

4.2.5 Management and Mitigation Measures

A preliminary acoustic assessment (Spectrum, 2010a) identified that under some meteorological conditions, the proposed operation of the Project would be likely to generate noise levels above the nominated intrusiveness noise criteria (35dB(A)). In order to reduce (and maintain) the predicted noise levels experienced at surrounding residences to levels complying with the noise criteria, the following management and mitigation measures would be adopted.

Construction Noise Controls

- Ensure all bulk earthworks strictly adhere to standard construction hours of operation, namely 7:00am to 6:00pm.
- Maintain the on-site road network to limit body noise from empty trucks travelling on internal roads.
- Maintain an open dialogue with the surrounding community and neighbours to ensure any concerns over noise or vibration are addressed.

Operational Noise Controls

- Place and operate the crusher within an enclosure engineered to achieve a noise reduction of at least 12dB.
- Ensure that the grinding circuit is rubber lined.
- Place and operate the final ventilation fan at least 10m below ground level rather than at the surface. The interim ventilation fan would be placed within the deepest section of the box cut until the final fan is commissioned. The interim fan may be retained as a backup ventilation system in the event of failure of the final fan.
- Construct a noise bund of at least 5m high along the southern and western edges of the ROM pad.
- Undertake noise monitoring at the residences most likely to be affected by noise generated by the Project.
- Prepare a *Noise Management Plan* prior to the commencement of mining activities which would incorporate the specific details of all noise controls and provide measures to address noise criteria exceedances and/or complaints should they occur.

Transport Noise Controls and Operational Procedures

- Ensure strict adherence to hours of operation, identified in **Table 2.6**.
- Ensure, where practicable, that all project employees and contractors enter and exit the Project Site in a courteous manner and without causing undue traffic noise.
- Prepare and implement a Drivers Code of Conduct and ensure that all drivers of heavy vehicles that regularly access the Project Site sign and comply with the code.



Blasting Controls

- Ensure that all blasts are designed by a suitably qualified and experienced blasting engineer or shotfirer and that each blast has an MIC of no greater than 105kg (until such time that a site law is developed which will allow for more precise predictions of blast emissions).

Other Noise and Vibration Controls

In addition to the design and operational features of the Project, the Proponent would apply the following noise controls.

- Ensure that equipment with lower sound power levels is used in preference to more noisy equipment.
- Maintain an open dialogue with the surrounding community and neighbours to ensure any concerns over noise or vibration are addressed.

4.2.6 Assessment of Impacts

4.2.6.1 Site Establishment Noise (Scenarios 1a and 1b)

Table 4.8 presents the predicted noise levels during site establishment at selected residential receivers surrounding the Project Site for Scenarios 1a and 1b. It is noted that only residences expected to receive construction noise levels greater than or equal to 30dB(A) are presented in **Table 4.8**. Spectrum, (2010b) presents assessment results for all residences surrounding the Project Site. The construction noise criteria and differential between the predicted noise level and the construction noise criteria for standard hours of operations is also presented in **Table 4.8**.

With the implementation of the nominated noise controls, compliance with the construction noise criteria is predicted by Spectrum (2010b).

4.2.6.2 Operational Noise (Scenario 2)

Table 4.9 presents the predicted operational noise levels at selected residential receivers surrounding the Project Site under calm and inversion conditions. It is noted that only residences expected to receive operational noise levels greater than or equal to 30dB(A) are presented in **Table 4.9**. Spectrum, (2010b) presents assessment results for all residences surrounding the Project Site. The operational noise criterion and differential between the predicted noise level and the operational noise criterion are also presented in **Table 4.9**.

Finally **Figures 4.12** and **4.13** present operational noise contours generated by the noise modelling of Spectrum (2010b) for calm and inversion conditions. It is noted that these contours are presented to provide the reader with a general appreciation of the likely noise environment during the operations stage of the Project, with the values presented in **Table 4.9** considered the definitive predictions for assessment purposes.



Table 4.8
Predicted Site Establishment Noise Levels

Residence ¹	Criterion dB(A), $L_{eq}(15min)$	Predicted level dB(A), $L_{eq}(15min)$			Differential dB
		Neutral	Inversion	NNW Wind	
Scenario 1a - 24-hour Site Establishment - Excluding Bulk Earthworks					
R1	35	<20	30	28	-5
R27	35	21	30	28	-5
R31	35	23	35	35	0
R32	35	21	31	29	-4
R33	35	20	30	28	-5
R107	35	26	33	28	-2
Scenario 1b - Site Establishment and Initial Mine Development - Bulk Earthworks					
R1	35	31	-	-	-4
R2	35	30	-	-	-5
R5	35	30	-	-	-5
R6	35	30	-	-	-5
R7	35	30	-	-	-5
R10	35	30	-	-	-5
R11	35	31	-	-	-4
R12	35	32	-	-	-3
R13	35	30	-	-	-5
R14	35	30	-	-	-5
R15	35	32	-	-	-3
R16	35	30	-	-	-5
R17	35	31	-	-	-4
R18	35	31	-	-	-4
R19	35	30	-	-	-5
R20	35	30	-	-	-5
R21	35	30	-	-	-5
R22	35	30	-	-	-5
R23	35	31	-	-	-4
R24	35	31	-	-	-4
R25	35	31	-	-	-4
R26	35	32	-	-	-3
R27	35	34	-	-	-1
R28	35	32	-	-	-3
R30	35	30	-	-	-5
R31	35	35	-	-	0
R32	35	33	-	-	-2
R33	35	32	-	-	-3
R34	35	30	-	-	-5
R58	35	30	-	-	-5
R59	35	30	-	-	-5
R60	35	30	-	-	-5
R107	35	32	-	-	-3

Note 1: For Scenario 1b, only those residences predicted to experience noise levels greater than or equal to 30 dB(A) are shown.
 Source: Modified after Spectrum (2010b) – Tables 4 and 5



Table 4.9
Predicted Operational Noise Levels at Non-Project-Related Residences

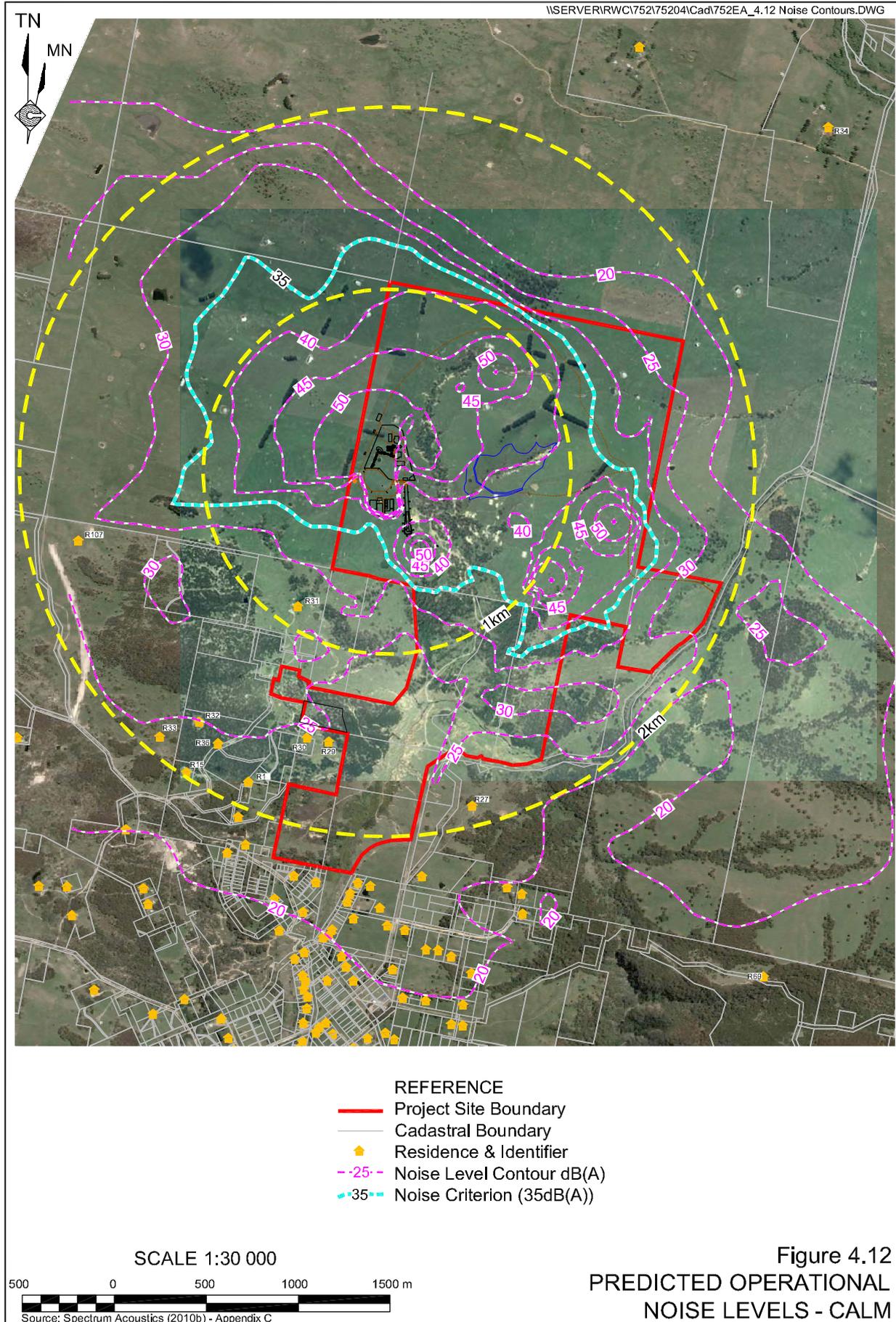
Residence	Criterion dB(A),L _{10(15min)}	Predicted level dB(A),L _{eq(15min)}			Minimum Differential dB
		Calm	Inversion	NNW Wind	
R2	35	20	30	30	-5
R5	35	20	31	29	-4
R6	35	20	30	30	-5
R7	35	20	30	30	-5
R11	35	21	32	32	-3
R12	35	22	32	32	-3
R13	35	20	32	31	-3
R14	35	20	31	30	-4
R15	35	22	33	31	-2
R16	35	20	31	31	-4
R17	35	21	31	31	-4
R18	35	21	32	32	-3
R19	35	20	31	31	-4
R20	35	20	31	31	-4
R21	35	20	30	31	-5
R22	35	20	31	31	-4
R23	35	21	31	31	-4
R24	35	21	32	32	-3
R25	35	21	31	31	-4
R26	35	22	31	32	-3
R27	35	24	33	34	-1
R28	35	22	31	32	-3
R31	35	25	31	31	-4
R32	35	23	31	32	-3
R33	35	22	30	30	-5
R34	35	<20	31	<20	-4
R59	35	20	30	30	-5
R60	35	20	30	30	-5
R62	35	<20	30	30	-5
R63	35	<20	30	29	-5
R70	35	<20	30	30	-5
R71	35	20	30	30	-5
R72	35	20	30	30	-5
R93	35	<20	30	30	-5
R94	35	<20	30	30	-5
R107	35	27	33	27	-2

Note 1: For Scenario 1b, only those residences predicted to experience noise levels greater than or equal to 30 dB(A) under inversion conditions are shown.
Source: Modified after Spectrum (2010b) – Table 6

4.2.6.3 Sleep Disturbance Assessment

Predicted sleep disturbance (maximum) noise levels at all non-project related residences under worst case night time conditions (temperature inversion) are shown in **Table 4.10** which also includes the “differentials” between the predicted levels and the noise criterion. It is noted that only residences expected to receive sleep disturbance noise levels greater than or equal to 40dB(A) are presented in **Table 4.10**. Spectrum, (2010b) presents assessment results for all residences surrounding the Project Site. With the implementation of the nominated noise controls, compliance with the operational noise criteria is predicted by Spectrum, (2010b). The maximum predicted L_{10(15min)} noise level under temperature inversion conditions is expected to be 33dB(A) at Residences 107 and 27.





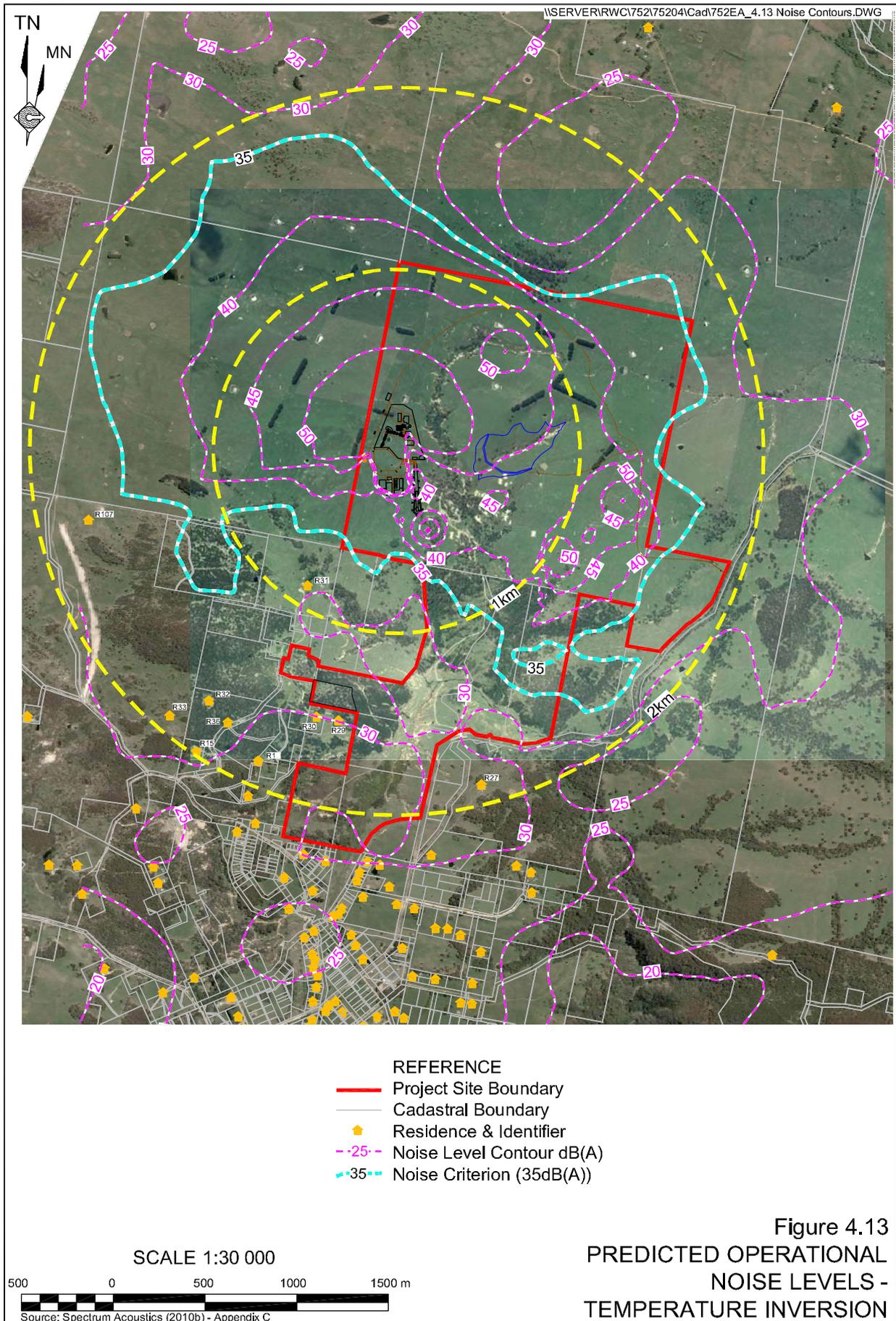


Figure 4.13
 PREDICTED OPERATIONAL
 NOISE LEVELS -
 TEMPERATURE INVERSION

With the implementation of the nominated noise controls compliance with the sleep-disturbance (maximum) noise criteria is predicted by Spectrum, (2010b). The maximum predicted $L_{A1(1\text{minute})}$ noise level is expected to be 42dB(A) at a number of residences.

Table 4.10
Predicted Maximum $L_{A1(1\text{-minute})}$ Operational Noise Levels

Residence	Criterion dB(A),L_{max}	Predicted level dB(A),L_{max}	Differential dB
R2	45	40	-5
R5	45	40	-5
R6	45	40	-5
R7	45	40	-5
R10	45	40	-5
R11	45	41	-4
R12	45	41	-4
R13	45	40	-4
R14	45	40	-5
R15	45	42	-3
R16	45	41	-4
R17	45	41	-4
R18	45	42	-3
R19	45	40	-5
R20	45	41	-4
R21	45	40	-5
R22	45	41	-4
R23	45	42	-3
R24	45	42	-3
R25	45	41	-4
R26	45	42	-3
R27	45	42	-3
R28	45	42	-3
R31	45	42	-3
R32	45	41	-4
R33	45	40	-5
R34	45	41	-4
R49	45	40	-5
R53	45	40	-5
R54	45	40	-5
R55	45	41	-4
R56	45	40	-5
R57	45	40	-5
R59	45	41	-4
R60	45	40	-5
R62	45	40	-5
R63	45	41	-4
R64	45	40	-5
R68	45	40	-5
R70	45	40	-5
R71	45	40	-5
R72	45	41	-4
R93	45	40	-5
R107	45	42	-3

Source: Modified after Spectrum (2010b) – Table 7

