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**ORICA AUSTRALIA PTY LTD.
NOISE AND VIBRATION MANAGEMENT PLAN**

24.6696.NVMP:GA/DT/2024

Revision 03

Prepared for: Orica Australia Pty Ltd
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DOCUMENT CONTROL LOG

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Document Revisions

REVISION	DESCRIPTION OF CHANGES	DATE
Original	As required by Orica's Development Consent Condition 32, for Phase 1 prior to the operation of the uprated Ammonia Plant commencing.	August 2011
Revision 01	General updates and inclusion of: <ul style="list-style-type: none"> Amendments to the layout of the Site, approved in July 2012; (MOD1) Changes to the size and location of the proposed nitric acid storage tank and the addition of ammonia flares, approved in December 2014 (MOD2); Administrative modification to increase the allowable annual production limit of ammonia at the site from 360,000t to 385,000t (MOD3), approved in December 2015 	July 2012
Revision 02	General updates and inclusion of: <ul style="list-style-type: none"> the replacement of the existing Nitrates Effluent Pond with an above ground bunded tank (MOD4) 	September 2021
Revision 03	General updates and inclusion of: <ul style="list-style-type: none"> Construction and operation of a prill tower scrubber to remove particulate associated with the existing ANP1 Prill tower. (MOD5) Construction and operation of a new ANSOL supply line from the AN1 Plant to the existing ANSOL export tank (MOD7) 	30 June 2024

Persons involved in this review

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1. Introduction

Orica's Kooragang Island site is located approximately 3 kilometres north of Newcastle CBD, with the closest residential area in relation to the site being Stockton, approximately 800m to the east of the site, across the North Arm of the Hunter River. Other residential areas are located across the southern arm of the Hunter River, and include Carrington and Mayfield, approximately 1.5 kilometres and 2 kilometres, respectively. The Stockton residential properties were identified as likely to be the most exposed to noise emitted from *Orica*. The *Orica* site currently operates twenty-four (24) hours a day, seven (7) days a week.

The NSW Minister for Planning granted Orica Australia Pty Ltd (*Orica*) approval for the expansion of the ammonium nitrate manufacturing site located on Kooragang Island 1 December 2009 (08_0129) (*the Approval*).

The expansion (*the Project*) involved:

- The construction and operation of a fourth nitric acid plant (NAP 4) and ammonium nitrate solution plant;
- The construction and operation of an ammonium nitrate prilling plant (ANP3);
- An uprate to the existing Ammonia Plant; and
- An uprate to existing infrastructure including onsite storage, cooling towers, a gas fired boiler, a compressor and electrical systems.

Subsequent modifications to 08_0129 have also been approved for:

- Amendments to the layout of the Site, approved in July 2012; (MOD1)
- Changes to the size and location of the proposed nitric acid storage tank and the addition of ammonia flares, approved in December 2014 (MOD2);
- Administrative modification to increase the allowable annual production limit of ammonia at the site from 360,000t to 385,000t (MOD3), approved in December 2015; and
- Replacement of the existing Nitrates Effluent Pond with an above ground bunded tank (MOD4)
- Construction and operation of a prill tower scrubber to remove particulate associated with the existing ANP1 Prill Tower. (MOD5)
- Construction and operation of a new ANSOL supply line from the AN1 Plant to the existing ANSOL export tank (MOD7)

It should be noted that NAP4 and ANP3 have not been constructed

The Project Approval (08_0129) included requirements relating to the verification of the existing noise emissions from the site and findings reported in the Orica Australia Pty Ltd. Kooragang Island. Noise Impact Assessment Report Numbered 39.6357.R1:GACD03, dated February 2009.

The Department of Planning, Housing and Industry (*Department*) in assessing the merits of the proposal, determined that noise generated through the inclusion of additional operating plants and infrastructure, should not increase the noise impacts from the existing operations. To ensure no discernible increase in noise levels at the Stockton residential receivers from *Orica*, the *Department* included a consent

condition (Condition 30) that any additional noise emitted from *the Project* must achieve a noise contribution at least 10dBA below current noise levels.

A Noise Verification Assessment prepared by Atkins Acoustic and Associates Pty. Ltd (41.6521.R1:GA/DESKTOP/2011 Rev 02) was subsequently prepared and submitted to DPHI in May 2011 to satisfy Consent Condition 31. The assessment was conducted to determine baseline noise levels and to establish appropriate noise monitoring points. Noise data obtained during the 2011 Noise Verification Assessment provided the basis for development of this Noise Management Plan, as required under Condition 32 of Orica's Development Consent (Note - as part of the MOD2 updates to development consent MP08_0129, Condition 32 was relabelled as a noise and vibration management plan) Noise and vibration associated with construction activities are addressed in the Construction Noise and Vibration Plan and therefore not addressed in this Plan.

Currently Orica's Kooragang Island site manufactures ammonia, nitric acid, and ammonium nitrate in both solution and solid forms. The existing facilities include an ammonia plant, three nitric acid plants (NAP 1, 2 and 3), two ammonium nitrate plants (AN 1 and 2). The site also includes storage and infrastructure services, including compressed air, demineralised water system, steam and cooling water and a liquid ammonia bottling plant.

The Project included;

- the construction and operation of a fourth nitric acid plant (NAP 4) and ammonium nitrate solution plant;
- the construction and operation of an ammonium nitrate prilling plant (ANP3);
- An uprate to the existing Ammonia Plant; and
- An uprate to existing infrastructure including onsite storage, cooling towers, a gas fired boiler, a compressor and electrical systems.

Subsequent modifications to 08_0129 have also been approved for:

- Amendments to the layout of the Site, approved in July 2012; (MOD1)
- Changes to the size and location of the proposed nitric acid storage tank and the addition of ammonia flares, approved in December 2014 (MOD2);
- Administrative modification to increase the allowable annual production limit of ammonia at the site from 360,000t to 385,000t (MOD3), approved in December 2015; and
- Replacement of the existing Nitrates Effluent Pond with an above ground bunded tank (MOD4)
- Construction and operation of a prill tower scrubber to remove particulate associated with the existing ANP1 Prill tower. (MOD5)

- Construction and operation of a new ANSOL supply line from the AN1 Plant to the existing ANSOL export tank (MOD7)

The project is being carried out in multiple phases. The construction, commissioning, and operation also follow this phased approach as outlined in Appendix A.

2. Noise Verification and the Noise and Vibration Management Plan

In 2008, Orica undertook a program to assess noise emissions from the Kooragang Island facility. This program involved both onsite and ambient monitoring, and the development of a noise model to predict Orica's contribution to ambient noise levels.

Prior to the completion of the site expansion project additional monitoring a Noise Verification Assessment prepared by Atkins Acoustic and Associates Pty. Ltd (41.6521.R1:GA/DESKTOP/2011 Rev 02) was subsequently prepared and submitted to DPHI in May 2011 to satisfy Consent Condition 31

This was undertaken to assist in the determination of the following:

- Confirm the noise emissions from the facility prior to the operation of the first stage of the expansion project;
- Assess the impact of seasonal meteorological conditions on ambient noise levels at local receptors; and
- Establish noise monitoring reference points to act as a baseline for comparison in future compliance monitoring

The noise and vibration management plan (This document – the NMP) was then developed and has since been implemented in accordance with the requirements of Orica's Development Condition 32 of Orica's Development Consent to monitor and if necessary, manage noise associated with *the Project*. The NMP includes:

- An overview of *the Project* and its phasing;
- Project noise assessment criteria;
- Identification of sensitive noise receptors and assessment monitoring locations;
- Measured and predicted noise levels from existing operations;
- Predicted noise contributions from this phase of *the Project*;
- Compliance monitoring and reporting procedures; and
- Response procedures to address reported noise incidents.

The objectives of the NMP are to:

- To minimise and control noise from *the Project*;
- Satisfy relevant noise conditions;
- Maintain an effective monitoring program to minimise noise exposure for residents;
- Maintain an effective monitoring program to evaluate trends in environmental noise levels;
- Manage impacts from *Project* generated noise, and
- Implement effective response procedures to address reported noise incidents.

Noise assessment criteria for *the Project* were documented in Schedule 3 'Specific Environmental Conditions', of the *Department* Project Approval (08_0129) dated 1 December 2009.

It is noted offsite ground vibration from Orica operations was not identified or detected during investigations for the preparation of the Noise Impact Assessment Report Numbered 39.6357.R1:GACD03 dated February 2009 or has been detected during annual noise audits and therefore vibration monitoring is not required in this Plan.

A summary of the noise related conditions as modified is provided in *Table 1* below.

Table 1. Development Consent Noise Conditions of Approval

<p>Noise Limits</p> <p>Condition 30:</p> <p>The Proponent shall ensure that noise levels from the operation of the Project are at least 10dB(A) below noise levels from Initial Operations as specified by conditions 31 & 32 below.</p> <p><i>Note: Ammonia flaring events are excluded from the noise limits and levels referred to in conditions 30 and 31.</i></p>
<p>Initial Operations – Noise Verification Program</p> <p>Condition 31:</p> <p>Prior to the commencement of construction the Proponent shall prepare and implement an Existing Operations Noise Verification Program to the satisfaction of the Director-General. The Program shall:</p> <ul style="list-style-type: none">(a) be undertaken by a suitably qualified and experienced person;(b) identify future reference points that will be used to demonstrate compliance;(c) collect new or review existing data, and report on the seasonal background levels for the noise catchment; and(d) confirm the noise levels from the Initial Operations. <p>3. <i>Note: Some construction activities may occur under the Project Approval provided that such activity is not undertaken during the monitoring period or that the Proponent can demonstrate that the activity would not contribute to the background noise level, to the satisfaction of the Secretary.</i></p>

Noise and Vibration Management Plan

Condition 32:

32. The Proponent shall prepare and implement a Noise and Vibration Management Plan for the Project to the satisfaction of the Secretary. The Plan shall:
- a) be prepared by a suitably qualified and experienced expert whose appointment has been agreed to in writing by the Secretary;
 - b) be approved by the Secretary (see Conditions 49A and 49B for scope and timing and Condition 49C for management plan requirements);
 - c) demonstrate how noise levels from the Project would be managed to ensure noise levels would be 10dB(A) below noise levels from the Proponent's Initial Operations (see Conditions 30 and 31);
 - d) include a detailed monitoring program for reporting on ongoing compliance. The monitoring program shall:
 - outline the proposed receiver sites at Stockton and sites on Kooragang Island that would be monitored;
 - include both attended and unattended noise monitoring;
 - verify that actual noise levels from the Project are consistent with the predictions made in the EA;
 - verify that noise levels from the Project are 10dB(A) below the noise levels identified in Condition 31 for the Proponent's Initial Operations;
 - e) provide details of any complaints received in the preceding year relating to noise generated by the Project, and action taken to respond to those complaints;
 - f) detail procedures for implementing additional reasonable and feasible noise mitigation measures for the Project in response to exceedance of limits and/or noise complaints;
 - g) be updated annually, unless otherwise agreed to by the Secretary; and
 - h) describe the measures that will be implemented to prevent and minimise potential adverse noise and vibration impacts from the Project, including:
 - reasonable and feasible measures being employed on the Project site;
 - plant and equipment being maintained to ensure that it is in good order;
 - how potential noise and vibration impacts will be minimised and managed; and
 - identification of the likely nature and timing of Project-related activities and works that could generate potential elevated noise emissions and a description of the mitigation measures that will be implemented to ensure compliance with the relevant conditions of this approval and the EPL.

This *NMP* and the Annual Noise Audits undertaken address the requirements of Condition 32 as shown in the Compliance register in Table 2 below. For completeness the compliance status of the "Noise Verification Program" (completed in 2011) against Condition 31 is also documented:

Table 2 – Compliance Register - Noise

Consent Condition	Relevant Document and Section	Compliance Comments
<p>Noise limits Condition 30:</p> <p>The Proponent shall ensure that noise levels from the operation of the Project are at least 10dB(A) below noise levels from Initial Operations as specified by conditions 31 & 32 below.</p> <p><i>Note: Ammonia flaring events are excluded from the noise limits and levels referred to in conditions 30 and 31.</i></p>	<p>Criteria noted in Section 3.0 of Annual Noise Audit and Table 1 and Section 6.0 of Noise and Vibration Management Plan (NMP)</p>	<p>Compliant - Assessment criteria for NMP and Noise audits is consistent with this criteria</p>
<p>Initial Operations – Noise Verification Program Condition 31:</p> <p>Prior to the commencement of construction the Proponent shall prepare and implement an Existing Operations Noise Verification Program to the satisfaction of the Secretary. The Program shall:</p>	<p>The Noise Verification Assessment prepared by Atkins Acoustic and Associates Pty. Ltd (41.6521.R1:GA/DESKTOP/2011 Rev 02) was submitted to DPHI in May 2011.</p>	<p>Compliant and closed</p>
<p>(a) be undertaken by a suitably qualified and experienced person;</p>	<p>Atkins Acoustic and Associates Pty. Ltd. prepared the report</p>	<p>Compliant and closed – Suitably qualified consultant used</p>

<p>(b) identify future reference points that will be used to demonstrate compliance;</p>	<p>Figure 2 of the 2011 Noise Verification Assessment identifies the original compliance noise monitoring locations.</p> <p>Section 3.0, 4.0 and Figure 1 of the NMP and Figure 1 of the Annual Noise Audit discuss and identify the current Compliance Noise Monitoring locations..</p>	<p>Compliant and closed</p>
<p>(c) collect new or review existing data, and report on the seasonal background levels for the noise catchment; and</p>	<p>Section 5.3 of the 2011 Noise Verification Assessment reviewed seasonal weather effects.</p>	<p>Compliant and closed</p>
<p>(d) confirm the noise levels from the Initial Operations.</p> <p><i>Note: Some construction activities may occur under the Project Approval provided that such activity is not undertaken during the monitoring period or that the Proponent can demonstrate that the activity would not contribute to the background noise level, to the satisfaction of the Secretary.</i></p>	<p>Baseline noise assessment levels were documented in Table 6 of the 2011 Noise Verification Assessment.</p>	<p>Compliant and closed</p>

<p>Noise and Vibration Management Plan Condition 32:</p> <p>32. The Proponent shall prepare and implement a Noise and Vibration Management Plan for the Project to the satisfaction of the Secretary. The Plan shall:</p>	<p>The previous Noise Management Plan (September 2021 NMP) was most recently approved on 11 October 2023 ref. MP08_0129-PA-31.</p>	<p>Compliant</p>
<p>a) be prepared by a suitably qualified and experienced expert whose appointment has been agreed to in writing by the Secretary;</p>	<p>Competence Statement provided in Section 2.2 of the Annual Noise Audit and Section 7 of the NMP.</p>	<p>Compliant</p>
<p>b) be approved by the Secretary (see Conditions 49A and 49B for scope and timing and Condition 49C for management plan requirements);</p>	<p>The Noise Management Plan was most recently approved on 11 October 2023 ref. MP08_0129-PA-31 (September 2021 NMP). This revision of the NMP (June 2024) will also be submitted for approval.</p>	<p>Compliant</p>
<p>c) demonstrate how noise levels from the Project would be managed to ensure noise levels would be 10dB(A) below noise levels from the Proponent’s Initial Operations (see Conditions 30 and 31);</p>	<p>Refer top Section 5 of the NMP</p>	<p>Compliant</p>

<p>d) include a detailed monitoring program for reporting on ongoing compliance. The monitoring program shall:</p> <ul style="list-style-type: none"> • outline the proposed receiver sites at Stockton and sites on Kooragang Island that would be monitored; • include both attended and unattended noise monitoring; • verify that actual noise levels from the Project are consistent with the predictions made in the EA; • verify that noise levels from the Project are 10dB(A) below the noise levels identified in Condition 31 for the Proponent’s Initial Operations; 	<p>Refer to Section 6 of the NMP Assessment of noise trends undertaken in Section 5.2.9 of Annual Noise Audit and in Section 7.1.2 of AEMR</p>	<p>Compliant</p>
<p>e) provide details of any complaints received in the preceding year relating to noise generated by the Project, and action taken to respond to those complaints;</p>	<p>Refer to Section 6.5 of NMP. Refer to Section 5.2.6 and Attachment 2 of the Annual Noise Audit.</p>	<p>Compliant</p>
<p>f) detail procedures for implementing additional reasonable and feasible noise mitigation measures for the Project in response to exceedance of limits and/or noise complaints;</p>	<p>Refer to Section 6.3, 6.4, 6.5 and 7.0 of NMP</p>	<p>Compliant</p>

<p>g) be updated annually, unless otherwise agreed to by the Secretary; and</p>	<p>As noted in Section 8.4 and approved on 11 October 2023 ref. MP08_0129-PA-31 (September 2021 NMP).</p> <p><i>“The NMP will be reviewed periodically or as directed by the Secretary of the Department. The review will reflect changes to site operating conditions and assessment guidelines.</i></p> <p><i>As required or directed by the Secretary of the Department, the NMP will be updated and actions undertaken to improve the effectiveness of monitoring and follow-up investigations and management practices.”</i></p>	<p>Compliant</p>
<p>h) describe the measures that will be implemented to prevent and minimise potential adverse noise and vibration impacts from the Project, including:</p> <ul style="list-style-type: none"> • reasonable and feasible measures being employed on the Project site; • plant and equipment being maintained to ensure that it is in good order; • how potential noise and vibration impacts will be minimised and managed; and • identification of the likely nature and timing of Project-related activities and works that could generate potential elevated noise emissions and a description of the mitigation measures that will be implemented to ensure compliance with the relevant conditions of this approval and the EPL. 	<p>Refer to Section 5.2, 5.3, 5.4, 5.5 of the NMP</p>	

2.1 Agency Consultation with Regulatory Authorities

In consultation since the issuing of the *Projects* Approval conditions EPA (formerly *OEH*) advised *Orica* that they do not review *NMP* documents as their responsibility is to set environmental objectives for environmental management, not to be directly involved in the development of strategies to achieve those objectives. A copy of the original *NMP* was provided to EPA.

The *NMP* is reviewed and submitted for DPHI approval periodically as noted in Section 8.4.

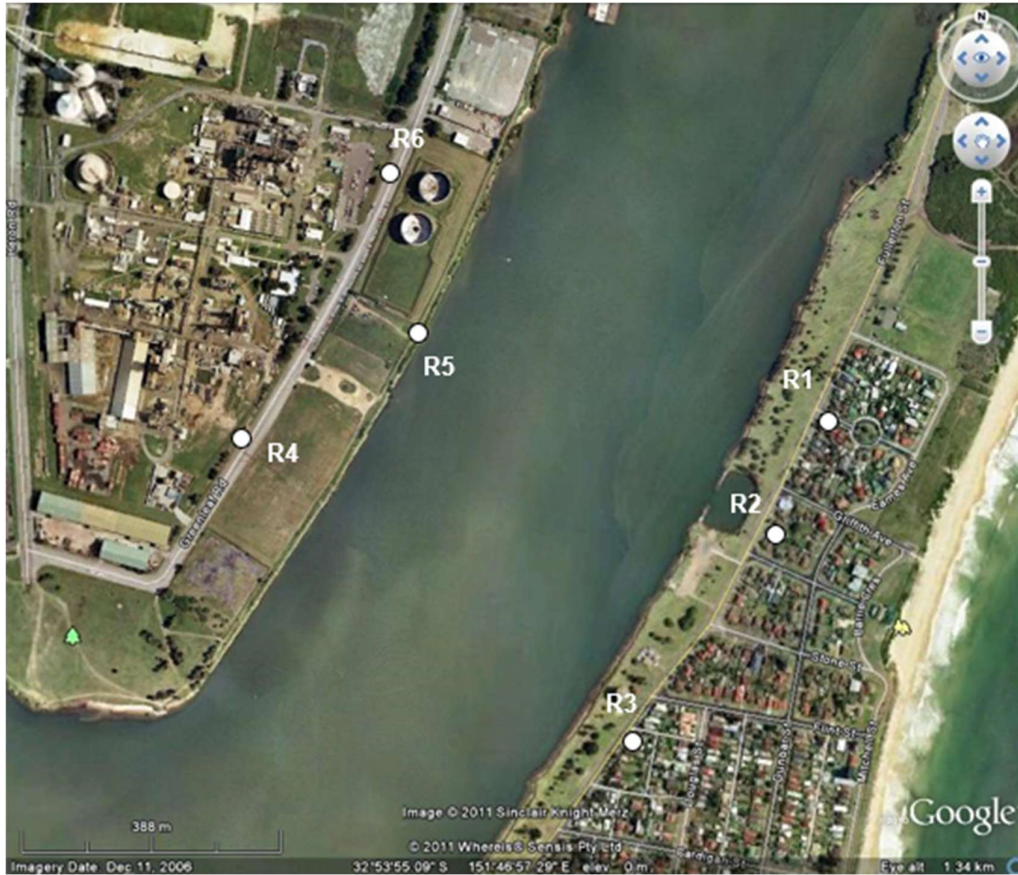
3. Noise Monitoring

The *Department* recognised that, as a result of weather effects and noise from other industries including extraneous sources, direct noise measurement at Stockton was not reliable for assessing *Orica's* noise compliance status. To provide a more reliable means of determining noise emissions generated directly from the *Orica* facility, it was proposed that a noise model be developed to assess the contribution of site noise emissions at Stockton.

For the purposes of the undertaking compliance noise monitoring, six reference locations were selected, comprising of three noise monitoring locations at Stockton and three noise monitoring location on Kooragang Island (*Figure 2*).). The Stockton locations on the western side of the peninsular were selected to represent residential properties most likely to be exposed to noise from *the Project*. In contrast noise monitoring undertaken closer to the *Orica* facility, located on Kooragang Island, was likely to be less influenced by surrounding industrial noise sources, extraneous noise and variable weather effects, and more accurately represent noise directly attributable to the site operations.

In addition to the selection criteria outlined above, noise monitoring locations on Kooragang Island and Stockton have been selected to ensure reliable, ongoing site access for future noise monitoring events. The monitoring locations are identified below and shown on *Figure 1*.

Figure 1- Compliance Noise Monitoring Locations



- R1 - 284 Fullerton Street, Stockton.
- R2 - 220 Fullerton Street, Stockton.
- R3 - 184 Fullerton Street, Stockton.
- R4 - Roadside (south) opposite Ammonium Nitrate Area
- R5 - Riverside (central) opposite Administration Building.
- R6 - Roadside (north) east of Ammonia Plant.

For the purpose of noise compliance monitoring at Stockton, unmanned noise monitoring is undertaken on the properties between the street boundaries and the building facades; attended monitoring is conducted at the street frontage to represent property boundaries.

4. Determination of Project Noise Criteria

To minimise the effects from other noise sources and meteorological conditions, attended audits were undertaken at night between 10.00pm and midnight in accordance with the requirements of the *NSW EPA Noise Policy for Industry (NPfI) (2017)*. Night-time noise measurements reported for the three Kooragang Island monitoring locations for the existing operations confirmed that there is minimal influence or effect from both other industrial sources and the prevailing meteorological conditions.

Attended and unattended measurements at the Reference Monitoring locations on Kooragang Island has shown that there is minimal variation between the L_{A90} and L_{Aeq} levels, and that the existing noise from Orica would be described as “steady state”. As described in Section 5 above, the use of a noise model plus verification monitoring at three locations on Kooragang Island was selected to assess compliance with the Project Approval Conditions.

Measurements have shown that the L_{A90} or L_{Aeq} descriptors are reliable for assessing noise from *Orica*; noise trends and status with the Project Approval Conditions.

In Table 6 of the “Noise Verification Assessment Report” the noise results for existing operations, as determined from the three monitoring sites located on Kooragang Island (R4-R6) were determined.

As a result of changes to monitoring location access and instrumentation security it was necessary to move locations R4 and R6 to the Orica onsite boundaries. As a consequence, the baseline noise assessment level for R4 of 62dBA has not changed. For monitoring location R6 the baseline noise assessment level increased 56dBA to 62dBA.

The revised baseline RBL’s and L_{A90} levels reported for Kooragang Island and Stockton and adopted for assessing future noise trends are summarised in *Table 2* and *Table 3*.

Table 2. Revised Baseline Nighttime Noise Measurements for Kooragang Island.

Reference Measurement Location	Baseline Rating Background Assessment Levels RBL	Rating Background Noise Level Trends	
		Median Range RBL	Median RBL
R4 – Orica Onsite (South)	62	55.6 to 63.0	59.4
R5 - Riverside (Central)	57	49.3 to 60.7	55.8
R6 - Orica Onsite (North)	62	60.1 to 65.4	62.7

Table 3. Nighttime Background Noise Measurements for Stockton.

Reference Monitoring Locations	Ambient Background LA90 Sound Pressure Levels		
	R1	R2	R3
February - March 2010			
Median	48.0	49.0	46.0
Max	57.4	55.6	53.1
Min	38.7	38.6	37.0
June 2010			
Median	51.0	51.0	53.0
Max	58.6	56.3	57.8
Min	41.0	47.5	36.8
September - October 2010			
Median	48.0	48.0	45.0
Max	50.8	51.8	53.3
Min	39.4	41.8	39.3
February 2011			
Median	-	50.0	48.0
Max	-	58	58.7
Min	-	42	40.4

Referring to the *Departments* Development Conditions for assessing noise trends and compliance status, operational noise resulting from *the Project* should be at least 10dBA below levels from *Orica's* existing plant. For compliance purposes *Table 4* presents the measured/predicted noise criteria for *the Project* for monitoring sites R4-R6 located on Kooragang Island.

Table 4. Project Noise Criteria

Location	Project Noise Criteria RBL
R4	52
R5	47
R6	52

5. Noise Management Strategy

5.1. Noise Assessment

Noise modelling for *the Project* is reported in the *Atkins Acoustics* report titled '*Orica Australia Pty Ltd. Kooragang Island. Noise Impact Assessment. Numbered 39.6357R1:GACD03, Rev 03 dated February 2009*'.

The modelling (Atkins Acoustics Feb '09) undertaken specifically for Phase 1 of *the Project* predicted that noise would satisfy the noise criteria, as levels would be 10dBA below the existing noise levels emitted by *Orica*. *Table 5* below presents a summary of noise levels predicted from the noise modelling for the existing plant and for Phase 1 of *the Project* for the Stockton reference locations.

Table 5. Predicted Existing and Projected Noise Contributions (Phase 1)

Assessment Location	Predicted Sound Pressure Levels LAeq, 15min	
	Existing Ammonia Plant	Up-rated Ammonia Plant
Assessment Location R1	50	37
Assessment Location R2	53	41
Assessment Location R3	51	39

5.2. Noise Management

Orica is committed to the ongoing management of noise from the existing plant and *the Project*. In accordance with this commitment specific activities and controls that will be implemented to manage noise from site activities, include:

- monitor noise in accordance with the *NMP*;
- ensure that all equipment used onsite is effectively maintained; and
- identify and manage modifications to plant and equipment that could potentially increase noise from the site (short term and long term).

5.3. Noise Reduction Management

Site investigation and ranking of *Orica's* sources contributing to environmental noise identified the following sources and noise control options for consideration in a site Noise Control Plan (NCP) that was submitted to the EPA. *Orica* has since implemented the following noise reduction activities:

- Designed and manufactured of an acoustic enclosure for the No. 2 Nitric Acid Plant Process air compressor;
- Designed an acoustic treatment for the No. 1 Nitric Acid Plant Compressor Building;
- Designed and installed an acoustic treated building for the new Ammonia Plant Process air compressor;

-
- Designed and installed a new converter quench valve station to reduce high frequency valve/pipe noise on the Ammonia Plant; and
 - Decommissioned two Ammonia Process Air Compressors (101J and 102J).
 - Installation of an acoustic enclosure on the No. 2 Nitric Acid Plant Process Air Compressor;
 - Installation of the acoustic treatment measures for the No. 1 Nitric Acid Plant Compressor Building;
 - Manage venting of surplus low pressure steam on the Ammonia Plant;
 - Verification of noise levels from Phase 1 of *the Project* and the existing plant;
 - Reassessment of contributors to plant noise emissions and development of action plans to address key contributors
 - Installation of a splitter silencer on the duct between the ID fan and stack of the Prill Tower Scrubber

Orica is committed to the control of environmental noise emissions and investigations to assess the feasibility and reasonableness of treatments available to minimise noise impacts.

5.4. Managing Short-term Noise Exceedances

In addition to controlling normal operational noise, managing noise at the source may be required from time to time to address short-term exceedances of the Approval Consent Conditions. These situations may include:

- commissioning of plant and equipment, and
- safety related testing of equipment and emergency systems such as valves
- abnormal operations due to unscheduled plant and equipment breakdowns or maintenance requirements.

During these situations noise mitigation strategies are often impractical and not feasible. In these situations, the *Senior Specialist - Environment* will be informed of the likely noise risk and procedures to minimise noise exposure for Stockton residents will be undertaken.

In addition, if the *Senior Specialist - Environment* is satisfied that the short-term noise is likely to give rise to impacts, communications will be undertaken with potentially affected residents.

5.5. Managing Noise Impacts

Annual noise monitoring, as detailed in Section 6 is undertaken to assess compliance of *the Project* with the Project Approval requirements. If the measurement and assessment of noise levels at R4, R5 and R6 identifies that the Baseline noise levels, as detailed in *Table 1*, are consistently being exceeded then *Orica* will update the site noise model to identify the contributing sources and identify options to reduce the noise levels. Any identified measures would be incorporated into noise reduction projects.

6. Noise Monitoring and Review

The Noise Monitoring Program (*NMP*) has been prepared to assess compliance status with the Project Approval Noise Conditions i.e. to assess compliance of the *Project* with the CoA, that noise levels from the *Project* be 10dB(A) less than the Baseline levels.

Demonstration of compliance with the *Project* noise criteria will be difficult to confirm by monitoring alone due to the variability of the background noise levels. Therefore, to assess compliance with the *Project* noise criteria it is proposed to undertake the following:

- Updating of the site noise model following the commencement of operation of the *Project* to determine the contribution of the *Project* plant and equipment to the predicted noise contributions at Kooragang Island and Stockton reference monitoring locations.
- Unattended and attended monitoring at the reference locations to assess long term changes in the noise levels at the locations to assess long term trends in noise emissions

6.1. Noise Model Updating

The site noise model, as detailed in the *Kooragang Island Noise Assessment (Report Number 39.6357.R1:GACD03 Rev 3, Atkins Acoustics, 2009)* is updated following the commencement of operation of each phase of the *Project* to determine the contribution of the plant and equipment associated with the *Project*. The updating of the noise model, which has been developed in the program *Environmental Noise Model*, will involve near field onsite measurement of the noise emissions from *Project* related plant and equipment.

Ongoing compliance of the *Project* with the Project Approval noise requirement is assessed against the Existing Facility noise levels detailed in Table 6 at the completion of the relevant phase.

6.2. Noise Audits

Attended and unattended monitoring is undertaken at both Kooragang Island and Stockton to validate the findings of the noise model updating. The monitoring is used to assess long-term trends in the site noise profile.

6.2.1. Frequency of Noise Audits

Attended monitoring is undertaken at the current residential reference locations identified as R1, R2 and R3 (R1 - 284 Fullerton Street, Stockton, R2 - 220 Fullerton Street, Stockton, R3 – 184 Fullerton Street, Stockton) and on Kooragang Island at R4, R5 and R6. The monitoring is undertaken annually.

6.2.2. Noise Audits Conditions

Noise audits using attended noise monitoring are undertaken during the night-time period (10.00pm and 7.00am) in accordance with the Noise Policy for Industry (NPfI). Noise measurements at each assessment location are undertaken over a fifteen (15) minute period. The measurement results reported include the L_{Amax} , L_{A1} , L_{A10} , L_{A50} , L_{Aeq} , and L_{A90} levels.

When direct measurement is not feasible to verify *the Project* noise contributions, modelling is undertaken to confirm the contribution. The measured or calculated noise contributed level will be assessed against the Project Approval criteria of 10dB(A) less than the Baseline levels.

During or following the attended noise monitoring, contact will be made with the relevant *Orica* nominated Plant Managers to confirm the status of operating plants and will be reported in the audit reports.

6.2.3. Noise Measurement Procedures

Noise measurements will be undertaken and assessed in accordance with the Australian Standards AS1055-1997 '*Acoustics - Description and Measurement of Environmental Noise*' and the EPA, Noise Policy for Industry (2017) (NPfI).

6.2.4. Noise Measurement Instrumentation

Noise measurements for assessing the compliance status will be undertaken with instrumentation calibrated by a NATA Certified Laboratory. Instrumentation calibration levels will be checked with a portable calibrator before and after the audit measurements to verify that any variation in calibration levels does not exceed ± 0.5 dB. Copies of the meter calibration certificates will be attached to the compliance noise audit report.

6.2.5. Meteorological Conditions

Meteorological conditions during the measurements will be determined from *Orica's* onsite weather station installed in accordance with the relevant Australian Standards for a licensed monitoring point. The reported parameters will include wind speed, wind direction, temperature, humidity and rainfall.

In the event the *Orica* weather station data is not available, data from the Port Waratah Coal Services (*PWCS*) Kooragang Island Coal Terminal (*KCT*) or suitable alternative meteorological station will be used.

6.2.6. Site Operating Conditions

To assist with the identification of site operating conditions during attended noise audits, the relevant Orica Shift *Team Leaders* telephone contact details will be provided to the person(s) undertaking the audit. Site operating conditions will be established for the period during the site audit and reported in the noise compliance report.

6.3. Assessing Non-Compliance's

Referring to *INP* assessment guidelines, a development is deemed to be non-compliant with a noise consent or licence condition, if the noise contribution is more than 2dB above the limit specified in the consent or licence condition. The *INP* guideline will be referred to for assessing noise compliance status with the criteria that the contribution of the new plant and equipment must be 10dB(A) less than the baseline levels.

6.4. Community Noise Related Inquiries

The *Orica* community incident reporting and inquiry telephone number, which is manned 24 hours per day, 7 days per week is 1800 789 044.

The procedure *Community Complaint Response Procedure (KIW0811/OEL1956969)* details the site response in the event of a complaint. This includes contacting plant operating personnel as well as a member of the site Environment Team to ensure that the appropriate response is implemented. Records of community complaints are maintained in the Orica SHES Incident Management System (Enablon) and reported in the site annual license return and compliance report.

6.5. Review of Incident Reports

As part of the annual noise audit and reporting, inquiries will be made with the *Senior Specialist - Environment* or representative to evaluate reported noise incidents and actions undertaken to investigate and address the reported incidents. Incident action and investigative measures are to be undertaken as per guidelines detailed in the *Community Complaint Response Procedure (KIW0811/OEL1956969)*. Details of the nature of the incident, including the date, time, nature of the incident and *Orica's* responses are reported in the noise audit report.

7. Roles and Responsibilities

Specific responsibilities for the operational plant and site under this *NMP* include:

Noise and vibration consultant

Any noise and/or vibration monitoring under this *NMP* shall be undertaken by a suitably qualified and experienced person, specifically a member firm of the Association of Australasian Acoustical Consultants (AAAC) and be conducted by a noise professional with tertiary qualifications and experience in the discipline of acoustics and a 'Member' of the Australian Acoustical Society (AAS).

Orica Site Manager

Provide direction for environmental management in accordance with *Orica* Environmental Policy;

Kooragang Island Senior Specialist - Environment or Delegate

- Ensure that the *NMP* is relevant for current site activities;
- Co-ordinate scheduled noise monitoring and investigate reported noise incidents in accordance with the *NMP*;
- Maintain protocols for evaluating compliance with relevant noise criteria;
- Maintain procedures for investigating and reporting incidents, including those related to noise;
- Maintain protocols to investigate and evaluate the effectiveness of installed noise mitigation;
- Liaise with local landowners as required and follow-up reported noise incidents;
- Undertake periodic reviews of the effectiveness of the *NMP*;
- Co-ordinate investigations to maintain and evaluate feasible and reasonable options to control and reduce noise from *Orica*;

Operational Site Shift Team Leaders

- Record noise incidents in *Orica*'s Safety, Health and Environmental Records Management (Enablon) system;
- Assist with preliminary investigations to assess reported noise incidents; and
- Assist the Senior Specialist - Environment to investigate reported noise incidents where required.

8. Reporting and Review

The results and findings of all scheduled noise monitoring and incident investigations will be reported in the Annual Noise Audit Reports, and a copy of the Annual Noise Audit report will be attached the relevant Annual Environmental Management Report. A summary of noise trends and their significance is also included in the AEMR in accordance with the Department's 2018 AEMR feedback.

8.1. Reporting of Attended Noise Monitoring Results

The Annual Noise Audit reports will include the following:

- dates and time of the audit.
- details and qualifications of person(s) who conducted the audit.
- a map identifying noise measurement locations.
- details of meteorological conditions.
- confirmation of site operating conditions.
- measured $L_{Amax, 15min}$, $L_{A1, 15min}$, $L_{A10, 15min}$, $L_{A50, 15min}$, $L_{A90, 15min}$ and $L_{Aeq, 15min}$ levels.
- measured/calculated $L_{Aeq, 15min}$ contribution from plant associated with *the Project*.
- description of noise sources identified during the audit.
- verification of noise compliance/non-compliance status, and
- summary of noise incidents reported at *Orica* for the period following the previous report.

8.2. Reporting Noise Complaints

Noise complaints are managed in accordance with Orica's *Community Complaint Response Procedure (KIW0811/OEL1956969)*. This procedure includes the requirements for the recording of the complaint, the complainant's details, notification of plant and environmental personnel, the outcomes of the investigation and follow-up with the complainant.

The number of complaints received by *Orica* is reported to EPA in the Annual Environmental Return and in the Annual Environmental Management Report that is submitted to the *Department*.

8.3. Reporting Non-Compliance's

In the event of an exceedance of *the Project* Consent Conditions, the *Senior Specialist - Environment* will initiate further investigation into the cause of the exceedance and the requirements for noise control actions, with the information recorded in Enablon, the incident management and investigation database.

The Site and Plant Managers shall be advised of the exceedance.

Any exceedances will be reported and summarised on an annual basis in the Annual Environmental Management Report.

8.4. Review

The *NMP* will be reviewed periodically or as directed by the Secretary of the *Department*. The review will reflect changes to site operating conditions and assessment guidelines.

As required or directed by the Secretary of the *Department*, the *NMP* will be updated and actions undertaken to improve the effectiveness of monitoring and follow-up investigations and management practices.

Appendix A - Project Staging Plan (June 2024)

Table 1 – Orica Kooragang Island Expansion Project Staging Plan

Phase	Stage	Description of Work	Sub-Stage	Approval Status	Estimated Construction Timing
Ammonia Plant Uprate					
1	1a	Ammonia Plant Expansion – Plant Air Compressor Building Construction of Plant Air Compressor building shell (compressor installed in Stage 1(b)).	Completed	Construction Complete and Operational	Completed
	1b	Ammonia Plant Expansion - Installation/Modification of Plant Installation of new equipment including new compressor, process vessels pipework and instruments in the Ammonia Plant.	Completed		
Proposed Trident Nitrates Expansion Project Construction Scheduling					
2	2a	OBL 1(a) – Nitrates Infrastructure & ANS Loadout Installation of new site infrastructure including the new site entrances, internal access roads, security and weighbridge facilities, ANS product storage and despatch facilities.	<ol style="list-style-type: none"> Internal access roads and minor civil works. Site entrances, security offices and weighbridges. Major civil works including piling and foundations. New ANS storage vessel loading equipment 	Approval for Construction granted / construction yet to commence.	Yet to be determined
	2b	OBL 1(b) – Nitrates Despatch & Support Infrastructure Construction of new AN Bag store, AN Despatch facilities and amenities, demolition of existing AN Bag store and despatch, construction of new AN Bulk Store, modification to existing AN bulk store, construction of WANS, construction of new control room and electrical infrastructure.		Approval to commence construction not yet granted by DoPI.	Yet to be determined
3	3a	NAP4 – Nitric Acid & AN Solution plants and Support Infrastructure Construction of the NAP4/ ANS Plant and tie-ins Construction of Nitrates support infrastructure including new Nitric Acid Storage, Ammonia Storage, Boiler, Cooling Tower, Demin Plant expansion Instrument Air upgrades, new Ammonia pumps, pipebridges & transfer lines.		Approval to commence construction not yet granted by DoPI.	Yet to be determined
	3b	AN3 – AN Prill Plant Construction of ANP3 Dry Section plant and tie-ins		Approval to commence construction not yet granted by DoPI.	Yet to be determined
Ammonia Management Improvement Program					
4	4	Ammonia Flares Construction and operation of three ammonia flares.	<ol style="list-style-type: none"> Nitrates Plant Flare Ammonia Storage Flare Ammonia Plant Flare 	Approval to commence construction of the flares was granted on 23 June 2015. Ammonia Flares The nitrates flare became operational during February 2016 The ammonia storage flare became operational during April 2016.	Completed

Phase	Stage	Description of Work	Sub-Stage	Approval Status	Estimated Construction Timing
				The ammonia plant flare was commissioned during April 2017.	
Nitric Acid Tank					
5	5	Nitric Acid Tank Construction and Operation of a nitric acid tank and associated scrubber, capable of exporting and importing nitric acid via the site's nitric acid wharf pipeline.		Approval to commence construction not yet granted by DoPI.	Yet to be determined
Boiler					
6	6	Construction and operation of new Site Boiler Construction and Operation of a new site boiler (to replace the decommissioned original site boiler)		Approval to commence construction granted on 27 July 2015	Completed 12 December 2019
Nitrates Effluent Tank					
7	7	Construction and operation of new Nitrates Effluent Tank (MOD4) Construction and Operation of a new Nitrate Effluent Tank (to replace the Nitrates Effluent Pond)		Approval to commence construction granted on 13 May 2021	Completed July 2023
Prill Tower Scrubber					
8	8	Construction and operation of new Prill Tower Scrubber (MOD5) Construction and Operation of a prill tower scrubber to remove particulate associated with the existing ANP1 Prill Tower		Approval to commence construction granted on 29 Oct 2021	Commenced CY 2022 - completion scheduled for September 2024
AN1 ANSOL supply line					
9	9	Construction and operation of new AN1 ANSOL supply line (MOD7) Construction and Operation of a new ANSOL supply line from the AN1 Plant to the existing ANSOL export tank		Approval to commence construction granted on 14 August 2023	Construction commenced October 2023 - completion scheduled for July 2024
Ammonia Tank					
TBD	TBD	Construction and operation of new 30,000 tonne Ammonia Tank (MOD6)		SEARS issued. Development application yet to be made.	Yet to be determined