



**AUSTRALIAN  
ZIRCONIA LTD**

(A wholly owned subsidiary of Alkane Resources Ltd)

ABN 51 091 489 511

# Dubbo Zirconia Project

# Noise Management Plan





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## TABLE OF REVISIONS

| Revision Number | Revision Date | Prepared By    | Approved by         | Comments  |
|-----------------|---------------|----------------|---------------------|---|
| 1.0             | 3/9/2015      | A. Irwin (RWC) | N. Earner (AZL)     | For Stage 1 – Construction (EPL Application)                    |
| 2.0             | 21/3/2016     | A. Irwin (RWC) | M. Sutherland (AZL) | Submitted for Secretary's approval following issue of EPL 20702 |
| 2.1             | 25/8//2016    | A. Irwin (RWC) | N. Earner           | Resubmitted for Secretary's approval                            |
| 2.1             | 6/10/2016     | A. Irwin (RWC) | C. Preshaw (DPE)    | Approved following minor revisions - refer to Appendix 4        |



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# CONTENTS

|   | Page      |
|---|-----------|
| <b>FOREWORD</b> .....                                   | <b>1</b>  |
| <b>1. SCOPE</b> .....                                   | <b>3</b>  |
| <b>2. CONSULTATION</b> .....                            | <b>5</b>  |
| 2.1 GOVERNMENT CONSULTATION .....                       | 5         |
| 2.2 TARONGA CONSERVATION SOCIETY AUSTRALIA .....        | 6         |
| 2.3 COMMUNITY CONSULTATION .....                        | 6         |
| <b>3. LEGAL AND OTHER REGULATORY REQUIREMENTS</b> ..... | <b>6</b>  |
| 3.1 DEVELOPMENT CONSENT SSD-5251 .....                  | 6         |
| 3.2 ENVIRONMENT PROTECTION LICENCE (POEO ACT) .....     | 8         |
| <b>4. OBJECTIVES AND OUTCOMES</b> .....                 | <b>10</b> |
| <b>5. LOCAL SETTING</b> .....                           | <b>10</b> |
| 5.1 CLIMATIC CONDITIONS .....                           | 10        |
| 5.2 AMBIENT (BACKGROUND) CONDITIONS .....               | 11        |
| 5.3 LOCAL LAND OWNERSHIP AND RESIDENCES .....           | 12        |
| <b>6. NOISE CRITERIA LIMITS</b> .....                   | <b>13</b> |
| 6.1 CONSTRUCTION NOISE LIMITS .....                     | 13        |
| 6.1.1 On-site Construction .....                        | 13        |
| 6.1.2 Linear Infrastructure Construction .....          | 13        |
| 6.2 OPERATIONS NOISE CRITERIA .....                     | 15        |
| 6.3 TRAFFIC NOISE CRITERIA .....                        | 16        |
| 6.3.1 Road Traffic Noise Criteria .....                 | 16        |
| 6.3.2 Rail Traffic Noise Criteria .....                 | 16        |
| <b>7. NOISE MANAGEMENT MEASURES</b> .....               | <b>17</b> |
| 7.1 INTRODUCTION .....                                  | 17        |
| 7.2 OFF-SITE (LINEAR INFRASTRUCTURE) CONSTRUCTION ..... | 17        |
| 7.2.1 Introduction .....                                | 17        |
| 7.2.2 Operating Hours and Conditions .....              | 17        |
| 7.2.3 Engineering Noise Controls .....                  | 18        |
| 7.2.4 Procedural Noise Controls .....                   | 18        |
| 7.3 ON-SITE CONSTRUCTION .....                          | 20        |
| 7.3.1 Introduction .....                                | 20        |
| 7.3.2 Operating Hours and Conditions .....              | 21        |
| 7.3.3 Engineering Noise Controls .....                  | 22        |
| 7.3.4 Procedural Noise Controls .....                   | 22        |
| 7.4 MINING OPERATIONS .....                             | 23        |
| 7.5 ROAD TRANSPORT OPERATIONS .....                     | 23        |
| 7.6 RAIL TRANSPORT OPERATIONS .....                     | 23        |

# CONTENTS

|  | Page      |
|--|-----------|
| <b>8. NOISE MONITORING PROGRAM .....</b>                             | <b>24</b> |
| 8.1 INTRODUCTION.....  | 24        |
| 8.2 METEOROLOGICAL MONITORING.....                                   | 24        |
| 8.3 NOISE MONITORING LOCATIONS.....                                  | 24        |
| 8.4 ATTENDED MONITORING .....  | 26        |
| 8.4.1 Purpose .....  | 26        |
| 8.4.2 Methodology.....   | 26        |
| 8.4.3 Frequency .....  | 27        |
| 8.4.4 Period.....  | 27        |
| 8.5 CONTINUOUS MONITORING.....                                       | 28        |
| 8.5.1 Purpose .....  | 28        |
| 8.5.2 Methodology.....   | 28        |
| 8.5.3 Validation of Continuous Noise Monitoring .....                | 29        |
| 8.6 SOUND POWER LEVEL MEASUREMENT AND AUDITS .....                   | 29        |
| 8.7 SUPPLEMENTARY NOISE SURVEY .....                                 | 29        |
| 8.8 TRAFFIC NOISE MONITORING .....                                   | 29        |
| 8.9 EVALUATION OF RESULTS.....                                       | 29        |
| <b>9. NOISE MANAGEMENT SYSTEM .....</b>                              | <b>30</b> |
| 9.1 INTRODUCTION.....  | 30        |
| 9.2 PROACTIVE MANAGEMENT.....  | 30        |
| 9.2.1 Meteorological Forecasting .....                               | 30        |
| 9.2.2 Proactive Mitigation Measures .....                            | 30        |
| 9.3 REACTIVE MANAGEMENT .....  | 31        |
| 9.3.1 Triggers .....   | 31        |
| 9.3.2 Response and Corrective Action.....                            | 31        |
| <b>10. COMPLAINTS HANDLING AND RESPONSE.....</b>                     | <b>33</b> |
| <b>11. INCIDENT MANAGEMENT, NOTIFICATION AND REPORTING .....</b>     | <b>34</b> |
| 11.1 INCIDENT IDENTIFICATION.....                                    | 34        |
| 11.2 INCIDENT MANAGEMENT AND NOTIFICATION .....                      | 34        |
| 11.2.1 Pollution Incident.....                                       | 34        |
| 11.2.2 Non-Compliance Incident.....                                  | 34        |
| 11.3 INCIDENT REPORTING.....   | 35        |
| <b>12. PUBLICATION OF MONITORING INFORMATION AND REPORTING .....</b> | <b>35</b> |
| <b>13. PLAN IMPLEMENTATION .....</b>                                 | <b>36</b> |
| 13.1 ROLES AND RESPONSIBILITIES .....                                | 36        |
| 13.2 COMPETENCE TRAINING AND AWARENESS.....                          | 37        |
| 13.3 REVIEW (AND CONTINUAL IMPROVEMENT PROTOCOL).....                | 37        |

# CONTENTS

|   | <b>Page</b> |
|---|-------------|
| <b>14. REFERENCES</b> .....   | <b>38</b>   |
| <br><b>APPENDICES</b>   |             |
| Appendix 1 Noise-related Conditions of SSD-5251 .....                         | A1-1        |
| Appendix 2 Noise-related Conditions of Environment Protection Licence.....    | A2-1        |
| Appendix 3 Out of Hours Work Protocol (Template).....                         | A3-1        |
| Appendix 2 Confirmation of Approval .....                                     | A4-1        |
| <br><b>FIGURES</b>  |             |
| Figure 1 Dubbo Zirconia Project Activities – Stage 1.....                     | 4           |
| Figure 2 Wind Roses for Toongi Locality .....                                 | 12          |
| Figure 3 Land Ownership, DZP Site and Surrounds.....                          | 14          |
| Figure 4 Taronga Western Plains Zoo – Critical Noise Receivers.....           | 15          |
| Figure 5 Taronga Western Plains Zoo Noise Barrier .....                       | 19          |
| Figure 6 Noise Monitoring Locations.....                                      | 25          |
| <br><b>TABLES</b>   |             |
| Table 1 Conditional Requirements of SSD-5251 for a Noise Management Plan..... | 7           |
| Table 2 Objectives and Outcomes.....  | 10          |
| Table 3 Adopted Rating Background Levels .....                                | 11          |
| Table 4 Site Noise Criteria .....   | 15          |
| Table 5 Road Traffic Noise Criteria.....                                      | 16          |
| Table 6 Rail Noise Criteria .....   | 16          |
| Table 7 Hours of Operation – Linear Infrastructure Construction.....          | 17          |
| Table 8 Construction Plant / Equipment Sound Power Levels .....               | 18          |
| Table 9 Hours of Operation – DZP Site Construction.....                       | 21          |
| Table 10 Meteorological Monitoring.....                                       | 24          |
| Table 11 Meteorological Monitoring.....                                       | 26          |
| Table 12 Roles and Responsibilities.....                                      | 36          |

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# FOREWORD

*This Noise Management Plan (“the Plan”) for the Dubbo Zirconia Project (DZP) has been prepared by R.W. Corkery & Co. Pty. Limited (RWC) on behalf of Australian Zirconia Limited (AZL), a subsidiary of Alkane Resources Ltd (Alkane). The DZP, approved as SSD-5251 by the NSW Planning Assessment Commission (PAC) on 28 May 2015, comprises a small scale open cut mine supplying ore containing rare metals (zirconium, niobium, hafnium and tantalum) and rare earth elements (REEs) to a processing plant near the village of Toongi, approximately 25km south of Dubbo. Waste residues produced by the processing operations will be managed in residue storage facilities, designed to contained and encapsulate these residues.*

*The DZP also includes the construction of a water pipeline between the processing plant and the Macquarie River, a pipeline to carry natural gas between Dubbo and the DZP Site, and the upgrades of the following linear infrastructure;*

- *Toongi Road;*
- *Obley Road; and*
- *the Toongi-Dubbo section of the currently disused Dubbo-Molong Rail Line.*

*Collectively, these are referred to as the DZP linear infrastructure.*

*In accordance with Condition 14 of Schedule 2 of SSD-5251, the Plan is prepared in a staged fashion.*

- *Stage 1: provides for noise management of construction activities on the DZP Site and linear infrastructure.*
- *Stage 2: provides for noise management following the commencement of mining operations (as defined by SSD-5251 as “the removal and emplacement of overburden and extraction, processing, handling, storage and transport of mineral ore / ore concentrate / refined ore products”).*

*This document represents Stage 1 of the Plan.*

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## 1. SCOPE

The Dubbo Zirconia Project (DZP) Noise Management Plan (“the Plan”) has been prepared as a tool to give consideration to and to manage noise related issues during the construction and operation of the DZP. It will be used by Australian Zirconia Limited (AZL) personnel as the first point of reference for noise related issues.

This plan synthesises the recommendations made during the preparation of an Environmental Impact Statement (EIS) for the DZP, and subsequent assessment and approval of SSD-5251. It is a practical guide for management of noise issues on site.

As noted in the **Foreword**, the NMP will be prepared in stages to reflect the initial construction activities on the DZP Site (as defined by Mining Lease 1724) and linear infrastructure (Stage 1), and ongoing construction and operations following commencement of mining operations (Stage 2). This document represents Stage 1 of the Plan and includes the following noise generating activities (see **Figure 1**).

### Site Construction

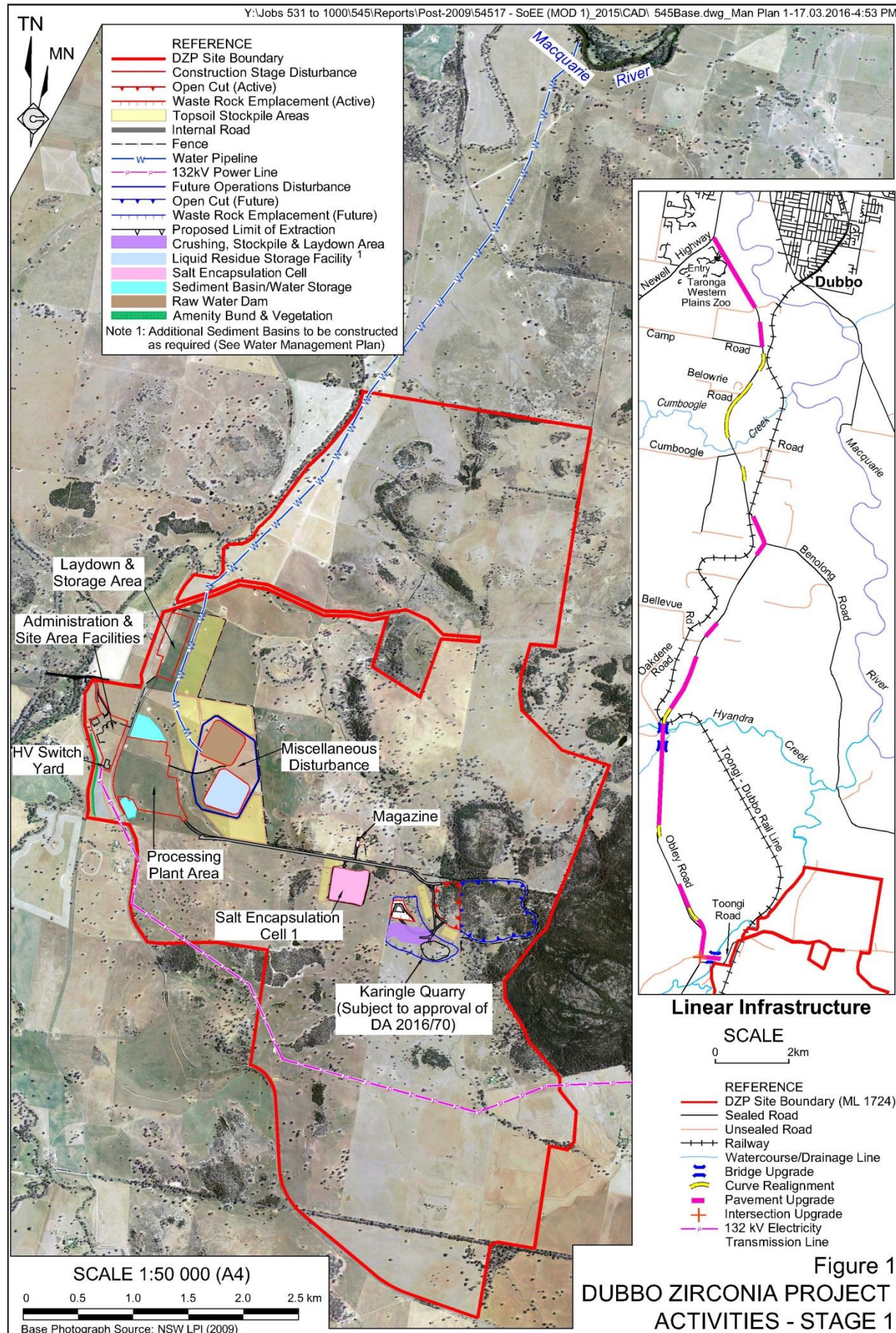
- Site Entrance and Access Road.
- Site Administration Area.
- Processing Plant Area.
- Laydown and Storage Area.
- Mine Haul Road.
- Residue Storage Facility (RSF).
- Salt Encapsulation Cell 1.
- Initial open cut development.
- Initial Waste Rock Emplacement (WRE) construction.
- Extraction of basalt from a small quarry (developed under separate development consent within the impact footprint of the WRE).

### Linear Infrastructure Construction

- Macquarie River Water Pipeline, pump station and 22kV powerline.
- Natural Gas Pipeline.
- Toongi Road Upgrade (including Wambangalang Creek Crossing).
- Obley Road Upgrade (including Hyandra and Twelve Mile Creek Crossings).

As this version of the Plan only considers the construction activities of Stage 1, some sections of the Plan remain to be completed and include the reference:

***To be included in Stage 2 of the Plan prior to commencement of mining operations***



Stage 2 of the Plan will be submitted prior to the commencement of mining operations (as defined by SSD-5251 as “the removal and emplacement of overburden and extraction, processing, handling, storage and transport of mineral ore / ore concentrate / refined ore products”).

## **2. CONSULTATION**

### **2.1 GOVERNMENT CONSULTATION**

#### **NSW Environment Protection Authority**

*Condition 8(a)* of Schedule 3 of SSD-5251 requires the NSW Environment Protection Authority (EPA) be consulted in the preparation of the Plan.

Following from recommendations provided by the EPA to the NSW Department of Planning & Environment (DPE) on 21 November 2013 and 20 January 2014, which provided advice on noise limits, noise monitoring, compliance assessment and reporting (refer to Section 3.2), a meeting between AZL (Mr Mike Sutherland, General Manager) and the EPA (Mr Bradley Tanswell, Acting Head Far West Operations) was held on 29 May 2015. The objective of this meeting, also attended by RWC (Mr Alex Irwin, Senior Environmental Consultant), was to confirm the EPA’s requirements for a Noise Management Plan, discuss the staged preparation of the Plan and the application for Environmental Protection Licence (EPL) generally.

At the 29 May 2015 meeting, it was confirmed that:

- A Noise Management Plan, identifying noise limits, noise management measures, noise monitoring, compliance assessment and contingency management, and reporting, is being required to support an application for an EPL.
- The EPA would consider a Noise Management Plan restricted to the construction activities of the Mine Site and associated infrastructure as part of an application for an EPL for Scheduled Development Work.

A copy of the Noise Management Plan was submitted to the EPA on 9 September 2015 for review. The EPA responded on 30 October 2015 declining to comment on the document.

#### **Dubbo City Council**

On 7 July 2015, AZL (Mr Mike Sutherland and Mr Nic Earner, Chief Operations Officer) met with representatives of Dubbo City Council (“Council”) to discuss progress and likely scheduling of tasks associated with the DZP. At this meeting, AZL sought feedback from Council with respect to the management of the linear infrastructure construction works to be undertaken on Council infrastructure, with the objective of ensuring that management effectively addressed issues both generally and with respect to noise.

Council requested that the Front End Engineering Design (FEED) drawings of road upgrades and infrastructure prepared by Hatch be forwarded to Steve Clayton at Council for consideration and comment. The construction or installation of a noise barrier between the Taronga Western Plains Zoo and Obley Road was also discussed, with Council requesting they be kept informed of plans for these works.

## 2.2 TARONGA CONSERVATION SOCIETY AUSTRALIA

Following exhibition of the EIS, AZL and RWC met with representatives of Taronga Conservation Society Australia (TCSA) to discuss possible impacts on Taronga Western Plains Zoo (“the Zoo”) operations and methods of minimising and mitigating these impacts. At this meeting and subsequently, the issue of traffic noise and the impacts this might have both on amenity for visitors to the Zoo and the breeding programs undertaken at the Zoo was raised.

As a consequence of these discussions, and subsequent correspondence between TSCA, AZL, RWC and DPE, conditions requiring specific treatments of the road surface adjacent to the Zoo (*Condition 40(c)* of Schedule 3) and the construction of a 3m high 1km long road noise barrier on land owned by the Zoo (*Condition 3* of Schedule 3) have been included in SSD-5251.

On 13 July 2015, Mr Mike Sutherland (AZL) and Mr Oliver Muller (Muller Acoustic Consultants [MAC]) met with Kathleen Oke (Manager, Facilities and Asset Operations) and Paul Metcalfe (Manager Life Sciences) to discuss the design specifications of the road noise barrier. A Noise Impact Assessment was subsequently prepared by MAC which identified the noise barrier arrangement which maximises the attenuation of road traffic noise at the breeding pens of Zoo. On review of the two options providing equivalent noise attenuation, considering factors such as practicality, security and visual impact management, the Zoo was provided with an assessment of the preferred option for construction of the noise barrier on 14 August 2015. Section 7.2.3 provides the details of this Engineering Noise Control.

## 2.3 COMMUNITY CONSULTATION

A Community Consultative Community (CCC) was established in November 2015 and provides a forum for open discussion between AZL, the community, Council and other stakeholders on issues directly relating to the mine’s operations, environmental performance and community relations, and to keep the community informed on these matters.

The representatives of the CCC comprise an independent chair, AZL representative(s), community, Council and Aboriginal community representatives. The contact details of the CCC representatives are published (with the permission of each) on Alkane’s website such that each may be contacted to present concerns of others in the community. The CCC meets quarterly (the first meeting being 14 November 2015) and provides an opportunity for issues of concern related to management of air quality to be raised and solutions identified and discussed.

AZL will continue to publish a community newsletter that will inform the local community of relevant developments which may impact on the local air quality environment. AZL has and will continue to operate an open door policy to those wishing to raise and discuss issues of concern.

## 3. LEGAL AND OTHER REGULATORY REQUIREMENTS

### 3.1 DEVELOPMENT CONSENT SSD-5251

The DZP is State Significant Development and an Environmental Impact Statement (RWC, 2013) was completed in accordance with Schedule 2, Part 3 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to assess the environmental impacts (including noise) of the DZP.

Development Consent SSD-5251 was granted by the NSW Planning Assessment Commission (PAC) on 28 May 2015, with *Condition 8* (of Schedule 3) requiring the preparation of a Noise Management Plan. More general requirements for the preparation of management plans are also provided by *Condition 3* of Schedule 5. **Table 1** identifies the conditional requirements of both conditions and identified where in the Plan individual requirements have been addressed.

**Table 1**  
**Conditional Requirements of SSD-5251 for a Noise Management Plan**

Page 1 of 2

| <b>Condition</b>   | <b>Section</b> |
|--|----------------|
| <b>Schedule 3</b>  |                |
| 8. The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:   |                |
| (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval prior to any development under this consent, unless the Secretary agrees otherwise;  | 2              |
| (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent and procedures within this plan, including procedures to minimise noise generated by construction activities and unloading and loading trains; | 7              |
| (c) describe the proposed noise management system in detail;   | 9              |
| (d) include a noise monitoring program that:   |                |
| • uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent;   | 8.4            |
| • evaluates and reports on:  | 8.8            |
| ○ the effectiveness of the noise management system;  |                |
| ○ compliance against the noise criteria in this consent; and   |                |
| ○ compliance against the noise operating conditions;   |                |
| • includes a program to calibrate and validate the real-time noise monitoring results over time; and   | 8.5.3          |
| • defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.  | 11             |
| <b>Schedule 5</b>  |                |
| 3. The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:  |                |
| (a) detailed baseline data;  | 5.1            |
| (b) a description of:  |                |
| • the relevant statutory requirements (including any relevant approval, licence or lease conditions);  | 3              |
| • any relevant limits or performance measures/criteria;  | 6              |
| • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;  |                |
| (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;  | 7              |
| (d) a program to monitor and report on the:  | 8              |
| • impacts and environmental performance of the development;  |                |
| • effectiveness of any management measures (see c above);  |                |
| (e) a contingency plan to manage any unpredicted impacts and their consequences;   | 9              |
| (f) a program to investigate and implement ways to improve the environmental performance of the development over time;   | 13.3           |

**Table 1 (Cont'd)**  
**Conditional Requirements of SSD-5251 for a Noise Management Plan**

Page 2 of 2

| Condition  | Section                                     |
|--|---|
| <b>Schedule 5 (Cont'd)</b>   |   |
| (g) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>• incidents;</li> <li>• complaints;</li> <li>• non-compliances with statutory requirements; and</li> <li>• exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul> | 9.3 & 11.2<br>9.3 & 10<br>9.3 & 11.2<br>9.3 |
| (h) a protocol for periodic review of the plan.  | 13.3  |

**Appendix 1** includes a copy of the 'relevant conditions' for which the Plan provides measures to ensure compliance, namely *Conditions 2 to 8 and 24* of Schedule 3, and *Condition 3* of Schedule 5, along with reference to the relevant section of the Plan.

### 3.2 ENVIRONMENT PROTECTION LICENCE (POEO ACT)

This version of the Plan supports an application for an Environment Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997* (POEO Act). In lieu of conditional requirement of an EPL, the following recommendations of the EPA to the DPE on assessment of the EIS and subsequent documentation, reflecting the requirements of the EPA in issuing a licence, have been considered and addressed in the Plan.

#### Limit Conditions

L6.1 Noise generated at the premises must not exceed the noise limits in the table below.

| Location   | Noise Limits dB(A)          |                             |                             |                            |
|--|-----------------------------|-----------------------------|-----------------------------|----------------------------|
|  | Day                         | Evening                     | Night                       |                            |
|  | $L_{Aeq}(15\text{ minute})$ | $L_{Aeq}(15\text{ minute})$ | $L_{Aeq}(15\text{ minute})$ | $L_{A1}(15\text{ minute})$ |
| R4, R6, R7A, R7B, R8A, R8B, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28A, R28B, R30A, R30B, R31A, R31B, R32, R35A, R35B, R36, R38, R40, R42, R43, R46, R61 | 35                          | 35                          | 35                          | 45                         |
| R12 (Toongi Hall)  | 40                          | 40                          | 40                          | N/A                        |
| R13 (Environmental Education Centre)   | 35                          | 35                          | 35                          | N/A                        |
| Any other residential receiver   | 35                          | 35                          | 35                          | 45                         |

Note: Day, Evening and Night Periods are as defined in the Industrial Noise Policy

L6.2 For the purpose of condition L6.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L6.3 The noise limits set out in condition L6.1 apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level.
- b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Stability category G temperature inversion conditions.

L6.4 For the purposes of condition L6.3:

- a) Data recorded by a meteorological station installed on site must be used to determine meteorological conditions; and
- b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L6.5 To determine compliance:

- a) with the  $L_{eq(15 \text{ minute})}$  noise limits in condition L6.1, the noise measurement equipment must be located:
  - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
  - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
  - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
- b) with the  $L_{A1(1 \text{ minute})}$  noise limits in condition L6.1, the noise measurement equipment must be located within 1 metre of a dwelling façade. c) with the noise limits in condition L6.1, the noise measurement equipment must be located:
  - at the most affected point at a location where there is no dwelling at the location; or
  - at the most affected point within an area at a location prescribed by conditions L6.5(a) or L6.5(b).

L6.6 A non-compliance of condition L6.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions L6.5(a) and L6.5(b); and/or
- at a point other than the most affected point at a location.

L6.7 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

### **Requirement to Monitor Noise**

M8.1 To assess compliance with Condition L6.1, attended noise monitoring must be undertaken in accordance with Conditions L6.5 and:

- a) at each one of the locations listed in Condition L6.1;
- b) occur annually in a reporting period;

- c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:
  - 1.5 hours during the day;
  - 30 minutes during the evening; and
  - 1 hour during the night.
- d) occur for three consecutive operating days.

**Noise Monitoring Report**

A noise compliance assessment report must be submitted to the EPA within 30 days of the completion of the yearly monitoring. The assessment must be prepared by a suitably qualified and experienced acoustical consultant and include:

- a) an assessment of compliance with noise limits presented in Condition L6.1; and
- b) an outline of any management actions taken within the monitoring period to address any exceedances of the limits contained in Condition L6.1.

**4. OBJECTIVES AND OUTCOMES**

Table 2 details the objectives and outcomes with respect to noise management of the DZP.

**Table 2  
Objectives and Outcomes**

| <b>Objectives</b>  | <b>Outcomes</b>   |
|--|---|
| (a) To ensure compliance with the criteria of SSD--5251, Environmental Protection Licence and reasonable community expectations.   | (i) Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.                     |
| (b) To implement appropriate noise management and mitigation measures during all stages of the DZP.  | (ii) All identified noise management and mitigation measures implemented.   |
| (c) To implement an appropriate attended and unattended noise monitoring program to establish compliance or otherwise with relevant criteria during all stages of the Project. | (iii) All identified monitoring undertaken in accordance with the Plan.   |
| (d) To implement an appropriate complaints handling and response protocol.   | (iv) Complaints (if any) handled and responded to in an appropriate manner.<br>(v) All complaints recorded and reported in accordance with annual reporting requirements. |
| (e) To implement appropriate corrective and preventative actions, if required.   | (vi) Corrective and preventative actions implemented, if required.  |
| (f) To implement an appropriate incident reporting program, if required.   | (vii) Incidents (if any) reported in an appropriate manner.   |

**5. LOCAL SETTING**

**5.1 CLIMATIC CONDITIONS**

The climatic conditions of the DZP Site are presented in Section 4.1.3 of RWC (2013). A summary of the climatic conditions is presented in this subsection.

## Temperature and Humidity

January is typically the warmest month of the year with a mean daily maximum temperature of 33.4°C and mean daily minimum temperature of 18.2°C. The coolest month of the year is typically July with the lowest mean daily maximum temperature of 15.4°C and minimum mean minimum temperature of 3.1°C.

The highest humidity is experienced in June, and the least humid month is December.

## Rainfall

On average, 647.3mm of rain is recorded each year, with that rainfall spread relatively evenly throughout the year. January is typically the wettest month (66.4mm) and September is the driest month (42.7mm).

## Wind Speed and Direction

Wind distribution patterns at the DZP Site are dominated by winds from the south-southwest in autumn, winter and spring, with northeasterly winds dominating in summer. **Figure 2** presents the wind roses from 2008, selected as a year representative of the prevailing annual conditions of the local setting.

## 5.2 AMBIENT (BACKGROUND) CONDITIONS

The ambient (background) noise levels surrounding the DZP Site are described in detail in *Section 4.2.2* of the EIS (RWC, 2013). In summary, the ambient noise levels are influenced by the following sources.

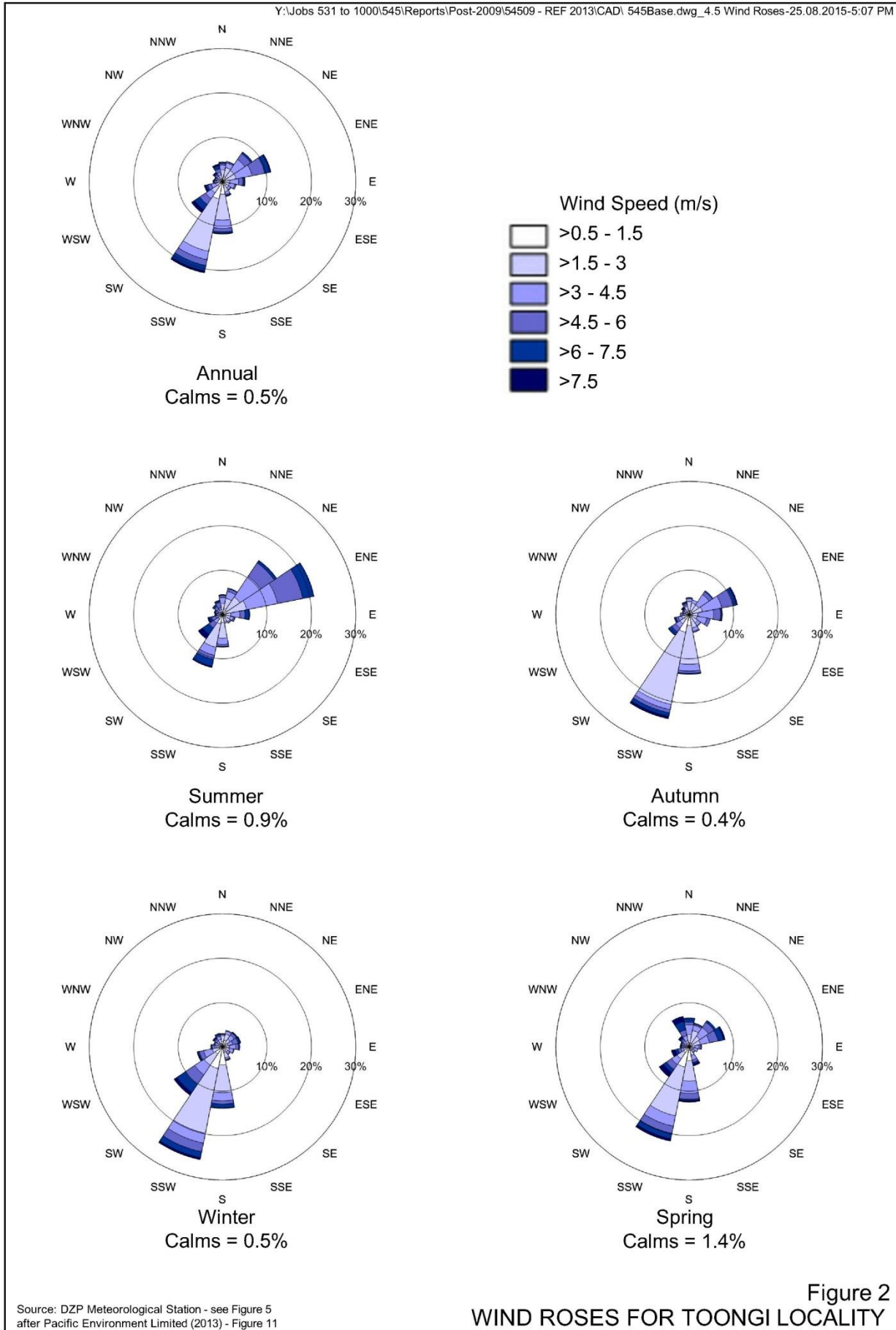
- Traffic on local roads, particularly Obley Road. Traffic on the Newell Highway is also a significant contributor to ambient noise levels at the northern end of Obley Road and the Zoo.
- Rural noises such as agricultural equipment, stock, birds and insects.
- Wind generated noises such as wind in trees.

In order to characterise the local variation in noise levels, EMM (2013) undertook a review of a noise monitoring program previously undertaken by Richard Heggie & Associates Pty Ltd in 2001. Based on the noise monitoring programs, and in accordance with the requirements of the *NSW Industrial Noise Policy*, **Table 3** presents the Rating Background Noise Levels.

**Table 3**  
**Adopted Rating Background Levels**

| Receptor      | Time period | RBL (dB(A)) |
|---------------|-------------|-------------|
| All Receptors | Day         | 30          |
|               | Evening     | 30          |
|               | Night       | 30          |

Source: EMM (2013) - Table 3



## 5.3 LOCAL LAND OWNERSHIP AND RESIDENCES

The land ownership within and surrounding the DZP Site is presented in **Figure 3**.

AZL owns 12 homesteads and cottages within and surrounding the DZP Site (R1, R2, R3A, R3B, R48, R49A, R49B, R51, R54, R55, R56 (derelict) and R58). Only R3A, 3B and R51 occur within the DZP Site. All residences within the village of Toongi are either owned, or under contract to purchase by AZL.

The closest residential receivers to the DZP Site, not owned by or under contract to AZL, are the four houses on smaller lifestyle blocks to the west of Obley Road (approximately 600m to 1000m from the entrance to the DZP Site). Other notable receivers surrounding the DZP Site include the Toongi Hall (R12), approximately 600m to the southwest of the DZP Site entrance and 800m west of the processing plant, "Glen Idol" Homestead (R4) approximately 1 000m from the open cut, the cottage of "Cockleshell Corner" (R7B) approximately 2 400m from the processing plant and the Wambangalang Environmental Education Centre (R13), approximately 4.8km to the southwest of the processing plant.

**Figure 4** identifies the critical locations within the Zoo, identified through consultation as potentially affected by road traffic noise.

## 6. NOISE CRITERIA LIMITS

### 6.1 CONSTRUCTION NOISE LIMITS

#### 6.1.1 On-site Construction

In accordance with *Condition 2* of Schedule 3 of SSD-5251, the noise criterion for all on-site activities undertaken during the construction stage of the DZP is as follows.

- $L_{Aeq(15min)} \leq 35dB(A)^1$ .

#### 6.1.2 Linear Infrastructure Construction

No noise criteria apply to the construction of linear infrastructure off the DZP Site, e.g. road upgrades, water pipeline, rail infrastructure, however, AZL will manage the noise generated by these activities in accordance with the noise management levels defined in the Interim Construction Noise Guideline (ICNG).

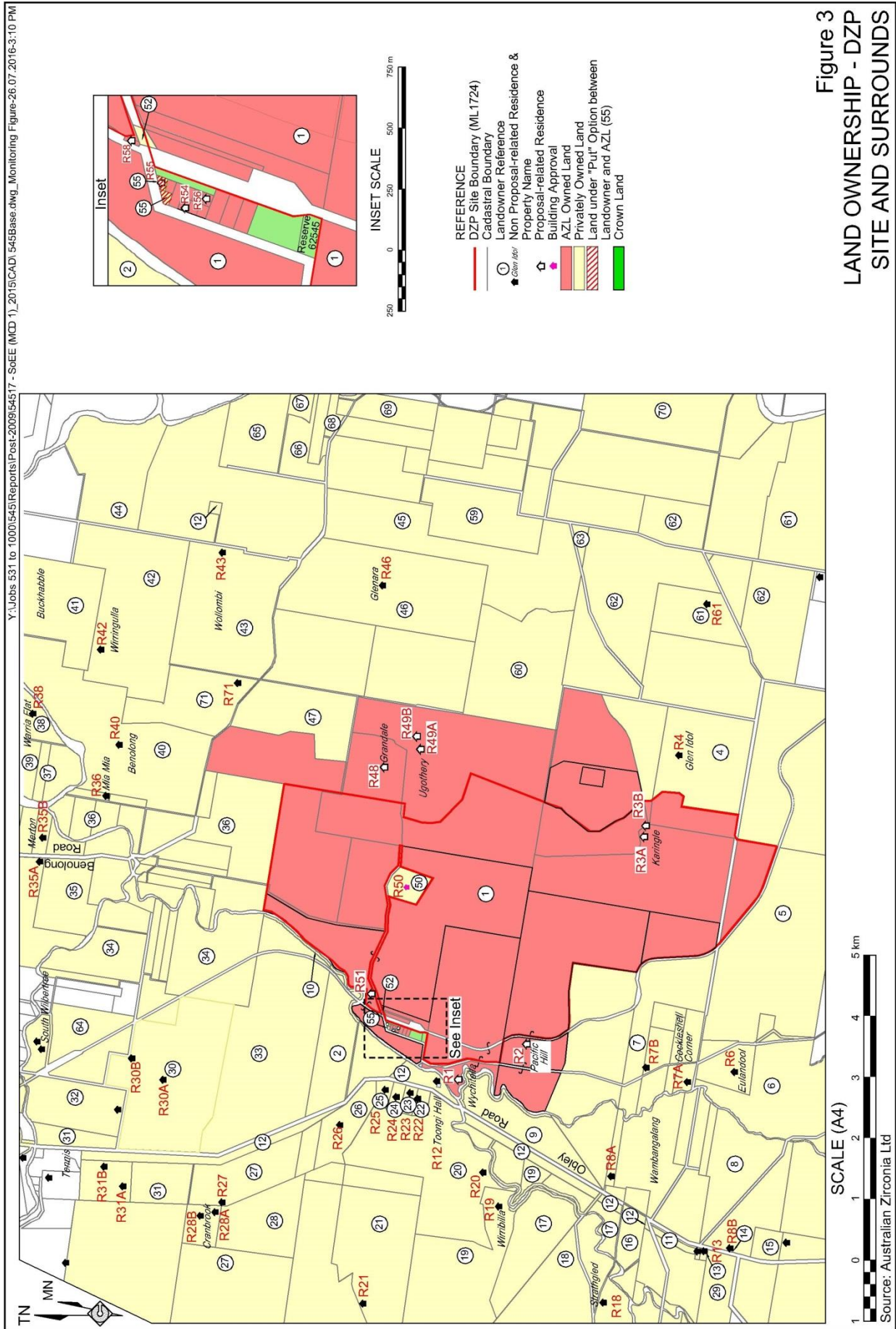
During standard construction hours of operation (Monday to Friday – 7:00am to 6:00pm & Saturday – 8:00am to 1:00pm), the ICNG recommends that the  $L_{Aeq(15min)}$  noise levels arising from construction activities, when measured at boundary or within 30m of the residence (whichever is the lesser), should not exceed the following levels.

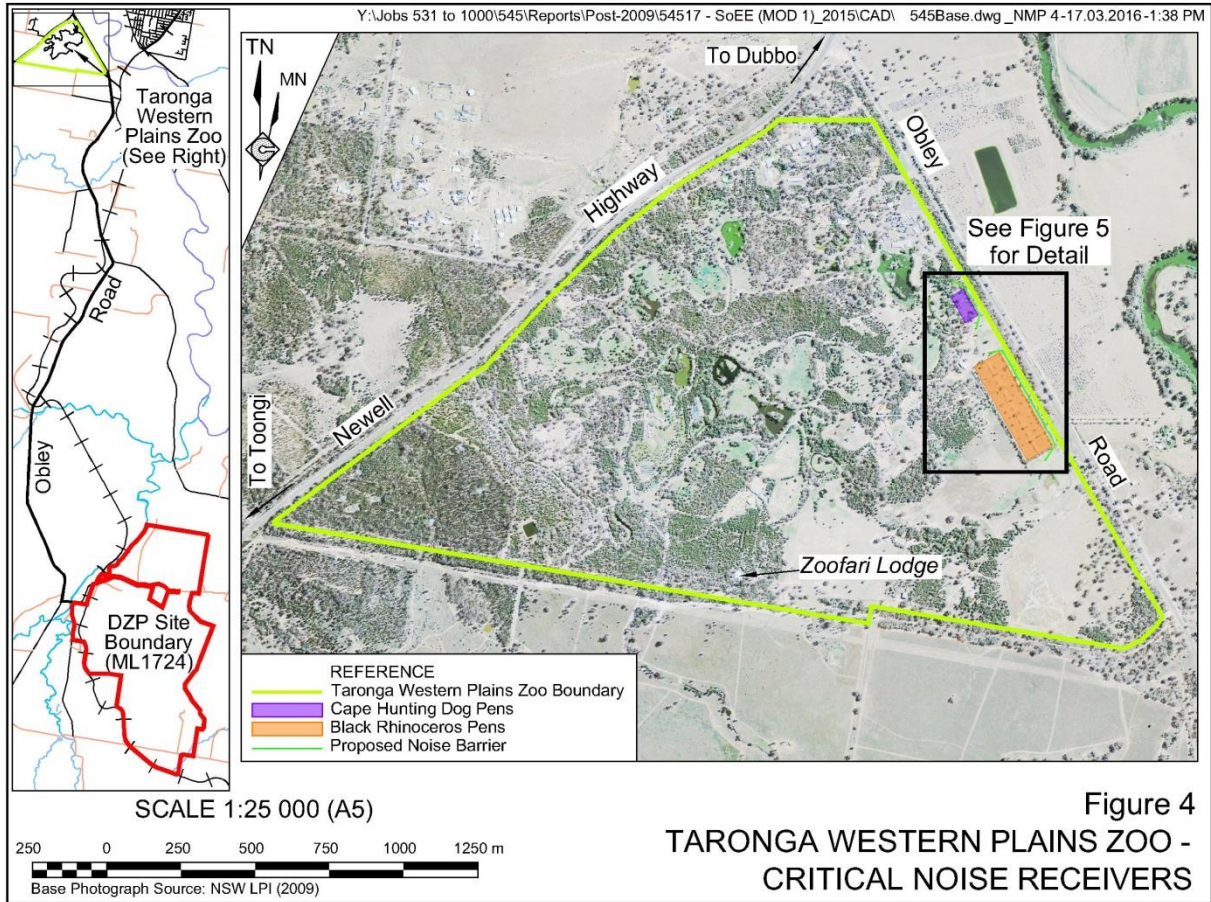
- Noise affected<sup>2</sup>:  $L_{Aeq(15min)} \leq RBL + 10dB(A)$ .
- Highly noise affected<sup>3</sup>:  $L_{Aeq(15min)} \leq 75dB(A)$ .

<sup>1</sup> Unless a written agreement with a landowner to exceed 35dB(A) is negotiated and the DPE is informed in writing as to the terms of the agreement.

<sup>2</sup> The noise level above which there may be some community reaction to noise.

<sup>3</sup> The noise level above which there may be strong community reaction to noise.





When operating outside the standard hours of operation, in accordance with an Out of Hours Work Protocol (refer to Section 7.2.4 and **Appendix 3**), the ICNG recommends that the  $L_{Aeq(15min)}$  noise levels arising from construction activities, when measured at boundary or within 30m of the residence (whichever is the lesser), should not exceed the following levels.

- Noise affected:  $L_{Aeq(15min)} \leq RBL + 5dB(A)$ .

## 6.2 OPERATIONS NOISE CRITERIA

In accordance with *Condition 2* of Schedule 3 of SSD-5251, the noise criteria for all operations undertaken on the Site are provided by **Table 4**.

**Table 4**  
**Site Noise Criteria**

| Location                       | Day                        | Evening                    | Night                      |                          |
|--------------------------------|----------------------------|----------------------------|----------------------------|--------------------------|
|                                | $L_{Aeq} (15 \text{ min})$ | $L_{Aeq} (15 \text{ min})$ | $L_{Aeq} (15 \text{ min})$ | $L_{A1} (1 \text{ min})$ |
| All privately-owned residences | 35                         | 35                         | 35                         | 45                       |

## 6.3 TRAFFIC NOISE CRITERIA

### 6.3.1 Road Traffic Noise Criteria

No traffic noise criteria have been established for the DZP by SSD-5251. In lieu of conditional road traffic noise limits, criteria are established in accordance with the NSW Road Noise Policy (RNP) (DECCW, 2011) (see **Table 5**).

**Table 5**  
**Road Traffic Noise Criteria**

| Road                       | Type of Development  | Noise Level Criterion*           |                                 |
|----------------------------|--|----------------------------------|---------------------------------|
|                            |  | Day <sup>1</sup>                 | Night <sup>2</sup>              |
| Obley Road                 | Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use development | L <sub>Aeq,15hr</sub><br>60dB(A) | L <sub>Aeq,9hr</sub><br>55dB(A) |
| Note 1: 07.00am to 10.00pm |  |                                  |                                 |
| Note 2: 10.00pm to 07.00am |  |                                  |                                 |

### 6.3.2 Rail Traffic Noise Criteria

The Rail Infrastructure Noise Guideline (RING) has been issued by the EPA (2013) sets out the rail noise assessment criteria trigger values for airborne and ground-borne noise. **Table 6** presents the RING airborne noise trigger levels<sup>4</sup> relevant to the Proposal.

**Table 6**  
**Rail Noise Criteria**

| Type of development  | Noise Trigger Level dB(A)<br>(External) <sup>3</sup> |   | Comment  |
|--|--|---|--|
|  | Day <sup>1</sup>                                     | Night <sup>2</sup>                                |  |
| Redevelopment of existing rail line  | 65 L <sub>Aeq</sub> (15-hr)<br>85 L <sub>max</sub>   | 60 L <sub>Aeq</sub> (9-hr)<br>85 L <sub>max</sub> | These numbers represent external levels of noise that trigger the need for an assessment of the potential noise impacts from a rail infrastructure project.<br><br>An 'increase' in existing rail noise levels is taken to be an increase of 2dB(A) or more in L <sub>eq</sub> in any hour or an increase of 3dB(A) or more in L <sub>max</sub> <sup>3</sup> . |
| Note 1: 07.00am to 10.00pm   |  |   |  |
| Note 2: 10.00pm to 07.00am   |  |   |  |
| Note 3: The trigger levels presented in this table should be read with the technical notes of Tables 1 and 3 of the RING |  |   |  |

<sup>4</sup> As the Proposal involves only the use of an above-ground rail network which would not generate ground-borne noise in a receiving building that is higher than airborne noise, ground-borne trigger levels are not considered.

## 7. NOISE MANAGEMENT MEASURES

### 7.1 INTRODUCTION

*Condition 3(8)(b)* of SSD-5251 identifies that this document describes the noise mitigation measures that will be implemented to ensure compliance with *Condition 3(4) to 3(8)* (**Table 1**). This section has been prepared in satisfaction of that requirement.

### 7.2 OFF-SITE (LINEAR INFRASTRUCTURE) CONSTRUCTION

#### 7.2.1 Introduction

The off-site linear infrastructure construction activities to be managed in accordance with the Plan include the following (**Figure 2**).

- Toongi Road, including a bridge over Wambangalang Creek (100% off site).
- Obley Road upgrade (100% off site).
- Gas pipeline from Dubbo to Toongi (99% off site).
- 132kV ETL power line from Geurie to Toongi (80% off site).
- Macquarie River Water Pipeline and associated infrastructure (50% off site).

Sections 7.2.2 to 7.2.4 describe the noise management measures that would be implemented during the construction of this infrastructure.

#### 7.2.2 Operating Hours and Conditions

The hours of operation presented in **Table 7** will be adhered to.

**Table 7**  
**Hours of Operation – Linear Infrastructure Construction**

| Activity                              | Operating Hours   |
|---------------------------------------|---|
| Construction of linear infrastructure | 6:00am to 6:00pm, Monday to Friday.<br>8:00am to 1:00pm, Saturday.<br>No construction to be undertaken on Sundays or Public Holidays. |

*Condition 7* (of Schedule 3) of SSD 5251 permits variation to the hours of operation nominated by **Table 7** if undertaken in accordance with an Out of Hours Work Protocol submitted to, and approved by the Secretary of the DPE. **Appendix 3** presents a template of this protocol, which will be completed prior to any off-site construction programs requiring an extension of the working hours beyond those nominated in **Table 7**.

### 7.2.3 Engineering Noise Controls

During construction the following design and engineering controls will be undertaken in order to minimise noise impact from the DZP.

- Frequency modulated reversing alarms will be installed on mobile equipment.
- Mobile equipment will be fitted with high efficiency mufflers, where available. These will be maintained to manufacturer’s specifications.
- The equipment operated will have sound power levels equivalent to those nominated in **Table 8**.

**Table 8**  
**Construction Plant / Equipment Sound Power Levels**

| Equipment               | Sound Power Level<br>( $L_{eq(15\ min)}$ , dB(A)) | Equipment             | Sound Power Level<br>( $L_{eq(15\ min)}$ , dB(A)) |
|-------------------------|---|-----------------------|---|
| Backhoe/small excavator | 103   | Light/Support vehicle | 76  |
| Compactor               | 116   | Pneumatic wrench      | 97  |
| Crane                   | 106   | Road truck            | 102   |
| Dozer                   | 116   | Road truck idling     | 90  |
| Excavator               | 107   | Scraper               | 110   |
| Front-end loader (FEL)  | 116   | Trencher              | 108   |
| Generator               | 98  | Tamping machine       | 116   |
| Grader                  | 104   | Vibrating roller      | 116   |
| Haul truck              | 108   | Water truck           | 103   |
| Jackhammer              | 107   | Welding truck         | 96  |

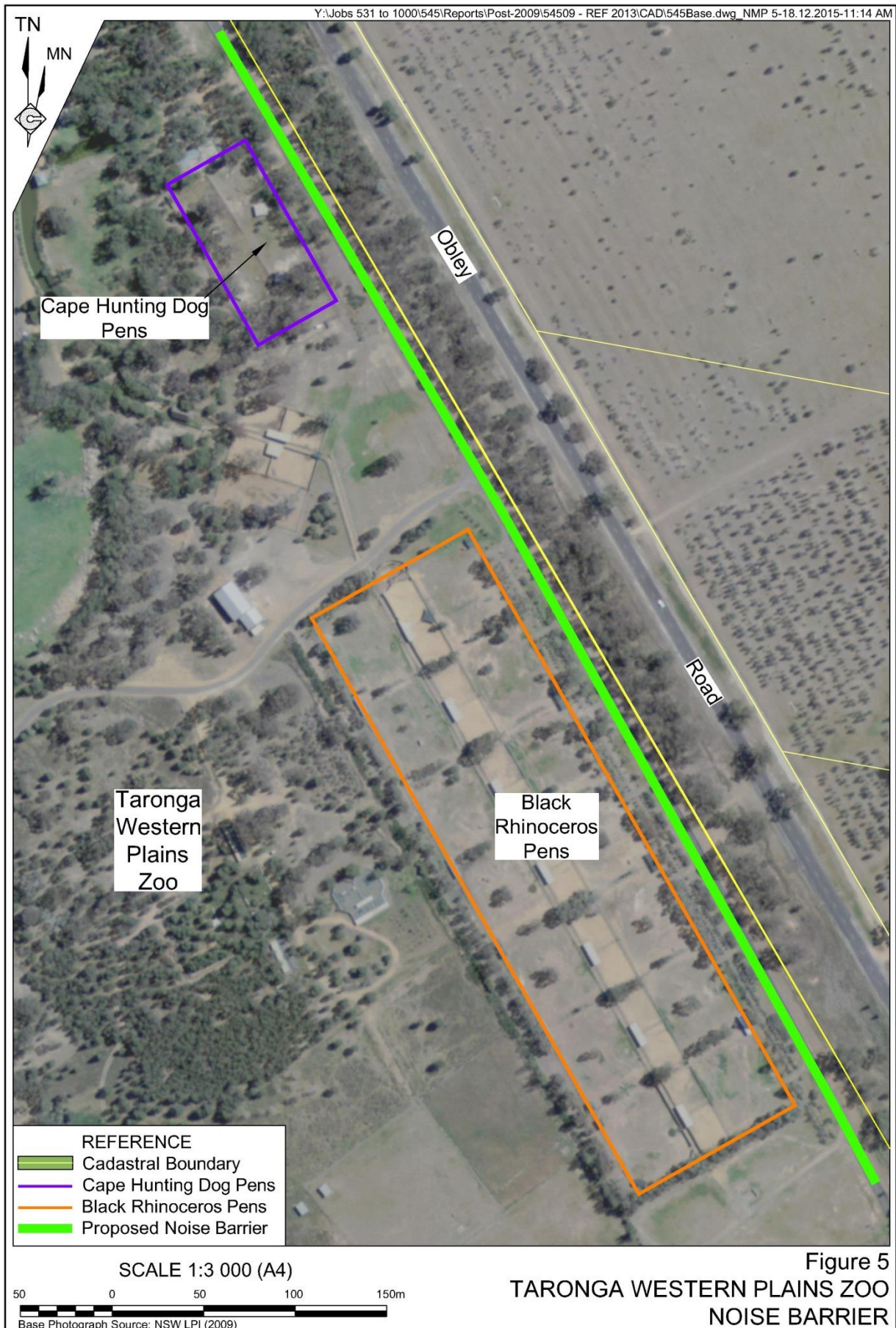
Source: EMM (2013) – Table 4.5

- A 1km long 3m high, hebel (or similar material) noise barrier, constructed just inside the Taronga Western Plains Zoo chain-mesh perimeter fence east of the Black Rhinoceros and Cape Hunting Dog breeding pens. **Figure 5** illustrates the location of the noise barrier.

### 7.2.4 Procedural Noise Controls

During construction the following procedural controls will be undertaken in order to minimise noise impact from the DZP.

- Regular and effective maintenance of all equipment will be conducted. Prompt attention will be given to repair of loose or rattling parts and broken equipment. All maintenance work will be carried out by qualified persons.



- All Project-related personnel, including contractors and their employees, will be made aware of their obligations and responsibilities with regard to minimising noise emissions. Contractors will be required to implement methods and alternative construction procedures for controlling noisy machines as identified in AS2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites". These will include, but not be limited to:
  - minimising the use of air brakes;
  - avoiding vehicle queuing adjacent to any residential receptor, or if unavoidable engines to be switched off;
  - no warming of vehicles permitted before the nominated working hours;
  - conservative driving methods;
  - minimising the volume of use of radios;
  - locating machinery to orientate direct noise away from closest sensitive receptors;
  - undertaking of regular maintenance of machinery to minimise noise emissions;
  - use of quietest suitable machinery reasonably available for selected work activities;
  - ensuring the coincidence of noise/plant machinery working simultaneously in close proximity to sensitive receptors is avoided, where practicable; and
  - promoting awareness and consideration of the expectation of landowners and surrounding residents.
- Occupants of residences adjoining construction activities will be provided with details ahead of time regarding the type of activities, their duration and the specific measures to minimise noise during the period. Occupants will also be provided with contact details for personnel managing the construction activities.
- In consultation local residents, placement of mobile barriers/screens may be undertaken to shield these receptors from noisy activities.
- Construction will be restricted to the operating hours presented in **Table 7**. Construction that is carried out outside these operating hours will be carried out in accordance with an Out of Hours Work Protocol, prepared following the template presented in **Appendix 3** and submitted to the Secretary of the DPE for approval.

## 7.3 ON-SITE CONSTRUCTION

### 7.3.1 Introduction

As identified in Section 1, the Stage 1 construction activities to which the management measures presented in Section 7.3.2 to 7.3.4 apply include the site preparation and construction of the following features depicted on **Figure 1**.

- Site Entrance and Access Road.

- Site Administration Area (incorporating lay down areas for equipment and materials).
- Processing Plant Area (incorporating lay down areas for equipment and materials).
- Laydown and Storage Area.
- Mine Haul Road.
- Residue Storage Facility (RSF).
- Salt Encapsulation Cell 1.
- Initial open cut development.
- Initial Waste Rock Emplacement (WRE) construction.
- Extraction of basalt from a small quarry (developed under separate development consent within the impact footprint of the WRE).
- Linear infrastructure associated with the on-site components of the Macquarie River Water Pipeline and 22kV power line and the Geurie-Toongi 132kV power line.

### 7.3.2 Operating Hours and Conditions

In order to effectively manage noise disturbance the hours of operation presented in **Table 9** will be adhered to.

**Table 9**  
**Hours of Operation – DZP Site Construction**

| <b>Activity</b>               | <b>Operating Hours</b>   |
|-------------------------------|--|
| Other construction activities | 6:00am to 6:00pm, Monday to Friday<br>8:00am to 1:00pm, Saturday<br>No construction to be undertaken on Sundays or Public Holidays unless noise from these activities does not result in any exceedances of noise criteria at any privately-owned residence. |

Construction activities may be undertaken outside of the nominated hours of operations if:

1. the activities undertaken are low noise generating like internal fit-outs, site preparation activities or where the noise levels received will be well below the noise criteria (35dB(A))<sup>5</sup>; or
2. an Out of Hours Work Protocol has been prepared and approved in accordance with Condition.

<sup>5</sup> This will be determined by noise survey from the Obley Road property boundary of the lifestyle blocks (Receivers R22 to R25 – see **Figure 3**).

- If activity inaudible it may proceed.
- If activity audible, a hand held noise monitor will be used to confirm the noise level (in the absence of traffic) is less than 35dB(A).

### 7.3.3 Engineering Noise Controls

The following design and engineering controls will be undertaken in order to minimise noise impact during construction activities on the DZP Site.

- Mobile equipment will be fitted with high efficiency mufflers. These will be maintained to manufacturer's specifications.
- Broadband (frequency modulated) reversing alarms will be installed on mobile equipment.
- The equipment operated will have sound power levels equivalent to those nominated in **Table 8**.

### 7.3.4 Procedural Noise Controls

During construction the following procedural controls will be undertaken in order to minimise noise impact from the DZP.

- Regular and effective maintenance of all equipment will be conducted. Prompt attention will be given to repair of loose or rattling parts and broken equipment. All maintenance work will be carried out by qualified persons.
- Equipment would not be left idling unnecessarily.
- Areas for loading and unloading materials and equipment will be positioned as far away as possible from surrounding residences.
- All personnel, including contractors and their employees, will be made aware of their obligations and responsibilities with regard to minimising noise emissions. Contractors will familiarise themselves with methods of controlling noisy machines and alternative construction procedures as identified in AS2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites".
- Specific instruction / guidance will be provided to construction personnel on minimising noise by:
  - minimising the use of air brakes;
  - no queuing of vehicles adjacent to any residential receptor, or if unavoidable engines to be switched off;
  - parking of vehicles where appropriate to shield locations prior to being used for maintenance work undertaken outside standard hours of operation;
  - no warming of vehicles permitted before the nominated working hours;
  - accessing sites via entry point most remote to receptors;
  - conservative driving methods;
  - minimising the use of radios and loud voices;
  - locating machinery to orientate direct noise away from closest sensitive receptors;
  - placement of mobile barriers/screens or extraction faces adjacent to static rock breaking sources to shield neighbouring receptors;

- undertaking of regular maintenance of machinery to minimise noise emissions;
  - use of quietest suitable machinery reasonably available for selected work activities;
  - ensuring the coincidence of noise/plant machinery working simultaneously in close proximity to sensitive receptors is avoided, where practicable; and
  - encouraging awareness of the expectation of landowners and surrounding residents.
- The use of noisier equipment in exposed locations, such as on top of acoustic bunds, or undertaking of noisier activities or close to residences will avoid noise enhancing weather conditions as far as practicable. Such conditions include prevailing winds towards the closest residential receivers and/or early morning during the cooler months when temperature inversions may be present.
  - A real-time noise monitor will be used to notify personnel if the noise limits nominated in Section 6.1.1 ( $L_{Aeq(15\ min)} > 35\text{dB(A)}$ ) are exceeded, allowing construction management to modify activities in order to reduce the impact from construction (refer to Section 8.5).
  - Construction will be restricted to the operating hours presented in **Table 9**. Construction that is carried out outside these operating hours will be carried out in accordance with an *Out of Hours Work Protocol*, prepared following the template presented in **Appendix 3** and submitted to the Secretary of the DPE for approval.
  - Occupants of residences adjoining construction activities will be provided with details ahead of time regarding the type of activities, their duration and the specific measures to minimise noise during the period. Occupants will also be provided with contact details for personnel managing the construction activities.
  - A 24-hour Community Information Line is advertised so that residents are able to contact site personnel should they have a noise related enquiry.

#### **7.4 MINING OPERATIONS**

***To be included in Stage 2 of the Plan prior to commencement of mining operations***

#### **7.5 ROAD TRANSPORT OPERATIONS**

***To be included in Stage 2 of the Plan prior to commencement of mining operations***

#### **7.6 RAIL TRANSPORT OPERATIONS**

***To be included in Stage 2 of the Plan prior to commencement of mining operations***

## 8. NOISE MONITORING PROGRAM

### 8.1 INTRODUCTION

Condition 8(d) (of Schedule 3) requires that the Plan include a noise monitoring program that uses attended monitoring to evaluate the performance of the project against the criteria identified in Condition 4(of Schedule 3) and include a protocol for determining exceedances of the relevant conditions of the approval. This sub-section has been prepared in part satisfaction of that requirement.

### 8.2 METEOROLOGICAL MONITORING

A meteorological station is operated on the “Whychitella” property (650163E 640816N) adjacent to the DZP Site (see **Figure 6**). The weather data collected, units of measure, frequency, averaging period and method is include in **Table 10**.

All noise monitoring will be accompanied by a quantitative record of weather conditions during the monitoring period together with a qualitative description of weather conditions, including cloud cover, fog etc. This data will be used to correlate environmental conditions with noise levels and derive a relationship between the two factors.

**Table 10**  
**Meteorological Monitoring**

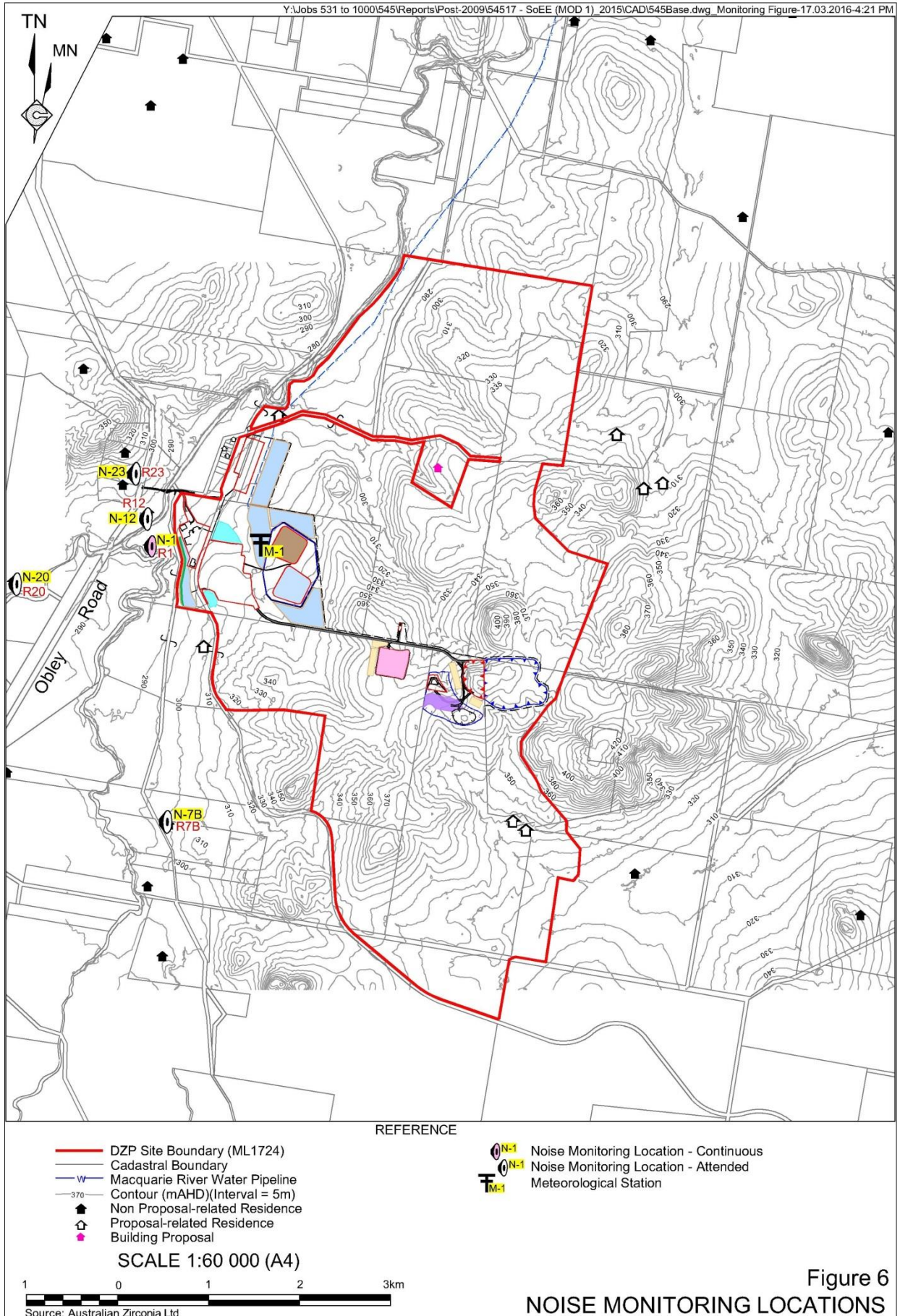
| Parameter             | Units of Measure | Frequency  | Averaging Period |
|-----------------------|------------------|------------|------------------|
| Rainfall              | Mm/hr            | Continuous | 1 hour           |
| Sigma theta           | °C               | Continuous | 10 minute        |
| Temperature at 2m     | Kelvin           | Continuous | 10 minute        |
| Temperature at 10m    | Kelvin           | Continuous | 10 minute        |
| Relative Humidity     | %                | Continuous | 10 minute        |
| Total solar radiation | W/m <sup>2</sup> | Continuous | 10 minute        |
| Wind Direction at 10m | °C               | Continuous | 10 minute        |
| Wind Speed at 10m     | m/s              | Continuous | 10 minute        |

### 8.3 NOISE MONITORING LOCATIONS

Noise monitoring will be undertaken at the locations presented in **Figure 6**. These locations have been categorised as those to be monitored during each attended monitoring campaign (full program monitoring locations) and those to be monitored annually (part program monitoring locations).

- Continuous Noise Monitoring: N-1.
- Full Program Attended Monitoring: N-7B, N-12, N-20, N-23.
- Part Program Attended Monitoring: R4, R6, R7A, R8, R13, R18, R19, R21, R22, R24, R25, R26, R27, R28, R30, R31, R32, R35, R36, R38, R40, R42, R43, R46.

The ‘N’ prefix references the monitoring is for the purpose of ‘Noise’, with the number referencing the property reference used for previous assessments of the DZP (for ease of comparison to predictive assessments).



The remaining locations retain the ‘R’ prefix of previous assessments, however, if monitored in accordance with the protocol established in Section 8.4.3, an ‘N’ prefix will be assigned to denote the fact that the monitoring was for the purpose of ‘Noise’.

**Table 11** identifies the location of each location, as identified by EPL 20702.

**Table 11  
Meteorological Monitoring**

| EPL Monitoring Point | DZP Reference | Easting | Northing |
|----------------------|---------------|---------|----------|
| 3                    | N-1           | 648938  | 6408350  |
| 4                    | N-23          | 648744  | 6409163  |
| 5                    | N-7B          | 649124  | 6405329  |
| 6                    | N-12          | 648893  | 6408687  |
| 7                    | N-20          | 647440  | 6407951  |

## 8.4 ATTENDED MONITORING

### 8.4.1 Purpose

The purpose of the attended noise monitoring will be to confirm compliance with the criteria identified in Sections 6.1.1 and 6.2. The locations chosen for the full program of attended monitoring reflect the closest non-project related receivers that noise modelling identified as likely to receive noise levels approaching the noise criteria. Activities resulting in occasional or periodic elevated noise levels at other receivers would be identified through a pre-monitoring noise survey and attended monitoring undertaken to review noise levels against criteria.

### 8.4.2 Methodology

Attended noise monitoring will be undertaken using a hand-held noise meter in accordance with the following documents.

- NSW Industrial Noise Policy (INP).
- AS 1055.1-1997 “Acoustics – Description and Measurement of Environmental Noise – General Procedures”.

The attended monitoring will be undertaken using a Type 1 integrating sound level meter with 1/3 octave filter and will be set to A-weighting (fast response). The monitoring will expressly seek to identify and quantify any relevant modification factors referred to in Chapter 3 of the INP.

All acoustic instrumentation employed throughout the monitoring program will comply with the requirements of AS IEC 61672 2004 “*Electroacoustics - Sound Level Meters*”, as amended, and will carry current NATA or manufacturer calibration certificates. Instrument calibration will be checked before and after each survey, with the variation in calibrated levels not exceeding ±0.5dB(A).

The maximum ( $L_{Amax}$ ), and the energy equivalent ( $L_{Aeq}$ ) intrusive noise level over a 15 minute measurement period will be recorded. If necessary, other descriptors such as  $L_{A10}$ ,  $L_{A50}$ ,  $L_{A90}$ ,  $L_{A99}$  and  $L_{Amin}$  could also be recorded. Wherever possible, the  $L_{A90}$  noise level (i.e. without contributions from DZP activities) will be recorded to identify the prevailing a background noise level.

Information that will be recorded during monitoring and about each location will include:

- the name of the person undertaking the monitoring;
- location(s) of the monitoring;
- recording intervals (date and times);
- meteorological conditions i.e. temperature, humidity, cloud cover, and wind speed and direction drawn from the on-site meteorological station;
- statistical noise level descriptors together with notes identifying the principal noise sources;
- instrument make, model, serial number and calibration details; and
- a brief description of activities occurring during the monitoring period.

### **8.4.3 Frequency**

Attended monitoring will be undertaken quarterly at the Full Program Monitoring Locations identified in Section 8.2 and on **Figure 6**.

Monitoring of the Part Program Monitoring Locations will be undertaken based on pre-monitoring noise survey undertaken each quarter. That is, prior to the commencement of the quarterly monitoring, a “spot check” of noise levels surrounding the DZP Site will be undertaken and additional monitoring locations (to the Full Program Monitoring Locations) will be selected based on where activities are audible and approaching noise limits.

### **8.4.4 Period**

During construction, attended noise monitoring will occur during the “day” period<sup>6</sup> only on three consecutive operating days for at least 1.5 hours.

If an Out of Hours Work Protocol has been completed and approved, attended monitoring will also be undertaken during the “evening” and/or “night” periods<sup>7</sup> (as relevant to the revised hours of operation) on three consecutive operating days for at least 15 minutes.

On commencement of operations, attended noise monitoring will also be undertaken on three consecutive operating days during the, “evening” and “night” period for:

- 30 minutes during the evening; and
- 1 hour during the night period.

In scheduling monitoring, best attempts will be made to avoid periods of high wind or consistent rain. Weather forecasts will be reviewed and monitoring postponed where there is reasonable probability (>50% chance) of these conditions.

In the event monitoring coincides with periods of rainfall or high wind, the personnel responsible for monitoring will be required to:

- cease monitoring during periods of rain;
- cease monitoring during windy conditions for as long as possible; and
- if calm conditions do not prevail after a reasonable period (2 hours) log wind conditions.

<sup>6</sup> Day period = 7:00am to 6:00pm

<sup>7</sup> Evening period = 6:00pm to 10:00pm      Night period = 10:00pm to 7:00am

If possible, the acoustic monitoring personnel will extend monitoring by several days to obtain monitoring data during the three periods under INP compliant conditions.

At the completion of monitoring, weather data will be reviewed and included as part of the monitoring report. Periods of non-INP compliant weather will be highlighted and if compliance with noise criteria cannot be assessed due to prevailing weather conditions, discussion provided as to the likelihood that operations were compliant with noise criteria. If noise monitoring cannot confirm compliance with noise criteria due to prevailing weather conditions for two consecutive quarters, supplementary monitoring will be scheduled at monthly intervals until compliance with noise criteria can be confirmed.

## 8.5 CONTINUOUS MONITORING

### 8.5.1 Purpose

Continuous monitoring is not a condition of SSD-5251, but will be used to monitor noise levels and alert management of increasing noise levels or exceedances of noise criteria.

A mobile unattended (real-time) noise monitor will be installed at the closest residence to activities on the DZP Site (N-1 – **Figure 5**). The noise monitor will be capable of providing continuous real-time noise information to site via the 3G network and will include an alert of noise levels exceeding criteria.

Compliance with noise criteria is not required with the purpose to provide warning of rising noise levels which could be received at receivers located further to the west and south.

### 8.5.2 Methodology

The monitor will be set with a noise level alert at the appropriate noise criterion:

- 40dB(A) during day time construction operations; and
- 35dB(A) during non-standard hours construction and operations.

During day shift, a notification will be received by the Environment and Community Manager (or delegate) of  $L_{Aeq(15 \text{ minute})}$  noise levels exceeding 40dB(A). In the event of non-standard hours of operation, notifications will be received by the night shift supervisor (or delegate) of  $L_{Aeq(15 \text{ minute})}$  noise levels exceeding 35dB(A).

An investigation into the source of elevated noise levels will be immediately commenced and the Mine Manager informed of the level and location of the noisy equipment / operations. The reactive management measures of the Noise Management System (Section 9.3.2.1) will then be implemented to mitigate the identified noise source.

Following elevated noise levels during non-standard hours of operation, AZL technical staff will review the overnight data and refer this to the Environment and Community Manager and/or Mine Manager. The play-back facility of the monitor will be used to confirm the level and location of the noise exceedance with modifications to operations in accordance with the reactive management measures of the Noise Management System (Section 9.3.2.1) implemented from the commencement of the next 'night shift'.

If required, the noise monitor may be moved to investigate noise emissions under various meteorological conditions, or in response to complaints.

### 8.5.3 Validation of Continuous Noise Monitoring

On a quarterly basis, the noise levels measured by the real-time noise monitor will be compared to those recorded during the attended quarterly monitoring at the same location. The comparison will be used to validate the monitoring result of the real-time monitor.

In the event that the  $L_{Aeq(15\text{ minute})}$  noise levels vary by more than 1-2dB(A), an independent acoustic consultant will be engaged to review the operation and performance of the real-time noise monitor and calibrate the device as required.

## 8.6 SOUND POWER LEVEL MEASUREMENT AND AUDITS

Within 6 weeks of construction activities commencing and annually thereafter, the sound power levels (SWL) of the equipment will be measured and compared to the target SWLs of **Table 8**. In the event that the SWL of an item of equipment exceeds the target SWL, remedial maintenance of that piece of equipment will be undertaken to reduce the SWL, or it will be removed from operation and replaced.

## 8.7 SUPPLEMENTARY NOISE SURVEY

In the event of a noise-related complaint, the Company would initially review the results of the noise monitoring program and make the results of that monitoring and/or subsequent investigation available to the complainant. In the event that this does not resolve the complaint, the Company would undertake a supplementary attended noise survey.

## 8.8 TRAFFIC NOISE MONITORING

*To be included in Stage 2 of the Plan prior to commencement of mining operations*

## 8.9 EVALUATION OF RESULTS

A noise monitoring report will be prepared by the person or company responsible for the monitoring within 14 days of each attended noise monitoring event. That report will include an assessment of the monitoring results against the criteria identified in *Condition 1* (of Schedule 3) of SSD-5251. The monitoring report will be reviewed by the Environmental Superintendent and a copy included within the Annual Environmental Management Report.

In the event that the noise monitoring report identifies an exceedance of the relevant criteria, the procedures identified in Section 9.3 will be implemented

## 9. NOISE MANAGEMENT SYSTEM

### 9.1 INTRODUCTION

As nominated in **Table 2**, an objective of AZL with respect to noise management is to maintain noise levels received at sensitive receivers below the noise criteria. However, it is noted that *Appendix 5* of SSD-5251 identifies conditions under which the noise criteria do not apply, namely:

- a) wind speeds greater than 3m/s at 10m above ground level; or
- b) stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- c) stability category G temperature inversion conditions.

These conditions are atypical of prevailing conditions, i.e. occur infrequently, and therefore operations have been designed to manage noise generated and received under the more common prevailing conditions. As a result, should these meteorological conditions occur, the noise levels received at sensitive receivers surrounding the Site could, without further management, exceed the criteria of SSD-5251 and Environment Protection Licence.

The following identifies the proactive and reactive measures that will be implemented as part of a Noise Management System to reduce the potential for exceedances of noise criteria.

### 9.2 PROACTIVE MANAGEMENT

#### 9.2.1 Meteorological Forecasting

Three day forecasts are available for the Dubbo Airport Weather Station (AWS) operated by the Bureau of Meteorology (BoM). These data will be reviewed daily by the managing AZL personnel (refer to Section 13) who will check weather conditions for coming days and plan accordingly for adverse weather.

Adverse weather in terms of noise impacts relates to either:

- winds in the direction of the closest sensitive receivers, i.e. from the northwest to southwest quadrants; or
- conditions likely to be indicative of temperature inversion, i.e. fog or frost conditions.

Considering the local wind data collected from the weather station operated by AZL, winds from the northwest to southwest quadrants are most prevalent in summer, with frosts and fogs most likely during the cooler months between May and August. Seasonal conditions will be reviewed annually with a view to modifying long-term forecasting and planning of activities on the Site.

#### 9.2.2 Proactive Mitigation Measures

Preparatory measures that can be put in place for adverse weather include:

- Long-term (annual) scheduling of activities to limit noise generating activities during the seasonal or daily periods when noise enhancing conditions are most likely to occur.

- Short-term modification of noise generating activities in response to forecasting of noise-enhancing conditions in the short-term (based on 3-day forecasts from the Dubbo AWS). Modifications could include the following.
  - Relocation of activities, e.g. surface clearing or soil stripping, to locations further from sensitive receivers or afforded better noise attenuation (by natural or constructed screening).
  - Modification (reduced intensity) of activities, e.g. reduction in the number of operating noise sources.
  - Modification to period over which activities are to occur, e.g. avoidance of early mornings and late evenings.
  - Postponement of activities until forecast provides for a cessation of noise enhancing conditions.

## **9.3 REACTIVE MANAGEMENT**

### **9.3.1 Triggers**

Three triggers for reactive management will be applied.

- a) Exceedance of noise criteria by real-time noise monitoring. While not a notifiable incident, such an occurrence will indicate potential for noise complaint or exceedance of noise criteria following attended noise monitoring (refer to b and c below) and trigger the implementation of the response and corrective action measures described in Section 9.3.2.1.
- b) Exceedance of noise criteria established through attended noise monitoring. Any record of noise exceeding the criteria nominated in Section 6 will trigger the response and corrective action measures described in Section 9.3.2.2.
- c) Noise Complaint. Any complaint received, either directly or via Council, EPA or other regulatory agency, will trigger the implementation of the response and corrective action measures described in Section 9.3.2.3. This will be especially relevant to off-site construction activities where no formal attended or unattended monitoring will be undertaken.

### **9.3.2 Response and Corrective Action**

#### **9.3.2.1 Real Time Noise Monitoring Results**

Following identification of the cause for elevated noise emissions, and notification of the Mine Manager, the following actions will be implemented.

1. The Environment and Community Manager (or delegated representative) will review meteorological conditions to assess whether these represent noise enhancing conditions under which the noise criteria do not apply (in accordance with the INP).
2. If the noise can be isolated to a specific piece of equipment, the Manager will make arrangements to alter the configuration of equipment, or stand down specific equipment, so that the noise levels are reduced.

3. If the noise cannot be isolated to specific equipment, the Manager will review opportunities to:
  - a. Relocate activities temporarily;
  - b. Replace or remove specific equipment to reduce the cumulative SWL of the activity(ies);
  - c. Construct or install noise mitigation such as earth bunds, fences, cladding.
4. The Manager will inform the Environment and Community Manager (or delegated representative) when activities have been altered.
5. The Environment and Community Manager will recheck noise levels by hand-held noise monitor or recheck the real-time noise monitoring data and then inform the Manager of the new noise levels.
6. Recorded noise levels, response and results will be logged, however, no publication or other notification required.

### 9.3.2.2 Noise Criteria Exceedance (Attended Monitoring)

If attended noise monitoring indicates that noise exceeds criteria, the following response and action plan will be implemented.

1. Immediately after obtaining exceedance information, the Environment and Community Manager (or delegated representative) will contact the Manager (of the work to which the noise is attributable) and inform them of the noise level and location of the noise exceedance.
2. The Environment and Community Manager (or delegated representative) will review meteorological conditions to confirm these represent conditions for which the noise criteria apply.
3. Notification procedures (of community and government agencies) will be commenced in accordance with Section 11.
4. The Manager will immediately investigate the source of the noise, review the performance of equipment and if necessary make arrangements to alter the configuration of equipment, or stand down specific equipment, so that the noise levels are reduced.
5. The Manager will inform the Environment and Community Manager (or delegated representative) when site operations have been altered.
6. The Environment and Community Manager will recheck noise levels by hand-held noise monitor and then inform the Manager of the new noise levels.
7. Unless meteorological conditions at the time reflected those for which noise criteria do not apply (refer to Section 9.1), a Non-Conformance and Corrective Action Report will be produced for the exceedance.
8. Within two weeks of obtaining any data showing an exceedance of noise criteria, the Environment and Community Manager will notify in writing any affected landowners or tenants. If AZL is unable to reduce the noise level to within the noise trigger levels then the Environment and Community Manager will advise the affected resident(s) of measures being undertaken to limit noise levels, provide an indication as to the longevity of construction activities generating the noise, and continue to provide the affected residents with regular monitoring results until construction activities are either completed or operating within the noise trigger levels.

### **9.3.2.3 Noise Complaint**

In the event of a complaint referencing noise being received, the following response and action plan will be implemented.

1. The complaint will be logged with the person attending the “Duty Phone”.
2. The person attending the “Duty Phone” will log the details of the complaint and immediately notify the Manager responsible for the specific activity (this could be an AZL manager or manager of contracted construction company) and the Environment Superintendent, of the complaint.
3. The Manager will immediately investigate the complaint, the source of the noise, review performance of equipment and if necessary make arrangements to alter the configuration of equipment, or stand down specific equipment, so that the noise levels are reduced.
4. The Manager will inform the Environment and Community Manager when site operations have been altered.
5. The Environment and Community Manager will review operations and noise emissions before contacting the complainant. If the complainant remains unsatisfied, supplementary noise monitoring will be arranged as described in Section 8.6.
6. Section 11 of the Plan and Section 15 of the Environmental Management Strategy will be followed as it details the procedure for the recording, investigating, communicating and reporting of all complaints.
7. If supplementary noise monitoring is undertaken, the Environment and Community Manager will notify the complainant of the results of noise monitoring within 2 weeks. If AZL is unable to reduce the noise level to within the noise trigger levels then the Environment and Community Manager will advise the affected resident(s) of measures being undertaken to limit noise levels, provide an indication as to the longevity of construction activities generating the noise, and continue to provide the affected residents with regular monitoring results until construction activities are either completed or operating within the noise trigger levels.

## **10. COMPLAINTS HANDLING AND RESPONSE**

In order to receive, record and respond to any complaints in a timely manner, the Company has established the following.

- Telephone via a 24-hour, 7 day per week Community Information Line.
- A dedicated email address ([dzp@alkane.com.au](mailto:dzp@alkane.com.au)).
- Registration of complaint portal on the Company web site ([www.alkane.com.au](http://www.alkane.com.au)).

*Section 10.1* of the DZP *Environmental Management Strategy* describes the complaints handling procedure and *Section 10.2* of the DZP *Environmental Management Strategy* the approach to dispute resolution.

Response measures on receipt of a complaint are described in Section 9.3.2.3. Notification of a complaint will be based on whether it classifies as an incident or not (see Section 11).

## 11. INCIDENT MANAGEMENT, NOTIFICATION AND REPORTING

### 11.1 INCIDENT IDENTIFICATION

SSD-5251 defines an incident as “a set of circumstances that:

- causes or threatens to cause material harm to the environment; and/or
- breaches or exceeds the limits or performance measures/criteria.”

In accordance with the definition provided by Section 147 of the POEO Act, harm to the environment is deemed to be material if:

- i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or
- ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations).

An incident which causes or threatens to cause material harm to the environment is referred to as a **Pollution Incident**. The EPA published document *Preparation of Pollution Incident Response Management Plans* (EPA, 2012) excludes noise emissions from the definition of a pollution incident (see below).

*an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise.*

An incident which result in the exceedance of noise criteria is referred to as a **Non-compliance Incident**.

### 11.2 INCIDENT MANAGEMENT AND NOTIFICATION

#### 11.2.1 Pollution Incident

As noted in Section 11.1, the EPA does not consider an incident involving noise emissions alone to be a pollution incident.

AZL maintains and implements a Pollution Incident Response Management Plan for the DZP which documents the notification and response measures to be implemented in the event of a pollution incident.

#### 11.2.2 Non-Compliance Incident

On identification of a non-compliance against noise criteria, which may follow receipt of a complaint, the Mine Manager will be notified and an investigation into the source of the non-compliant or complaint causing emissions commenced.

On identification of the source of the offending noise, the Mine Manager, Environment and Community Manager or delegate will implement one or more of the corrective measures identified in the Noise Management System (see Section 9.3).

An investigation into the cause of the non-compliant noise emissions will be undertaken involving the personnel involved, supervisor personnel, relevant Manager and/or Environment Manager. The investigation will review all reasonable and feasible steps which may be taken to:

- correct the activity resulting in elevated noise emissions; and
- prevent recurrence.

At the earliest opportunity<sup>8</sup> following the completion of the investigation, a report will be prepared and submitted to the DPE and EPA summarising the investigation and proposed corrective and preventative measures.

If the incident was identified following receipt of complaint, the complainant will be provided with a report confirming the incident, source or cause of the incident, actions taken and ongoing management to prevent subsequent incident at the earliest opportunity (see also Section 10).

### **11.3 INCIDENT REPORTING**

In addition to the reports prepared for notification purposes (see Section 11.2.2), a short report documenting any non-compliance incident, actions taken and results of the corrective actions will be compiled by the Environment Manager, Environmental Superintendent or equivalent position. This report will be provided to the regulatory authorities and/or complainant at the earliest opportunity.

A summary of all incidents, including dates of occurrence, corrective measures taken and success of these measures will be compiled and reported in the Annual Environmental Management Report to the DPE and Annual Return to the EPA.

## **12. PUBLICATION OF MONITORING INFORMATION AND REPORTING**

AZL will include all attended noise monitoring reports as appendices to the Annual Environmental Management Report. That document, once approved by the relevant government agencies, would be published on the Company's website.

In accordance with the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997*, AZL will make any noise monitoring data available on AZL's website within 14 days of obtaining the data. In addition, AZL will provide a copy of obtained data (the value of each individual monitoring sample) free of charge to a member of the public when requested. The data will be published in a format that includes raw data values, is comprehensible by the general public and also includes all accompanying necessary information. These requirements are presented in detail in *Requirements for Publishing Pollution Monitoring Data* (EPA, 2013).

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<sup>8</sup> Unless justification is provided at the time, earliest opportunity refers to the end of the next business day (from completion of investigation) and within 7 days of the incident.

## 13. PLAN IMPLEMENTATION

### 13.1 ROLES AND RESPONSIBILITIES

**Table 12** outlines the roles and responsibilities of personnel with reference to noise management.

**Table 12**  
**Roles and Responsibilities**

| <b>Role</b>                                     | <b>Responsibilities</b>   |
|---|---|
| Chief Operations Officer                        | Ensure adequate resources are available to enable implementation of the Plan.   |
| General Manager NSW                             | Ensure community notifications and negotiations are undertaken as nominated in the Plan and in a timely manner.   |
| The Manager (Construction or Mining Operations) | Ensure reviews of meteorological forecasts are completed prior to the commencement of noisy linear infrastructure construction activities.<br>Relocate or postpone noisy activities in the event of adverse (noise enhancing) winds.<br>Initiate investigations of noise complaints as received from public or regulator.<br>Inform the Environment and Community Manager of identified causes of elevated noise levels and any alterations to site operations. |
| Environment and Community Manager               | Ensure the implementation of this Plan.<br>Ensure pre-monitoring noise survey is completed and revise or extend the attended noise monitoring program as necessary.<br>Ensure attended noise monitoring is undertaken.<br>Review noise monitoring results, as generated following attended noise monitoring program and enter into environmental database.  |
| Environment and Community Manager (Cont'd)      | Respond to alerts of continuous noise monitor (during the day time).<br>Obtain overnight alerts from continuous noise monitor and instigate investigations as required.<br>Assist the Manager in investigations of a recorded incident.<br>Prepare a report to regulatory authorities or neighbours following a recorded incident.<br>Ensure employees are competent through training and awareness programs.   |
| Maintenance Manager                             | Ensure all equipment used for blast development and initiation is in good working order.  |
| Mobile Equipment / Processing Operators         | Ensure areas of disturbance and hours of operation strictly adhere to instructions provided by the Manager, Environment and Community Manager or the Plan.<br>Operate equipment in accordance with design and operational specifications and with consideration of those in close proximity.<br>Report any anomalous noise emissions or unaccounted for events to the Manager, or Environment and Community Manager.  |
| All Personnel                                   | Follow any instructions provided by the Environment and Community Manager or Manager.<br>Travel to and from the DZP Site in a courteous manner, avoiding unnecessary or excessive vehicle noise.  |

## **13.2 COMPETENCE TRAINING AND AWARENESS**

Prior to commencement of work on the DZP Site or specific off-site construction sites, personnel and subcontractors will undertake a DZP Induction. The induction will address occupational health and safety, quality, and environmental issues. *Section 6.3.2* of the DZP *Environmental Management Strategy* describes the overall content of induction to be undertaken. After completing the induction workers will sign a statement of attendance and records of this are kept in the site office.

AZL and contract personnel will also be provided with environmental awareness training. As discussed in *Section 6.3.3* of the DZP *Environmental Management Strategy*, training will be targeted to specific activities or locations depending on the potential for environmental impact. The training will be prepared and delivered by the Environment Manager (or equivalent position) or delegate, with specific training relevant to noise management to include the following.

- Incident identification and reporting.
- Noise Management Plan obligations and requirements.
- Engineering and Procedural Noise Controls (Noise Minimisation).

## **13.3 REVIEW (AND CONTINUAL IMPROVEMENT PROTOCOL)**

In accordance with Condition 5, of Schedule 5, of SSD-5251, the Plan will be reviewed and if necessary advised within 3 months of:

- a) the submission of an Annual Review of operations in accordance with Condition 4, of Schedule 5, of SSD-5251 (to be completed by 30 September each year);
- b) any notifiable incident related to noise emissions;
- c) any internal or external audits undertaken of the DZP; and/or
- d) any significant modifications to operations that may influence noise management.

These reviews will consider monitoring data, complaints and management measures to ensure noise levels are reduced as far as reasonably possible. This will ensure the adequacy of the Plan and allow for opportunities of adaptive management and continual improvement.

## 14. REFERENCES

Australian Standard (AS) 1055.1-1997. *Acoustics – Description and Measurement of Environmental Noise – General Procedures.*

Australian Standard (AS) IEC 61672-2004. *Electroacoustics - Sound Level Meters.*

Environment Protection Authority (EPA) (1999). *NSW Industrial Noise Policy.*

Environment Protection Authority (EPA) (2012). *Environmental Guidelines: Preparation of Pollution Incident Response Management Plans, March 2012.*

Environmental Protection Authority (EPA) (2013). *Requirements for Publishing Pollution Monitoring Data.*

R.W. Corkery & Co. Pty Limited (RWC) (2013). *Environmental Impact Statement for the Dubbo Zirconia Project, September 2013.* Prepared on behalf of Australian Zirconia Limited.

# **Appendix 1**

## **Noise-related Conditions of SSD-5251**

Schedule 3, Conditions 2 to 7 and 24  
Schedule 5, Condition 3

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**SCHEDULE 3**  
**ENVIRONMENTAL PERFORMANCE CONDITIONS**

**ACQUISITION UPON REQUEST**

1. Upon receiving a written request for acquisition from the owner of R50, the Applicant shall acquire the land in accordance with the procedures in conditions 4 and 5 of schedule 4.

*Note: To interpret the land referred to in this condition, see the figure in Appendix 4.*

**NOISE**

**Noise Mitigation – Western Plains Zoo**

2. Prior to undertaking any construction on Obley Road between Camp Road and the Newell Highway, the Applicant shall construct a 3 m high and 1 km long road noise barrier on land owned by the Zoo and in consultation with the Zoo, to the satisfaction of the Secretary.

In the event that there is a dispute between the Applicant and the Zoo about the implementation of this condition, then either party may refer the matter to the Secretary for resolution.

**Hours of Operation**

3. The Applicant shall comply with the operating hours set out in Table 1, unless the applicant has written approval from the Secretary to temporarily alter the operational hours due to an emergency situation.

*Table 1: Operating Hours*

| <b>Activity</b>   | <b>Operating Hours</b>   |
|---|--|
| Mining operations (excluding the operation of the ore processing facility)  | 7 am to 6 pm, Monday to Friday<br>8 am to 5 pm, Saturday<br>No activities on Sundays or Public Holidays  |
| Operation of the ore processing facility and receipt of processing reagents | 24 hours a day, 7 days a week  |
| Construction of linear infrastructure                                       | 7 am to 6 pm, Monday to Friday<br>8 am to 1 pm, Saturday<br>No construction to be undertaken on Sundays or Public Holidays   |
| Other construction activities   | 7 am to 6 pm, Monday to Friday<br>8 am to 1 pm, Saturday<br>No construction to be undertaken on Sundays or Public Holidays unless noise from these activities does not result in any exceedances of the noise criteria in Table 2 at any privately-owned residence |
| Dispatch of refined ore products and receipt of limestone products          | 6 am to 10 pm, Monday to Friday<br>8 am to 5 pm, Saturday<br>No activities on Sundays or Public Holidays   |

**Noise Criteria**

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land (excluding the noise generated by the construction of the project's linear infrastructure).

*Table 2: Noise Criteria dB(A)*

| <b>Location</b>                | <b>Day</b>                      | <b>Evening</b>                  | <b>Night</b>                    |                               |
|--------------------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|
|                                | <i>L<sub>Aeq</sub> (15 min)</i> | <i>L<sub>Aeq</sub> (15 min)</i> | <i>L<sub>Aeq</sub> (15 min)</i> | <i>L<sub>A1</sub> (1 min)</i> |
| All privately-owned residences | 35                              | 35                              | 35                              | 45                            |

Noise generated by the development (excluding the noise generated by the construction of the project's linear infrastructure) is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (or its latest version). Appendix 5 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 a written agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

**Operating Conditions**

5. The Applicant shall:
- (a) implement all reasonable and feasible measures to minimise the construction, operational, low frequency, road and rail noise of the development;
  - (b) ensure Australian Standard AS 2436-2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites" is implemented during the construction of any buildings on the site;
  - (c) operate a comprehensive noise management system on site that uses a combination of meteorological and noise monitoring data to guide the planning of operations and the implementation of noise mitigation measures to ensure compliance with the relevant conditions of this consent;
  - (d) minimise the noise impacts of the development during meteorological conditions when the noise criteria in this consent do not apply (see Appendix 5);
  - (e) ensure that its rail spur is only accessed by locomotives that are approved to operate on the NSW rail network in accordance with the noise limits in the relevant rail authority's EPL;
  - (f) use its best endeavours to ensure that rolling stock is selected to minimise noise; and
  - (g) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent and, if necessary, adjust the scale of operations on site to meet the criteria in this consent,
- to the satisfaction of the Secretary.

**Construction – Linear Infrastructure**

6. The Applicant shall manage noise from the construction of linear infrastructure in accordance with the noise management levels defined in the *Interim Construction Noise Guideline*.
7. In seeking any variations to the construction hours (see Table 2), the Applicant shall submit an Out of Hours Work Protocol to the Secretary. This protocol must:
- (a) be prepared in consultation with the EPA and any people who may be affected by the proposed variation; and
  - (b) address the relevant requirements of the *Interim Construction Noise Guideline*.

**Noise Management Plan**

8. The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval prior to any development under this consent, unless the Secretary agrees otherwise;
  - (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent and procedures within this plan, including procedures to minimise noise generated by construction activities and unloading and loading trains;
  - (c) describe the proposed noise management system in detail;
  - (d) include noise monitoring program that:
    - uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent;
    - evaluates and reports on:
      - the effectiveness of the noise management system;
      - compliance against the noise criteria in this consent; and
      - compliance against the noise operating conditions; and
    - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

### Processing Plant Design and Validation

21. Prior to commissioning the ore processing facility on the site, the Applicant shall:
- finalise the detailed design of the emission control measures at the ore processing facility to ensure:
    - it has TM-1 compliant sample ports so sampling of emissions will comply with the EPA's *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW 2006* (or its latest version); and
    - compliance with the minimum stack height detailed in the EIS, unless otherwise agreed with the EPA; and
  - prepare a revised air quality impact assessment to predict the emissions from the development at surrounding sensitive receivers based on the final design of the ore processing facility, in consultation with the EPA and to the satisfaction of the Secretary.

*Note: The revised air quality impact assessment must be undertaken in accordance with the relevant methods and guidelines, including EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW 2005* (or latest version).*

22. Within 1 month of commissioning the ore processing facility, unless the Secretary agrees otherwise, the Applicant shall prepare an emissions validation report, which includes monitoring to compare the actual emissions with:
- the predicted emissions in the revised air quality impact assessment in condition 21 (b) above; and
  - the criteria in Table 7,
- in consultation with the EPA and to the satisfaction of the Secretary.

### Air Quality Management Plan

23. The Applicant shall prepare and implement a detailed Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
- be prepared in consultation with the EPA, and be submitted for approval prior to the commencement of construction activities under this consent, unless the Secretary agrees otherwise;
  - describe the measures that would be implemented to ensure compliance with air quality criteria and operating conditions of this consent;
  - describe the proposed air quality management system;
  - include an air quality monitoring program that:
    - adequately supports the proactive and reactive air quality management system;
    - evaluates and reports on:
      - the effectiveness of the air quality management system; and
      - compliance with the air quality operating conditions; and
    - defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents; and
  - include procedures and a schedule for the preparation of emissions validation reports for the processing plant during the operation of the development.

### METEOROLOGICAL MONITORING

24. Prior to undertaking any development on the site, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:
- complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
  - is capable of measuring temperature inversion conditions (stability category) determined by the sigma-theta method in accordance with the *NSW Industrial Noise Policy*, unless a suitable alternative is approved by the Secretary following consultation with the EPA.

### RADIATION MANAGEMENT

#### Radiation Management Plan

25. The Applicant shall prepare and implement a Radiation Management Plan for the development to the satisfaction of the Secretary. This plan must:
- be prepared in consultation with EPA and DRE by a suitably qualified expert/s whose appointment has been approved by the Secretary;
  - be submitted for approval prior to commencing mining operations on the site, unless the Secretary agrees otherwise;
  - be consistent with the *Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing* (ARPANSA, 2005);
  - describe:
    - the measures that would be implemented to ensure compliance with the ARPANSA Public Dose Limit;

**SCHEDULE 5  
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING**

**ENVIRONMENTAL MANAGEMENT**

**Environmental Management Strategy**

1. The Applicant shall prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
  - (a) be submitted to the Secretary for approval prior to the commencement of an activity associated with the development;
  - (b) provide the strategic framework for environmental management of the development;
  - (c) identify the statutory approvals that apply to the development;
  - (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
  - (e) describe the procedures that would be implemented to:
    - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
    - receive, handle, respond to, and record complaints;
    - resolve any disputes that may arise during the course of the development;
    - respond to any non-compliance;
    - respond to emergencies; and
  - (f) include:
    - copies of any strategies, plans and programs approved under the conditions of this consent; and
    - a clear plan depicting all the monitoring required to be carried out under the conditions of this consent.

**Adaptive Management**

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

Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:

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

**Management Plan Requirements**

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

# **Appendix 2**

## **Noise-related Conditions of Environment Protection Licence**

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P1.2 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or setting of limits for the emission of noise from the premises.

**Noise.**

| EPA identification no. | Type of monitoring point | Location description                          |
|------------------------|--------------------------|---|
| 2                      | Noise monitoring         | Whychitella Meteorological station            |
| 3                      | Noise monitoring         | Whychitella Receptor 1                        |
| 4                      | Noise monitoring         | 218R Obley Road Receptor R23                  |
| 5                      | Noise monitoring         | Cockleshell Corner Receptor R7B               |
| 6                      | Noise monitoring         | Toongi Hall & Recreation Reserve Receptor R12 |
| 7                      | Noise monitoring         | Wirribilla, 235R Obley Road Receptor R20      |
| 8                      | Noise monitoring         | All other residential receptors               |
| 9                      | Meteorological Station   | Weather station on the mine site              |

P1.3 The monitoring requirements may be modified by the EPA subject to ongoing review of licence conditions and monitoring results

**L3 Noise limits**

L3.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

**POINT 2,3,4,5,6,7,8**

| Time period | Measurement parameter | Measurement frequency | Noise level dB(A) |
|-------------|-----------------------|-----------------------|-------------------|
| Day         | LAeq (15 minute)      | -                     | 35                |
| Evening     | LAeq (15 minute)      | -                     | 35                |
| Night       | LAeq (15 minute)      | -                     | 35                |
| Night       | Lmax OR LA1,1min      | -                     | 45                |

- L3.2 For the purpose of condition L3.1;
- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
  - Evening is defined as the period 6pm to 10pm.
  - Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.
- L3.3 The noise limits set out in condition L3.1 apply under all meteorological conditions except for the following:
- a) Wind speeds greater than 3 metres/second at 10 metres above ground level.
  - b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
  - c) Stability category G temperature inversion conditions.
- L3.4 For the purposes of condition L3.3:
- a) Data recorded by a meteorological station installed on site must be used to determine meteorological conditions; and
  - b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.
- L3.5 To determine compliance:
- a) with the Leq(15 minute) noise limits in condition L3.1, the noise measurement equipment must be located:
    - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
    - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
    - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.
  - b) with the LA1(1 minute) noise limits in condition L3.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.
  - c) with the noise limits in condition L3.1 the noise measurement equipment must be located,
    - at the most affected point at a location where there is no dwelling at the location; or
    - at the most affected point within an area at a location prescribed by conditions L3.5(a) or L3.5(b).
- L3.6 A non-compliance of condition L3.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:
- at a location other than an area prescribed by conditions L3.5(a) and L3.5(b); and/or
  - at a point other than the most affected point at a location.
- L3.7 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

**L5 Hours of operation**

- L5.1 Construction activities must be conducted between the times of 7am - 6pm Monday to Friday and 8am - 1pm Saturday  
Construction activities are not permitted on Sundays or Public holidays unless approved in writing by the EPA

**4 Operating Conditions**

**O1 Activities must be carried out in a competent manner**

- O1.1 Licensed activities must be carried out in a competent manner.  
This includes:  
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and  
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

**O2 Maintenance of plant and equipment**

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:  
a) must be maintained in a proper and efficient condition; and  
b) must be operated in a proper and efficient manner.

**5 Monitoring and Recording Conditions**

**M1 Monitoring records**

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:

- a) in a legible form, or in a form that can readily be reduced to a legible form;
- b) kept for at least 4 years after the monitoring or event to which they relate took place; and
- c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:

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

**M2 Weather monitoring**

M2.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

**POINT 9**

| Parameter                   | Sampling method | Units of measure  | Averaging period | Frequency  |
|-----------------------------|-----------------|-------------------|------------------|------------|
| Rainfall                    | AM-4            | millimetres       | 1 hour           | Continuous |
| Wind Direction at 10 metres | AM-2 & AM-4     | Degrees           | 15 minutes       | Continuous |
| Siting                      | AM-1 & AM-4     | -                 | -                | -          |
| Sigma theta                 | AM-2 & AM-4     | Degrees           | -                | Continuous |
| Wind Speed at 10 metres     | AM-2 & AM-4     | metres per second | 15 minutes       | Continuous |

**M3 Recording of pollution complaints**

M3.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M3.2 The record must include details of the following:

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

M3.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M3.4 The record must be produced to any authorised officer of the EPA who asks to see them.

**M4 Telephone complaints line**

M4.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M4.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M4.3 The preceding two conditions do not apply until - the date of the issue of this licence.

**G2 Signage**

G2.1 The location of each Monitoring and Discharge point must be clearly marked by signs that indicate the point identification number used in this licence and be located as close as practical to the point.

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# **Appendix 3**

# **Out of Hours Work Protocol (Template)**

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**OUT OF HOURS WORK PROTOCOL**

|                      |                |                       |               |             |
|----------------------|----------------|-----------------------|---------------|-------------|
| <b>Work:</b>         |                | <b>Reference No.:</b> |               |             |
| <b>Completed by:</b> |                | <b>Date:</b>          |               |             |
|                      | <b>Company</b> | <b>Landholder</b>     | <b>Agency</b> | <b>Date</b> |
| <b>Reviewed by:</b>  |                |                       |               |             |
|                      |                |                       |               |             |
|                      |                |                       |               |             |
|                      |                |                       |               |             |
|                      |                |                       |               |             |
|                      |                |                       |               |             |
|                      |                |                       |               |             |

**Works Overview:**

| 1                 | The activity to be undertaken outside of standard hours of operation is as follows.  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
|-------------------|--|-------|-----|-----|---------|--|--|-----------|--|--|------------------|--|--|-------------------|--|--|--------|--|--|----------|--|--|--------|--|--|-------|--|--|------------|--|--|-----------------|--|--|-----------------|--|--|-------|--|--|-------|--|--|
| 2                 | The Out of Hours Work is required for the following reasons.   |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| 3                 | <p>The activity will require the use of the following equipment.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Plant</th> <th style="padding: 5px;">No.</th> <th style="padding: 5px;">SPL</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Backhoe</td> <td style="width: 50px;"></td> <td style="width: 50px;"></td> </tr> <tr> <td style="padding: 5px;">Excavator</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Front-end Loader</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Bulldozer (D6/D7)</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Grader</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Trencher</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Roller</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Crane</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Road Truck</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Tamping Machine</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">Other:<br/>.....</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">.....</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">.....</td> <td></td> <td></td> </tr> </tbody> </table> | Plant | No. | SPL | Backhoe |  |  | Excavator |  |  | Front-end Loader |  |  | Bulldozer (D6/D7) |  |  | Grader |  |  | Trencher |  |  | Roller |  |  | Crane |  |  | Road Truck |  |  | Tamping Machine |  |  | Other:<br>..... |  |  | ..... |  |  | ..... |  |  |
| Plant             | No.  | SPL   |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Backhoe           |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Excavator         |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Front-end Loader  |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Bulldozer (D6/D7) |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Grader            |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Trencher          |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Roller            |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Crane             |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Road Truck        |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Tamping Machine   |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| Other:<br>.....   |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| .....             |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |
| .....             |  |       |     |     |         |  |  |           |  |  |                  |  |  |                   |  |  |        |  |  |          |  |  |        |  |  |       |  |  |            |  |  |                 |  |  |                 |  |  |       |  |  |       |  |  |



7 The following consultation has been completed with the EPA and potentially affected receivers.

8 The measures to be implemented to minimise noise levels are as follows.

9 In the event a noise complaint is received, the following management measures will be implemented.

| Management Measure                       | Order of Implementation |
|--|-------------------------|
| Undertake attended noise monitoring      |                         |
| Relocate equipment further from receiver |                         |
| Reduce no. of operating equipment        |                         |
| Modify hours of operation to .....       |                         |
| Cease out of hours work                  |                         |
|  |                         |
| Other:                                   |                         |
| .....                                    |                         |
| .....                                    |                         |

10 This Out of Hours Work Protocol will be implemented by:

Name: ..... Position: .....

Signed: ..... Date: .....



# Appendix 4

# Confirmation of Approval

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**Planning Services**  
**Resource Assessments**  
Contact: Phillipa Duncan  
Tel: 9274 6451  
Email: [phillipa.duncan@planning.nsw.gov.au](mailto:phillipa.duncan@planning.nsw.gov.au)

Mr Mike Sutherland  
General Manager NSW  
Alkane Resources  
PO Box 910  
DUBBO NSW 2830

Dear Mr Sutherland

**Dubbo Zirconia Project (SSD-5251)**  
**Environmental Management Plan**

I refer to an email dated 20 August 2016 sent by Alex Irwin of RW Corkery & Co Pty Limited on your behalf, seeking approval of the management plans required by conditions 8, 16, 23 and 30 of Schedule 3 and condition 1 of Schedule 5 of the project approval for the Dubbo Zirconia Project.

The Department has reviewed the final versions of the management plans and considers that they meet the requirements of the relevant conditions of approval.

Accordingly, please be advised that the Secretary has approved the following management plans:

- Environmental Management Strategy (Version 2.1 dated 6 October 2016);
- Air Quality Management Plan (Version 1.2 dated 6 October 2016);
- Noise Management Plan (Version 2.1 dated 6 October 2016);
- Water Management Plan (Version 2.1 dated 6 October 2016); and
- Blast Management Plan (Version 2.1 dated 6 October 2016).

I would appreciate if you could make the approved plans available on your website as soon as possible.

If you have any further enquiries about this matter, please contact Phillipa Duncan on the above contact details.

Yours sincerely

A handwritten signature in blue ink that reads 'Preshaw' followed by the date '12/10/16'.

Clay Preshaw  
**A/Director**  
**Resource Assessments**  
as nominee of the Secretary

cc: Alex Irwin of RW Corkery & Co Pty Limited

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