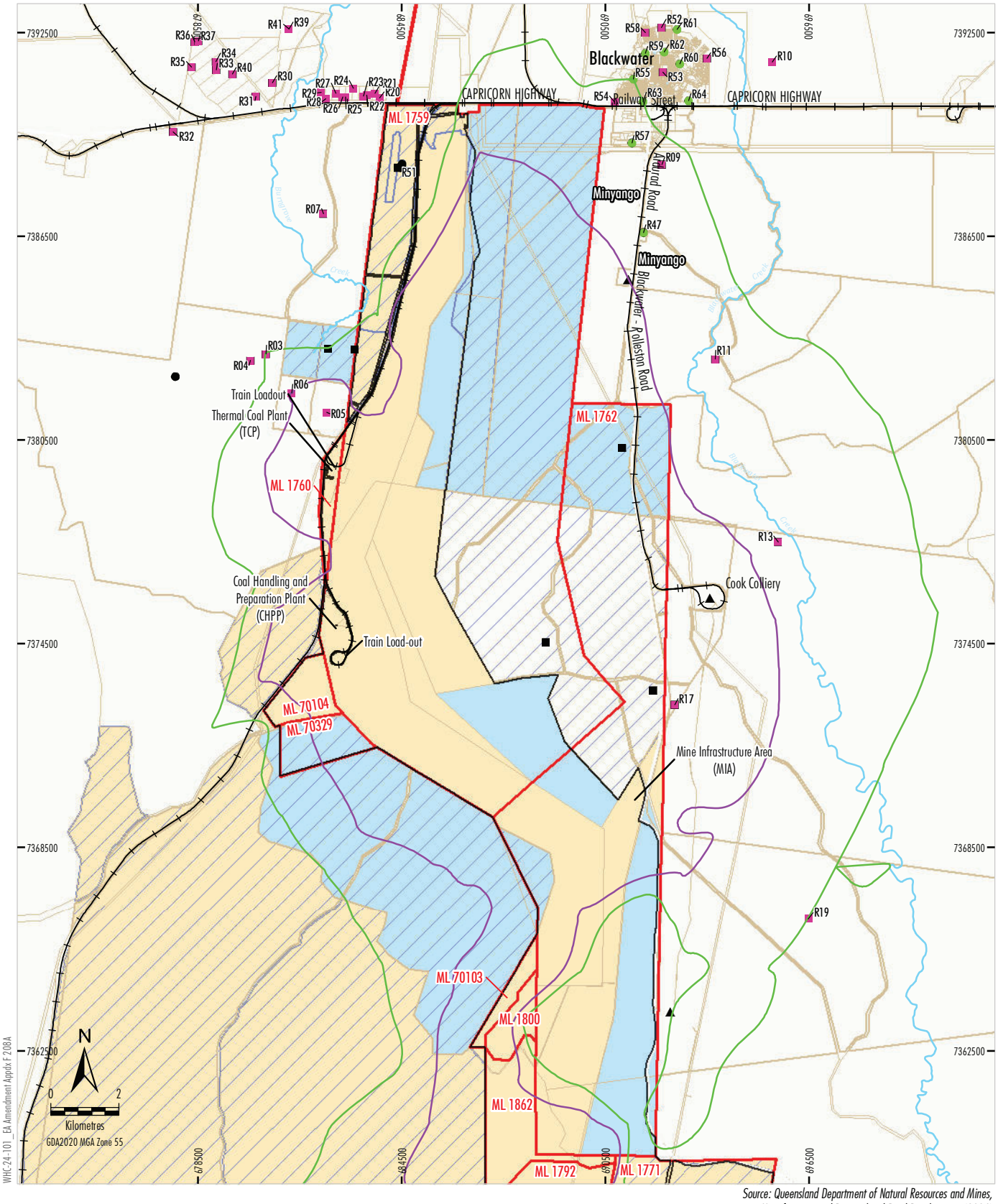
Noise Contour (Day)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Day) FY 2050

Figure F-7



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

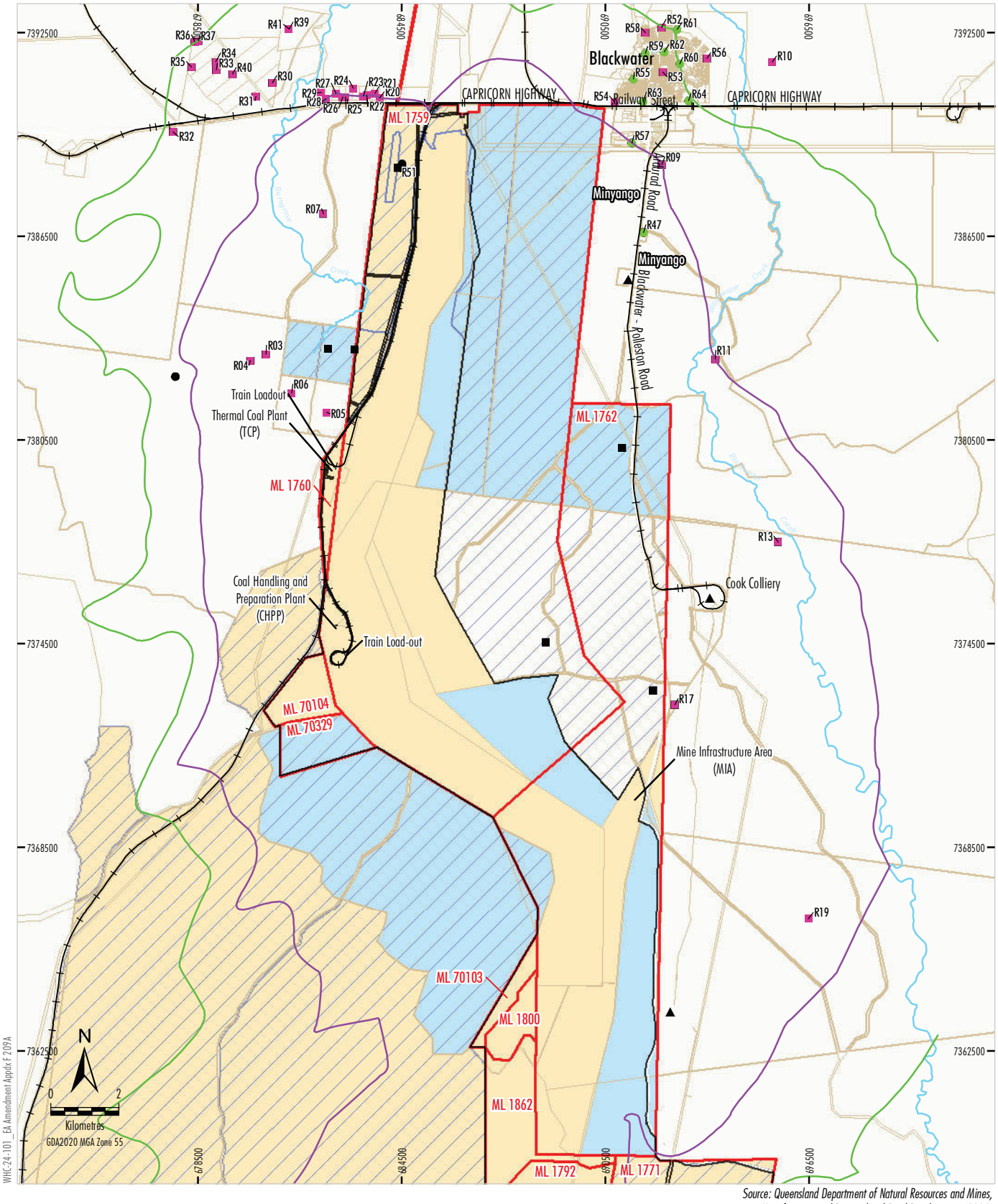
Noise Contour (Eve)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Eve) FY 2050

Figure F-8



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

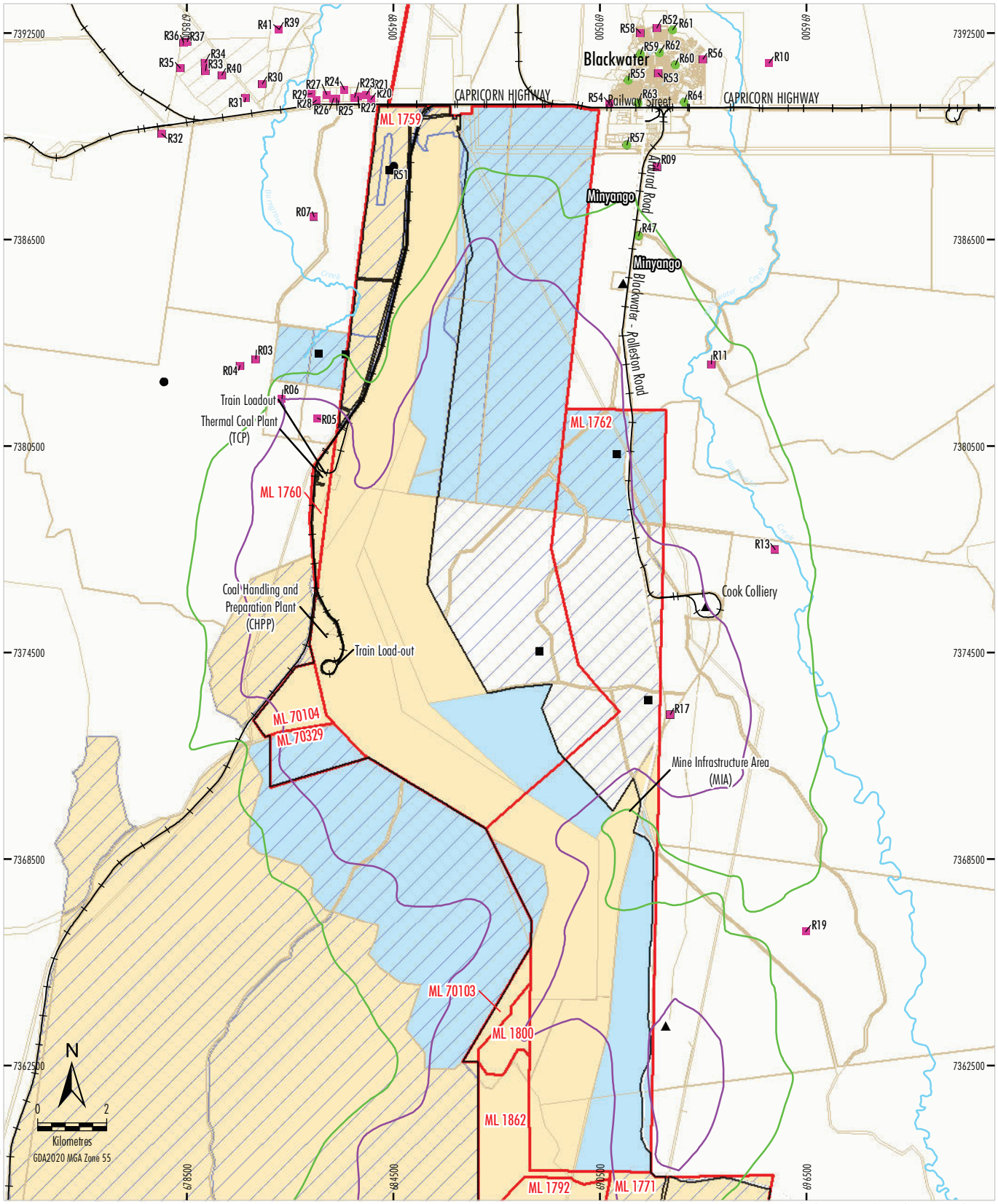
Noise Contour (Night)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Night) FY 2050

Figure F-9



LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

Noise Contour (Day)
- 35 dBA
- 40 dBA

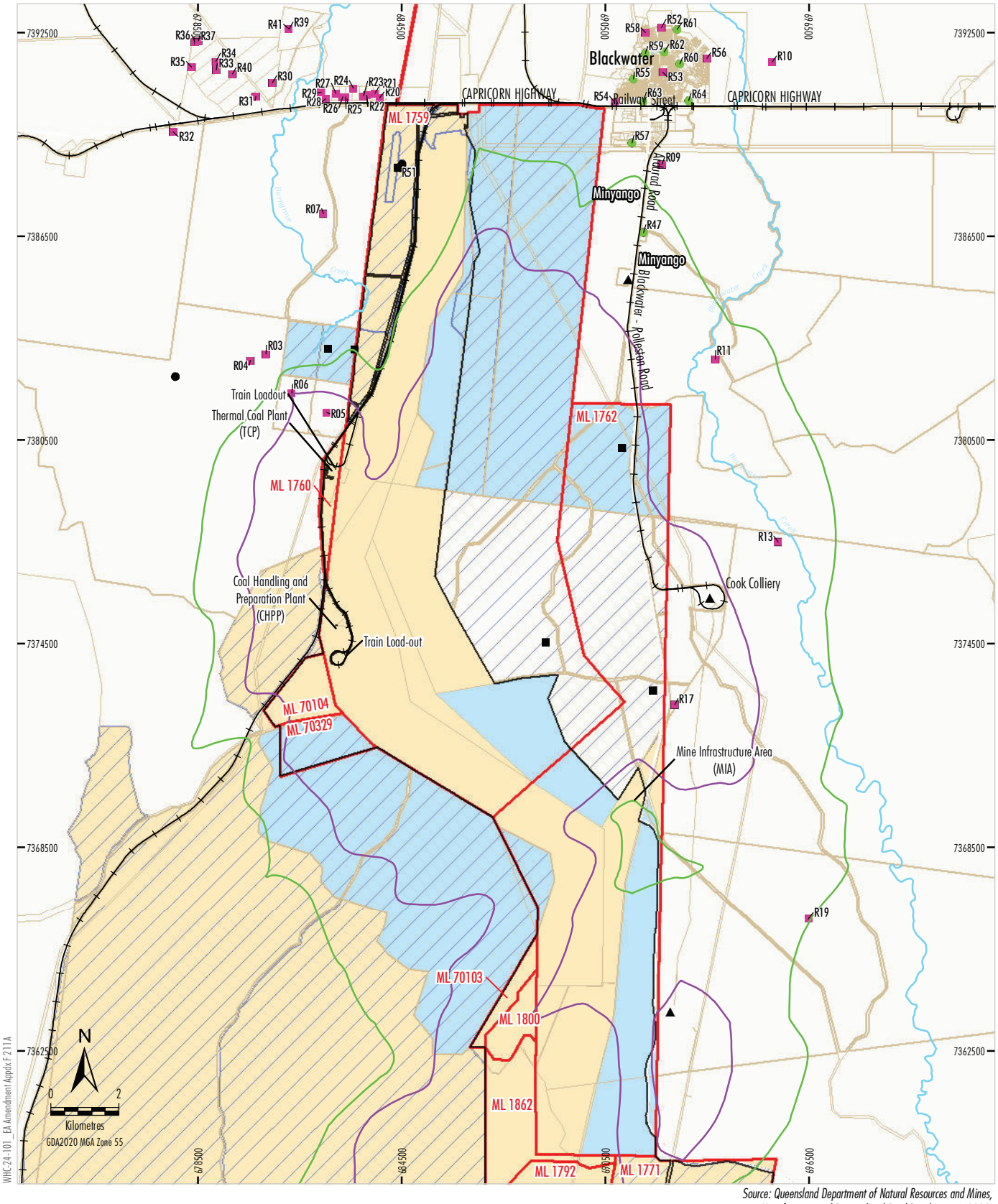
Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Day)
FY 2055

Figure F-10



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

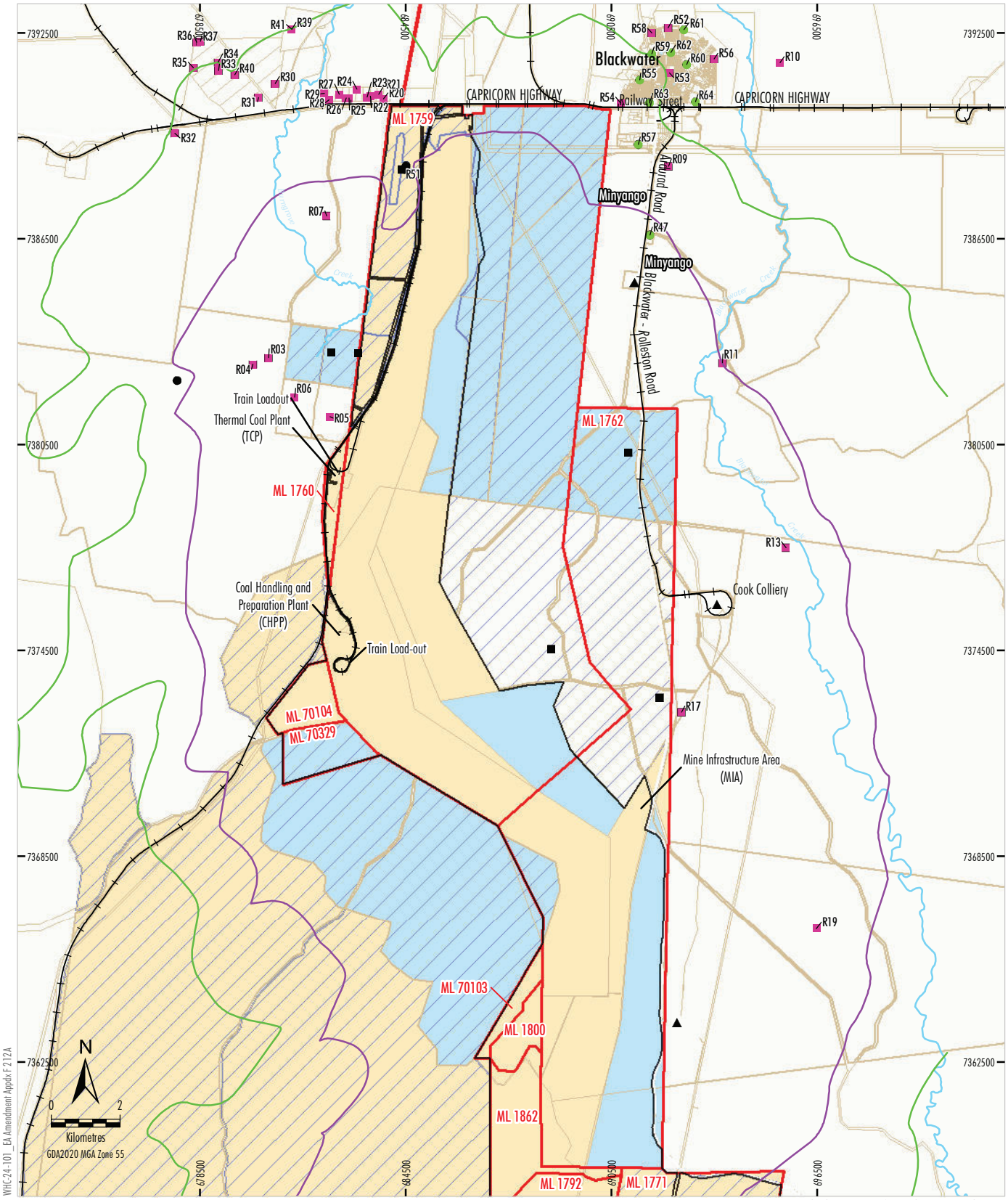
Noise Contour (Eve)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Eve) FY 2055

Figure F-11



Source: Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (2024); Whitehaven (2026)

LEGEND

- Mining Lease
- Railway
- Road
- Watercourse
- Property Boundary
- Approved Disturbance Footprint
- Leassee or Agistee Boundary
- Whitehaven Freehold Land
- Whitehaven Leasehold Land

Sensitive Receiver
- Community
- Private

Non-sensitive Receiver
- Mine-owned or Privately-owned
- Under Agreement
- Commercial
- Community

Noise Contour (Night)
- 35 dBA
- 40 dBA

Whitehaven

BLACKWATER NORTH EXTENSION PROJECT

Operational $L_{Aeq,15min}$ Noise Contours (Night) FY 2055

Figure F-12

APPENDIX G

NIGHT-TIME MAXIMUM NOISE LEVEL EVENT PREDICTIONS

Table G-1: Night-time Maximum Noise Level Event Predictions – Privately-owned Residential Receptors

Rec ID	$L_{A1,15min}$ Night-time Maximum Noise Predictions (dBA)				BWM EA $L_{A1,15min}$ Noise Criteria (dBA)
	FY30	FY32	FY50	FY55	
Privately-owned Residential Receptors					
R03	43	39	44	43	45
R04	44	39	43	43	45
R05	56	50	52	52	45
R06	48	45	47	46	45
R07	39	35	43	41	45
R09	36	33	41	39	45
R10	30	27	33	31	45
R11	39	36	41[2]	41[2]	45
R13	39	38	43	43	45
R17	50	49	56	57	45
R19	44	45	42	43	45
R20	35	32	41[2]	39	45
R21	35	31	41[2]	39	45
R22	35	32	42[2]	39	45
R23	35	32	41[2]	39	45
R24	35	31	41	38	45
R25	35	32	41	39	45
R26	35	32	41	39	45
R27	35	32	41	38	45
R28	35	32	41	38	45
R29	34	32	40	37	45
R30	34	31	39	37	45
R31	34	31	39	37	45
R32	34	31	37	36	45
R33	33	30	37	36	45
R34	33	30	37	35	45
R35	33	30	36	35	45
R36	32	30	36	35	45
R37	32	30	36	35	45
R39	33	30	38	36	45
R40	33	30	38	36	45
R41	33	30	38	36	45
R42	27	27	28	28	45

Rec ID	$L_{A1,15min}$ Night-time Maximum Noise Predictions (dBA)				BWM EA $L_{A1,15min}$ Noise Criteria (dBA)
	FY30	FY32	FY50	FY55	
Privately-owned Residential Receptors					
R43	27	26	28	29	45
R52	31	29	36	34	45
R53	33	29	38	35	45
R54	35	31	41	38	45
R55	31	28	35	32	45
R56	32	29	37	35	45

Notes:

1. Night = 10.00 pm – 7.00 am.
2. Noise level incorporates proactive noise mitigation measures (for the $L_{Aeq,15min}$ component but not the $L_{A1,1min}$ component).
3. Noise exceedances highlighted in red.

Table G-2: Night-time Maximum Noise Level Event Predictions – Other Receptor Types

Rec ID	$L_{A1,15min}$ Night-time Maximum Noise Predictions (dBA)				BWM EA $L_{A1,15min}$ Noise Criteria (dBA)
	FY30	FY32	FY50	FY55	
Other Receptor Types[2]					
R57	33	29	37	35	45
R58	31	27	36	32	45
R59	32	28	36	33	45
R60	32	29	37	34	45
R61	34	31	40	37	45
R62	33	30	39	36	45
R47[3]					45
R63	30	29	36	33	45

Notes:

1. Night = 10.00 pm – 7.00 am.
2. Other receptor types include: three schools, a childcare, hospital, medical centre, camp accommodation and a cemetery (all located in Blackwater except for the cemetery).
3. Assumed not in use at night.

Table G-3: Night-time Maximum Noise Level Event Predictions – Non-sensitive Receptors

Rec ID	$L_{A1,15min}$ Night-time Maximum Noise Predictions (dBA)				BWM EA $L_{A1,15min}$ Noise Criteria (dBA)
	FY30	FY32	FY50	FY55	
Mine-owned Receptors					
R01	51	41	47	43	n/a[2]
R02	56	42	49	43	n/a[2]
R12	44	42	47	47	n/a[2]
R50	38	34	43	41	n/a[2]
R51	38	34	44	41	n/a[2]
Privately-owned Receptors Currently Under Agreements					
R15	50	52	61	63	n/a[2]
R16	51	49	57	59	n/a[2]
Commercial/Industrial Receptors					
R14	44	44	48	47	45
R46	51	56	44	51	45
R48	40	36	45	44	45
R49	38	30	39	40	45
R64	36	33	42	38	45

Notes:

1. Night = 10.00 pm – 7.00 am.
2. Mine-owned receptors and privately-owned receptors current under agreements are not subject to noise criteria and are included for information only.
3. Noise exceedances highlighted in red.

APPENDIX H

LOW-FREQUENCY NOISE PREDICTION METHODOLOGY

All operational noise predictions presented in the assessment are based on octave band levels ranging from 31.5 hertz (Hz) to 16 kilohertz (kHz). Predictions do not include one-third octave band levels in frequency bands ranging down to 10 Hz or 20 Hz as required by the relevant guidelines for assessing low-frequency noise (LFN). Noise predictions were, therefore, extrapolated in the lower frequencies using a generic LFN spectrum shape representative of large open-cut coal mining operations.

As part of a noise audit conducted at Bulga Village (Wilkinson Murray [now RWDI], 2016), a typical low-frequency spectrum profile of long-distance mining noise was measured in third-octave bands between 10 Hz and 160 Hz. The spectrum presented in **Table H-1** represents an average of 130 LFN measurements, normalised to a consistent broadband level, from an open-cut coal mining complex comparable to the Project (i.e. Wambo Coal Mine, Bulga Coal Mine and Mount Thorley Warkworth Coal Mines). These low-frequency measurements were taken approximately 3–4 kilometres (km) from the mine along propagation paths similar to those surrounding the Project.

Table H-1: Representative LFN Spectrum Profile

Survey Location	Third Octave Band Centre Frequency (Hz)												
	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
Bulga Village	49	54	55	52	51	51	51	52	49	50	48	45	40

For the extrapolation of noise predictions at lower frequencies, the following methodology was applied:

1. Interpolate one-third octave band levels from the predicted night-time octave band noise levels (31.5 Hz to 16 kHz).
2. Normalise the representative LFN spectrum shape (**Table H-1**) to the one-third octave band predictions using the 63 Hz one-third octave band level (generally considered a relatively reliable band of the predicted spectrum).
3. Combine the normalised LFN spectrum shape to the one-third octave band predictions to generate a complete spectrum (10 Hz to 630 Hz or 20 Hz to 200 Hz depending on the guideline).

APPENDIX I

BLASTING PREDICTION CURVES AND EQUATIONS

Figure I-1 illustrates the measured data and associated linear trend lines for ground vibration. The figure shows a revised best fit line – a 95th percentile line – and the previously adopted 95th percentile based on 1999 data from Bayswater No 3. The correlation with the old data is close, although the new 95th percentile shows slightly lower vibration levels at shorter scaled distance – in the order of 0.2 to 0.3 millimetres per second (mm/s).

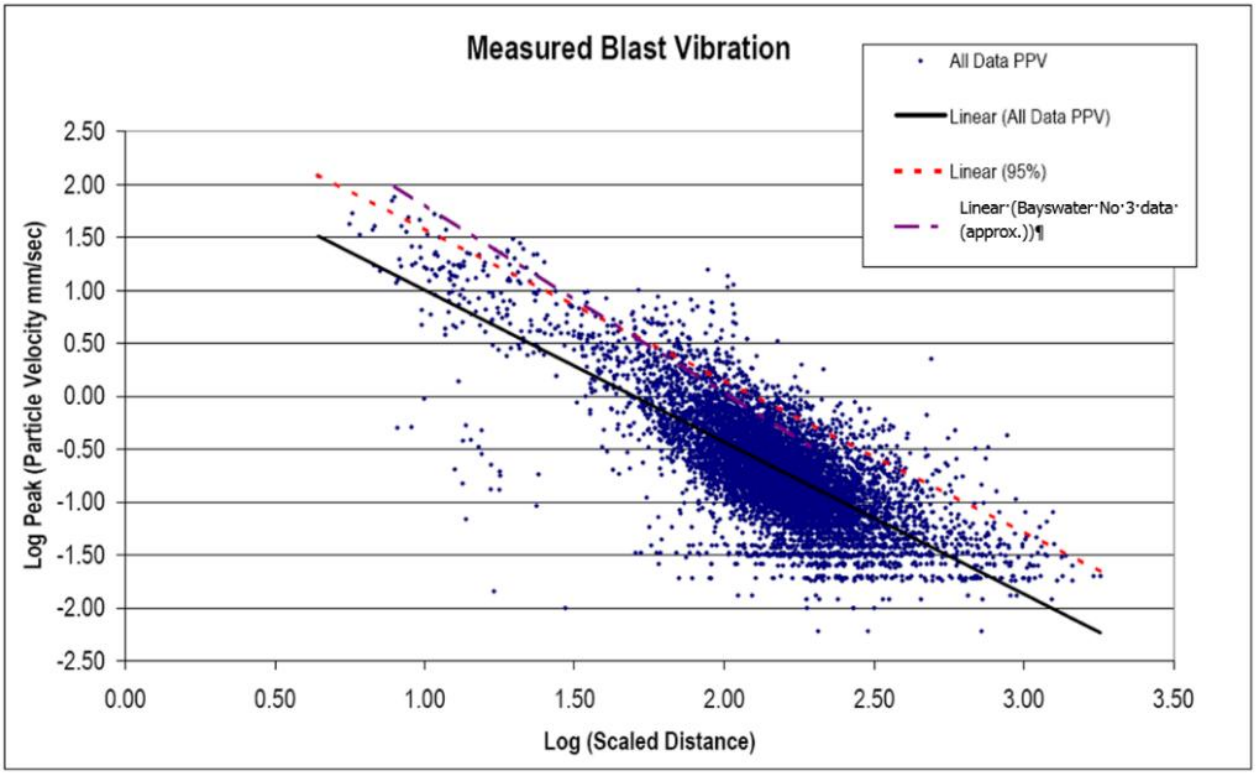


Figure I-1: Measured Peak Particle Velocity from Blasts at Mt Arthur North (logarithmic scale) and Comparison with Data from Bayswater No 3

Figure I-2 shows airblast overpressure data. Analysis of the data showed that the relationship between measured peak overpressure and scaled distance is better defined with a polynomial equation (blue) at close range rather than a standard linear equation (red). At relatively low values of scaled distance, the new polynomial 95th percentile curve is approximately 5 decibels (dB) lower than the linear trend line derived from the previous Bayswater No 3 data.

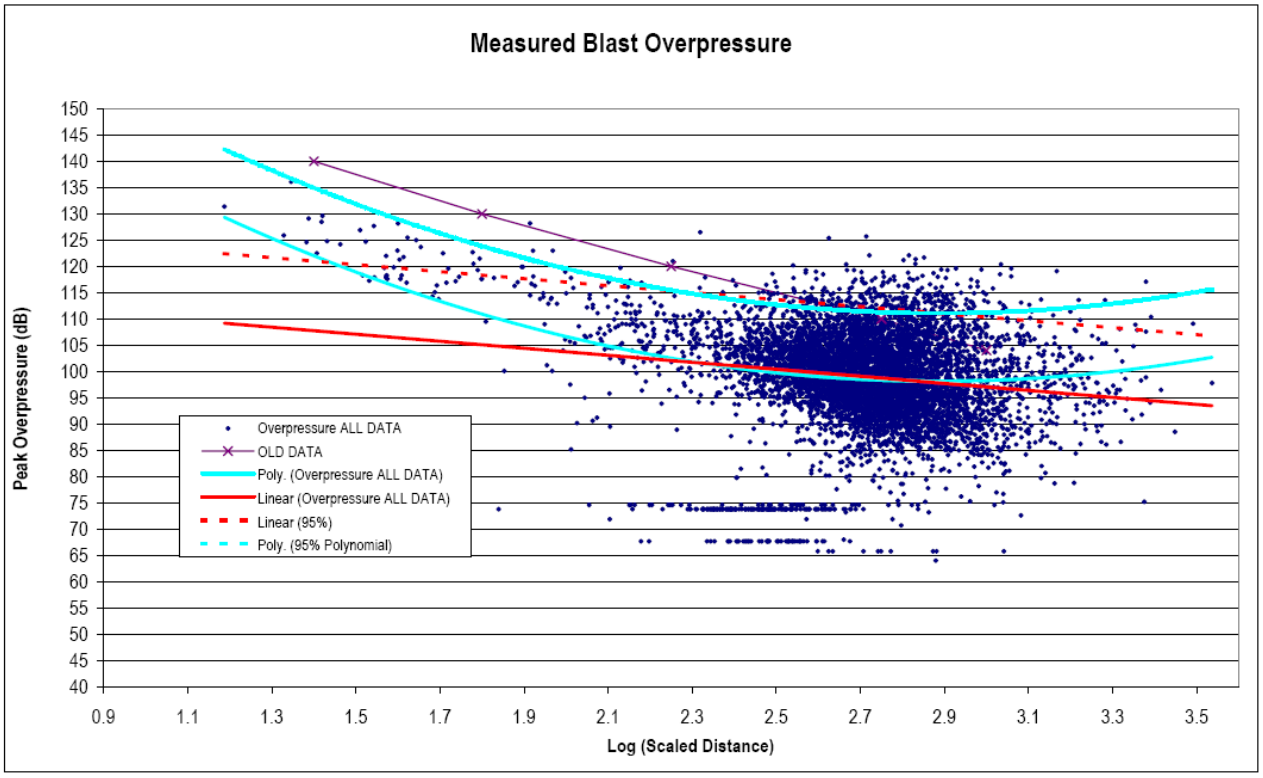


Figure I-2: Measured Peak Overpressure from Blasts at Mt Arthur North, and Comparison with Data from Bayswater No 3