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Tattersall Lander Pty Ltd

Bobs Sand Farm EIS DPE Response

Operational Noise Management Plan

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TABLE OF CONTENTS

1	INTE	RODUCTION	4
1.1	Obje	ectives	4
1.2	Envi	ironmental Requirements and Obligations	4
1.3	Sum	nmary of noise and vibration criteria	5
1.4	•	ponsibilities	
2	BAC	CKGROUND INFORMATION	6
2.1	Site	Location	6
2.2	Prop	posed Operations	6
2.3	Minii	ng Noise Sources	7
2.4	Sens	sitive Receptors	8
2.5	Pote	ential for Impacts	11
3	NOI	SE AND VIBRATION MANAGEMENT STRATEGY	11
3.1	Nois	se and Vibration Mitigation Measures	11
3.2	Wea	ather Forecasting System	12
3.3	Nois	e and Vibration Monitoring	13
3.4	Com	nplaints Management	13
3.5	Repo	orting	14
	3.5.1	Non-compliant Monitoring Results	14
	3.5.2	Environmental Incidents	14
	3.5.3	General	15
3.6	Audi	iting and Review	15
	3.6.1	Auditing	15
	3.6.2	Review	15
3.7	Disp	oute Resolution	15
4	RFF	FRENCES	16



1 INTRODUCTION

This report documents the Noise and Vibration Management Plan (NVMP) for the Sand Farm located on Deposited Plans DP753204 (40.9ha) and DP1015671 (6.63ha), Bob's Farm NSW.

The steps for managing noise impacts from the operation of the mine are outlined as follows:

- Identifying the location of the works
- Identify the sensitive receiver locations with respect to the works proposed.
- Define the nature of the works to be undertaken and their expected duration.
- Predict levels of noise from the operational works at the identified sensitive receivers.
- Provide management strategies for when the noise management levels are exceeded.

The NVMP will be administered as a supporting document for the Project's Environmental Impact Statement.

1.1 OBJECTIVES

The objectives of the NVMP are to:

- Comply with all regulatory requirements;
- Identify major noise and vibration sources from the mining operations;
- Minimise noise and vibration emissions to the maximum possible extent;
- Provide a process for the investigation of complaints relating to noise and vibration in a timely manner and for derivation of measures that deal effectively with the causes of legitimate complaints;
- Reduce the potential for exceedances relating to noise and vibration emissions;
- Document proactive mitigation measures for each noise and vibration source;
- Identify proposed noise and vibration monitoring locations, equipment and frequency for the Mine's monitoring program;
- Document actions and responsibilities in the event of an exceedance of a noise and vibration trigger level or a legitimate complaint; and
- Document reporting and management requirements for noise and vibration monitoring data.

1.2 ENVIRONMENTAL REQUIREMENTS AND OBLIGATIONS

New South Wales legislation relevant to addressing the noise and vibration aspects of the project:

- NSW EPA Noise Policy For Industry
- DECC Assessing Vibration: A Technical Guideline
- NSW Road Noise Policy



1.3 SUMMARY OF NOISE AND VIBRATION CRITERIA

A summary of noise and vibration criteria assessed and recommended for management of noise for the Project are detailed in Table 1-1.

Table 1-1 - Summary of Noise and Vibration Criteria

Noise and vibration type	Criteria	Period	Levels dB(A)
Operational mining noise (all noise sources)	NSW NPI	Day Evening	LAeq,adj,11 hr 40-45 LAeq,adj,4 hr 39-45
Vibration	DECC Assessing Vibration: A Technical Guideline	When Operating	Human Perception 0.28-0.53 mm/s Cosmetic Damage 5mm/s
Road Traffic Noise	NSW Road Noise Policy	Between 7am and midnight	Residential L _{Aeq (15hr)} 60 dB(A) (external) Non-Residential L _{Aeq, 1hr} 40 dB(A) (internal)

1.4 RESPONSIBILITIES

The key responsibilities under the NVMP are defined in Table 1-2.

Table 1-2 Responsibilities of Operator staff relating to the NVMP

Role	Responsibilities
Mine Management	 Ensuring the Mine Environmental Team is adequately resourced to achieve the best possible environmental management at the Mine, including implementation and maintenance of the NVMP. Ensuring the Mine possesses an efficient and focussed complaints management procedure to properly manage legitimate complaints in a timely manner. Ensuring the Mine possess an adequate community consultation strategy. Ensuring the appropriate staff are available after hours to make as required critical management decisions around the Mine's activities based on noise monitoring, noise complaint receipt or other noise management related inputs.
Mining Superintendents	 Ensure mining is planned and completed within compliance guidelines Ensure that relevant complaints are investigated in a timely manner and as required the implementation of management measures to reduce the likelihood of similar complaints being generated in the future.
Product Handling Superintendent	 Ensure operations are planned and completed within compliance guidelines Ensure that relevant complaints are investigated in a timely manner and as required the implementation of management measures to reduce the likelihood of similar complaints being generated in the future.



Role	Responsibilities
Maintenance Superintendent	 Ensure equipment is maintained appropriately to operate within compliance guidelines Ensure that relevant complaints are investigated in a timely manner and as required the implementation of management measures to reduce the likelihood of similar complaints being generated in the future.
Corporate Office Environmental Staff	 Provision of as required support to Mine management and the Mine Environmental Team to update management plans, implement new noise and vibration control measures and investigate significant noise and vibration complaints. Provision of as required support to Mine management and the Mine Environmental Team for significant regulatory and community matters.

2 BACKGROUND INFORMATION

2.1 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.

2.2 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 2-1 also showing the outline of the mine site boundary.



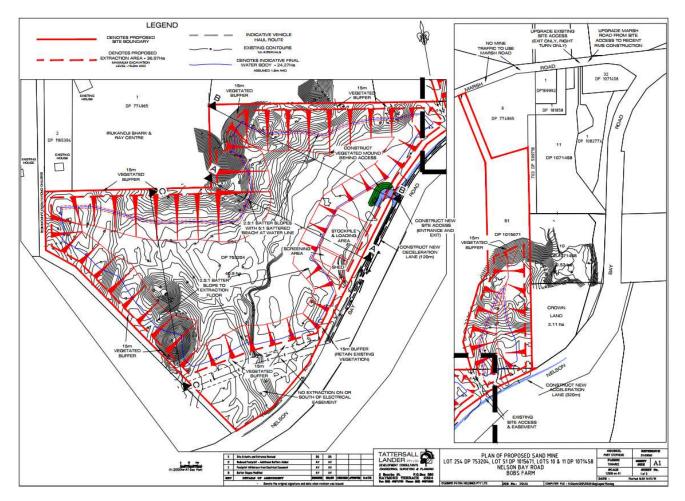


Figure 2-1 - Proposed Mine Design and Configuration

2.3 MINING NOISE SOURCES

The mining fleet incorporated in the noise model during each phase are presented in Table 2-1

Table 2-1 - Mining Fleet and Quantities

Description	Modelled Quantity per Phase					
Description	Phase 1	Phase 2	Phase 3	Phase 4	Peak	
22 Tonne Excavator	2	2	-	-	-	
35 Tonne Excavator	2	2	-	-	-	
44 tonne Haul Truck	2	2	0	0	0	
Sales Loader	3	3	3	3	3	
Conveyor System Head Drive	1	1	1	1	1	
Screens	1	1	1	1	1	
Pump	2	2	2	2	2	
Export lorry 32 tonne	24	40	72	112	200	
Pump on Dredge	-	-	3	3	3	



2.4 SENSITIVE RECEPTORS

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 2-2 below and illustrated in Figure 2-3.

Table 2-2 - Noise Sensitive Receptors

	Table 2-2 - Noise Sensitive Heceptors	Distance	UTM Coordinates	
Reference	Description	from Site Boundary (approx.)	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



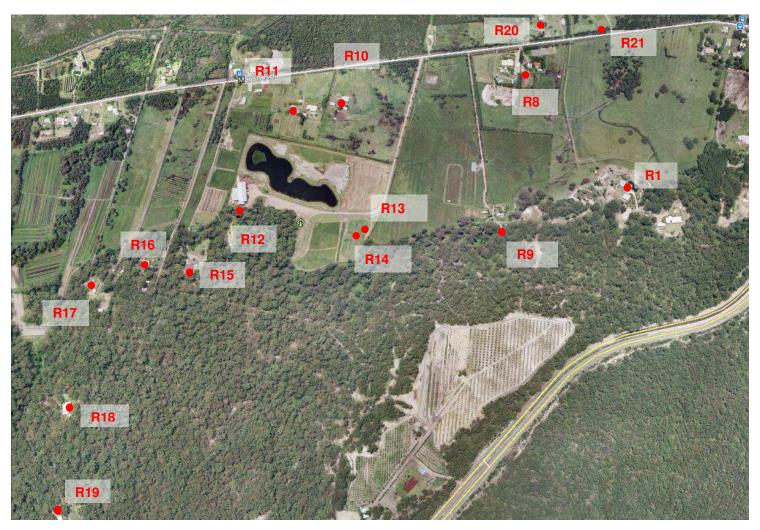


Figure 2-2- Noise Sensitive Receivers (R9 - R17, R20, R21)





Figure 2-3 - Noise Sensitive Receivers R1-R8 and R22-R28



2.5 POTENTIAL FOR IMPACTS

The noise and vibration impact of the revised Project has been assessed. A computer noise model was developed using SoundPLAN version 8.0 to predict the noise impact during different stages of the mining operations with results detailed in the Updated Noise Impact Assessment report prepared by Vipac (ref: 70Q-18-0276-TRP-8551444).

Modelling results show the most dominant noise sources include the excavators, dredge pumps and internal dump truck routes at the majority of the closest receivers through varying operational phases and environmental conditions.

Road traffic noise impacts have been assessed and are considered acceptable.

Vibration impacts have been assessed and are considered acceptable given the sufficient separation distance between source and receiver.

The predicted noise levels from the revised Project's mining operation are predicted to exceed the criteria at Receivers R1 and R15-18 with the construction of barriers and bunds in worst case weather conditions. All remaining receivers are predicted to comply with the noise criteria throughout the life of the Project.

Given there are exceedances predicted in worst case conditions with the implementation of physical barriers, an operational noise management plan will play a pivotal role in managing affected landowner expectations and exposure to adverse noise impacts.

3 NOISE AND VIBRATION MANAGEMENT STRATEGY

This section details the proposed approach to minimise potential noise and vibration impacts from the revised Project including:

- Noise and Vibration Mitigation Measures;
- Weather Forecasting System;
- Noise and Vibration Monitoring;
- Complaint Management;
- Reporting;
- Auditing; and
- Dispute Resolution.

3.1 NOISE AND VIBRATION MITIGATION MEASURES

The following mitigation measures are proposed as management commitments to reduce the Project's potential noise impact.

- A real-time noise monitoring network is proposed to be established, which will be used in conjunction
 with a weather forecasting system and an adaptive management process, to proactively relocate,
 reduce or stop noisier mining operations and other noise sources when required.
- Based on ambient conditions (climate and the current mine plan) and feedback from the real-time noise monitoring (warning and alarm protocols), the Project may be required to modify (limit) or stop



- mining operations in the western corner closest to receivers R15-18. This requirement is based on the revised noise assessment work completed for the Project's EIS.
- The operators are to ensure noisier mining equipment such as excavators, track dozers, loaders and rear dump trucks are fully attenuated. This recommendation is based on the noise assessment work completed for the Project's EIS.
- If a legitimate complaint is received and/or a noise issue is identified by investigation, where possible
 the operator will modify mining operations until a satisfactory solution for the noise issue is developed
 and implemented.
- Where possible, the operator will schedule noisier operations during daylight hours only.
- If no suitable or acceptable noise amelioration solutions are available for a particular noise issue, the operator will negotiate in good faith with all affected property owners (particularly receivers R1 and R15-18) for property purchase or by agreement implement some other form of amicable arrangement (e.g. acoustic treatment of the dwelling, relocation or replacement of the dwelling at another suitable location, relocation of the landowner to another living arrangement for the period of the issue or any other suitable innovative solution) in accordance with the NSW Voluntary Land Acquisition and Mitigation Policy (VLAMP). The operator would be responsible for all reasonable costs associated with any agreed solution to a noise issue.
- The Operator will ensure proper maintenance and operational procedures will be undertaken to minimise noise emissions from equipment, including appropriate servicing and maintenance of exhaust systems on mine equipment.
- The Operator will ensure all complaints are investigated in a timely manner to determine the source of the nuisance noise. Where appropriate, noise monitoring will be conducted at the affected residence, and as required, noise amelioration solutions will be investigated and implemented by agreement. It is recommended the operator purchase a specialist noise logger that can be placed at a complainant's residence for a length of time to record the problem periods. This equipment will be maintained and the results will be interpreted by a qualified professional.
- Where practicable, the Operator using the mine planning process will utilise topsoil and other dumps as noise barriers between active mine operations and nearby noise receptor locations.
- It is recommended The Operator utilise broadband alarms instead of reverse beepers on all mobile equipment.
- It is recommended the Operator limit the speed of heavy vehicle traffic on haul roads.

3.2 WEATHER FORECASTING SYSTEM

It is recommended the Operator implements a weather forecasting system to provide daily predictions of upcoming meteorological conditions and potential risk of noise and vibration impacts from mining operations from the Project.

The weather forecasting system predicts potential risk of noise and vibration impacts using dispersion modelling tools for up to two days in advance. The weather forecasts will be updated on a daily basis, generating a daily automated email of forecast meteorological conditions.

Predictions from the weather forecasting system will allow Mine management to identify locations and times of potentially increased risk, and to facilitate appropriate planning to minimise or avoid potential impacts.

Significant noise and vibration issues will be highlighted at shift changes between the Production Supervisors or are and will be conveyed to the general workforce on a regular basis through 'Tool Box Talks'. This



approach ensures that the day-to-day business focuses on good work practices to help reduce the potential for noise and vibration impacts from the Project.

3.3 NOISE AND VIBRATION MONITORING

Noise or vibration monitoring and the assessment of impact must be conducted in response to a complaint (from any sensitive receptor). The Mine Environmental Team has the responsibility to ensure this is conducted in a timely manner.

Any noise monitoring program must be conducted in accordance with the NSW Noise Policy for Industry.

Noise monitoring should include the following descriptor characteristics and matters:

- L_{AN,T} (where N equals the statistical levels of 1, 10 and 90 and T = 15 mins);
- Background noise L_{A90};
- The level and frequency of occurrence of impulsive or tonal noise and any adjustment and penalties to statistical levels;
- Atmospheric conditions including temperature, relative humidity and wind speed and directions;
- Effects due to any extraneous factors such as traffic noise; and
- Location, date and time of monitoring.

Appropriately qualified and experienced personnel should be engaged to undertake the monitoring and assessment of noise and vibration impact. The results must be notified to the Environmental Team Manager (or Mine Manager) following completion of monitoring.

A noise and vibration assessment is to be conducted relative to the applicable conditions or criteria. If criteria are exceeded, or a complaint continues to occur, then a risk assessment and corrective actions need to be undertaken which may include changes in mine practices or additional controls to be applied.

3.4 COMPLAINTS MANAGEMENT

A register of complaints received in relation to the Project's operations will be maintained for auditing purposes by the NSW Environment Protection Authority (EPA). In general, the register will record the complaint's details, the complainant(s), a summary of the investigations completed, any management actions taken, and the status of the complaint.

A twenty four hour telephone number should be made available to nearby neighbours for receiving complaints. This 'fast response' approach is designed to ensure access to the Operator at the time with the necessary responsibility to take immediate actions if required.

A record of all complaints will be kept by the Operator's Environmental Team, who are responsible for the Project's environmental complaints management. Each complaint received in relation to the Project will be formally documented and a record of the following information is maintained for legal and compliance purposes.

- 1) The date and time of complaint.
- 2) The nature of complaint (e.g. noise).
- 3) The method by which the complaint was received (e.g. telephone).
- 4) The name and title of the person who receives the complaint.
- 5) The personal details of the complainant, if made available, or if no details were provided, a note to that effect.



- 6) The action taken in relation to the complaint, including any follow-up contact, the outcome of investigations and any required on-going actions.
- 7) If no action was taken, then the reason why no action was taken.
- 8) The final status of the complaint (e.g. resolved, continuing or unresolved).

Standard actions taken by the Environmental Team in relation to noise complaints will include reviewing in relation to the time of the complaint:

- Meteorological data;
- Relevant available noise monitoring data; and
- Mine operations.

Follow up actions taken by the Environmental Team in relation to noise complaints may include, depending on circumstances:

- A site inspection of the complainant's residence;
- Targeted noise monitoring at the complainant's residence (i.e. via the use of the Operators noise logger or real-time remote monitoring equipment for general nuisance assessment);
- An investigation of other potential noise generating sources in the vicinity of the complainant's residence;
- Engagement of a noise specialist to assist the complaints investigation process.

The Operator's Management team should be fully appraised of all complaints to ensure the key decision makers for mining operations, mine planning and the Mine, respectively, are involved in the complaints management process.

In general, the Project's complaints will be managed within a reasonable time frame. Depending on the severity of the complaint, the Operator as a courtesy may also advise the EPA about the matter.

Importantly, the Operator will be committed to working with its near neighbours to resolve genuine issues as they arise in relation to the operation of the Mine.

In summary, the Operator will be committed to rectifying all noise issues that are legitimately attributed to the Mine operations through proper scientific evaluation, in an appropriate timeframe, using accepted and practical mitigation measures, and if reasonably possible, to the satisfaction of the affected party.

3.5 REPORTING

3.5.1 NON-COMPLIANT MONITORING RESULTS

The Operator will advise the EPA in a timely manner of all non-compliances identified in relation to the Project (e.g. 'exception reporting').

3.5.2 ENVIRONMENTAL INCIDENTS

The Operator will be bound to report all environmental incidents as a requirement of its approval for the Project (i.e. based on the same requirement for the current Mine).



3.5.3 GENERAL

As required, the Operator will prepare and submit to the EPA any requested information about environmental management and other related matters in relation to the Project's operations, including applicable noise monitoring data.

3.6 AUDITING AND REVIEW

3.6.1 AUDITING

Over the life of the Project, the Operator is to regularly audit the performance of its noise management using both internal and third party auditing processes. Internal and third party audits should be conducted on annual and three yearly timeframes. The audit process will generally be designed to review noise complaints management and evaluate the overall performance of the Operators noise management for the Project. The strategy for the Operator's audit processes is to ensure compliance and promote continuous improvement as part of the Project's noise management regime.

In addition, the Operators noise management regime should be subject to potential audit by the EPA during Compliance Inspections and other site inspections, and as a possible component of a formal noise complaint investigation process.

3.6.2 REVIEW

This NVMP should be formally reviewed on an annual basis and updated as required. The NVMP may also be updated based on the findings of internal and third party audit processes, based on the outcomes of a complaint investigation or following a regulatory inspection (i.e. as corrective actions). The EPA will be advised of all significant revisions of the NVMP.

3.7 DISPUTE RESOLUTION

The Operator will work to resolve all legitimate and perceived noise complaints in a timely and practical manner, and where possible, to the satisfaction of the complainant. In the event that resolution of a noise complaint involving the Project's operation cannot be achieved by amicable means or agreement, and the matter remains an on-going issue for the complainant, the Operator will seek the use of a formal disputes resolution process.



4 REFERENCES

New South Wales Government Environment Protection Authority October 2017, Noise Policy for Industry

New South Wales Government December 2014, Voluntary Land Acquisition and Mitigation Policy

New South Wales Government Department of Environment, Climate Change and Water March 2011, Road Noise Policy

New South Wales Government Department of Environment and Conservation February 2006, Assessing Vibration: A Technical guideline

New South Wales Government Department of Environment, Climate Change and Water July 2009, Interim Construction Noise Guideline