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Vipac Engineers & Scientists

Tattersall Lander Pty Ltd

Bobs Sand Farm EIS DPE Response

Construction Noise Management Plan

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Report Title: Construction Noise Management Plan **Job Title: Bobs Sand Farm EIS DPE Response**	
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1 INTRODUCTION

Vipac Engineers and Scientists Ltd (Vipac) was commissioned by Tattersall Lander Pty Ltd to conduct a Construction Noise Impact Assessment and Management Plan for the proposed Sand Mine located on Deposited Plans DP753204 (40.9ha) and DP1015671 (6.63ha), Bob's Farm NSW. The location of the proposed development site is illustrated in Figure 3-1.

The steps for managing potential Noise Impacts from construction are outlined as follows:

- Identify the location of the proposed works.
- Identify the sensitive receiver locations with respect to the proposed works.
- Define noise management levels for the sensitive locations.
- Describe the nature of the works to be undertaken and their expected duration.
- Predict levels of noise from construction work at the identified sensitive receivers.
- Provide reasonable and feasible mitigation and management strategies where the noise management levels are exceeded.

The potential Construction Phase noise impacts have been assessed in accordance with the Department of Environment & Climate Change (DECC) NSW "*Interim Construction Noise Guideline";* the EPA (OEH) NSW "*Industrial Noise Policy";* and AS 2436-2010 "*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites".*

2 GLOSSARY OF TERMS

A list of commonly used acoustical terms (and their definition) used in this report is provided below in Table 2-1, as an aid to readers of the report.

Table 2-1- Definition of Acoustical Terms

Term	Definition
$L_{eq,1hr}$	Equivalent Continuous Noise Level - which, lasting for as long as a given noise event, has the same amount of acoustic energy as the given event for the period of one hour.
$L_{A10,1\ hr}$	The noise level, which is equalled or exceeded for 10% of the measurement period of one hour.
$L_{A90,T}$	The noise level, which is equalled or exceeded for 90% of a given measurement period, T. $L_{A90,T}$ is used in Australia as the descriptor for background noise.
$L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level that has the same mean square pressure level as a sound that varies over time, for a given time period. It can be considered as the average sound pressure level over the measurement period and is commonly used as a descriptor for ambient noise.
L_n	The Sound Pressure levels that is equalled or exceeded for n% of the interval time period. Commonly used noise intervals are L_1, L_{10}, L_{90} and L_{99}%
$L_{A10,18hrs}$	The L_{10} noise level for the time period extending from 6am to midnight.

3 PROJECT DESCRIPTION

3.1 SITE LOCATION

The Bobs Farm site deposit is situated on the northern end of the Stockton Bight Dunal system, approximately 200 km north of Sydney, near Bobs Farm, NSW. The surrounding area is predominately zoned as rural with minimal primary production. The site is located in Bob's Farm approximately 27 km north-east of Newcastle and approximately 14 km south-west of Nelsons Bay. The site is bounded to the south by Nelson Bay Road and to the north by Marsh Road.

3.2 PROPOSED OPERATIONS

The proposed Bobs Farm Sand Mine project comprises of:

- The establishment of a quarry to extract and process sand at a rate of up to 750,000 tonnes per annum, from a total sand resource of 10 million tonnes. The total life of the extraction process is up to 20 years;
- The construction of extractive materials processing and transport infrastructure;
- The transportation of extractive materials off-site via roads; and
- The rehabilitation of the site.

Sand will be extracted from the site by two main mining methods:

- Dry mining utilising excavator and haul trucks to remove dry sand products from the pit areas above the water table for processing prior to export; and
- Wet mining utilising a dredge and pump line system to pump wet raw sand materials for processing prior to export.

A graphical display of the Deposited Plan is presented below in Figure 3-1 also showing the outline of the mine site boundary.

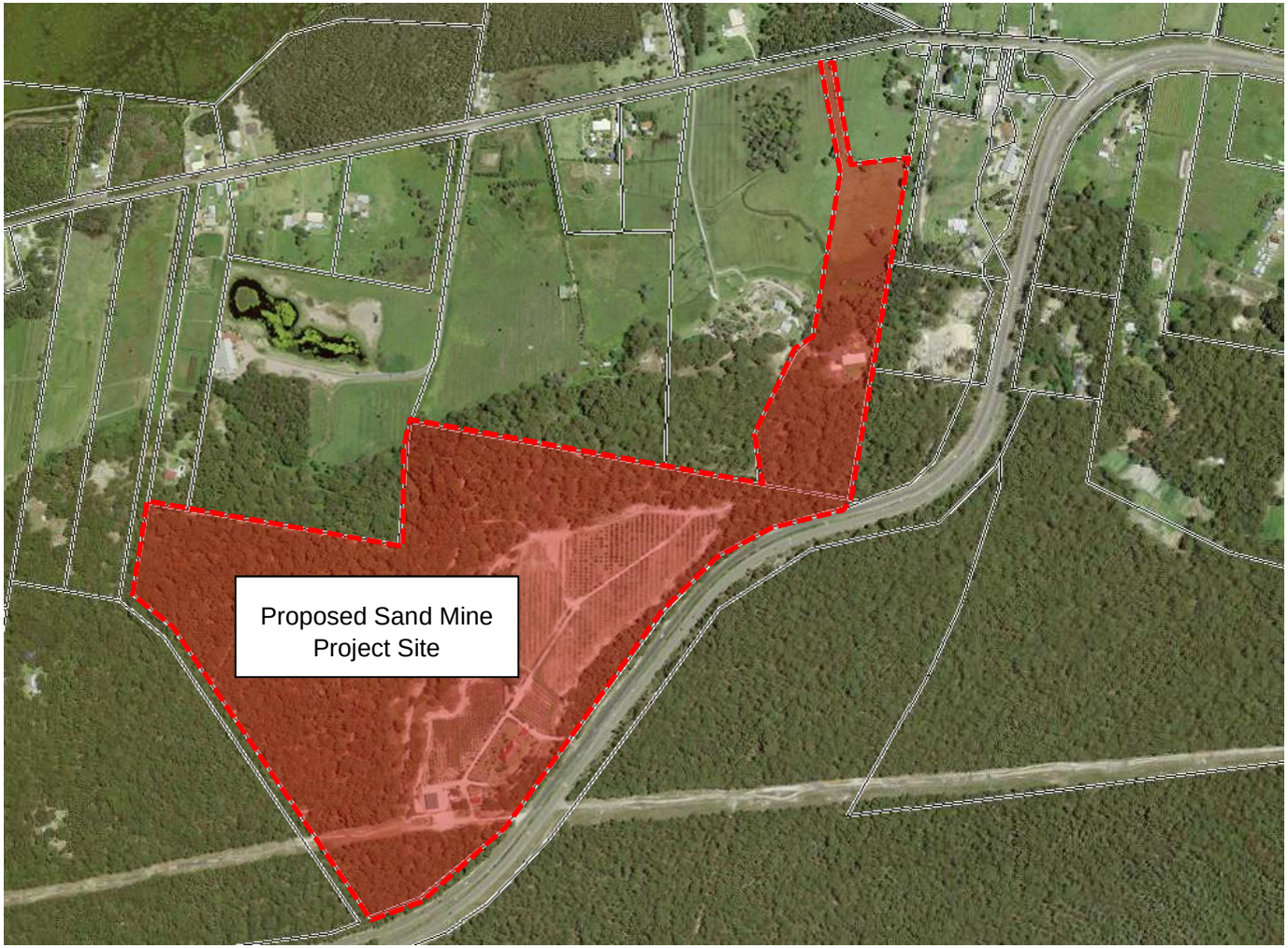

Figure 3-1 - Site Location

3.3 CONSTRUCTION METHODOLOGY

The typical construction work activities to be undertaken in preparing the site to operate as a Sand Mine will be:

- Clearing and mulching of tress,
- Removal of layer of topsoil overlaying the sand material for extraction,
- Construction of Noise bunds and barriers surrounding the pit.

3.4 OPERATIONAL HOURS

The Sand Mine proposes hours of construction work to be conducted between 7am and 7pm.

3.5 EQUIPMENT

The proposed construction equipment that will be utilized during the stripping of vegetation and topsoil to prepare the site to operate as a Sand Mine is outlined below:

Clearing of Vegetation / Trees

- Chain saw
- Grab Arm Excavator
- Trucks for Removal of waste

Top Soil Removal & Bund Construction

- D7 Dozer
- Excavator
- Trucks for Removal of waste

3.6 NOISE SENSITIVE RECEIVERS

The closest dwellings to the extraction area are located approximately 55m to west of the extraction area in the north eastern corner of the site, and 60m from the extraction area in the bottom west corner of the proposed mine. The sensitive receptors considered in this assessment are presented in Table 3-1 below and illustrated in Figure 3-2 and Figure 3-3.

Table 3-1 - Noise Sensitive Receptors

Reference	Description	Distance from Site Boundary (approx.)	UTM Coordinates	
			Easting	Northing
R1	724 Marsh Road - Residential	45m	407080	6373782
R2	776 Marsh Road - Residential	155m	407432	6374056
R3	772 Marsh Road - Residential	180m	407410	6374157
R4	764 Marsh Road (Marsh Road Public School)	120m	407377	6374169
R5	762 Marsh Road - Residential	130m	407313	6374153
R6	760 Marsh Road (Marsh Road Public Hall)	160m	407306	6374183
R7	756 Marsh Road - Residential	115m	407270	6374128
R8	710 & 712 Marsh Road - Residential	350m	406822	6374040
R9	698 Marsh Road - Residential	160m	406807	6373689
R10	666 Marsh Road - Residential	330m	406409	6373926
R11	650 Marsh Road - Residential	365m	406345	6373915
R12	686 Marsh Road (Shark and Ray Centre)	240m	406209	6373694
R13	686 Marsh Road (Tourist Accommodation – Managers Residence)	40m	406497	6373636
R14	686 Marsh Road (Tourist Accommodation – Nearest Eco Cabins)	60m	406444	6373588
R15	644 Marsh Road - Residential	53m	406123	6373508
R16	640 Marsh Road - Residential	103m	406016	6373514
R17	630 Marsh Road - Residential	154m	405912	6373456
R18	3551 Nelson Bay Road - Residential	235m	405906	6373182
R19	3515 Nelson Bay Road - Residential	485m	405758	6372941
R20	723 Marsh Road - Residential	650m	406868	6374185
R21	731 Marsh Road - Residential	500m	407003	6374232
R22	761 Marsh Road - Residential	260m	407322	6374277
R23	767 Marsh Road - Residential	270m	407385	6374280
R24	781 Marsh Road - Residential	320m	407503	6374223
R25	3780 Nelson Bay Road - Residential	345m	407631	6374081
R26	3724 Nelson Bay Road - Residential	380m	407629	6373758
R27	3790 Nelson Bay Road - Residential	315m	407547	6373678
R28	774 Marsh Road - Residential	70m	407339	6373929

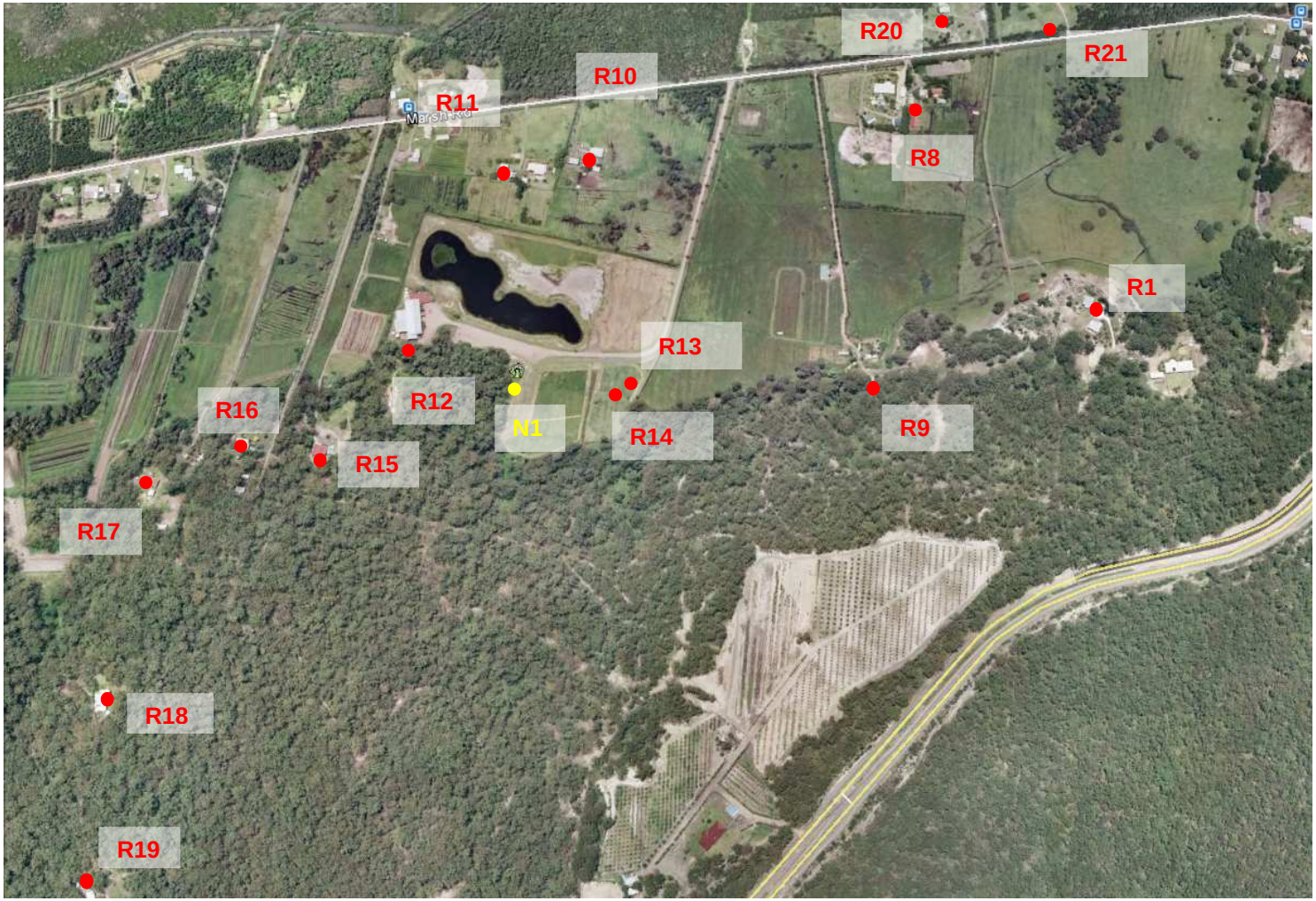

Figure 3-2- Noise Sensitive Receivers (R9 - R17, R20, R21) and Noise Monitoring Location N1

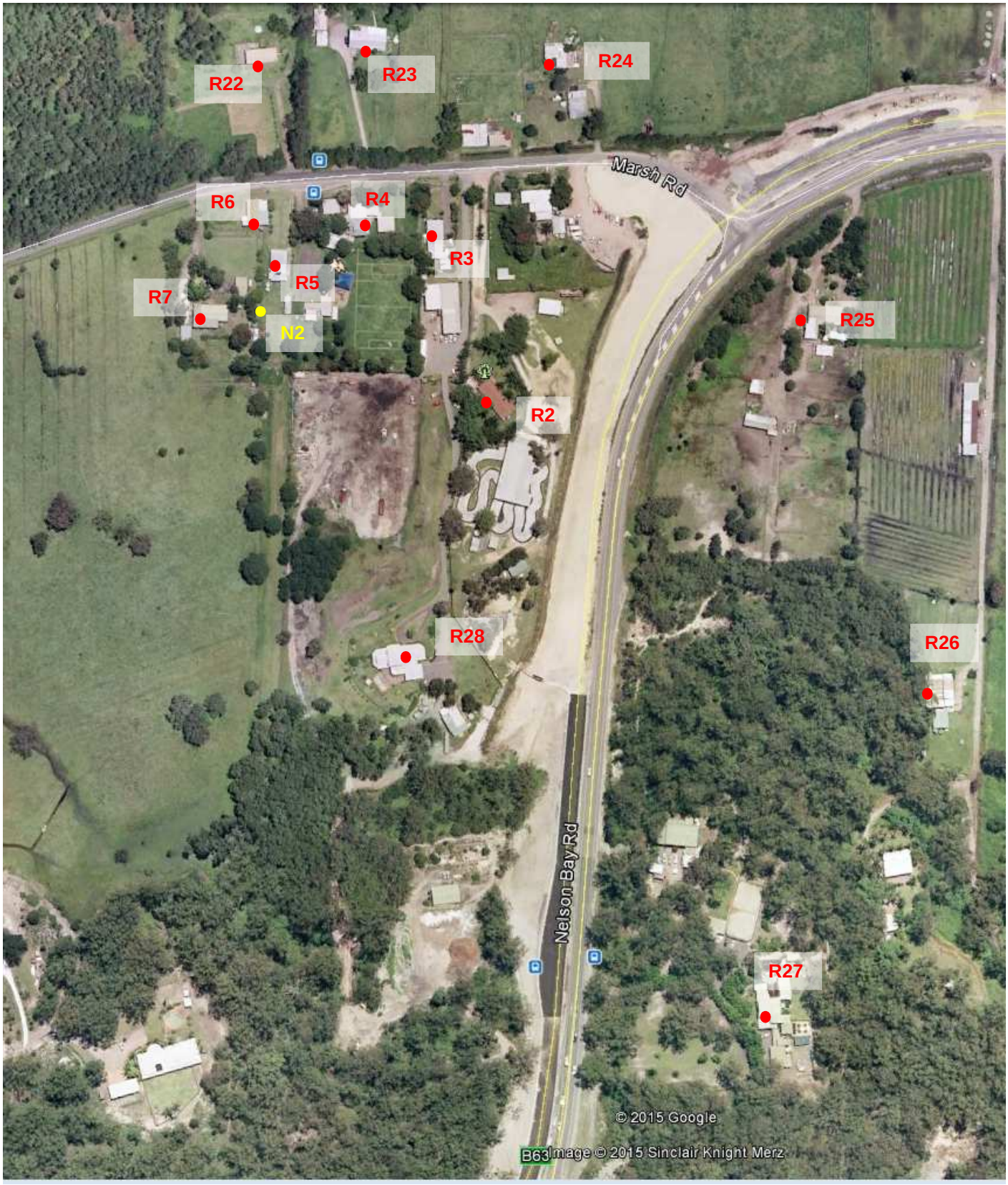

Figure 3-3 - Noise Sensitive Receivers R1-R8 and R22-R28 and Noise Monitoring Location N2

4 EXISTING NOISE ENVIRONMENT

4.1 UNATTENDED NOISE MEASUREMENTS

Vipac installed noise logging equipment at two locations to measure baseline environmental noise levels at representative noise sensitive receptor locations in the vicinity of the proposed sand mine site. The location of the monitoring points are listed in Table 4-1 and shown in Figure 3-2 and Figure 3-3. Monitoring was undertaken for a period of one week between October 1st and October 8th 2019 and conducted in accordance with AS1055:2018 – Acoustics – Description and Measurement of Environmental Noise.

The primary aim of the noise logging survey was to determine the existing environmental noise levels of the potentially affected area and to enable an assessment of the potential noise impacts on the receiving environment. Logger Location 1 (N1) is considered representative of the ambient environment experienced by sensitive receivers North West and West of the site while Logger Location 2 (N2) is representative of receivers North East and East of the site.

Table 4-1 - Monitoring Locations

Loc.	Noise Survey Dates	Location / Address	Instrument	Serial No.
N1	1st – 8th October 2019	686 Marsh Road	RION NL-42	00521660
N2	1st – 8th October 2019	762 Marsh Road	RION NL-42	00621927

The microphones were installed in a free field location and 1.5m above ground level. The instruments were programmed to accumulate noise data continuously over sampling periods of 15-minutes for the entire monitoring period. Internal software then calculates and stores the Ln percentile noise levels for each sampling period, which can later be retrieved for detailed analysis.

All equipment was calibrated by a National Association of Testing Authorities (NATA) accredited laboratory. The instruments were field calibrated using an Onno-Sokki calibrator immediately before and after monitoring.

Table 4-2 presents a summary of the current ambient noise levels at the monitoring locations.

Table 4-2 - Summary of Current Ambient Noise Levels (dB (A))

Loc.	Period	L_{Aeq}	L_{A90}	RBL[1]
N1 (R1-8, R20-28)	Day	49	40	35
	Evening	50	45	42
	Night	44	37	28
N2 (R9-19)	Day	51	45	40
	Evening	49	43	34
	Night	43	37	26

Weather during the monitoring period was mostly fine with light winds, temperatures ranging between 7 and 35 degrees Celsius (source: Bureau of Meteorology – Williamtown RAAF Station (ID: 061078) with rainfall occurring on the morning of the 5th of October between 9am and1pm. This weather affected data has been excluded from the analysis.

[1] RBL is the median of the overall assessment background noise level calculated using OEH Industrial Noise Policy methodology as defined in the glossary of acoustic term

5 CONSTRUCTION NOISE GUIDELINES

5.1 DECC "INTERIM CONSTRUCTION NOISE GUIDELINE"

The NSW Interim Construction Noise Guidelines were developed by the Department of Environment & Climate Change and contains detailed procedures for the assessment and management of construction noise impacts.

The Guideline presents two ways of assessing construction noise impacts – the quantitative method, which is generally suited to longer-term construction projects, and the qualitative method, which is generally suited to short-term works (usually not more than 3 weeks) such as infrastructure maintenance.

The construction activities will extend for more than 3 weeks and therefore, a quantitative method has been used for this assessment.

5.1.1 RESIDENCES AND OTHER SENSITIVE LAND USES

Table 5-1 and Table 5-2 set out the management levels for noise at residences and sensitive land uses, respectively. Restrictions to the hours of construction may apply to activities that generate noise at residences above the 'highly noise affected' noise management level.

Table 5-1 - Noise at residence using Quantitative Assessment

Recommended Hours	Time of Day	Management level $L_{Aeq(15min)}$[1]
Recommended standard hours	Monday to Friday - 7 am to 6pm Saturday - 8am to 1 pm No Work on Sundays or Public holidays	Noise affected RBL[2] + 10dB
		Highly noise affected[3] 75dB
Outside recommended standard hours		Noise affected RBL[2] + 5dB

Table 5-2 - Noise at sensitive land uses (other than residences) using quantitative assessment

Land use	Management Level, $L_{Aeq(15min)}$ Applies when properties are being used
School Classroom	Internal Noise Levels 40dB
Active Recreation Areas	55dB

Where internal noise management levels are specified, the external noise level may be 10dB(A) greater for buildings with no adequate ventilation or 20dB(A) for buildings with fixed external windows and mechanical ventilation

When assessing construction noise, it should be noted that several types of plant and equipment can be particularly annoying to nearby residents. In those instances a +5dB penalty is applied to the predicted noise level. Examples of the type of machines and operations that typically fit this category are listed below:

- Use of 'beeper' style reversing or movement alarms, particularly at night-time,
- Use of power saws, such as used for cutting timber, masonry, road pavement or steel work,
- Grinding metal, concrete or masonry,

1 Noise levels apply at the boundary that is most exposed to construction noise and at a height of 1.5 m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise-affected residence.

2 RBL is the Rating Background Level as defined in the EPA Noise Policy for Industry.

3 $L_{Aeq\ 15\text{-}minute} \geq 75$ dB is highly likely to generate strong community reactions and should be avoided.

- Rock drilling,
- Vibratory rolling,
- Bitumen milling or profiling,
- Jack hammering, rock hammering or rock breaking', and
- Impact piling.

5.1.2 ASSESSING IMPACTS

The process of predicting noise is summarised in Figure 5-1.

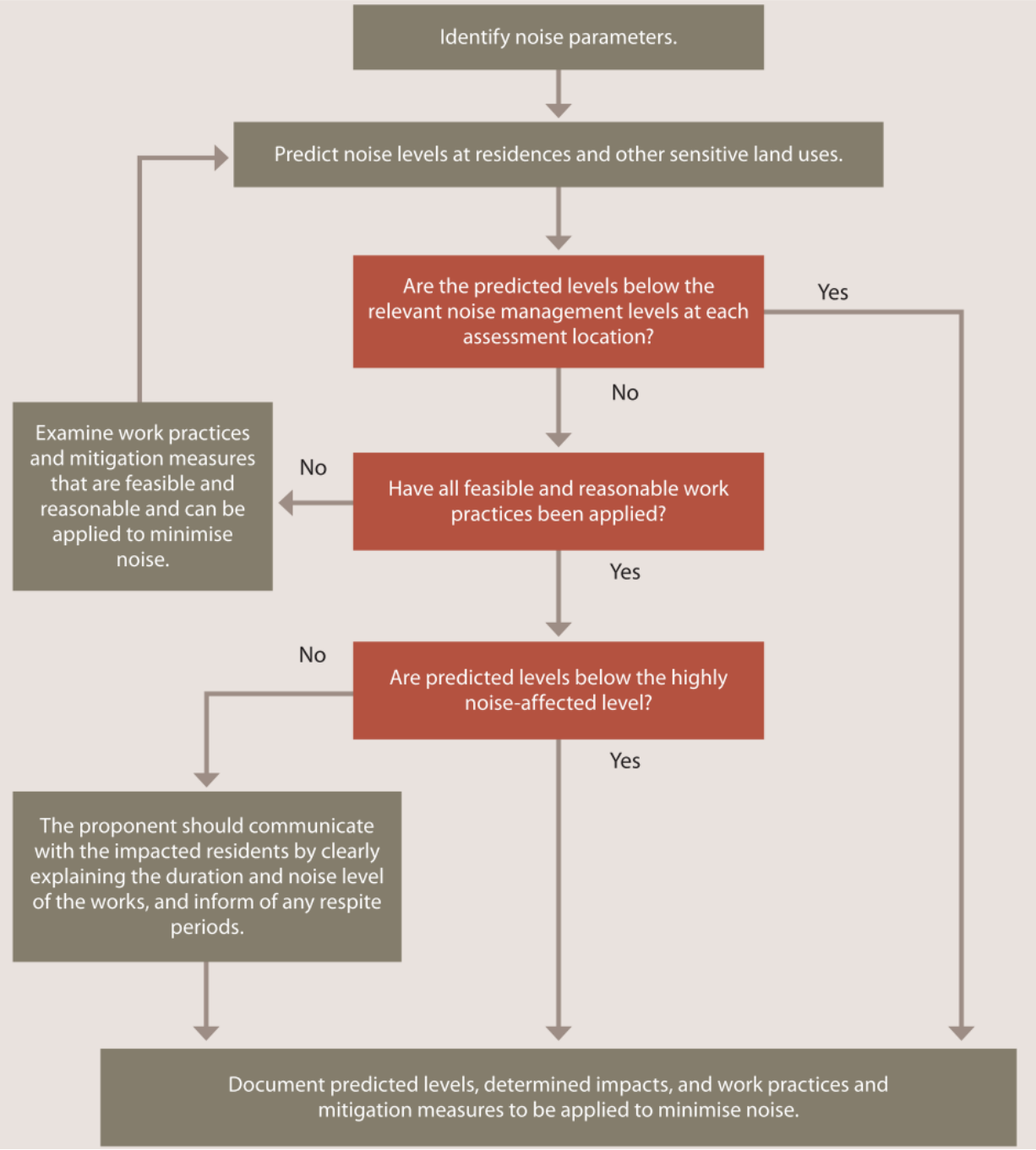

Figure 5-1 - Prediction and Assessment of Impacts - Quantitative Method

5.2 SLEEP DISTURBANCE ASSESSMENT APPROACH

The NPI refers to the NSW Road Noise Policy for criteria when assessing sleep disturbance. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages. The NPI states that:

Where the subject development/premises night-time noise levels at a residential location exceed:

- $L_{Aeq,\ 15min}$ 40dB(A) or the prevailing RBL plus 5dB, whichever is greater, and/or
- L_{AFmax} 52dB(A) or the prevailing RBL plus 15dB, whichever is the greater,

A detailed maximum noise level event (sleep disturbance) assessment should be undertaken.

Guidance indicating the potential for sleep disturbance is set out in the NSW Road Noise Policy (RNP) and is summarised as follows:

The NSW Office of Environment and Heritage (OEH) reviewed research on sleep disturbance in the NSW Environmental Criteria for Road Traffic Noise (ECRTN) (EPA, 1999). This review concluded that the range of results is sufficiently diverse that it was not reasonable to issue new noise criteria for sleep disturbance.

From the research, OEH recognised that current sleep disturbance criterion of an $L_{A1,\ (1\ minute)}$ not exceeding the L_{A90}, (15 minute) by more than 15 dB(A) is not ideal. Nevertheless, as there is insufficient evidence to determine what should replace it, OEH will continue to use it as a guide to identify the likelihood of sleep disturbance.

This means that where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis is required.

The detailed analysis should cover the maximum noise level or $L_{A1,\ (1\ minute)}$, that is, the extent to which the maximum noise level exceeds the background level and the number of times this happens during the night-time period. Some guidance on possible impact is contained in the review of research results in the appendices to the ECRTN. Other factors that may be important in assessing the extent of impacts on sleep include:

- How often high noise events will occur
- Time of day (normally between 10pm and 7am)
- Whether there are times of day when there is a clear change in the noise environment (such as during early morning shoulder periods).

The $L_{A1,\ (1\ minute)}$ descriptor is meant to represent a maximum noise level measured under 'fast' time response. The NSW Department of Environment, Climate Change and Water (DECCW) will accept analysis based on either $L_{A1,\ (1\ minute)}$ or $L_{A(Max)}$.

Given the proposed hours of operation does not include activity during the night time periods, a sleep disturbance assessment has not been conducted.

6 CRITERIA

6.1 CONSTRUCTION NOISE GOALS

A summary of the Noise Management Level (NML) criterion at the noise sensitive receptors is provided in Table 6-1.

Table 6-1 - Construction Noise Management Levels

Receiver type	Period	NML $L_{Aeq\ (15min)}$	Highly affected Noise Level $L_{Aeq\ (15min)}$
N1 (R9-19)	Day - (RBL+10)	45	75
	Day (RBL +5) (or outside standard hours)	40	
	Evening - (RBL+5) (or outside standard hours)	47	
	Night (RBL+5) (or outside standard hours)	33	
N2 (R1-8, R20-28)	Day - (RBL+10)	50	
	Day (RBL +5) (or outside standard hours)	45	
	Evening - (RBL+5) (or outside standard hours)	39	
	Night (RBL+5) (or outside standard hours)	31	

7 CONSTRUCTION NOISE ASSESSMENT

7.1 CONSTRUCTION NOISE MODELLING

Noise modelling has been undertaken using the SoundPLAN® computational noise modelling software package. The use of the SoundPLAN® software and referenced modelling methodology is accepted for use in the state of NSW by the EPA (OEH) for environmental noise modelling purposes. Vipac have undertaken numerous noise modelling and impact assessments previously for a range of projects, including infrastructure development and industrial projects using SoundPLAN®.

7.2 GEOGRAPHICAL DATA

Tattersall Lander supplied topographical details of the area to Vipac and Table 7-1 below lists the drawings received and used in the noise prediction model.

Table 7-1 - Drawings used

Drawing Title	Description	Date
Existing Surface Survey dxf	Current Terrain Layout	11/08/2014
3m Design Surface dxf	3m pit proposed design	11/08/2014
Sand Mine Plan (Rev E)	Proposed Mine Layout	23/09/2019

7.3 PLANT AND EQUIPMENT

The proposed construction plant and equipment and the corresponding acoustic power produced by each item is listed in Table 7-2. The total predicted sound power levels for each of the construction phases is also presented in Table 7-2. The typical sound levels of the plant and equipment were extracted from *"Australian Standard AS 2436-2010, Appendix A"*; "*British Standard BS 5228-1:2009- Code of practice for noise and vibration control on construction and open sites- Part 1: Noise*" and "*Vipac database".*

Table 7-2 - Construction Activities and Sound Powel Levels

Plant & Equipment	Quantity	Sound Power Level (L_W) dB(A)	Predicted Sound Pressure Levels (dB(A)) at various distances per equipment (metres)					
			50	100	200	300	400	500
D7 Dozer	1	109	67	61	55	51	49	47
22 Tonne Tracked Excavator	1	106	64	58	52	48	46	44
Chain Saw	2	109	67	61	55	51	49	47
Haul Truck onsite	1	118	76	70	64	60	58	56

7.4 PREDICTED CONSTRUCTION NOISE LEVELS

As outlined above, the predicted noise levels have been calculated using the SoundPLAN computational noise prediction modelling software package.

Noise levels are expressed as external $L_{Aeq,\ 15\ minutes}$ at the nearest boundary of the receiver properties. The predicted levels are presented in Table 7-3 for each of the construction stages.

These predictions are based on a conservative assumption that construction operations and activities are situated at the closest distances to noise sensitive receivers, which relates to the highest potential impact on the local community during the construction phase of the proposed development.

Note – as construction is not proposed during the night time period, assessment against the night time criteria has not been conducted.

Table 7-3 - Predicted Noise Levels (dB(A))

Receiver ID	Period	Criteria	Noise Management Level	Predicted Noise Level	Compliance
R1 Residential	Standard Hours	Highly Noise Affected	75	60	✓
		Noise Affected (RBL+10dB)	50		×
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		×
		Noise Affected Evening (RBL+5dB)	39	54	×
R2 Residential	Standard Hours	Highly Noise Affected	75	29	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	23	✓
R3 Residential	Standard Hours	Highly Noise Affected	75	35	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	29	✓
R4 School	When in use	Highly Noise Affected	75	38	✓
		Noise Affected (RBL+10dB)	50	32	✓
R5 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	31	✓
R6 Public Hall	When in use	Highly Noise Affected	75	34	✓
		Noise Affected (RBL+10dB)	50	28	✓
R7 Residential	Standard Hours	Highly Noise Affected	75	38	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	39		✓
		Noise Affected Evening (RBL+5dB)	31	32	×
R8 Residential	Standard Hours	Highly Noise Affected	75	39	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	39		✓
		Noise Affected Evening (RBL+5dB)	31	33	×
R9 Residential	Standard Hours	Highly Noise Affected	75	40	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		✓
		Noise Affected Evening (RBL+5dB)	47	34	✓
R10 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		✓
		Noise Affected Evening (RBL+5dB)	47	31	✓

Receiver ID	Period	Criteria	Noise Management Level	Predicted Noise Level	Compliance
R11 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		✓
		Noise Affected Evening (RBL+5dB)	47	31	✓
R12 Aquarium	When in use	Highly Noise Affected	75	39	✓
		Noise Affected (RBL+10dB)	45	33	✓
R13 Residential	Standard Hours	Highly Noise Affected	75	50	✓
		Noise Affected (RBL+10dB)	45		×
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		×
		Noise Affected Evening (RBL+5dB)	47	44	✓
R14 Residential	Standard Hours	Highly Noise Affected	75	42	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		×
		Noise Affected Evening (RBL+5dB)	47	36	✓
R15 Residential	Standard Hours	Highly Noise Affected	75	57	✓
		Noise Affected (RBL+10dB)	45		×
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		×
		Noise Affected Evening (RBL+5dB)	47	51	×
R16 Residential	Standard Hours	Highly Noise Affected	75	50	✓
		Noise Affected (RBL+10dB)	45		×
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		×
		Noise Affected Evening (RBL+5dB)	47	44	✓
R17 Residential	Standard Hours	Highly Noise Affected	75	48	✓
		Noise Affected (RBL+10dB)	45		×
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		×
		Noise Affected Evening (RBL+5dB)	47	42	✓
R18 Residential	Standard Hours	Highly Noise Affected	75	40	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		✓
		Noise Affected Evening (RBL+5dB)	47	34	✓
R19 Residential	Standard Hours	Highly Noise Affected	75	33	✓
		Noise Affected (RBL+10dB)	45		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	40		✓
		Noise Affected Evening (RBL+5dB)	47	27	✓
R20 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		
		Noise Affected Evening (RBL+5dB)	39	31	✓

Receiver ID	Period	Criteria	Noise Management Level	Predicted Noise Level	Compliance
R21 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	31	✓
R22 Residential	Standard Hours	Highly Noise Affected	75	33	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	27	✓
R23 Residential	Standard Hours	Highly Noise Affected	75	34	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	28	✓
R24 Residential	Standard Hours	Highly Noise Affected	75	28	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	22	✓
R25 Residential	Standard Hours	Highly Noise Affected	75	35	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	29	✓
R26 Residential	Standard Hours	Highly Noise Affected	75	32	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	26	✓
R27 Residential	Standard Hours	Highly Noise Affected	75	37	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	31	✓
R28 Residential	Standard Hours	Highly Noise Affected	75	42	✓
		Noise Affected (RBL+10dB)	50		✓
	Outside Standard Hours	Noise Affected Day (RBL+5dB)	45		✓
		Noise Affected Evening (RBL+5dB)	39	36	✓

7.4.1 CONSTRUCTION PHASE SUMMARY AND DISCUSSION

The results of the noise modelling show that there are a number of exceedances predicted at the closest sensitive receivers to construction activities at the sand mine. The exceedances are primarily related to the use of chainsaws and bulldozers operating at close distances to the receivers. However, the predicted noise levels are within the Highly Noise Affected – Noise Management Levels for Standard and Non-Standard Construction Hours at all of the noise sensitive monitoring locations, located in the vicinity of the proposed development site. Table 7-4 below summarises the exceedances at the nearest sensitive receivers:

Table 7-4 - Exceeding Receiver Summary

Hours of Operation	Day	Evening
Standard Hours	R1, R13, R15-17	-
Outside Standard Hours	R1, R13-17	R1, R7, R8, R15

Given the number of exceedances outside standard hours, it is recommended to contain construction activities to standard hours of operation (i.e. 7am-6pm).

In order to limit the impact on the surrounding noise sensitive receivers, Vipac makes the following recommendation to minimise noise emissions from the site during the construction phase:

- To reduce the predicted noise impact on residential receivers in particular R1, R13, R15-17, removal of trees by chainsaw near these receivers should only be completed following consultation with the receivers to notify them of the planned works and to advise the receivers of the proposed schedule to complete the tree removal works, with regard to the use of chainsaws for tree felling.

- Additionally, in order to minimise the potential construction phase noise impacts on the sensitive receptors located in the vicinity of the site, a site specific construction noise management plan adopting feasible and reasonable noise attenuation and management measures should be implemented as detailed in Section 9 of this report, as best practise to minimise the potential construction phase noise impacts.

8 CONCLUSION

A construction noise impact assessment has been undertaken to determine the potential noise impact of the construction of proposed sand mine at Bobs Farm on noise sensitive receptors in the surrounding area.

Future potential noise levels at the nearest noise sensitive receivers were predicted using the SoundPLAN noise model for the construction phase. Noise levels were predicted in the day and evening periods for standard and nonstandard hours of operation.

Noise levels are predicted to comply with the ‘highly noise affected’ criteria during standard operation, however exceed day and evening ‘noise affected’ noise management levels during standard and nonstandard hours for both day and evening periods.

A Construction Noise Management Plan has been provided based on these exceedances to manage the expectations and minimise the impacts at the nearest sensitive receivers.

9 CONSTRUCTION NOISE MANAGEMENT PLAN

Construction Noise Management Plan		
Component		**Details**
General/Site Management Issues		All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: should instruct all persons at the site with regard to all relevant project specific and standard noise and vibration mitigation measures detailed herein including permissible hours of work; any limitations on high noise generating activities; location of nearest sensitive receivers; construction employee parking areas; designated loading/unloading areas and procedures; site opening/closing times (including deliveries); and environmental incident procedures.
		A dedicated person will form a point of contact for the dissemination of general information regarding site operations. Contact persons will also be defined to receive comment or complaints from the community.
Hours of Work/Respite Periods		Typical Standard Hours for Construction 07:00 – 18:00 Monday – Friday and 08:00 -13:00 on Saturday
Source Controls	**General/Work Practices**	Avoid unnecessary revving of engines and turn off plant that is not being used / required.
		Use only non-tonal reverse alarms (broadband alternatives are needed). Where possible organise the site so that delivery trucks and haulage trucks only drive forward to avoid the use of reversing alarms.
		Organise and schedule the equipment operations to limit the noisiest machines operating simultaneously.
		Site set up / movement of plant / delivery of materials / waste removal to site should generally be restricted to the daytime period.
		Truck drivers are to be informed of site access routes, acceptable delivery hours and must minimise extended periods of engine idling.
		Ensure there is no unnecessary shouting or loud stereos/radios on-site. There must be no dropping of materials from heights, throwing of metal items, or slamming of doors.

Construction Noise Management Plan		
Component		**Details**
		Equipment must be inspected on a regular basis and maintained as necessary, to ensure it is in good working order. This must include inspections of the condition and performance of mufflers.
	Substitution	Use less noise-intensive equipment where reasonable and feasible.
		Construction equipment with the most effective mufflers, enclosures and low-noise tool bits and blades must be procured and utilised for the project.
		Where possible mains power should be utilised for temporary traffic signals / work area lighting. Where this is not feasible silenced generator sets are to be used instead.
	Use and Siting of Equipment/ Activities	Where practical fixed plant should be positioned as far away as possible from sensitive receivers.
		During paving works or any concrete cutting works consideration should be given to taking materials off site for cutting where practical.
Consultation	**Notification**	A letter should be distributed to local residents in advance of the works to notify them of the nature and estimated timescales for completion of the proposed works.
	Project info-line and Construction response line	A 24-hour contact point should be provided for any complaints regarding the construction work. A Project representative must respond to all complaints as soon as possible.
Complaints management		Upon receiving any complaint regarding construction activities, the nominated contact must investigate the source of the complaint. The aim will be for a Project representative to initiate a complaint investigation and to respond to all complaints as soon as possible. Where practicable a visit should be made to the complainant to verify the nature of the complaint and if justified appropriate action should be taken to cease or amend the activity causing the complaint. A Complaint Management Plan will be developed and implemented by the contractor engaged for the Construction Works. The Complaint Management Plan will at a minimum include provisions for the recommendations outlined above.