APPENDIX 7

Noise Impact Assessment




umwelt

Inspired people | Dedicated team
Quality outcomes

MT OWEN COMPLEX
GLENCORE

NOISE IMPACT ASSESSMENT

Mount Owen Continued Operations
Modification 2

FINAL

July 2018

MT OWEN COMPLEX
GLENCORE

NOISE IMPACT ASSESSMENT

Mount Owen Continued Operations
Modification 2

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Mount Owen Pty Limited

Project Director:	Barbara Crossley
Project Manager:	Penelope Williams
Technical Director:	Tim Procter
Technical Manager:	Stephen Lyons
Report No.	3810/R14/Final
Date:	July 2018

umwelt

Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au

Certified System
Quality
ISO 9001

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	**Date**	**Name**	**Date**
Final	Tim Proctor	25/07/2018	Barbara Crossley	25/07/2018

Table of Contents

Tables

Figures

Appendices

1.0 Introduction

1.1 Project Background

The Mount Owen Complex is located within the Hunter Coalfields in the Upper Hunter Valley of New South Wales (NSW), approximately 20 kilometres (km) north-west of Singleton, 24 km south-east of Muswellbrook and to the north of Camberwell. Mt Owen Pty Limited (Mount Owen), a subsidiary of Glencore Coal Pty Limited (Glencore), currently owns three existing open cut operations in the Mount Owen Complex; Mount Owen (North Pit) and associated infrastructure, Ravensworth East (Bayswater North Pit (BNP)) and Glendell (Barrett Pit).

Mount Owen received development consent (SSD-5850) from the Planning Assessment Commission for the Mount Owen Continued Operations Project (Continued Operations Project) in November 2016. The Continued Operations Project development consent incorporates all previously approved operations at the Mount Owen Mine and Coal Handling and Preparation Plant (CHPP) and Ravensworth East Mine and allows for continued and expanded mining until 2031, now referred to as the 'Approved Operations'. Glendell Mine operates under a separate consent (DA 80/952) and does not form part of the Approved Operations.

In September 2017 Mount Owen modified SSD-5850 (Modification 1) to allow for the construction of a water pipeline from the Integra Underground Mine to the Mount Owen Complex and allow the integration of the Integra Underground Mine into the Greater Ravensworth Area Water and Tailings Scheme (GRAWTS). Mount Owen now proposes to further modify development consent SSD-5850 to allow for the optimisation of the North Pit mine plan to access coal reserves from the mining tenements obtained by Glencore through its acquisition of the Integra Underground Mine (the Proposed Modification).

1.2 Noise Impact Assessment

This Noise Impact Assessment (NIA) has been prepared by Umwelt (Australia) Pty Limited (Umwelt) as part of the Statement of Environmental Effects (SEE) for the Proposed Modification. Approval for the Proposed Modification will be sought under Section 96(2) of the *NSW Environmental Planning & Assessment Act, 1979* (EP&A Act). As part of confirming the approval pathway for the Proposed Modification, the Department of Planning and Environment (DPE) provided the following advice in April 2017 for the completion of studies to support this assessment:

> *The Statement of Environmental Effects for the proposed modification should build upon the contemporary baseline data provided in the Environmental Impact Statement for the MOCO Project, to inform the assessment of the potential impacts of the modification, paying particular attention to the relative changes under the modification and any increase in potential impacts.*
>
> *Glencore will also be required to update any relevant technical studies (including air quality, noise, biodiversity and water modelling/assessments) to meet contemporary assessment standards and ensure that any changes in impacts under the modification are clearly identified.*

Accordingly, the NIA has been undertaken in accordance with the NSW Environment Protection Authority (EPA) *Industrial Noise Policy (INP)* (2000) and other current and relevant guidelines and policies relating to environmental noise resulting from the Proposed Modification, including *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries)* (Mining SEPP) (2007) and *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments* (VLAMP) (DPE 2014).

A draft revised VLAMP is currently under review coupled with amendments to the Mining SEPP to give effect to these changes. The draft revised VLAMP refines the application of this policy to modifications of consent and states:

> *The policy commences from the date that it is gazetted, and applies to:*
>
> - *Modification applications that involve increases in the approved dust or noise impacts of a development.*

As demonstrated by this assessment, the Proposed Modification is not predicted to result in increased impacts to any areas of privately owned land relative to the Approved Operations (refer to **Figure 1.1**). . Accordingly, at the point that the draft revised VLAMP is gazetted, it will not apply to the assessment of the Proposed Modification. As such this assessment only considers the requirements of the existing VLAMP (2014) as it applies to the Proposed Modification until the gazettal of the draft revised VLAMP.

It is noted that the 2017 *Noise Policy for Industry* (NPfI) has replaced the *NSW Industrial Noise Policy* (2000) (INP). Notwithstanding this, given that the Proposed Modification is a modification of the recently approved Continued Operations Project (Umwelt 2014 and 2016), the existing approval requirements in relation to relevant noise criteria, which were developed in accordance with the INP, have been adopted for this assessment (refer to **Section 1.3**). The application of the INP to this NIA has been confirmed by DPE in correspondence dated 8 December 2017 on the basis that this NIA was substantially commenced prior to the commencement of the NPfI in October 2017.

The only exception is that the analysis of modifying factors, have been re-assessed based on the NPfI Fact Sheet C (EPA 2017). This approach has been taken in accordance with the NPfI implementation and transitional arrangements for the NPfI where it is noted the 'NPfI modification factor approach reflects more recent understanding of the impact of tonal and low-frequency noise on the community'.

A glossary of terms and abbreviations used in this report is provided in **Appendix 1**.

1.3 Existing Development Consent

The SSD-5850 development consent (as modified) for the Approved Operations contains comprehensive environmental performance conditions, including noise considerations. Relevant noise conditions, including parts of Conditions 1, 2 and 5 in Schedule 3 – Environmental Performance Conditions, are reproduced below. Conditions 3 and 4 of Schedule 3 relate to construction noise associated with the Hebden Road upgrade works and additional rail line. No further construction or additional infrastructure is proposed and accordingly, the construction related conditions are not relevant to the Proposed Modification.

ACQUISITION UPON REQUEST

1. *Upon receiving a written request from the owner of any land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of Schedule 4.*

Table 1: Land subject to acquisition upon request

Acquisition Basis	***Land[a]***
Noise	*21, 22, 23*

Note: a. The location of the land referred to in Table 1 is shown on the figure in Appendix 3.

ADDITIONAL MITIGATION UPON REQUEST

2. *Upon receiving a written request from the owner of any residence listed in Table 1 or Table 2, the Applicant must implement additional mitigation measures at the residence, in consultation with the landowner, in respect of the basis on which that residence is identified in Table 1 or Table 2.*

   These measures must be reasonable and feasible, and directed towards reducing the air quality and/or noise impacts of the development on the residence. In the case of air quality, mitigation may include measures such as air filters, a first flush drainage system and/or air conditioning. In the case of noise, mitigation may include measures such as double-glazing, insulation and/or air conditioning.

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

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	***Residence***
Noise	*13, 19, 93*

Note: The location of the land referred to in Table 2 is shown on the figure in Appendix 3.

NOISE

Noise Criteria

5. *The Applicant must ensure that the noise generated by the development (including rail movements along the Mount Owen Rail Loop, but excluding the construction works specified in condition 3), does not exceed the criteria in Table 3 at any residence on privately-owned land.*

Table 3: Noise criteria dB(A)

Residence	***Day / Evening / Night LAeq(15 min)***	***Night LA1(1 min)***
41, 48	*36 / 35 / 35*	*45*
91	*37 / 37 / 36*	*45*
14, 92	*37 / 37 / 37*	*45*
10, 11	*37 / 37 / 37*	*46*
13	*38 / 38 / 38*	*45*
12, 94, 95, 112	*38 / 38 / 38*	*46*

Residence	*Day / Evening / Night LAeq(15 min)*	*Night LA1(1 min)*
111	*39 / 39 / 36*	*45*
19	*39 / 39 / 39*	*45*
93	*40 / 40 / 40*	*46*
21, 22, 23	*41 / 41 / 41*	*45*
122	*42 / 42 / 42*	*50*
All other residences Area 4 – South	*37 / 37 / 36*	*46*
All other residences Area 4 – North and all other residences Area 5	*37 / 37 / 35*	*45*
All other residences Area 6	*40 / 40 / 40*	*50*
All other residences Area 7	*40 / 40 / 38*	*48*
All other residences Area 8 – East	*39 / 39 / 35*	*45*
All other residences Area 8 – West	*44 / 44 / 42*	*52*
All other residences Area 9	*48 / 48 / 43*	*53*
Other privately-owned residences	*35 / 35 / 35*	*45*

Note: The location of the land referred to in Table 3 is shown on the figure in Appendix 3.

Noise generated by the development is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy (as may be updated from time-to-time). Appendix 4 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 4 - NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. *The noise criteria in Table 3 of the conditions are to apply under all meteorological conditions except the following:*

   (a) during periods of rain or hail;

   (b) average wind speed at microphone height exceeds 5 metres/second;

   (c) wind speeds greater than 3 metres/second measured at 10 metres above ground level; or

   (d) temperature inversion conditions greater than 3°C/100 metres.

In accordance with Schedule 3 Condition 7 of the existing Approved Operations development consent (SSD-5850) a Noise Management Plan (NMP) has been submitted and approved by the Secretary. The NMP:

- was submitted to the EPA for consultation and comment;
- describes the measures to be implemented to ensure compliance with the noise limits and operating conditions in SSD-5850; and
- provides a detailed description of the noise management system including the monitoring program, compliance assessment methodology and reporting protocols; and a detailed description of the real-time noise monitoring system.

SSD-5850 allowed for the acquisition upon request of three properties due to noise. All three properties (properties 21, 22 and 23) remain in private ownership and are subject to acquisition upon receiving a written request from the owner in accordance with the procedures in Conditions 5 and 6 of Schedule 4 of SSD-5850. These properties were also afforded mitigation rights with mitigation works commenced at property 21. SSD-5850 also allowed for the provision of additional mitigation measures at three residences due to noise. In consultation with the landowner the three residences (properties 13, 19 and 93) have enacted their rights and additional noise mitigation works have commenced.

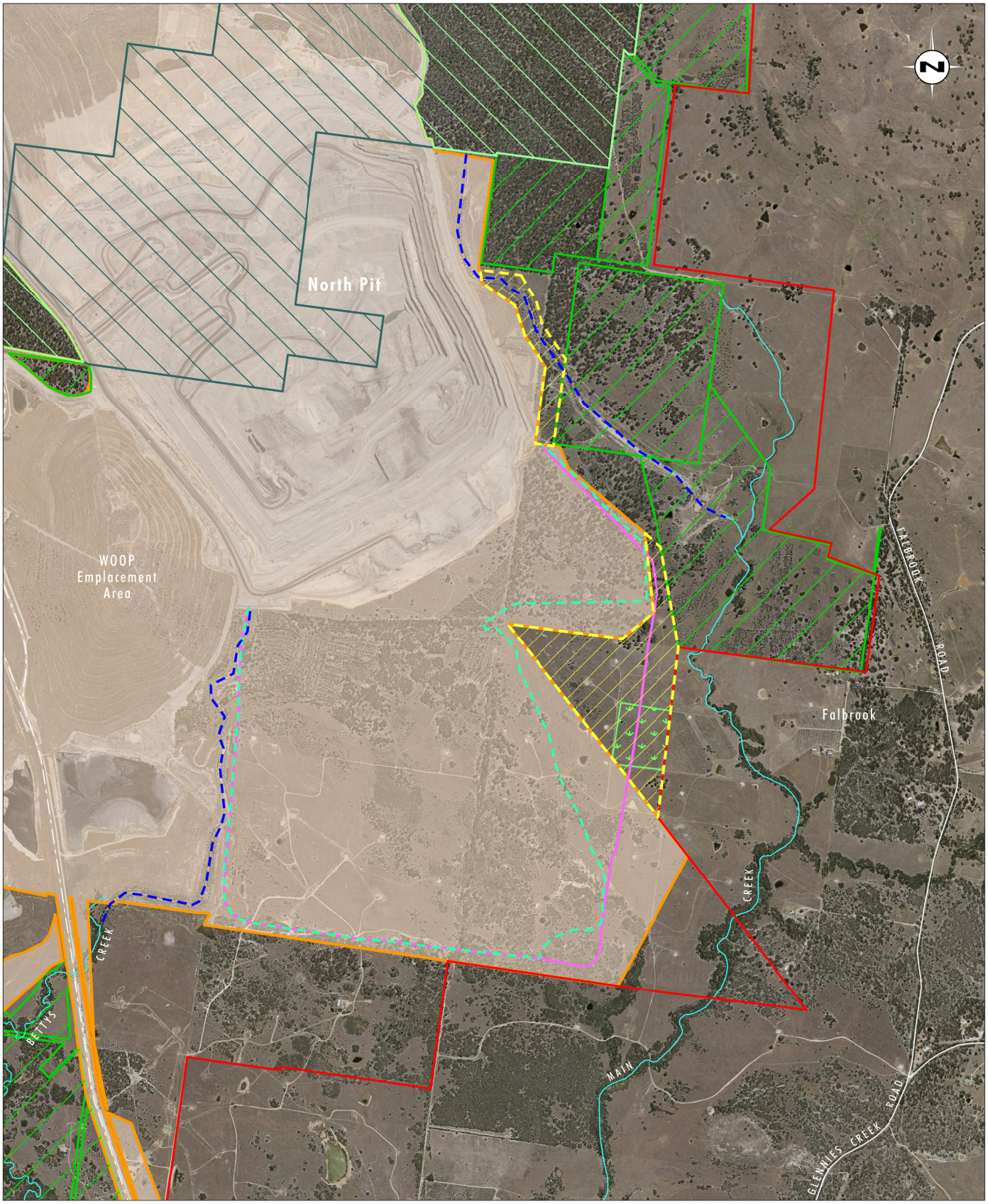


Image Source: Glencore (Feb 2017)
Data Source: Glencore (2018)

0 0.25 0.5 1.0km
1:25 000

Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Operations Pit Boundary
- Approved Disturbance Area
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Existing Biodiversity Offset Area
- Ravensworth State Forest
- Ravensworth State Forest within Approved Disturbance Area
- Existing Bettys Creek Diversion
- Drainage Line
- Olive Grove (within the Proposed Disturbance Area)

FIGURE 1.1

Proposed Modification Overview

File Name (A4): R14/3810_138.dgn
20180619 15.27

2.0 Proposed Modification and Operational Noise Control Measures

2.1 The Proposed Modification and Locality

The Proposed Modification will enable access to approximately 35 million tonnes (Mt) of additional run-of-mine (ROM) coal from the North Pit. Recovery of the additional coal reserves will result in approximately 46 hectares (ha) of additional disturbance (Proposed Disturbance Area) (refer to **Figure 1.1**), representing an increase of approximately 1.8 per cent (%) to the total disturbance area currently approved, and require an increased depth in the North Pit to provide for mining down to the Hebden Seam. The change to the North Pit mine plan will require the extension of the mine life through to 2037 (an additional 6 years).

Prior to the acquisition of the Integra Underground mining tenements, the mine plan design for the North Pit did not allow access to the deeper coal seams and was restricted to the east of the approved North Pit footprint. This resulted in the pit floor 'stepping up' as it progressed further southwards and the 'stepping in' of the mine plan along its eastern boundary. The acquisition of the Integra Underground Mine and associated mining tenements has removed this previous constraint and allows for deeper and extended coal extraction across the proposed modified North Pit.

The Proposed Disturbance Area extends further east from the Proposed Modification pit boundary to provide for additional infrastructure such as water management structures and access. In addition, the northern extent of the Proposed Disturbance Area is identified to provide for earthworks to shape and improve the final landform of the North Pit to tie into the surrounding topography, these works are located in proximity to the existing approved Bettys Creek diversion. It is not proposed to modify the existing Bettys Creek diversion in this area which continues through the South East Offset and South East Corridor Offset areas into Main Creek.

No changes are proposed to current mining methods, extraction limits, transportation methods, operational hours or workforce numbers. The Proposed Modification will utilise existing and approved infrastructure with the exception of proposed water management structures to manage water from the mining operation.

Table 2.2 provides a comparison between the Approved Operations and the Proposed Modification.

Table 2.2 Comparison between the Approved Operations and the Proposed Modification

Component	Approved Operations	Proposed Modification
Mining Method	Truck and excavator	No change to mining methods
Target Seams	Down to Hebden Seam Down to approximately 300 m depth	No change to target seams Down to approximately 380 m depth (average 340 m)
Total Reserve Recovered	Total of 257 Mt ROM coal (Ravensworth East – 48 Mt Mount Owen – 209 Mt)	Additional approximately 35 Mt ROM coal over the life of the mine (approximately 13% of total approved reserve)
Disturbance Area	Approved Disturbance Area of 2534 ha	Additional 46 ha disturbance (increase of 1.8% of total Approved Disturbance Area) Modification to SSD-5850 consent boundary to include Proposed Disturbance Area

Component	Approved Operations	Proposed Modification
Annual Production	Ravensworth East – 4 Mtpa Mount Owen – 10 Mtpa	No change to annual production limit
Mine Life	2031	2037
CHPP Capacity	Up to 17 Mtpa	No change to CHPP capacity
Management of Mining Waste	Emplacement of waste in-pit and out-of-pit, up to maximum existing approved height of 230 m. Tailings emplacement in Ravensworth East voids (including West Pit), within in-pit tailings cells in North Pit and/or BNP, and transfer under the GRAWTS to Liddell (subject to relevant approvals)	Emplacement of waste in Approved Disturbance Areas (up to maximum existing approved height) Tailings emplacement within West Pit, in-pit tailings cells in North Pit and/or BNP, and transfer under the GRAWTS.
Water Management	Upper and Middle Bettys Creek Diversions Management of water within the water management system and GRAWTS Works to provide flood attenuation for Yorks Creek	No changes to existing approved creek diversions Extension of water management system to Proposed Disturbance Area and continued management of water within the GRAWTS Proposed amendments to design of existing water management system to provide flood attenuation for Yorks Creek.
Operational Workforce	Up to approximately 660 at Mount Owen and up to 260 at Ravensworth East	Continued employment of existing Mount Owen workforce (up to approximately 660) for an additional 6 years.
Hours of Operation	24 hours, 7 days per week	No change to hours of operation.
Interactions with Integra Underground	Minimum 250 m separation subject to strict safety and operational controls	No change to minimum separation – implementation of safety and operational controls through integration of Glencore owned mining operations.
Final Landform	Final voids at BNP and North Pit Final landform approved with commitments relating to landform design (including micro relief), conservation and water management considerations as part of further detailed mine design	No additional void in final landform. Proposed changes to the final void arrangement in North Pit. Final landform to be designed to incorporate detailed design commitments relating to landform design (including micro relief), conservation and water management considerations and be consistent with the existing progressive rehabilitation objectives in the development consent.

2.2 Mine Plant and Equipment

The noise modelling inputs for the Proposed Modification consider mining activities for the proposed Year 2, 8 and 15 mining operations. The indicative equipment schedules for the three mine plan stages modelled are presented in **Table 2.1**. The indicative equipment sound power levels presented in **Table 2.2** are considered indicative rather than mandatory. The actual performance of the mining operation as a whole will be determined by monitoring noise levels at select receptors and modifying the mobile fleet mix to meet noise criteria.

Table 2.1 Indicative Equipment Schedule

Description		Year 2	Year 8	Year 15
Excavators	Liebherr 9800	1	1	1
	Liebherr 996	3	2	1
	Liebherr 9400	2	2	2
Trucks	Hitachi EH4500	12	-	-
	Cat 793F	17	27	19
	Cat 785	6	5	5
Dozers	Dozer D10	8	8	4
	Dozer D11	2	2	2
	RTD	1	1	1
Ancillary	Drills	4	4	2
	Service Truck	4	4	4
	Water Trucks	4	4	3
	Grader 16M	1	1	-
	Grader 24M	2	2	2
Haulage Breakdown[1]		**Year 2**	**Year 8**	**Year 15**
Exc 1_9800 - Haul		nine 793 sized trucks (90% waste/10% coal)	eight 793 sized trucks (90% waste/10% coal)	six 793 sized trucks (90% waste or up to 11 coal haul trucks)
Exc2_996 – Haul		five 793 sized trucks (90% waste/10% coal)	five 793 sized trucks (90% waste/10% coal)	six 793 sized trucks (90% waste or up to eight coal haul trucks)
Exc3_996 – Haul		five 793 sized trucks (90% waste/10% coal)	seven 793 sized trucks (90% waste/10% coal)	-
Exc4_996 – Haul		five 793 sized trucks (90% waste in-pit/10% coal or to WOOP Dump)	-	-
Exc5_9400 – Haul		five 793 sized trucks (50% waste/50% coal)	five 793 sized trucks (50% waste/50% coal)	five 793 sized trucks (90% waste or up to six coal haul trucks)
Exc6_9400 - Haul		six 785 sized trucks (50% waste/50% coal)	five 785 and two 793 sized trucks (50% waste/50% coal)	five 785 and two 793 sized trucks (50% waste/50% coal)

Note 1: the breakdown of equipment on the haulage routes for each excavator is indicative only and has been provided to indicate the fleet numbers required to support the waste and coal excavators.

Table 2.2 Indicative Equipment Sound Power Level (or equivalent) as modelled

Item	Label	Activity	dB(Lin)	dB(A)
1	**Liebherr R9800 excavator**	Digging	123	117
2	**Liebherr 996 excavator**	Digging	123	117
3	**Liebherr R9400 excavator**	Digging	121	116
4	**Cat 793FXQ Mine Truck**	Idle loading	110	103
		Pulling away	125	116
		Flat	125	114
		Up hill	125	116
		Dumping	122	113
		Down hill	125	114
5	**EH4500 Mine Truck**	Flat	120	110
		Up hill	119	113
		Dumping	120	110
		Down hill	117	111
6	**Cat 785CXQ Mine Truck**	Idle loading	110	103
		Pulling away	121	114
		Flat	120	111
		Up hill	121	114
		Dumping	120	112
		Down hill	120	111
7	**D11 Dozer**	Forward	123	112
		Reverse 2nd gear	126	122
		Reverse 1st gear	124	120
8	**D10 Dozer**	Forward	122	113
		Reverse 2nd gear	126	120
		Reverse 1st gear	124	118
9	**Rubber Tyred Dozer**	Forward	116	110
10	**CAT 992D FEL**	Working on raw coal	121	113
11	**CAT 785 Water Cart**	Road maintenance	126	115
12	**CAT 777 Water Cart**	Road maintenance	122	115
13	**CAT 16M Grader**	Road maintenance	115	108
14	**CAT 24M Grader**	Road maintenance	119	112
15	**Reedrill SK50 Drill**	Drilling	119	114
16	**Service Truck**	Ancillary - flat	112	112

2.3 Incorporated Noise Control Measures

Consistent with the approach to noise mitigation and management as part of Approved Operations, Mount Owen has committed to the ongoing implementation of noise control measures to minimise noise emissions and to meet the relevant noise criteria at surrounding private residences as part of ongoing operations.

Throughout the development of the conceptual mine plan, mine planning has considered a range of iterative noise modelling processes designed to identify noise controls that can be implemented into the Proposed Modification. This process was undertaken to ensure that the modifications to the North Pit mining were able to be practically undertaken to meet current noise criteria as detailed in SSD-5850. This process included a number of revisions to the modified mine plan progression including:

- optimisation of pit geometry and overburden emplacement sequencing to enable placement of mining equipment lower in the dump and in pit during adverse meteorological conditions;
- redesign of overburden haulage routes from the pit to emplacement areas to maximise shielding from the pit crest and surrounding topography to limit noise emissions - it is noted that this has resulted in viable coal reserves being left in the mining area to enable design of the haul road along the eastern high wall of the North Pit;
- detailed review of production planning and mine sequencing to enable the incorporation of required operational controls (such as slow down in mine progression, provision of low dump areas and where required selective mining equipment shut downs) during periods of adverse weather conditions; and
- Detailed review of mine plan sequencing and slowing of proposed production in the latter years to reduce noise impacts to be consistent with Approved Operations.

In addition to the mine design controls above, the following reasonable and feasible controls have been committed to over the life of the Proposed Modification. Where relevant, all of these controls have been factored into the noise model to determine that the existing noise criteria are achievable over the life of the Proposed Modification. Consistent with the approach and controls identified in the approved Mount Owen Complex NMP, these controls largely relate to operational measures that are implemented in response to the real time noise monitoring system surrounding the Mount Owen Complex. In general, these controls can include the following:

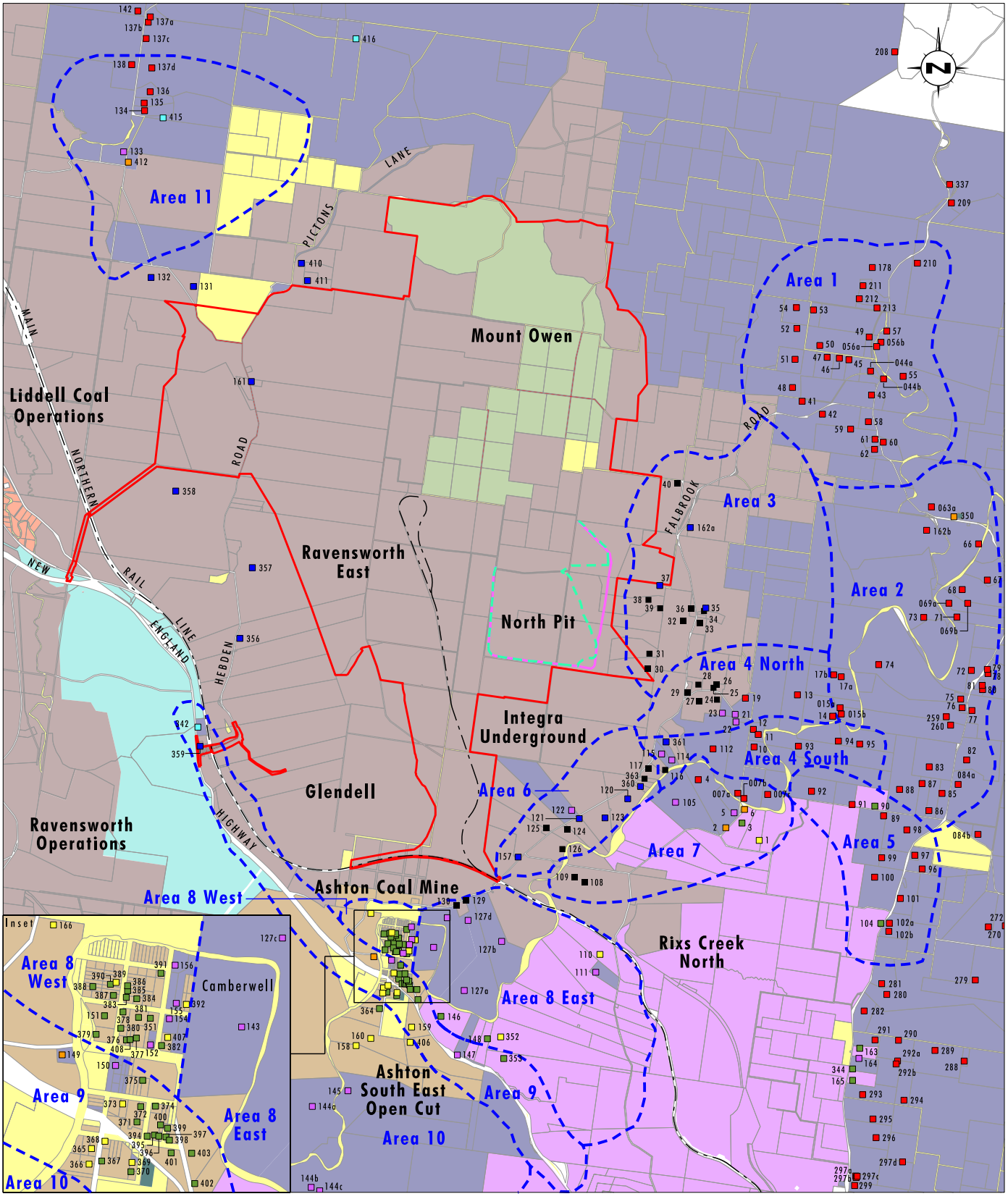
- The management of mobile machines during adverse weather conditions when wind conditions or inversion conditions enhance noise propagation towards sensitive receiver locations. In order to control/eliminate noise impacts this would likely include:
    - providing alternative dumping locations;
    - moving parts of the fleet to locations deeper in the pit; and/or
    - Revising mining operations to reduce noise impacts including the implementation of a hierarchy of controls ranging from review of equipment locations and nature of activity, through to shut down of equipment as required to maintain compliance with noise criteria.

- Managing a number of ancillary activities to limit their occurrence during adverse meteorological conditions, such as those which may occur during winter night-times, including:
    - limiting ancillary mining equipment (e.g. dozers on overburden dumps, drills) during times of adverse weather conditions;
    - reducing bulldozer activity on exposed rehabilitation areas; and/or
    - managing activities located at or near ground surface, such as top-soil and pre-strip, during the later stage of the mine life.
- The inclusion of bunds in strategic locations along some haul roads, and where practicable, locate these along the south-eastern side of the ramps, shielding trucks and equipment on exposed sections of the ramps.
- Location and orientation of haul roads such that they are not aligned with prevailing source to receiver winds where practicable.
- Incorporation of reasonable and feasible noise attenuation on key plant and equipment consistent with current commitments for the Approved Operations.

Further details on the specific mitigation measures incorporated into the relevant mine plans is provided in **Section 3.4**.

2.4 Noise Receiver Areas

Residences in the region surrounding the Approved Operations have been grouped into localities or areas that have similar representative background noise levels. These areas have been defined giving consideration to topographical features that may enhance or attenuate the transmission of noise and the relative location of other noise sources (such as industrial, train and road traffic). The noise receiver areas as referenced in SSD-5850 have been adopted for the Proposed Modification and are reproduced in **Figures 2.1** and **2.2**.



Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Operations Pit Boundary
- Defined Receiver Areas (Project-specific Noise Level)
- Proposed Modification Pit Boundary
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 2.1

Sensitive Receivers Areas

File Name (A4): R14/3810_231.dgn
20180621 10.07

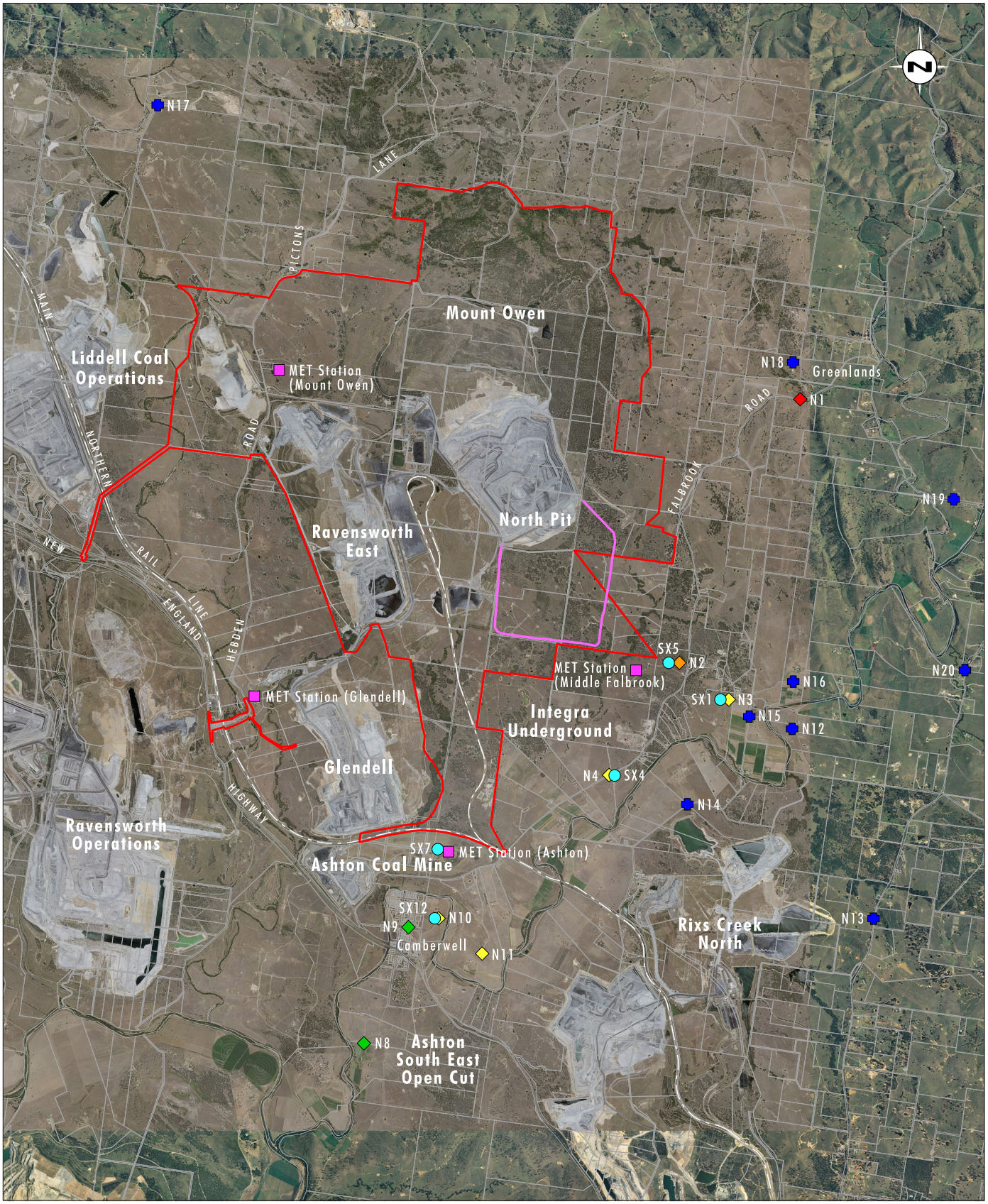


Image Source: Glencore (2017)
Data Source: Glencore (2018)

Legend

- SSD-5850 Consent Boundary
- Proposed Modification Pit Boundary
- Routine Validation Attended Noise Monitoring Location
- Combined - Adopted Compliance Attended Noise Monitoring Location
- Glendell - Adopted Compliance Attended Noise Monitoring Location
- Mount Owen - Adopted Compliance Attended Noise Monitoring Location
- Meteorological Station Location
- Real Time Continuous Noise Monitoring Location
- Supplementary Performance Management Attended Noise Monitoring Location

FIGURE 2.2

Existing Noise Monitoring Locations

3.0 Methodology

3.1 Predictive Noise Model

In accordance with the INP the prediction of noise levels takes into account all possible noise sources that may reasonably be expected when the Proposed Modification is fully operational. The objective of the noise modelling is to provide a prediction of the noise impacts from the Proposed Modification for comparison against the relevant noise criteria specified in SSD-5850.

The computer-based modelling software package Environmental Noise Model (ENM), developed by RTA Technology Pty Ltd, was used to predict the noise levels produced by the Proposed Modification within the surrounding environment. ENM is recognised and accepted by the EPA as a computer modelling program suited to predicting noise impacts from industrial noise sources.

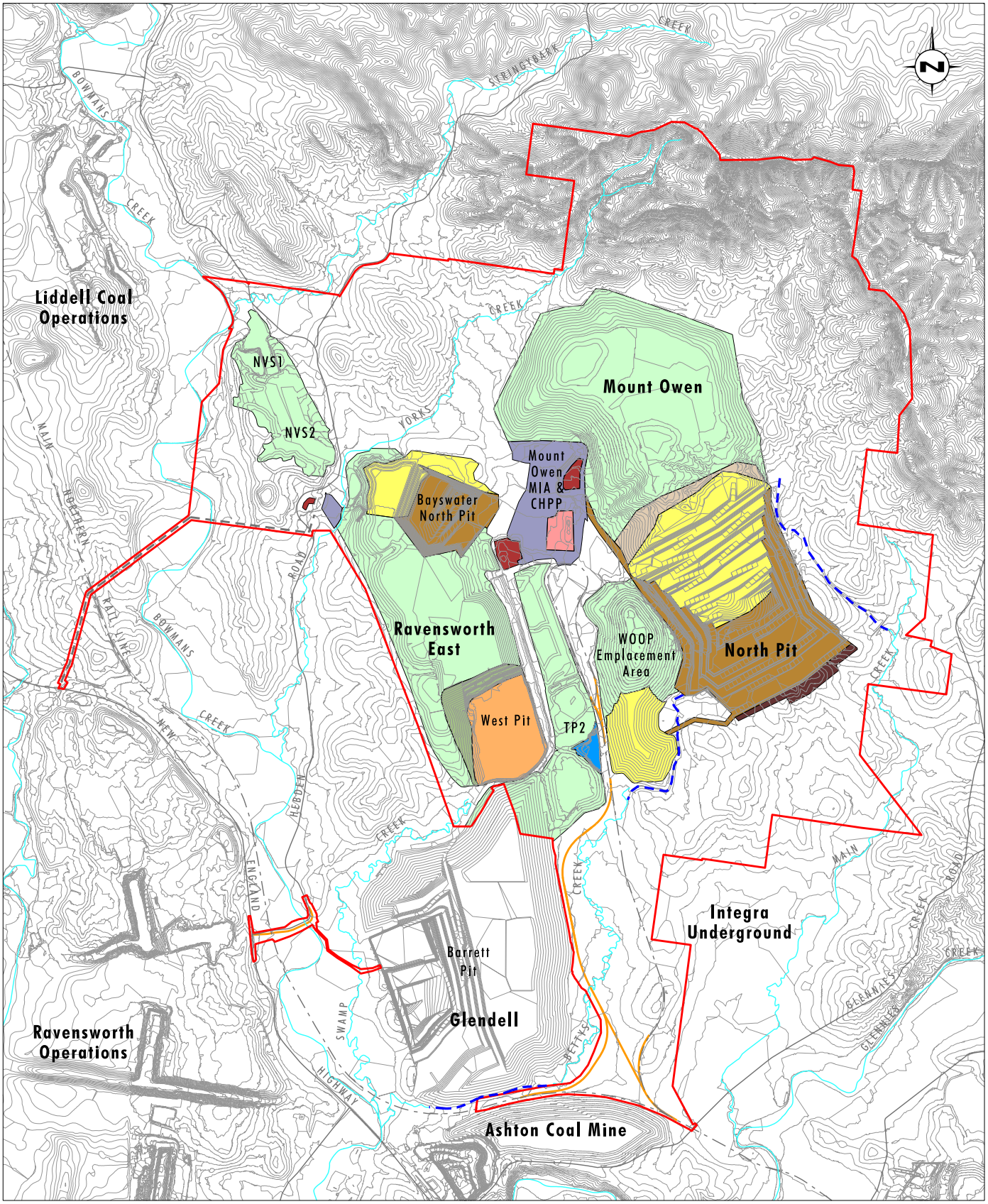
The ENM noise modelling of the Proposed Modification was based on a number of model inputs:

- Noise source data – Indicative machine and plant sound power levels (SWL) are presented in **Table 2.2**. The SWL data was compiled from current operational noise monitoring data and supplementary data collected by Umwelt from various existing mining operations.

- Meteorological data – Collated meteorological data was obtained from the SX 13 monitoring station located to the south-west of the active mining areas (see **Figure 2.2**) for the period January 2014 to December 2014 inclusive. The selection of this meteorological data set is consistent with the air quality impact assessment for the Proposed Modification (Jacobs, 2018) which was selected as it provided a representative meteorological data set for the surrounding area. The meteorological data was analysed to determine prevailing wind conditions likely to influence the propagation of noise from the Proposed Modification. Temperature lapse rate was determined using wind stability classes in accordance with the methods described in the INP.

- Proposed mine plans - The production schedules and mine plans were provided by Mount Owen and include the location of the mining activities, dump locations and the type of machines representative of the proposed mining operation. The mine plans for the three modelled years (Years 2, 8 and 15) are shown in **Figures 3.1**, **3.2** and **3.3** respectively, which incorporate the mine design noise control measures as outlined in **Section 2.3**. The model considered operations for the North Pit, the Bayswater North Pit (in Year 2 model only), the CHPP and train loading facility, and the Glendell ROM haul road.

- Surrounding terrain characteristics - The digital terrain maps of the region surrounding the Proposed Modification were prepared by Umwelt using LiDAR data and the mine plans provided by Mount Owen.



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 1.0 2.0 3.0km
1:60 000

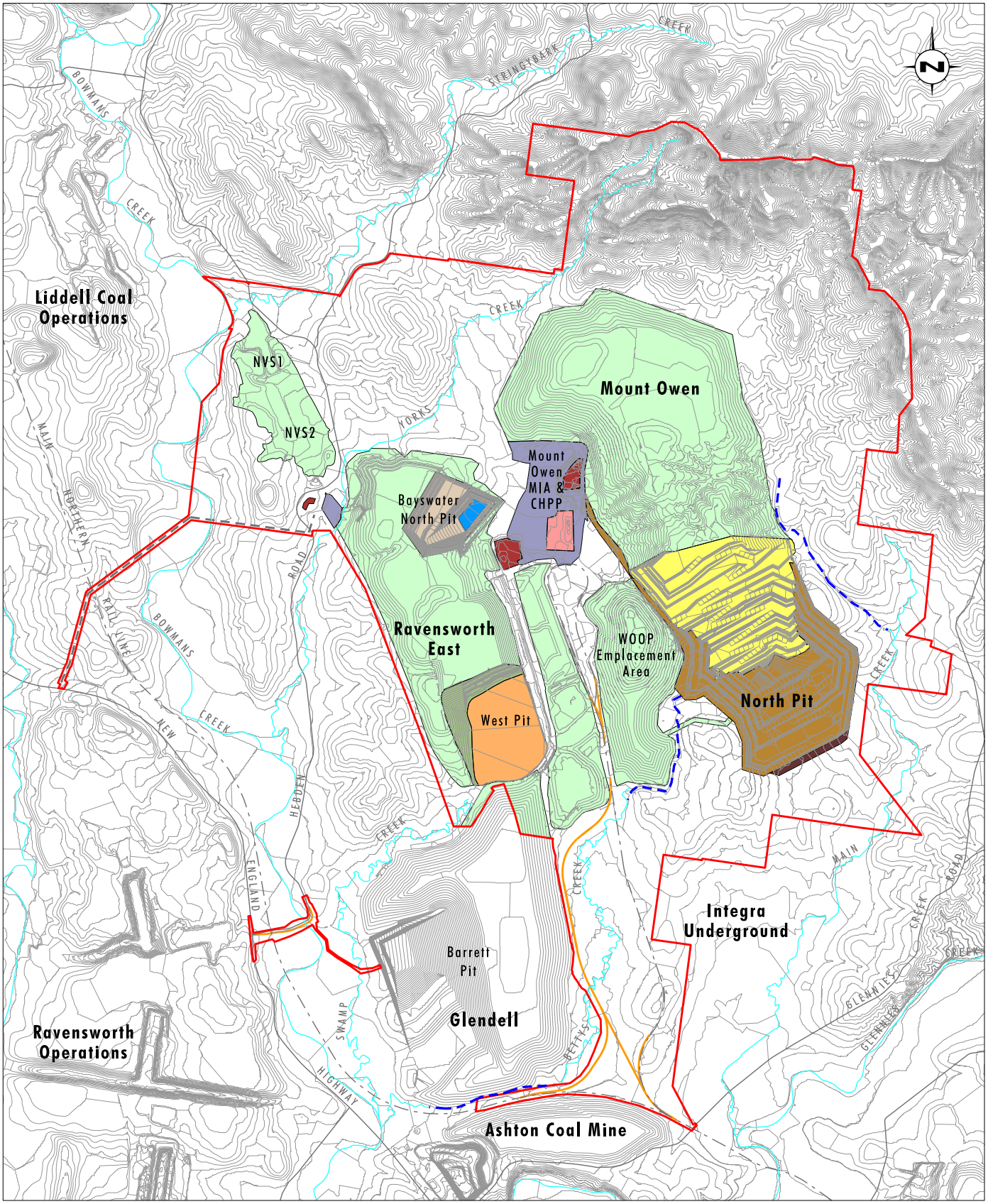
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Active Mining Area
- Active Overburden Emplacement Area
- Coal Stockpile - Product
- Coal Stockpile - ROM
- Infrastructure
- Rehabilitation - Temporary
- Rehabilitation - Complete
- Shaped Not Seeded
- Tailings Emplacement
- Topsoil Removal Strip
- Water Storage Area

FIGURE 3.1

Conceptual Year 2 Mine Plan

File Name (A4): R14/3810_177.dgn
20180523 12.28



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 1.0 2.0 3.0km
1:60 000

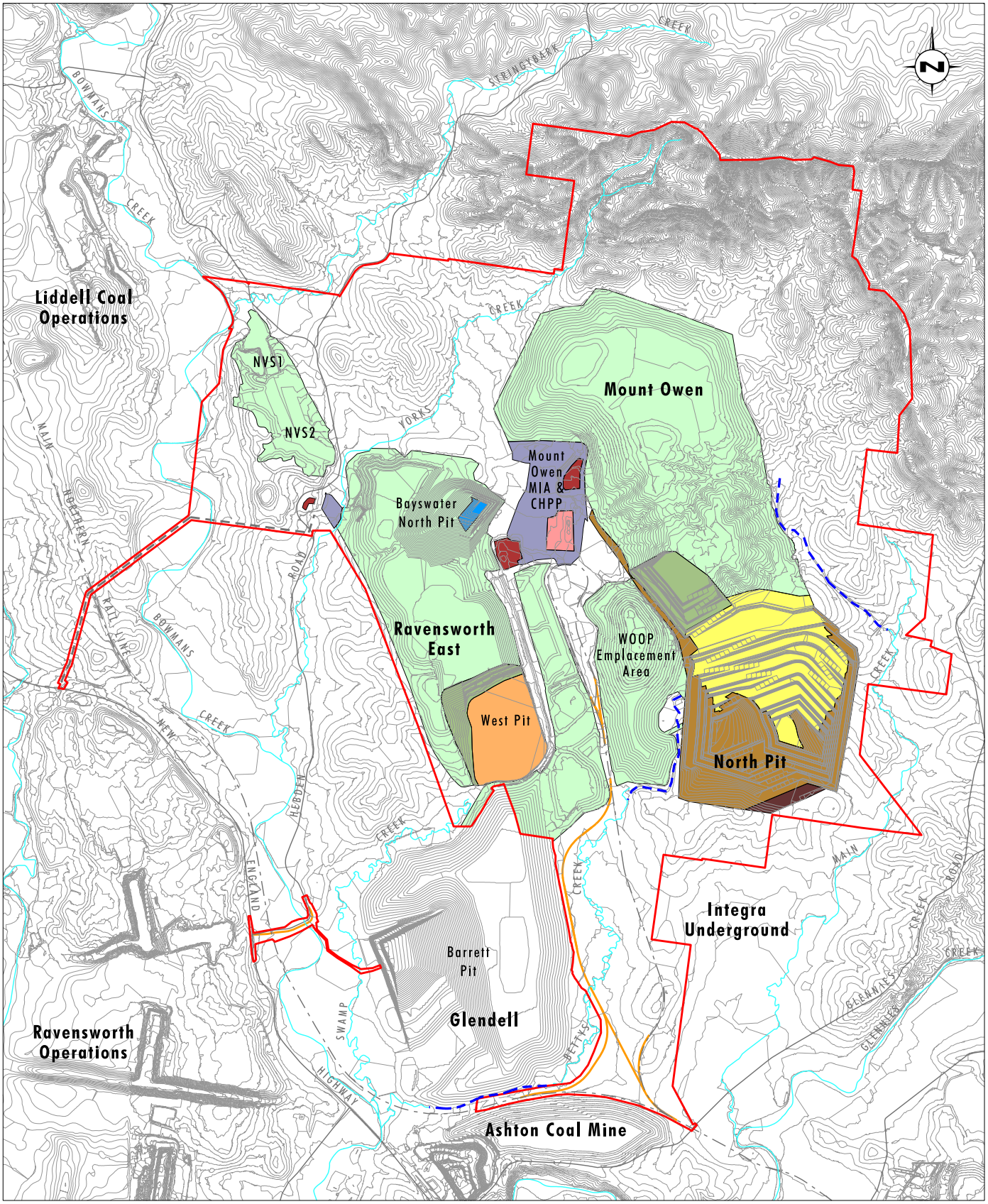
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Active Mining Area
- Active Overburden Emplacement Area
- Coal Stockpile - Product
- Coal Stockpile - ROM
- Infrastructure
- Rehabilitation - Temporary
- Rehabilitation - Complete
- Shaped Not Seeded
- Tailings Emplacement
- Topsoil Removal Strip
- Water Storage Area

FIGURE 3.2

Conceptual Year 8 Mine Plan

File Name (A4): R14/3810_178.dgn
20180523 12.28



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 1.0 2.0 3.0km
1:60 000

Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Active Mining Area
- Active Overburden Emplacement Area
- Coal Stockpile - Product
- Coal Stockpile - ROM
- Infrastructure
- Rehabilitation - Temporary
- Rehabilitation - Complete
- Tailings Emplacement
- Topsoil Removal Strip
- Water Storage Area

FIGURE 3.3

Conceptual Year 15 Mine Plan

File Name (A4): R14\3810_179.dgn
20180523 12.30

In the noise models of the Proposed Modification it was assumed that:

- At least 90-95% of the total mobile equipment fleet would be operating at any point in time during the productive period of each shift and that the acoustically significant plant and equipment would operate simultaneously;
- Mobile noise sources, such as front-end loaders, excavators and haul trucks were modelled at typical locations and assumed to operate in repetitive cycles;
- Where possible, the emplacement areas would incorporate alternate shielded operational locations for evening/night time operations. This included configuring the overburden emplacement areas such that there were options to remove machines from the higher or exposed locations during periods associated with adverse meteorological conditions;
- Noise bunds were located along haul roads and ramps. The Continued Operations Project (Umwelt 2014) investigated potential locations for bunds along haul roads and on exposed ramps to provide additional 'shielding' for the operational equipment. The quantitative review of the effectiveness of these bunds identified that, when located appropriately the bunds assist in the reduction of predicted noise emissions. Accordingly, conceptual bunding and shielding has been included in Year 2, 8 and 15 noise models;
- The mine plan layouts for Bayswater North Pit included overburden emplacement to enable day/night dumping alternatives during periods associated with adverse meteorological conditions;
- The equipment will nominally be in use 7 days per week, 24 hours per day; and
- Key items of plant and equipment will incorporate reasonable and feasible noise control measures.

The modelling process investigated the probability of noise criteria being exceeded during a specified period (i.e. day, evening, night). The probabilistic modelling then investigated the effectiveness of a range of control options by comparing the noise impacts at individual receiver locations using cumulative probability charts specific to the receiver location and noise contours that cover the whole region surrounding the Proposed Modification.

3.2 Multivariable Meteorological Analysis

As a 24 hour 7 day per week operation, the Proposed Modification would need to comply with noise limits at all times, except for under the meteorological conditions listed in Appendix 4 of SSD-5850 (reproduced in **Section 1.3** above).

The noise model was used to predict the noise contribution at sensitive receivers of interest based on 172 multivariable meteorological conditions (All Conditions). These conditions are used to represent every combination of wind speed, wind direction and temperature stability that could be experienced in the area surrounding the mine throughout the year. The percentage of time the combinations of wind speed and temperature stability that are applicable according to the definitions in Appendix 4 of SSD-5850 is as follows:

- All Seasons Day (Applicable conditions - 71% of the time)
- Non-winter Evenings (Applicable conditions - 69% of the time)
- Non-winter Nights (Applicable conditions - 89% of the time)
- Winter Evening/Nights (Applicable conditions - 80% of the time)

It should be noted that there is a regulatory expectation that the controls that are put into place during conditions that satisfy the requirements of SSD-5850 would also remain in place once the meteorological conditions become adverse and non-licensable. To enable an assessment of the time the noise control measures would be required, the modelled meteorological conditions also considers combinations of wind speed and temperature stability that are not applicable according to the definitions in Appendix 4 of SSD-5850.

As noted above, combinations of wind speed and temperature stability that are not applicable according to the definitions in Appendix 4 of SSD-5850 have been included in the analysis. Depending on the direction from the source to the receiver location the non-applicable conditions can account for up to 14% of the prevailing adverse meteorological conditions. These conditions include wind speeds greater than 3 m/second measured at 10 m above ground level; wind speeds greater than 2 m/second measured at 10 m above ground level during F class stability conditions and G class stability conditions.

3.3 Assessment Methodology

The objective of this noise assessment is to confirm whether or not the approved noise limits as detailed in SSD-5850 will continue to be achievable over the life of the Proposed Modification.

In order to provide quantitative information that could be used to assess the noise implications of the Proposed Modification, the predictive noise model was run using meteorological data representative of each season and each time period (day, evening and night). The assessment methodology involved the following steps:

1. The probability of exceedance of the noise criteria at each of the respective receivers of interest was assessed for the Approved Operations in combination with the Proposed Modification for all meteorological conditions. The predictive noise models of the Proposed Modification included all the noise control commitments of the Approved Operations along with the specific mine design controls detailed in **Section 2.3**.

2. Additional operational noise controls were then systematically implemented via a predictive process within the noise model, using a hierarchy of control options (see **Section 4.0** below for further detail) to reduce the probability of exceedance of the existing noise criteria at the receivers of interest. This required multiple scenarios to be tested through the model; gradually refining and amending the type and level of operational controls applied for each meteorological scenario until the optimal combination was identified. The operational controls that are incorporated into the optimised scenario are designed to offset any noise impacts from proposed changes to mining in the North Pit and extension of mine life. The optimised scenario also accounts for worst-case meteorological conditions that enhance source to receiver noise propagation.

3. As discussed in **Section 3.2**, the probability of exceedance of the existing noise criteria includes periods when the meteorological conditions are not applicable according to the definitions in Appendix 4 of SSD-5850. Therefore, the objective of systematic implementation of the noise controls was to reduce the probability of exceeding the respective noise limit for each receiver location to less than 10% of the respective time period. This is consistent with the approach taken for the Continued Operations Project for the assessment of the noise impacts and the setting of achievable criteria (Umwelt 2014 and 2016).

4. Once an achievable level of operational modification had been identified, this became known as the Optimum Scenario under which the Proposed Modification could continue to meet the noise criteria via an augmented set of operating conditions. Optimum Scenarios for each period were then checked against applicable meteorological conditions to determine any residual probability of exceedance of the noise criteria.

3.4 Modelled Operational Scenarios

The alterations to the operations for each modelled scenario discussed in **Section 3.3** were based on step-by-step changes to operational activities, centred on the following hierarchy of control options (implemented once the mine design noise controls were developed for the Proposed Modification):

1. Relocate or shutdown ancillary equipment in exposed locations (e.g. rehabilitation and pre-strip dozers);

2. Employ first-gear reverse for dozers in exposed locations;

3. Strategically relocate or shutdown ancillary equipment (road construction maintenance, extra water cart(s), drill(s));

4. Move activities to lower dumps, or night dumps;

5. Shut down exposed dozers and/or replace with rubber tyred dozers, and reduce speed of all other dozers;

6. Reduce speed of trucks; and

7. Implement shutdown options based on waste/coal priority.

The objective of the modelling was to determine the operational constraints that the Proposed Modification could be required to operate within to continue to meet the existing approved noise criteria. The hierarchy of control options was used to enable the assessment of the potential noise impacts with indicative controls in place. The actual implementation of control options will depend on the specific meteorological conditions, information from the real time noise monitoring system and operational requirements at that time. The protocols for the implementation of these controls are well established and defined in the approved Mount Owen Complex NMP.

For the purposes of this assessment the optimisation of the operational scenarios identified above have been incorporated into the noise models for key periods, with the results identified in **Section 4.1**. It is important to note that the scenarios identified are not prescriptive or exhaustive, rather they are to confirm that with the implementation of a range of operational controls, Mount Owen can maintain its commitment of managing the Proposed Modification to meet existing noise criteria. Further details on noise management and mitigation commitments are provided in **Section 6.0**.

It should be noted that the maximum level of control required to meet the existing noise criteria at each of the residential receiver locations is only required for the worst case meteorological conditions that are applicable according to the definitions in Appendix 4 of SSD-5850. The actual implementation of operational controls would occur on a sliding scale from initial machine relocations up to the maximum operational constraint proposed, dependent on the actual meteorological conditions at the time of operations.

4.0 Noise Predictions

ENM's Single Point calculation feature was used to determine noise levels from the Proposed Modification at receiver locations. **Table 4.1** provides a summary of the compliance of the Proposed Modification against the existing noise criteria. The predicted operational noise levels for the optimised models for Years 2, 8 and 15 are presented as noise contours in **Figures 4.1** to **4.12**. The contours show the predicted 10th percentile optimised operational noise levels for Years 2, 8 and 15 of the Proposed Modification. Worst case outcomes are driven largely by unfavourable meteorological conditions that lead to increased noise propagation. These meteorological conditions have required detailed analysis which has led to the modelled scenarios. As discussed in **Section 3**, this iterative process has identified mine design controls outlined in **Section 2.3,** and effective noise management measures outlined in **Section 3.4,** which are incorporated into the model to demonstrate that compliance with the existing criteria, can be achieved under worst-case conditions. The model predictions for the optimised modelling scenario are provided in **Appendix 5.**

It should be noted that the model predictions provided in **Appendix 5**, are an example of the predicted noise levels with representative operational noise management controls in place during unfavourable meteorological conditions. Consistent with the Approved Operations management controls will only be implemented when required under unfavourable meteorological conditions and the level of operational management will vary to manage noise levels to meet existing noise criteria. The predictions are an example of the controls that can be achieved during unfavourable meteorological conditions and demonstrate that the Proposed Modification can be managed to meet existing criteria.

Table 4.1 Compliance with SSD-5850 Criteria for Predicted Noise Levels for Optimised Scenarios

Residence (as defined on SSD-5850)[1]	Noise Criteria	Compliance with Criteria (all applicable meteorological scenarios)		
	Day/Evening/Night LAeq(15 min)	Year 2	Year 8	Year 15
41, 48	*36 / 35 / 35*	*Y*	*Y*	*Y*
91	*37 / 37 / 36*	*Y*	*Y*	*Y*
14, 92	*37 / 37 / 37*	*Y*	*Y*	*Y*
10, 11	*37 / 37 / 37*	*Y*	*Y*	*Y*
13[4]	*38 / 38 / 38*	*Y*	*Y*	*Y*
12, 94, 95, 112	*38 / 38 / 38*	*Y*	*Y*	*Y*
111	*39 / 39 / 36*	*Y*	*Y*	*Y*
19[4]	*39 / 39 / 39*	*Y*	*Y*	*Y*
93[4]	*40 / 40 / 40*	*Y*	*Y*	*Y*
21, 22, 23[2]	*41 / 41 / 41*	*Y*	*Y*	*Y*
122[3]	*42 / 42 / 42*	*Y*	*Y*	*Y*
All other residences Area 4 – South	*37 / 37 / 36*	*Y*	*Y*	*Y*
All other residences Area 4 – North and all other residences Area 5	*37 / 37 / 35*	*Y*	*Y*	*Y*
All other residences Area 6	*40 / 40 / 40*	*Y*	*Y*	*Y*
All other residences Area 7	*40 / 40 / 38*	*Y*	*Y*	*Y*

Residence (as defined on SSD-5850)[1]	Noise Criteria	Compliance with Criteria (all applicable meteorological scenarios)		
	Day/Evening/Night LAeq(15 min)	Year 2	Year 8	Year 15
All other residences Area 8 – East	*39 / 39 / 35*	*Y*	*Y*	*Y*
All other residences Area 8 – West	*44 / 44 / 42*	*Y*	*Y*	*Y*
All other residences Area 9	*48 / 48 / 43*	*Y*	*Y*	*Y*
Other privately-owned residences	*35 / 35 / 35*	*Y*	*Y*	*Y*

Notes:

1 Consistent with the definition under SSD-5850 the residences and areas defined in this table represent all of the noise receiver areas surrounding Mount Owen. Where a noise receiver area is not specifically listed in the table this is covered by the criteria defined by 'other privately-owned residences' which is consistent with the minimum PSNL under the INP.

2 Residences have acquisition upon request rights under SSD-5850.

3 Residence 122 has acquisition rights under Glendell Mine Development Consent (DA80/952).

4 Residences have mitigation upon request rights under SSD-5850.

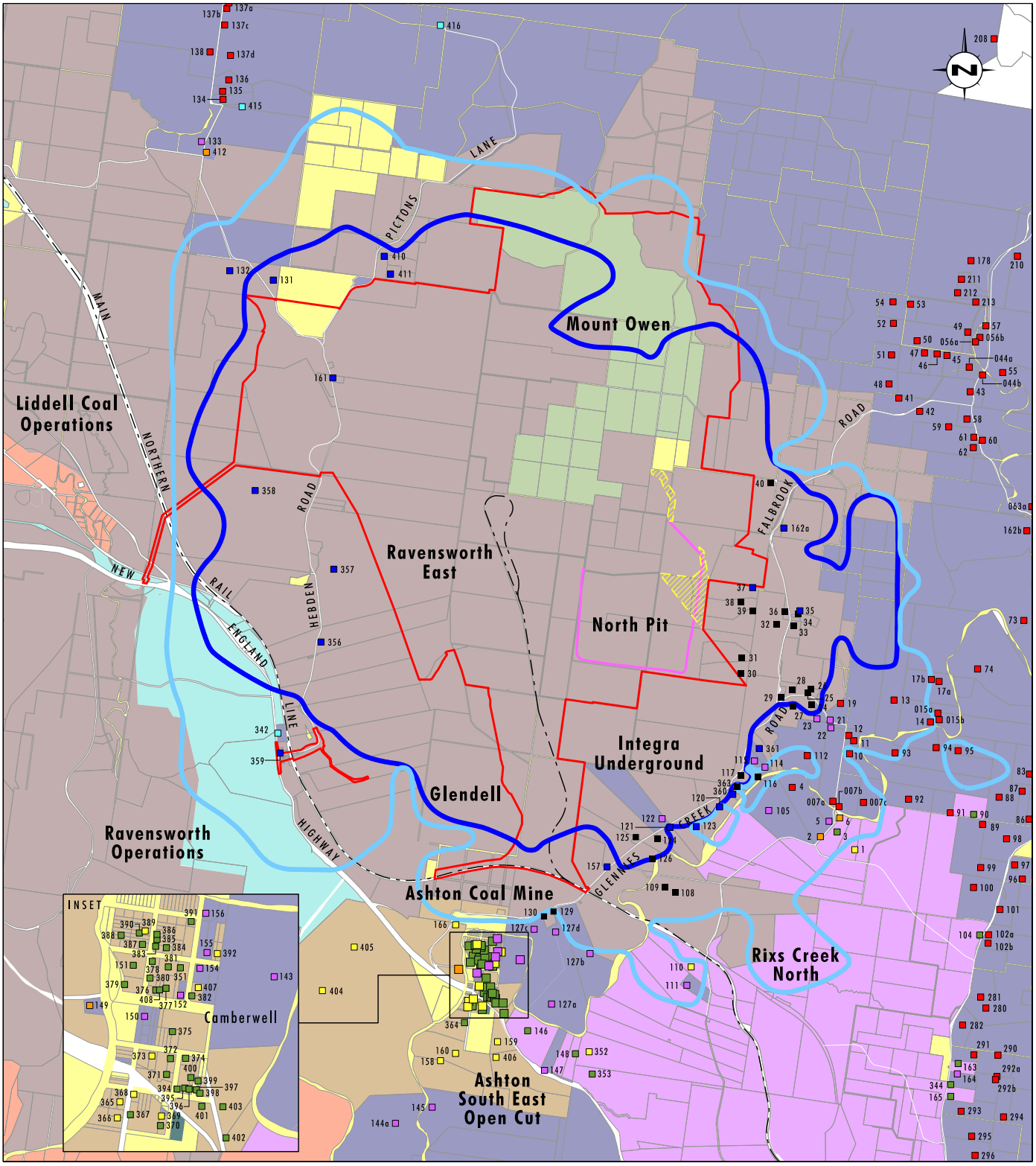
As noted in **Section 3.4**, the objective of the predictive noise modelling was to demonstrate whether or not Mount Owen can maintain its commitment of managing the Proposed Modification to meet the existing noise criteria. It is also reiterated that the hierarchy of control options identified in **Section 3.4** are not prescriptive or exhaustive, but show how the proposed additional control measures are effective at all receivers in the area surrounding Mount Owen Mine. As detailed on **Figures 4.1** to **4.12**, the existing noise criteria can be met by the Proposed Modification.

In accordance with the requirements of the Mining SEPP the assessment has considered potential impacts on private land in accordance with the VLAMP 2014.

The VLAMP 2014 summarises the NSW Government's interpretation of the significance of any potential exceedance of the relevant project specific noise criteria. With respect to vacant land, the VLAMP 2014 notes that a 'consent authority should only grant voluntary land acquisition rights where the noise generated by the development would contribute to exceedances of the recommended maximum noise levels in Table 2.1 of the INP on more than 25% of any privately owned land, and a dwelling could be built on that land under existing planning controls'. As demonstrated as part of this assessment, the noise impacts associated with the Proposed Modification are consistent with the Approved Operations and as such there are no additional impacts to private land (as defined in the VLAMP 2014) as a result of the Proposed Modification.

An assessment was also undertaken to identify if the predicted noise levels could exceed the original target project specific noise levels (PSNL) by more than 5 dB over more than 25% of any private land with dwellings where the predicted noise levels at the dwelling did not exceed the original PSNL by more than 5 dB. No additional private land has been identified where the target PSNLs have been exceeded by more than 5dB over more than 25% of the property.

As noted in **Section 1.2**, this assessment has demonstrated that the Proposed Modification is not predicted to result in increased impacts to any areas of privately owned land relative to the Approved Operations. Accordingly, at the point that the draft revised VLAMP is gazetted, it will not apply to the assessment of the Proposed Modification.



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

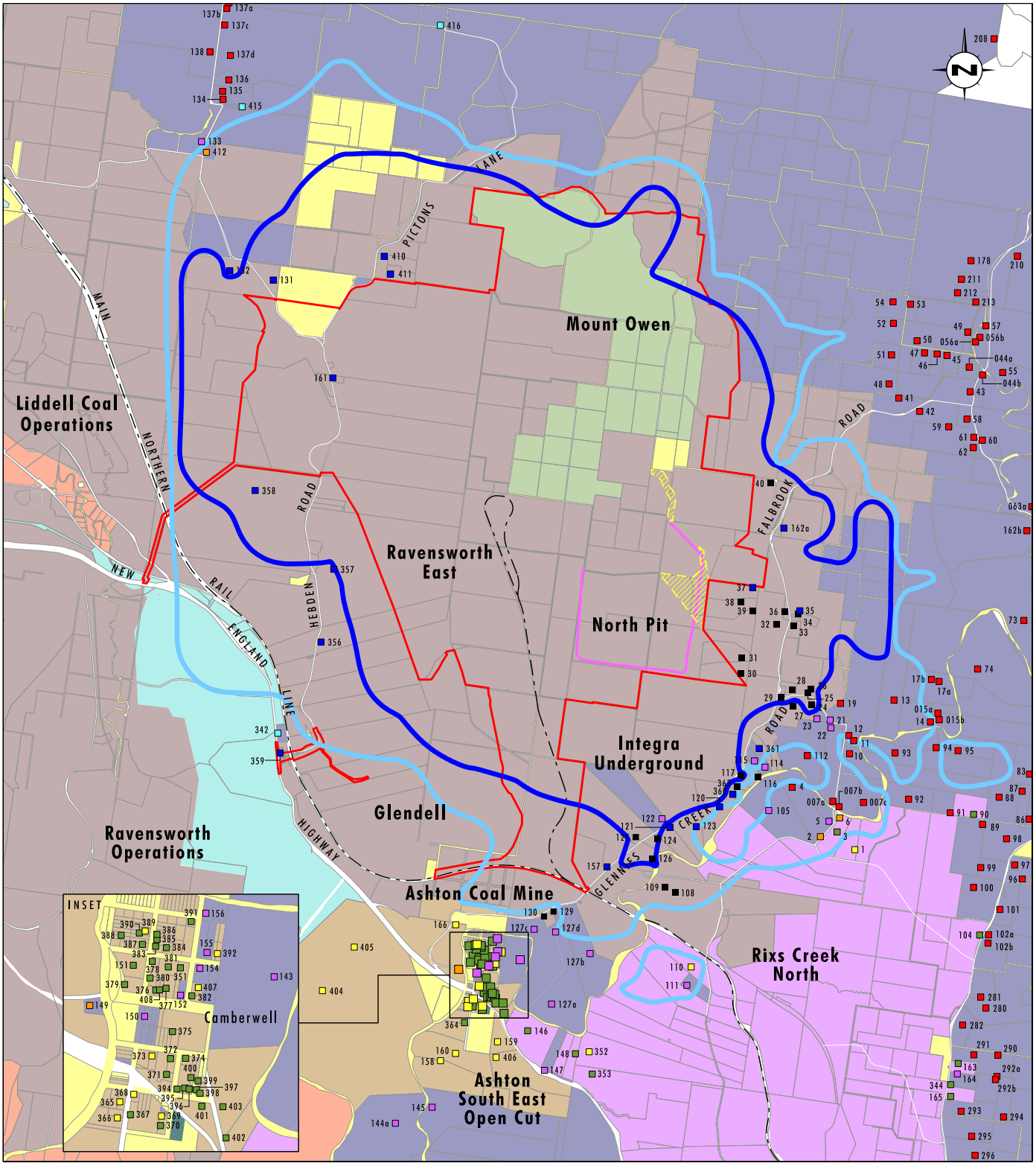
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.1

Noise Impact
Winter Evening/Nights
Year 2

File Name (A4): R14/3810_139.dgn
20180619 15.50



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

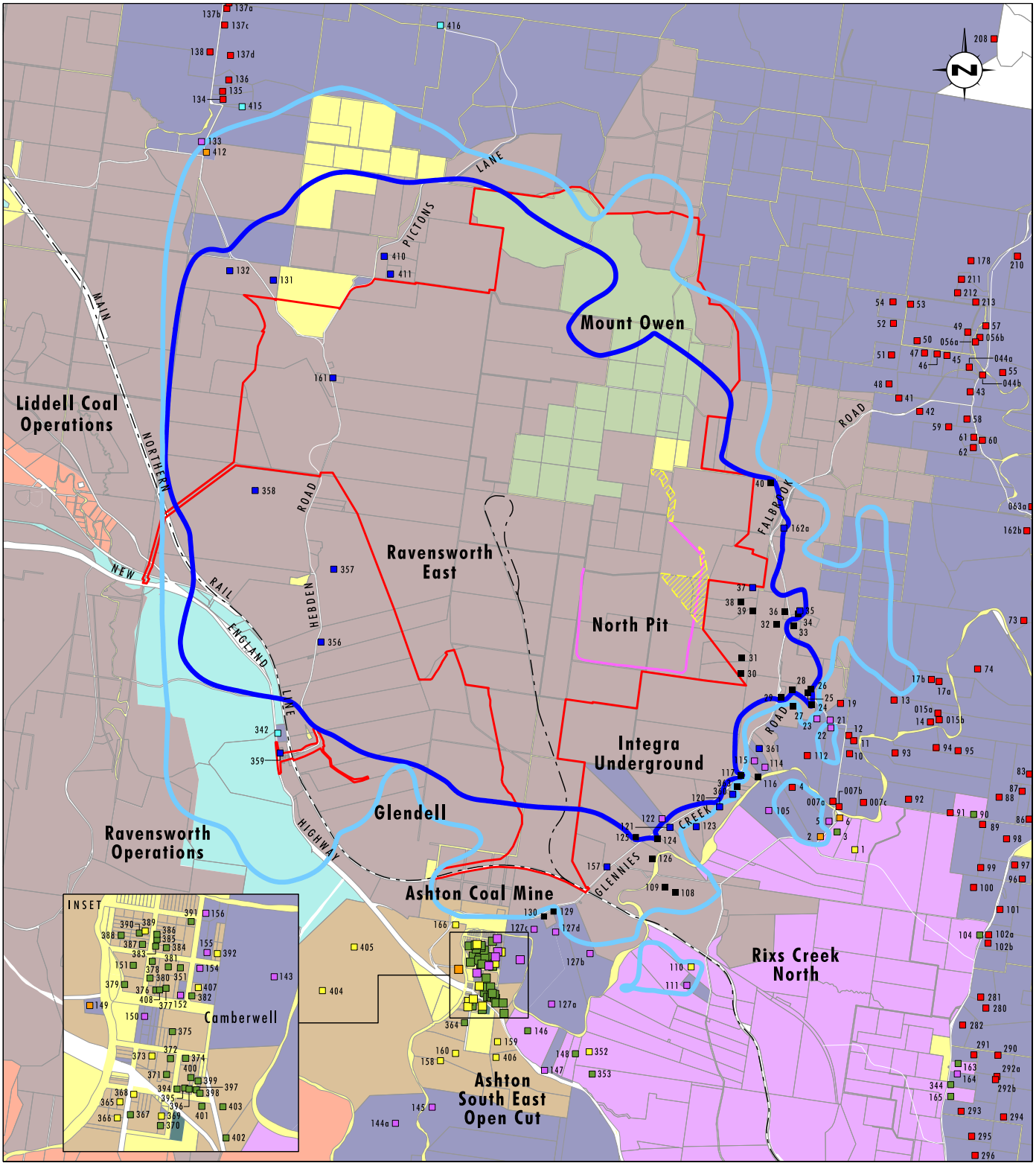
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.2

Noise Impact
All Seasons Day
Year 2

File Name (A4): R14/3810_140.dgn
20180619 15.50



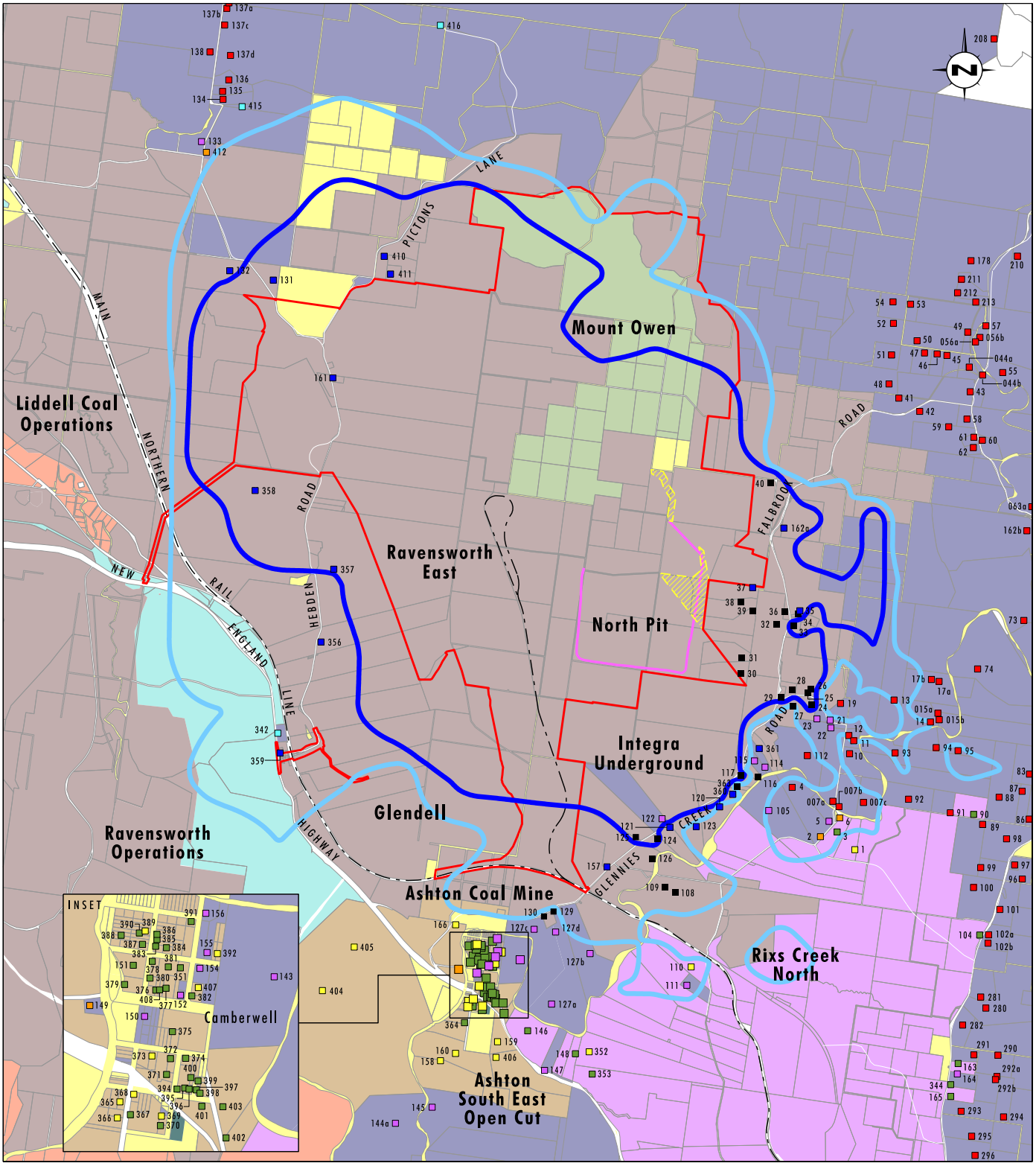
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.3

Noise Impact
Non-winter Evenings
Year 2

File Name (A4): R14/3810_141.dgn
20180619 15.50



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

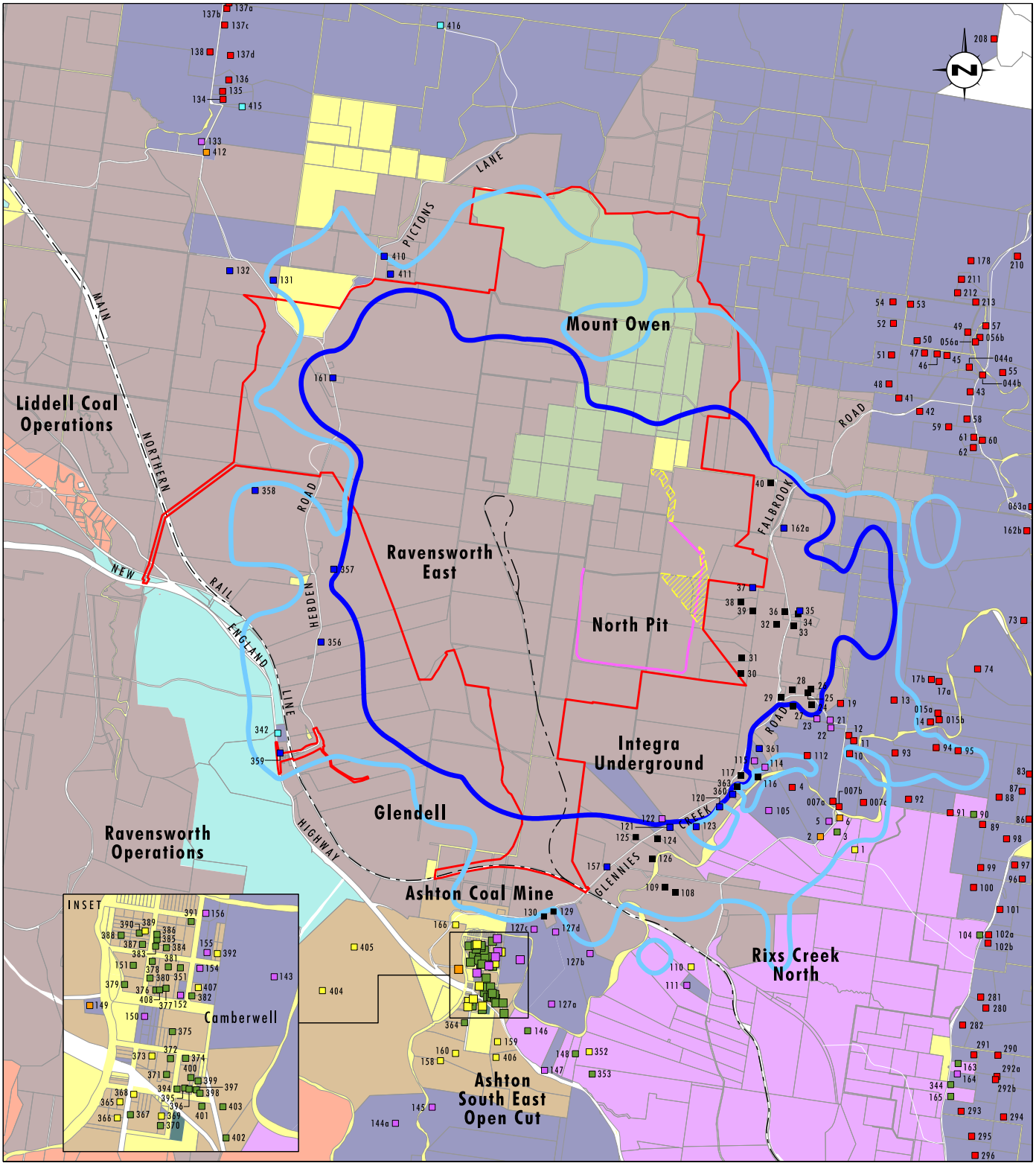
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.4

Noise Impact
Non-winter Nights
Year 2

File Name (A4): R14/3810_142.dgn
20180619 15.51



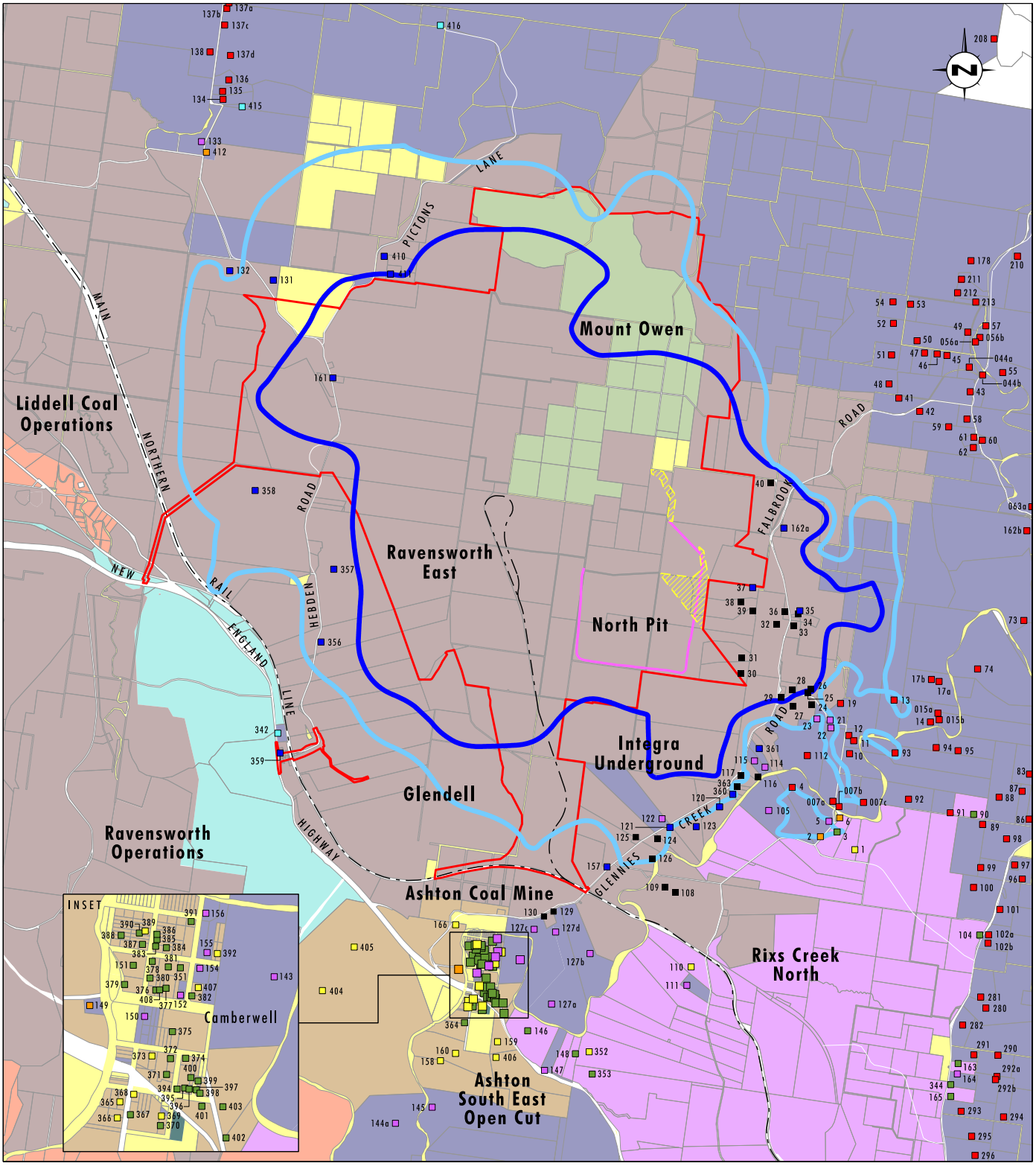
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.5

Noise Impact
Winter Evening/Nights
Year 8

File Name (A4): R14/3810_143.dgn
20180619 15.51



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

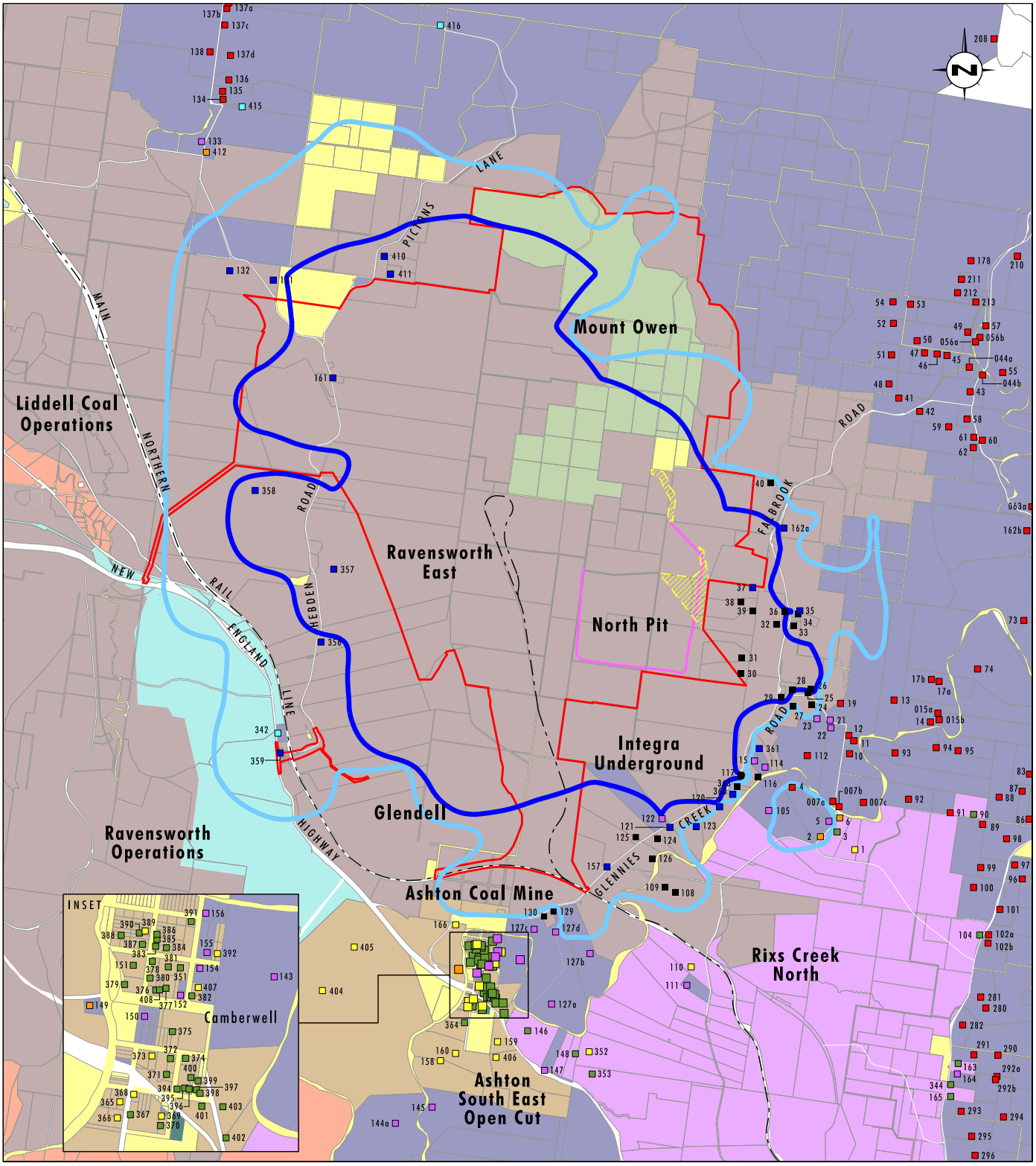
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.6

Noise Impact
All Seasons Day
Year 8

File Name (A4): R14/3810_144.dgn
20180619 15.52



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

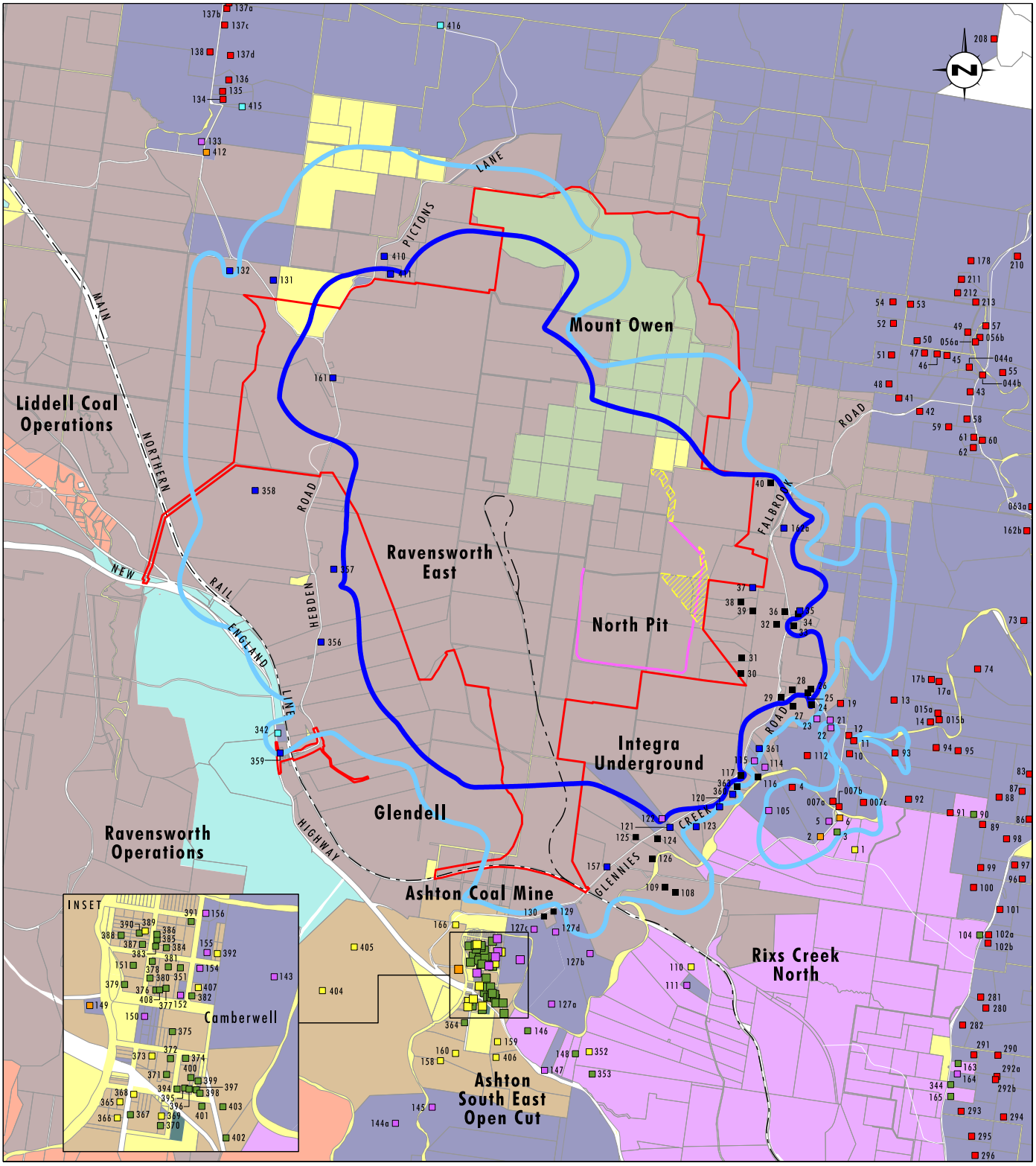
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.7

Noise Impact
Non-winter Evenings
Year 8

File Name (A4): R14/3810_145.dgn
20180619 15.52



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

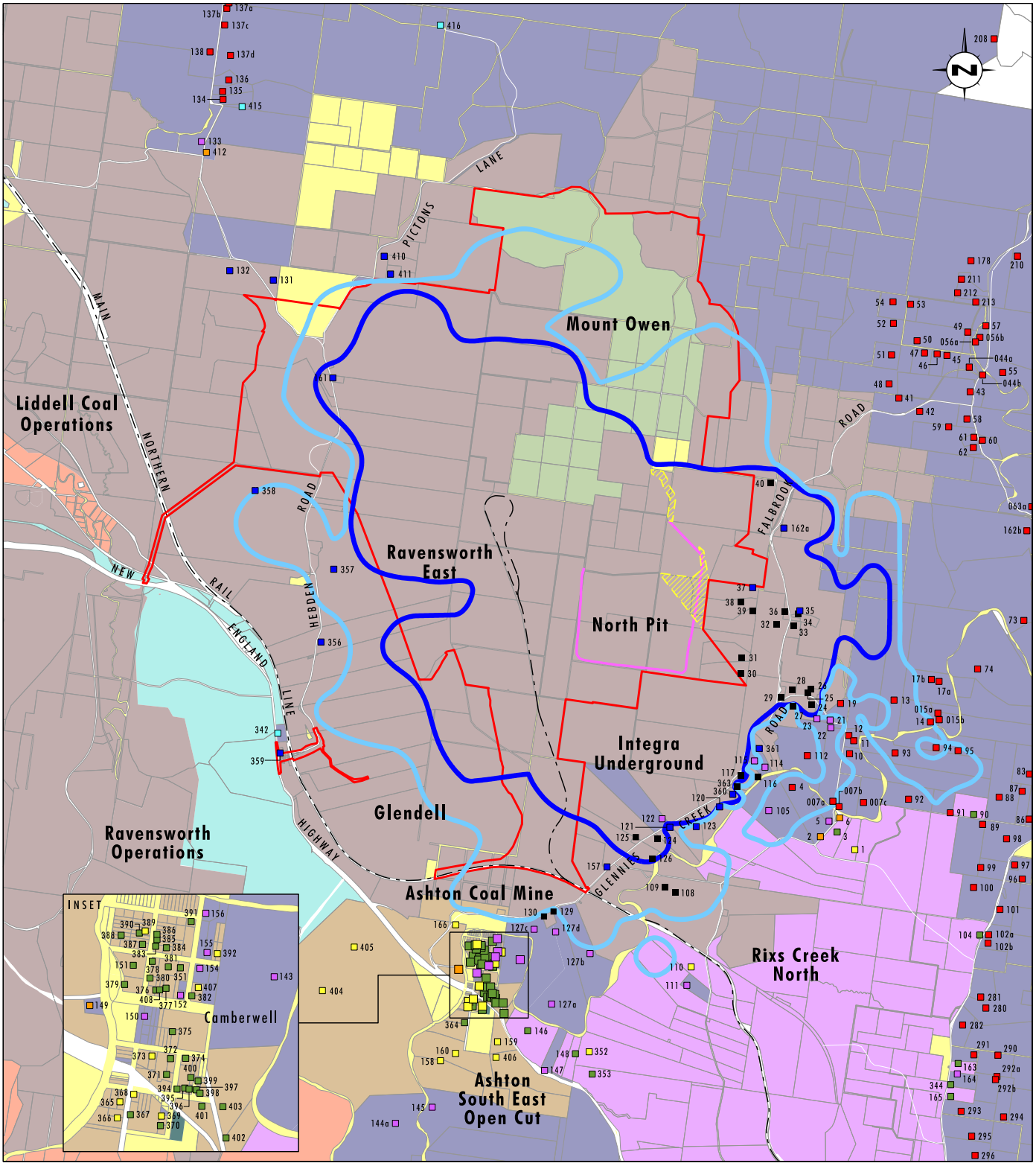
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.8

Noise Impact
Non-winter Nights
Year 8

File Name (A4): R14/3810_146.dgn
20180619 15.52



Data Source: Glencore (2018)

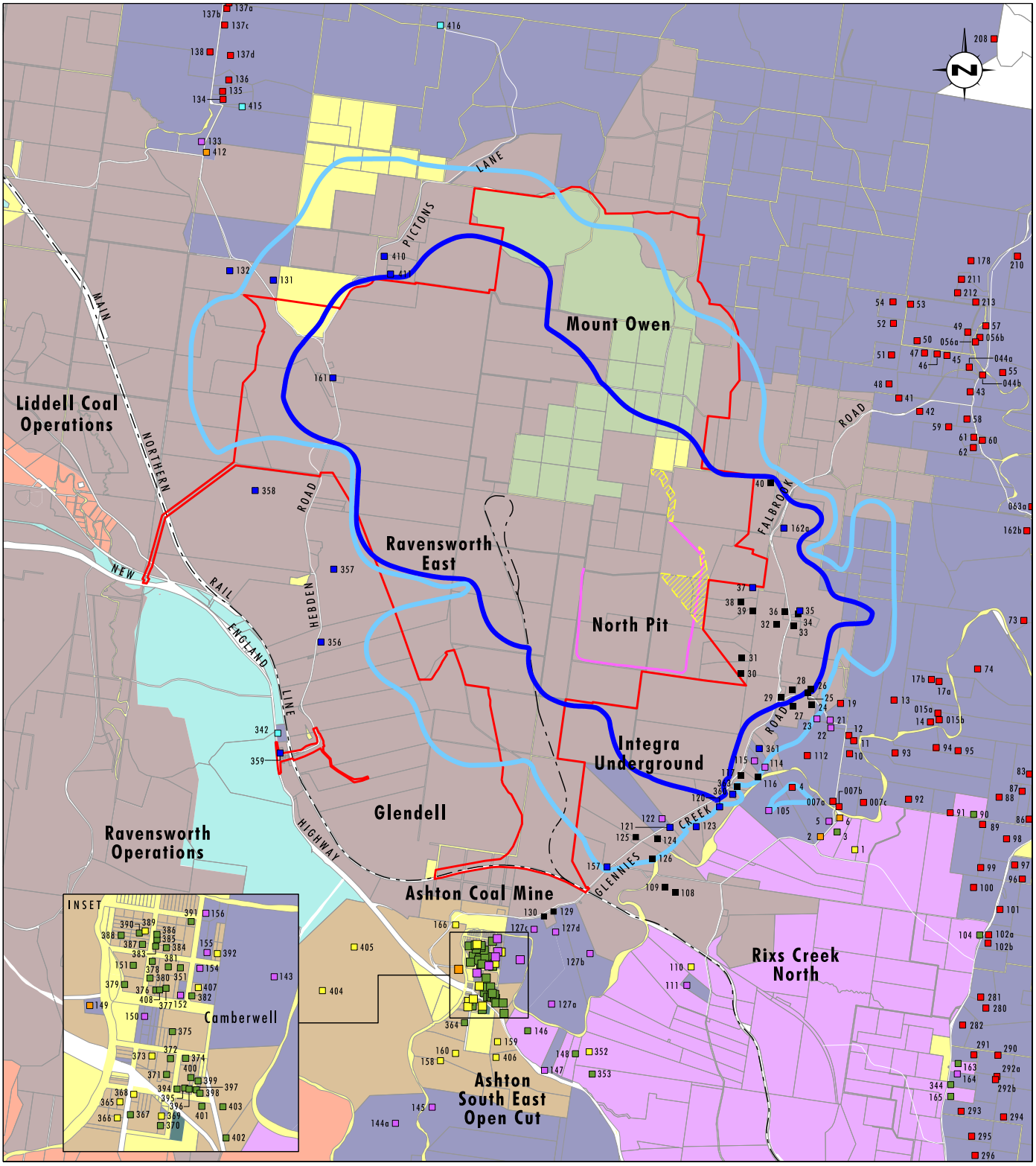
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.9

Noise Impact
Winter Evening/Nights
Year 15

File Name (A4): R14/3810_147.dgn
20180619 15.53



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

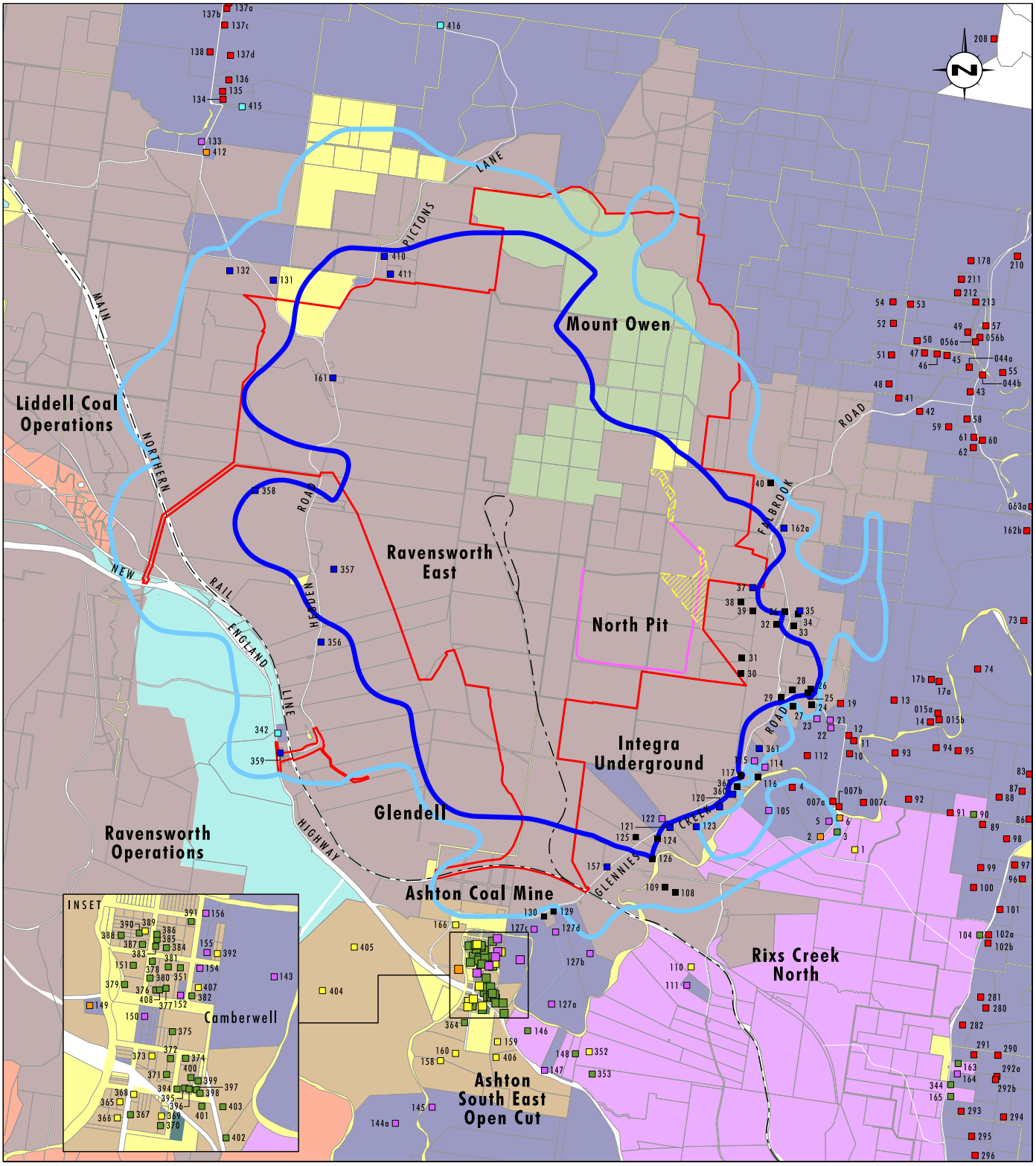
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.10

Noise Impact
All Seasons Day
Year 15

File Name (A4): R14/3810_148.dgn
20180619 15.53



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

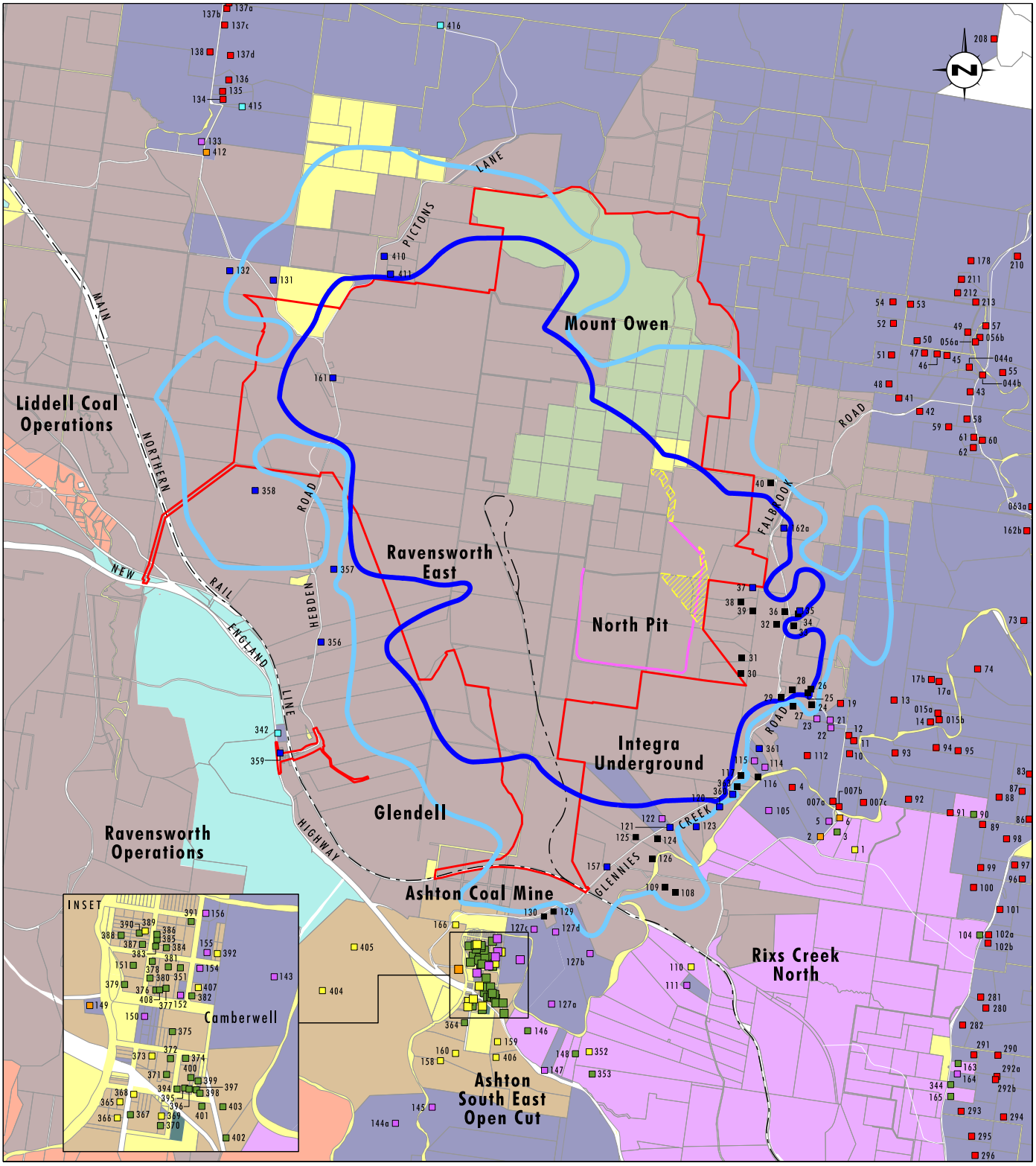
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.11

Noise Impact
Non-winter Evenings
Year 15

File Name (A4): R14/3810_149.dgn
20180619 15.53



Data Source: Glencore (2018)

0 1 2 4 km

Scale 1:90 000

Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Disturbance Area
- Proposed Modification Pit Boundary
- Proposed Modification Noise Impact 35dB(A) Contour
- Proposed Modification Noise Impact 40dB(A) Contour
- Ashton Coal
- Bloomfield Collieries
- Coal and Allied
- Crown Land
- Glencore
- Government Authority
- AGL Macquarie
- Private
- State Forest
- Community Infrastructure
- Glencore Owned
- Glencore Owned - Vacant
- Other Mine Owned
- Other Mine Owned - Vacant
- Private
- Private - Subject to Acquisition Rights
- Private Infrastructure

FIGURE 4.12

Noise Impact
Non-winter Nights
Year 15

File Name (A4): R14/3810_150.dgn
20180619 15.54

5.0 Noise Impact Assessment

5.1 Operational Noise Impacts

As outlined in the predicted noise impacts detailed in **Section 4.0**, with the incorporation of appropriate noise mitigation controls and processes, the existing noise criteria can continue to be achieved over the life of the Proposed Modification for all receiver locations.

5.2 Sleep Disturbance

Table 5.1 provides a summary of the compliance of the Proposed Modification in relation to the sleep disturbance criteria provided in SSD-5850.

Table 5.1 Compliance with SSD-5850 Sleep Disturbance Criteria for Predicted Noise Levels for Optimised Scenarios

Residence (as defined on SSD-5850)[1]	Sleep Disturbance Criteria	Compliance with Criteria (all applicable meteorological scenarios)		
	(Night LA1(1 min))	Year 2	Year 8	Year 15
41, 48	45	Y	Y	Y
91	45	Y	Y	Y
14, 92	45	Y	Y	Y
10, 11	46	Y	Y	Y
13[4]	45	Y	Y	Y
12, 94, 95, 112	46	Y	Y	Y
111	45	Y	Y	Y
19[4]	45	Y	Y	Y
93[4]	46	Y	Y	Y
21, 22, 23[2]	45	Y	Y	Y
122[3]	50	Y	Y	Y
All other residences Area 4 – South	46	Y	Y	Y
All other residences Area 4 – North and all other residences Area 5	45	Y	Y	Y
All other residences Area 6	50	Y	Y	Y
All other residences Area 7	48	Y	Y	Y
All other residences Area 8 – East	45	Y	Y	Y
All other residences Area 8 – West	52	Y	Y	Y
All other residences Area 9	53	Y	Y	Y
Other privately-owned residences	45	Y	Y	Y

Notes:

1 Consistent with the definition under SSD-5850 the residences and areas defined in this table represent all of the noise receiver areas surrounding Mount Owen. Where a noise receiver area is not specifically listed in the table this is covered by the criteria defined by 'other privately-owned residences' which is consistent with the minimum PSNL under the INP.

2 Residences have acquisition upon request rights under SSD-5850.

3 Residence 122 has acquisition rights under Glendell Mine Development Consent (DA80/952).

4 Residences have mitigation upon request rights under SSD-5850.

As shown in **Table 5.1**, Mount Owen can continue to comply with the existing sleep disturbance criteria during the Proposed Modification.

5.3 Low Frequency Noise Analysis

The NIA for the Continued Operations Project (Umwelt 2014) included an analysis of the predicted noise level results for the inclusion of 'modifying factors'. It was found that a strict application of Section 4 of the INP could require the addition of a low frequency noise modifying factor at some receivers under noise enhancing meteorology. However, the analysis found that the predicted low frequency noise levels for the Continued Operations Project were below the DPE 60 dB(C) night time criteria and generally close to the threshold of hearing, i.e. unlikely to be intrusive or cause annoyance.

The analysis has been carried out in accordance with the requirements of the NPfI and has confirmed that the outcomes for the Continued Operations Project remain unchanged by the Proposed Modification (refer to **Appendix 4**). Therefore, no low frequency modifying factors were applied to the predicted noise levels.

5.4 Cumulative Noise Impacts

The cumulative noise impact assessment completed for the Continued Operations Project (Umwelt 2014) for the areas surrounding the Proposed Modification indicated that the cumulative noise impacts assessment criteria would not be exceeded based on the Continued Operations Project and the relevant surrounding mining operations. This is on the basis that the INP derived criteria for existing and approved mining operations in this area is designed to protect and preserve the overall cumulative noise environment for these areas. Accordingly, it follows that should all mining operations meet their required noise criteria, the cumulative noise criteria of an area will be met.

As outlined in **Section 4.0**, Mount Owen will be able to meet the existing noise criteria for the Proposed Modification and as such it is considered that there will be no significant change to cumulative noise impacts as a result of the Proposed Modification.

Mount Owen will maintain continuous noise monitoring units suitably located to discern the contribution the Proposed Modification makes to the cumulative noise levels at potentially affected privately-owned residential receivers. This approach to performance-based adaptive noise management has been implemented at Mount Owen since 2004 (refer to **Section 6.0**).

6.0 Noise Control Measures

The noise control measures detailed in **Section 2.0** represent a level of commitment by Mount Owen to ensure the Proposed Modification is operable within the existing noise limits. Mount Owen have committed to the implementation of these controls over the life of the Proposed Modification as will be detailed as part a revised NMP.

6.1 Management of Operational Noise Levels

As outlined in **Section 2.0**, the identification and assessment of reasonable and feasible noise controls have been considered through the design process for the Proposed Modification and incorporated into detailed noise modelling (refer to **Section 3.0**). The incorporation of these reasonable and feasible controls has reduced the noise affectation area and related noise impacts associated with the Proposed Modification as far as practicable. Mount Owen commits to the implementation of the following reasonable and feasible controls over the life of the Proposed Modification, which have been factored into the noise model:

- The management of mobile machines during adverse weather conditions when wind conditions or inversion conditions enhance noise propagation towards sensitive receiver locations. In order to control/eliminate noise impacts this would likely include:
    - providing alternative dumping locations;
    - moving parts of the fleet to locations deeper in the pit; and/or
    - Revising mining operations to reduce noise impacts including the implementation of hierarchy of controls ranging from review of equipment locations, nature of activity, through to shut down of equipment as required to maintain compliance with noise criteria.
- Managing a number of ancillary activities to not occur during adverse meteorological conditions, such as those which may occur during winter night-times, including:
    - limiting ancillary mining equipment (e.g. dozers on overburden dumps, drills) during times of adverse weather conditions;
    - reducing bulldozer activity on exposed rehabilitation areas; and/or
    - managing activities located at or near ground surface, such as top-soil and pre-strip, during the later stage of the mine life.
- The inclusion of bunds in strategic locations along some haul roads, and where practicable, be located along the south eastern side of the ramps shielding trucks and equipment on exposed sections of the ramps.
- Location of key haul roads below ground surface to maximise topographical shielding to surrounding receiver areas. This includes running haul roads along benches on the eastern highwall to maximise the barrier attenuation afforded by the highwall.
- Location and orientation of haul roads to be not aligned with prevailing source to receiver winds where practicable.
- Incorporation of reasonable and feasible noise attenuation on key plant and equipment.

Mount Owen will continue to achieve the Approved Operations noise limits throughout the life of the Proposed Modification through the continued implementation of an adaptive management approach, focused on implementing appropriate operational controls and management strategies to minimise noise impacts. The approach will vary during different mine stages and weather conditions, and will also consider evolving technology and associated equipment noise levels. Following is a range of controls and strategies that may be adopted as required to meet noise performance requirements:

- Dozer operations:
    - using a low gear when reversing
    - remaining in gear when reversing down the stockpiles
    - moving track dozer operations off elevated locations during adverse weather conditions
    - using rubber tyred dozers on elevated or exposed dump locations during adverse weather conditions
    - re-scheduling topsoil pre-strip prior to adverse weather conditions
- Waste haulage:
    - the use of high dumping locations may be restricted during periods when the weather conditions can potentially enhance the noise impacts
    - creating sheltered dumping locations that can be used during adverse weather conditions, where practical
    - schedule the dump sequence to enable dumping locations deep in-pit to be used during adverse weather conditions
- Excavator operations:
    - using ‘silent horns’ to communicate with trucks
    - managing the drop of the first load into truck bodies to minimise impact noise from the material
- Drilling operations:
    - re-scheduling drilling in exposed locations for periods when the weather conditions do not enhance the noise impacts

In addition to the implementation of noise mitigation strategies during periods of adverse weather conditions, Mount Owen will implement the following general noise mitigation measures as part of the Proposed Modification:

- use smart broadband ‘Quacker' reversing
- regular inspection and maintenance of noise attenuation systems
- implement a process for periodic review of noise performance of the equipment fleet
- implement work area specific controls for high risk areas

The implementation of these controls to meet the approved noise criteria over the life of the Proposed Modification will be detailed as part of the revised NMP for the Mount Owen Complex (refer to **Section 6.2**). Central to the management of noise impacts is the implementation of an

extensive continuous noise monitoring system to enable proactive and real time management of operations during noise propagating conditions (refer to **Section 6.2.1.2**).

The use of a continuous noise monitoring system to proactively inform operational noise management has been implemented at Mount Owen since 2004 and will be continued as part of the Proposed Modification.

In addition to the above, Glencore's approach to effective noise management at sites they operate and/or manage includes:

- Identification of effective noise management controls during the mine planning, assessment and operational phases
- Minimum requirements to be implemented for effective noise management to reduce the potential for impacts, including the implementation of activity specific noise controls and site-wide management systems and procedures
- Use of automated systems for early identification of adverse meteorological conditions which are likely to result in noise impacts, i.e. gradient winds and temperature inversions
- Monitoring and reporting requirements for noise management
- Requirements for the implementation of noise awareness training for employees to facilitate effective noise management.

The approach taken by Glencore is not designed to replace or override environmental legislation or external requirements but to maintain a minimum standard for the implementation of the noise control measures required for effective noise management at all Glencore sites.

The recommended approach to managing the noise impacts associated with the Proposed Modification, as outlined below, is a combination of statutory requirements, approval conditions, and Glencore's approach to effective noise management.

6.2 Noise Management Plan

Mount Owen Complex has a NMP approved by the Secretary in accordance with SSD-5850. The NMP is updated from time to time to reflect changes in the implementation of environmental management controls utilised by Mount Owen to manage potential noise impacts associated with site operations. As a result of the Proposed Modification, the NMP will be revised to include the additional noise mitigation measures, referencing relevant operating procedures with documented controls and automated monitoring systems. The suitability of the noise management controls is to be assessed on an annual basis as part of ongoing review of operational risks to the Proposed Modification.

6.2.1 Proactive Noise Management

6.2.1.1 Predictive Forecasting/Adverse Weather Conditions

During adverse weather conditions, Mount Owen will continue to initiate changes to operations to mitigate potential noise impacts. Mount Owen uses predictive forecasting of adverse weather conditions to identify when and where management measures are likely to be required as a result of an adverse weather event. The current NMP outlines the procedural requirement for the predictive forecasting of adverse weather conditions. A typical response to the prediction of an adverse weather event would include:

- Open Cut Examiner (or relevant operational supervisor) is alerted by the environmental forecast system, or other similar system(s) that operations may need to be modified to avoid noise impact at sensitive receivers;

- Monitoring the noise levels recorded by the real-time noise monitoring network to assess when the noise levels are approaching predefined noise conditions and the modification of operations to adapt to the situation as required;

- Temporarily ceasing or modifying part of the operations, if required, to prevent noise criteria being exceeded; and

- Recording the actions taken when management measures are implemented.

The meteorological monitoring sites are linked to the real time monitoring system allowing access to real time weather conditions and the effective management of operations during periods of adverse weather.

6.2.1.2 Continuous Noise Monitoring Network

Mount Owen will maintain the existing real time monitoring network consisting of fixed and mobile continuous noise monitoring units and three weather stations.

The continuous (real time) noise monitoring network is currently used by Mount Owen as a proactive way to manage operational noise performance. The continuous noise monitors allow noise levels and local meteorological data to be analysed and compared against the development consent conditions, providing information on the ongoing performance of the mine. The minimum requirements for the real time noise monitoring network include SMS alarming to key operational personnel if a trigger noise condition has been reached. The SMS alerts are set below the statutory noise criteria, allowing action to be taken before compliance limits are reached.

Following an alarm, a review of operations and current meteorological conditions will be undertaken by Open Cut Examiner (or relevant operational supervisor) in order to identify if the site operations are contributing to the recorded noise levels. If elevated noise levels are deemed to be as a result of site activities, mitigation measures will be undertaken to achieve compliance. This may include modification of operations, such as those outlined in **Section 6.1**.

Data collected by the continuous noise monitoring units will continue to be reviewed on a regular basis to establish any correlation between meteorological conditions and elevated noise levels from Mount Owen. This data can then be used to proactively manage noise impacts and mitigate the potential for noise enhancement as a result of meteorological conditions. Specifically, the data will be reviewed to identify if the recorded noise levels are trending towards a non-compliance with noise criteria.

6.2.2 Change Management Process

During the operational phase of the Proposed Modification, a change management process will be implemented in order to assess the potential noise impacts associated with operational changes at Mount Owen. The change management process will be implemented at a minimum, in the following instances:

- When significant changes are made to the number of equipment or type of equipment utilised on site providing for evolving technology and equipment changes, to ensure the potential risk of noise criteria being exceeded is minimised; and

- Prior to the purchase or rental of equipment which, through either size or capacity of the equipment, has the potential to result in exceedances of noise criteria.

The change management process is to consider and include a review of the existing noise performance of the operation. Where considered necessary, noise modelling of the predicted noise emissions from the operation may be undertaken to confirm that compliance with the relevant statutory approval will be maintained following the proposed change.

6.2.3 Incident Investigation and Response

In the event that an exceedance of the noise criteria is identified, Mount Owen will notify the relevant government agencies and report within the statutory timeframes and liaise with any affected landowners.

If a non-compliance is identified or a request for installation for noise impact mitigation measures is received, corrective or preventative actions will be implemented in accordance with SSD-5850. A review of the effectiveness of the corrective/preventative action will be conducted at a specified interval following the implementation of the corrective action.

Where the noise impacts reach a predefined level outlined in the development consent, Mount Owen will contact the affected property owner in writing in accordance with the requirements of SSD-5850. Corrective actions that may be initiated on request include:

- Installation of noise impact mitigation measures at residential receivers within the noise management zone; or
- Initiation of the property acquisition process in accordance with the development consent for properties within the noise affectation zone.

6.3 Monitoring Requirements

6.3.1 Noise Monitoring Program

The existing noise monitoring program at Mount Owen Complex is a combination of unattended continuous noise monitoring and attended noise monitoring.

6.3.1.1 Unattended Continuous Noise Monitoring

The current unattended continuous monitoring network consists of five fixed and one mobile units as detailed in **Table 6.1**. The monitoring units:

- Specifically assess operational performance against the intrusiveness criteria using a $L_{Aeq,\ 15\ minute}$ descriptor;
- Measure and assess the environmental noise levels due to industrial noise sources using the amenity assessment descriptor of $L_{Aeq,\ Period}$; and
- Measure and assess the transient noise levels due to industrial noise sources using the $L_{A1,\ 1\ minute}$ sleep disturbance criteria descriptor.

Table 6.1 Current and Proposed Continuous Noise Monitoring Program for the Mount Owen Complex

Monitoring Unit	Current	Proposed
SX 1 - Middle Falbrook	In place at R026	Discontinue following installation of SX 1a
SX 1a - Middle Falbrook	-	Install by Year 2 in the vicinity of R023
SX 4 - Glennies Creek	In place at R120	Retain
SX 5 – Falbrook	In place at R037	Discontinue following installation of SX 5a
SX 5a – Falbrook	-	Install by Year 2 west of Glennies Creek Road/Middle Falbrook Road intersection
SX 6 - Mobile Unit	Currently located in Greenlands but routinely moved	To be routinely moved
SX 7 - Camberwell	In place on Ashton Coal Mine waste emplacement area	Retain
SX 11 - Middle Falbrook	-	Install by Year 2 in the vicinity of R010, R011 or R012
SX 12 - Camberwell	In place at R143	Retain

To accommodate the progression of mining operations, it is recommended that by Year 2:

- an additional continuous noise monitoring unit be located in Middle Falbrook in the vicinity of Receivers R010, R011 or R012 in Area 4 – South (identified as SX 11 on **Figure 6.1**).
- continuous noise monitoring unit at mine owned property R026 (identified as SX 1 on **Figure 2.2**) be discontinued and a new continuous noise monitoring site be installed 400 m to the east of SX 1 in the vicinity of Receiver R023 (identified as SX 1a on **Figure 6.1**).
- continuous noise monitoring unit used as a reference monitor at mine owned property R037 (identified as SX 5 on **Figure 2.2**) be discontinued and a new reference monitor be installed approximately 1.6 km to the south of SX 5 to the west of the Glennies Creek Road/Middle Falbrook Road intersection (identified as SX 5a on **Figure 6.1**).

6.3.1.2 Attended Noise Monitoring

Table 6.2 describes the current attended monitoring locations for the Mount Owen Complex and the proposed monitoring locations for Mount Owen. The frequency of attended monitoring is undertaken in accordance with the requirements of SSD-5850 and the requirements of the applicable Environmental Protection Licence (EPL).

Attended compliance noise monitoring for Mount Owen is currently undertaken in accordance with the approved NMP at five locations (N1, N3, N4, N10 and N11), that are considered to be representative of the most sensitive noise receivers (refer to **Figure 2.2** and **Table 6.2**). Routine monitoring is also undertaken at N2 to validate the monitoring results from the reference continuous noise monitor SX 5.

In addition to the attended routine compliance monitoring locations, the NMP identifies a number of other supplementary attending noise monitoring locations (N12 - N20, refer to **Figure 2.2**) that may be used if potentially high noise levels are recorded at the routine compliance monitoring locations. The choice and frequency of monitoring at each of these supplementary locations is selected on a risk-based approach that takes into consideration:

- Meteorological conditions that enhance the propagation of noise towards the sensitive receiver locations;
- Noise levels recorded at the continuous noise monitoring units and at the routine monitoring locations; and
- The location and intensity of mining activities at the mining operations in the region.

It is recommended that Mount Owen retain the existing attended routine compliance monitoring locations N1, N4, and N11.

N3 should be discontinued as an attended routine compliance monitoring location when continuous noise monitor SX 1 is decommissioned. However, once the continuous noise monitor SX 1a is installed, an attended routine compliance monitoring site should be established nearby (identified as N21 on **Figure 6.1**) which can also be used to validate the monitoring results from the continuous noise monitor.

N10 should be discontinued as an attended routine compliance monitoring location however it should be retained as a routine validation monitoring site to validate the monitoring results from the continuous noise monitor SX 12.

N2 should be discontinued as a routine validation monitoring site when continuous noise monitor SX 5 is decommissioned. However, once the continuous noise monitor SX 5a is installed, a routine validation monitoring site should be established nearby (identified as N22 on **Figure 6.1**) to validate the monitoring results from the continuous noise monitor.

Once the continuous noise monitor SX 11 is installed, N15 should be established as an attended routine compliance monitoring site which can also be used to validate the monitoring results from the continuous noise monitor.

The details of each of the proposed future monitoring locations are provided in **Table 6.2** and the locations shown on **Figure 6.1**. The assessment methodology will be based on the procedures currently in place for assessing the impact of Mount Owen on the surrounding noise environments.

Table 6.2 Current Attended Noise Monitoring Program for Mount Owen Complex and Proposed Monitoring for the Mount Owen

Monitoring Location	Current Attended Noise Monitoring for the Mount Owen Complex	Proposed Mount Owen Monitoring
N1 – Area 1	Routine compliance assessment for Mount Owen	Retain
N2 – Area 2	Routine monitoring to validate SX 5	Discontinue following installation of SX 5a
N3 – Area 4 North	Routine compliance assessment for Mount Owen and Glendell and to validate SX 1	Discontinue following installation of SX 1a
N4 – Area 6	Routine compliance assessment for Mount Owen and Glendell and to validate SX 4	Retain
N8 – Area 10	Routine compliance assessment for Glendell	n/a to Mount Owen

Monitoring Location	Current Attended Noise Monitoring for the Mount Owen Complex	Proposed Mount Owen Monitoring
N9 – Area 8 West	Routine compliance assessment for Glendell	n/a to Mount Owen
N10 – Area 8 East	Routine compliance assessment for Mount Owen and Glendell and to validate SX 12	Retain to validate SX 12
N11 – Area 8 East	Routine compliance assessment for Mount Owen and Glendell	Retain
N12 – Area 4 South	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N13 – Area 5	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N14 – Area 7	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N15 – Area 4 South	Supplementary performance management monitoring site for Mount Owen and Glendell	Routine compliance assessment for Mount Owen and to validate SX 11
N16 – Area 4 North	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N17 – Area 11	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N18 – Area 1	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N19 – Area 2	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N20 – Area 2	Supplementary performance management monitoring site for Mount Owen and Glendell	Retain
N21 – Area 4 North	-	Routine compliance assessment for Mount Owen and to validate SX 1a
N22 - Area 4 North	-	Routine monitoring to validate SX 5a

6.3.1.3 Meteorological Data

The weather stations have been installed and operate in accordance with the requirements of *Australian Standard AS2922-1987 Ambient Air – Guide for the siting of sampling units*. The weather stations record the following meteorological data at 15-minute intervals:

- wind speed, wind direction and sigma-theta;
- temperature at 2 and 10 m;
- humidity; and
- rainfall.

The current continuous monitoring network includes three 10 metre tower weather stations and a fourth 10 m tower fitted with a temperature sensor (refer to **Figure 6.1**).

Mount Owen should maintain the current meteorological monitoring program in order to assess the occurrence of noise enhancing conditions as part of the noise monitoring program. Based on current EPA expectations, where the noise impacts are predicted based on stability class rather than lapse rate, a 10 metre tower is suitable for measuring stability class based on sigma theta. As a result, the current 10 metre tower weather stations used by Mount Owen are suitable for assessing the presence of inversion conditions that could lead to the enhancement of noise impacts.

6.3.2 Compliance Assessment

The methodology for assessing compliance with the requirements of SSD-5850 and the applicable Environmental Protection Licence would utilise the following components:

- Undertake attended noise monitoring to measure ambient noise levels in the surrounding region and determination of the mine's contribution to measured noise levels as outlined in **Section 6.2**; and
- Compare the attended noise monitoring results with predicted noise levels from the operations noise models of the mine under similar meteorological conditions.

When comparing the predicted noise levels with the relevant noise impact assessment criteria it should be noted that the NIA reported noise levels are likely to be exceeded 10% of the time.

The monitoring program would also be used to assess the performance of all mining machinery as a whole. Equipment selection will be governed by the noise performance of the mine not necessarily on individual items of equipment.

6.3.3 Noise Performance Monitoring

To ensure ongoing compliance with the noise criteria, Mount Owen will actively manage the operations by controlling the placement and use of mining equipment, particularly during unfavourable meteorological conditions, as detailed in the NMP (refer to **Section 6.2**). Worst-case weather conditions would be associated with winds from the north-west and during winter inversion conditions with drainage flow from the north-west.

To assess the effectiveness of the control measures and when they should be implemented, Mount Owen will maintain the current performance monitoring program. The performance monitoring program is based around continuous noise monitors identified in **Table 6.1** and includes:

- Measurement and reporting against criteria using the $L_{Aeq,\ 15\ minute}$ descriptor and when appropriate the $L_{Aeq,\ period}$ descriptor;
- Measurement and reporting against the cumulative industrial noise level criteria using the $L_{Aeq,\ period}$ as the descriptor;
- Identification and reporting of transient impact noise levels against the $L_{A1,\ 1\ minute}$ sleep disturbance descriptor; and
- The establishment and regular review of alarm triggers for each of the descriptors.

The response of Mount Owen to reports and alarms from the continuous noise monitors will be documented in the NMP.

6.3.4 Reporting

The monitoring results should be reviewed to assess compliance with the NIA predictions and noise criteria. The results will be reported in accordance with the requirements of the development consent and the applicable Environmental Protection Licence.

A summary of the noise monitoring results will be reported in the Annual Review for the operation and be placed on the Mount Owen Complex website.

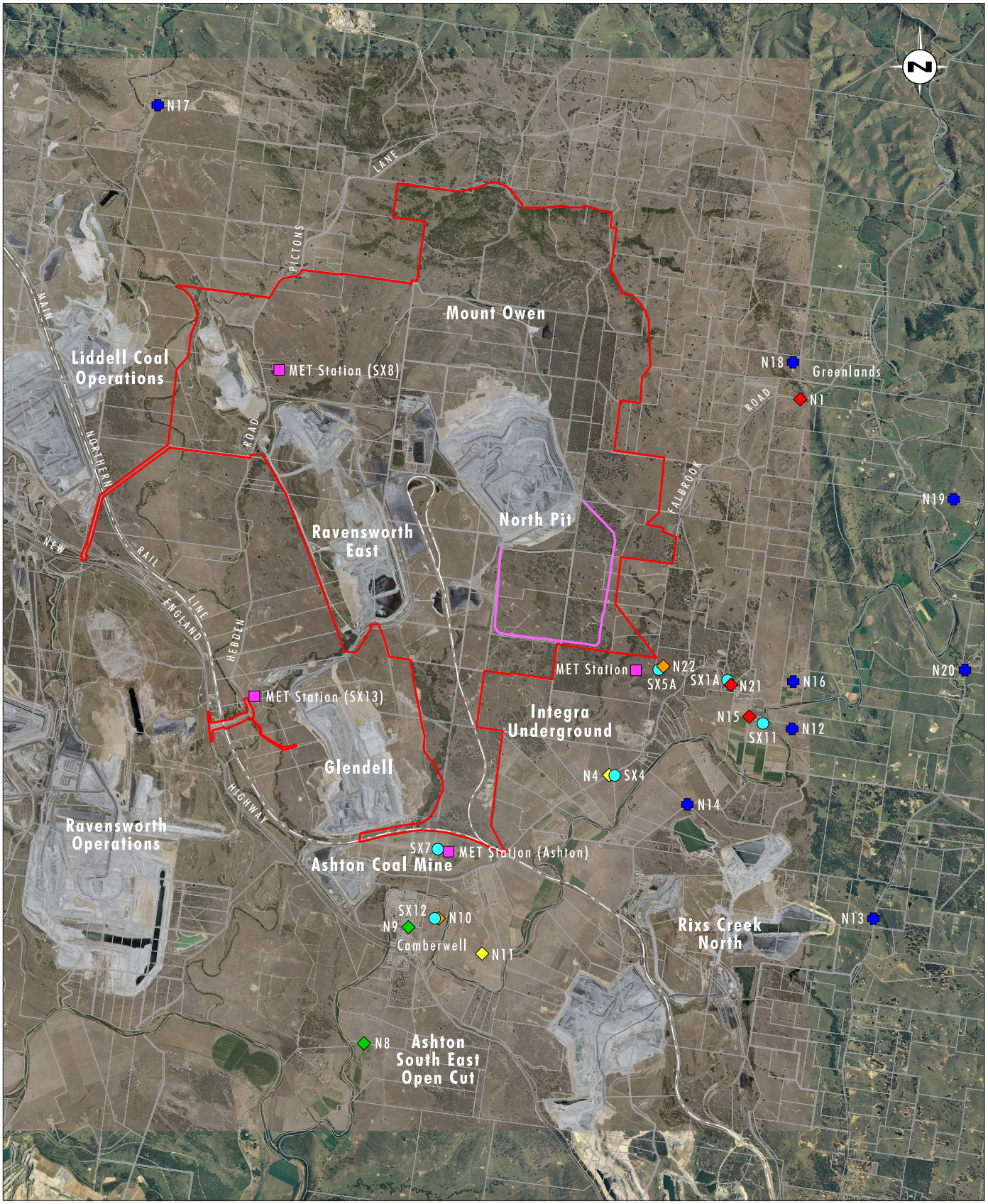


Image Source: Glencore (2017)
Data Source: Glencore (2018)

0 1.0 2.0 4.0km
Scale 1:90 000

Legend

- Proposed SSD-5850 Modification Consent Boundary
- Proposed Modification Pit Boundary
- Routine Validation Attended Noise Monitoring Location
- Combined - Adopted Compliance Attended Noise Monitoring Location
- Glendell - Adopted Compliance Attended Noise Monitoring Location
- Mount Owen - Adopted Compliance Attended Noise Monitoring Location
- Meteorological Station Location
- Real Time Continuous Noise Monitoring Location
- Supplementary Performance Management Attended Noise Monitoring Location

FIGURE 6.1

Proposed Noise Monitoring Locations

File Name (A4): R14/3810_184.dgn
20180524 10.26

7.0 Conclusion

The predictive noise modelling demonstrates Mount Owen, through the implementation of appropriate controls, can meet the existing noise criteria and not increase impacts on private receivers relative to the Approved Operations. Mount Owen will continue to implement all reasonable and feasible noise controls over the life of the Proposed Modification in accordance with a revised NMP and with the requirements of SSD-5850.

8.0 References

NSW Department of Planning and Environment, 2014. *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments.*

NSW Environmental Protection Authority, 2017. *Noise Policy for Industry.*

NSW Environmental Protection Authority, 2000. *NSW Industrial Noise Policy.*

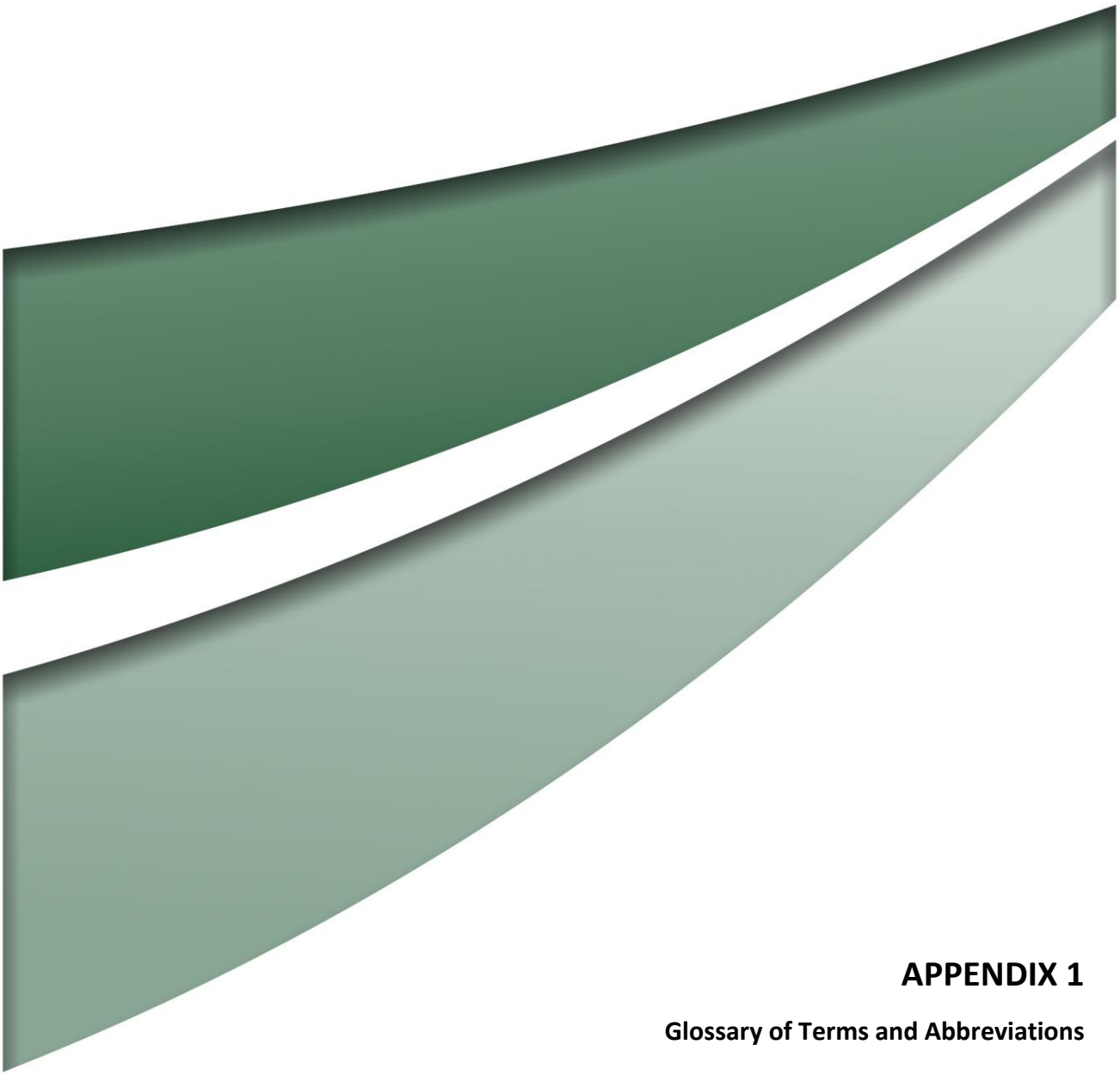
NSW Government, 2007. *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) (NSW).*

NSW Government, 2014. *Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Developments*

Standards Australia 1987. *Australian Standard AS2922-1987 Ambient Air – Guide for the siting of sampling units*

Umwelt 2014. *Noise Impact Assessment. Mount Owen Continued Operations Project*.

Umwelt 2016. *Mount Owen Continued Operations Project, Response to PAC Review Report*.



APPENDIX 1

Glossary of Terms and Abbreviations

Appendix 1 – Glossary of Terms and Abbreviations

Project Aspect	Description/Reference
Technical Terms	
1/3 Octave	Single octave bands divided into three parts.
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment background level – A single-figure background noise level representing each assessment period – day, evening and night (that is, three assessment background levels are determined for each 24 hour period of the monitoring period). It is determined by taking the lowest 10^{th} percentile of the L_{90} level for each assessment period.
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dB(A), dBA	Decibels A-weighted.
dB(C), dBC	Decibels C-weighted.
dB(Z), dBZ	Decibels Linear or decibels Z-weighted.
Decibel (dB)	The units of sound level and noise exposure measurement where a step of 10 dB is a ten-fold increase in intensity or sound energy and actually sounds a little more than twice as loud.
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
EPA	Environment Protect Authority
EPL	Environment Protection Licence
Hertz (Hz)	The measure of frequency of sound wave oscillations per second – 1 oscillation per second equals 1 hertz.
INP	NSW Industrial Noise Policy
LA10	The percentile sound pressure level exceeded for 10%of the measurement period with 'A' frequency weighting calculated by statistical analysis. Typically used to assess the impact of an existing operation on a receiver area and is referred to as the cumulative noise levels at the receiver attributable to the noise source.
LA90	Background Noise Level. The percentile sound pressure level exceeded for 90% of the measurement period with 'A' frequency weighting calculated by statistical analysis.
LAmax	The maximum of the sound pressure levels recorded over an interval of 0.1 second.
LA1,1minute	The measure of the short duration high-level noises that cause sleep arousal. The noise level is measured as the percentile sound pressure level that is exceeded 1% of measurement period with 'A' frequency weighting calculated by statistical analysis during a measurement time interval of 1 minute.
LAeq,t	Equivalent continuous sound pressure lev–l – The value of the sound pressure level of a continuous steady noise that, a measurement interval of time (t), has the same mean square sound pressure as the sound under consideration whose level varies with time. Usually measured IN dB with 'A' weighting.
LAn	Percentile level – A measure of the fluctuation of the sound pressure level which is exceeded 'n' per cent of the observation time.

Project Aspect	Description/Reference
NIA	Noise Impact Assessment
NMP	Noise Management Plan
NPfI	Noise Policy for Industry
PSNL	Project-specific noise levels – The target noise levels for a particular noise generating facility based on the most stringent of the intrusive criteria or amenity criteria.
RBL	Rating background level – The overall single figure background level representing each assessment period over the whole monitoring period determined by taking the median of the ABLs found for each assessment period.
SEE	Statement of Environmental Effects
SPL (dBA)	Noise: Sound pressure level – The basic measure of noise loudness. The level of the root-mean-square sound pressure in decibels given by: $SPL = 10.\log10\ (p/p_o)^2$ where: p is the rms sound pressure in pascals and p_o is the sound reference pressure at 20 μPa. decibels
SWL	Sound power level – a measure of the energy emitted from a source as sound and is given by: $SWL = 10.\log10\ (W/W_o)$ where: W is the sound power in watts and W_o is the sound reference power at 10^{-12} watts.
VLAMP	Voluntary Land Acquisition and Mitigation Policy

APPENDIX 2

Meteorological Data

Appendix 2 – Meteorological Data

The collated meteorological data for SX 13 for the period from January 2014 to December 2014 (inclusive) is provided in **Tables A2.1** to **A2.4**. The meteorological data was analysed to determine prevailing wind conditions likely to influence the propagation of noise from the Proposed Modification.

Table A2.1 Prevailing Wind Analysis, Summer

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Day							
N	1.8%	-	-	-	-	-	-
NNE		-	-	0.1%	-	-	-
NE		0.1%	0.1%	0.1%	-	-	-
ENE		0.1%	0.3%	0.3%	0.1%	0.1%	-
E		0.1%	1.2%	1.2%	0.2%	-	-
ESE		0.3%	1.8%	4.1%	2.6%	1.1%	0.2%
SE		0.6%	2.4%	5.4%	8.9%	8.0%	8.9%
SSE		0.7%	2.6%	5.0%	4.7%	1.4%	1.5%
S		0.6%	2.5%	2.4%	1.1%	0.4%	0.2%
SSW		0.7%	1.5%	0.8%	0.2%	-	-
SW		0.7%	1.4%	1.0%	0.1%	-	-
WSW		0.5%	0.8%	0.9%	0.2%	0.1%	-
W		0.3%	0.9%	1.2%	0.7%	0.2%	0.1%
WNW		0.1%	0.6%	1.4%	1.7%	0.7%	0.4%
NW		0.3%	0.5%	1.3%	2.9%	2.5%	1.1%
NNW		0.1%	0.5%	0.2%	0.4%	0.2%	0.5%
Evening							
N	0.9%	-	-	-	-	-	-
NNE		-	0.1%	0.1%	0.1%	-	-
NE		-	0.2%	0.1%	0.1%	-	-
ENE		0.1%	0.2%	0.1%	0.1%	-	-
E		0.1%	0.7%	0.4%	0.1%	-	-
ESE		0.1%	0.3%	1.3%	1.9%	0.8%	0.2%
SE		0.1%	1.0%	1.8%	7.0%	16.1%	17.6%
SSE		0.5%	0.7%	3.3%	10.0%	8.5%	3.0%
S		0.4%	1.5%	3.7%	1.0%	0.2%	0.7%
SSW		0.4%	0.6%	1.0%	0.2%	0.1%	-
SW		0.1%	0.4%	0.2%	-	-	-
WSW		0.2%	0.7%	0.1%	0.1%	-	-
W		-	0.8%	0.6%	0.4%	0.1%	0.1%
WNW		-	0.5%	1.3%	0.7%	0.4%	0.1%
NW		-	0.4%	1.2%	1.2%	0.5%	-
NNW		-	0.1%	0.4%	0.7%	0.4%	-

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Night							
N	6.4%	-	0.1%	-	-	-	-
NNE		0.1%	-	-	-	-	-
NE		0.7%	0.7%	0.1%	-	-	-
ENE		0.6%	1.1%	0.2%	-	-	-
E		0.6%	0.8%	0.2%	0.1%	0.1%	-
ESE		0.5%	1.0%	0.7%	0.7%	0.1%	-
SE		1.0%	2.5%	4.3%	5.0%	1.6%	0.1%
SSE		1.7%	4.3%	11.3%	10.3%	1.2%	0.1%
S		1.9%	5.6%	6.0%	0.8%	0.1%	-
SSW		1.3%	2.5%	1.0%	-	-	-
SW		0.8%	1.1%	0.2%	-	-	-
WSW		0.4%	0.6%	-	0.1%	-	-
W		0.7%	0.8%	0.4%	-	-	-
WNW		0.6%	1.2%	0.6%	0.3%	0.2%	-
NW		0.9%	2.2%	1.7%	1.1%	0.3%	0.1%
NNW		0.4%	4.0%	2.9%	0.2%	0.2%	-

Table A2.2 Prevailing Wind Analysis, Autumn

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Day							
N	3.1%	-	-	-	-	-	-
NNE		-	0.2%	-	-	-	-
NE		0.3%	0.1%	-	-	-	-
ENE		0.3%	0.4%	0.3%	-	-	-
E		0.4%	0.9%	0.5%	0.1%	0.1%	-
ESE		0.8%	2.1%	1.9%	1.6%	0.5%	-
SE		0.6%	3.0%	4.3%	4.7%	1.8%	0.4%
SSE		1.2%	3.1%	5.2%	2.9%	0.4%	-
S		1.3%	4.0%	2.9%	0.9%	-	-
SSW		1.1%	2.3%	0.6%	0.1%	-	-
SW		0.9%	1.5%	0.3%	0.1%	-	-
WSW		0.7%	1.6%	0.5%	0.1%	-	-
W		0.6%	1.6%	1.6%	0.8%	0.1%	-
WNW		0.5%	1.9%	4.1%	1.9%	1.0%	0.7%
NW		0.3%	1.9%	5.1%	6.3%	3.2%	2.7%
NNW		0.2%	1.3%	1.7%	1.1%	1.1%	0.2%

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Evening							
N	6.3%	-	-	-	-	-	-
NNE		0.1%	0.2%	-	-	-	-
NE		0.4%	0.1%	0.1%	-	-	-
ENE		0.4%	0.6%	0.3%	-	-	-
E		0.7%	0.9%	0.6%	-	-	-
ESE		0.4%	1.2%	3.4%	0.6%	-	-
SE		0.7%	2.8%	6.1%	5.3%	2.6%	0.4%
SSE		1.2%	4.6%	6.3%	2.5%	0.1%	-
S		0.9%	4.8%	4.2%	0.4%	0.1%	-
SSW		1.3%	2.5%	0.8%	0.1%	-	-
SW		0.7%	0.8%	0.2%	-	0.1%	-
WSW		0.9%	0.6%	0.3%	0.1%	-	-
W		0.6%	0.9%	0.7%	-	-	-
WNW		1.2%	1.1%	1.4%	0.4%	0.1%	0.1%
NW		1.2%	3.2%	3.5%	3.0%	0.5%	1.8%
NNW		0.2%	4.1%	6.1%	1.5%	0.2%	-
Night							
N	9.6%	-	0.1%	-	-	-	-
NNE		0.2%	0.3%	-	-	-	-
NE		0.5%	0.7%	0.1%	-	-	-
ENE		0.8%	0.5%	0.1%	-	-	-
E		0.6%	0.6%	0.1%	-	-	-
ESE		0.7%	0.5%	0.3%	0.1%	-	-
SE		1.2%	2.4%	2.8%	0.4%	-	-
SSE		1.7%	3.5%	4.9%	1.0%	-	-
S		1.9%	4.7%	2.0%	-	-	-
SSW		1.1%	1.9%	0.2%	-	-	-
SW		1.1%	1.2%	0.2%	-	-	-
WSW		0.9%	1.7%	0.1%	-	-	-
W		1.2%	2.0%	0.3%	-	-	-
WNW		1.3%	2.9%	1.9%	0.2%	0.1%	0.1%
NW		2.0%	6.0%	2.7%	1.7%	0.6%	1.3%
NNW		1.0%	16.8%	6.1%	0.6%	0.1%	0.3%

Table A2.3 Prevailing Wind Analysis, Winter

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Day							
N	3.0%	-	-	-	-	-	-
NNE		-	0.1%	-	-	-	-
NE		0.3%	0.3%	-	-	-	-
ENE		0.4%	0.8%	0.2%	-	-	-
E		0.7%	1.0%	0.3%	-	-	-
ESE		0.5%	1.9%	1.6%	0.6%	-	-
SE		0.6%	1.5%	4.0%	2.9%	1.2%	0.1%
SSE		0.8%	1.9%	3.5%	2.7%	0.5%	0.1%
S		0.8%	2.1%	2.5%	1.8%	0.2%	-
SSW		0.7%	1.3%	0.9%	0.3%	0.1%	-
SW		0.8%	1.2%	0.5%	0.2%	-	-
WSW		0.4%	1.5%	0.3%	0.2%	-	-
W		0.5%	1.3%	0.5%	0.4%	0.1%	0.1%
WNW		0.3%	1.4%	2.1%	1.1%	1.6%	3.3%
NW		0.4%	1.7%	3.6%	5.4%	6.9%	13.2%
NNW		0.1%	1.0%	1.2%	1.8%	1.7%	2.6%
Evening							
N	5.9%	-	-	-	-	-	-
NNE		0.1%	0.1%	-	-	-	-
NE		0.1%	0.1%	0.2%	-	-	-
ENE		0.2%	0.3%	0.3%	-	-	-
E		0.7%	0.5%	0.7%	-	-	-
ESE		0.5%	1.2%	2.6%	1.0%	-	-
SE		1.0%	2.4%	4.3%	2.2%	0.3%	-
SSE		1.2%	4.1%	4.0%	0.7%	-	-
S		1.0%	3.5%	3.3%	0.3%	0.1%	-
SSW		1.2%	1.2%	0.5%	0.1%	-	-
SW		0.4%	0.5%	0.3%	-	-	-
WSW		0.6%	0.6%	0.3%	0.2%	-	-
W		0.5%	0.8%	0.3%	0.1%	-	-
WNW		0.7%	0.8%	0.7%	0.6%	0.5%	0.3%
NW		1.0%	2.4%	2.6%	9.8%	7.1%	6.0%
NNW		0.3%	5.6%	6.0%	2.6%	1.6%	0.3%

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Night							
N	8.5%	-	0.1%	-	-	-	-
NNE		0.2%	0.2%	-	-	-	-
NE		0.5%	0.5%	0.1%	-	-	-
ENE		0.8%	0.8%	0.1%	-	-	-
E		0.2%	0.5%	-	-	-	-
ESE		0.9%	0.5%	0.1%	-	-	-
SE		0.9%	1.8%	1.1%	0.1%	-	-
SSE		1.6%	2.0%	1.4%	1.0%	0.1%	-
S		1.1%	2.4%	1.1%	0.3%	-	-
SSW		0.8%	0.7%	-	-	-	-
SW		0.9%	0.9%	0.2%	-	-	-
WSW		0.9%	1.3%	0.2%	0.1%	-	-
W		0.7%	1.7%	0.8%	0.1%	-	-
WNW		0.8%	1.7%	2.7%	0.5%	-	0.1%
NW		1.8%	4.9%	4.8%	6.1%	6.1%	5.5%
NNW		0.9%	12.1%	6.3%	3.1%	3.4%	0.8%

Table A2.4 Prevailing Wind Analysis, Spring

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Day							
N	8.5%	-	-	-	-	-	-
NNE		-	-	-	-	-	-
NE		-	0.1%	0.1%	-	-	0.1%
ENE		0.1%	0.5%	0.2%	-	-	-
E		0.4%	1.5%	0.7%	-	-	-
ESE		0.9%	1.6%	2.5%	1.5%	1.0%	0.6%
SE		1.3%	2.0%	3.4%	4.6%	5.4%	3.1%
SSE		0.9%	1.8%	2.5%	1.0%	0.3%	0.2%
S		0.8%	1.1%	1.3%	1.0%	0.3%	-
SSW		0.6%	1.0%	0.4%	0.5%	-	-
SW		0.8%	1.4%	0.6%	0.4%	0.1%	-
WSW		0.6%	1.1%	0.7%	0.7%	0.2%	-
W		0.5%	1.3%	1.6%	1.3%	0.6%	0.4%
WNW		0.3%	1.2%	2.6%	3.7%	2.3%	2.9%
NW		0.2%	1.0%	2.9%	5.2%	4.8%	2.9%
NNW		0.1%	0.2%	0.6%	0.9%	0.7%	0.5%

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Evening							
N	12.7%	-	0.1%	-	-	-	-
NNE		-	0.4%	0.1%	-	-	-
NE		0.3%	0.3%	0.1%	-	0.1%	-
ENE		0.3%	0.3%	0.3%	0.1%	-	0.1%
E		0.1%	0.2%	0.3%	0.5%	-	-
ESE		0.3%	0.5%	1.7%	2.4%	1.8%	1.0%
SE		0.1%	0.7%	4.6%	9.4%	8.8%	5.2%
SSE		0.4%	2.1%	5.6%	3.5%	0.9%	0.1%
S		1.2%	4.5%	3.6%	0.2%	-	-
SSW		0.3%	0.5%	0.2%	-	-	-
SW		0.1%	0.5%	0.2%	-	0.1%	-
WSW		0.3%	0.1%	0.3%	0.1%	-	-
W		0.4%	0.6%	0.6%	0.7%	0.3%	0.1%
WNW		0.3%	0.5%	1.4%	2.0%	1.9%	1.4%
NW		0.3%	1.0%	1.9%	1.2%	1.2%	0.8%
NNW		0.8%	2.3%	1.9%	0.7%	0.1%	-
Night							
N	37.5%	-	-	-	-	-	-
NNE		0.1%	0.1%	-	-	-	-
NE		0.2%	0.3%	0.1%	-	-	-
ENE		0.1%	0.2%	0.1%	-	-	-
E		0.3%	0.4%	-	-	-	-
ESE		0.3%	0.9%	0.6%	0.5%	0.1%	-
SE		0.7%	2.2%	2.8%	2.7%	0.9%	0.1%
SSE		1.0%	2.0%	3.1%	1.0%	0.1%	-
S		1.6%	2.3%	1.1%	-	-	-
SSW		0.5%	0.6%	0.1%	-	-	-
SW		0.5%	0.4%	0.1%	0.1%	-	0.1%
WSW		0.4%	0.6%	0.2%	0.1%	-	-
W		0.5%	0.6%	0.4%	0.4%	0.3%	0.1%
WNW		0.4%	1.2%	1.5%	0.7%	0.4%	0.1%
NW		1.1%	1.8%	2.2%	3.0%	1.2%	0.6%
NNW		4.9%	6.9%	3.9%	0.6%	-	-

Wind speed analysis of the prevailing winds has also been conducted and is summarised in **Figures A2.1** to **A2.4**.

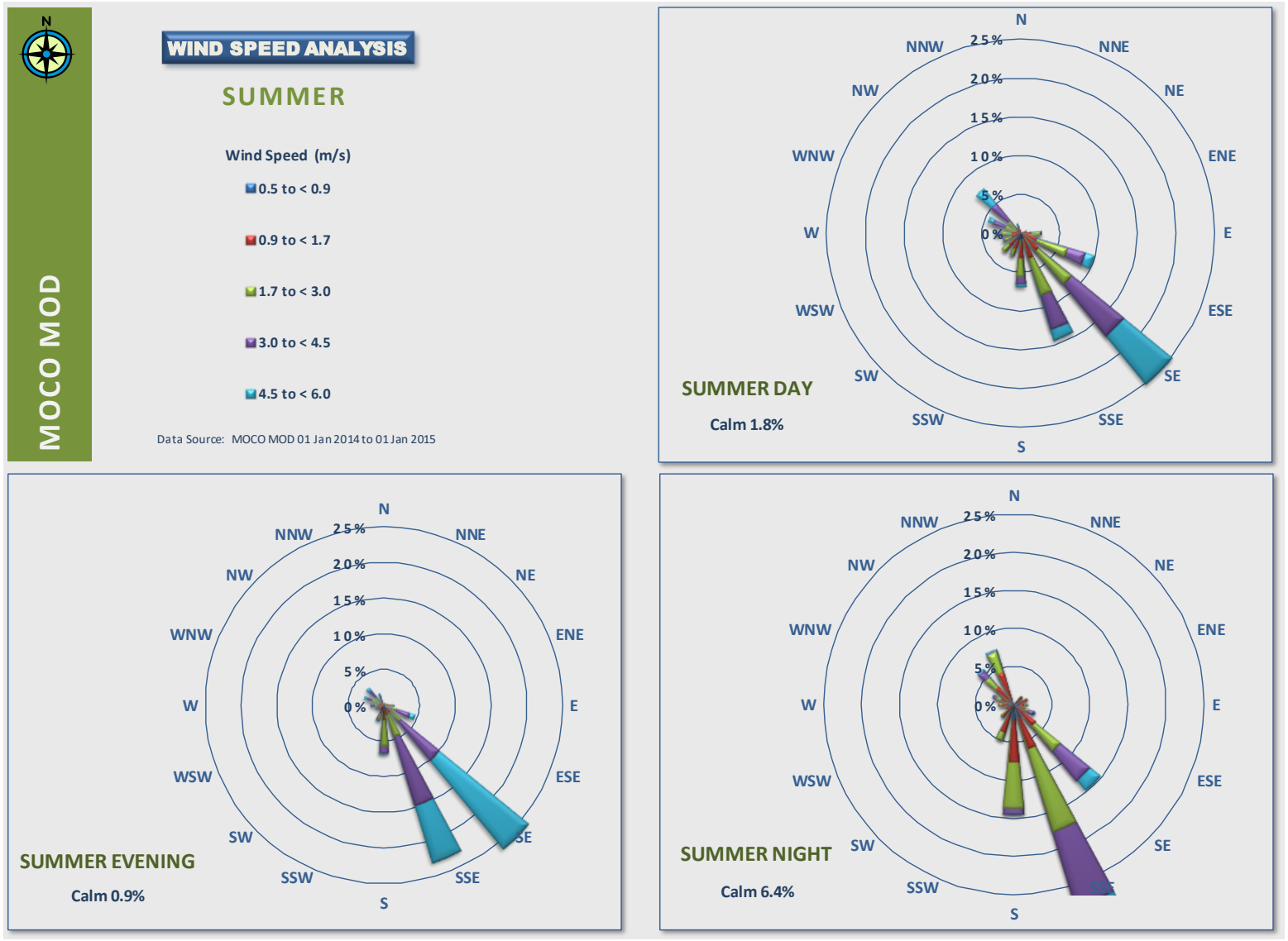


Figure A2.1 – Wind Speed Analysis, Summer

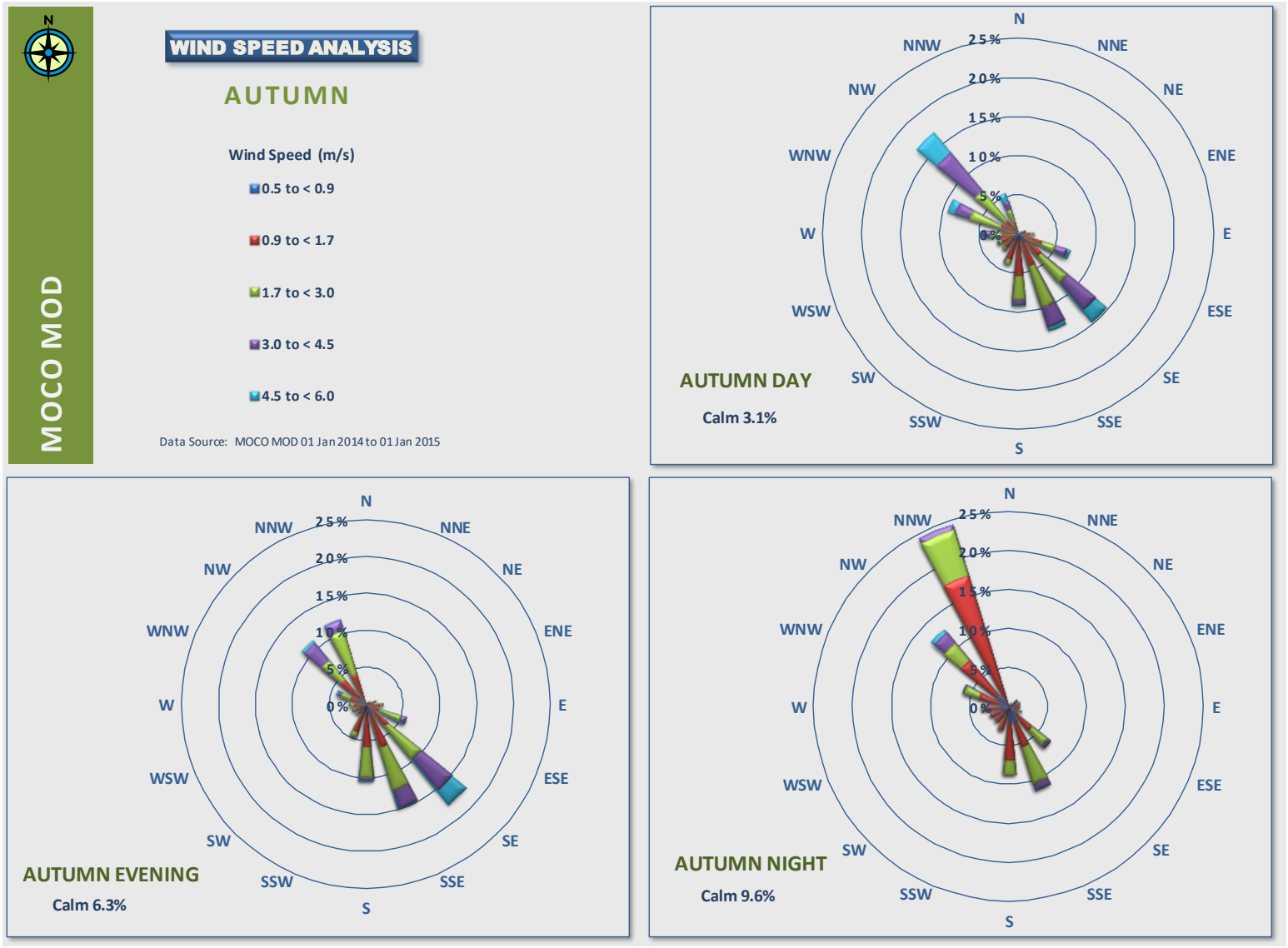


Figure A2.2 – Wind Speed Analysis, Autumn

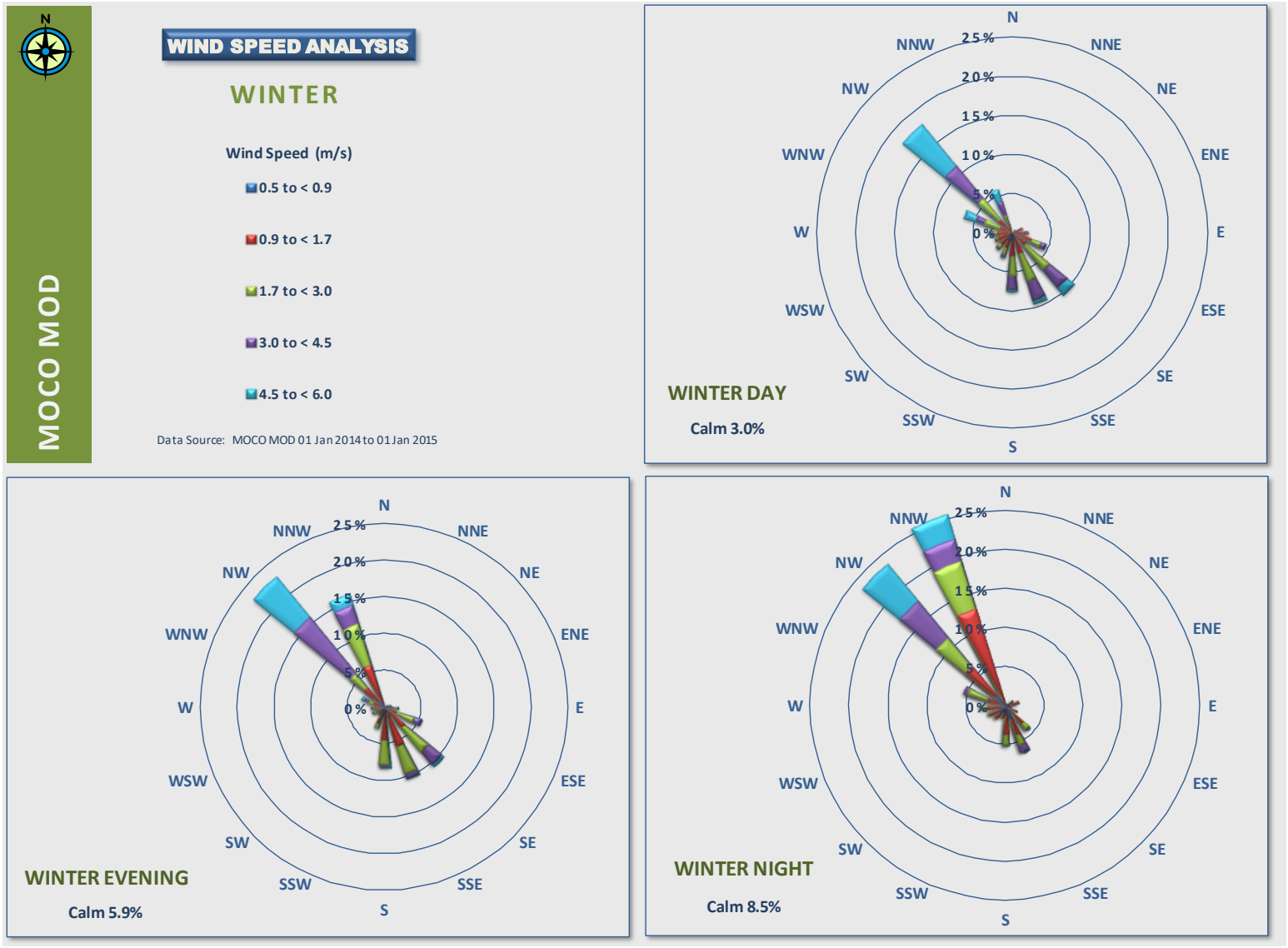


Figure A2.3 – Wind Speed Analysis, Winter

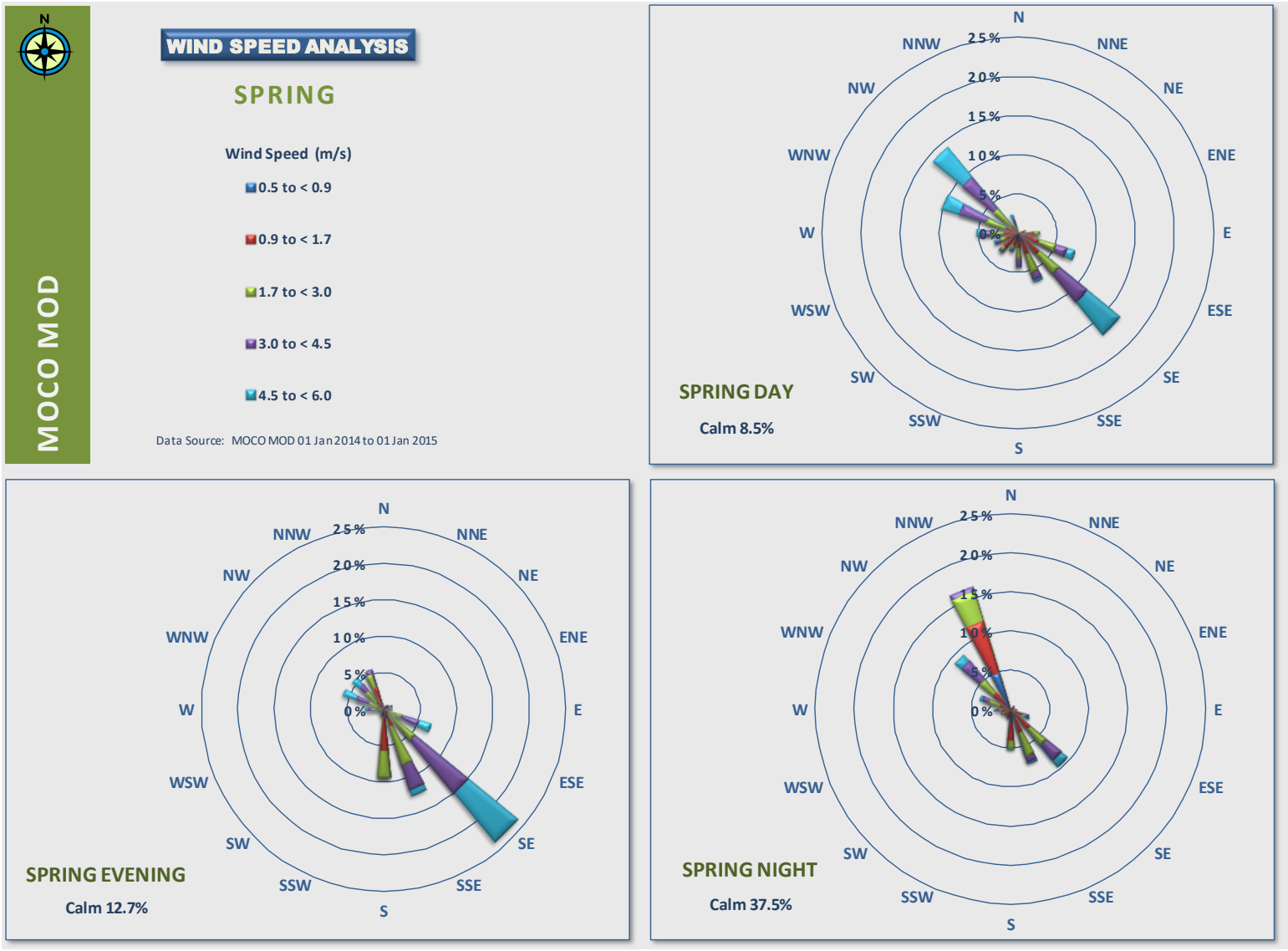


Figure A2.4 – Wind Speed Analysis, Spring

Temperature Inversions

These results of the analysis of the meteorological data to identify temperature inversions are presented in **Table A2.5**.

Table A2.5 – Stability Class Wind Analysis, Winter Evening and Night (6.00 pm to 7.00 am)

	< 0.5	0.5 to < 0.9	0.9 to < 1.7	1.7 to < 3.0	3.0 to < 4.5	4.5 to < 6.0	> 6.0
Non-Inversion Conditions – 36.5%							
N	8.3%	-	0.1%	-	-	-	-
NNE		-	0.1%	-	-	-	-
NE		0.1%	0.2%	-	-	-	-
ENE		0.3%	0.2%	-	-	-	-
E		0.3%	0.3%	-	-	-	-
ESE		0.4%	0.4%	-	-	-	-
SE		0.5%	0.4%	0.1%	-	-	-
SSE		0.8%	0.8%	0.2%	-	-	-
S		0.6%	0.8%	0.3%	-	-	-
SSW		0.6%	0.4%	-	-	-	-
SW		0.6%	0.3%	0.1%	-	-	-
WSW		0.6%	0.4%	0.1%	-	-	-
W		0.5%	0.6%	0.2%	-	-	-
WNW		0.6%	0.5%	0.3%	-	-	-
NW		0.6%	1.3%	0.7%	-	-	-
NNW		0.5%	8.1%	4.3%	-	-	-
Inversion Conditions – 63.5%							
N	27.1%	1.6%	-	-	-	-	-
NNE			0.1%	0.1%	-	-	-
NE			0.3%	0.3%	0.1%	-	-
ENE			0.2%	0.3%	0.2%	-	-
E			0.1%	0.3%	0.2%	-	-
ESE			0.2%	0.3%	0.8%	0.3%	-
SE			0.3%	1.4%	1.6%	1.0%	0.3%
SSE			0.5%	1.7%	2.0%	0.7%	-
S			0.5%	2.3%	1.9%	0.2%	-
SSW			0.3%	0.6%	0.1%	-	-
SW			0.1%	0.5%	0.2%	-	-
WSW			0.2%	0.9%	0.2%	0.1%	-
W			0.2%	1.0%	0.5%	0.1%	-
WNW			0.4%	1.4%	1.7%	0.8%	0.2%
NW			1.0%	3.4%	3.8%	5.9%	4.5%
NNW			0.4%	3.0%	3.1%	2.3%	1.7%

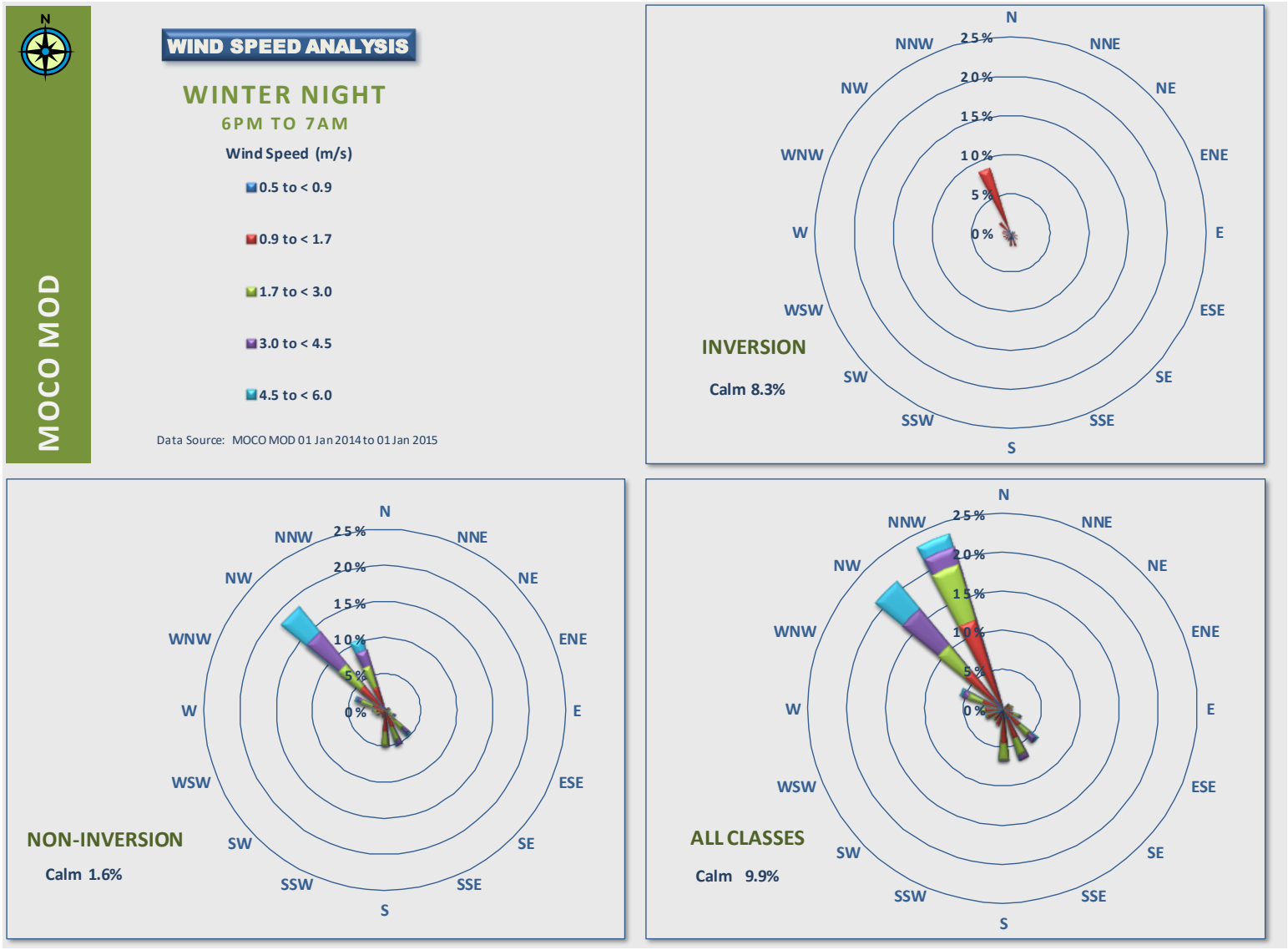
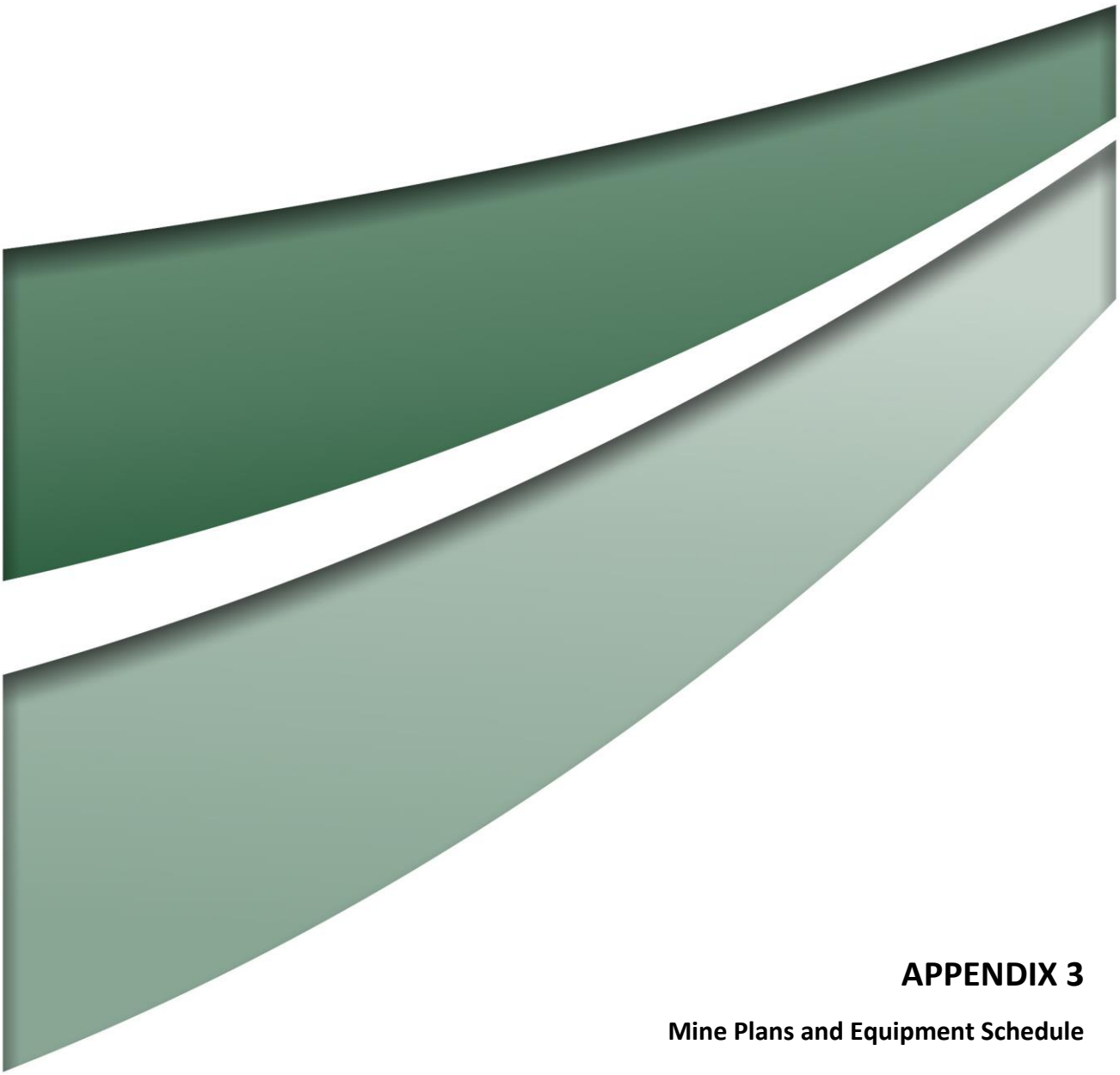


Figure A2.5 – Wind Speed Analysis, Winter Night (6.00 pm to 7.00 am)



APPENDIX 3

Mine Plans and Equipment Schedule

Appendix 3 – Mine Plans and Equipment Schedule

A3.1 Introduction

The sound power levels of the equipment (including acoustic utilisation factors) proposed over the life of the mine are presented in the **Tables 1**, **2** and **3** for Years 2, 8 and 15 respectively. It is important to note that these sound power levels are considered indicative rather than mandatory. The actual performance of the mining operation will be determined by monitoring the environmental noise levels over the life of the Proposed Modification. That is, while the representative sound power levels provide a guide to equipment selection, the actual performance of the mine as a whole will dictate equipment selection criteria for mine operations.

Many of the machines and items of equipment presented in **Tables 1**, **2** and **3** are represented as multiple point sources in order to simulate:

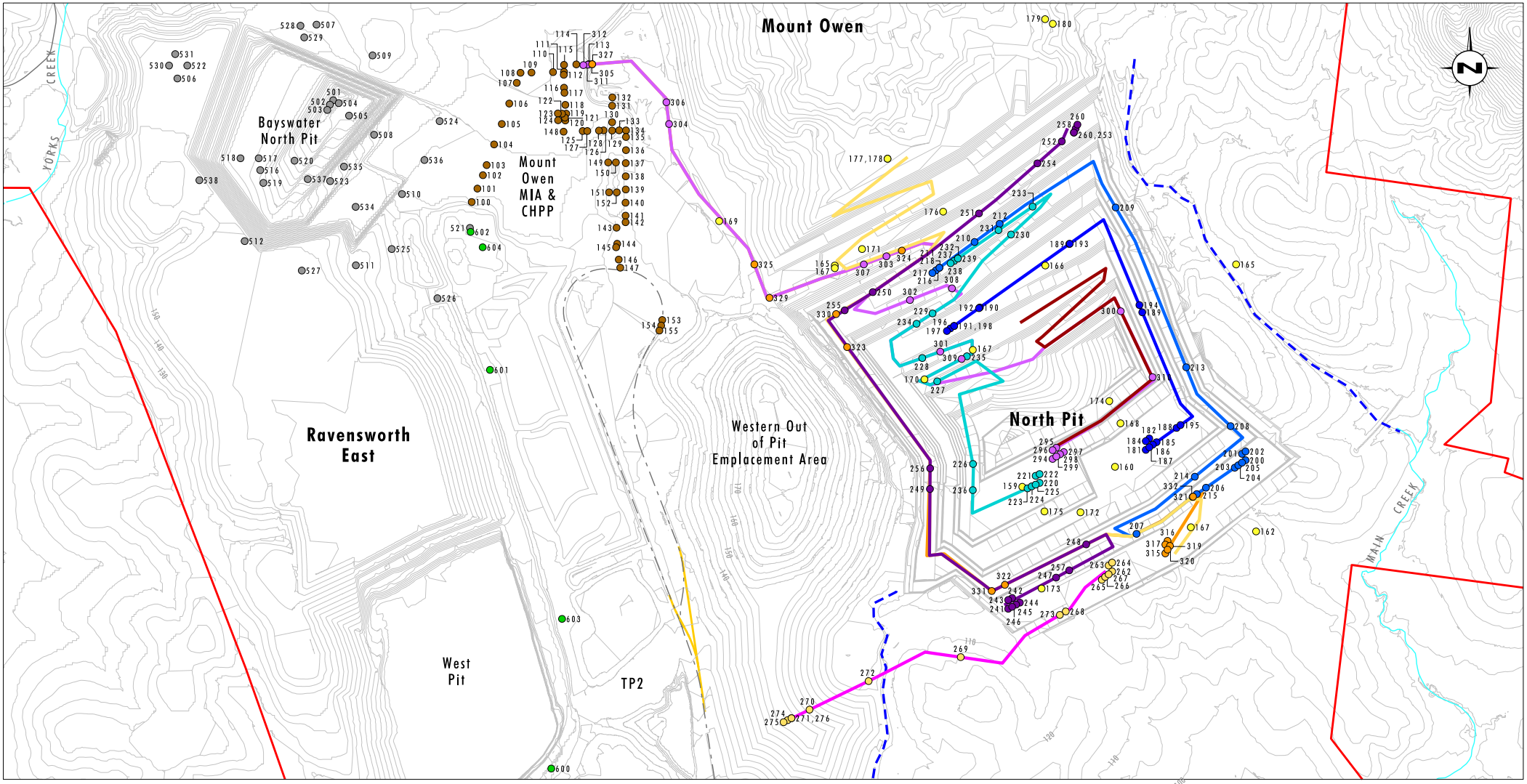
- the possible alternate locations of the machine e.g. the use of three alternate excavator locations;
- the same machine doing two different activities e.g. a bulldozer pushing and reversing;
- a fleet of trucks as a continuous circuit;
- conveyors as the equivalent of a line source; and
- the rail loop as the equivalent of a line source.

The ENM models of the staged mine plans include all the equipment that would be operating in and around the mine. In addition to the mining activities the noise models include:

- raw coal handling facilities for Mount Owen, Ravensworth East and Glendell mines;
- the Mount Owen Complex CHPP;
- the clean coal handling system and rail load-out facility; and
- the rail loop.

The ENM model of the CHPP, rail loop, conveyor systems and mobile equipment working in and around the CHPP were based on the representative equipment list and topographical layout of the facility. It was assumed that these activities would remain basically unchanged over the life of the mine.

The representative locations of the equipment within each stage of the mining operation are shown in **Figures A3.1**, **A3.2** and **A3.3**.



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 0.25 0.5 1.0km
1:25 000

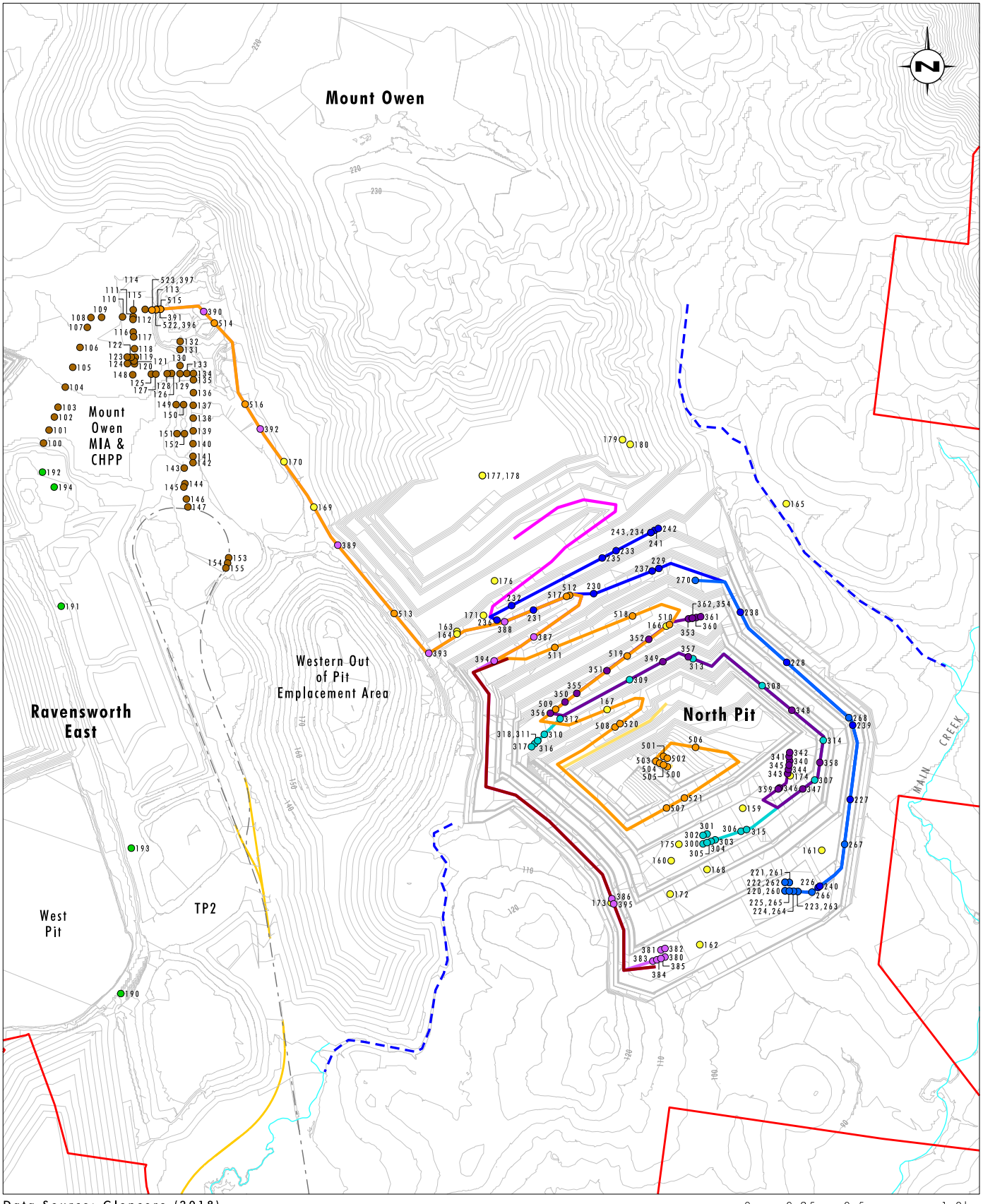
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Ancillary, Rehabilitation, Maintenance
- Baywater North Pit Sources
- CHPP Sources
- Glendell Haul Road
- Ex01 Waste
- Ex02 Waste
- Ex03 Waste
- Ex04 Waste
- Ex04 Woop
- Ex05 Coal
- Ex05 Waste
- Ex06 Coal
- Ex06 Waste

FIGURE A3.1

Year 2 Noise Model Source Locations

File Name (A4): R14/3810_214.dgn
20180523 12.32



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 0.25 0.5 1.0km
1:25 000

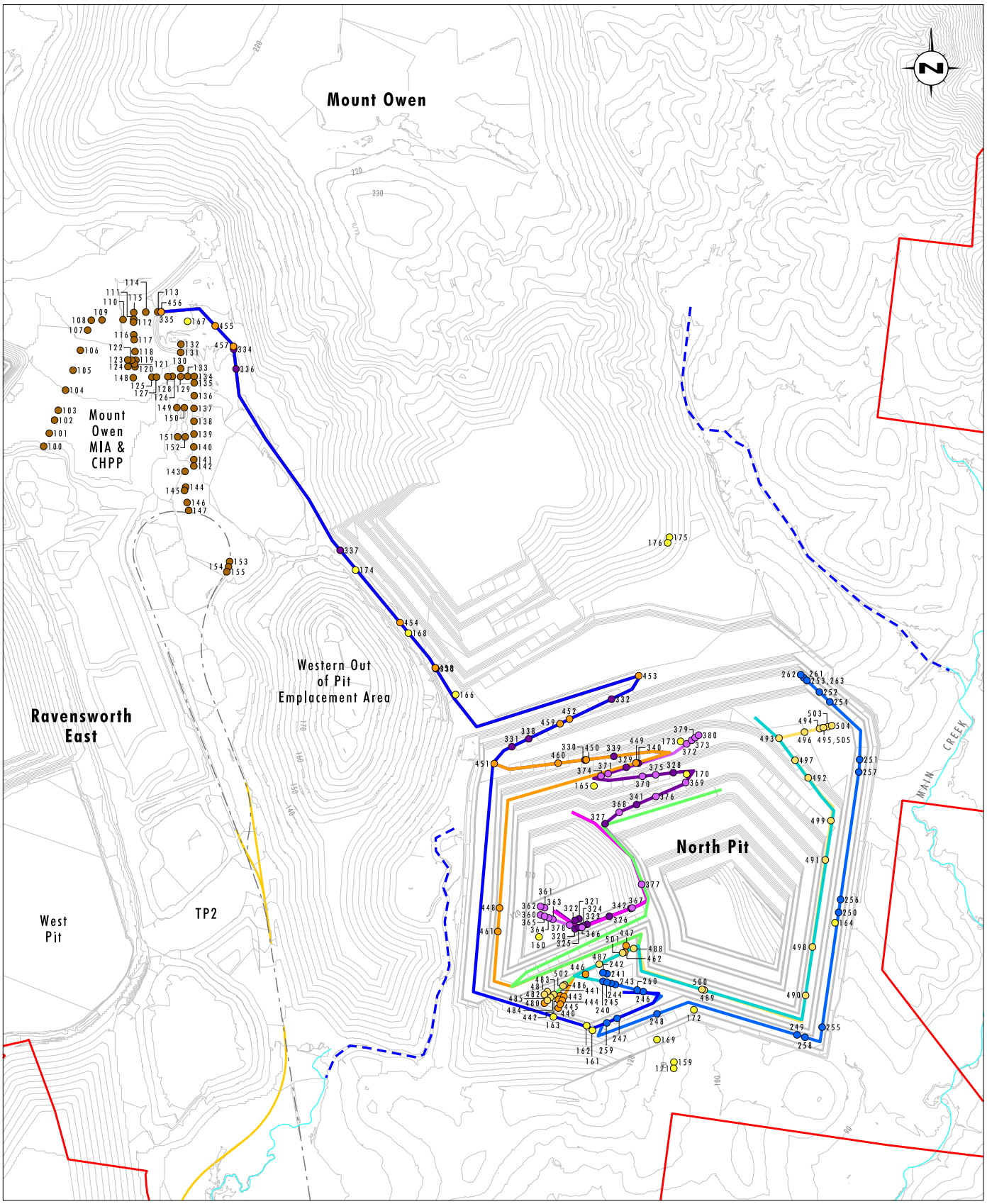
Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Ancillary, Rehabilitation, Maintenance
- CHPP Sources
- Glendell Haul Road
- Ex01 Waste
- Ex01 Waste Alternate
- Ex02 Waste
- Ex03 Waste
- Ex05 Coal
- Ex05 Waste
- Ex05 Waste Alternate
- Ex06 Coal
- Ex06 Waste

FIGURE A3.2

Year 8
Noise Model
Source Locations

File Name (A4): R14/3810_215.dgn
20180523 12.33



Data Source: Glencore (2018)
Note: Contour Interval 5m

0 0.25 0.5 1.0km
1:25 000

Legend

- Proposed SSD-5850 Modification Consent Boundary
- Approved Infrastructure
- Existing Bettys Creek Diversion
- Drainage Line
- Ancillary, Rehabilitation, Maintenance
- CHPP Sources
- Ex02 Coal
- Ex02 Waste
- Ex02 Waste Alternate
- Ex05 Coal
- Ex05 Waste
- Ex05 Waste Alternate
- Ex05 Waste Short
- Ex06 Coal
- Ex06 Waste
- Ex06 Waste Alternate

FIGURE A3.3

Year 15 Noise Model Source Locations

File Name (A4): R14/3810_216.dgn
20180523 12.33

Table 1 – Year 2

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
100	CHPP 01 Hopper	Glendell ROM Hopper	100%	111	120	320032	6413471	110
101	CHPP 02 Conveyor	Glendell ROM Conveyor 1 Seg 1	100%	102	113	320058	6413532	110
102	CHPP 03 Transfer Tower	Glendell ROM Conveyor 1 - TT	100%	109	117	320083	6413593	110
103	CHPP 04 Conveyor	Glendell ROM Conveyor 2 Seg 1	100%	101	112	320100	6413639	110
104	CHPP 05 Conveyor	Glendell ROM Conveyor 2 Seg 2	100%	101	112	320134	6413733	110
105	CHPP 06 Conveyor	Glendell ROM Conveyor 2 Seg 3	100%	101	112	320169	6413826	112
106	CHPP 07 Conveyor	Glendell ROM Conveyor 2 Seg 4	100%	101	112	320203	6413919	114
107	CHPP 08 Conveyor	Glendell ROM Conveyor 2 Seg 5	100%	101	112	320237	6414013	116
108	CHPP 09 Transfer Tower	Glendell ROM Conveyor 2 - TT	100%	109	117	320254	6414059	116
109	CHPP 10 Conveyor	Glendell ROM Conveyor 3 Seg 1	100%	101	112	320304	6414060	116
110	CHPP 11 Conveyor	Glendell ROM Conveyor 3 Seg 2	100%	101	112	320402	6414062	115
111	CHPP 12 Transfer Tower	Glendell-XMO ROM Conveyor TT	100%	109	117	320452	6414063	114
112	CHPP 13 Conveyor	XMO ROM Conveyor 2 Seg 1	100%	99	110	320451	6414050	114
113	CHPP 14 Hopper	XMO ROM Hopper	100%	111	120	320564	6414098	114
114	CHPP 15 Conveyor	XMO ROM Conveyor 1 Seg 1	100%	102	112	320508	6414097	114
115	CHPP 16 Transfer Tower	XMO ROM Conveyor 1 - TT	100%	109	117	320452	6414095	114
116	CHPP 17 Conveyor	XMO ROM Conveyor 2 Seg 2	100%	100	111	320452	6413991	114
117	CHPP 18 Conveyor Drive	XMO Rom Conveyor 2 - drive	100%	105	113	320454	6413968	114
118	CHPP 19 Conveyor	XMO ROM Conveyor 2 Seg 3	100%	100	111	320458	6413913	114
119	CHPP 20 Bin	XMO ROM Bin	100%	89	98	320462	6413873	113
120	CHPP 21 Conveyor	XMO ROM Conveyor 4 Seg 1	100%	99	110	320458	6413842	113
121	CHPP 22 Conveyor	XMO ROM Conveyor 3 Seg 1	100%	99	110	320456	6413855	113
122	CHPP 23 Conveyor	XMO ROM Conveyor 5 Seg 1	100%	97	107	320443	6413873	114
123	CHPP 24 Transfer Tower	XMO ROM Conveyor 6 - TT	100%	109	117	320424	6413874	114
124	CHPP 25 Conveyor	XMO ROM Conveyor 6 Seg 1	100%	99	110	320425	6413843	113
125	CHPP 26 Conveyor	Reject Coal Conveyor Seg 1	100%	97	112	320537	6413794	111
126	CHPP 27 Conveyor	Reject Coal Conveyor Seg 2	100%	97	112	320632	6413797	110
127	CHPP 28 Conveyor	Clean Coal Conveyor Seg 1	100%	97	112	320558	6413794	110
128	CHPP 29 Conveyor	Clean Coal Conveyor Seg 2	100%	97	112	320611	6413796	110
129	CHPP 30 Transfer Tower	Reject & Clean Coal Conveyor - TT	100%	109	117	320671	6413796	112
130	CHPP 31 Conveyor	Reject Conveyor Seg 1	100%	97	112	320671	6413834	111
131	CHPP 32 Conveyor	Reject Conveyor Seg 2	100%	97	112	320671	6413909	116

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
132	CHPP 33 Bin	Reject Bin	100%	89	98	320672	6413947	128
133	CHPP 34 Conveyor	Clean Coal Conveyor 1 Seg 1	100%	96	111	320703	6413797	115
134	CHPP 35 Transfer Tower	Clean Coal Conveyor - TT	100%	109	117	320734	6413797	117
135	CHPP 36 Conveyor	Clean Coal Conveyor 2 Seg 2	100%	98	109	320734	6413767	115
136	CHPP 37 Conveyor	Clean Coal Conveyor 2 Seg 3	100%	98	109	320734	6413707	118
137	CHPP 38 Conveyor	Clean Coal Conveyor 2 Seg 4	100%	98	109	320733	6413648	119
138	CHPP 39 Conveyor	Clean Coal Conveyor 2 Seg 5	100%	98	109	320733	6413588	120
139	CHPP 40 Conveyor	Clean Coal Conveyor 2 Seg 6	100%	98	109	320733	6413528	120
140	CHPP 41 Conveyor	Clean Coal Conveyor 2 Seg 7	100%	98	109	320732	6413468	120
141	CHPP 42 Conveyor	Clean Coal Conveyor 2 Seg 8	100%	98	109	320732	6413409	120
142	CHPP 43 Conveyor Drive	Clean Coal Conveyor 2 - drive	100%	105	113	320732	6413379	119
143	CHPP 44 Conveyor	Product Conveyor 1 Seg 1	100%	98	111	320691	6413354	115
144	CHPP 45 Conveyor	Product Conveyor 1 Seg 2	100%	98	111	320694	6413281	117
145	CHPP 46 Conveyor Drive	Product Conveyor 1 - drive	100%	110	116	320689	6413265	117
146	CHPP 47 Conveyor	Product Conveyor 1 Seg 3	100%	98	111	320701	6413209	117
147	CHPP 48 Bin	Product Bin	100%	89	98	320708	6413172	117
148	CHPP 49 CHPP building	Operating	100%	111	123	320450	6413791	112
149	CHPP 50 Dozer Product Coal 1	Forward	100%	112	122	320653	6413651	120
150	CHPP 51 Dozer Product Coal 1	Reversing	100%	121	126	320688	6413651	126
151	CHPP 52 Dozer Product Coal 2	Forward	100%	112	122	320657	6413515	123
152	CHPP 53 Dozer Product Coal 2	Reversing	100%	121	126	320692	6413515	125
153	CHPP 54 Train	Idle	100%	104	112	320899	6412934	115
154	CHPP 55 Train	Idle	100%	104	112	320894	6412909	117
155	CHPP 56 Train	Idle	100%	104	112	320886	6412886	115
159	Drill 1 Reedrill SK50	Ancillary - Drilling	100%	114	119	322537	6412175	-68
160	Drill 2 Reedrill SK50	Ancillary - Drilling	100%	114	119	322959	6412266	-7
167	Drill 3 Reedrill SK50	Ancillary - Drilling	100%	114	119	323304	6411991	87
162	Drill 4 Reedrill SK50	Ancillary - Drilling	100%	114	119	323601	6411972	122
165	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Forward	75%	108	119	321684	6413182	117
167	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Reverse	25%	116	120	321684	6413170	116
165	785 10 Cat 785 120t Water Truck	Road Maintenance - Flat	100%	115	126	323510	6413187	133
166	785 11 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	322642	6413182	-4

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
167	785 12 Cat 785 120t Water Truck	Road Maintenance - Up Hill	100%	115	126	322312	6412798	-32
168	785 13 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	322984	6412464	-41
169	785 14 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Up Hill	100%	115	126	321158	6413384	123
170	Grader 1 Grader 16M	Road Maintenance - Grading	100%	108	115	322092	6412664	-34
171	Grader 2 Grader 24M	Road Maintenance - Grading	100%	112	119	321808	6413257	117
172	Grader 3 Grader 24M	Road Maintenance - Grading	100%	112	119	322802	6412059	-8
173	Service Truck 1 Service Truck	Ancillary - Down Hill	100%	112	112	322625	6411712	86
174	Service Truck 2 Service Truck	Ancillary - Flat	100%	112	112	322933	6412565	-94
175	Service Truck 3 Service Truck	Ancillary - Up Hill	100%	112	112	322638	6412063	-39
176	Service Truck 4 Service Truck	Ancillary - Flat	100%	112	112	322177	6413427	115
177	Dozer 12 D10 or D11 Dozer	Rehab - Forward	75%	108	119	321924	6413668	200
178	Dozer 12 D10 or D11 Dozer	Rehab - Reverse	25%	116	120	321924	6413668	200
179	Dozer 13 D10 or D11 Dozer	Rehab - Forward	75%	108	119	322641	6414303	184
180	Dozer 13 D10 or D11 Dozer	Rehab - Reverse	25%	116	120	322676	6414282	179
181	2020_EXC1_9800_WASTEHAUL	Excavator	100%	118	125	323099	6412343	-7
182	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323115	6412395	-8
184	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323099	6412383	-8
185	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 8 - Queue at Loader 260%	260%	107	114	323148	6412378	-7
186	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 8 - Spot Time at loader 25%	25%	107	117	323131	6412367	-7
187	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 8 - Loading 120%	120%	104	111	323115	6412355	-7
188	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 8 - Haul Segment 1 50%	50%	113	122	323239	6412443	-7
189	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 8 - Haul Segment 3 50%	50%	113	122	323083	6412969	-5
189	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 8 - Haul Segment 4 50%	50%	113	122	322751	6413280	-3
190	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 8 - Haul Segment 4 50%	50%	113	122	322344	6412991	-2

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
191	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 8 - Spot at Dump 10%	10%	103	113	322227	6412907	-3
192	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 8 - Haul Segment 4 (rev.) 45%	45%	111	121	322340	6412988	-2
193	CAT793F (Std) 8 CAT793F (Std)/ 8 Haulage System-1	Waste RL115 Truck 8 of 8 - Haul Segment 4 (rev.) 45%	45%	111	121	322753	6413281	-3
194	CAT793F (Std) 8 CAT793F (Std)/ 8 Haulage System-1	Waste RL115 Truck 8 of 8 - Haul Segment 3 (rev.) 45%	45%	111	121	323070	6413002	-5
195	CAT793F (Std) 8 CAT793F (Std)/ 8 Haulage System-1	Waste RL115 Truck 8 of 8 - Haul Segment 1 (rev.) 50%	50%	111	121	323257	6412456	-7
196	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322210	6412896	-3
197	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322194	6412884	-3
198	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322227	6412907	-3
200	2020_EXC2_996_WASTEHAUL	Excavator	100%	117	123	323553	6412296	86
201	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323537	6412325	85
202	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323553	6412336	85
203	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Queue at Loader 50%	50%	100	107	323504	6412262	86
204	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Spot Time at loader 15%	15%	105	115	323520	6412273	86
205	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Loading 80%	80%	102	109	323537	6412285	86
206	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Haul Segment 1 50%	50%	113	122	323373	6412171	86
207	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 3 50%	50%	113	122	323057	6411961	58
208	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 7 50%	50%	113	122	323485	6412451	56
209	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 9 50%	50%	113	122	322962	6413446	58
210	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 12 50%	50%	113	122	322320	6413289	53

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
211	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Dumping 10%	10%	103	113	322160	6413172	53
212	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Haul Segment 12 (rev.) 50%	50%	111	121	322434	6413372	53
213	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 8 (rev.) 50%	50%	111	121	323283	6412719	59
214	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 6 (rev.) 50%	50%	111	121	323322	6412221	52
215	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 1 (rev.) 45%	45%	111	121	323331	6412142	86
216	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322144	6413160	55
217	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322128	6413148	57
218	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322160	6413172	53
220	2020_EXC3_996_WASTEHAUL	Excavator	100%	117	123	322616	6412193	-67
221	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322598	6412225	-68
222	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322616	6412233	-68
223	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Queue at Loader 35%	35%	98	106	322561	6412168	-67
224	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Spot Time at loader 15%	15%	105	115	322580	6412177	-67
225	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Loading 70%	70%	101	109	322598	6412185	-67
226	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Haul Segment 3 50%	50%	113	122	322313	6412279	-64
227	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 6 45%	45%	113	121	322150	6412655	-38
228	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 10 45%	45%	113	121	322082	6412761	-14
229	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 13 45%	45%	113	121	322129	6412964	15
230	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 15 45%	45%	113	121	322486	6413323	40

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
231	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 17 45%	45%	113	121	322429	6413343	51
232	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Dumping 10%	10%	103	113	322244	6413215	52
233	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Haul Segment 17 (rev.) 45%	45%	111	121	322584	6413450	53
234	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Haul Segment 13 (rev.) 50%	50%	111	121	322056	6412917	8
235	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 8 (rev.) 50%	50%	111	121	322285	6412769	-33
236	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 2 (rev.) 50%	50%	111	121	322312	6412160	-63
237	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322227	6413203	52
238	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322211	6413192	52
239	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322244	6413214	52
241	2020_EXC4_996_WASTEHAUL	Excavator	100%	117	123	322473	6411620	85
242	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322491	6411669	85
243	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322473	6411660	85
244	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Queue at Loader 40%	40%	99	106	322526	6411648	87
245	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 6 - Spot Time at loader 15%	15%	105	115	322509	6411639	86
246	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Loading 70%	70%	101	109	322491	6411629	86
247	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 6 - Haul Segment 2 45%	45%	113	121	322691	6411762	84
248	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 4 45%	45%	113	121	322828	6411913	52
249	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 6 - Haul Segment 8 45%	45%	113	121	322117	6412165	56
250	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 11 45%	45%	113	121	321857	6413061	58

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
251	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 12 45%	45%	113	121	322340	6413419	85
252	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Haul Segment 14 40%	40%	112	121	322717	6413747	115
253	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 6 - Dumping 10%	10%	103	113	322772	6413787	115
254	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Haul Segment 13 (rev.) 50%	50%	111	121	322606	6413647	105
255	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 6 - Haul Segment 10 (rev.) 50%	50%	111	121	321729	6412978	54
256	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 8 (rev.) 50%	50%	111	121	322118	6412259	58
257	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 6 - Haul Segment 2 (rev.) 50%	50%	111	121	322751	6411795	77
258	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322780	6413805	115
260	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322788	6413823	115
260	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322772	6413787	115
262	2020_EXC6_EXC4_WOOP_WASTEHAUL	Excavator	100%	118	125	322946	6411790	92
263	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322930	6411817	91
264	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322946	6411830	91
265	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste - WOOP Dump Truck 1 of 6 - Queue at Loader 300%	300%	108	115	322899	6411752	92
266	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste - WOOP Dump Truck 2 of 6 - Spot Time at loader 15%	15%	105	115	322914	6411765	92
267	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste - WOOP Dump Truck 3 of 6 - Loading 90%	90%	102	110	322930	6411777	92
268	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste - WOOP Dump Truck 4 of 6 - Haul Segment 3 40%	40%	112	121	322735	6411608	90
269	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste - WOOP Dump Truck 5 of 6 - Haul Segment 5 35%	35%	112	120	322257	6411400	116
270	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste - WOOP Dump Truck 6 of 6 - Haul Segment 7 35%	35%	112	120	321569	6411161	137

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
271	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste - WOOP Dump Truck 6 of 6 - Dumping 10%	40%	109	119	321487	6411122	150
272	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste - WOOP Dump Truck 6 of 6 - Haul Segment 7 (rev.) 35%	35%	110	119	321838	6411291	105
273	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste - WOOP Dump Truck 6 of 6 - Haul Segment 3 (rev.) 40%	40%	110	120	322708	6411592	93
274	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	321469	6411113	150
275	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	321451	6411104	150
276	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	321487	6411122	150
294	2020_EXC5_9400_COALHAUL	Excavator	100%	118	125	322675	6412302	-67
295	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322692	6412353	-66
296	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322675	6412342	-66
297	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal Truck 1 of 6 - Queue at Loader 65%	65%	101	108	322726	6412333	-66
298	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal Truck 1 of 6 - Spot Time at loader 10%	10%	103	113	322709	6412323	-66
299	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal Truck 2 of 6 - Loading 65%	65%	101	108	322692	6412313	-66
300	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal Truck 2 of 6 - Haul Segment 3 50%	50%	113	122	322985	6412974	-63
301	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal Truck 3 of 6 - Haul Segment 12 50%	50%	113	122	322164	6412790	-22
302	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal Truck 3 of 6 - Haul Segment 19 50%	50%	113	122	322026	6413025	41
303	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal Truck 4 of 6 - Haul Segment 25 50%	50%	113	122	321919	6413224	99
304	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal Truck 4 of 6 - Haul Segment 31 50%	50%	113	122	320930	6413826	123
305	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal Truck 4 of 6 - Dumping 10%	10%	103	113	320580	6414098	129
306	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal Truck 5 of 6 - Haul Segment 31 (rev.) 40%	40%	110	120	320918	6413925	124

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
307	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal Truck 5 of 6 - Haul Segment 25 (rev.) 40%	40%	110	120	321816	6413187	108
308	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal Truck 6 of 6 - Haul Segment 17 (rev.) 40%	40%	110	120	322217	6413078	25
309	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal Truck 6 of 6 - Haul Segment 10 (rev.) 40%	40%	110	120	322261	6412757	-33
310	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal Truck 6 of 6 - Haul Segment 3 (rev.) 40%	40%	110	120	323130	6412674	-62
311	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	320560	6414096	114
312	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	320540	6414094	114
315	2020_EXC6_9400_COALHAUL	Excavator	100%	118	125	323188	6411872	88
316	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323198	6411929	87
317	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323188	6411912	87
319	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal Truck 1 of 7 - Spot Time at loader 15%	15%	105	115	323209	6411906	88
320	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal Truck 2 of 7 - Loading 90%	90%	102	110	323198	6411889	88
321	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal Truck 3 of 7 - Haul Segment 3 50%	50%	113	122	323312	6412129	86
322	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal Truck 3 of 7 - Haul Segment 7 50%	50%	113	122	322458	6411729	52
323	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal Truck 4 of 7 - Haul Segment 11 50%	50%	113	122	321740	6412811	57
324	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal Truck 4 of 7 - Haul Segment 16 50%	50%	113	122	321989	6413250	93
325	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal Truck 5 of 7 - Haul Segment 19 50%	50%	113	122	321318	6413187	129
327	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal Truck 5 of 7 - Dumping 10%	10%	103	113	320580	6414098	129
329	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal Truck 6 of 7 - Haul Segment 18 (rev.) 50%	50%	111	121	321387	6413035	130
330	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal Truck 7 of 7 - Haul Segment 12 (rev.) 50%	50%	111	121	321690	6412961	54

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
331	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal Truck 7 of 7 - Haul Segment 8 (rev.) 50%	50%	111	121	322398	6411701	54
332	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal Truck 7 of 7 - Haul Segment 3 (rev.) 45%	45%	111	121	323314	6412130	86
501	BNP Hitachi EXC5500	Overburden	100%	118	125	319402	6413934	-27
502	BNP Cat D10T Dozer #1	Forward	75%	111	122	319387	6413914	-27
503	BNP Cat D10T Dozer #1	Reverse	25%	116	120	319375	6413890	-26
504	BNP Cat 793D XQ #1	Idle	100%	103	110	319427	6413921	-22
505	BNP Cat 793D XQ #2	Accelerating	33%	111	121	319474	6413864	-11
506	BNP Cat 793D XQ #3	Dumping	50%	113	120	318693	6414033	152
507	BNP Cat 793D XQ #3	Dumping	50%	113	120	319326	6414278	122
508	BNP Cat 793D XQ #2	Up-ramp	33%	111	121	319588	6413777	92
509	BNP Cat 793D XQ #2	Down-ramp	33%	111	118	319581	6414138	130
510	BNP Cat 793D XQ #4	Up-ramp	33%	111	121	319715	6413507	110
511	BNP Cat 793D XQ #4	Down-ramp	33%	111	118	319505	6413183	138
512	BNP Cat 793D XQ #4	Up-ramp	33%	111	121	318999	6413293	155
516	BNP Hitachi EXC2500	Coal_Overburden	100%	116	121	319070	6413616	36
517	BNP Cat D10T Dozer #2	Forward	75%	111	122	319063	6413670	39
518	BNP Cat D10T Dozer #2	Reverse	25%	116	120	318980	6413670	43
519	BNP Cat 789C #1	Idle	100%	103	110	319084	6413558	33
520	BNP Cat 789C #2	Accelerating	33%	111	123	319226	6413659	4
521	BNP Cat 789C #3	Dumping	50%	113	120	320024	6413353	129
522	BNP Cat 789C #3	Dumping	25%	110	117	318738	6414092	151
523	BNP Cat 789C #2	Up-ramp	33%	111	123	319388	6413566	63
524	BNP Cat 789C #2	Down-ramp	33%	111	120	319886	6413839	106
525	BNP Cat 789C #4	Up-ramp	33%	111	123	319668	6413257	121
526	BNP Cat 789C #4	Down-ramp	33%	111	120	319876	6413033	120
527	BNP Cat 789C #4	Up-ramp	33%	111	123	319259	6413159	156
528	BNP Cat D10T Dozer #3	Forward	75%	111	122	319253	6414273	120
529	BNP Cat D10T Dozer #3	Reverse	25%	116	120	319270	6414220	120
530	BNP Cat D11 Dozer #4	Forward	75%	111	122	318655	6414092	151
531	BNP Cat D11 Dozer #4	Reverse	25%	116	120	318683	6414144	151
534	BNP Drill Sk50	Drilling	100%	113	120	319504	6413449	88

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
535	BNP Water Cart 777	Road Maintenance	100%	115	122	319451	6413632	72
536	BNP Grader 16H	Road Maintenance	100%	108	115	319817	6413662	110
537	BNP Service Truck	Ancillary	100%	112	112	319286	6413575	22
538	BNP Cat 789C #3	Up-ramp	25%	110	122	318793	6413570	156
600	Glendell Haulroad Glendell Truck 190t	Uphill	100%	114	121	320394	6410893	101
601	Glendell Haulroad Glendell Truck 190t	Uphill	100%	114	121	320115	6412707	119
602	Glendell Haulroad Glendell Truck 190t	Dumping at ROM	100%	112	120	320027	6413335	129
603	Glendell Haulroad Glendell Truck 190t	Downhill	100%	111	120	320443	6411574	115
604	Glendell Haulroad Glendell ROM FEL	Working on Raw Coal	100%	113	121	320082	6413265	130

Table 2 – Year 8

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
100	CHPP 01 Hopper	Glendell ROM Hopper	100%	111	120	320032	6413471	110
101	CHPP 02 Conveyor	Glendell ROM Conveyor 1 Seg 1	100%	102	113	320058	6413532	110
102	CHPP 03 Transfer Tower	Glendell ROM Conveyor 1 - TT	100%	109	117	320083	6413593	110
103	CHPP 04 Conveyor	Glendell ROM Conveyor 2 Seg 1	100%	101	112	320100	6413639	110
104	CHPP 05 Conveyor	Glendell ROM Conveyor 2 Seg 2	100%	101	112	320134	6413733	110
105	CHPP 06 Conveyor	Glendell ROM Conveyor 2 Seg 3	100%	101	112	320169	6413826	112
106	CHPP 07 Conveyor	Glendell ROM Conveyor 2 Seg 4	100%	101	112	320203	6413919	114
107	CHPP 08 Conveyor	Glendell ROM Conveyor 2 Seg 5	100%	101	112	320237	6414013	116
108	CHPP 09 Transfer Tower	Glendell ROM Conveyor 2 - TT	100%	109	117	320254	6414059	116
109	CHPP 10 Conveyor	Glendell ROM Conveyor 3 Seg 1	100%	101	112	320304	6414060	116
110	CHPP 11 Conveyor	Glendell ROM Conveyor 3 Seg 2	100%	101	112	320402	6414062	115
111	CHPP 12 Transfer Tower	Glendell-XMO ROM Conveyor TT	100%	109	117	320452	6414063	114
112	CHPP 13 Conveyor	XMO ROM Conveyor 2 Seg 1	100%	99	110	320451	6414050	114
113	CHPP 14 Hopper	XMO ROM Hopper	100%	111	120	320564	6414098	114
114	CHPP 15 Conveyor	XMO ROM Conveyor 1 Seg 1	100%	102	112	320508	6414097	114
115	CHPP 16 Transfer Tower	XMO ROM Conveyor 1 - TT	100%	109	117	320452	6414095	114
116	CHPP 17 Conveyor	XMO ROM Conveyor 2 Seg 2	100%	100	111	320452	6413991	114
117	CHPP 18 Conveyor Drive	XMO Rom Conveyor 2 - drive	100%	105	113	320454	6413968	114
118	CHPP 19 Conveyor	XMO ROM Conveyor 2 Seg 3	100%	100	111	320458	6413913	114
119	CHPP 20 Bin	XMO ROM Bin	100%	89	98	320462	6413873	113
120	CHPP 21 Conveyor	XMO ROM Conveyor 4 Seg 1	100%	99	110	320458	6413842	113
121	CHPP 22 Conveyor	XMO ROM Conveyor 3 Seg 1	100%	99	110	320456	6413855	113
122	CHPP 23 Conveyor	XMO ROM Conveyor 5 Seg 1	100%	97	107	320443	6413873	114
123	CHPP 24 Transfer Tower	XMO ROM Conveyor 6 - TT	100%	109	117	320424	6413874	114
124	CHPP 25 Conveyor	XMO ROM Conveyor 6 Seg 1	100%	99	110	320425	6413843	113
125	CHPP 26 Conveyor	Reject Coal Conveyor Seg 1	100%	97	112	320537	6413794	111
126	CHPP 27 Conveyor	Reject Coal Conveyor Seg 2	100%	97	112	320632	6413797	111
127	CHPP 28 Conveyor	Clean Coal Conveyor Seg 1	100%	97	112	320558	6413794	110
128	CHPP 29 Conveyor	Clean Coal Conveyor Seg 2	100%	97	112	320611	6413796	110
129	CHPP 30 Transfer Tower	Reject & Clean Coal Conveyor - TT	100%	109	117	320671	6413796	113
130	CHPP 31 Conveyor	Reject Conveyor Seg 1	100%	97	112	320671	6413834	113
131	CHPP 32 Conveyor	Reject Conveyor Seg 2	100%	97	112	320671	6413909	116

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
132	CHPP 33 Bin	Reject Bin	100%	89	98	320672	6413947	128
133	CHPP 34 Conveyor	Clean Coal Conveyor 1 Seg 1	100%	96	111	320703	6413797	114
134	CHPP 35 Transfer Tower	Clean Coal Conveyor - TT	100%	109	117	320734	6413797	117
135	CHPP 36 Conveyor	Clean Coal Conveyor 2 Seg 2	100%	98	109	320734	6413767	114
136	CHPP 37 Conveyor	Clean Coal Conveyor 2 Seg 3	100%	98	109	320734	6413707	118
137	CHPP 38 Conveyor	Clean Coal Conveyor 2 Seg 4	100%	98	109	320733	6413648	119
138	CHPP 39 Conveyor	Clean Coal Conveyor 2 Seg 5	100%	98	109	320733	6413588	120
139	CHPP 40 Conveyor	Clean Coal Conveyor 2 Seg 6	100%	98	109	320733	6413528	120
140	CHPP 41 Conveyor	Clean Coal Conveyor 2 Seg 7	100%	98	109	320732	6413468	120
141	CHPP 42 Conveyor	Clean Coal Conveyor 2 Seg 8	100%	98	109	320732	6413409	120
142	CHPP 43 Conveyor Drive	Clean Coal Conveyor 2 - drive	100%	105	113	320732	6413379	119
143	CHPP 44 Conveyor	Product Conveyor 1 Seg 1	100%	98	111	320691	6413354	115
144	CHPP 45 Conveyor	Product Conveyor 1 Seg 2	100%	98	111	320694	6413281	117
145	CHPP 46 Conveyor Drive	Product Conveyor 1 - drive	100%	110	116	320689	6413265	117
146	CHPP 47 Conveyor	Product Conveyor 1 Seg 3	100%	98	111	320701	6413209	117
147	CHPP 48 Bin	Product Bin	100%	89	98	320708	6413172	117
148	CHPP 49 CHPP building	Operating	100%	111	123	320450	6413791	112
149	CHPP 50 Dozer Product Coal 1	Forward	100%	112	122	320653	6413651	120
150	CHPP 51 Dozer Product Coal 1	Reversing	100%	121	126	320688	6413651	126
151	CHPP 52 Dozer Product Coal 2	Forward	100%	112	122	320657	6413515	123
152	CHPP 53 Dozer Product Coal 2	Reversing	100%	121	126	320692	6413515	125
153	CHPP 54 Train	Idle	100%	104	112	320899	6412934	116
154	CHPP 55 Train	Idle	100%	104	112	320894	6412909	117
155	CHPP 56 Train	Idle	100%	104	112	320886	6412886	115
159	Drill 1 Reedrill SK50	Ancillary - Drilling	100%	114	119	323306	6411761	-85
160	Drill 2 Reedrill SK50	Ancillary - Drilling	100%	114	119	322971	6411515	-77
161	Drill 3 Reedrill SK50	Ancillary - Drilling	100%	114	119	323676	6411564	33
162	Drill 4 Reedrill SK50	Ancillary - Drilling	100%	114	119	323105	6411122	49
163	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Forward	75%	108	119	321968	6412589	119
164	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Reverse	25%	116	120	321968	6412577	118
165	785 10 Cat 785 120t Water Truck	Road Maintenance - Flat	100%	115	126	323510	6413187	133
166	785 11 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	322948	6412614	-8

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
167	785 12 Cat 785 120t Water Truck	Road Maintenance - Up Hill	100%	115	126	322671	6412223	-82
168	785 13 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	323139	6411474	-38
169	785 14 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Up Hill	100%	115	126	321298	6413171	128
170	Grader 1 Grader 16M	Road Maintenance - Grading	100%	108	115	321158	6413384	123
171	Grader 2 Grader 24M	Road Maintenance - Grading	100%	112	119	322092	6412664	114
172	Grader 3 Grader 24M	Road Maintenance - Grading	100%	112	119	322966	6411359	-17
173	Service Truck 1 Service Truck	Ancillary - Down Hill	100%	112	112	322690	6411318	58
174	Service Truck 2 Service Truck	Ancillary - Flat	100%	112	112	323528	6411913	-96
175	Service Truck 3 Service Truck	Ancillary - Up Hill	100%	112	112	323007	6411592	-79
176	Service Truck 4 Service Truck	Ancillary - Flat	100%	112	112	322144	6412826	142
177	Dozer 12 D10 or D11 Dozer	Rehab - Forward	75%	108	119	322087	6413319	230
178	Dozer 12 D10 or D11 Dozer	Rehab - Reverse	25%	116	120	322087	6413319	230
179	Dozer 13 D10 or D11 Dozer	Rehab - Forward	75%	108	119	322743	6413487	193
180	Dozer 13 D10 or D11 Dozer	Rehab - Reverse	25%	116	120	322779	6413465	187
190	Glendell Haulroad Glendell Truck 190t	Uphill	100%	114	121	320394	6410893	105
191	Glendell Haulroad Glendell Truck 190t	Uphill	100%	114	121	320115	6412707	119
192	Glendell Haulroad Glendell Truck 190t	Dumping at ROM	100%	112	120	320027	6413335	129
193	Glendell Haulroad Glendell Truck 190t	Downhill	100%	111	120	320443	6411574	115
194	Glendell Haulroad GlendellROM FEL	Working on Raw Coal	100%	113	121	320082	6413265	130
220	2026_2_EXC1_9800_WASTEHAUL	Excavator	100%	117	123	323504	6411374	42
221	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323524	6411413	41
222	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323504	6411414	41
223	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 7 - Queue at Loader 10%	10%	93	100	323564	6411371	43
224	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL115 Truck 1 of 7 - Spot Time at loader 20%	20%	106	116	323544	6411372	43
225	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 7 - Loading 90%	90%	102	110	323524	6411373	43
226	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 7 - Haul Segment 2 40%	40%	112	121	323659	6411390	40
227	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL115 Truck 2 of 7 - Haul Segment 4 40%	40%	112	121	323809	6411802	57

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
228	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 7 - Haul Segment 6 40%	40%	112	121	323512	6412444	58
229	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL115 Truck 3 of 7 - Haul Segment 10 40%	40%	112	121	322913	6412884	57
230	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 7 - Haul Segment 11 40%	40%	112	121	322608	6412766	82
231	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 7 - Haul Segment 12 40%	40%	112	121	322326	6412689	102
232	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL115 Truck 4 of 7 - Haul Segment 14 40%	40%	112	121	322224	6412710	118
233	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 7 - Haul Segment 14 45%	45%	113	121	322713	6412967	118
234	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 7 - Dumping 10%	10%	103	113	322876	6413052	118
235	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL115 Truck 5 of 7 - Haul Segment 14 (rev.) 40%	40%	110	120	322648	6412933	118
236	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 7 - Haul Segment 13 (rev.) 40%	40%	110	120	322155	6412642	113
237	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL115 Truck 6 of 7 - Haul Segment 10 (rev.) 40%	40%	110	120	322882	6412872	59
238	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 7 - Haul Segment 7 (rev.) 45%	45%	111	121	323295	6412679	58
239	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 7 - Haul Segment 5 (rev.) 40%	40%	110	120	323821	6412150	56
240	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Waste RL115 Truck 7 of 7 - Haul Segment 2 (rev.) 40%	40%	110	120	323667	6411396	35
241	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322893	6413062	118
242	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322911	6413071	118
243	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322876	6413052	118
260	2026_2_alt_EXC1_9800_WASTEHAUL	Excavator	100%	117	123	323504	6411374	42
261	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323524	6411413	41
262	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323504	6411414	41

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
263	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL55 Truck 1 of 5 - Queue at Loader 15%	15%	95	102	323564	6411371	43
264	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL55 Truck 1 of 5 - Spot Time at loader 20%	20%	106	116	323544	6411372	43
265	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL55 Truck 2 of 5 - Loading 105%	105%	103	110	323524	6411373	43
266	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL55 Truck 2 of 5 - Haul Segment 2 40%	40%	112	121	323630	6411368	42
267	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL55 Truck 3 of 5 - Haul Segment 4 40%	40%	112	121	323783	6411592	58
268	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL55 Truck 3 of 5 - Haul Segment 6 40%	40%	112	121	323803	6412185	56
270	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL55 Truck 4 of 5 - Haul Segment 8 40%	40%	112	121	323084	6412828	52
300	2026_2_EXC2_996_WASTEHAUL	Excavator	100%	117	123	323120	6411594	-79
301	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323139	6411640	-80
302	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323120	6411634	-79
303	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL65 Truck 1 of 5 - Queue at Loader 10%	10%	93	100	323177	6411613	-80
304	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL65 Truck 1 of 5 - Spot Time at loader 20%	20%	106	116	323158	6411606	-80
305	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL65 Truck 2 of 5 - Loading 95%	95%	103	110	323139	6411600	-79
306	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL65 Truck 2 of 5 - Haul Segment 1 40%	40%	112	121	323298	6411653	-81
307	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL65 Truck 3 of 5 - Haul Segment 3 40%	40%	112	121	323643	6411893	-67
308	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL65 Truck 3 of 5 - Haul Segment 5 40%	40%	112	121	323397	6412335	-63
309	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL65 Truck 3 of 5 - Haul Segment 8 40%	40%	112	121	322776	6412363	-63
310	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL65 Truck 4 of 5 - Haul Segment 9 40%	40%	112	121	322377	6412107	-64

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
311	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL65 Truck 4 of 5 - Dumping 10%	10%	103	113	322346	6412077	-63
312	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL65 Truck 4 of 5 - Haul Segment 9 (rev.) 40%	40%	110	120	322451	6412180	-64
313	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL65 Truck 5 of 5 - Haul Segment 7 (rev.) 40%	40%	110	120	323073	6412461	-63
314	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL65 Truck 5 of 5 - Haul Segment 4 (rev.) 40%	40%	110	120	323683	6412079	-62
315	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL65 Truck 5 of 5 - Haul Segment 1 (rev.) 45%	45%	111	121	323324	6411661	-85
316	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322332	6412063	-63
317	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322317	6412049	-64
318	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	322346	6412077	-63
340	2026_2_EXC3_996_WASTEHAUL	Excavator	100%	117	123	323526	6411982	-98
341	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323523	6412003	-99
342	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323526	6412022	-99
343	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL-5 Truck 1 of 6 - Queue at Loader 10%	10%	93	100	323516	6411923	-97
344	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Waste RL-5 Truck 1 of 6 - Spot Time at loader 15%	15%	105	115	323520	6411943	-97
345	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL-5 Truck 2 of 6 - Loading 85%	85%	102	109	323523	6411963	-98
346	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL-5 Truck 2 of 6 - Haul Segment 2 40%	40%	112	121	323478	6411856	-95
347	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Waste RL-5 Truck 2 of 6 - Haul Segment 4 40%	40%	112	121	323587	6411851	-73
348	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL-5 Truck 3 of 6 - Haul Segment 6 35%	35%	112	120	323536	6412220	-63
349	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL-5 Truck 3 of 6 - Haul Segment 9 35%	35%	112	120	322932	6412447	-63
350	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Waste RL-5 Truck 3 of 6 - Haul Segment 12 35%	35%	112	120	322474	6412258	-61

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
351	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL-5 Truck 4 of 6 - Haul Segment 12 35%	35%	112	120	322670	6412405	-39
352	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL-5 Truck 4 of 6 - Haul Segment 12 35%	35%	112	120	322866	6412552	-17
353	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Waste RL-5 Truck 4 of 6 - Haul Segment 13 35%	35%	112	120	323052	6412648	-3
354	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL-5 Truck 5 of 6 - Dumping 10%	10%	103	113	323070	6412651	-2
355	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL-5 Truck 5 of 6 - Haul Segment 12 (rev.) 40%	40%	110	120	322529	6412299	-56
356	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Waste RL-5 Truck 5 of 6 - Haul Segment 11 (rev.) 40%	40%	110	120	322405	6412206	-62
357	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL-5 Truck 6 of 6 - Haul Segment 8 (rev.) 40%	40%	110	120	323051	6412470	-63
358	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL-5 Truck 6 of 6 - Haul Segment 5 (rev.) 35%	35%	110	119	323667	6411975	-63
359	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Waste RL-5 Truck 6 of 6 - Haul Segment 2 (rev.) 35%	35%	110	119	323472	6411851	-95
360	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323089	6412654	-2
361	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323109	6412658	-1
362	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	323070	6412651	-2
380	2026_2_EXC5_9400_COALHAUL	Excavator	100%	117	123	322942	6411064	52
381	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322923	6411097	51
382	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322942	6411104	51
383	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL50 Truck 1 of 4 - Queue at Loader 5%	5%	90	97	322885	6411045	52
384	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL50 Truck 1 of 4 - Spot Time at loader 10%	10%	103	113	322904	6411051	52
385	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL50 Truck 1 of 4 - Loading 60%	60%	101	108	322923	6411057	52
386	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL50 Truck 2 of 4 - Haul Segment 3 40%	40%	112	121	322693	6411337	57

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
387	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL50 Truck 2 of 4 - Haul Segment 10 40%	40%	112	121	322328	6412563	62
388	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL50 Truck 2 of 4 - Haul Segment 13 30%	30%	111	120	322191	6412634	113
389	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL50 Truck 3 of 4 - Haul Segment 16 30%	30%	111	120	321410	6412993	130
390	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL50 Truck 3 of 4 - Haul Segment 21 30%	30%	111	120	320782	6414087	129
391	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL50 Truck 3 of 4 - Dumping 10%	10%	103	113	320580	6414098	129
392	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL50 Truck 3 of 4 - Haul Segment 19 (rev.) 40%	40%	110	120	321047	6413537	121
393	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL50 Truck 4 of 4 - Haul Segment 15 (rev.) 35%	35%	110	119	321836	6412487	127
394	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL50 Truck 4 of 4 - Haul Segment 9 (rev.) 35%	35%	110	119	322142	6412451	59
395	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL50 Truck 4 of 4 - Haul Segment 3 (rev.) 35%	35%	110	119	322702	6411313	57
396	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	320560	6414096	114
397	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	320540	6414094	114
500	2026_2_EXC6_9400_COALHAUL	Excavator	100%	117	123	322953	6411955	-210
501	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322935	6412004	-214
502	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322953	6411995	-213
503	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL-210 Truck 1 of 7 - Queue at Loader 5%	5%	90	97	322899	6411981	-212
504	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL-210 Truck 1 of 7 - Spot Time at loader 10%	10%	103	113	322917	6411972	-212
505	CAT793F (Std) 1 CAT793F (Std)/ 1 Haulage System-1	Coal RL-210 Truck 1 of 7 - Loading 65%	65%	101	108	322935	6411964	-212
506	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL-210 Truck 2 of 7 - Haul Segment 4 40%	40%	112	121	323085	6412046	-184
507	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL-210 Truck 2 of 7 - Haul Segment 7 40%	40%	112	121	322949	6411762	-143

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
508	CAT793F (Std) 2 CAT793F (Std)/ 2 Haulage System-1	Coal RL-210 Truck 2 of 7 - Haul Segment 11 40%	40%	112	121	322708	6412141	-108
509	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL-210 Truck 3 of 7 - Haul Segment 16 40%	40%	112	121	322430	6412224	-61
510	CAT793F (Std) 3 CAT793F (Std)/ 3 Haulage System-1	Coal RL-210 Truck 3 of 7 - Haul Segment 17 40%	40%	112	121	322963	6412621	-6
511	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL-210 Truck 4 of 7 - Haul Segment 20 40%	40%	112	121	322426	6412514	42
512	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL-210 Truck 4 of 7 - Haul Segment 26 40%	40%	112	121	322495	6412758	86
513	CAT793F (Std) 4 CAT793F (Std)/ 4 Haulage System-1	Coal RL-210 Truck 4 of 7 - Haul Segment 29 40%	40%	112	121	321674	6412673	132
514	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal RL-210 Truck 5 of 7 - Haul Segment 34 40%	40%	112	121	320832	6414033	128
515	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal RL-210 Truck 5 of 7 - Dumping 10%	10%	103	113	320580	6414098	129
516	CAT793F (Std) 5 CAT793F (Std)/ 5 Haulage System-1	Coal RL-210 Truck 5 of 7 - Haul Segment 32 (rev.) 45%	45%	111	121	320976	6413653	120
517	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal RL-210 Truck 6 of 7 - Haul Segment 26 (rev.) 40%	40%	110	120	322481	6412753	87
518	CAT793F (Std) 6 CAT793F (Std)/ 6 Haulage System-1	Coal RL-210 Truck 6 of 7 - Haul Segment 20 (rev.) 40%	40%	110	120	322790	6412661	8
519	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal RL-210 Truck 7 of 7 - Haul Segment 17 (rev.) 40%	40%	110	120	322765	6412474	-29
520	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal RL-210 Truck 7 of 7 - Haul Segment 11 (rev.) 40%	40%	110	120	322731	6412157	-106
521	CAT793F (Std) 7 CAT793F (Std)/ 7 Haulage System-1	Coal RL-210 Truck 7 of 7 - Haul Segment 6 (rev.) 45%	45%	111	121	323033	6411809	-152
522	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	320560	6414096	114
523	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	320540	6414094	114

Table 3 – Year 15

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
100	CHPP 01 Hopper	Glendell ROM Hopper	100%	111	120	320032	6413471	110
101	CHPP 02 Conveyor	Glendell ROM Conveyor 1 Seg 1	100%	102	113	320058	6413532	110
102	CHPP 03 Transfer Tower	Glendell ROM Conveyor 1 - TT	100%	109	117	320083	6413593	110
103	CHPP 04 Conveyor	Glendell ROM Conveyor 2 Seg 1	100%	101	112	320100	6413639	110
104	CHPP 05 Conveyor	Glendell ROM Conveyor 2 Seg 2	100%	101	112	320134	6413733	110
105	CHPP 06 Conveyor	Glendell ROM Conveyor 2 Seg 3	100%	101	112	320169	6413826	112
106	CHPP 07 Conveyor	Glendell ROM Conveyor 2 Seg 4	100%	101	112	320203	6413919	114
107	CHPP 08 Conveyor	Glendell ROM Conveyor 2 Seg 5	100%	101	112	320237	6414013	116
108	CHPP 09 Transfer Tower	Glendell ROM Conveyor 2 - TT	100%	109	117	320254	6414059	117
109	CHPP 10 Conveyor	Glendell ROM Conveyor 3 Seg 1	100%	101	112	320304	6414060	117
110	CHPP 11 Conveyor	Glendell ROM Conveyor 3 Seg 2	100%	101	112	320402	6414062	115
111	CHPP 12 Transfer Tower	Glendell-XMO ROM Conveyor TT	100%	109	117	320452	6414063	114
112	CHPP 13 Conveyor	XMO ROM Conveyor 2 Seg 1	100%	99	110	320451	6414050	114
113	CHPP 14 Hopper	XMO ROM Hopper	100%	111	120	320564	6414098	114
114	CHPP 15 Conveyor	XMO ROM Conveyor 1 Seg 1	100%	102	112	320508	6414097	114
115	CHPP 16 Transfer Tower	XMO ROM Conveyor 1 - TT	100%	109	117	320452	6414095	114
116	CHPP 17 Conveyor	XMO ROM Conveyor 2 Seg 2	100%	100	111	320452	6413991	114
117	CHPP 18 Conveyor Drive	XMO Rom Conveyor 2 - drive	100%	105	113	320454	6413968	114
118	CHPP 19 Conveyor	XMO ROM Conveyor 2 Seg 3	100%	100	111	320458	6413913	114
119	CHPP 20 Bin	XMO ROM Bin	100%	89	98	320462	6413873	113
120	CHPP 21 Conveyor	XMO ROM Conveyor 4 Seg 1	100%	99	110	320458	6413842	113
121	CHPP 22 Conveyor	XMO ROM Conveyor 3 Seg 1	100%	99	110	320456	6413855	113
122	CHPP 23 Conveyor	XMO ROM Conveyor 5 Seg 1	100%	97	107	320443	6413873	114
123	CHPP 24 Transfer Tower	XMO ROM Conveyor 6 - TT	100%	109	117	320424	6413874	114
124	CHPP 25 Conveyor	XMO ROM Conveyor 6 Seg 1	100%	99	110	320425	6413843	113
125	CHPP 26 Conveyor	Reject Coal Conveyor Seg 1	100%	97	112	320537	6413794	111
126	CHPP 27 Conveyor	Reject Coal Conveyor Seg 2	100%	97	112	320632	6413797	111

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
127	CHPP 28 Conveyor	Clean Coal Conveyor Seg 1	100%	97	112	320558	6413794	110
128	CHPP 29 Conveyor	Clean Coal Conveyor Seg 2	100%	97	112	320611	6413796	110
129	CHPP 30 Transfer Tower	Reject & Clean Coal Conveyor - TT	100%	109	117	320671	6413796	113
130	CHPP 31 Conveyor	Reject Conveyor Seg 1	100%	97	112	320671	6413834	113
131	CHPP 32 Conveyor	Reject Conveyor Seg 2	100%	97	112	320671	6413909	116
132	CHPP 33 Bin	Reject Bin	100%	89	98	320672	6413947	128
133	CHPP 34 Conveyor	Clean Coal Conveyor 1 Seg 1	100%	96	111	320703	6413797	114
134	CHPP 35 Transfer Tower	Clean Coal Conveyor - TT	100%	109	117	320734	6413797	116
135	CHPP 36 Conveyor	Clean Coal Conveyor 2 Seg 2	100%	98	109	320734	6413767	114
136	CHPP 37 Conveyor	Clean Coal Conveyor 2 Seg 3	100%	98	109	320734	6413707	118
137	CHPP 38 Conveyor	Clean Coal Conveyor 2 Seg 4	100%	98	109	320733	6413648	119
138	CHPP 39 Conveyor	Clean Coal Conveyor 2 Seg 5	100%	98	109	320733	6413588	120
139	CHPP 40 Conveyor	Clean Coal Conveyor 2 Seg 6	100%	98	109	320733	6413528	120
140	CHPP 41 Conveyor	Clean Coal Conveyor 2 Seg 7	100%	98	109	320732	6413468	120
141	CHPP 42 Conveyor	Clean Coal Conveyor 2 Seg 8	100%	98	109	320732	6413409	120
142	CHPP 43 Conveyor Drive	Clean Coal Conveyor 2 - drive	100%	105	113	320732	6413379	119
143	CHPP 44 Conveyor	Product Conveyor 1 Seg 1	100%	98	111	320691	6413354	115
144	CHPP 45 Conveyor	Product Conveyor 1 Seg 2	100%	98	111	320694	6413281	117
145	CHPP 46 Conveyor Drive	Product Conveyor 1 - drive	100%	110	116	320689	6413265	117
146	CHPP 47 Conveyor	Product Conveyor 1 Seg 3	100%	98	111	320701	6413209	117
147	CHPP 48 Bin	Product Bin	100%	89	98	320708	6413172	117
148	CHPP 49 CHPP building	Operating	100%	111	123	320450	6413791	112
149	CHPP 50 Dozer Product Coal 1	Forward	100%	112	122	320653	6413651	120
150	CHPP 51 Dozer Product Coal 1	Reversing	100%	121	126	320688	6413651	126
151	CHPP 52 Dozer Product Coal 2	Forward	100%	112	122	320657	6413515	123
152	CHPP 53 Dozer Product Coal 2	Reversing	100%	121	126	320692	6413515	125
153	CHPP 54 Train	Idle	100%	104	112	320899	6412934	116
154	CHPP 55 Train	Idle	100%	104	112	320894	6412909	117

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
155	CHPP 56 Train	Idle	100%	104	112	320886	6412886	115
159	Drill 1 Reedrill SK50	Ancillary - Drilling	100%	114	119	322971	6410599	108
160	Drill 2 Reedrill SK50	Ancillary - Drilling	100%	114	119	322342	6411183	-96
161	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Forward	75%	108	119	322591	6410747	59
162	Dozer 11 D10 or D11 Dozer (day shift only)	Road Maintenance - Reverse	25%	116	120	322564	6410769	57
163	785 10 Cat 785 120t Water Truck	Road Maintenance - Flat	100%	115	126	322409	6410810	57
164	785 11 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	323722	6411249	57
165	785 12 Cat 785 120t Water Truck	Road Maintenance - Up Hill	100%	115	126	322598	6411887	-4
166	785 13 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Flat	100%	115	126	321953	6412313	123
167	785 14 Cat 785 120t Water Truck (day shift only)	Road Maintenance - Up Hill	100%	115	126	320703	6414054	134
168	Grader 1 Grader 16M	Road Maintenance - Grading	100%	108	115	321733	6412600	133
169	Grader 2 Grader 24M	Road Maintenance - Grading	100%	112	119	322892	6410704	94
170	Grader 3 Grader 24M	Road Maintenance - Grading	100%	112	119	323030	6411942	-34
171	Service Truck 1 Service Truck	Ancillary - Down Hill	100%	112	112	322970	6410570	108
172	Service Truck 2 Service Truck	Ancillary - Flat	100%	112	112	323064	6410843	59
173	Service Truck 3 Service Truck	Ancillary - Up Hill	100%	112	112	323002	6412095	-1
174	Service Truck 4 Service Truck	Ancillary - Flat	100%	112	112	321486	6412894	133
175	Dozer 12 D10 or D11 Dozer	Rehab - Forward	75%	108	119	322950	6413047	171
176	Dozer 12 D10 or D11 Dozer	Rehab - Reverse	25%	116	120	322942	6413021	171
240	2033v2_EXC2_996_WASTEHAUL	Excavator	100%	117	123	322640	6410976	31
241	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322659	6411011	30
242	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322640	6411016	29
243	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 1 of 5 - Queue at Loader 10%	10%	93	100	322698	6410961	32
244	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 1 of 5 - Spot Time at loader 15%	15%	105	115	322679	6410966	31

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
245	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 1 of 5 - Loading 75%	75%	102	109	322659	6410971	31
246	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 2 of 5 - Haul Segment 1 35%	35%	112	120	322828	6410928	32
247	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 2 of 5 - Haul Segment 3 30%	30%	111	120	322706	6410803	48
248	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 2 of 5 - Haul Segment 5 30%	30%	111	120	322892	6410824	53
249	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 3 of 5 - Haul Segment 6 30%	30%	111	120	323545	6410726	56
250	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 3 of 5 - Haul Segment 8 30%	30%	111	120	323739	6411297	58
251	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 3 of 5 - Haul Segment 9 30%	30%	111	120	323837	6412010	57
252	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 4 of 5 - Haul Segment 10 30%	30%	111	120	323649	6412325	57
253	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 4 of 5 - Dumping 10%	10%	103	113	323591	6412379	58
254	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 4 of 5 - Haul Segment 10 (rev.) 25%	25%	108	118	323698	6412279	57
255	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 4 of 5 - Haul Segment 8 (rev.) 25%	25%	108	118	323662	6410762	58
256	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 4 of 5 - Haul Segment 8 (rev.) 25%	25%	108	118	323748	6411357	58
257	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 5 of 5 - Haul Segment 8 (rev.) 25%	25%	108	118	323833	6411952	58
258	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 5 of 5 - Haul Segment 6 (rev.) 25%	25%	108	118	323582	6410715	55
259	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 5 of 5 - Haul Segment 3 (rev.) 25%	25%	108	118	322658	6410782	53
260	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC2_996_WASTEHAUL	Waste RL30 Truck 5 of 5 - Haul Segment 1 (rev.) 25%	25%	108	118	322800	6410935	32

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
261	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323576	6412392	58
262	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323562	6412406	59
263	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	323591	6412379	58
320	2033v2_EXC5_9400_COALHAUL	Excavator	100%	117	123	322510	6411220	-96
321	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322528	6411267	-95
322	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322510	6411260	-95
323	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 1 of 6 - Queue at Loader 5%	5%	90	97	322566	6411241	-92
324	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 1 of 6 - Spot Time at loader 10%	10%	103	113	322547	6411234	-93
325	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 1 of 6 - Loading 60%	60%	101	108	322528	6411227	-93
326	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 2 of 6 - Haul Segment 1 30%	30%	111	120	322670	6411279	-80
327	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 2 of 6 - Haul Segment 5 30%	30%	111	120	322650	6411711	-63
328	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 2 of 6 - Haul Segment 9 30%	30%	111	120	322968	6411949	-32
329	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 2 of 6 - Haul Segment 11 30%	30%	111	120	322749	6411974	-2
330	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 3 of 6 - Haul Segment 13 30%	30%	111	120	322556	6412008	23
331	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 3 of 6 - Haul Segment 16 40%	40%	112	121	322215	6412070	59
332	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 4 of 6 - Haul Segment 16 40%	40%	112	121	322680	6412292	105
333	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 4 of 6 - Haul Segment 20 40%	40%	112	121	321861	6412434	125
334	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 4 of 6 - Haul Segment 25 40%	40%	112	121	320918	6413924	124

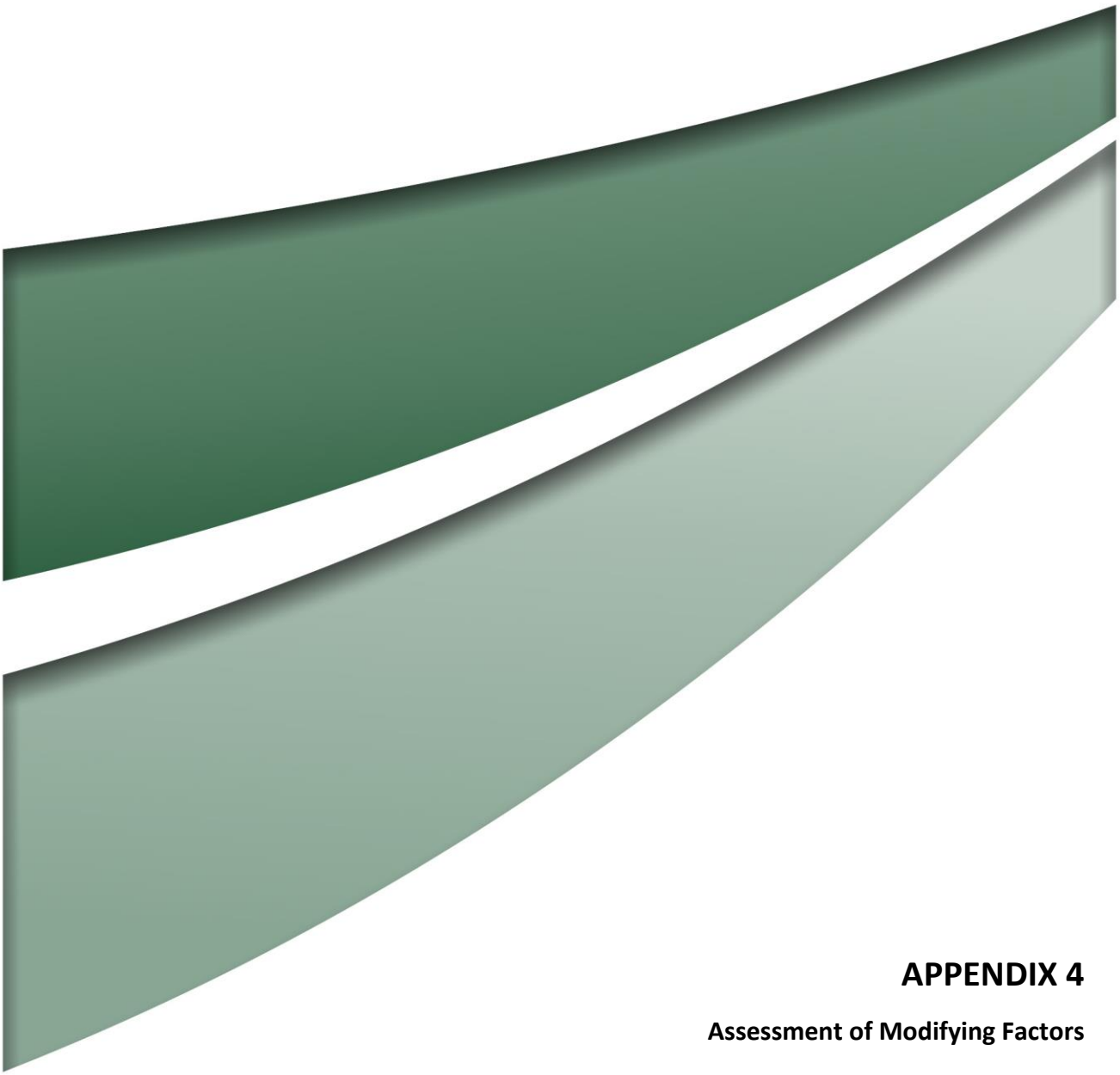
Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
335	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 4 of 6 - Spot at Dump 10%	10%	103	113	320580	6414098	129
336	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 5 of 6 - Haul Segment 25 (rev.) 35%	35%	110	119	320929	6413832	124
337	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 5 of 6 - Haul Segment 21 (rev.) 35%	35%	110	119	321415	6412986	130
338	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 5 of 6 - Haul Segment 16 (rev.) 35%	35%	110	119	322294	6412107	67
339	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 6 of 6 - Haul Segment 13 (rev.) 25%	25%	108	118	322691	6412025	11
340	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 6 of 6 - Haul Segment 11 (rev.) 25%	25%	108	118	322805	6411993	-2
341	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 6 of 6 - Haul Segment 6 (rev.) 25%	25%	108	118	322797	6411800	-57
342	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL-95 Truck 6 of 6 - Haul Segment 1 (rev.) 25%	25%	108	118	322770	6411316	-69
360	2033v2_EXC5_9400_WASTEHAUL	Excavator	100%	117	123	322349	6411285	-98
361	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322368	6411319	-99
362	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322349	6411325	-99
363	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 1 of 5 - Queue at Loader 10%	10%	93	100	322406	6411265	-98
364	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 1 of 5 - Spot Time at loader 15%	15%	105	115	322387	6411272	-98
365	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 2 of 5 - Loading 110%	110%	103	110	322368	6411279	-98
366	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 2 of 5 - Haul Segment 2 35%	35%	112	120	322542	6411227	-92
367	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 3 of 5 - Haul Segment 2 35%	35%	112	120	322776	6411318	-68
368	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 3 of 5 - Haul Segment 6 35%	35%	112	120	322716	6411764	-61

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
369	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 3 of 5 - Haul Segment 8 35%	35%	112	120	323026	6411903	-35
370	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 4 of 5 - Haul Segment 10 30%	30%	111	120	322824	6411932	-19
371	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 4 of 5 - Haul Segment 12 30%	30%	111	120	322664	6411944	-3
372	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 4 of 5 - Haul Segment 13 30%	30%	111	120	323030	6412083	-2
373	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 4 of 5 - Dumping 10%	10%	103	113	323054	6412100	-2
374	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 4 of 5 - Haul Segment 12 (rev.) 25%	25%	108	118	322631	6411933	-2
375	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 5 of 5 - Haul Segment 10 (rev.) 25%	25%	108	118	322886	6411939	-24
376	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 5 of 5 - Haul Segment 7 (rev.) 25%	25%	108	118	322887	6411838	-48
377	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 5 of 5 - Haul Segment 4 (rev.) 25%	25%	108	118	322820	6411428	-65
378	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC5_9400_WASTEHAUL	Waste RL-95 Truck 5 of 5 - Haul Segment 1 (rev.) 25%	25%	108	118	322485	6411238	-96
379	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323070	6412112	-2
380	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323086	6412124	-1
440	2033v2_EXC6_9400_COALHAUL	Excavator	100%	117	123	322432	6410851	25
441	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322441	6410909	25
442	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322432	6410891	25
443	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 1 of 7 - Queue at Loader 5%	5%	90	97	322458	6410905	25
444	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 1 of 7 - Spot Time at loader 10%	10%	103	113	322450	6410887	25
445	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 1 of 7 - Loading 75%	75%	102	109	322441	6410869	25

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
446	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 2 of 7 - Haul Segment 2 30%	30%	111	120	322559	6411009	30
447	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 2 of 7 - Haul Segment 4 30%	30%	111	120	322748	6411142	26
448	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 2 of 7 - Haul Segment 7 30%	30%	111	120	322158	6411318	-1
449	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 3 of 7 - Haul Segment 8 30%	30%	111	120	322794	6411994	-2
450	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 3 of 7 - Haul Segment 11 35%	35%	112	120	322562	6412009	23
451	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 3 of 7 - Haul Segment 12 35%	35%	112	120	322133	6411991	57
452	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 4 of 7 - Haul Segment 14 35%	35%	112	120	322484	6412199	86
453	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 4 of 7 - Haul Segment 16 35%	35%	112	120	322807	6412401	115
454	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 4 of 7 - Haul Segment 19 45%	45%	113	121	321694	6412649	132
455	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 5 of 7 - Haul Segment 24 45%	45%	113	121	320832	6414033	128
456	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 5 of 7 - Dumping 10%	10%	103	113	320580	6414098	129
457	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 5 of 7 - Haul Segment 23 (rev.) 45%	45%	111	121	320917	6413937	125
458	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 6 of 7 - Haul Segment 18 (rev.) 45%	45%	111	121	321858	6412438	125
459	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 6 of 7 - Haul Segment 14 (rev.) 40%	40%	110	120	322440	6412177	81
460	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 7 of 7 - Haul Segment 11 (rev.) 40%	40%	110	120	322431	6411993	35
461	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 7 of 7 - Haul Segment 7 (rev.) 40%	40%	110	120	322150	6411208	-1

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
462	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_COALHAUL	Coal RL25 Truck 7 of 7 - Haul Segment 2 (rev.) 40%	40%	110	120	322742	6411112	27
480	2033v2_EXC6_9400_WASTEHAUL	Excavator	100%	117	123	322367	6410874	25
481	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	322381	6410927	25
482	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	322367	6410914	25
483	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 1 of 7 - Queue at Loader 15%	15%	95	102	322411	6410914	25
484	CAT793F (Std) 1 CAT793F (Std)/ 1 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 1 of 7 - Spot Time at loader 20%	20%	106	116	322396	6410901	25
485	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 2 of 7 - Loading 110%	110%	103	110	322381	6410887	25
486	CAT793F (Std) 2 CAT793F (Std)/ 2 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 2 of 7 - Haul Segment 1 35%	35%	112	120	322461	6410959	26
487	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 3 of 7 - Haul Segment 2 35%	35%	112	120	322623	6411056	22
488	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 3 of 7 - Haul Segment 2 35%	35%	112	120	322783	6411129	27
489	CAT793F (Std) 3 CAT793F (Std)/ 3 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 3 of 7 - Haul Segment 4 35%	35%	112	120	323112	6410935	-8
490	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 4 of 7 - Haul Segment 5 40%	40%	112	121	323585	6410910	-3
491	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 4 of 7 - Haul Segment 5 35%	35%	112	120	323677	6411542	-4
492	CAT793F (Std) 4 CAT793F (Std)/ 4 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 4 of 7 - Haul Segment 7 35%	35%	112	120	323597	6411925	5
493	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 5 of 7 - Haul Segment 8 35%	35%	112	120	323461	6412110	21
494	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 5 of 7 - Haul Segment 8 35%	35%	112	120	323650	6412155	27
495	CAT793F (Std) 5 CAT793F (Std)/ 5 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 5 of 7 - Dumping 10%	10%	103	113	323668	6412159	27

Source ID	Equipment Name	Activity	Acoustic Utilisation Factor	SWL, dB(A)	SWL, dB(Z)	Easting, MGA	Northing, MGA	Ground Elevation m AHD
496	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 6 of 7 - Haul Segment 8 (rev.) 30%	30%	109	119	323580	6412138	25
497	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 6 of 7 - Haul Segment 7 (rev.) 35%	35%	110	119	323536	6412007	14
498	CAT793F (Std) 6 CAT793F (Std)/ 6 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 6 of 7 - Haul Segment 5 (rev.) 35%	35%	110	119	323617	6411136	-4
499	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 7 of 7 - Haul Segment 5 (rev.) 35%	35%	110	119	323703	6411725	-4
500	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 7 of 7 - Haul Segment 4 (rev.) 30%	30%	109	119	323102	6410938	-8
501	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 7 of 7 - Haul Segment 2 (rev.) 30%	30%	109	119	322732	6411108	27
502	CAT793F (Std) 7 CAT793F (Std)/ 7 2033v2_EXC6_9400_WASTEHAUL	Waste RL25 Truck 7 of 7 - Haul Segment 1 (rev.) 30%	30%	109	119	322454	6410954	26
503	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Forward	75%	108	119	323688	6412163	28
504	D11 1 CAT D11 Dozer Ex996_01 support	Dozer Reverse	25%	116	120	323707	6412168	28
505	D11 2 CAT D11 Dozer EX996_01 Option 1 RL 180	Dozer Reverse 1st gear option	25%	113	117	323668	6412159	27



APPENDIX 4

Assessment of Modifying Factors

Appendix 4 – Assessment of Modifying Factors

A4.1 Noise Policy for Industry

Fact Sheet C of the NSW Noise Policy for Industry (NPfI) (EPA 2017) notes that noise sources containing characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequencies can cause greater annoyance than other noise at the same noise level.

Where the noise source contains annoying characteristics, the NPfI outlines the correction factors that should be applied to the noise from the source measured or predicted at the receiver before comparison with the Project Noise Trigger Level.

The modifying factors that are potentially relevant to the NIA of the Proposed Modification are:

- Tonal noises with prominent frequency determined according to the following criteria:
    - Level of one-third octave band exceeds the level of the adjacent bands on both sides by:
        - 5 dB or more if the centre frequency of the band containing the tone is above 400 Hz;
        - 8 dB or more if the centre frequency of the band containing the tone is 160 to 400 Hz inclusive;
        - 15 dB or more if the centre frequency of the band containing the tone is below 160 Hz.
- Low frequency determined according to the following criteria:
    - Compare the predicted dB(A) and dB(C), if the difference is than 15 dB and
        - If the Low Frequency Threshold (NPfI Table C2) is exceeded by up to 5 dB and cannot be mitigated, a 2 dB penalty is applicable during the evening and night-time.
        - If the Low Frequency Threshold (NPfI Table C2) is exceeded by more than 5 dB and cannot be mitigated, a 5 dB penalty is applicable during the evening and night-time or a 2 dB penalty during the daytime.
- Intermittent noise applied to night-time only:
    - Subjectively assessed where the noise level varies by more than 5 dB.
- Duration:
    - Measured as a single-event noise where the duration may range from 1.5 minutes to 2.5 hours over any 24-hour period.

The NPfI states that the modifying factors are to be applied to the noise from the source measured or predicted at the receiver and before comparison with the criteria, and where two or more modifying factors are present, the maximum correction is limited to 10 dB. However, the NPfI also notes that where a source emits tonal and low frequency noise, only one 5 dB correction should be applied if the tone is in the low-frequency range.

A4.2 Noise Modelling

The noise model for the Proposed Modification was prepared on the basis that equipment generating noise in the potentially audible range of 25 to 20,000 Hz range is well maintained. Failure to replace damaged mufflers, acoustic louvres and associated attenuation equipment could result in the generation of unacceptable tonal or low frequency noises. Notwithstanding this, each item of equipment used in the ENM noise model of the Proposed Modification was assessed for tonal noise and low frequency noise in accordance with the procedure outlined in the NPfI. While the NPfI provides guidance for the assessment of tonal and low frequency noise, two important additional factors need to be considered:

- Air attenuation over distance reduces the high frequency noises. The contribution air makes to the absorption of high frequency sound is a function of air temperature, humidity, and frequency. It is reasonable to conclude that if a high frequency noise is inaudible due to the distance from the source then it should not be included in the tonal noise assessment described above.

- There is a threshold to the audibility of low frequency noises that the human ear can detect. As with the high frequency noises, if low frequency noises are inaudible, it is reasonable to conclude that they should not be included in the low frequency noise assessment described above. The threshold of audibility is defined in AS ISO 389.7 2003 'Acoustics- Reference zero for the calibration of audiometric equipment Part 7: Reference threshold of hearing under free-field and diffuse field listening conditions'.

Based on the above, for each predicted noise result an analysis of audibility, as defined by AS ISO 389.7 2003, is made against each one-third octave band. Where the predicted noise result for an octave band was found to be inaudible the octave band noise result is excluded from the assessment of tonality and low frequency noise.

The tonal assessment of the predicted noise levels at example receiver locations under the NPfI default worst case meteorological conditions (3°C/100 metre inversion with 2 m/s drainage flow from the north-west) are presented graphically in **Figures A4.1** to **A4.12** for receiver locations 7c, 41, 95 and 100 which were chosen to represent a selection of the receivers most affected by tonal and low frequency noise.

A4.3 Low Frequency Noise Assessment

Low frequency analysis of the noise levels at the receivers shows that the difference between C-weighted and A-weighted noise levels is greater the 15 dB at selected locations, however the predicted noise levels do not exceed the reference curve and therefore penalties for low frequency noise are not applicable in accordance with the NPfI.

For the receivers listed in Tables 1 to 3, the following is noted (refer to examples locations in **Figures A4.1** to **A4.12**) in regard to the predicted noise levels:

- The predicted noise levels are generally within a few dB of the background noise environment.

- The predicted noise levels comprise of noise only in the range of 25 Hz to 2,000 Hz (i.e. almost entirely made up of low frequency noise). This is due to the combined effects of distance attenuation and noise attenuation applied at the source rendering the high frequency components inaudible.

- Generally the predicted noise levels comprise frequencies below 80Hz. These in turn combine to make up the largest component of the combined single number C-weighted result. This provides a C-weighted predicted noise levels which are relatively high compared to the A-weighted noise level but that are not always audible to the human ear.

- The predicted noise levels shown are for worst case NPfI meteorological conditions.

The predicted noise levels shown are due to the Proposed Modification only and do not consider the masking effect of the background noise environment. The NPfI states that in examining results in relation to the assessment of modifying factors that 'noise from all sources, individually and in combination, that contribute to the total noise at a site' should be considered. Given the predicted noise levels are relatively low compared to the background noise environment, with consideration of the masking effect of the background noise environment, it is unlikely that the predicted low frequency noise levels from the Proposed Modification would be overly intrusive or cause greater annoyance over that of the full spectrum analysis.

Table 1 - Year 2 Night Time Predicted NPfI Low Frequency Modifying Factors under 3°C/100 m inversion with a 2 m/s drainage flow from the North-West

Receiver	Predicted Noise Level dB(A)	Predicted Noise Level dB(C)	dB(C) minus dB(A)	Predicted Noise Level Exceed LF Threshold[1]?	Penalty Applicable?
4	34.9	49.8	14.9	No	No
5	34.4	50.1	15.7	No	No
7c	34.1	50.1	16.0	No	No
10	30.4	45.3	14.9	No	No
11	34.3	49.6	15.3	No	No
12	33.9	49.0	15.1	No	No
13	34.4	50.5	16.1	No	No
14	34.3	50.6	16.3	No	No
17a	22.7	38.4	15.7	No	No
17b	22.7	38.4	15.7	No	No
19	32.7	47.9	15.2	No	No
41	33.6	49.0	15.4	No	No
42	31.0	46.8	15.8	No	No
43	32.4	48.5	16.1	No	No
48	32.8	48.2	15.4	No	No
50	27.7	43.3	15.6	No	No
55	31.2	47.4	16.2	No	No
58	30.7	47.1	16.4	No	No
66	28.2	45.3	17.1	No	No
72	30.3	47.8	17.5	No	No
73	30.4	46.8	16.4	No	No
74	32.0	48.4	16.4	No	No
80	29.5	46.4	16.9	No	No
81	29.8	46.9	17.1	No	No
91	32.2	48.8	16.6	No	No
92	32.9	49.0	16.1	No	No
93	33.6	49.7	16.1	No	No
94	32.9	49.3	16.4	No	No
95	34.9	50.1	15.2	No	No
96	30.3	47.4	17.1	No	No
97	30.2	47.2	17.0	No	No
99	31.3	48.0	16.7	No	No
100	31.2	48.0	16.8	No	No
101	30.5	47.6	17.1	No	No
112	31.2	45.9	14.7	No	No
15a	19.9	36.5	16.6	No	No
15b	21.6	38.4	16.8	No	No
44b	30.8	46.5	15.7	No	No
102a	29.2	45.9	16.7	No	No
102b	29.9	46.7	16.8	No	No

Note 1: NPfI Table C2 low frequency threshold

Table 2 - Year 8 Night Time Predicted NPFI Low Frequency Modifying Factors under 3°C/100 m inversion with 2 m/s drainage flow from the North-West

Receiver	Predicted Noise Level dB(A)	Predicted Noise Level dB(C)	dB(C) minus dB(A)	Predicted Noise Level Exceed LF Threshold[1]?	Penalty Applicable?
4	35.4	50.4	15.0	No	No
5	34.6	50.4	15.8	No	No
7c	34.1	50.0	15.9	No	No
10	31.3	46.2	14.9	No	No
11	33.9	48.9	15.0	No	No
12	33.6	48.5	14.9	No	No
13	34.4	49.5	15.1	No	No
14	30.1	45.2	15.1	No	No
17a	27.5	42.6	15.1	No	No
17b	27.5	42.6	15.1	No	No
19	33.2	47.9	14.7	No	No
41	30.4	45.5	15.1	No	No
42	30.2	45.6	15.4	No	No
43	29.2	45.4	16.2	No	No
48	31.2	46.2	15.0	No	No
50	22.8	38.3	15.5	No	No
55	28.8	44.6	15.8	No	No
58	29.1	44.9	15.8	No	No
66	27.2	43.4	16.2	No	No
72	29.0	45.8	16.8	No	No
73	29.6	45.3	15.7	No	No
74	30.0	45.5	15.5	No	No
80	26.6	43.0	16.4	No	No
81	27.0	43.5	16.5	No	No
91	32.1	48.7	16.6	No	No
92	33.3	49.6	16.3	No	No
93	33.6	49.0	15.4	No	No
94	32.8	49.1	16.3	No	No
95	33.1	49.4	16.3	No	No
96	29.5	46.0	16.5	No	No
97	29.6	46.1	16.5	No	No
99	30.5	47.3	16.8	No	No
100	30.3	47.0	16.7	No	No
101	29.0	46.0	17.0	No	No
112	32.5	47.5	15.0	No	No
15a	26.4	41.5	15.1	No	No
15b	26.6	42.3	15.7	No	No
44b	28.8	43.8	15.0	No	No
102a	28.8	45.8	17.0	No	No
102b	29.4	46.1	16.7	No	No

Note 1: NPfI Table C2 low frequency threshold

Table 3 - Year 15 Night Time Predicted NPFI Low Frequency Modifying Factors under 3°C/100 m inversion with 2 m/s drainage flow from the North-West

Receiver	Predicted Noise Level dB(A)	Predicted Noise Level dB(C)	dB(C) minus dB(A)	Predicted Noise Level Exceed LF Threshold[1]?	Penalty Applicable?
4	34.5	50.1	15.6	No	No
5	32.7	48.6	15.9	No	No
7c	31.9	47.9	16.0	No	No
10	27.6	42.8	15.2	No	No
11	30.8	45.7	14.9	No	No
12	29.6	44.7	15.1	No	No
13	33.3	49.1	15.8	No	No
14	31.7	46.1	14.4	No	No
17a	18.1	32.3	14.2	No	No
17b	18.1	32.3	14.2	No	No
19	29.6	44.7	15.1	No	No
41	26.3	40.7	14.4	No	No
42	26.2	42.6	16.4	No	No
43	28.5	44.4	15.9	No	No
48	28.3	42.9	14.6	No	No
50	17.3	32.4	15.1	No	No
55	27.7	43.6	15.9	No	No
58	26.7	41.9	15.2	No	No
66	27.7	43.3	15.6	No	No
72	27.8	44.3	16.5	No	No
73	30.4	46.7	16.3	No	No
74	27.5	43.8	16.3	No	No
80	24.1	40.6	16.5	No	No
81	24.2	40.7	16.5	No	No
91	31.7	47.6	15.9	No	No
92	31.7	47.4	15.7	No	No
93	32.6	48.2	15.6	No	No
94	31.9	47.4	15.5	No	No
95	32.8	48.6	15.8	No	No
96	29.9	45.7	15.8	No	No
97	30.0	45.6	15.6	No	No
99	30.5	46.5	16.0	No	No
100	30.9	46.5	15.6	No	No
101	27.7	44.8	17.1	No	No
112	28.0	43.2	15.2	No	No
15a	18.8	35.2	16.4	No	No
15b	19.7	36.1	16.4	No	No
44b	27.6	42.8	15.2	No	No
102a	28.7	45.1	16.4	No	No
102b	29.3	45.6	16.3	No	No

Note 1: NPfI Table C2 low frequency threshold

A4.4 Tonal Noise Assessment

The ENM noise models incorporated over 100 1/3 octave noise sources per model. The tonal noises that can be generated by the Proposed Modification would emanate from:

- reversing beepers on mobile equipment;
- alarms and sirens;
- 50 Hz drives associated with rotating machinery;
- mechanical gearbox gear noise on drives; and
- hydraulics systems.

While individually these noise sources may be observed to have tonal aspects when in close proximity to the equipment, the cumulative sound power attributable to the Proposed Modification would not typically have tonal noises that exceed the criteria set out in the NPfI.

The results of the analysis in **Figures A4.1** to **A4.12** show that the noise generated at the source by the cumulative sound power attributable to the mining operation does not exceed the tonal noise criteria set out in the NPfI.

A4.5 Assessment for Impulsive or Intermittent Noise and Single-event Duration

As a 24 hour per day, 7 day per week operation the Proposed Modification would not normally generate noises that are impulsive or intermittent in character or give rise to short duration single-event noises.

A4.6 Assessment of Predicted Noise Levels

Based on the analysis of the modifying factors that are potentially relevant to the noise impact assessment of the Proposed Modification, a modifying factor correction does not need to be applied to the predicted noise levels.

A4.7 References

Australian Standard ISO 389.7 2003 *Acoustics- Reference zero for the calibration of audiometric equipment Part 7: Reference threshold of hearing under free-field and diffuse field listening conditions*

Department of Planning (DP&I). *NSW Draft Guideline: Mining. Noise Monitoring Application Note.* 2013

NSW Environment Protection Authority 2017. *New South Wales Noise Policy for Industry*.

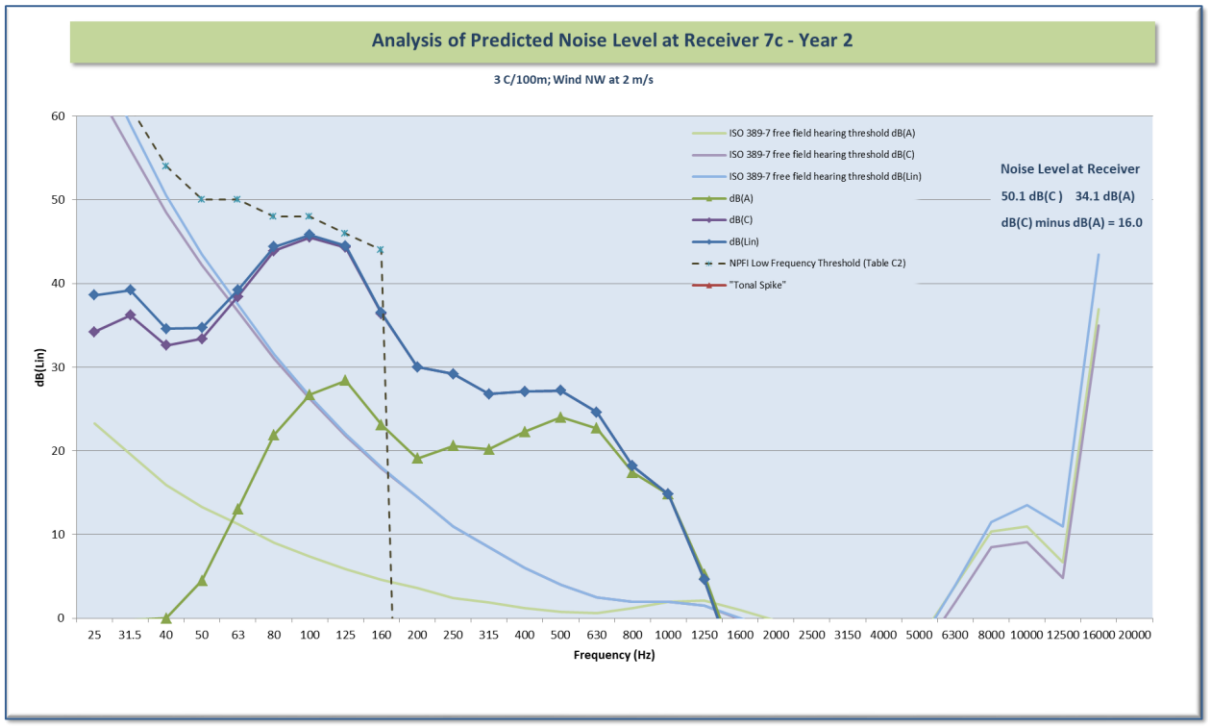


Figure A4.1 - Tonal and Low Frequency Analysis of at Receiver 7c Year 2

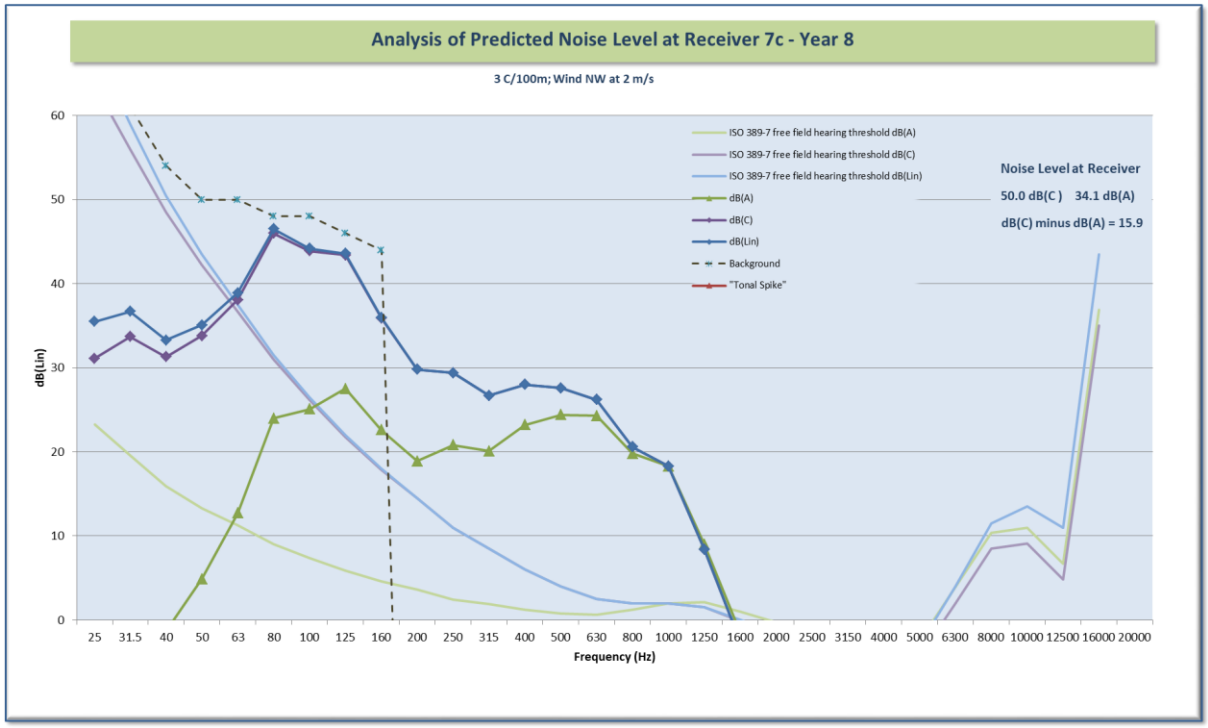


Figure A4.2 - Tonal and Low Frequency Analysis of at Receiver 7c Year 8

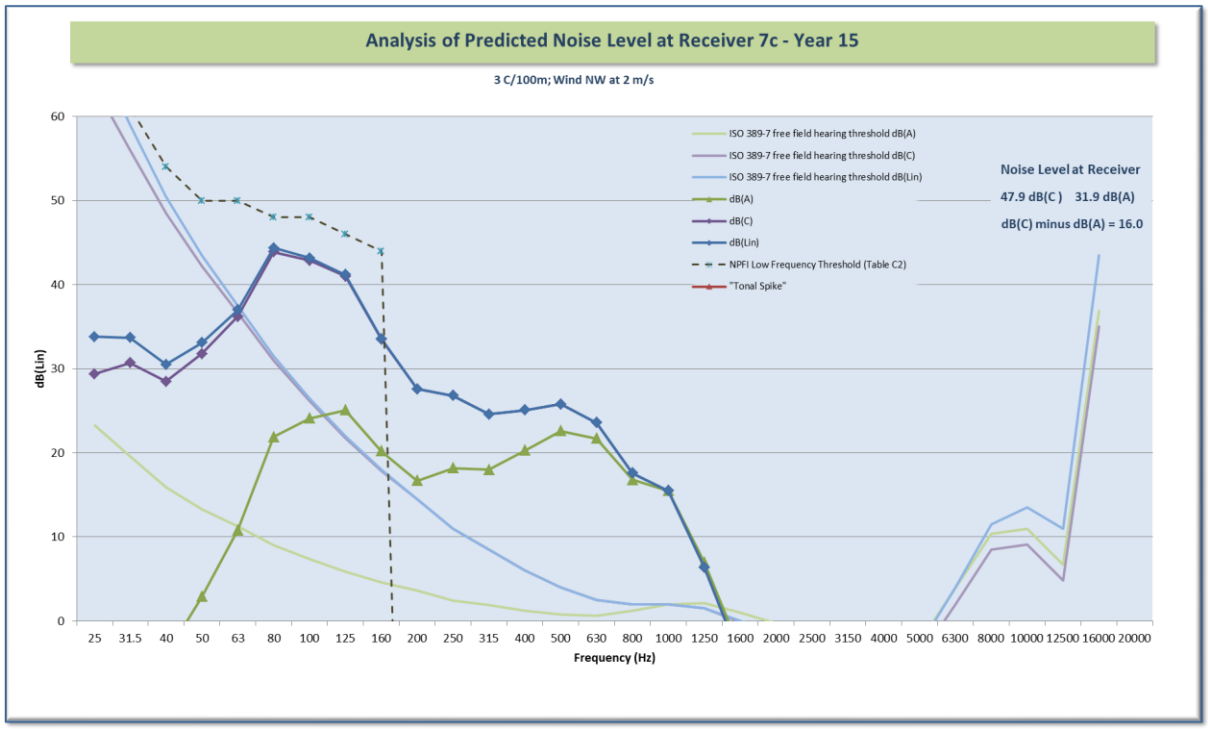


Figure A4.3 - Tonal and Low Frequency Analysis of at Receiver 7c Year 15

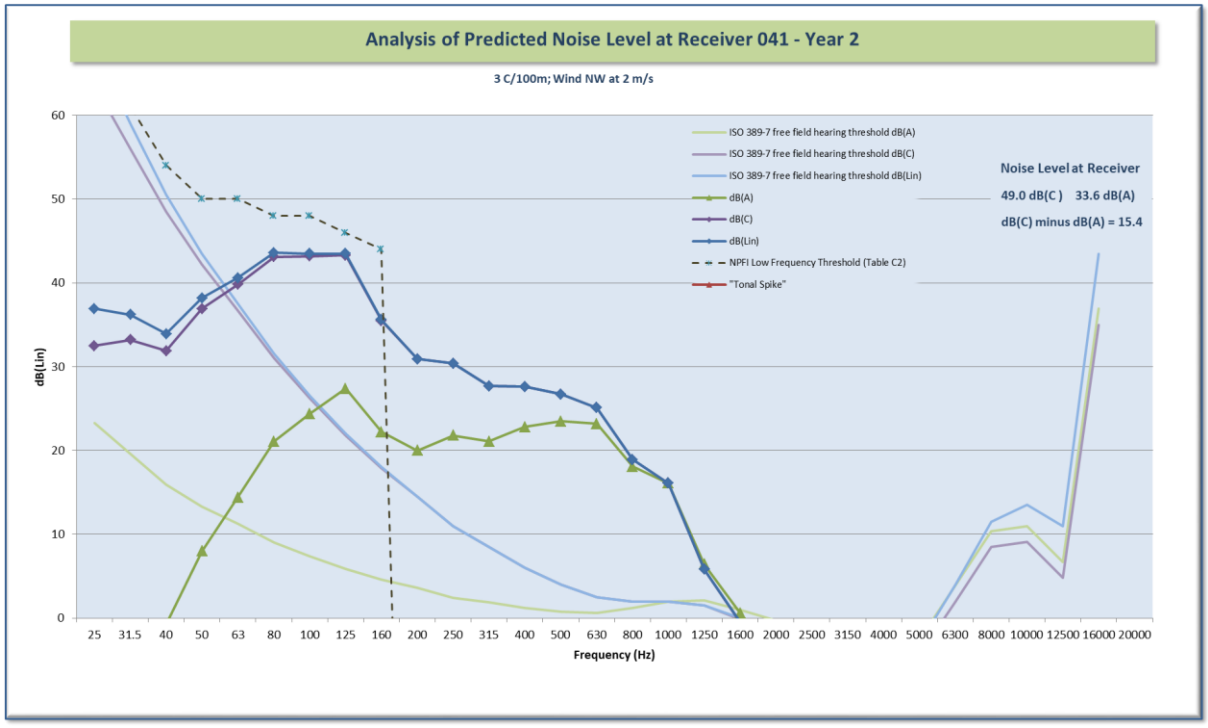


Figure A4.4 - Tonal and Low Frequency Analysis of at Receiver 41 Year 2

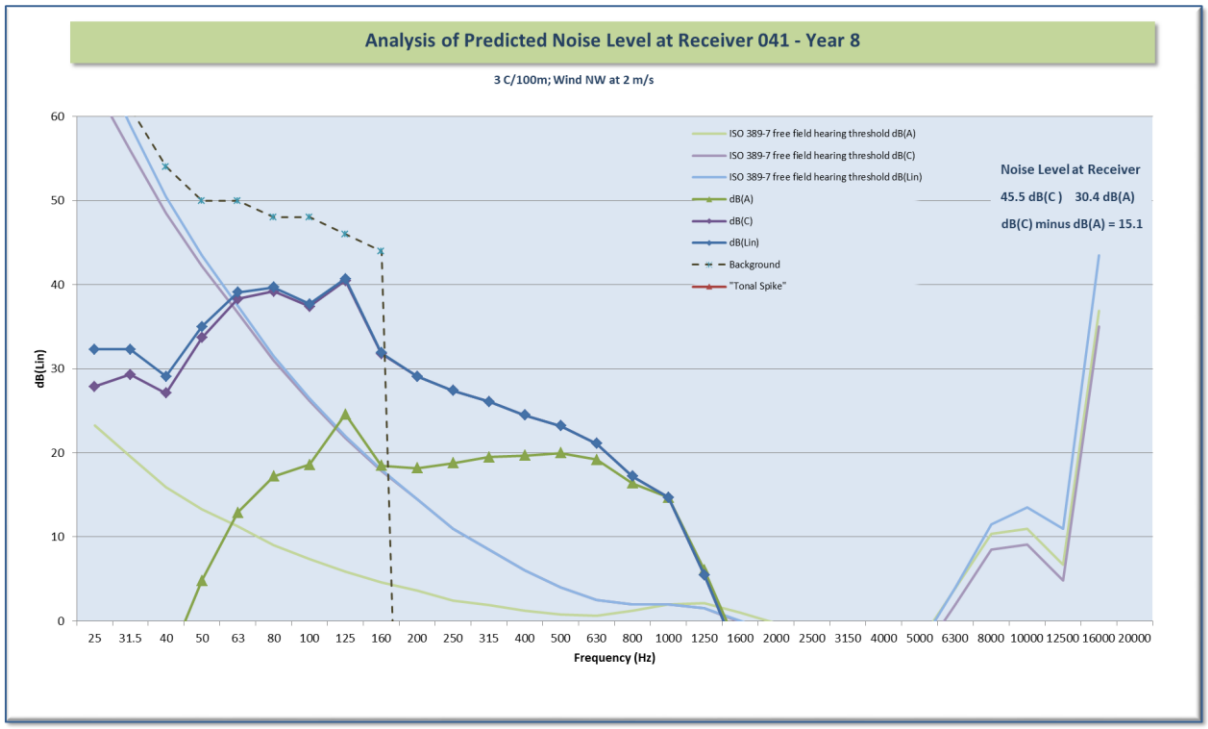


Figure A4.5 - Tonal and Low Frequency Analysis of at Receiver 41 Year 8

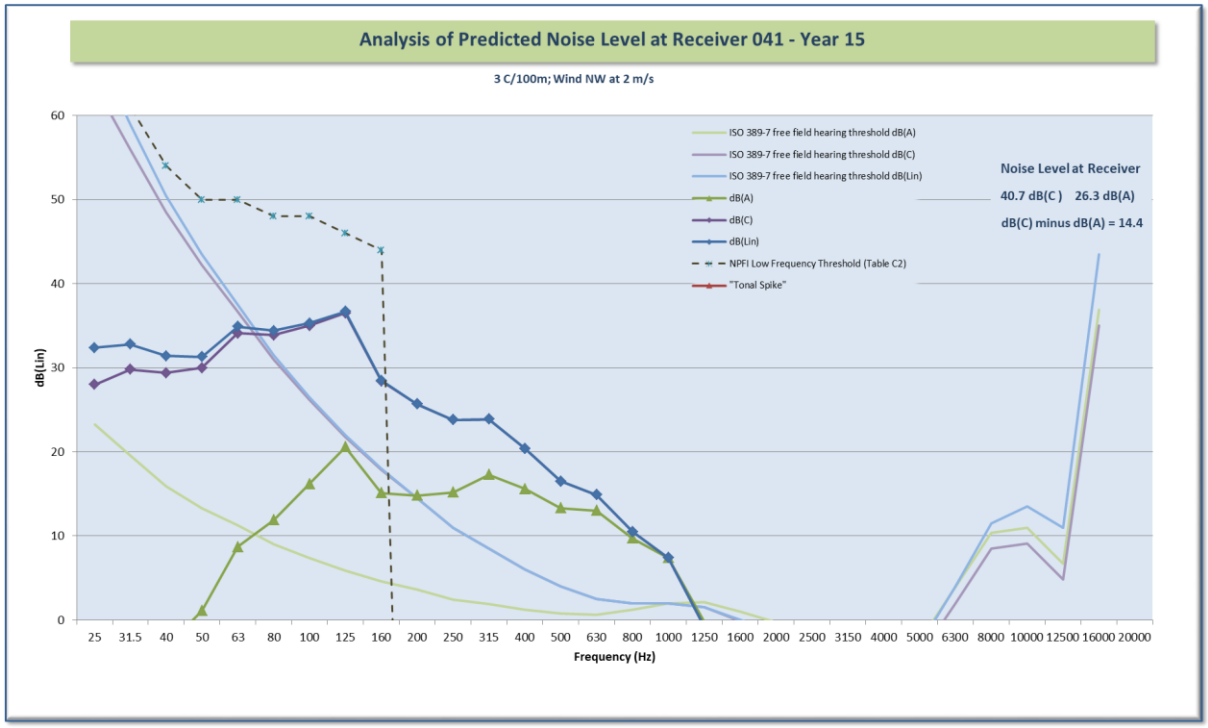


Figure A4.6 - Tonal and Low Frequency Analysis of at Receiver 41 Year 15

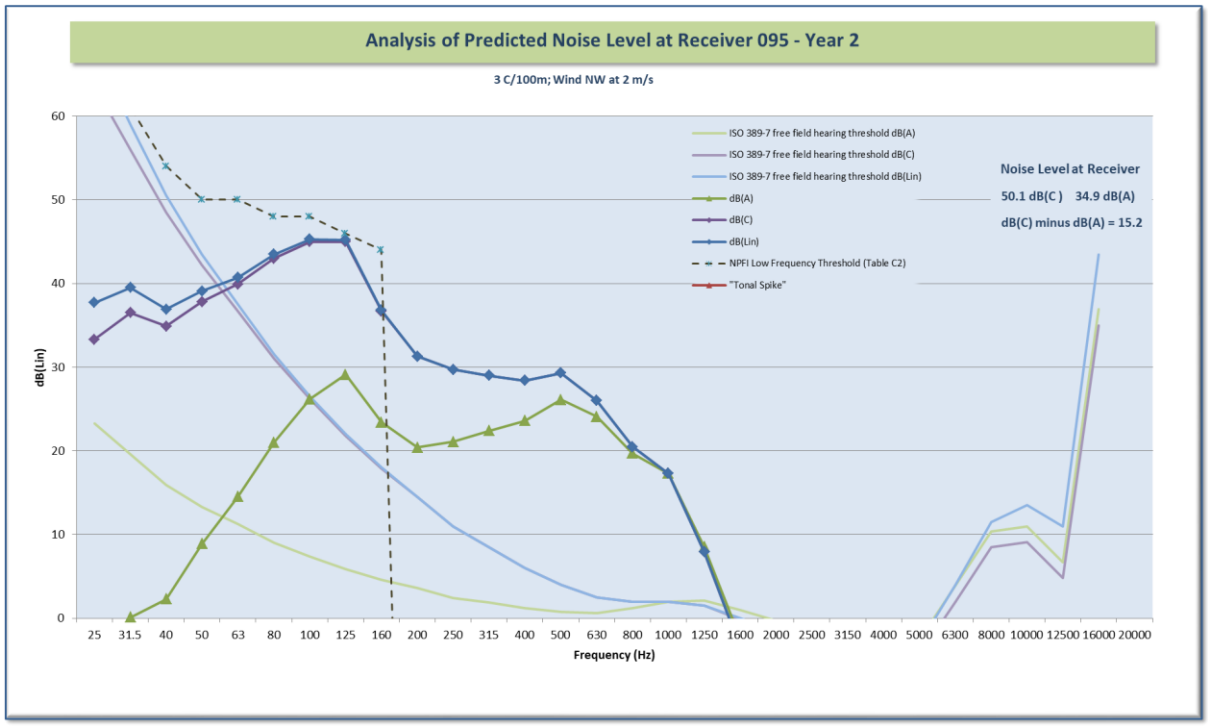


Figure A4.7 - Tonal and Low Frequency Analysis of at Receiver 95 Year 2

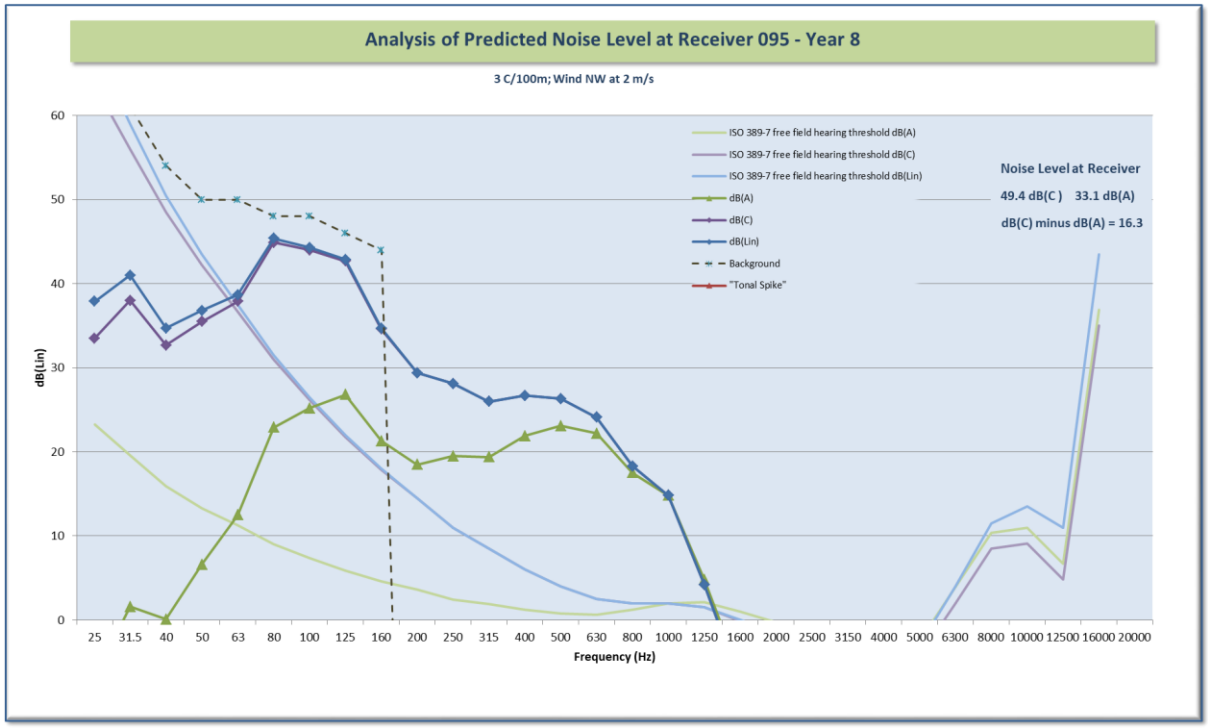


Figure A4.8 - Tonal and Low Frequency Analysis of at Receiver 95 Year 8

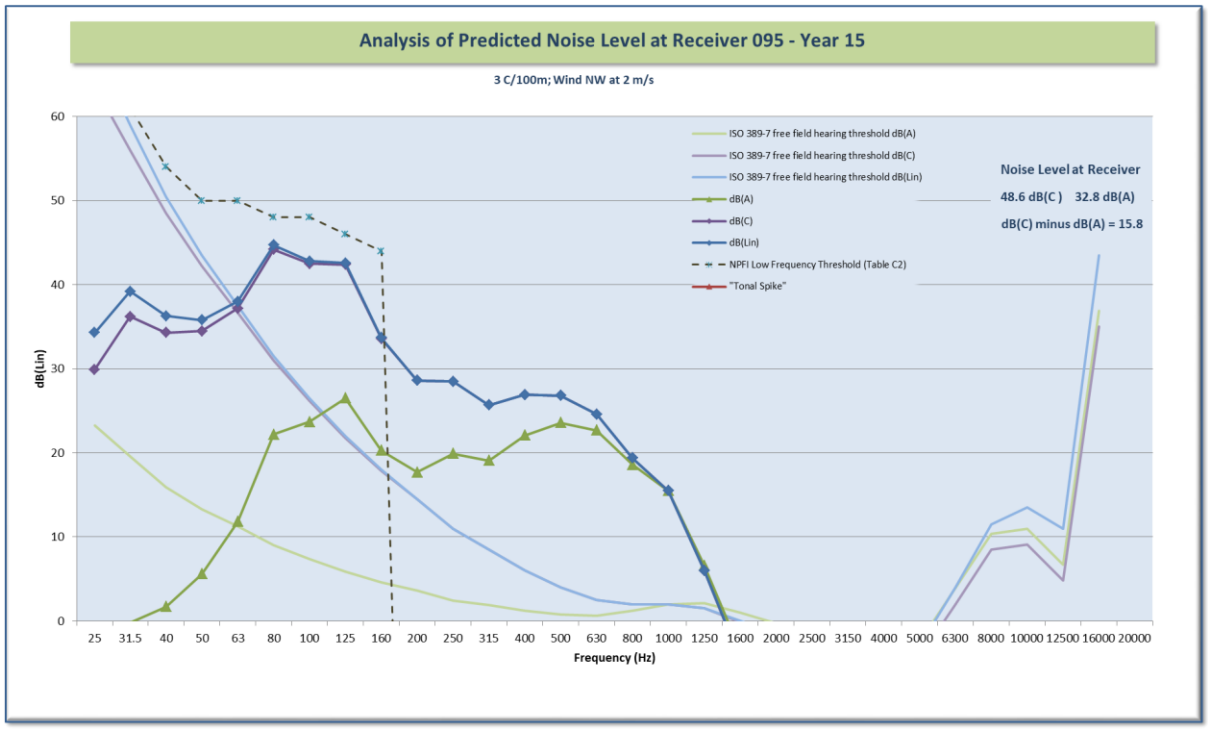


Figure A4.9 - Tonal and Low Frequency Analysis of at Receiver 95 Year 15

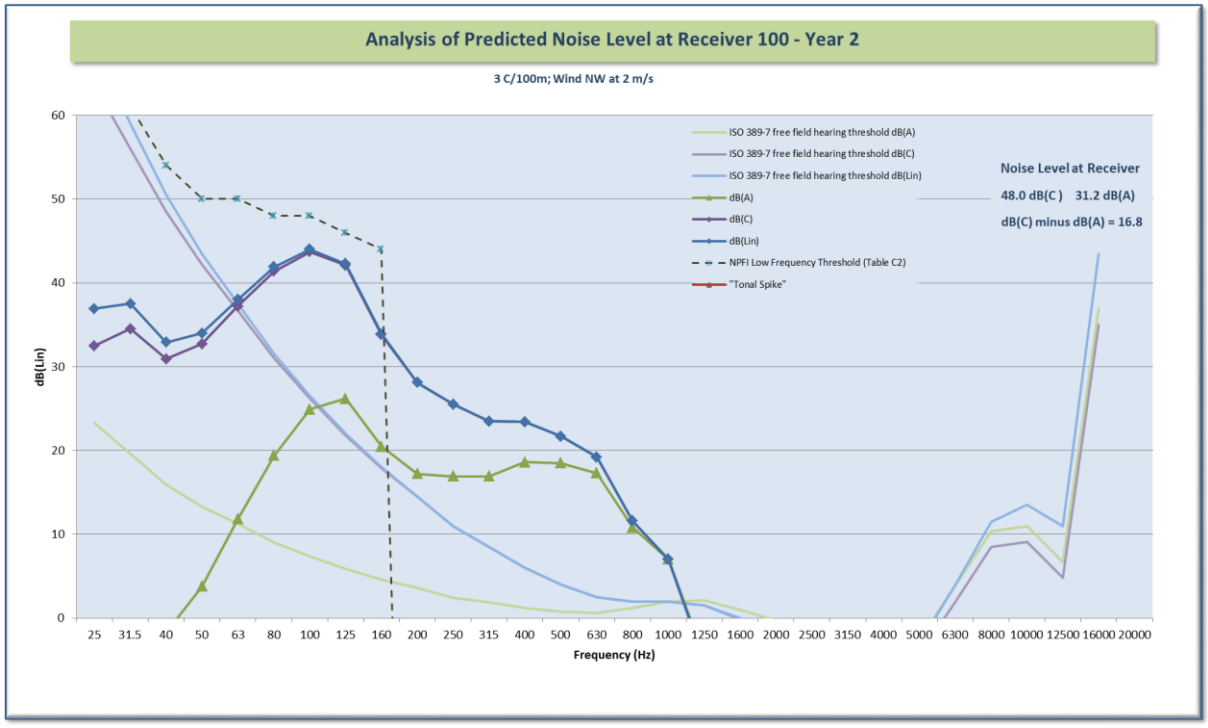


Figure A4.10 - Tonal and Low Frequency Analysis of at Receiver 100 Year 2

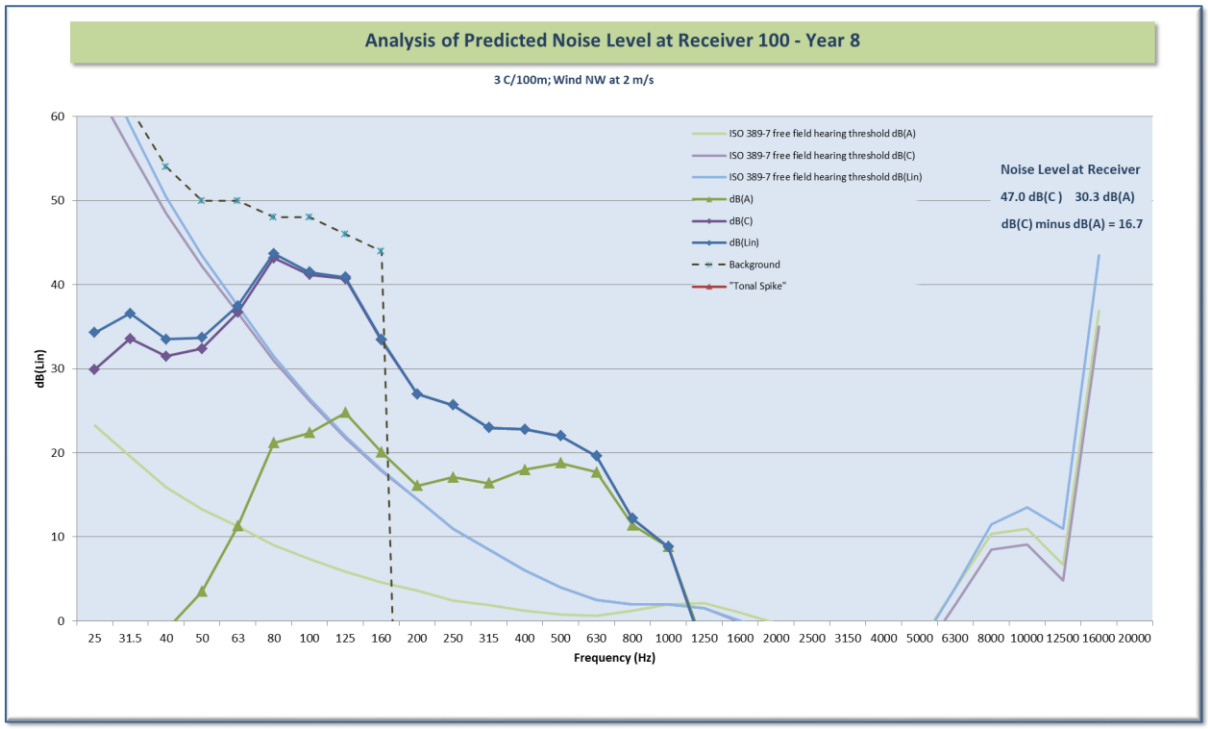


Figure A4.11 - Tonal and Low Frequency Analysis of at Receiver 100 Year 8

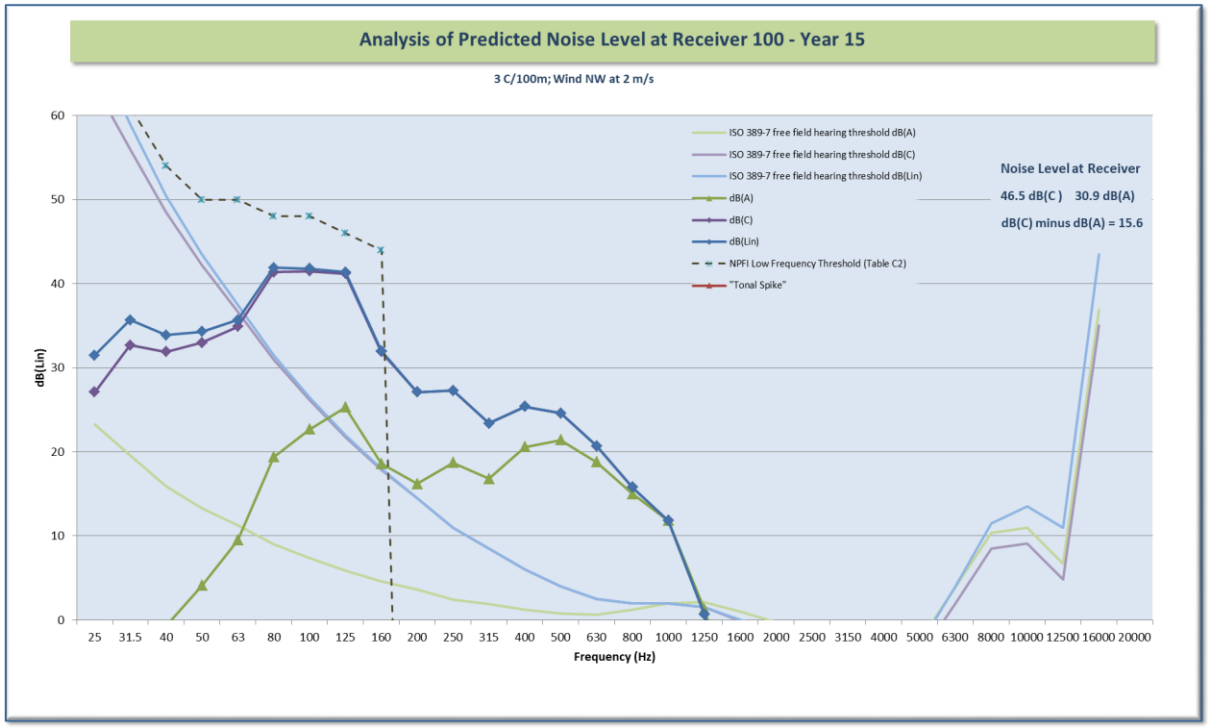


Figure A4.12 - Tonal and Low Frequency Analysis of at Receiver 100 Year 15

APPENDIX 5

Predicted Noise Levels at Private Receiver Locations for Optimised Scenarios

Appendix 5 – Predicted Noise Levels at private receiver locations for Optimised Scenarios, dB(A)

Note: the model predictions are an example of the predicted noise levels with representative operational noise management controls in place during unfavourable meteorological conditions. Consistent with the Approved Operations management controls will only be implemented when required under unfavourable meteorological conditions and the level of operational management will vary to manage noise levels to meet existing noise criteria. The predictions are an example of the controls that can be achieved during unfavourable meteorological conditions and demonstrate that the Proposed Modification can be managed to meet existing criteria.

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 1 - 41	Day	36	-	-	-	35	-	-	-	32	-	-	-	< 30
	Evening	35	-	-	31	-	-	-	< 30	-	-	-	< 30	-
	Night	35	34	34	-	-	31	< 30	-	-	< 30	< 30	-	-
Area 1 – 42	Day	35	-	-	-	34	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	30	-	-	31	< 30	-	-	< 30	< 30	-	-
Area 1 – 43	Day	35	-	-	-	34	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	33	32	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 44a	Day	35	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 44b	Day	35	-	-	-	33	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 45	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 1 - 46	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 47	Day	35	-	-	-	30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 48	Day	36	-	-	-	35	-	-	-	32	-	-	-	31
	Evening	35	-	-	30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	33	33	-	-	31	< 30	-	-	< 30	< 30	-	-
Area 1 - 49	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 50	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 51	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 52	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 53	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 1 – 54	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 55	Day	35	-	-	-	33	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 56a	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 56b	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 57	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 - 58	Day	35	-	-	-	33	-	-	-	31	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	31	-	-	30	< 30	-	-	< 30	< 30	-	-
Area 1 – 59	Day	35	-	-	-	33	-	-	-	32	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	30	-	-	30	< 30	-	-	< 30	< 30	-	-
Area 1 – 60	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 1 – 61	Day	35	-	-	-	30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 62	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 178	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 210	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 211	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 212	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 1 – 213	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 15a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 2 - 15b	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 17a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 17b	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 63a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 66	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 67	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 68	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 69a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 2 - 69b	Day	35	-	-	-	30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	< 30	-	-	< 30	< 30	-	-	31	< 30	-	-
Area 2 – 71	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 72	Day	35	-	-	-	31	-	-	-	31	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	32	-	-	31	30	-	-	< 30	< 30	-	-
Area 2 – 73	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	33	30	-	-	32	< 30	-	-	32	30	-	-
Area 2 – 74	Day	35	-	-	-	33	-	-	-	31	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	33	33	-	-	33	30	-	-	32	< 30	-	-
Area 2 – 75	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 76	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 77	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 2 – 78	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 79	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 80	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 81	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	32	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 82	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 83	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 84a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
~~**Area 2 – 84b**~~	~~Day~~	~~35~~	~~-~~	~~-~~	~~-~~	~~< 30~~	~~-~~	~~-~~	~~-~~	~~< 30~~	~~-~~	~~-~~	~~-~~	~~< 30~~
	~~Evening~~	~~35~~	~~-~~	~~-~~	~~< 30~~	~~-~~	~~-~~	~~-~~	~~< 30~~	~~-~~	~~-~~	~~-~~	~~< 30~~	~~-~~
	~~Night~~	~~35~~	~~< 30~~	~~< 30~~	~~-~~	~~-~~	~~< 30~~	~~< 30~~	~~-~~	~~-~~	~~< 30~~	~~< 30~~	~~-~~	~~-~~

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 2 – 85	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 86	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 87	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 88	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 162b	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 – 259	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 - 260	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 2 (INP), 350 - Mt Pleasant Primary School - External	Day	55	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
Area 4 North – 13	Day	38	-	-	-	36	-	-	-	36	-	-	-	32
	Evening	38	-	-	34	-	-	-	34	-	-	-	32	-
	Night	38	36	36	-	-	37	35	-	-	36	34	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 4 North – 14	Day	37	-	-	-	36	-	-	-	< 30	-	-	-	31
	Evening	37	-	-	34	-	-	-	< 30	-	-	-	< 30	-
	Night	37	36	36	-	-	32	30	-	-	35	30	-	-
Area 4 North - 19	Day	39	-	-	-	36	-	-	-	34	-	-	-	34
	Evening	39	-	-	31	-	-	-	34	-	-	-	32	-
	Night	39	36	33	-	-	37	34	-	-	36	< 30	-	-
Area 4 North – 21	Day	41	-	-	-	37	-	-	-	35	-	-	-	33
	Evening	41	-	-	33	-	-	-	35	-	-	-	33	-
	Night	41	37	35	-	-	37	35	-	-	37	32	-	-
Area 4 North – 22	Day	41	-	-	-	38	-	-	-	37	-	-	-	35
	Evening	41	-	-	36	-	-	-	37	-	-	-	35	-
	Night	41	38	38	-	-	39	37	-	-	38	36	-	-
Area 4 North – 23	Day	41	-	-	-	36	-	-	-	35	-	-	-	34
	Evening	41	-	-	32	-	-	-	35	-	-	-	34	-
	Night	41	36	34	-	-	37	34	-	-	35	< 30	-	-
Area 4 South - 10	Day	37	-	-	-	33	-	-	-	32	-	-	-	32
	Evening	37	-	-	30	-	-	-	33	-	-	-	31	-
	Night	37	33	32	-	-	34	32	-	-	31	< 30	-	-
Area 4 South – 11	Day	37	-	-	-	36	-	-	-	35	-	-	-	33
	Evening	37	-	-	35	-	-	-	35	-	-	-	32	-
	Night	37	37	36	-	-	37	35	-	-	35	32	-	-
Area 4 South – 12	Day	38	-	-	-	36	-	-	-	34	-	-	-	33
	Evening	38	-	-	34	-	-	-	35	-	-	-	31	-
	Night	38	37	36	-	-	37	35	-	-	33	31	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 4 South - 93	Day	40	-	-	-	35	-	-	-	35	-	-	-	33
	Evening	40	-	-	34	-	-	-	34	-	-	-	33	-
	Night	40	35	35	-	-	36	36	-	-	37	33	-	-
Area 4 South – 94	Day	38	-	-	-	35	-	-	-	34	-	-	-	32
	Evening	38	-	-	33	-	-	-	34	-	-	-	32	-
	Night	38	35	35	-	-	35	35	-	-	35	33	-	-
Area 4 South – 95	Day	38	-	-	-	36	-	-	-	34	-	-	-	33
	Evening	38	-	-	35	-	-	-	34	-	-	-	33	-
	Night	38	37	36	-	-	36	35	-	-	36	33	-	-
Area 4 South – 112	Day	38	-	-	-	35	-	-	-	33	-	-	-	34
	Evening	38	-	-	31	-	-	-	34	-	-	-	31	-
	Night	38	35	32	-	-	35	33	-	-	32	< 30	-	-
Area 4 South – 114	Day	37	-	-	-	37	-	-	-	34	-	-	-	37
	Evening	37	-	-	32	-	-	-	36	-	-	-	37	-
	Night	36	36	33	-	-	36	35	-	-	35	31	-	-
Area 5 - 89	Day	37	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 5 – 91	Day	37	-	-	-	34	-	-	-	33	-	-	-	32
	Evening	37	-	-	33	-	-	-	34	-	-	-	32	-
	Night	36	34	34	-	-	34	34	-	-	35	32	-	-
Area 5 -92	Day	37	-	-	-	35	-	-	-	34	-	-	-	32
	Evening	37	-	-	33	-	-	-	35	-	-	-	33	-
	Night	37	34	35	-	-	35	35	-	-	35	32	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 5 – 96	Day	37	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	31	-	-	-	31	-	-	-	30	-
	Night	35	31	32	-	-	31	31	-	-	31	31	-	-
Area 5 – 97	Day	37	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	31	-	-	-	31	-	-	-	30	-
	Night	35	31	32	-	-	31	31	-	-	31	31	-	-
Area 5 – 98	Day	37	-	-	-	30	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	31	30	-	-	30	< 30	-	-	32	31	-	-
Area 5 – 99	Day	37	-	-	-	33	-	-	-	31	-	-	-	30
	Evening	37	-	-	32	-	-	-	32	-	-	-	31	-
	Night	35	33	33	-	-	32	32	-	-	32	32	-	-
Area 5 – 100	Day	37	-	-	-	33	-	-	-	31	-	-	-	30
	Evening	37	-	-	32	-	-	-	32	-	-	-	31	-
	Night	35	32	33	-	-	32	32	-	-	32	32	-	-
Area 5 – 101	Day	37	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	31	-	-	-	31	-	-	-	< 30	-
	Night	35	32	32	-	-	30	31	-	-	< 30	< 30	-	-
Area 5 - 102a	Day	37	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	30	-	-	-	30	-	-	-	< 30	-
	Night	35	30	31	-	-	30	30	-	-	30	< 30	-	-
Area 5 - 102b	Day	37	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	37	-	-	31	-	-	-	31	-	-	-	30	-
	Night	35	31	31	-	-	31	31	-	-	31	31	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 6 - 122	Day	42	-	-	-	42	-	-	-	39	-	-	-	39
	Evening	42	-	-	41	-	-	-	41	-	-	-	42	-
	Night	42	42	41	-	-	41	40	-	-	42	39	-	-
Area 7 (INP), 2 - Glennies Creek Community Hall	Day	50	-	-	-	37	-	-	-	35	-	-	-	34
	Evening	50	-	-	35	-	-	-	36	-	-	-	36	-
	Night	50	37	36	-	-	37	36	-	-	35	33	-	-
Area 7 - 4	Day	40	-	-	-	37	-	-	-	36	-	-	-	36
	Evening	40	-	-	36	-	-	-	37	-	-	-	37	-
	Night	38	38	37	-	-	38	37	-	-	37	35	-	-
Area 7 - 5	Day	40	-	-	-	36	-	-	-	35	-	-	-	34
	Evening	40	-	-	35	-	-	-	36	-	-	-	35	-
	Night	38	36	36	-	-	37	36	-	-	35	34	-	-
Area 7 - 7a	Day	40	-	-	-	36	-	-	-	35	-	-	-	34
	Evening	40	-	-	34	-	-	-	35	-	-	-	33	-
	Night	38	36	36	-	-	37	35	-	-	36	33	-	-
Area 7 - 7b	Day	40	-	-	-	36	-	-	-	35	-	-	-	34
	Evening	40	-	-	34	-	-	-	36	-	-	-	34	-
	Night	38	36	36	-	-	37	36	-	-	35	33	-	-
Area 7 - 7c	Day	40	-	-	-	35	-	-	-	35	-	-	-	34
	Evening	40	-	-	34	-	-	-	35	-	-	-	34	-
	Night	38	36	36	-	-	36	36	-	-	34	33	-	-
Area 7 (INP), 6 - Glennies Creek Rural Fire Service	Day	50	-	-	-	36	-	-	-	35	-	-	-	34
	Evening	50	-	-	35	-	-	-	36	-	-	-	35	-
	Night	50	36	36	-	-	36	36	-	-	35	34	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 7 – 105	Day	40	-	-	-	37	-	-	-	35	-	-	-	36
	Evening	40	-	-	35	-	-	-	36	-	-	-	35	-
	Night	38	38	36	-	-	38	35	-	-	36	32	-	-
Area 8 East – 111	Day	39	-	-	-	36	-	-	-	32	-	-	-	33
	Evening	39	-	-	36	-	-	-	36	-	-	-	35	-
	Night	36	36	36	-	-	35	35	-	-	35	35	-	-
Area 8 East - 127a	Day	39	-	-	-	30	-	-	-	< 30	-	-	-	< 30
	Evening	39	-	-	31	-	-	-	31	-	-	-	< 30	-
	Night	35	31	31	-	-	< 30	30	-	-	< 30	< 30	-	-
Area 8 East - 127b	Day	39	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	39	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 8 East - 127c	Day	39	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	39	-	-	< 30	-	-	-	32	-	-	-	30	-
	Night	35	31	< 30	-	-	31	31	-	-	< 30	< 30	-	-
Area 8 East - 127d	Day	39	-	-	-	35	-	-	-	< 30	-	-	-	< 30
	Evening	39	-	-	35	-	-	-	36	-	-	-	33	-
	Night	35	35	34	-	-	34	34	-	-	33	32	-	-
Area 8 East – 143	Day	39	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	39	-	-	< 30	-	-	-	31	-	-	-	< 30	-
	Night	35	31	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 8 West – 152	Day	44	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	44	-	-	30	-	-	-	31	-	-	-	31	-
	Night	42	31	< 30	-	-	30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 8 West – 154	Day	44	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	44	-	-	< 30	-	-	-	30	-	-	-	< 30	-
	Night	42	31	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 8 West – 155	Day	44	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	44	-	-	< 30	-	-	-	30	-	-	-	< 30	-
	Night	42	30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 8 West – 156	Day	44	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	44	-	-	< 30	-	-	-	30	-	-	-	< 30	-
	Night	42	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 9 – 147	Day	48	-	-	-	33	-	-	-	< 30	-	-	-	< 30
	Evening	48	-	-	33	-	-	-	33	-	-	-	32	-
	Night	43	32	33	-	-	31	32	-	-	31	31	-	-
Area 9 (INP), 149 - St Clements Church	Day	50	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	50	-	-	< 30	-	-	-	31	-	-	-	30	-
	Night	50	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 9 - 150	Day	48	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	48	-	-	< 30	-	-	-	31	-	-	-	30	-
	Night	43	31	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 9 (INP) - 342 - Daracon Mining	Day	65	-	-	-	35	-	-	-	31	-	-	-	31
	Evening	65	-	-	40	-	-	-	39	-	-	-	37	-
	Night	65	40	38	-	-	36	35	-	-	34	33	-	-
Area 10 - 144a	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
Area 10 - 144b	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 10 - 144c	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 10 - 145	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 11 – 134	Day	35	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	31	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 11 – 135	Day	35	-	-	-	33	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	32	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 11 – 136	Day	35	-	-	-	33	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	33	-	-	-	30	-	-	-	< 30	-
	Night	35	30	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 11 – 137d	Day	35	-	-	-	31	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-
Area 11 – 138	Day	35	-	-	-	32	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	32	-	-	-	30	-	-	-	< 30	-
	Night	35	30	31	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Receiver Location and ID	Period	SSD-5850 Noise Limits	Year 2				Year 8				Year 15			
			Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day	Winter Night	Non-winter Nights	Non-winter Evening	All Seasons Day
411(INP) – Hebden Community Hall	Day	50	-	-	-	45	-	-	-	40	-	-	-	39
	Evening	50	-	-	45	-	-	-	41	-	-	-	40	-
	Night	50	42	43	-	-	36	39	-	-	35	39	-	-
All other Properties	Day	35	-	-	-	< 30	-	-	-	< 30	-	-	-	< 30
	Evening	35	-	-	< 30	-	-	-	< 30	-	-	-	< 30	-
	Night	35	< 30	< 30	-	-	< 30	< 30	-	-	< 30	< 30	-	-

Note: Receivers **115** and **133** were assessed as vacant land and comply with the relevant VLAMP criterion of 45 dB(A) across all parts of the land parcel, as demonstrated in the noise level contours presented in **Figures 4-1** to **4-12.**

Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

Perth

PO Box 783
West Perth WA 6872
7 Havelock Street
West Perth WA 6005

Ph. 1300 793 267

Canberra

PO Box 6135
56 Bluebell Street
O'Connor ACT 2602

Ph. 02 6262 9484

Sydney

50 York Street
Sydney NSW 2000

Ph. 1300 793 267

Brisbane

Level 11
500 Queen Street
Brisbane QLD 4000

Ph. 1300 793 267

www.umwelt.com.au