

Aus-10 Rhyolite Pty Ltd

TINDA CREEK SAND QUARRY

Noise Management Plan

FINAL

May 2017

Aus-10 Rhyolite Pty Ltd

TINDA CREEK SAND QUARRY

Noise Management Plan

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Aus-10 Rhyolite Pty Ltd

Project Director: **Peter Jamieson**
Technical Director: **Tim Procter**
Report No. **1731/R31/FINAL**
Date: **May 2017**



Newcastle

**75 York Street
Teralba NSW 2284**

Ph. 02 4950 5322

www.umwelt.com.au



**Quality
ISO 9001**

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

Disclaimer

This document has been prepared for the sole use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by Umwelt (Australia) Pty Ltd (Umwelt). No other party should rely on this document without the prior written consent of Umwelt.

Umwelt undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. Umwelt assumes no liability to a third party for any inaccuracies in or omissions to that information. Where this document indicates that information has been provided by third parties, Umwelt has made no independent verification of this information except as expressly stated.

Table of Contents

| | | |
|-------------|--|-----------|
| 1.0 | Introduction | 1 |
| 1.1 | Background | 1 |
| 1.2 | Project description | 1 |
| 1.3 | Purpose and scope | 1 |
| 1.4 | Objectives | 2 |
| 2.0 | Regulatory requirements | 5 |
| 2.1 | Development consent | 5 |
| 2.2 | Statement of commitments | 9 |
| 3.0 | Baseline data | 10 |
| 3.1 | Existing noise environment | 10 |
| 4.0 | Noise criteria | 12 |
| 5.0 | Noise management controls | 13 |
| 5.1 | Hours of operation | 13 |
| 5.2 | General controls | 14 |
| 6.0 | Noise monitoring | 16 |
| 6.1 | Attended monitoring program | 16 |
| 6.1.1 | Assessable meteorological conditions | 17 |
| 6.1.2 | Noise compliance assessment | 17 |
| 6.2 | Meteorological monitoring | 18 |
| 6.3 | Independent review | 18 |
| 7.0 | Reporting | 20 |
| 7.1 | External reporting | 20 |
| 7.2 | Noise criteria exceedance reporting protocol | 20 |
| 7.2.1 | Adaptive management | 20 |
| 7.3 | Complaint response | 21 |
| 8.0 | Review and improvement | 22 |
| 9.0 | Definitions | 23 |
| 10.0 | Accountabilities | 24 |
| 11.0 | References | 25 |

Figures

| | | |
|------------|--|----|
| Figure 1.1 | Locality map | 3 |
| Figure 1.2 | Proposed expansion of Tinda Creek Sand Quarry project | 4 |
| Figure 3.1 | Background noise monitoring and noise sensitive receiver locations | 11 |
| Figure 6.1 | Noise monitoring site | 19 |

Tables

| | | |
|------------|---|----|
| Table 2.1 | Development consent conditions | 5 |
| Table 2.2 | Statement of commitments | 9 |
| Table 3.1 | Baseline noise monitoring details | 10 |
| Table 4.1 | Development consent noise criteria dB (A) | 12 |
| Table 5.1 | Hours of operation | 13 |
| Table 5.2 | Equipment sound power levels, dB(A) | 14 |
| Table 9.1 | Definitions | 23 |
| Table 10.1 | Accountabilities | 24 |

Appendices

| | |
|------------|--|
| Appendix A | Consultation with EPA |
| Appendix B | Assessment of existing noise environment |
| Appendix C | Email from DP&E – (Genevieve Seed 20 January 2017) |
| Appendix D | Environmental noise monitoring results |

1.0 Introduction

1.1 Background

Aus-10 Rhyolite Pty Ltd t/a Hy-Tec Concrete and Aggregates (Hy-Tec) operate Tinda Creek Quarry, a sand quarry located approximately 67 kilometres north of Windsor along Putty Road, NSW (refer to **Figure 1.1**). Quarrying activities have been undertaken at Tinda Creek Quarry for approximately 30 years with the quarry currently producing up to 125,000 tonnes of product per year. The existing operations have been developed in accordance with a number of development consents, licences and project approvals, including DA 134/95 (incorporating the 2009 modifications) and Environment Protection Licence (EPL) 12007.

Hy-Tec has recently been granted approval to increase production levels from Tinda Creek Quarry from approximately 125,000 tonnes per annum (tpa) up to 300,000 tpa by increasing the area subject to sand extraction to include additional identified resource domains (the Project). The duration of the Project is expected to be approximately 30 years.

The development consent allows for continued operations of the Tinda Creek Quarry across a broader area which will enable the extraction of additional sand resources (refer to **Figure 1.2**).

Hy-Tec is committed to implementing continued quarrying operations in the context of updated and contemporary environmental management requirements. This Noise Management Plan (NMP) has been prepared in accordance with Condition 6 of Schedule 3 of the development consent.

1.2 Project description

The revised Tinda Creek Quarry development consent (SSD_4978) provides for the following:

- extraction of up to 300,000 tpa of sand in any calendar year until December 2045
- extension of the approved extraction area as shown on **Figure 1.2**
- the transport of up to 300,000 tpa of sand from in the site in any calendar year
- the dispatch of up to 34 trucks per day and receipt of up to 34 trucks per day, averaged over a calendar month.

1.3 Purpose and scope

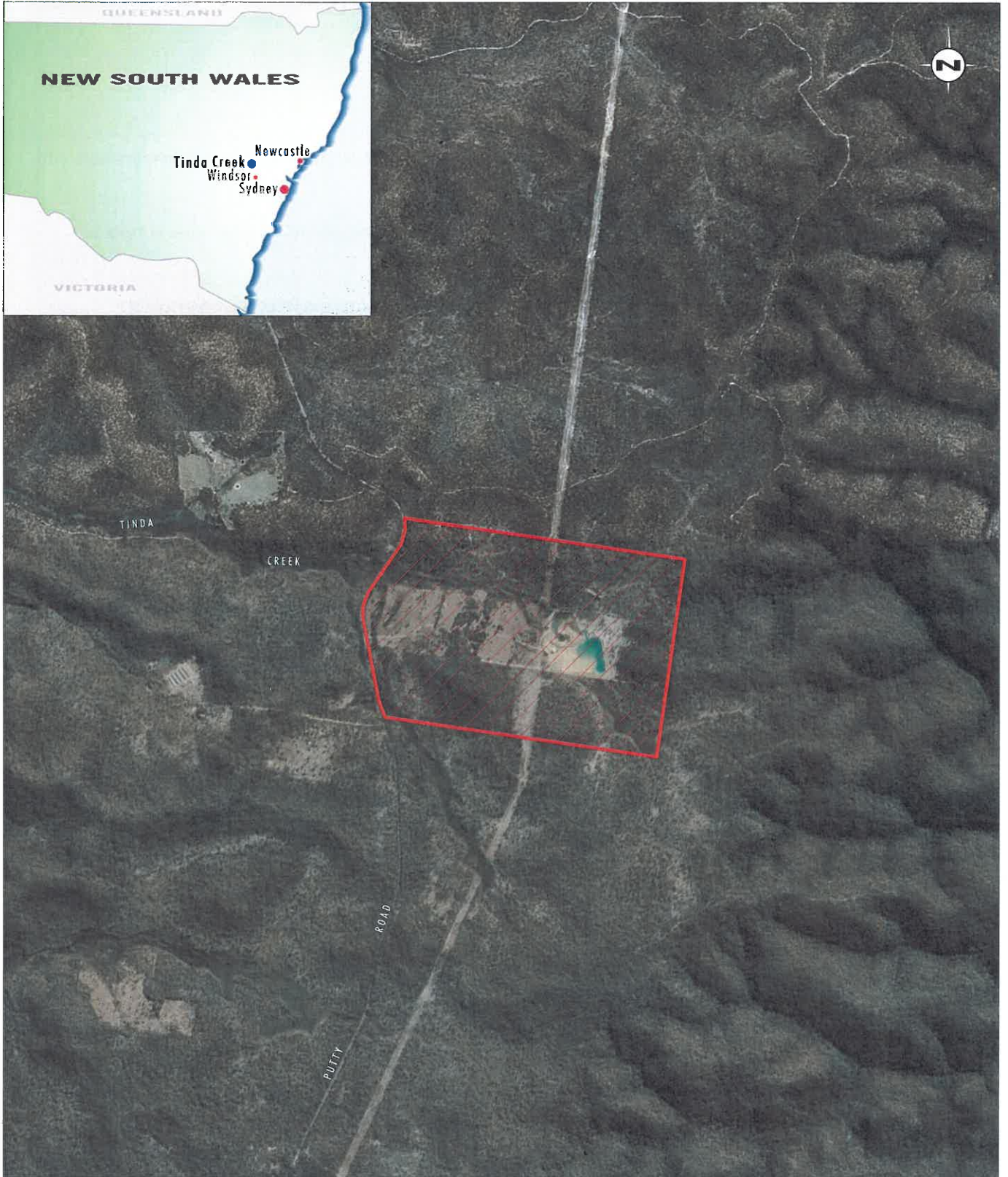
The purpose of this NMP is to describe the noise management strategies, procedures, controls and the monitoring programs that are to be implemented in accordance with the Tinda Creek Sand Quarry Expansion Environmental Impact Statement (EIS, Umwelt 2014) and the development consent granted on 10 April 2015. The area covered by this plan is shown on **Figure 1.2**. The approved quarrying plan has been designed to include several noise mitigation factors and these design mitigation measures are further described in **Section 5.0**.

This NMP also addresses the requirements detailed in the development consent. The development consent conditions and Statement of Commitments relevant to this plan are provided in **Section 2.0** respectively, including a checklist of where each condition has been addressed within this document. This plan also outlines the control measures to be implemented as part of the Tinda Creek Sand Quarry expansion to minimise the potential impacts on noise amenity on the local community.

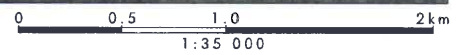
1.4 Objectives

The objectives of this NMP include the following:

- establish a noise monitoring system to assess the noise impact on surrounding sensitive receivers and performance against the development consent noise criteria
- provide a mechanism to assess monitoring results against development consent noise criteria to evaluate compliance
- detail the requirement for reporting noise criteria exceedances to the relevant stakeholders
- detail the controls to be implemented to minimise noise emissions from the site
- allow adaptive management of the quarrying operation based on predicted meteorological conditions
- address the relevant conditions of the development consent
- manage noise related community complaints in a timely and effective manner
- detail the independent review process to be followed if Tinda Creek Quarry receives a written request by a landowner(s) for an independent review of noise impacts.



Source: Google (2002)



Legend
▨ Project Area

FIGURE 1.1
Locality Map



Source: Google Earth (2012), LPI NSW (2007)

- Legend**
- Project Area
 - National Park Boundary
 - Proposed Extraction Area
 - Domain 3 Extraction Area
 - Domain 7 Extraction Area
 - Private Holding Duck Farm
 - Private Holding Hobby Farm

FIGURE 1.2

Proposed Expansion of Tinda Creek Sand Quarry Project

2.0 Regulatory requirements

2.1 Development consent

The development consent for the Tinda Creek Sand Quarry Expansion Project was assessed under the *Environmental Planning and Assessment Act 1979* (EP&A Act). Approval for the project was granted by the Minister for Planning on 10 April 2015. The requirement for this NMP arises from Condition 6 of Schedule 3 of the Tinda Creek Sand Quarry development consent. The requirements from the development consent relating to noise, and where these requirements are addressed within this document, are provided in **Table 2.1**.

Table 2.1 Development consent conditions

| Conditions | | Addressed in Section |
|--|--|----------------------|
| Schedule 3 – Environmental Performance Conditions Operating Conditions | | |
| 5. | The Applicant Shall | |
| | <ul style="list-style-type: none"> implement all reasonable and feasible mitigation measures to minimise the construction, operational and road noise of the development; | Section 5.0 |
| | <ul style="list-style-type: none"> regularly assess noise monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the noise criteria in this consent; | Sections 4.0 and 5.0 |
| | <ul style="list-style-type: none"> minimise the noise impacts of the development during meteorological conditions under which the noise criteria in this consent do not apply; | Section 5.0 |
| | <ul style="list-style-type: none"> carry out regular noise monitoring to determine whether the development is complying with the relevant conditions of this consent. | Section 6.0 |
| Schedule 3 – Environmental Performance Conditions Noise Management Plan | | |
| 6. | The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the secretary. This plan must: | |

| Conditions | Addressed in Section |
|---|--|
| <ul style="list-style-type: none"> • be prepared in consultation with the EPA, and submitted to the Secretary within 6 months of the date of this consent, unless the secretary agrees otherwise; | <p>A copy of the Noise Management Plan was forwarded to EPA and response was received on 18 November 2015 with further discussions up to 18 December 2015 when EPA issued a Notice 1533429 – Variation to EPL 12007. Noise monitoring set out in Section 6.0 is in accordance with EPL 12007. Correspondence with EPA is provided in Appendix A.</p> |
| <ul style="list-style-type: none"> • describe the reasonable and feasible mitigation measures that would be implemented to ensure: <ul style="list-style-type: none"> ○ construction noise minimised; ○ compliance with the relevant noise criteria and operating conditions in this consent; ○ best management practice is being employed; and ○ the noise impacts of the development are minimised during meteorological conditions under which the noise criteria in this consent do not apply. | <p>Section 5.0</p> |
| <ul style="list-style-type: none"> • Describe the proposed noise management system on site; and | <p>Sections 6.0, 7.0, 8.0 and 11.0</p> |
| <ul style="list-style-type: none"> • Include a monitoring program that: <ul style="list-style-type: none"> ○ 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 and the best practise noise management measures; and ○ defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents. | <p>Section 6.0</p> |

| Conditions | Addressed in Section |
|--|----------------------|
| Schedule 5 – Environmental Management, Reporting and Auditing 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: | |
| <ul style="list-style-type: none"> • detailed baseline data; | Section 3.0 |
| <ul style="list-style-type: none"> • a description of: <ul style="list-style-type: none"> ○ the relevant statutory requirements (including any relevant approval, licence or lease conditions); ○ any relevant limits or performance measures/criteria; and ○ the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; | Sections 2.0 and 4.0 |
| <ul style="list-style-type: none"> • a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; | Section 5.0 |
| <ul style="list-style-type: none"> • a program to monitor and report on the: <ul style="list-style-type: none"> ○ impacts and environmental performance of the development; and ○ effectiveness of any management measures (see (c) above); | Section 6.0 |
| <ul style="list-style-type: none"> • a contingency plan to manage any unpredicted impacts and their consequences; | Section 7.2.1 |
| <ul style="list-style-type: none"> • a program to investigate and implement ways to improve the environmental performance of the development over time; | Section 8.0 |
| <ul style="list-style-type: none"> • a protocol for managing and reporting any: <ul style="list-style-type: none"> ○ incidents; ○ complaints; ○ non-compliances with statutory requirements; and ○ exceedances of the impact assessment criteria and/or performance criteria; and | Section 7.0 |
| <ul style="list-style-type: none"> • a protocol for periodic review of the plan. | Section 8.0 |

| Conditions | | Addressed in Section |
|--|---|----------------------|
| Schedule 5 – Environmental Management, Reporting and Auditing Annual Review | | |
| 4. | By the end of December each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must: | Section 7.0 |
| | <ul style="list-style-type: none"> describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year; | Section 7.0 |
| | <ul style="list-style-type: none"> include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against: <ul style="list-style-type: none"> the relevant statutory requirements, limits or performance measures/criteria; the monitoring results of previous years; and the relevant predictions in the EIS; | Section 7.0 |
| | <ul style="list-style-type: none"> identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance; | Section 7.0 |
| | <ul style="list-style-type: none"> identify any trends in the monitoring data over the life of the development; | Section 7.0 |
| | <ul style="list-style-type: none"> identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and | Section 7.0 |
| | <ul style="list-style-type: none"> describe what measures will be implemented over the current calendar year to improve the environmental performance of the development. | Section 7.0 |

| Conditions | | Addressed in Section |
|--|---|----------------------|
| Schedule 5 – Environmental Management, Reporting and Auditing Access to Information | | |
| 11. | Within 6 months of the date of this consent, the Applicant shall: | |
| | <ul style="list-style-type: none"> • make copies of the following publicly available on its website: <ul style="list-style-type: none"> ○ the EIS; ○ current statutory approvals for the development; ○ approved strategies, plans and programs required under the conditions of consent; ○ a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of the consent. Or any approved plans and programs; ○ a complaints register, which is to be updated monthly; ○ minutes of CCC meetings; ○ the annual reviews of the development (for the last 5 years); ○ any independent environmental audit of the development, and the Applicant's response to the recommendations in any audit; ○ any other matter required by the secretary; and | Sections 6.0 and 7.0 |
| | <ul style="list-style-type: none"> • keep this information up to date, to the satisfaction of the Secretary. | Section 8.0 |

2.2 Statement of commitments

The Statement of Commitments relevant to the NMP, and where they are addressed in this document, is detailed in Table 2.2.

Table 2.2 Statement of commitments

| Commitment | Addressed in Section |
|--|----------------------|
| Hy-Tec will undertake an attended noise monitoring program in order to assess ongoing compliance with the relevant noise impact assessment criteria over the life of the Project. Details of the Noise Management plan will be provided in the revised EMP. | Section 6.0 |
| The monitoring results will be reviewed by the Hy-Tec environmental representative to assess compliance with the Noise Impact Assessment (NIA) predictions and with the relevant NIA criteria. The results will be reported in accordance with the Project approval and EPL. | Section 6.0 |

3.0 Baseline data

3.1 Existing noise environment

The existing background noise environment in the area surrounding the Tinda Creek Sand Quarry was measured using a continuous noise logger. The location of the monitoring site is presented in **Figure 3.1** and the details of the monitoring program are given in **Table 3.1**. The monitoring results were used to assess the background (LA90) and amenity (LAeq) noise levels within the residential receiving areas adjacent to the site.

Table 3.1 Baseline noise monitoring details

| Title | Location | Logger serial number | Measurement started | Measurement stopped |
|-------|--|----------------------|---------------------|---------------------|
| N1 | Lot 2, DP 628806 MGA56 E285298 N6327945 | 194625 | 17/11/10 10:00 | 26/11/10 10:45 |

Monitoring location N1 is located to the west of the existing sand quarry on Lot 2, DP 628806. The monitoring location represents an undeveloped rural area, nearby to the existing sand quarry, that is considered representative of the of the background noise environment at the potentially affected noise sensitive locations.

The results of the monitoring program are provided in **Appendix B**.

The continuous noise logger recorded:

- date, time and temperature
- background, LA90 noise levels and amenity, LAeq,15minute noise levels
- maximum and minimum noise levels
- statistical noise levels representative of the noise environment.

The run chart of the raw data from the monitoring program and the determination of the corresponding Assessment Background Level (ABL) and Rating Background Level (RBL) are also provided in **Appendix B**.

Based on the background monitoring results it can be reasonably assumed that, due to the rural nature of the area surrounding the Project, the existing background level is at or below 30 dB(A). In addition to this, there are no other industrial noise sources in the areas surrounding the Tinda Creek Sand Quarry. Therefore the existing industrial LAeq, period (where period is day, evening or night) noise levels is more than 10 dB below the Acceptable Noise Level as defined by the INP (EPA, 2000).



Source: Google Earth (2012), LPI NSW (2007)

- Legend**
- Project Area
 - Proposed Extraction Area
 - Domain 3 Extraction Area
 - Domain 7 Extraction Area
 - Private Holding Duck Farm
 - Private Holding Hobby Farm
 - National Park Boundary
 - Background Noise Monitoring Location
 - Noise Receiver Location

FIGURE 3.1
Background Noise Monitoring and
Noise Sensitive Receiver Locations

4.0 Noise criteria

Noise criteria are set for day shoulder, day and evening periods to protect the amenity of neighbouring residents. Noise criteria are expressed as a LAeq (15 min) limit (refer to **Section 9.0** for definitions) and are specified in the development consent for the Tinda Creek Sand Quarry. Project specific noise criteria for the Tinda Creek Sand Quarry are outlined in Table 2 of the development consent and are reproduced as **Table 4.1**. Hy-Tec shall ensure that the noise generated by the development does not exceed the criteria in **Table 4.1** at any residence on privately-owned land.

Table 4.1 Development consent noise criteria dB (A)

| Receiver | Day/Evening | Night | |
|---------------|--------------|--------------|------------|
| | LAeq(15 min) | LAeq(15 min) | LA1eq(max) |
| All receivers | 35 | 35 | 45 |

5.0 Noise management controls

Tinda Creek Sand Quarry is committed to implementing reasonable and feasible best practice noise mitigation measures and investigating ways to minimise the construction, operational and road traffic noise generated by quarry operations.

In order to mitigate any potential noise impacts from the operation, a number of noise management controls will be implemented throughout the life of the operation. These controls are outlined in:

- the Tinda Creek Sand Quarry Expansion Project EIS (Umwelt, 2014)
- the development consent noise management conditions (Conditions 3 to 6 of Schedule 3)
- general management plan requirements listed in Condition 3 of Schedule 5 of the development consent
- the development consent Statement of Commitments (Condition 16 of Appendix 3 of the development consent).

The relevant noise controls for the operation are detailed in the sections below.

5.1 Hours of operation

Impacts to noise amenity for sensitive receivers in the vicinity of Tinda Creek Sand Quarry have been managed through the design of the operation, including the restrictions on the hours of operation for the facility. The hours of operation for Tinda Creek Sand Quarry are prescribed in Table 2 of the development consent and are reproduced in Table 5.1 below. Tinda Creek Sand Quarry will operate in accordance with the hours of operation defined in Table 5.1.

Table 5.1 Hours of operation

| Activity | Operating hours |
|--------------------------------------|--|
| Extraction operations and deliveries | 7 am to 6 pm, Monday to Friday 7 am to 3 pm, Saturday No activities on Sundays or Public Holidays |
| Dispatch | 5 am to 10 pm, Monday to Friday 6 am to 3 pm, Saturday |
| Construction | 7 am to 6 pm, Monday to Friday 8 am to 1 pm, Saturday No construction to be undertaken on Sundays or Public Holidays |
| Maintenance | 24 hours a day, 7 days per week, providing maintenance activities are inaudible at any privately-owned residence |

5.2 General controls

Control measures that have been considered as a standard part of the operation of the quarry and incorporated include:

- maintenance of the existing equipment and associated sound attenuation features including mufflers and sound suppression lining of equipment
- selection of new equipment with sound power levels (SWL) equivalent to, or less than the sound power levels nominated in Table 5.2.

Table 5.2 Equipment sound power levels, dB(A)

| Equipment | SWL |
|---|-----|
| Suction Cutter Dredge | 103 |
| Dozer (equivalent to CAT D7) | 108 |
| 35 t 6X6 articulated dump trucks (equivalent to Volvo A35D) | 109 |
| 45 t Excavator (equivalent to Sumitomo SH 450 HD) | 95 |
| Front End Loader (equivalent to CAT 950) | 110 |
| Sand processing plant | 99 |
| Diesel Generator (500kVA) | 98 |
| Water Cart | 103 |
| Truck and Dog Tipper (transport of sand to customer) | 103 |

Source: Umwelt SWL Library.

Note 1: Equipment make and model are listed for size comparison purposes only.

Where noise levels exceed the required criteria or goals, the three main strategies for noise control to reduce the noise impact on offsite receivers will be explored. These include:

- controlling noise at the source – There are three approaches to controlling noise generated by the source: Source elimination; Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA)
- controlling the transmission of noise – There are two approaches: the use of barriers and land-use controls which attenuate noise by increasing the distance between source and receivers
- controlling noise at the receiver – There are two approaches: negotiating an agreement with the landholder or acoustic treatment of dwellings to control noise.

The highest predicted noise level under worst case source to receiver winds is 35 dB(A) at Receiver 3. While no exceedances of noise goals for the Project were predicted, Hy-Tec will need to ensure that the control measures listed in this section are implemented and that operations are appropriately managed to minimise noise generating activities during extraction of sand from the areas located closest to the identified receivers (i.e. Domain 1).

The management of operations such as regular maintenance of equipment to minimise noise emissions during adverse weather conditions when extracting sand from the areas located closest to the identified receivers and the maintenance of equipment and associated sound attenuation features should prove adequate to control noise at the source so the Project meets the project noise goals.

If unacceptable noise impacts from a development persist after noise mitigation action has been undertaken, Section 8 and Section 10 of the INP (EPA, 2000) provide a process for negotiating an agreement between the proponent and the affected party(s).

Road traffic noise will be managed by limiting truck receipt and dispatch to the 34 trucks per day, averaged over a calendar month, within the hours specified in **Table 5.1**.

6.0 Noise monitoring

Noise monitoring requirements for the operation are provided in Conditions 5 (d) and 6 (d) of Schedule 3 of the development consent. Noise monitoring will be undertaken in accordance with Condition 4 of the development consent and in accordance with the requirements of EPL 12007. This includes the requirement to measure the noise generated by the development in accordance with the NSW Industrial Noise Policy (EPA, 2000).

6.1 Attended monitoring program

Attended noise monitoring will be undertaken in accordance with requirements of EPL 12007 at the nearest proposed location near Receiver 1 as nominated in **Figure 6.1**. Additional baseline monitoring has been undertaken at two locations between quarry operations and Receiver R1 to identify noise generation from the quarry independent of noise sources from Putty Road and vegetation as requested by DP&E in email of 20 January 2017 (see **Appendix C**). The results of this monitoring are provided in **Appendix D** and demonstrate that noise emissions from the current quarry operations have negligible potential to adversely impact on surrounding residences.

Monitoring will initially be undertaken annually as required by EPL 12007. Monitoring will also be undertaken when significant changes to the quarry operations occur that may impact on noise levels at the nearest residential receivers. This includes the move of dredging operations from Domain 6 to Domain 1 at which time operations will be closer to adjoining residences.

If monitoring shows measured or predicted noise from quarry operations at Receiver R1 are above Project Specific Noise Criteria set out in **Table 4.1**, quarterly monitoring will be undertaken until it is demonstrated that the quarry will not adversely impact on noise levels at Receiver R1.

The results will then be compared with the noise criteria defined in **Section 4.0** to determine whether Tinda Creek Sand Quarry is in compliance with noise criteria defined within the development consent and EPL 12007.

The attended noise monitoring program is used to:

- determine the individual noise sources contributing to the ambient noise environment
- estimate the contribution from quarry noise sources to the measured noise levels
- determine whether a modifying factor should be applied to the contributing quarry noise levels (in accordance with the INP)
- gain an understanding of the effects of meteorological conditions on the propagation of the noise from Tinda Creek Sand Quarry to the monitoring location.

Each attended noise survey will comprise one hour of measurement at the location shown on **Figure 6.1** during operations. Night time (before 7 am) monitoring of traffic noise associated with despatch of quarry product will be undertaken as part of the attended noise monitoring program. For each monitoring period, the following information will be recorded:

- operator's name
- monitoring location

- dates and times that monitoring began and ended at each location
- height of the microphone above the ground and, if relevant, distances to building facades or property boundaries
- qualitative/quantitative meteorological data such as temperature, wind speed, wind direction, cloud cover, humidity, fog, rainfall or opinions as to the onset or breakup of temperature inversions
- instrument calibration details before and after the monitoring period
- the LAeq,15minute noise level for each 15 minute period
- statistical noise level descriptors over each 15 minute interval: LAmin, LA90, LA10, LA1 and LAmax
- LA1,1minute noise levels (to allow comparison with the relevant sleep arousal criteria)
- notes that identify the noise sources that contribute to the peak noise levels (LA1 or LAmax) and noise sources that contribute to the overall noise environment or for periods of time when a specific noise source is audible. These notes will be presented on a run-chart of the recorded noise levels
- an estimate of the noise contribution from operations at Tinda Creek Sand Quarry (including despatch of product) or from other identifiable noise sources
- measurements in one-third octave bands for each 15 minute interval to assess if any of the noise sources exhibit tonal characteristics that may require modifying factors to be applied
- data suitable for assessing the relative contribution of mine-generated noise to the overall noise being measured.

6.1.1 Assessable meteorological conditions

In accordance with the methodology outlined in Section 3.4 of the INP (EPA, 2000), if any of the data in a 15 minute period is affected by the following meteorological conditions, noise monitoring for compliance with the criteria provided in **Table 4.1** does not apply:

- affected by rain or hail; or
- wind speeds in excess of 5 m/s at microphone height; or
- wind speeds greater than 3 m/s measured at 10 metres above ground level; or
- temperature inversion conditions greater than 3°C/100 metres.

6.1.2 Noise compliance assessment

Provided the attended noise monitoring results were obtained under assessable meteorological conditions, the compliance of the quarry will be assessed against the noise criteria specified in Schedule 3 of the development consent (refer to **Table 4.1**).

6.2 Meteorological monitoring

A meteorological station will be maintained at the Tinda Creek Sand Quarry as the location shown on **Figure 6.1**. The meteorological monitoring data obtained from the station will be in accordance with the requirements of Condition 10 of Schedule 3 of the development consent.

6.3 Independent review

In the event that a landowner considers that the Tinda Creek Sand Quarry is exceeding noise criteria at his or her property, the landowner may request an independent review of the noise impacts at the property. The independent review will be conducted in accordance with the procedure described in Condition 2 of Schedule 4 of the development consent.



Source: Google Earth (2012), LPI NSW (2007)

- Legend**
- Project Area
 - Proposed Extraction Area
 - Domain 3 Extraction Area
 - Domain 7 Extraction Area
 - Private Holding Duck Farm
 - Private Holding Hobby Farm
 - National Park Boundary
 - Noise Receiver Location
 - Noise Monitoring Site (R1)
 - Meteorological Station

FIGURE 6.1

Noise Monitoring Site

7.0 Reporting

7.1 External reporting

A summary of noise monitoring results will be provided in the Tinda Creek Sand Quarry Annual Review. The following information will be reported in the Annual Review in accordance with Condition 4 of Schedule 5 of the development consent:

By the end of December each year Hy-Tec shall review the environmental performance of the development to the satisfaction of the Secretary. The requirements of the review are detailed in **Table 2.1**.

In addition, in accordance with *Protection of the Environment Legislation Amendment Act 2011* (Amendment Act) and Condition 11 of Schedule 5 of the development consent, Hy-Tec will also publish noise monitoring results on the Hy-Tec website (<http://www.hy-tec.com.au/>).

Performance monitoring, which includes an assessment of the effectiveness of noise monitoring and compliance with the relevant development consent and EPL conditions, may be discussed at Community Consultative Committee (CCC) meetings.

7.2 Noise criteria exceedance reporting protocol

Exceedances of noise criteria will be classified as environmental incidents and will be managed in accordance with the Tinda Creek Sand Quarry Environmental Management Strategy (EMS) which includes a procedure for the management of environmental incidents and community complaints. In accordance with this procedure, all environmental incidents will be investigated to a level commensurate to their risk level by Tinda Creek Sand Quarry Manager in consultation with environmental personnel from Hy-Tec. Additional controls will be implemented where required, based on the outcomes of the investigation. All environmental incidents/exceedances will be reported annually in the Annual Review.

Additionally, in accordance with Schedule 4, Condition 1 of the development consent, in the event an exceedance of the noise impact assessment criteria is identified, Hy-Tec will notify DP&E, EPA and any affected landowner(s) and provide regular monitoring results to each of these parties until the results show that the operation is complying with the relevant criteria (refer to **Section 4.0**).

7.2.1 Adaptive management

In accordance with Condition 2 of Schedule 5 of the development consent, Hy-Tec will assess and manage noise related risks to ensure compliance with the criteria outlined in **Section 4.0**.

Where a non-compliance relating to noise impact has occurred, Hy-Tec shall, at the earliest opportunity to the satisfaction of the Secretary:

- take all reasonable and feasible measures to ensure the exceedance ceases and does not recur
- 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
- implement remediation measures as directed by the Secretary

7.3 Complaint response

Complaints relating to noise from Tinda Creek Sand Quarry are to be managed in accordance with the requirements of the Tinda Creek Sand Quarry EMS. This includes:

- responding to the complainant acknowledging that the complaint has been received
- making a record of the complaint
- investigating the reason for the complaint
- implementing appropriate measures to address the complaint.

A summary of complaints will be available to regulatory authorities on request and provided in the Annual Review.

8.0 Review and improvement

Ongoing monitoring and review on the performance and implementation of this NMP will be undertaken in accordance with Tinda Creek Sand Quarry EMS.

In accordance with Condition 5 of Schedule 5, within 3 months of a modification to the consent or the submission of:

- (a) an annual review under condition 4 of Schedule 5
- (b) an incident report under condition 7 of Schedule 5
- (c) an audit report under condition 9 of Schedule 5

the Applicant shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Secretary.

Tinda Creek Sand Quarry Manager and Hy-Tec environmental personnel will review and if necessary, revise this NMP and resubmit to NSW Planning & Environment every year or earlier if required.

Any changes made to the NMP as a result of the review will be made in consultation with EPA. A copy of the revised NMP will be supplied to the Secretary for approval. The NMP will reflect changes in environmental requirements, technology and operational procedures. Updated versions of the approved NMP will be made publicly available on the Hy-Tec website (<http://www.hy-tec.com.au/>).

Continuous improvement will also occur through independent review as a result of the three-yearly compliance audit, which is required in accordance with Condition 9 of Schedule 5 of the development consent.

9.0 Definitions

The terminology utilised within this NMP is defined in **Table 9.1** below.

Table 9.1 Definitions

| Term | Definition |
|----------------|--|
| Daytime | In relation to noise criteria it is the period 7.00 am to 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm Sundays and public holidays. |
| Decibel dB(A) | A decibel scale, weighted so that it takes into account the frequency response of the normal human ear. |
| Evening | In relation to noise criteria is the period 6.00 pm to 10.00 pm. |
| Non-Compliance | Occurs when environmental monitoring results fall outside acceptable regulatory limits (i.e. development consent or EPL criteria). |
| LAeq (Period) | The average noise level, measured in dB(A), during a measurement period. |
| Night | In relation to noise criteria it is the period 10.00 pm to 7.00 am Monday to Saturday and 10.00 pm to 8.00 am Sundays and public holidays. |

10.0 Accountabilities

Relevant roles and responsibilities associated with this NMP are presented in **Table 10.1** below.

Table 10.1 Accountabilities

| Role | Accountabilities for this document |
|----------------|--|
| Quarry Manager | Ensure NMP is complied with and review as required |

11.0 References

NSW Environmental Protection Agency (EPA) 2000. Industrial Noise Policy.

Standards Australia, AS 1055 – 1997 Acoustics – Description and Measurement of Environmental Noise (Parts 1-3).

Standards Australia, AS 2702-1984 Acoustics – Methods for the Measurement of Road Traffic Noise.

Standards Australia, AS 2923-1987 Ambient Air – Guide for Measurement of Horizontal Wind for Air Quality Applications.

Standards Australia, AS IEC 61672.1 – 2004 Electroacoustics – Sound Level Meters.

Umwelt (Australia) Pty Limited, 2014. Proposed Expansion of Tinda Creek Sand Quarry, Environmental Impact Statement, Report prepared for Aus-10 Rhyolite Pty Ltd.