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GINKGO AND SNAPPER MINES

NOISE MANAGEMENT PLAN



Revision History

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Document name	Ginkgo and Snapper Mines Noise Management Plan		
Revision Number	Amendment/Addition	Distribution	Date
0	Final	GHD and TRONOX	October 2014
1	Update of plan to include Crayfish	GHD	September 2015
2	Update of plan to amend compulsory annual noise monitoring requirement	GHD and TRONOX	March 2018
3	Approved by Department	Tronox, DPHI	February 2019
3	Periodic update to reflect changes in government names and cessation of mineral extraction at Ginkgo, Snapper and Crayfish mines	GHD, Tronox, DPHI	April 2025

Abbreviations

Abbreviation	Full Title
Annual Review	Annual Review as required by the relevant Development Application
AR	Annual Return for EPL
Assessment Background Level (ABL)	The single-figure background level representing each of three assessment periods (day, evening, and night) for each 24-hour monitoring period. The ABL is determined using the tenth percentile method.
CCP	Community and Consultation Plan
CoA	Conditions of Approval
DA	Development Application
dB	Unit of measurement for Sound Pressure Level known as a decibel.
dB(A)	'A-weighted' decibel measurement. Developed in the 1930's as a way to represent the sound frequency sensitivity of the human ear.
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
Department	NSW Department of Planning, Housing and Infrastructure
DPHI	NSW Department of Planning, Housing and Infrastructure
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Murray Basin Environmental Management Strategy
EPA	Environmental Protection Authority
EP & A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environmental Protection Licence
GHD	GHD Pty Ltd
Haulage Route	The route shown in Appendix 2 found in Snapper PA 06_0168 Modification 5 dated 20 March 2015.
HMC	Heavy Mineral Concentrate
INP	NSW Industrial Noise Policy
Intrusiveness	This is summarised as $L_{Aeq, 15 \text{ minute}} \leq \text{rating background level plus } 5 \text{ dB(A)}$
$L_{Aeq} \text{ (Time)}$	Equivalent sound pressure level is the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring. This is considered to represent ambient noise.
$L_{A90} \text{ (Time)}$	The A-weighted sound pressure level that is exceeded for 90 percent of the time over which a given sound is measured. This is considered to represent the background noise.

Abbreviation	Full Title
LA10 (Time)	The arithmetic average of the sound pressure level that is exceeded for 10 percent of the time specified. This is considered representative of the average maximum noise
Minister	Minister for Planning, or delegate
MSP	Tronox Mining Australia Limited's Mineral Separation Plant located on the south-western outskirts of Broken Hill
NMP	Noise Management Plan
NSW	New South Wales
NPfl	Noise Policy for Industry
POEO Act 1997	<i>Protection of the Environment Operations Act 1997</i>
Proponent	Tronox Mining Australia Limited, or its successors
Rating Background Level (RBL)	The overall single-figure background level representing each of three assessment periods (day, evening, and night) for each 24-hour monitoring period. The RBL is the figure used for assessment purposes.
Receiver	The noise-sensitive land use at which noise from a development can be heard (NSW EPA, 2000)
RNP	NSW Road Noise Policy 2011
Secretary	Secretary of the Department of Planning, Housing and Infrastructure, or nominee
Site	The land bounded by the red line (ML 1621) plus the ETL from the Ginkgo Mine and access road extensions, shown in Appendix 5 of Snapper PA 06_0168 Modification 5 dated 20 March 2015.
Sound Pressure Level (SPL)	The Sound Pressure Level is the change in air pressure above and below the average atmospheric pressure (amplitude) cause by a passing pressure wave; this is then converted to decibels and can be abbreviated as SPL or Lp.
Tronox	Tronox Mining Australia Ltd

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1 INTRODUCTION

1.1 PURPOSE OF THE MANAGEMENT PLAN

Tronox Mining Australia Ltd (Tronox) operates three mineral sands mines located near Pooncarie in the Murray Basin as well as a Mineral Separation Plant (MSP) at Broken Hill in New South Wales (NSW). These mines include Ginkgo Mine (ML 1504), Crayfish Mine (ML 1735) and Snapper Mine MLs 1621 and 1809. This Noise Management Plan (NMP) has been created and applies to noise management at the Snapper mineral sands mine (Snapper) and the Ginkgo/ Crayfish mineral sands mine (Ginkgo) in south-west NSW. These three mine sites in the Murray Darling Basin have been collectively referred to as the 'Murray Basin mines' for the purpose of this Plan and operated under DA 251-09-01 and PA 06_0168.

1.2 SCOPE OF THE MANAGEMENT PLAN

This NMP provides an overview of the environmental management and performance requirements related to noise resulting from the development and operation of the Murray Basin Mines at Ginkgo/Crayfish and Snapper.

The NMP includes:

- Identification of noise sensitive receivers
- Identification of relevant noise criteria
- Identification of potential sources of noise during the operational phases
- Identification of noise mitigation and management measures
- A noise monitoring program
- Establishment of proactive and responsive noise emission management protocols including a standard protocol, a complaint response protocol, and an amenity protocol
- An outline of community consultation protocols

1.3 APPROVAL

This NMP has been prepared in consultation with relevant authorities as required by consents, permits, licences and approvals relevant to the scope of this NMP (refer to section 3.2.1). Consultation for this revision of the NMP includes the following:

- The Department of Planning, Housing and Infrastructure (DPHI), reviewed the revised version of the NMP, dated August 2018 and approved the plan in February 2019.
- This revision has been prepared to incorporate changes to government departments and to reflect the cessation of mineral extraction at the Ginkgo, Crayfish, and Snapper mines. Mineral extraction ceased at Ginkgo in June 2024, at Crayfish in August 2023, and at Snapper in March 2022. The key activities currently underway at these sites are decommissioning, rehabilitation, and closure.

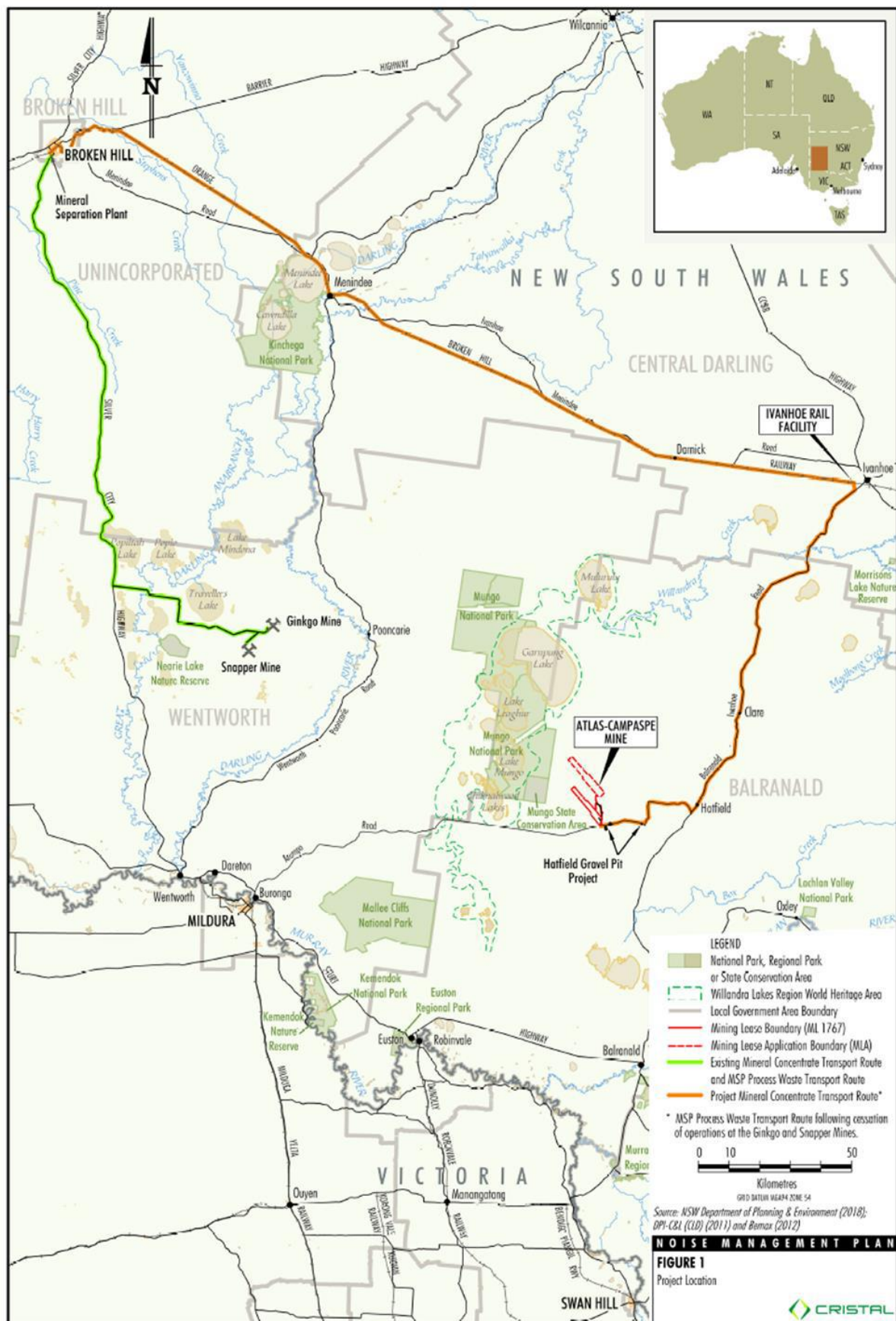


Figure 1 Project location

2 PROJECT DESCRIPTION

2.1 INTRODUCTION

The Environmental Management Strategy (EMS, Section 3.1) provides details on the current operations at Tronox's mineral sands mines within the Murray Basin in NSW. Noise is an environmental aspect that requires management to minimise impacts associated with activities for the project.

2.2 SITE DESCRIPTION

2.2.1 Ginkgo and Crayfish deposits

Ginkgo is located approximately 85 km north of Mildura and 40 km west of the township of Pooncarie in western NSW (refer to Figure 1). The Crayfish deposit, considered as an extension of the Ginkgo mining operation, is approximately six kilometres from the southernmost tip of the existing Ginkgo Mine, approximately 230 kilometres by road from Broken Hill, and is within TRONOX owned land.

The mining operations at Ginkgo use conventional wet dredge mining techniques to recover the valuable heavy minerals from the ore deposit. The ore from Crayfish deposit is dry mined using a truck and shovel fleet and transported approximately 10 km to the Ginkgo dredge pond to be processed through the dredge and floating concentrator. The Heavy Mineral Concentrate (HMC) obtained by the wet-dredging process is pumped to the mineral concentrate stockpile area next to the HMC treatment facility. The HMC is then transported by road train to the MSP in Broken Hill for processing.

Production at the Crayfish mine ceased in August 2023 and at Ginkgo mine in June 2024.

The closest neighbour to Ginkgo and Crayfish that could be considered as a sensitive receiver is the Manilla Station property, approximately seven kilometres to the west.

2.2.2 Snapper

Snapper is located approximately 100 km north of Mildura and is adjacent to Ginkgo.

Conventional wet dredge mining techniques continued to recover the valuable heavy minerals from the ore deposit. The dredge and primary gravity concentration unit operates in a dredge pond and Heavy Mineral Concentrate is then pumped to a central location on the mining lease, where it is stockpiled ready for transport to Ginkgo Mine for further processing and then transportation to Broken Hill. The current methods of mining overburden at Snapper are primarily using a truck and shovel fleet. Overburden is removed from the front of the pit and replaced over tailings at the back of the pit or stockpiled in temporary waste dumps for closing out final voids. Modification 7 was approved in March 2020; the extension of the Snapper mining pit will result in an additional 12 months of production.

Mineral extraction at Snapper mine ceased in March 2022.

The closest neighbour to Snapper that could be considered as a sensitive receiver is the Manilla Station property, which is approximately four kilometres to the north.

2.3 SUMMARY OF RELEVANT ACTIVITIES

The operations and potential sources of noise associated with the Murray Basin mines are:

- Construction of roads and infrastructure
- Construction of overburden emplacements
- Clearing vegetation and topsoil stripping in front of the mine path using bulldozers
- Removing and stockpiling topsoil, subsoil and overburden using scrapers
- Dredging, mining, and initial processing of ore
- Transport of mineral concentrates
- Processing of mineral concentrate
- Covering sand residues with overburden and emplacing topsoil and subsoil using scrapers, dozers, graders

2.4 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Significant impacts potentially associated with operations were assessed in the EIS documents for Ginkgo (Bemax, 2001) and the EA documents for the Snapper (Bemax, 2007) developments. Mitigation measures that regulatory authorities deemed required to reduce the potential risks to an acceptable level were identified and included in the project regulatory approvals.

A preliminary, high-level risk assessment for the Murray Basin mines was created as part of the update of the EMS. This high-level assessment was a subjective assessment based on Tronox's knowledge of site operations to-date and Tronox's advice on the effectiveness of existing controls in reducing risks. Further details on this risk assessment are provided in the EMS.

The potential environmental impacts for noise emitting activities identified in the risk assessment and from the assessment above are:

- Exceedance of traffic noise limits
- Amenity impacts on the surrounding communities

This NMP is designed to minimise the potential impact of these above potential environmental impacts.

3 ENVIRONMENTAL MANAGEMENT FRAMEWORK

The environmental management framework for Tronox's Eastern Operations is based on the general requirements of AS/NZ ISO14001:2016 (the standard) and is designed to support the implementation of the Tronox Environmental Policy.

This NMP has been designed as a subordinate document to the EMS (2021), which provides the framework for Tronox's operations at the Ginkgo/Crayfish and Snapper mines. Each of the main components of the standard has been addressed in detail within the EMS. Information provided within this management plan provides additional, specific details for environmental management at Ginkgo/Crayfish and Snapper. The Environmental Management Framework in place for Tronox's current Eastern Operations is illustrated in Figure 2.



Figure 2 Tronox's environmental management framework

3.1 ENVIRONMENTAL POLICY

The Tronox Environmental Policy (Policy No. 50.03) provides direction for setting environmental objectives and the responsible environmental management of activities undertaken by Tronox Global and its subsidiaries, including Tronox Mining Australia Ltd.

The TRONOX Environmental Policy is available at: [Australia Environmental Policy - TRONOX](#).

3.2 LEGISLATIVE REQUIREMENTS AND PROJECT ENVIRONMENTAL APPROVALS

3.2.1 Project regulatory approvals

Tronox is required to create, maintain, and implement Environmental Management Plans (EMP) in accordance with the approval conditions for the Murray Basin mines. There are several regulatory approval documents that contain conditions for environmental management that Tronox must adhere to for operations in the Murray Basin.

This NMP has been created to address the specific requirements of the regulatory approval documents and to manage noise impacts from Tronox's mining operations in the Murray Basin.

The current regulatory approval documents for the Murray Basin mines are provided in Table 1. The requirements of these regulatory approvals to be addressed in this NMP are provided in Table 2.

Table 1 Applicable approval documents for the Murray Basin Mine sites

Approval Document	Document Number	Current Revision Date
Ginkgo Mineral Sands Mine Development Approval Conditions	DA 251-09-01 (MOD 15)	July 2022
Ginkgo Mining Lease	ML No. 1504	6 March 2002
Ginkgo Mine Environmental Protection Licence	EPL 12264	Renewed annually
Snapper Mining Lease	ML No. 1621 and ML No. 1809	10 July 2008
Snapper Mine Environmental Protection Licence	EPL 12799	Renewed annually
Snapper Mineral Sands Mine Conditions of Project Approval	DA 06_0168 (MOD 8)	July 2022

Table 2 Conditions of approval applicable to the NMP

Condition number	Condition details	Relevant Section in NMP
Ginkgo [DA 251-09-01]		
Schedule 2, Administrative Conditions, Condition 15 Operation of Plant and Equipment	The Applicant shall ensure that all plant and equipment used at the site, or any equipment used for monitoring the performance of the development is: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Section 4.3.2
Schedule 3, Specific Environmental Conditions, Condition 12 Noise Impact Assessment Criteria	The Applicant shall ensure that the noise generated by the development does not exceed 35 dB(A) $L_{Aeq(15 \text{ minute})}$ at any residence on privately-owned land. <i>Note: Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions(including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 5 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.</i> However, these noise criteria do not apply if the Applicant has an agreement with the relevant landowner to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.	Section 4.4.1
Schedule 3, Specific Environmental Conditions, Condition 13 Noise Monitoring Program	The Applicant shall prepare and implement a Noise Monitoring Program for the development to the satisfaction of the Secretary. This plan must: (a) be submitted to the Secretary for approval within six months of the date of consent for MOD 9, unless otherwise agreed with the Secretary; (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent; (c) include a monitoring program that: – Uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent; and – Defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.	Sections 4.3, 4.4 and 4.6.3

Condition number	Condition details	Relevant Section in NMP
Schedule 4, Additional Procedures, Condition 1 Notification of Landowners	As soon as practicable after obtaining monitoring results which show an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the Applicant is again complying with the relevant criteria.	Section 4.3.5
Schedule 4, Additional Procedures, Condition 2 Independent Review	If an owner of privately-owned land considers that the Applicant is exceeding the relevant criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land. If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant shall: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: (i) consult with the landowner to determine his/her concerns; (ii) conduct monitoring to determine whether the Applicant is complying with the relevant criteria in Schedule 3; and (iii) if the Applicant is not complying with these criteria then identify the measures that could be implemented to ensure compliance with the relevant criteria; and (b) give the Secretary and landowner a copy of the independent review.	Section 4.4.3
Ginkgo (EPL 12264)		
Schedule 4 Operating Conditions, Condition O1 Activities must be carried out in a competent manner, Sub Condition O1.1	O1.1 Licensed activities must be carried out in a competent manner. This includes a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Sections 4.3.2, 4.3.3, and 4.3.4

Condition number	Condition details	Relevant Section in NMP
Schedule 4 Operating Conditions, Condition O2 Maintenance of plant and equipment, Sub Condition O2.1	O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Section 4.3.2
Snapper Mine Mineral Sands Project Approval (DA 06_0168)		
Schedule 3 Noise, Condition 10 Noise Impact Assessment Criteria	The Proponent shall ensure that the noise generated by the project does not exceed 35 dB(A) $L_{Aeq(15 \text{ minute})}$ at any residence on non-Proponent held land. Notes: – To determine compliance with the $L_{Aeq(15 \text{ minute})}$ limit, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the development is impractical, the EPA may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable. – The noise limit above applies under the following meteorological conditions: – Wind speeds of up to 3 m/s at 10 metres above ground level; or – Temperature inversion conditions of up to 3°C/100 m, and wind speeds of up to 2 m/s at 10 metres above ground level. – These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.	Section 4.4.1
Schedule 3 Noise, Condition 11 Traffic noise Criteria	The Proponent shall ensure that traffic noise generated by the project does not exceed the following noise goals at any residence on non-Proponent held land along the haulage route between the Silver City Highway and the site: – $L_{Aeq(1 \text{ hour})}$ 50 dB(A) for 7:00 am to 10:00 pm; and – $L_{Aeq(1 \text{ hour})}$ 45 dB(A) for 10:00 pm to 7:00 am.	Section 4.4.1

Condition number	Condition details	Relevant Section in NMP
Schedule 3 Noise, Condition 12 Noise Monitoring	The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Secretary. This program must: a) be prepared in consultation with the EPA b) be submitted to the Secretary for approval prior to carrying out any development on the site; and c) use a combination of attended and unattended monitoring measures to monitor the performance of the project.	Section 4.4
Snapper (EPL 12799)		
Schedule 4 Operating Conditions, Condition O1 Activities must be carried out in a competent manner, Sub Condition O1.1	O1.1 Licensed activities must be carried out in a competent manner. This includes a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Sections 4.3.2, 4.3.3, and 4.3.4
Schedule 4 Operating Conditions, Condition O2 Maintenance of plant and equipment, Sub Condition O2.1	O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Section 4.3.2
APPLICABLE POLICIES		
NSW Industrial Noise Policy (INP) – January 2000 and the Noise Policy for Industry (NPfI)(2017)		
	<u>Background Noise</u> The rating background level (RBL) is a calculated median background level representing each assessment period over a monitoring period (e.g. day/ evening/ night). The likely noise climate (i.e. RBL) of the mine sites was estimated based on existing land use and the assessment of likely noise sources in the area. The most significant noise sources are likely to be wildlife, in particular birds and possible insects and the sound of the wind in vegetation. Given the lack of significant noise sources, the RBL is expected to be less than 30 dB(A) (decibel A-weighted) for day, evening and night.	Section 4.4.1

Condition number	Condition details	Relevant Section in NMP								
	As the RBL is less than 30 dB(A), then for the purposes of noise assessments the RBL is set to 30 dB(A), as specified by the INP (2000).									
	<u>Intrusiveness Noise Criteria</u> Under the NSW Industrial Noise Policy (INP 2000), the mine noise assessments are made against intrusiveness noise criteria. This criteria states that the equivalent continuous (energy-average) noise level of the source should not be more than 5 dB above the background level. The RBL for the Ginkgo and Snapper mine area is 30 dB(A), and therefore the intrusiveness criterion for the mines is set at 35 dB(A) for daytime and night time¹. The RBL is the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-hour period used for the assessment background level). The rating background noise level is the level used for assessment purposes. Where the rating background noise level is found to be less than 30 dB(A) for the evening and night periods, then it is set to 30 dB(A); where it is found to be less than 35 dB(A) for the daytime period, then it is set to 35 dB(A). The NPfI increased the minimum daytime noise criterion to 40 dB(A), while the evening and night-time criteria remained at 35dB(A) <table><tr><th>Night time Noise limit</th><th>Day time Noise Limit</th></tr><tr><th>L_{Aeq} dB(A)</th><th>L_{Aeq} dB(A)</th></tr><tr><th>(10 pm to 7 am)</th><th>(7 am to 10 pm)</th></tr><tr><td>35</td><td>40</td></tr></table>	Night time Noise limit	Day time Noise Limit	L _{Aeq} dB(A)	L _{Aeq} dB(A)	(10 pm to 7 am)	(7 am to 10 pm)	35	40	Section 4.4.1
Night time Noise limit	Day time Noise Limit									
L _{Aeq} dB(A)	L _{Aeq} dB(A)									
(10 pm to 7 am)	(7 am to 10 pm)									
35	40									
	Note: The noise limit criteria in this table apply in accordance with the specifications and requirements of the NSW EPA Industrial Noise Policy 2017									

¹ Section 2.3 of the Noise Policy for Industry, 2017, indicates that the method for determining minimum assumed RBLs and project intrusive levels, as apply to this project, have not changed. NSW EPA website ([http://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-\(2017\)](http://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/noise-policy-for-industry-(2017))) accessed; 21/12/2017) notes that the Noise Policy for Industry (2017 applies to all new developments and existing premises that need to vary their licence or modify their consent conditions under certain circumstances, the NSW INP (2000) still applies when assessing noise from existing developments that have licence or consent conditions that refer to that policy).

Condition number	Condition details	Relevant Section in NMP									
NSW Road Noise Policy (Department of Environment, Climate Change and Water) March 2011											
	<u>Road Traffic Noise for Residential Land Uses</u> In accordance with the requirements of the Road Noise Policy (DECCW) 2011, assessment of the potential impacts of mine traffic is made against goals for arterial/sub-arterial roads, recognising that they carry a different level and mix of traffic to local roads. The road transport noise goals for these are provided below. <table> <tr> <th></th><th>Night time Noise limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (10 pm to 7 am)</th><th>Day time Noise Limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (7 am to 10 pm)</th></tr> <tr> <td><i>Freeways/Arterial/sub-arterial roads</i></td><td>55</td><td>60</td></tr> <tr> <td>Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments</td><td></td><td></td></tr> </table> Note: The noise limit criteria in this table applies in accordance with the specifications and requirements of the NSW Road Noise Policy (DECC) 2011		Night time Noise limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (10 pm to 7 am)	Day time Noise Limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (7 am to 10 pm)	<i>Freeways/Arterial/sub-arterial roads</i>	55	60	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments			Section 4.4.1
	Night time Noise limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (10 pm to 7 am)	Day time Noise Limit $L_{Aeq}(1 \text{ hour}) \text{ dB(A)}$ (7 am to 10 pm)									
<i>Freeways/Arterial/sub-arterial roads</i>	55	60									
Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments											

3.2.2 Relevant legislation and other requirements

This project is subject to the requirements of the *NSW Protection of the Environment Operations Act 1997* and its subordinate legislation. A full legislative register is provided in the EMS (2021). The EMS outlines the process by which TRONOX reviews the currency and application of legislation, statutory and other compliance obligations.

Federal Commonwealth Legislation

- Environment Protection and Biodiversity Conservation Act 1999
- National Environmental Protection Measures (Implementation) Act 1998
- National Environmental Protection Measures (Implementation) Regulations 1999

NSW Legislation

Acts and regulations

- Local Land Services Act 2013
- Mining Act 1992
- Pesticides Act 1999
- Protection of the Environment Operations Act 1997
- Protection of the Environment Operations (Noise Control) Regulation 2017
- Roads Act 1993
- Work Health and Safety Act 2011
- Work Health and Safety (Mines and Petroleum Sites) Act 2013

Relevant standards and policies

- Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) (7.7 Edition issued 1 October 2020)
- NSW Industrial Noise Policy, NSW EPA, January 2000
- Noise Policy for Industry 2017
- Road Noise Policy, Department of Environment, Climate Change and Water (DECCW 2011)
- Australian Standard. (2018). AS 1055.1:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: General procedures. Australian Standard
- Australian Standard. (2018). AS 1055.2:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: Application to Specific Situations. Australian Standard
- Australian Standard. (2018). AS 1055.3:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: Acquisition of Data Pertinent to Land Use. Australian Standard
- Australian Standard. (2019). AS IEC 61672.1:2019 Electroacoustics - Sound Level Meters, Part 1: Specifications. Australian Standard
- Australian Standard. (2019). AS IEC 61672.2:2019 Electroacoustics - Sound Level Meters, Part 2: Pattern Evaluation Tests. Australian Standard
- Australian Standard. (2010). AS 2436:2010 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites. Australian Standard

3.3 ROLES AND RESPONSIBILITIES

Overall roles and responsibilities for environmental management at the Murray Basin mines are outlined in Tronox's EMS.

The responsibility for this NMP lies with the environmental department, primarily the Environmental Lead (see EMS). Specific allocation of responsibilities under the NMP is detailed in section 4. A summary of these responsibilities is contained in Table 3.

Table 3 Responsibilities for environmental management related to the NMP

Management Measure	Section in NMP	Responsibility
Mine site noise mitigation and management	4.3.1 and 4.3.2	Environmental Lead
Transportation noise mitigation and management	4.3.3	Environmental Lead
Compliance noise monitoring	4.4.1	Environmental Lead
Independent noise monitoring	4.4.2	Consultant if required
Standard noise management protocol	4.3.1	Environmental Lead
Complaint response protocol	4.6.3	Environmental Lead

3.4 CONTRACTOR MANAGEMENT

All contractor(s) are required to comply with this NMP or to prepare documentation demonstrating how the requirements of the NMP will be met in the context of the services provided by each contractor.

Environmental management documentation is to be prepared and submitted to Tronox prior to the contractor starting works. Works shall not start until written approval of the contractor's documentation has been issued by Tronox. Contractors are responsible for regularly reviewing their documentation to confirm they continue to adequately address environmental management requirements relevant to their scope of services. Any changes to the contractor's documentation, where documents have been reviewed and approved by Tronox, must be discussed, and agreed with Tronox prior to implementing the changes.

3.5 TRAINING AND INDUCTIONS

Overall training and induction requirements for Tronox's operations at the MSP and the Ginkgo/Crayfish and Snapper mines are outlined in the EMS.

All employees and contractors complete an induction program prior to the commencement of work at the Murray Basins mines. The induction program outlines the importance of protecting the environment and ensures that employees and contractors are aware of the environmental and community requirements for the operation.

3.6 COMMUNICATION

3.6.1 Internal communications

Regular meetings will be held within Tronox, with noise management included as a standing agenda item where applicable. The frequency of these meetings will increase if complaints or concerns about noise are received.

3.6.2 External communication and consultation

Tronox is responsible for all liaison with external agencies. Contractors must keep a written record of all contact with members of the community, public agency, or authority representatives and direct their enquiries to Tronox.

3.7 REPORTING

The effectiveness of the proposed mitigation measures and monitoring for noise emissions is documented and summarised in the Annual Review for the Department of Planning, Housing and Infrastructure and the Annual Return for the EPL.

3.7.1 Annual Review

Tronox is required to review the environmental performance of the Murray Basins mines to the satisfaction of the Secretary of the Department. This review occurs through the Annual Review, which is completed by Tronox and submitted to the Secretary for review.

General requirements for the Annual Review are outlined in the EMS. Additionally, the annual review must include:

- Unattended and attended noise monitoring results
- Details of noise non-compliances and incidents over the past year and actions taken to address non-compliances and incidents
- Details on any trends in noise monitoring data collected to-date
- Information on any discrepancies between predicted and actual noise impacts and discussion on potential causes of significant discrepancies
- A description of measures planned over the next year to continue to improve noise performance.

3.7.2 Annual Return

Tronox is mandated to complete Annual Returns ARs associated with each of the three Environment Protection Licences (EPLs) for Ginkgo/Crayfish, Snapper and MSP. Tronox's commitment to completing annual returns is detailed in Tronox's EMS.

3.8 COMPLAINT, NON-CONFORMANCE, AND INCIDENT MANAGEMENT

Complaint, non-conformance, and incident management for Tronox's operations in the Murray Basin are described in the EMS. Any complaints related to noise matters are included in the Annual Return for each site.

3.9 AUDIT OF THE MP

Development Consents for the Ginkgo and Snapper Mine Projects require Tronox to undertake an Independent Environmental Audit every three years, or as otherwise directed by the Secretary of the DPHI. The scope of the Independent Environmental Audit is outlined in the Environmental Management Strategy (EMS). Further details on the conduct of audits, including internal audits of Environmental Management Plans (EMPs), are also provided within the EMS

3.10 RECORDS MANAGEMENT

All documents and records must be managed so that they can be easily identified, stored, protected, retrieved, retained and disposed appropriately. Records must be kept for a period of seven years and be legible, identifiable and traceable. Details of records required are listed in the EMS. Tronox will

maintain records specific to noise management and provide them to regulators as required, where applicable.

3.11 DOCUMENT CONTROL

Documentation control of the NMP is detailed in Section 5.6 of the EMS.

3.12 REVIEW AND UPDATE OF THE MP

The Condition of Approval (refer to Table 2), for the Murray Basin mines outlines the requirements for the revision and update of this NMP. Further details are provided in the EMS.

3.13 CONTINUAL IMPROVEMENT

Overall continual improvement for environmental management at the Murray Basin mines are outlined in the EMS.

4 ENVIRONMENTAL MANAGEMENT PROGRAM

4.1 OBJECTIVES

The primary objective of the NMP is to establish a noise management strategy that minimises the impacts on sensitive receivers and complies with the Development Approval Conditions, and other regulatory environmental requirements through:

- Identification of major sources of noise (Section 4.3.1)
- Establishment of a complaint protocol to facilitate prompt and comprehensive responses to community concerns that relate to noise (Section 4.6.3)
- Identification of relevant noise criteria (Section 4.4)
- Establishment of mitigation measures for minimising noise emissions (Section 4.3)
- Identification of specific communication requirements for noise management (Section 4.3.5)
- Formulation of a noise monitoring program (Section 4.4)
- Establishment of a contingency plan for excessive noise impacts (Section 4.6)
- Identification of reporting requirements (Section 3.7)

4.2 PERFORMANCE STANDARD

The following performance outcomes have been identified against the objectives of the NMP. The objectives will be achieved if:

- Operations and road transportation at the Ginkgo/Crayfish and Snapper mines do not exceed the criteria set by regulators, as defined in the EPL and the Development Approval and Project Approvals (as detailed in Table 2)
- Mitigation measures required by the NMP are implemented and maintained
- No complaints, non-compliances or incidents are reported for noise quality impacts associated with operations or road transport.
- All requirements of the NMP are complied with, with specific reference to demonstrating compliance with this NMP, permits, approvals and codes of practice as assessed through monitoring, maintenance, and audits.

4.3 ENVIRONMENTAL MITIGATION MEASURES

4.3.1 Standard mitigation measures

The objective of the standard noise management measures (Standard Protocol) is to facilitate the day-to-day management of noise from mining activities. Noise control will be actively carried out as a standard operating procedure to facilitate a safe working environment, using techniques outlined in this section (4.3). The Standard Protocol is the responsibility of the Mine Manager. The Standard Protocol can be broken into four steps as follows:

- Source identification
- Management Strategy
- Implementation
- Review.

Source Identification

The first step of the Standard Protocol involves identification of the mining activities with the potential for noise generation. Consideration is given to the following:

- Methods and types of equipment that will be used
- Timing of the activity

- Location of the activity (including surrounding topography and land use)
- Prevailing climatic conditions.

Management Strategy

The management strategy component involves determination of the noise control and mitigation measures that will be used to minimise noise levels, based on the results of the identification stage. Potential noise mitigation and management measures are presented in this section (4.3).

Implementation

This stage involves implementation of the noise mitigation and management measures chosen in the management strategy process.

Review

An important component of the protocol is the review of noise mitigation and management measures. These will be assessed by comparing the results of the noise monitoring program detailed in section 4.4 with the noise criteria outlined in section 3. Where necessary, the Manager will return to the management strategy phase of the protocol.

4.3.2 Mine site noise mitigations measures

The following noise mitigation measures will be implemented:

- Ensure all operational activities are carried out in a competent manner
- Administration of a noise awareness training program on the effects of noise and the use of quiet work practices

4.3.3 Transportation noise mitigation measures

Training programs have been developed and implemented to educate road train drivers on the effects of noise and the use of quiet work practices such as avoiding exhaust braking at night in the vicinity of homesteads along the highway access road.

4.3.4 Additional management controls

Additional noise management controls will be identified and implemented as required with consideration given to:

- Mine activities scheduled for the next phase of operation
- Possible reasons for elevated noise levels
- Additional control measures that could be adopted
- Equipment to be utilised
- Location of mine activities

Following implementation, the effectiveness of the additional control measures adopted will be further assessed by monitoring.

4.3.5 Communication

Communication with Wentworth Shire Council will occur if there is an ongoing environmental noise issue. In such an event, residents in the vicinity of the mines will be informed of the event. Communication with residents will occur in accordance with the Murray Basin Operations Community and Consultation Plan (CCP). Where increased activity results in noise impacts on sensitive receivers, this will be tracked to ensure that recorded noise is not above the limits set in the Approvals.

4.4 MONITORING

4.4.1 Compliance monitoring

The consent conditions for Murray Basin mines require that the mines do not cause an exceedance of the criteria shown in Table 4.

Table 4 Noise limits

Criteria	Day Noise level LAeq (15 minute) dB(A)	Night Noise level LAeq (15 minute) dB(A)
Noise Limits (INP, DA/PA)	35	35
Traffic Noise Limits (DA/PA)	50	45
Traffic Noise Limits (RNP)	60	55

4.4.2 Periodic monitoring

There is currently no requirement for regular noise monitoring.

4.4.3 Contingency monitoring

The DPHI approved Tronox's request to cease annual noise monitoring if agreements are in place with landowners that allow landowners to request noise monitoring in the future. There are unattended Environmental Noise loggers at two offsite residences (Manilla and Woodlands) that are capable of monitoring to assess tonal and low frequency noise if requested.

If a landholder or occupier of a non-mine property makes a written request for independent noise monitoring and the Secretary determines that an investigation is warranted, then an independent consultant will develop and implement a noise monitoring program to quantify the impact and determine the source and contribution of Ginkgo/Crayfish and Snapper mines to the effect.

Table 5 Contingency noise monitoring at the Murray Basins mines

Monitoring requirement	Location	Frequency
Unattended Environmental Noise logger (Logger must be capable of monitoring to assess tonal and low frequency noise as per guidance in Chapter 4, INP (EPA 2017).	Manilla Homestead	As requested by landholders
Unattended Environmental Noise logger (Logger must be capable of monitoring to assess tonal and low frequency noise as per guidance in Chapter 4, INP (EPA 2017).	Woodlands Homestead	As requested by landholders

4.5 SAMPLING

Noise monitoring is to be undertaken by a suitably qualified and experienced employee. The Environmental Lead is responsible for overseeing the implementation of the monitoring program. The Environmental department manages data collection, entry and assessment against criteria.

All noise monitoring records must be kept for at least four years after the monitoring or event to which they relate took place and must be maintained in a legible form, and made available to authorised officers of the EPA. When collecting samples, the recorded information must include:

- The date(s) on which the samples were taken
- The time(s) at which the sample was collected;
- The point at which the sample was taken
- The name of the sampler
- The 15 minute L_{Aeq} , L_{A90} , L_{A10} , L_{Amin} , and L_{Amax} values.

4.6 CONTINGENCY MEASURES

The purpose of contingency measures is to further manage any risks and rectify any issues and impacts. Contingency measures must be followed in response to a non-compliance, an incident, or a complaint (refer to section 3.8 for details).

Environmental incidents concerning noise, such as an exceedance of the noise criterion, are reported in accordance with the requirements of Section 5.4 of the Murray Basin Operations EMS. The contingency measures are detailed below.

4.6.1 Mine site noise contingency measures

Contingency measures for excessive noise levels will follow the hierarchy, which is listed from most preferred to least preferred options, of noise control strategies:

1. Control of noise at the source – Reduce the noise output of the source by methods such as enclosing the source, silencing exhausts, limiting times of operations.
2. Control of the transmission of noise – Use of noise barriers, mounds, bunds, and trenches to control noise along the sound- transmission path.
3. Control of noise at the receiver – Protecting the internal environment of the receiver through controls such as double-glazing of windows and air-conditioning, insulation, and acquisition.

Where noise impacts are identified the following mitigation measures will be considered:

- The use of low noise plant such as exhaust and radiator silencers
- Relocation of offending reversing alarms on vehicles to behind panels at the lowest practical height above the ground that is directed towards the ground or the use of smart alarms to limit the acoustic range
- Installation of shields on offending equipment to reduce tonal noise to acceptable levels
- Redesigning machinery, applying active noise control or restricting operating times to reduce tonal noise.

4.6.2 Transportation noise contingency measures

The following measures will be implemented in the event that transportation noise exceeds noise limits:

- If there is a noise complaint from a landholder or resident which cannot be resolved by consultation, monitoring to assess compliance with the applicable road transport noise criteria will be undertaken in consultation with regulatory authorities.

- Measures, such as acoustic barriers or alterations to dwellings, may be considered if elevated traffic noise levels are demonstrated by the compliance monitoring. This will be undertaken in consultation with regulatory authorities and the affected resident.

4.6.3 Complaint response protocol

The objective of the Complaint Response Protocol is to facilitate responses to community concerns that relate to noise issues. The Complaint Response Protocol will be the responsibility of the Environmental Lead.

Complaint

A complaint handling and response protocol is established as a component of the CATS Incident Management database. This system provides a means of reporting and recording incidents, assessing the incident including a risk assessment and identifying preventative/ correction actions for all incidents. In the event that a complaint is received, an incident report form, will be completed and relevant information logged in the CATS. Details to be recorded will include; complainant name, the time, date and nature of the complaint and any actions/ response undertaken.

A list of complaints received will be provided in monthly reports and reported in the Annual Review.

Assessment

An incident assessment will include determining the likely causes of the complaint event using information regarding prevailing climatic conditions, the nature of mining activities taking place and recent noise monitoring results.

In the event that a landholder considers that noise from the operation at their residence is in excess of the consent criteria and makes a written request for an investigation, and the Secretary is satisfied that an investigation is required, an independent investigation will be commissioned as outlined in section 4.4.2. The investigation would be conducted as soon as practicable following the written request.

Further management/implementation/review

The management strategy component involves determination of any additional noise mitigation and management measures (refer to section 4.3). These will be used to further minimise noise levels should the results of the assessment stage determine the need for additional mitigation. Following implementation, the effectiveness of the additional control and mitigation measures adopted will be further assessed by monitoring. A noise survey will be conducted annually using the results of the monitoring programme and reported in the Annual Review (refer to section 3.7)

Complaints demonstrated to be below criteria

In the event of a complaint where noise levels are demonstrated to be below the relevant criteria, the resolution process will be one of informed discussion involving the complainant and the Health Safety and Environmental Manager. The complainant will be made fully aware of the monitoring and reporting procedures used for the Murray Basin mines. If the issue remains unresolved further in the short-term, monitoring will be proposed to allay the complainant's concerns. In the event that the complainant is still unsatisfied, the matter will be referred to the Secretary. Every effort will be made to ensure that concerns are addressed in a manner that results in a mutually acceptable outcome, including facilitated dispute resolution.

5 REFERENCES

- Australian Standard. (2018). AS 1055.1:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: General procedures. Australian Standard
- Australian Standard. (2018). AS 1055.2:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: Application to Specific Situations. Australian Standard
- Australian Standard. (2018). AS 1055.3:2018 Acoustics – Description and Measurement of Environmental Noise, Part 2: Acquisition of Data Pertinent to Land Use. Australian Standard
- Australian Standard. (2019). AS IEC 61672.1:2019 Electroacoustics - Sound Level Meters, Part 1: Specifications. Australian Standard
- Australian Standard. (2019). AS IEC 61672.2:2019 Electroacoustics - Sound Level Meters, Part 2: Pattern Evaluation Tests. Australian Standard
- Australian Standard. (2010). AS 2436:2010 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites. Australian Standard
- National Transport Commission. (2020). Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) (7.7 Edition issued 1 October 2020)
- NSW EPA. (2000). NSW Industrial Noise Policy, NSW EPA, January 2000 NSW EPA (2017) Noise Policy for Industry 2017
- DECC. (2011, March) Road Noise Policy, Department of Environment, Climate Change and Water (DECCW 2011)
- TRONOX. (2018). Tronox Australia Environmental Policy

Appendix A: APPROVAL OF MANAGEMENT PLAN



**Planning &
Environment**

Resource & Energy Assessments
Contact: Leesa Johnston
Tel: 9274 6164
Email: Leesa.Johnston@planning.nsw.gov.au

Brendan Isaacs
Environmental Superintendent
Cristal Mining Australia

Via Email to: brendan.isaacs@cristal.com

Dear Mr Isaacs

**Ginkgo and Snapper Mineral Sands Mines (DA 251-09-01 and PA 06_0168)
Approval – Noise Management Plan**

I refer to your submission, seeking the Secretary's review and approval of the Noise Management Plan (NMP) for the Ginkgo and Snapper Mineral Sands Mines.

The Department has reviewed the revised version of the NMP, dated August 2018, and is satisfied that it addresses the requirements of Condition 13, Schedule 3 of Development Consent DA 251-09-07 and Condition 12, Schedule 3 of Project Approval 06_0168.

Accordingly, the Secretary approves the revised NMP. Please ensure that a copy of the approved plan is placed on your website as soon as possible.

If you require further information, please contact Leesa Johnston on 02 82896861 or by email at Leesa.Johnston@planning.nsw.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to be "SO", followed by the date "19/2/19".

Steve O'Donoghue
A/Director
Resource & Energy Assessments
as nominee of the Secretary