

EMS0005

Operational Noise Management Plan

Borg Panels

124 Lowes Mount Road

Oberon

Borg Panels Pty Ltd

October 2020

This document should be read in conjunction with the EMS0001 Operational Environmental Management Plan, EMS0029 Mobile Wood Chipper Operation Management Plan

Revision History






Rev No.	Revision Date	Author / Position	Details	Reviewed / Authorised	
				Name / Position	Signature
0	14/11/17	Carly McCormack Planning and Environmental Officer	Draft	Victor Bendevski Environmental and Regulatory Compliance	
1	16/11/17	C McCormack Planning and Environmental Officer	Draft	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
2	16/11/17	C McCormack Planning and Environmental Officer	Draft	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
3	17/11/17	C McCormack Planning and Environmental Officer	Draft	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
4	28/11/17	C McCormack Planning and Environmental Officer	Draft	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
5	28/11/17	C McCormack Planning and Environmental Officer	Final	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
6	11/12/17	C McCormack Planning and Environmental Officer	Final Incorporating DP&E Comments	Jeremy Welbourne Acoustics Engineer – Global Acoustics	
7	13/11/18	Jacqui Blomberg Environment Manager	Review as per SSD7016 C10 Nil changes required	J Blomberg Environment Manager	
8	06/10/20	J Blomberg Environment Manager	Review as per SSD7016 B19(c) and B19(d)	J Blomberg Environment Manager	

Table of Contents

Definitions and Abbreviations	iv
1 Introduction	1
1.1 Background.....	1
1.2 Purpose and Objectives.....	1
1.3 Structure of the ONMP	1
1.4 Consultation.....	2
1.5 Training.....	2
2 Legislative and Regulatory Compliance.....	2
2.1 Relevant Legislation	2
2.2 Conditions of Consent	2
2.3 Mitigation Measures	5
2.4 Environment Protection Licence	6
2.5 Guidelines and Standards	6
3 Sensitive Receivers.....	7
4 Noise Criteria.....	10
4.1 Hours of Operation	10
4.2 Operational Noise Limits.....	10
4.3 Modifying Factors	11
5 Noise and Vibration Impact Assessment	12
5.1 Noise Assessment	12
5.1.1 Development Consent SSD 7016	12
5.1.2 SSD-7016-Mod-1	12
5.1.3 SSD-7016-Mod-2	13
5.1.4 SSD-7016-Mod-3	13
5.2 Vibration Assessment	14
6 Mitigation & Management Measures.....	14
6.1 Gas Turbine.....	16
6.2 Materials Handling Area	16
6.3 Northern Warehouse	16
7 Noise Monitoring.....	17
7.1 Overview.....	17
7.2 Baseline Data	17
7.3 Attended Noise Monitoring	18
7.3.1 Compliance Monitoring	18
7.3.2 Complaints Monitoring.....	19
7.4 Monitoring Locations	19
7.5 Meteorological Conditions	19
8 Contingency Plan for Unpredicted Impacts	21
9 Reporting	21
9.1 Internal Review.....	21
9.2 Scheduled Reporting.....	21
9.3 Exceedance of Criteria / Environmental Incident Management.....	21
9.4 Complaints.....	22
10 ONMP Review	22
11 References.....	23

Table 1 Development Consent Conditions	3
Table 2 Noise Sensitive Receivers.....	7
Table 3 Noise Limits dB(A)	10
Table 4 Operational Noise Impact Mitigation Measures	14
Table 5 Noise Monitoring Locations	19
 Figure 1 Noise Sensitive Receivers	 9
Figure 2 Noise Monitoring Locations.....	20

Definitions and Abbreviations

Abbreviation	Description
ABL	Assessment background level (ABL), the 10th percentile background noise level for a single period (day, evening or night) of a 24 hour monitoring period.
Ambient Noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Background Noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed.
Day	The period from 7:00am to 6:00pm on Monday to Saturday, and 8:00am to 6:00pm on Sundays and Public Holidays
dB(A)	Noise level measurement units are decibels (dB). The “A” weighting scale is used to describe human response to noise.
DPIE	NSW Department of Planning, Industry and Environment
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence issued by the EPA under the POEO Act
Evening	The period from 6:00pm to 10:00pm
Existing Development	The continuation of the existing MDF facility, located at 124 Lowes Mount Road, Oberon (Lot 26 DP 1200697), comprising the main production hall, warehouse, moulding plant, sawing plant, thin MDF plant and outdoor infrastructure, as described in the EIS and RTS, and the documents, drawings and plans in Appendix C of Development Consent SSD 7016
Incident	A set of circumstances causing or threatening material harm to the environment, and/or exceedance of the limits of performance criteria in Development Consent SSD 7016
L_{Aeq} (15 min)	The average noise energy during a 15 minute period.
Night	The period from 10:00pm to 7:00am on Monday to Saturday, and 10:00pm to 8:00am on Sundays and Public Holidays
MDF	Medium Density Fibreboard
Mod	Modification
OEMP	Operational Environmental Management Plan
ONMP	Operational Noise Management Plan

Abbreviation	Description
Project	The construction and operation of a particle board facility and alterations and additions to the Existing Development, as described in the EIS and RTS, and as generally depicted on the plans in Appendix A of Development Consent SSD 7016
RBL	Rating background level (RBL), the background noise level for a period (day, evening or night) determined from ABL data.
Sound Level Meter (SLM)	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.

1 Introduction

1.1 Background

Borg Panels operates a medium density fibreboard (MDF) and particleboard facility in Oberon NSW manufacturing a range of Customwood MDF and particleboard products including:

- Standard MDF;
- Moisture resistant MDF;
- E0 (low formaldehyde emitting) MDF;
- Ultraprime MDF mouldings;
- Standard particleboard;
- Moisture resistance particleboard;
- Decorative laminated MDF and particleboard; and
- Treated paper for the lamination of MDF and particleboard

On 29 May 2017 Development Consent SSD 7016 was granted by the Minister for Planning to construct a particleboard manufacturing facility, modify the existing MDF manufacturing facility and undertake general site works (the Project) at the existing site located at 124 Lowes Mount Road, Oberon. Since that date, the Minister for Planning has approved three modifications to SSD 7016;

- SSD 7016 Mod 1 on 20 November 2018,
- Mod 2 on 29 November 2019 and

Mod 3 on 22 May 2020.

Conditions contained within the Consent require Borg to provide for the ongoing environmental management of the Development. Though initially developed to satisfy conditions B18, C4 and C9, this Operational Noise Management Plan has been updated as per condition B19. See section 2.2 Conditions of Consent for further detail.

1.2 Purpose and Objectives

This Plan has been developed to:

- Ensure that operational noise generated by the facility is managed;
- Maintain compliance with conditions of approval and legislation relating to noise;
- Provide a protocol for monitoring and evaluation of noise impacts on surrounding private residences and sensitive receivers;
- Communicate with the local community and regulators regarding Borg Panels activities.

1.3 Structure of the ONMP

This ONMP has been developed to manage operational noise at the facility and to satisfy the requirements set out in Conditions B18, B19 and C9 of Development Consent SSD 7016, and includes information on the following:

- Section 2 – Legislative and Regulatory Compliance
- Section 3 – Sensitive Receivers
- Section 4 – Noise Criteria
- Section 5 – Noise and Vibration Impact Assessment
- Section 6 – Impact Management Measures

- Section 7 – Noise Monitoring
- Section 8 – Contingency Plan for Unpredicted Impacts
- Section 9 – Reporting
- Section 10 – ONMP Review
- Section 11 – References

1.4 Consultation

The ONMP (28 November 2017) was provided to the EPA for review and consultation, and submitted to the Secretary of the Department of Planning and Environment (DPI&E) for approval on 29 November 2017 in accordance with SSD 7016 condition C4. DPI&E were satisfied that the ONMP met with the terms of the relevant conditions of consent and issued approval on 21 December 2017.

As required under condition B19, this ONMP was re-submitted to the Secretary of the Department of Planning, Industry and Environment (DPIE) 7 October 2020.

As per condition C10, subsequent revised versions of the ONMP will be submitted to the Secretary for approval as is necessary.

1.5 Training

Training and Assessment Manual *EMS0018 Environmental Standard Awareness Noise* has been developed and will be delivered to all Supervisors and Operators on site. The Standard outlines Borg employee's responsibilities to assist with managing noise at the facility to ensure regulatory compliance, and to mitigate against noise nuisance to the local community. Training records are maintained in DataStation, Borg's information management system.

2 Legislative and Regulatory Compliance

2.1 Relevant Legislation

Key environmental legislation relating to noise management for the facility includes:

- *Protection of the Environment Operations Act 1997*; and
- *Environmental Planning and Assessment Amendment Act 2017*

2.2 Conditions of Consent

Borg Panels operations are subject to the conditions contained in Development Consent SSD 7016 dated 29 May 2017, and the following modifications:

- SSD 7016 Mod 1 – site layout changes (approved 20 November 2018)
- SSD 7016 Mod 2 – installation of an electricity generating gas turbine and ancillary equipment (approved 29 November 2019)
- SSD 7016 Mod 3 – additional material handling equipment, extension to northern warehouse, changes to the site surface water system and construction of further hardstand (22 May 2020)

No additional conditions were imposed by the Minister during the assessment and approval of Mod 1. Mod 2 contains new condition B19(c) and Mod 3 new condition B19(d) which pertain to this ONMP. See Table 1 for details.

Approved hours of operation, operational noise limits and noise mitigation measures for the facility are listed in Table 1 Development Consent Conditions. Specific requirements for an ONMP (Schedule 2, Condition B18) and general requirements for environmental management plans (Schedule 2, Condition C9) are also detailed in Table 1.

Table 1 Development Consent Conditions

No.	Requirement	Document Reference									
	NOISE										
	Hours of Work										
B13	<p>The Applicant must comply with the hours detailed in Table 1, unless otherwise agreed in writing by the Secretary.</p> <p>Table 1: Hours of Work</p> <table><tr><th>Activity</th><th>Day</th><th>Time</th></tr><tr><td>Earthworks and Construction</td><td>Monday – Friday Saturday</td><td>7 am to 7 pm 8 am to 1 pm</td></tr><tr><td>Operation</td><td>Monday – Sunday</td><td>24 hours</td></tr></table>	Activity	Day	Time	Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm	Operation	Monday – Sunday	24 hours	Section 4
Activity	Day	Time									
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm									
Operation	Monday – Sunday	24 hours									
	Operational Noise Limits										
B16	<p>The Applicant must ensure that noise generated by the Development does not exceed the noise limits in Table 2.</p> <p>Table 2: Noise Limits dB(A)</p> <table><tr><th>Location</th><th>Day LAeq(15 minute)</th><th>Evening LAeq(15 minute)</th><th>Night LAeq(15 minute)</th></tr><tr><td>All sensitive receivers</td><td>55</td><td>50</td><td>45</td></tr></table> <p>Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.</p>	Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night LAeq(15 minute)	All sensitive receivers	55	50	45	Section 4	
Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night LAeq(15 minute)								
All sensitive receivers	55	50	45								
	Noise Mitigation										
B17	<p>The Applicant must ensure all noise attenuation measures already installed for the Existing Development are maintained in good working order for the life of the Development.</p>	Section 6									
	Operational Noise Management Plan										
B18	<p>Within 6 months of the date of this consent, the Applicant must prepare an Operational Noise Management Plan (ONMP) for the Existing Development, to manage operational noise to the satisfaction of the Secretary. The ONMP must form part of the OEMP required by Condition C4 and be prepared in accordance with Condition C9. The ONMP must:</p>	This Plan									
	<p>a) be prepared by a suitably qualified and experienced noise expert;</p>	Revision History									

No.	Requirement	Document Reference
	<p>b) describe the measures that will be implemented to minimise noise from the Existing Development including:</p> <ol style="list-style-type: none"> 1. (i) all reasonable and feasible measures being employed on site; 2. (ii) maintain equipment to ensure it is in good order; 3. (iii) traffic noise is effectively managed; 4. (iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply; 5. (v) compliance with the relevant conditions of this consent; 	Section 6
	<p>c) includes a noise monitoring program that:</p> <ol style="list-style-type: none"> 1. (i) must be carried out until otherwise agreed to in writing by the Secretary; 2. (ii) is capable of evaluating the performance of the Existing Development; and 3. (iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and 	<p>Section 7</p> <p>Section 9</p>
	<p>d) include a procedure for implementing noise mitigation measures, should the Applicant be directed by the EPA or the Secretary, or should non-compliances be detected.</p>	Section 8
B19	<p>Prior to the commencement of operation of the Project, the Applicant must update the ONMP required under Condition B18, to incorporate the Project and its management, to the satisfaction of the Secretary. The updated plan must be prepared in accordance with the requirements of Condition B18, and must incorporate the following:</p>	This Plan
	<p>a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL;</p>	Section 7
	<p>b) description of any additional measures that would be implemented for the Development to ensure compliance with the noise limits in Condition B16 and the EPL;</p>	<p>Section 2.3</p> <p>Section 6</p>
	<p>c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area; and</p>	Section 6
	<p>d) details of the noise attenuation measures for the materials handling equipment approved for installation and operation under SSD-7016-Mod-3.</p>	<p>Section 2.3</p> <p>Section 6</p>
	<p>MANAGEMENT PLAN REQUIREMENTS</p>	
C9	<p>The Applicant must ensure that the environmental management plans required under Condition C4 of this consent are prepared by a suitably qualified person or persons in accordance with best practice and include:</p>	Revision History

No.	Requirement	Document Reference
	a) detailed baseline data;	Section 7.2
	b) a description of: <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures/criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the Development or any management measures; 	Section 2 Section 4 Section 6
	c) a description of the management measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;	Section 6
	d) a program to monitor and report on the: <ul style="list-style-type: none"> (i) impacts and environmental performance of the Development; and (ii) effectiveness of any management measures (see (c) above); 	Section 9
	e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 8
	f) a program to investigate and implement ways to improve the environmental performance of the Development over time;	Section 6
	g) a protocol for managing and reporting any: <ul style="list-style-type: none"> (i) incidents; (ii) complaints; (iii) non-compliances with statutory requirements; and (iv) exceedances of the impact assessment criteria and/or performance criteria; and 	Section 9
	h) a protocol for periodic review of the plan.	Section 10
	Note: These requirements also apply to the preparation or updates of management plans for the Existing Development and the Project.	

2.3 Mitigation Measures

Appendix B Applicant's Management and Mitigation Measures to Development Consent SSD 7016 details the reasonable and practical measures to avoid or minimise impacts to the environment and community that may arise as a result of activities at Borg Panels Oberon. Borg is committed to providing further noise attenuation to certain items of plant to achieve sufficient sound power reductions to allow additional noise sources to be added to the site. This includes the following:

- the air intake for the Conti 1 dryer fan was redesigned and fan speed reduced;
- additional insulation was installed to the housing of the booster fan and fan speed reduced;
- a concrete enclosure constructed around the fibre transport fan;
- locating fan units in between buildings/structures and acoustically treating (insulating) them;
- acoustically treating (insulating) the blowers; and
- enclosing the cyclops' and roller screen within sheet metal housing.

Borg continually revise design of plant and equipment housing to reduce noise emissions as far as is reasonably practicable.

Management measures have also been implemented for the mobile chipping plant to minimise noise impacts on nearby sensitive receivers (see EMS0029 Mobile Wood Chipper Operation Management Plan). Management and mitigation measures are detailed in Section 5.1. 2.4 Environment Protection Licence

Environment Protection Licence 3035 (EPL3035) specifies noise limits for operation of the facility. L4 Noise Limits provides for limit conditions, which are reproduced below:

L4 Noise limits

L4.1 Noise from the premises must not exceed:

- 55 dB(A) $L_{Aeq}(15 \text{ minute})$ during the day (7am to 6pm); and
- 50 dB(A) $L_{Aeq}(15 \text{ minute})$ during the evening (6pm to 10pm); and
- at all other times 45 dB(A) $L_{Aeq}(15 \text{ minute})$, except as expressly provided by this licence.

Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L4.2 To determine compliance with condition L4.1, noise must be measured at or computed for Oberon High School or any other noise sensitive locations (such as a residence/school). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "NSW Industrial Noise Policy (EPA, January 2000)".

L4.3 The noise limits set out in condition L4.1 apply under all meteorological conditions except for the following:

- Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- Stability category G temperature inversion conditions.

L4.4 For the purpose of condition L4.3:

- Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
- Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

2.5 Guidelines and Standards

The guidelines and standards relevant to noise management for the facility include:

- EPA 2017, *Noise Policy for Industry (NPfI)*, Environment Protection Authority. Sydney NSW.

- EPA 2000, *NSW Industrial Noise Policy (INP)*, Environment Protection Authority: Sydney NSW.
- DECCW 2011, *NSW Road Noise Policy*, Department of Environment, Climate Change and Water NSW. Sydney NSW.
- DEC 2006, *Assessing Vibration: A Technical Guideline*, Department of Environment and Conservation. Sydney NSW.

3 Sensitive Receivers

The subject land is located on the northern outskirts of Oberon, to the east of Lowes Mount Road. As per the Oberon Local Environmental Plan (LEP) 2013, the land zoning classification of the subject site is IN1 General Industrial. Borg operations are part of the larger Oberon Timber Complex (OTC) which are operated by a number of separate companies and generally involve timber product manufacture.

The Oberon LEP 2013 identifies a designated buffer area that aims:

- to protect the operational environment of industries operating within the OTC; and
- to control development near the OTC and waste disposal facilities to minimise land use conflict.

Before granting development consent to development on land to which is identified as being within the designated buffer area, the consent authority must consider the following:

- the impact that any noise, odour or other emissions associated with existing land uses may have on the development;
- any proposed measures incorporated into the development that limit the impact of such noise and other emissions associated with the existing land use;
- any opportunities to relocate the development outside the designated buffer area; and
- whether the development is likely to adversely affect the operational environment of any existing development within the designated buffer area.

Land use north, east and west of the subject site is generally agricultural. Land use to the immediate south is industrial / recreational, and further south residential and the township of Oberon.

For the purpose of identifying and managing noise impacts representative noise sensitive receivers (NSR) have been selected, including the nearest and potentially most affected residences to the site, the Oberon Christian Life Centre and Oberon High School. The following NSRs are considered representative of all potentially affected receivers and are referred to in this Plan. Refer to Figure 1 for details.

Table 2 Noise Sensitive Receivers

Receiver ID	Receiver Location
R01	32 O'Connell Road
R02	6 Herborn Street
R03	Oberon High School

Receiver ID	Receiver Location
R04	10 Tasman Street
R05	127 Hazelgrove Road
R06	26 Cunnygham Street
R07	131 Hazelgrove Road
R08	2 Herborn Street
R09	15-19 Albion Street
R10	Jenolan Holiday Park
R11	Oberon Christian Life Centre

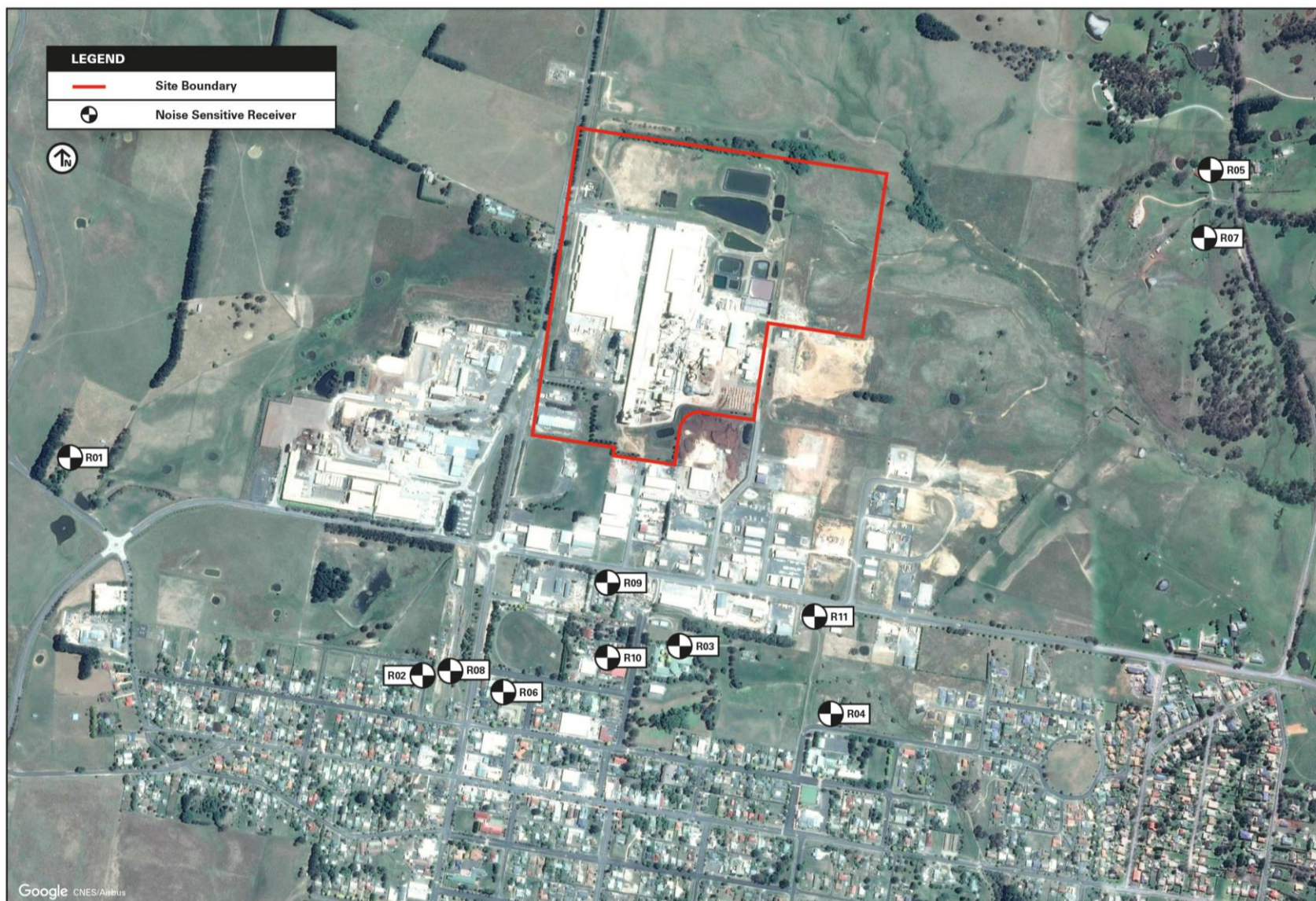


Figure 1 Noise Sensitive Receivers

4 Noise Criteria

4.1 Hours of Operation

The Borg Panels facility is approved to operate 7 days per week 24 hours per day.

4.2 Operational Noise Limits

Relevant limits are detailed in Table 3. Monitoring locations are detailed in Table 6.

Table 3 Noise Limits dB(A)

Location	Day L _{Aeq} (15 minute)	Evening L _{Aeq} (15 minute)	Night L _{Aeq} (15 minute)
All sensitive receivers	55	50	45

Note: Noise generated by the Development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.

EPL3035 Condition L4.2 specifies:

To determine compliance with condition L4.1 [Table 3 above], noise must be measured at or computed for Oberon High School or any other noise sensitive locations (such as a residence/school). A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the “NSW Industrial Noise Policy (EPA, January 2000)”.

In October 2017 the EPA released the *Noise Policy for Industry* (EPA, 2017). The *Noise Policy for Industry* (EPA, 2017) replaces the *NSW Industrial Noise Policy* (EPA, 2000). Implementation and transitional arrangements have been developed to ensure that there is an orderly and transparent transition from the *NSW Industrial Noise Policy* (2000) to the *Noise Policy for Industry* (2017).

Section 8 of the *Implementation and Transitional Arrangements for the Noise Policy for Industry* (2017) states:

The NSW Industrial Noise Policy (2000) will continue to apply where it is referenced in existing statutory instruments (such as consents and licences), except for the NSW Industrial Noise Policy Section 4 modifying factors, which will be transitioned to the Noise Policy for Industry (2017) Fact Sheet C through a NSW Industrial Noise Policy application note. This approach has been taken because the Noise Policy for Industry (2017) modification factor approach reflects more recent understanding of the impact of tonal and low-frequency noise on the community.

The *Industrial Noise Policy* (2000) application notes state:

Section 4 of the INP is withdrawn and the modifying factor adjustments outlined in the Noise Policy for Industry (2017) – Fact Sheet C are to be used when assessing the characteristics of a noise source. Fact Sheet C provides approaches to modifying factors that are supported by contemporary science and policy considerations.

As such, modifying factors will now be assessed in accordance with the *Noise Policy for Industry* (2017) as detailed in Section 4.3.

The noise limits set out in Table 3 apply under all meteorological conditions except for the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
- c) Stability category G temperature inversion conditions.

Data recorded by the on-site meteorological station must be used to determine meteorological conditions.

Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the *NSW Industrial Noise Policy* (2000) (EPL 3035 Condition L4.4). Again, the procedure for use of sigma-theta data has been updated in Section D1.4 of the *Noise Policy for Industry* (EPA, 2017). This new method for estimating stability class will be used.

4.3 Modifying Factors

As detailed in Section 4.2, the *Noise Policy for Industry* (2017) *Fact Sheet C: Corrections for Annoying Noise Characteristics* will be used to assess modifying factors that may apply.

This section outlines the correction factors to be applied to the source noise level at the receiver before comparison with the project noise levels specified in Table 3, to account for the additional annoyance caused by these noise characteristics.

As defined in the *Noise Policy for Industry* (2017):

Tonal noise: noise containing a prominent frequency and characterised by a definite pitch.

Low-frequency noise: noise with an unbalanced spectrum and containing major components within the low-frequency range (10–160 Hz) of the frequency spectrum.

Intermittent noise: noise where the level suddenly drops/increases several times during the assessment period, with a noticeable change in source noise level of at least 5 dB(A); for example, equipment cycling on and off. The intermittency correction is not intended to be applied to changes in noise level due to meteorology.

Correction for duration: this is applied where a single-event noise is continuous for a period of less than two and a half hours in any assessment period. The allowable exceedance of the $L_{Aeq,15min}$ equivalent noise criterion [is detailed] for the duration of the event. This adjustment is designed to account for unusual and one-off events, and does not apply to regular and/or routine high-noise level events.

Maximum correction: the maximum correction to be applied to the predicted or the measured level where two or more modifying factors are present. The maximum adjustment is 10 dB(A) where the noise contains two or more modifying factors (excluding the duration correction).

The facility typically operates with relatively continuous noise emission levels, and low frequency, intermittent and tonal noise characteristics have not been identified during historical monitoring. Future monitoring will include evaluation of these noise characteristics,

and modifying penalties as defined in the *Noise Policy for Industry* (2017) will be applied to measured levels as appropriate.

5 Noise and Vibration Impact Assessment

Global Acoustics was engaged by Borg to carry out a noise and vibration impact assessment for the proposed expansion of the MDF manufacturing facility and construction of a particleboard facility (SSD 7016 May 2017). The resulting *Borg Panels Timber Panel Processing Facility Oberon NSW Noise and Vibration Impact Assessment (May 2016)* considered impacts associated with noise and vibration from the existing site, and the proposed expansion.

Global Acoustics also provided updated noise models and acoustic advice for Mod 1, Mod 2 and Mod 3.

5.1 Noise Assessment

5.1.1 Development Consent SSD 7016

Modelling undertaken for the 2016 Impact Assessment indicated the site operated close to EPL3035 criteria during periods of enhancing meteorological conditions. Management measures and noise control for some plant were recommended to both manage and reduce noise emission from the site.

Model predictions indicated:

- Compliance with existing EPL criteria was predicted for all receivers during non-enhancing meteorological conditions;
- Compliance with existing EPL criteria was predicted for all receivers for the evening and night periods during prevailing (enhancing) meteorological conditions;
- At R09 (Figure 1), a minor 1 dB exceedance was predicted for the day period during enhancing meteorological conditions when one mobile chipper is operational; and
- A minor 1 dB exceedance was predicted for R03 and R10, and a moderate exceedance of 4 dB for R09 for the day period during enhancing meteorological conditions if two mobile chippers are operated concurrently.

The following management measures were recommended:

- Mobile chipping plant should be restricted to the day period;
- Two mobile chippers should not operate concurrently during enhancing meteorological conditions;
- During periods of strong meteorological enhancement to the south, neither mobile chipper should operate; and
- Conti 1 dryer fan, main fibre transport fan, and booster fan drive should be provided with further noise control (attenuation).

5.1.2 SSD-7016-Mod-1

Acoustic advice for S96(1A) modification to Development Consent SSD 7016 (Mod 1) was provided for each of the proposed modifications, these being:

1. Materials handling building reorientation;
2. Extension to the mouldings warehouse;
3. Extension to the particleboard chipper/debarker building;
4. Northern boundary noise bund extension; and
5. Design changes to the surface water management system.

The site noise model was updated to incorporate the materials handling building reorientation and a minor 1dB increase for night period during noise enhanced meteorological conditions at R09 (see Figure 1) was predicted. The installation of an acoustic barrier (minimum 30mL x 7.8mH) on the eastern side of the building was recommended, as this will provide sufficient attenuation to mitigate the predicted noise increase. Compliance with EPL 3035 noise limits is predicted for all time periods with this barrier included.

For the each of the remaining modifications under Mod 1 it was concluded that there would be no significant acoustic implications to long-term operational noise emissions from the site.

5.1.3 SSD-7016-Mod-2

Acoustic advice for S4.55 modification to Development Consent SSD 7016 (Mod 2) was provided for each of the proposed modifications, these being:

1. Remove requirement for installation of acoustic barrier as recommended in Mod 1 adjacent to the materials handling building and replace with attenuation treatment at the source for key plant items;
2. Changes to the location, orientation and construction materials of selected buildings and items of plant associated with development as approved under SSD 7016 (29 May 2017);
3. As a result of further detailed design (element 2 above), changes to noise emission data; and
4. Installation of an electricity generating gas turbine.

The site noise model was revised and updated to reflect changes proposed under Mod 2. The results showed compliance with EPL 3035 noise limits for all time periods with the exception of a 1dB exceedance at R09 (see Figure 1) during the day period if a mobile chipper is operational. SSD 7016 provides restrictions for the operation of mobile chippers that will prevent this exceedance (see EMS0029 Mobile Wood Chipper Operation Management Plan).

Overall, a reduction in site noise emissions is predicted due to these modifications relative to Mod 1 assessment, with development considered substantially the same as no increase to site noise emissions is expected.

5.1.4 SSD-7016-Mod-3

Acoustic advice for S4.55 modification to Development Consent SSD 7016 (Mod 3) was provided for each of the proposed modifications, these being:

1. Addition of an enclosed awning on the northern end of the northern warehouse extension to optimise loading and unloading activities;
2. Addition of plant items in the materials handling area and a sorting tower to improve the efficiency of material flow in these areas; and
3. Addition of hardstand areas and improved drainage infrastructure. Though these changes will not affect ongoing operational noise emissions from site, construction activities have the potential to cause nuisance. These activities will be conducted and managed in accordance with the site Construction Noise Management Plan.

Modelled predictions were updated by Global Acoustics to reflect the changes proposed under Mod 3 by allocating sound power for equivalent plant items modelled in the original project EIS for the items of equipment under Mod 3. For the northern warehouse extension, door openings (located on the east, north and west sides of the enclosed awning) were modelled as fully open to consider the worst-case scenario. Three forklifts and three prime mover trucks were modelled within the awning enclosure. Conservatively, Global Acoustics assumed all equipment operates concurrently, with trucks operating at 1500rpm, a scenario that is unlikely to occur.

Overall, only a minor 1 dB increase is predicted for select receptors due to the proposed changes under Mod 3. In all cases, the predicted increase is due to rounding, with actual change being less than 1 dB. Global Acoustics concluded that continued compliance with noise limits shown in Table 3 is predicted for all receptors.

5.2 Vibration Assessment

Global Acoustics concluded that for the facilities manufacturing operations, there would be no measurable vibration impact to surrounding residences due to:

- The equipment and processing of material does not involve blasting or generate any vibration of significance; and
- The separation distance from the plant to residences being significantly large enough for any vibrations to be damped out.

Therefore, there will be no further discussion regarding vibration impacts in this Plan.

6 Mitigation & Management Measures

Model predictions indicated reductions of up to 5 dB at receiver locations may result from implementation of noise control. Table 4 describes the general mitigation and management measures that will be implemented at Borg Panels Oberon to assist with meeting noise level criteria.

Section 6.1 specifically details the noise attenuation measures for the gas turbine and Section 6.2 the ancillary equipment associated with the particleboard material handling area as per SSD 7016 condition B19 (c).

Section 6.3 details those changes proposed under Mod 3 for the northern warehouse extension works.

Table 4 Operational Noise Impact Mitigation Measures

Measure	Timing	Responsibility
Administrative Controls		
Provide an induction to site personnel addressing the requirements of this ONMP and their responsibilities with regard to noise management.	Prior to starting work on site	Borg Panels WHS and/or Environment Coordinator
Ensure truck drivers are informed of designated vehicle routes, parking locations, delivery hours, and minimising engine exhaust braking and idling.	Prior to starting work on site	Borg Panels Management

Measure	Timing	Responsibility
Provide education to supervisors, operators and sub-contractors on the need to minimise noise through Toolbox meetings	As needed	Borg Panels WHS and/or Environment Coordinator/Manager
Deliver Training and Assessment Manual <i>EMS0018 Environmental Standard Awareness Noise</i> to site personnel	Prior to starting work on site	Borg Panels WHS and/or Environment Coordinator/Manager, Supervisors
Procedures for handling noise complaints (Section 9) will be implemented including recording, reporting and acting on complaints.	As needed	Borg Panels Environment Coordinator/Manager
Operational Controls		
Select low noise emission plant where possible.	When new plant introduced to site	Borg Panels Management
Ensure all equipment is equipped with reasonable and feasible noise control (e.g. mufflers, acoustic enclosures, flashing lights or 'quackers' as an alternative to traditional reversing beepers) and is turned off when not in use.	Daily	Borg Panels Management
Ensure equipment is operated in the correct manner and adequately maintained - including replacement of engine covers, repair of defective silencing equipment, tightening of rattling components, repair of leakages in air lines and shutting down equipment not in use.	Daily	Borg Panels Management, WHS and/or Environment Coordinator
Where practicable, maintenance work on all plant will be carried out away from noise sensitive receivers.	Daily	Borg Panels Management
Ensure all noise attenuation measures are maintained in good working order.	Daily	Borg Panels Management
Minimise noise impacts during any meteorological conditions when noise criteria do not apply (refer Section 2.4 L4.3).	As needed	Borg Panels Management, Environment Coordinator
Mobile Wood Chipper operation is to be in accordance with EMS0029 Mobile Wood Chipper Operation Management Plan.	Daily	Borg Panels Management, Environment Coordinator
Conti 1 dryer fan, main fibre transport fan, and booster fan drive to be provided with further noise control (attenuation).	Prior to operation of the particleboard line	Borg Panels Operations Manager
Operational Noise Monitoring		
Monitor operational noise levels to verify compliance with the ONMP.	As needed	Environment Coordinator

Measure	Timing	Responsibility
Report any exceedance of limits to DPIE and EPA in accordance with Development Consent SSD 7016 and EPL 3035.	As needed	Environment Manager/Corporate Manager/Operations Manager
Engage a suitable qualified consultant to undertake annual noise monitoring.	Annually	Environmental Manager

6.1 Gas Turbine

The primary noise source for this plant is the turbine unit. All noise generating equipment associated with the turbine, other than the air intake, will be housed within an acoustic enclosure of dimensions 14.7 x 4.79 x 4.65m. This will have a maximum sound pressure level (SPL) of 85 dB (A) at 1m. Noise verification monitoring will be undertaken to demonstrate compliance with noise limits set in EPL 3035.

The air intake will be located on top of the turbine enclosure and will include an acoustic silencer. The exhaust will be ducted back into the main plant, resulting in negligible noise emission during normal operation.

The emergency stack will only be used in emergencies at which time the main plant will not be operating.

The acoustic enclosure and silencer are proprietary items from the turbine supplier and have been specifically designed to maximise noise reduction for this unit.

6.2 Materials Handling Area

Under the approval granted as Mod 1, Borg had proposed to install an acoustic barrier at the Materials Handling area to mitigate against the 1dB exceedance predicted in the noise model due to reorientation of the Materials Handling building. The requirement for this barrier was able to be removed under Mod 2 as further design changes including alterations and additions to existing structures at the facility now affording sufficient acoustic treatment. These changes include:

- Increase to building extents
- Increase to silo height
- Construction of concrete enclosures to plant
- Installation of roller doors to external access areas
- Reduction in number of plant items
- Plant locations revised and relocated where applicable

Noise verification monitoring will be undertaken to demonstrate compliance with noise limits set in EPL 3035.

6.3 Northern Warehouse

Modification 3 includes the installation of additional equipment at the material handling area located at the south western section of the facility. The noise attenuation measures for this component are discussed in Section 2.3 above.

Truck loading and unloading has been identified as a bottleneck for the site. The extension (awning) proposed under Mod 3 to the northern warehouse will allow segregation between these activities, further improving these operations. The enclosed awning will typically allow

these truck activities to occur within the enclosed area. It is expected that this addition to site will reduce noise from the loading/unloading activities by reducing the need to perform these activities outside.

7 Noise Monitoring

7.1 Overview

Noise monitoring is conducted at the nearest sensitive residential receptors in accordance with the *NSW Industrial Noise Policy* (2000), *Noise Policy for Industry* (2017) and *Australian Standard AS1055 Acoustics, Description and Measurement of Environmental Noise*.

Operational noise monitoring will be undertaken to:

- Verify compliance with the noise criteria for the facility as specified in Development Consent SSD 7016 and EPL 3035;
- In response to any exceedance of limits; and
- In response to complaints where this is considered appropriate.

7.2 Baseline Data

During the 2014-15 reporting period, Vipac Engineers and Scientists Ltd (Vipac) undertook an Environmental Noise Survey (Vipac, 30 January 2015) of the facility. The purpose of that survey was to measure and quantify the overall ambient noise levels and noise contribution from industrial operations in accordance with relevant Australian Standards and procedures. The findings of the report included:

- The survey determined the internal noise level monitored at Oberon High School was within the prescribed limit.
- It is apparent from the results of both the attended noise surveys and the unattended noise logging surveys that noise emission from the Borg facility, in addition to the other industrial sites in the area, including the Carter Holt Harvey site and the Australian Pine Products site are notable contributory sources to the ambient noise levels in the area.
- The noise emissions from the industrial sites however are not generally the dominant noise source during the daytime or evening due to the masking effect of other extraneous noise sources in the area. The contribution of industrial noise sources is more influential during the night-time due to the reduction in road traffic noise levels in the area during the night-time.

Global Acoustics prepared a Noise and Vibration Impact Assessment for the proposed expansion of the MDF facility (May 2016). This assessment included both attended noise surveys and unattended noise logging surveys. Attended monitoring results were compliant with EPL3035 criteria. Compliance with the EPL¹ night period operational noise criterion was demonstrated. Day and evening periods were not monitored.

During May to July 2016 Borg Panels undertook an Environmental Noise Survey of the facility as existing to measure and quantify the influence of Borg Panels mobile chippers on the overall ambient noise levels measured at a noise sensitive receptor within the Oberon community. The survey included both attended noise survey and unattended noise logging. The key findings of this report included:

¹ EPL 3035 licence version date: 08-Apr-2016

- The mobile chippers were found to have no discernible impact on the OTC's compliance to the established EPL noise limits; and
- The noise monitoring survey confirmed that the Oberon Industrial Area was compliant to Borg Panels EPL3035 levels ~98% of the time. It is worth noting that this is a conservative assessment of the entire OTC, and not just the Borg premises. The non-compliance outcomes were largely due to:
 - Engine idle noise;
 - Trucks entering and leaving factories;
 - General urban noises; and
 - Non OTC industry noises.

In summary, the facility typically operates with relatively continuous noise emission levels, and low frequency, intermittent and tonal noise characteristics have not been identified during historical monitoring.

7.3 Attended Noise Monitoring

Attended noise monitoring is preferred to the use of noise loggers when determining compliance with prescribed limits as it allows the most accurate determination of the contribution, if any, to measured noise levels by the source of interest.

Operational noise impacts are potentially greatest at night when background levels are typically low and the allowable levels are correspondingly low, and, this is the period when noise propagation enhancement is most likely.

The Environmental Coordinator/Manager for verification purposes can undertake attended noise monitoring. A suitably qualified noise expert will undertake annual attended noise monitoring (see 7.3.1 below).

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring at each location identified in Table 6 once per year during the day, evening and night periods (pending weather and operational constraints) with results compared to noise criteria in Table 3. Compliance monitoring should be conducted during the winter period as this season represents the likely worst-case season due to temperature inversions.

Any exceedance of a noise criterion recorded during annual compliance noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Coordinator/Manager as soon as practicable to advise of the recorded results. If exceedance of limits is demonstrated follow-up monitoring is to be undertaken within one week of the exceedance. The regular monitoring frequency will be resumed if no further exceedances are measured.

Annual compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the facility in isolation (in the absence of all extraneous noise sources). These techniques could include, but are not limited to:

- Pausing the sound level meter during extraneous noise events, for example, when a dog is barking or road traffic noise is clearly audible and affecting the measurements;
- Using frequency filtering techniques where certain frequencies of noise are excluded from the measurements; or
- Using other noise descriptors such as L_{A90} or L_{A50} to filter extraneous noise events.

The facility should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in Section 9.

7.3.2 Complaints Monitoring

In the event of a noise complaint being received, the complaint is to be investigated (refer Section 9.4). As soon as practicable following receipt and validation of the complaint follow-up monitoring is to be undertaken. If exceedance of limits is demonstrated further follow-up monitoring is to be undertaken within one week of the exceedance. The regular monitoring frequency will be resumed if no further exceedances are measured.

7.4 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in Table 6. Refer to Figure 2 for these locations.

Table 5 Noise Monitoring Locations

Location ID	Monitoring Location
NM1	Oberon Caravan Park
NM2	Intersection Pine Street and Herborn Street
NM3	127 Hazelgrove Road
NM4	Intersection Tasman Street and Earl Street

Noise management levels for each monitoring location are provided in Table 3. Where these are exceeded from operational noise sources, the exceedance should be investigated (as discussed in Section 9) to determine the cause and any necessary mitigation.

7.5 Meteorological Conditions

Monitoring should be undertaken on days of light winds (<5 m/s) and no rain. Wind speed is to be monitored using a hand held wind speed monitor or can be sourced from the site meteorological weather station. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions.

Meteorological data is obtained from the Borg Panels weather station (EPA Point 26). This data allows correlation of atmospheric parameters and measured noise levels. Atmospheric condition measurement at ground level is also undertaken during attended monitoring.



Figure 2 Noise Monitoring Locations

8 Contingency Plan for Unpredicted Impacts

In the event of unpredicted noise impacts, resulting from either an exceedance of criteria or valid complaint, the following process will be implemented:

- The Environment Coordinator is to be notified;
- Investigate to evaluate the contributing factors to the event. The investigation may include (where applicable):
 - Assessment of meteorological conditions for the period of monitoring, including wind speed and temperature inversion conditions;
 - Review of operational activities during the period of monitoring;
- Implement remedial response and/or adaptive management measures, dependant on the outcomes of the above investigation;
- Record exceedance/complaint and outcome from investigation in SharePoint; and
- Implement the Review component (Section 10) of this ONMP as required.

9 Reporting

Borg Panels will manage all internal and external reporting requirements in accordance with the Operational Environmental Management Plan (OEMP). Specific reporting functions relevant to this ONMP are detailed below.

9.1 Internal Review

The Environment Coordinator/Manager will review noise monitoring results annually. Results of investigations of any complaints and any exceedances of the criteria outlined in **Table 3** will be reported to senior management promptly.

9.2 Scheduled Reporting

Results of the annual noise compliance monitoring and any complaints investigations are reported externally as follows:

- Annual noise compliance monitoring reports, which include a comparison of measured noise emissions with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035;
- Annual updates of monitoring results on the Borg website;
- Annual Review. A copy of the Annual Review is sent to relevant stakeholders, including DPIE, EPA and Oberon Council and is available on the Borg website; and
- EPA Annual Return, statement of compliance and a monitoring and complaints summary annually as required by EPL 3035.

9.3 Exceedance of Criteria / Environmental Incident Management

Notification procedures and actions upon identification of an exceedance of any impact assessment criteria or management levels will be as per the Operational Environmental Management Plan (OEMP), and any specific requirements of the relevant management plan or monitoring program.

Where an exceedance of the impact assessment criteria and/or performance criteria outlined in Development Consent SSD 7016 and EPL 3035 continually occurs:

- A detailed examination of the existing processes to identify the potential for noise emissions reduction will be undertaken; and
- Where practicable and economically feasible to do so measures may be put in place to further reduce noise emissions.

9.4 Complaints

Community complaints will be managed in accordance with the procedures in the Operational Environmental Management Plan (OEMP).

10 ONMP Review

In accordance with Development Consent SSD 7016 Condition C10, this ONMP will be reviewed and if necessary revised within 3 months of an:

- Approval of a modification;
- Submission of an incident report under Condition C13;
- Approval of an Annual Review under Condition C11; or
- Completion of an audit under Condition C15.

Revisions to the ONMP will be submitted to the Secretary DPIE for approval where necessary.

11 References

Borg Panels (August 2016) *Borg Panels Oberon NSW In-House Noise Monitoring Survey. Survey Period May-July 2016*. Prepared by Borg Panels.

Broner 2010, *A Simple Method for Low Frequency Noise Emission Assessment*, JLFNV Vol 29-1 pp.1 to 14 2010)

DEC 2006, *Assessing Vibration: A Technical Guideline*, Department of Environment and Conservation. Sydney NSW.

DECCW 2011, *NSW Road Noise Policy*, Department of Environment, Climate Change and Water NSW. Sydney NSW.

Environment Protection Authority (January 2000) *NSW Industrial Noise Policy*. ISBN 0 7313 2715 2, EPA 00/1.

Environment Protection Authority (September 2015) *Draft Industrial Noise Guideline*. ISBN 978 1 74359 940 2, EPA 2015/0185.

Environment Protection Authority (October 2017) *Noise Policy for Industry*. ISBN 978 1 76039 481 3. EPA 2016/0524.

Global Acoustics (May 2016) *Borg Panels Timber Panel Processing Facility Oberon NSW – Noise and Vibration Impact Assessment*. Prepared for Borg Manufacturing.

Global Acoustics (January 2018) Borg Panels Oberon, S96(1A) modification to Development Consent SSD 7016

Global Acoustics (March 2019) Borg Panels Oberon, S96(1A) modification to Development Consent SSD 7016

Global Acoustics (March 2020) Borg Panels Oberon, Modification 3 to Development Consent SSD 7016

Vipac, 30 January 2015 *Borg Oberon Environmental Noise Survey*. Prepared for Borg Manufacturing. Vipac Engineers and Scientists, Toronto NSW.