Annual Review 2021/22

Borg Manufacturing Oberon

124 Lowes Mount Road, Oberon NSW

Borg Manufacturing

1 August 2022

Revision History

Rev No.	Revision Date	Author / Position	Details	Authorised	
				Name / Position	Signature
1	1/08/2022	Andrew Brady Environmental Manager	For submission to DPE	Victor Bendevski Environmental and Regulatory Compliance	

Table of Contents

Annual Review Title Block

Name of operation	Borg Manufacturing
Name of operator	Borg Manufacturing
Development consent / project approval #	SSD 7016
Name of holder of development consent / project approval	Borg Construction
Mining lease #	N/A
Name of holder of mining lease	N/A
Water Access Licence #	80WA715797
Name of holder of water licence	Borg Panels Pty Ltd.
MOP/RMP start date	N/A
MOP/RMP end date	N/A

I, Victor Bendevski, certify that this audit report is a true and accurate record of the compliance status of Borg Manufacturing Oberon for the period 1st May 2021 to 30th April 2022 and that I am authorised to make this statement on behalf of Borg Panels Pty Ltd

Note.

a) *The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.*

b) *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment, $22,000, or both.)*

Name of authorised reporting officer	Victor Bendevski
Title of authorised reporting officer	Environment and Regulatory Compliance
Signature of authorised reporting officer	
Date	1/08/2022

1 Introduction

1.1 Scope

This Annual Review has been prepared for the Borg Manufacturing Oberon site and covers the twelve-month reporting period from 1 May 2021 to 30 April 2022. This Annual Review has been prepared to satisfy condition C11 of Development Consent SSD 7016 issued by the Minister for Planning on 29 May 2017.

The Borg facility is located at 124 Lowes Mount Road, Oberon and consists of a medium density fibreboard (MDF) and particleboard manufacturing plant and a mouldings manufacturing plant..

This Annual Review is submitted to NSW Department of Planning and Environment (DPE), NSW Environment Protection Authority (EPA) and Oberon Council to ensure all interested parties are kept informed of the environmental performance of the Development. The Annual Review is also made available on the Borg website:

BORG - Oberon NSW (borgs.com.au)

Borg Manufacturing generally maintained compliance with necessary approvals and licenses with the exception of EPL 3035 condition L2.5 and O2.1 as listed in Table 1. These non-compliance items are discussed in Section 4.4 Surface Water and Section 7.2 Non-Conformances respectively.

Table 1 Compliance

Relevant approval	Condition	Condition description (summary)	Compliance status	Comment	Where addressed in Annual Review
SSD 716	C11	Annual review	Compliant		1.4 Annual Review Requirements
EPL 3035	Section 3 L4.1	Noise	Compliant		
EPL 3035	Section 3 L2.4	Air Quality	Compliant		
EPL 3035	Section 3 L2.5	Water Quality	Non-compliant	Exceedances of EPL 3035 water discharge limits	4.4 Surface Water
WAL28951	N/A	Aquifer extraction	Compliant		
EPL 3035	O2.1	Off-site fugitive fibre discharge	Non-compliant	Plant installed at the premises not maintained in a proper end efficient condition	7.2 Non-Conformances

1.2 Background

In March 2010, Borg acquired the former Carter Holt Harvey MDF and mouldings plant at Oberon. In 2012 Borg further acquired the associated JeldWen factory that adjoins the MDF plant. Borg have integrated the facilities into one site, which they own and operate (see Figure 1).

Figure 1 Regional context

The Borg Panels facility forms part of the wider Oberon Timber Complex, manufacturing a range of MDF products (Custom wood) and particleboard including:

- Standard MDF;
- Moisture Resistant MDF;
- E0 (Low Formaldehyde Emitting) MDF;
- Ultraprime MDF Mouldings;
- Decorative Laminated MDF and Particle Board;
- Treated paper for the lamination of MDF and Particle Board;
- Raw Standard Particleboard for joinery and laminating applications;
- Raw Moisture Resistant Particleboard for joinery and laminating applications; and
- Particleboard flooring products for structural applications.

1.3 Consent

Development Consent SSD 7016 was issued by the Minister for Planning on 29 May 2017 to construct and operate a particleboard facility, and continuation of and alterations and additions to, the existing medium density fibreboard facility.

Condition A26 of SSD 7016 required Borg to modify DA27/95. Borg submitted a Section 96 Modification Application requesting removal of condition A26. This application also included a minor change to the orientation of the material handling building at particleboard, an increase to the warehouse footprint and amendments to the stormwater management system at the northern section of the site. A determination was received from the Department approving this application on 20 November 2018 (SSD 7016 MOD 1 – Site layout changes).

Under Modification of Development Consent SSD 7016 MOD 2 Borg proposed to install a high-pressure natural gas pipeline connection and turbine, and ancillary equipment to produce electricity and utilise waste exhaust heat in the particleboard manufacturing process. The Minister for Planning provided approval for MOD 2 on 29 November 2019.

Activities proposed under Modification 3 include the installation of additional equipment to the materials handling area for better separation and removal of undesirable materials found in the recycled wood that is used in the production of particleboard, and the addition of an enclosed awning to the northern end of the Northern Warehouse for more optimized truck loading/unloading. Works to the site stormwater management system are also occurring under MOD 3. These include reclamation of the overflow effluent pond and reinstatement at another location to allow for further hardstand, and changes to the stormwater conveying swales and ponds to allow construction of the hardstand and also to separate surface water flows between Borg and HPP, including the construction of a new HPP discharge point.

Approval was provided by the Minister of Planning for MOD 3 on 22 May 2020.

An application to modify SSD 7016 (Modification 4) was submitted to the Department of Planning and Environment on 26 October 2021. Activities proposed under MOD 4 include the following:

- reclamation of the remaining portion of the man-made spring fed dam to allow for increase in the size of the hardstand at the north eastern corner of the site to facilitate the relocation of the existing site mechanic's workshop;
- modernisation of the old multidaylight press used for producing medium density fibreboard and changes to its exhaust air emissions;
- addition of an enclosure to the site water treatment biological tanks;
- installation of additional reverse osmosis filtered water production;
- construction of a new bunded chemical storage shed for the water treatment plant;
- construction of an additional lined effluent storage dam for the water treatment plant; and
- construction of a new road within the site to better facilitate traffic flow.

This modification was still under review during this reporting period (i.e. approval had not yet been granted).

A summary of development consents including modifications currently held by Borg Manufacturing is presented in Table 2.

Table 2 Borg Manufacturing Development Consents

Consent Description	Approval Date	Approval Authority	Approved Development
Development Consent SSD 7016	29 May 2017	NSW Minister for Planning	Construction and operation of a particle board facility and continuation of, and alterations and additions to, the existing medium density fibreboard facility.
Development Consent SSD 7016 MOD 1	20 November 2018	NSW Minister for Planning	Site layout changes Surrender of DA27/95
Development Consent SSD 7016 MOD 2	29 November 2019	NSW Minister for Planning	Installation of an electricity generating gas turbine and ancillary equipment
Development Consent SSD 7016 MOD 3	22 May 2020	NSW Minister for Planning	Additional material handling equipment, extension to the Northern Warehouse, changes to the site surface water system and construction of further hardstand.

1.4 Annual Review Requirements

In accordance with condition C11 of Development Consent SSD 7016, annual review requirements and the sections within this review where these are addressed have been summarised in Table 3.

Table 3 Annual Review Requirements

Development Consent SSD 7016 – Condition C11	Section of Annual Review
By 31 July 2017, and each year thereafter, unless otherwise agreed by the Secretary, the Applicant must review and submit a report to the Secretary detailing the environmental performance of the Development to the satisfaction of the Secretary. This review must:	This Report
(a) describe the development that was carried out during the reporting period, and the development that is proposed to be carried out over the next reporting period;	Section 2 Section 8
(b) include a comprehensive review of the monitoring results and complaints records of the Development over the previous reporting period, which includes a comparison of these results against the: i. relevant statutory requirements, limits or performance measures/criteria; ii. requirements of any plan or program required under this consent; iii. the monitoring results of previous years; and iv. the relevant predictions in the EIS;	Section 4 Section 5
(c) identify any non-compliance during the reporting period, and describe what actions were (or are being) taken to ensure compliance;	Section 4 Section 7
(d) identify any trends in the monitoring data over the life of the Development;	Section 4
(e) identify any discrepancies between the predicted and actual impacts of the Development, and analyse the potential cause of any significant discrepancies; and	Section 4
(f) describe what measures will be implemented over the next reporting period to improve the environmental performance of the Development.	Section 8

1.5 Environment Protection Licence

Borg Panels operates in accordance with Environment Protection Licence 3035 (EPL 3035), issued on 14 February 2001 by the NSW Environment Protection Authority (EPA) under Section 55 of the *Protection of the Environment Operations Act 1997*. The current Licence version date is 02 February 2022.

The EPL was varied and updated during this reporting period to include for a second urban wood residue (UWR) trial whereby Borg will take receipt, storage, processing of UWR to be used as an alternative raw material in the production of particleboard. This trial will be conducted over a 12 month period. The trial will incorporate the following elements:

- All UWR received at the premises must be managed in accordance with the Urban Wood Residue Quality Assurance and Control Plan, v2.0 (UWR QA/QC Plan); and

- The sampling and testing must be undertaken in accordance with the sampling method, units of measure and sampling frequency specified in condition M2.2. The sampling must be undertaken when UWR input is at its maximum processing rate of 20% (or 6 tonnes of UWR per hour) to monitor for worst case emissions.

Following the conclusion of the trial a report will be prepared and submitted to the EPA assessing the results of the trial, providing commentary on the effectiveness of the QA/QC Plan, and any deficiencies or problems encounter during the trial and what actions were taken to manage them.

1.6 Water Licences

Borg holds a Water Access Licence for use of groundwater in operations. Current licence details issued under the *Water Management Act 2000* are summarised in Table 4.

Table 4 Water Licences

Approval Details	Approval Number	Validity of Licence	Approval Kind	Extraction Limit
WAL28951	80WA715797	16 January 2012 – 01 March 2026	Water Extraction	28 Units

1.7 Trade Waste Licence

Borg's Trade Waste Service Contract with Oberon Council for the discharge of liquid trade wastes into Council's sewerage system was not applicable this reporting period as there was no renewal of the licence. Borg Panels now treats its liquid trade waste on site.

1.8 Environmental Management Plans

As per Schedule 2 Part C of SSD 7016, construction activities continue to be undertaken in accordance with the Construction Environmental Management Plan (CEMP) and the existing development in accordance with the Operational Environmental Management Plan (OEMP) and associated sub-plans.

In accordance with C10 Revision of Strategies, Plans and Programs, environmental management plans were reviewed, and minor amendments made where necessary. In this review period the following Plans were updated:

- Traffic Management

- Waste Management
- Noise Management
- Mobile Wood Chipper Management
- Erosion and Sediment Management
- Spring Fed Dam Reclamation Management Plan
- Operational Noise Management
- Surface Water Management
- Waste Management
- Operational Air Management
- Urban Wood Residue Management Plan

1.9 Contacts

Table 5 outlines the contact details for site personnel responsible for managing environmental operations the Borg Panels facility.

Table 5 Site Personnel

Name	Title	Contact Details
Richard Witham	Facility Manager	0466 055 094
Victor Bendevski	Environmental and Regulatory Compliance	(02) 4340 9827
Andrew Brady	Environmental Manager	0447 765 913

1.10 Actions Required from Previous Annual Review

The actions listed in Table 6 were identified in the 2020/21 Annual Review for implementation during this 2021/22 reporting period.

Table 6 Proposed Activities in 2020/21 Reporting Period

Activities Proposed in 2020/21 Reporting Period	Results achieved in 2021/22 Reporting Period
Ongoing implementation of Environmental Management Plans for the existing development and the project.	Ongoing implementation of the OEMP, CEMP and sub plans including environmental inspections undertaken at least monthly. Inspections recorded and actions assigned accordingly, and use of DataStation to track progress and close out. CEMP, OEMP and sub plans reviewed and updates performed where: a) changes to site operations (existing and project); and b) in accordance with SSD 7016 C10.
Carry out independent environmental audit (IEA) as per condition C15	IEA was completed by Molino Stewart and submitted to DPIE on 18 October 2021. See Section 6 Independent Audit for details.
Complete verification studies required for SSD 7016 including modifications	Condition B20A, undertake a noise verification study for the gas turbines and ancillary equipment was completed and submitted to DPIE on 15 September. DPIE considered the Study generally satisfied condition B20A.

Complete reporting requirements related to the commissioning of particleboard plant	Aside from the noise verification study under B20A, no reporting requirements were triggered in this reporting period.
Continue with implementation of various management and mitigation measures as detailed in the development consent, including additional items provided in SSD 7016 MOD 1, MOD 2 and MOD 3	As reported in this Annual Review. All additional conditions imposed by modifications have been incorporated into Borg's tracking document OBERON Approvals and Licensing Compliance Register.
Complete commissioning of the gas turbine (MOD 2)	Commissioning completed 28 May 2021. Noise Verification Study (condition B20A) was submitted to DPIE on 15 September 2021.
Complete construction of sorting tower for recycled wood (MOD 3)	Works complete within this reporting period.
Undertake required environmental monitoring associated with the newly installed gas turbine	Verification noise monitoring was undertaken as per condition B20A. Ongoing quarterly and annual noise monitoring also performed during this reporting period captures the operation of this plant.
Undertake rehabilitation works to areas disturbed by construction activities	Stormwater swales impacted by construction activities established good groundcover to assist with managing erosion control and sediment mobilisation which can affect stormwater quality discharge.

2 Operations during the Reporting Period

2.1 Production

Development Consent SSD 7016 allows for production of up to 380,000 m^3 of MDF and 500,000 m^3 of particleboard per calendar year. During this reporting period Borg manufactured 281,577m^3 of MDF and 369,369m^3 of particleboard and had a total intake of 33,281 wet tonnes of UWR.

2.2 Facility Improvements

The following improvements were made to site infrastructure, plant and/or equipment during the reporting period:

- Complete the installation of the roller screen, conveyors and the extra air grader to better separate the recycled wood used in the production of particleboard;
- Completed the construction of the sorting tower and the installation of equipment to identify and remove physical contaminants from the recycled wood used in the production of particleboard;
- Construction of the eastern hardstand area was completed for the storage of surplus equipment/construction storage;
- Upgrades undertaken to reclaimer footings;
- Fit out of new office and meal room areas; and
- Installation of insulation room above the laminating lines.

See Figure 2 for location of site infrastructure.

2.3 Site Activities

The following activities associated with the construction of the particleboard facility and modifications to existing operations occurred during the reporting period:

- Alterations to the site surface water channels at the northern area of the site to facilitate the integration of the new hardstand and provide further separation of Borg and HPP surface water runoff including the creation of a new discharge point (HPP);
- Installation of new headwall and pipe infrastructure for the new HPP discharge point;
- Extensive erosion and sediment control works to the norther and eastern swale system to improve discharge water quality including rectification to eroded sections, installation of rock check dams in areas of high flow and improvements to the inflow path to the first flush basin; and
- Continued to receive recycled wood material under *The Borg Panels Urban Wood Residue order and exemption March 2021* for inclusion in the production of particleboard.

Environmental commitments and management/mitigation measures that were applied during the reporting period include the following:

- operational works undertaken in accordance with the Operational Environmental Management Plan and sub-plans;
- construction works undertaken in accordance with the Construction Environmental Management Plan and sub-plans;
- attended noise verification monitoring;
- air emission verification monitoring;
- water quality sampling events;
- site environmental inspections; and
- site wide communication of environmental requirements via EHSR Alerts and Toolbox Talks.

2.4 Wood Recycling Program

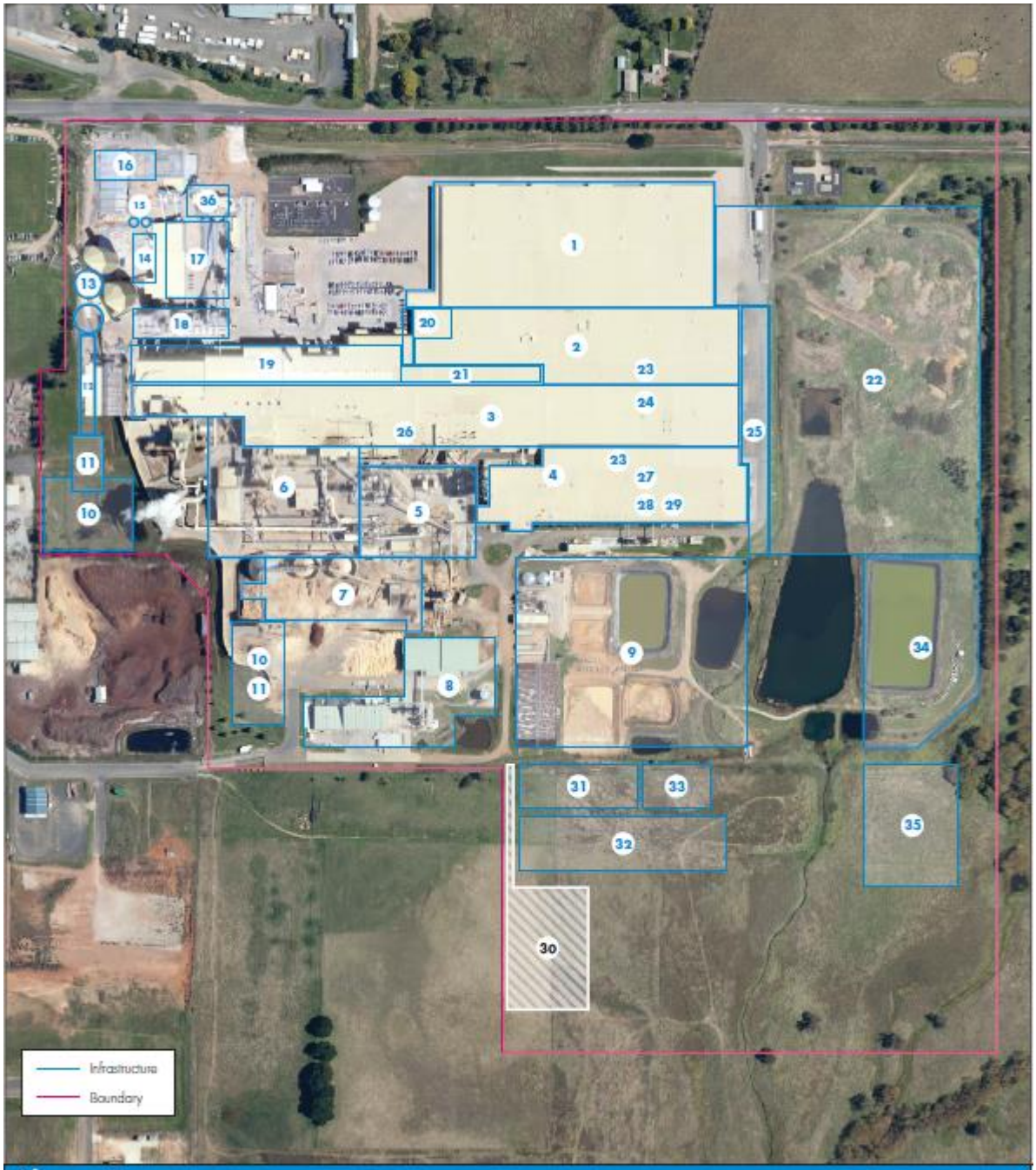
During this reporting period Borg continued to accept recycled wood materials in accordance with *The Borg Panels Urban Wood Residue order and exemption March 2021.* Approximately 33,000t of UWR was received on site for inclusion in the production of particleboard. The recycled material is aggregated at one of two Borg sites located in Sydney where it is inspected prior to delivery to Oberon. When this material arrives at Oberon it is again inspected as it enters the site in trucks, then is spread out on a hardstand for further inspection before being incorporated into the manufacture of particleboard.

Air emission sampling was conducted on the 1st of March 2022 in accordance with EPL 3035 condition M2.2 and included license discharge points 29, 30, 31 and 32 (points associated with air emissions from the recycled wood program) for the following pollutants:

- Total solid particles
- Fine particulate matter (PM10)
- Formaldehyde
- Nitrogen oxides
- Smoke

Results from the stack testing were all within EPL 3035 specified air concentration discharge limits. See section 4.3.3 Air Monitoring of this report for emission monitoring results.

Figure 2 SSD 7016 Approved Development Area



Infrastructure Key

1 Warehouse	13 Silos	25 Building Extension
2 Mouldings Plant	14 Flaking Building	26 Additional Sanding Line
3 Existing Manufacturing Plant	15 Silos	27 Automated Paper Storage
4 Existing Manufacturing Plant	16 Building for Fines and Sawdust Storage	28 Impregnated Paper Treater
5 Heat Plant	17 Dryer Area	29 Impregnated Paper Treater
6 Manufacturing and Processing Plant	18 Screening Area	30 Proposed Hardstand
7 Log Yard	19 New Press Production Hall	31 Effluent Storage
8 Lot 22 DP1017457 – *(not included in submission)*	20 New Administration Area	32 First Flush Basin
9 Water Recycling Plant	21 Automated Particle Board Warehouse	33 Emergencyy Catchment
10 Log Yard	22 Automated Storage Warehouse System	34 Hardstand Include Western Area
11 Enclosed Chipper / Debarker	23 Automated Storage Warehouse System	35 Hardstand Include Eastern Area
12 Conveyor	24 Additional laminating Line	36 Gas Turbine

3 Waste Management

Waste generated at the Borg Manufacturing site is managed in accordance with the Waste Management Plan that has been developed for the facility. The management process incorporates a system of recycling and reuse of waste materials where possible. Waste that cannot be incorporated into this system is removed from site and taken to landfill for lawful disposal.

3.1 Solid Waste

A summary of waste removed from Borg facility during the reporting period is provided in Table 7.

Table 7 Waste Management 2021/22

Month	Description				Destination
	Litres	m^3	Tonnes	Waste	
May 2021		730		General	Oberon Council Waste Depot
			30.82	Waste requiring burial	Bathurst Regional Council
	4500			Oil	Cleanaway/Nationwide Oil
June 2021		580		General	Oberon Council Waste Depot
			2.4	Waste requiring burial	Bathurst Regional Council
	6900			Oil	Cleanaway/Nationwide Oil
July 2021		600		General	Oberon Council Waste Depot
		290	16.34	Waste requiring burial	Bathurst Regional Council
August 2021		750		General	Oberon Council Waste Depot
			30.18	Waste requiring burial	Bathurst Regional Council
September 2021		580		General	Oberon Council Waste Depot
			37.84	Waste requiring burial	Bathurst Regional Council
		180		General	Oberon Council Waste Depot
		10		Ash	Oberon Council Waste Depot
October 2021		650		General	Oberon Council Waste Depot
			24.98	Waste requiring burial	Bathurst Regional Council
		200		Ash	Oberon Council Waste Depot
	6500			Oil	Cleanaway/Nationwide Oil
November 2021			20.5	Waste requiring burial	Bathurst Regional Council
		490		Ash	Oberon Council Waste Depot
	9400			Oil	Cleanaway/Nationwide Oil

December 2021		50		Ash	Oberon Council Waste Depot
		420		General	Oberon Council Waste Depot
			13.1	Waste requiring burial	Bathurst Regional Council
January 2022		400		General	Oberon Council Waste Depot
			12.68	Waste requiring burial	Bathurst Regional Council
February 2022		570		General	Oberon Council Waste Depot
			10.96	Waste requiring burial	Bathurst Regional Council
			0.16	mixed commercial	Bathurst Regional Council
			11.88	sludge bi product	Bathurst Regional Council
March 2022		710		General	Oberon Council Waste Depot
			46.12	Waste requiring burial	Bathurst Regional Council
April 2022		790		General	Oberon Council Waste Depot
			11.36	Waste requiring burial	Bathurst Regional Council
TOTAL			**257.28**	**Waste requiring Burial**	**Bathurst Regional Council**
			11.88	**Sludge bi product**	**Bathurst Regional Council**
			0.16	**Mixed Commercial**	**Bathurst Regional Council**
			750	**Ash**	**Oberon Council Waste Depot**
		6960		**General Waste**	**Oberon Council Waste Depot**
	27300			**Waste Oil**	**Cleanaway/Nationwide oil**

Waste types in Table 7 are further described as:

- General waste including a mix of both putrescible and non-putrescible waste;
- Waste requiring burial made up of urea formaldehyde spade-able resin and paraffin wax bladders;
- Building and demolition waste including concrete, metal and timber are recycled when appropriate; and
- Used oils from the plant process oil systems and mechanical workshop are recycled off site via third parties.

There was no trackable waste generated during this reporting period.

3.2 Trade Waste

Borg's Trade Waste Service Contract with Oberon Council for the discharge of liquid trade wastes into Council's sewerage system was not applicable during this reporting period as there was no renewal of the licence. Borg Panels treats its liquid trade waste on site.

4 Environmental Monitoring and Performance

4.1 Environmental Management System

Borg Manufacturing operates in accordance with the Operational Environmental Management Plan (OEMP) as documented in Section 1.8. This OEMP aims to ensure adequate management, monitoring and mitigation systems are in place to protect the surrounding environment. Similarly, construction activities are undertaken in accordance with the Construction Environmental Management Plan (CEMP).

Environmental monitoring is conducted in accordance with the requirements of SSD 7016, its subsequent modifications (MOD1, MOD2 & MOD3), and EPL 3035. Environmental monitoring is an integral part of Borg's environmental management system. The measurement and evaluation of monitoring results allows for the assessment of performance against quantitative and qualitative standards and assists in the identification of any non-conformances or areas that may require additional attention.

4.2 Meteorological Data

Borg Panels operate and maintain a meteorological monitoring station located east of the existing Spring Dam (EPA Point 26). The following section summarises the meteorological data for the 2021/22 reporting period.

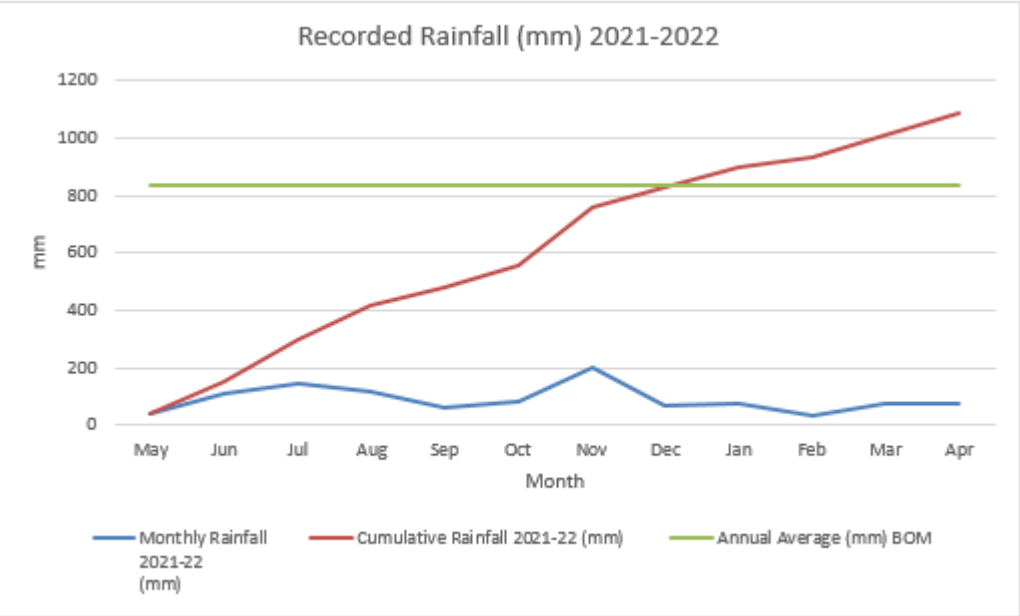
4.2.1 Rainfall

The total monthly rainfall (mm) and number of rain days during this reporting period recorded at EPA Point 26 is shown in Table 8 and displayed in Figure 3 below. Total recorded rainfall for the period was 1,085mm.This is 249.3mm above the annual mean rainfall of 835.7mm for the Oberon region (Bureau of Meteorology, Oberon Springbank Site No. 063063).

Table 8 Recorded Rainfall 2021/22

Total Monthly Rainfall (mm)												
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Total**
39.6	111	148.2	114.6	63.4	79.8	200.4	68.2	73.1	43.4	76.8	74.6	1085
Number of Rain Days (≥0.2mm)												
21	15	13	22	22	20	13	20	21	14	17	21	219

Figure 3 Recorded Rainfall (mm) at Borg Panels Meteorological Station 2021/22



4.2.2 Temperature

Monthly maximum and minimum temperatures recorded from the site weather station during the reporting period are shown in Table 9.

Table 9 Monthly Minimum and Maximum Temperatures 2021/22

Minimum and Maximum Monthly Temperatures (°C)											
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
-5.4	-3.5	-6.4	-3.6	-1.4	-0.3	2.6	4	9.6	5.6	4.7	3.2
19	14	12.9	17.8	18.9	24.4	21.1	27.5	28.7	27.8	25.1	22.1

4.2.3 Wind Speed and Direction

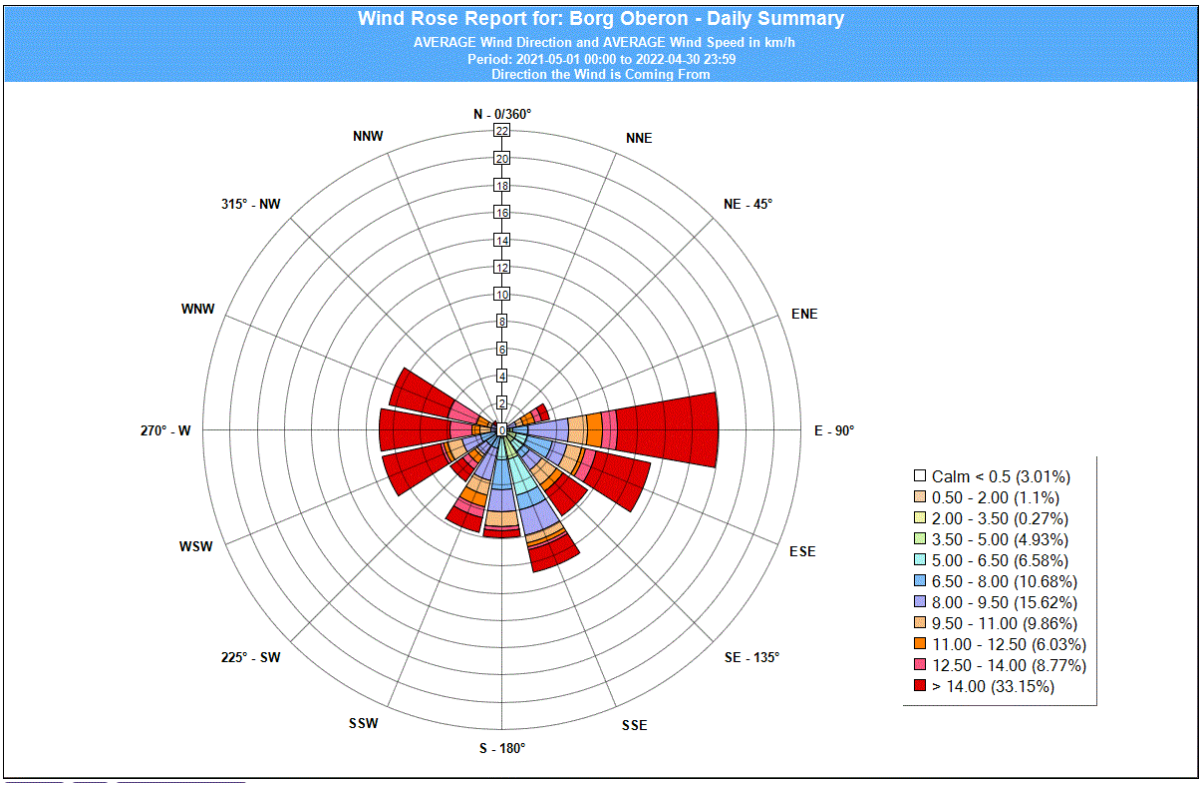
The site weather station recorded wind speed and direction data is summarised in Table 10. The annual wind rose for the reporting period is displayed in Figure 4. As can be seen in Table 10 and Figure 4, the dominant wind direction during this reporting period was from an easterly direction.

Table 10 Monthly Daily Wind Data 2021/22

Month	Maximum Wind Speed (km/hr)	Mean Wind Speed (km/hr)	Dominant Wind Direction
May 2021	58.3	10.1	278° (W)
June 2021	49.4	12.0	273° (W)
July 2021	55.9	14.3	274° (W)
August 2021	43.1	12.5	233° (SW)
September 2021	57.1	12.9	278° (W)
October 2021	51.1	12.8	270° (W)

November 2021	57.1	14.7	93° (E)
December 2021	46.2	10.9	96° (E)
January 2022	56.4	13.4	91° (E)
February 2022	95.1	9.3	95° (E)
March 2022	96.6	8.2	93° (E)
April 2022	45.6	12.5	89° (E)

Figure 4 Daily Summary Average Wind Rose 2021/22



4.3 Air Quality

4.3.1 Dust Depositional Gauges

Dust deposition monitoring is undertaken in accordance with the Borg Panels Operational Air Quality Management Plan (OAQMP). Condition O3 of EPL 3035 states that:

> *The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.*

EPL 3035 does not specify dust deposition monitoring be undertaken, Borg conduct this to assist with site management. The air quality criteria adopted for deposited dust is provided in Table 11.

Table 11 Air Quality Criteria Deposited Dust

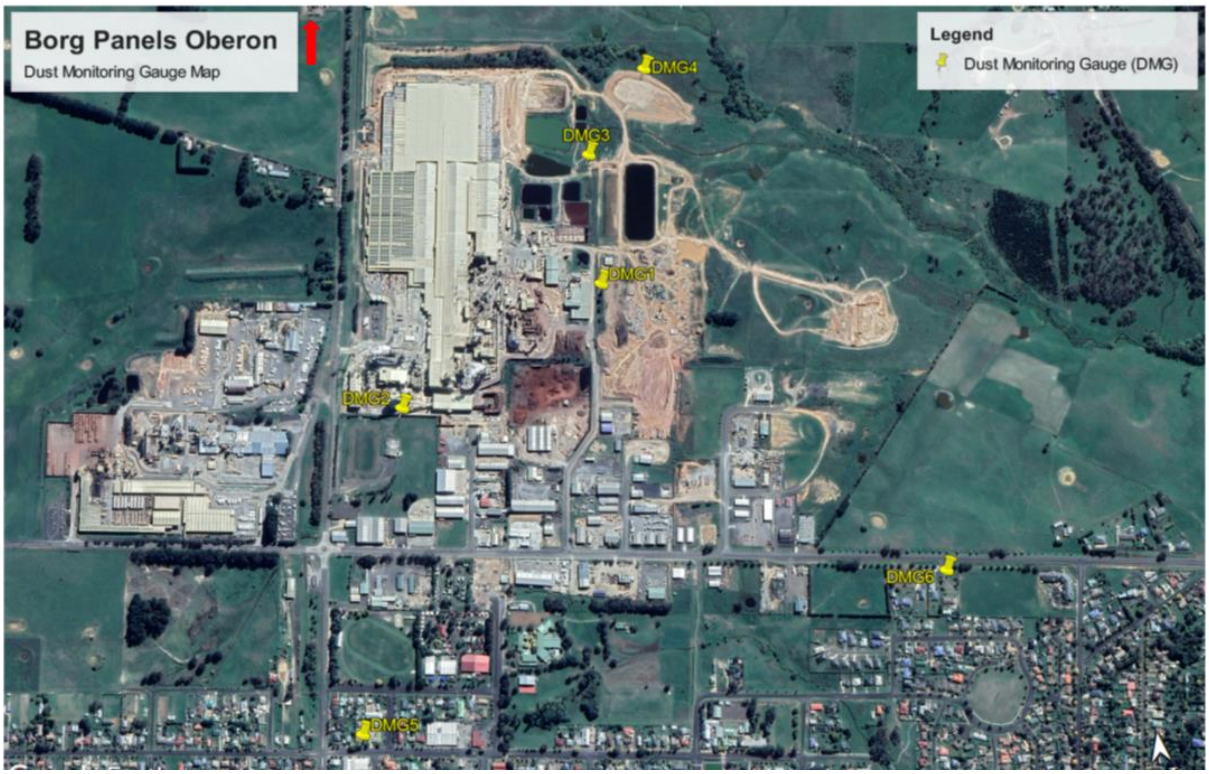
Averaging Period	Impact	Criteria
Annual	Incremental	2 g/m^2/month
	Total	4 g/m^2/month

There are six dust depositional gauges (DMG) located in and around the site. The six gauges were sampled monthly throughout the year from May to April. The locations of dust depositional gauges are listed in Table 12 and shown in Figure 5.

Table 12 Location of Dust Depositional Gauges

Dust Depositional Gauge	Location Description
DMG 1	Borg Panels eastern boundary with Woodchem
DMG 2	Materials handling building
DMG 3	Water treatment plant
DMG 4	Northern boundary
DMG 5	Highlands Motor Inn, South of Borg Panels Plant
DMG 6	Albion Street, East of Borg Panels plant

Figure 5 Depositional Dust Gauge Locations



DMGs 1 to 4 are located on the periphery of the site. DMG 1 is located within the operational boundary of the site immediately adjacent to an unsealed laydown area and in general proximity of an unsealed road. DMG 2 is located adjacent to the materials handling building. DMG 4 is located towards the northern boundary in an area of unsealed compacted surfaces

used for storage of large pieces of machinery and reusable material such as steel. DMG 1, DMG 2 and DMG 4 returned results showing exceedances of the annual average criteria of 4g/m^2. DMG 1 is exposed to regular traffic and day-to-day activities with DMG 2 near the materials handling building which can produce wood dust. and DMG 4 is also exposed to machinery traffic on the unsealed road and adjacent pad. As these are on-site gauges the criteria noted in Table 11 does not apply.

DMG 5 and DMG 6 are located at off-site receivers. There was no exceedance of the dust deposition criteria (4g/m^2) at these locations.

Deposited dust is assessed as insoluble solids as defined by *Standards Australia AS3580.10.1-2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method*. During the reporting period all dust samples were collected by trained specialists and analysed by NATA certified laboratories.

Table 13 Dust Depositional Gauges Annual Average

No.	Location	Annual Average Insoluble Solids (g/m^2/month) 2019/20	Annual Average Insoluble Solids (g/m^2/month) 2020/21	Annual Average Insoluble Solids (g/m^2/month) 2021/22
DMG 1	Borg Panels eastern boundary with Woodchem	7.1	5.0	7.9
DMG 2	Materials handling building	4.6	2.4	5.8
DMG 3	Water treatment plant	2.8	1.3	1.2
DMG 4	Northern boundary	3.9	1.7	1.3
DMG 5	Highlands Motor Inn	2.3	0.6	0.9
DMG 6	Albion Street east of Borg Panels plant	2.4	0.6	0.8

Table 13 shows a reduction in average annual insoluble solids over time across two dust gauge locations (DMG 3 and 4). However, four of the six (DMG 1, 2, 5 and 6) showed a slight increase in average annual insoluble solids over time.

4.3.2 Air Emissions Monitoring Points

The locations of air emission monitoring points are listed in Table 14 and are consistent with monitoring/discharge points noted in EPL 3035 licence version date 02 February 2022 Full laboratory results are attached to this document as Appendix B.

Table 14 Location of Air Emissions Monitoring

EPA Identification No.	Description
4	DC1 Baghouse
5	DC2 Baghouse
7	Conti 2 Stage 1 Dryer Cyclone #1 (west)
8	Conti 2 Stage 1 Dryer Cyclone #2 (east)

EPA Identification No.	Description
9	Conti 1 Dryer Cyclone #1 (south)
10	Conti 1 Dryer Cyclone #2 (north)
11	Conti 2 Heat Plant
12	Press Vents Conti 1
17	Conti 1 Heat Plant
18	Press exhaust vents
19	Dryer stack
20	Reject cyclone DC 11
21	Reject cyclone DC 12
22	Reject cyclone DC 13
27	Combined Conti 2 Press Vent
29	Forming Line Baghouse
30	Form Station Baghouse
31	Particleboard Press Extraction
32	Wet Electrostatic Precipitator (WESP)

EPA Identification Points 18, 19, 20, 21 and 22 are recognised as discharge points in EPL 3035 however there is no requirement to monitor the concentration of pollutants discharged at these points. In any case, this plant is dormant. Similarly, Points 11 and 17 do not produce flow. The exhaust for Conti 2 heat plant (Point 11) is ducted back into Conti 2 dryer cyclones (Points 7&8), and exhaust for Conti 1 heat plant (Point 17) is ducted back into the Conti 1 production system (Points 9&10).

4.3.3 Air Monitoring

Environment Protection Licence 3035 sets pollution concentration limits for emission Points 7, 8, 9 and 10 as shown in Table 15. All plant and equipment must comply with the relevant concentration standards listed in Schedule 2, 3 and 4 of the *Protection of the Environment Operations (Clean Air) Regulation 2010* where pollution limits are not specified in the EPL. Monitoring results are assessed against these criteria to determine compliance with air emission limits.

Table 15 EPL 3035 Air Concentration Limits

Pollutant	ID Point	Units of Measure	100 Percentile Concentration Limit	Reference Condition	Oxygen Correction	Averaging Period
Total Solid Particulates	7,8,9,10	mg/m^3	200	n/a	n/a	n/a
Formaldehyde	7,8,9,10	mg/m^3	5	n/a	n/a	n/a

Source: EPL 3035 (04 September 2019)

Air emission monitoring was undertaken by trained specialists and samples analysed by NATA certified laboratories. Monitoring equipment is maintained by the consultant and calibrated in accordance with the manufacturer's specifications by qualified specialists. This

monitoring is performed in accordance with the methodologies as specified in the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* and the requirements of EPL 3035. USEPA Method GD-008 is the approved method for determining flow rate and sampling for particulate matter in cyclonic flow from licenced discharge Points 7, 8, 9 & 10.

For each discharge point identified in Table 14 above, Borg monitored the concentration of each pollutant as specified in EPL 3035. The results for this period are compared against results from the previous two years as displayed in Tables 16 to 33.

Table 16 Air Emissions Monitoring Results EPA Identification Point 4

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	<2	<2	<2
Formaldehyde	mg/m^3	Yearly	2.4	1.5	11

Table 17 Air Emissions Monitoring Results EPA Identification Point 5

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	<2	<2	<2
Formaldehyde	mg/m^3	Yearly	1.1	2.5	5.6

Table 18 Air Emissions Monitoring Results EPA Identification Point 7

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	45	79	28
Formaldehyde	mg/m^3	Yearly	2	1.6	4.2
Nitrogen oxides	mg/m^3	Yearly	210	140	250
PM10	mg/m^3	Yearly	32	8.9	11
Smoke	Obscuration	Every 6 months	0	0	0

Table 19 Air Emissions Monitoring Results EPA Identification Point 8

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	26	68	25
Formaldehyde	mg/m^3	Yearly	2.8	3	4.6
Nitrogen Oxides	mg/m^3	Yearly	170	210	220
PM10	mg/m^3	Yearly	24	28	10

Smoke Emissions	Obscuration	Every 6 months	0	0	0

Table 20 Air Emissions Monitoring Results EPA Identification Point 9

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m3	Yearly	71	38	12
Formaldehyde	mg/m3	Yearly	1.5	4.8	3.6
Nitrogen Oxides	mg/m3	Yearly	190	260	84
PM10	mg/m3	Yearly	9.1	26	6.8
Smoke Emissions	Obscuration	6 Monthly	0	0	0

Table 21 Air Emissions Monitoring Results EPA Identification Point 10

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	110	41	17
Formaldehyde	mg/m^3	Yearly	2	4.7	3.3
Nitrogen Oxides	mg/m^3	Yearly	200	73	48
PM10	mg/m^3	Yearly	21	27	8.3
Smoke Emissions	Obscuration	6 Monthly	0	0	0

Tables 16 to 19 show an increase in formaldehyde at EPA Points 4,5,7 and 9. Formaldehyde emissions can vary depending on plant operating conditions due to which product is being processed at the time of sampling. No change in total solid particles (TSP) was shown in Tables 16 and 17 with results remaining below the level of reporting when compared to the previous two years data. A reduction in TSP was noted in Tables 18, 19, 20 and 21. A reduction in PM10 was also noted in Tables 19, 20 and 21. Nitrogen oxides decreased in Tables 20 and 21 however increased in Tables 18 and 19 compared to last the previous year's data.

All results shown in Tables 16 to 21 are within EPL 3035 limits as well as the *Protection of the Environment Operations (Clean Air) Regulation 2010.*

Table 22 Air Emissions Monitoring Results EPA Identification Point 12 Vent 1

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Every 3 years	-	3.3	-
Formaldehyde	mg/m^3	Every 3 years	-	5.4	-
Nitrogen Oxides	mg/m^3	Every 3 years	-	<4	-
PM10	mg/m^3	Every 3 years	-	<3	-

Table 23 Air Emissions Monitoring Results EPA Identification Point 12 Vent 2

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Every 3 years	-	7.2	-
Formaldehyde	mg/m^3	Every 3 years	-	6.5	-
Nitrogen Oxides	mg/m^3	Every 3 years	-	<4	-
PM10	mg/m^3	Every 3 years	-	4.8	-

Table 24 Air Emissions Monitoring Results EPA Identification Point 12 Vent 3

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Every 3 years	-	19	-
Formaldehyde	mg/m^3	Every 3 years	-	3.8	-
Nitrogen Oxides	mg/m^3	Every 3 years	-	<4	-
PM10	mg/m^3	Every 3 years	-	13	-

Table 25 Air Emissions Monitoring Results EPA Identification Point 12 Vent 4

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Every 3 years	-	28	-
Formaldehyde	mg/m^3	Every 3 years	-	1.2	-
Nitrogen Oxides	mg/m^3	Every 3 years	-	<4	-
PM10	mg/m^3	Every 3 years	-	20	-

Table 26 Air Emissions Monitoring Results EPA Identification Point 27

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	13	7.6	12
Formaldehyde	mg/m^3	Yearly	1.6	1.9	7.2
Nitrogen Oxides	mg/m^3	Yearly	<3	<4	<4
PM10	mg/m^3	Yearly	9.6	5.2	3.4

Table 26 shows a minor increase in TSP and an increase in formaldehyde at this press vent from the previous year however these results remain within EPL 3035 and *Protection of the Environment Operations (Clean Air) Regulation 2010* limits. The increase in formaldehyde may be as a result of a trial change in the resin recipe.

Table 27 Air Emissions Monitoring Results EPA Identification Point 29

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	<2	<2	<2
Formaldehyde	mg/m^3	Yearly	0.8	1.7	4.9
Nitrogen Oxides	mg/m^3	Yearly	<3	<4	<4
PM10	mg/m^3	Yearly	<2	<2	<2
Smoke Emissions	Obscuration	Yearly	0	0	0

Table 28 Air Emissions Monitoring Results EPA Identification Point 30

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	1.8	<2	<2
Formaldehyde	mg/m^3	Yearly	0.87	1.5	1.3
Nitrogen Oxides	mg/m^3	Yearly	<3	<4	<4
PM10	mg/m^3	Yearly	<3	<4	<3
Smoke Emissions	Obscuration	Yearly	0	0	0

Table 29 Air Emissions Monitoring Results EPA Identification Point 31

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	27	46	30
Formaldehyde	mg/m^3	Yearly	0.57	4.6	1.5
Nitrogen Oxides	mg/m^3	Yearly	<3	<4	<4
PM10	mg/m^3	Yearly	25	40	20
Smoke	Obscuration	Yearly	0	0	0

Table 30 Air Emissions Monitoring Results EPA Identification Point 32

Pollutant	Units	Frequency	2019/20	2020/21	2021/22
Total Solid Particles	mg/m^3	Yearly	3.6	30	39
Formaldehyde	mg/m^3	Yearly	0.63	0.21	2.3
Nitrogen Oxides	mg/m^3	Yearly	180	210	210
PM10	mg/m^3	Yearly	*	*	*
Smoke Emissions	Obscuration	Yearly	0	0	0

*Fine particulate testing could not be undertaken at this location due to excessively saturated gas stream

Points 29 to 32 have remained fairly consistent with the previous year's results with the exception of formaldehyde. This may be due to trial changes in the resin recipe. Regardless, the results remain within EPL 3035 and Protection of the Environment Operations (Clean Air) Regulation 2010 limits.

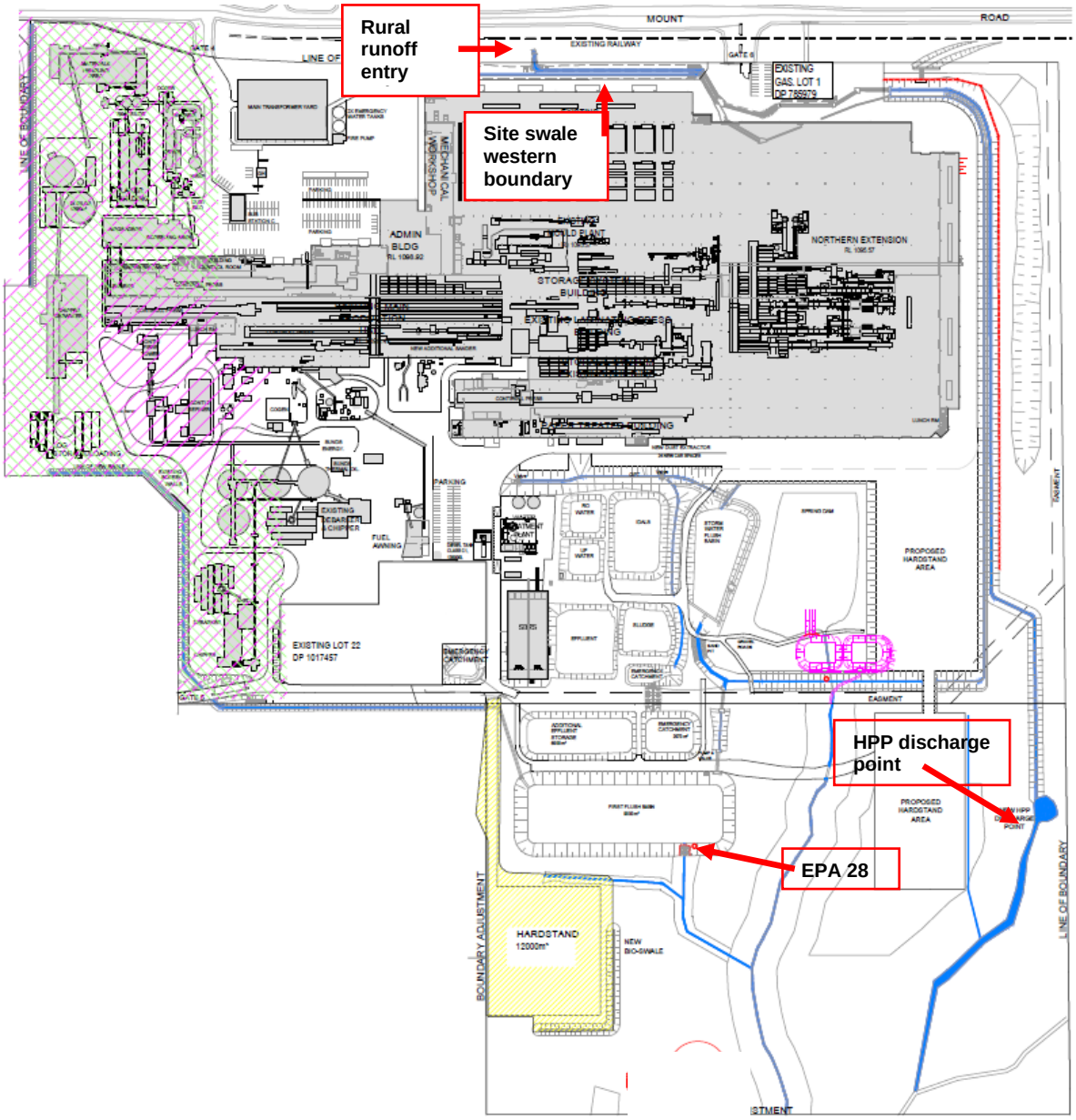
4.4 Surface Water

The existing surface water management system (see Figure 6) includes runoff from Borg Panels site and adjoining properties in the Oberon Timber Complex on the western side of Lowes Mount Road, and operates as follows:

- Runoff from Structaflor and Highland Pine Products Sawmill 2 flows across Lowes Mount Road and directed onto the site via the swale on the western boundary
- Runoff from rural parcels of land on Lowes Mount Road is also directed into the site from the western boundary, conveyed via a ‘clean’ water swale, which runs alongside the site swale following the northern boundary before discharging at HPP discharge point to a tributary of Kings Stockyard Creek
- Borg Manufacturing roof and surface runoff from the western side of the facility is directed into the boundary swale and transferred into the first flush basin
- Runoff from the eastern and open parts of the site, which contains fine fibrous wood material, is directed first to a gross pollutant trap (GPT) and then into the stormwater flush basin

- Any overflow from the existing stormwater flush basin is directed into the first flush basin
- Water captured in the basins is harvested by the site water treatment plant for reuse in the production system
- Stormwater harvesting averaged 123m3/day over the reporting period the largest volume of water harvested in one day was 657m^3
- Runoff from construction areas is managed in accordance with Erosion Sediment Control Plans as part of the CEMP for SSD7016. Surface water from these zones is directed into the site swale then on to the stormwater basin
- Water discharges from EPL discharge Points 1 and 28, and HPP discharge point to a tributary of Kings Stockyard Creek (shown on Figure 6)

Figure 6 Surface water management system - SSD 7016



In accordance with EPL 3035, water quality monitoring is undertaken weekly during discharge to manage discharge compliance requirements. During this reporting period water discharge was from EPA Point 1 and Point 28, and the HPP discharge point.

The HPP discharge point was enabled due to earthworks and powerline realignment. At the time of writing this report, the HPP discharge point was not a EPL discharge point though it was managed in accordance with EPL 3035 requirements. Discussion with the EPA has commenced regarding the HPP discharge point and licensing requirements.

The concentration limit of a pollutant discharged from EPA Point 1 & 28 (and HPP discharge point) in EPL 3035 is shown below in Table 31.

Table 31 EPA Identification Point 1- Water pollution limits

Pollutant	Units of Measure	50 percentile concentration limit	100 percentile concentration limit
Aldrin	µg/L		0.3
Biochemical Oxygen Demand (BOD)	mg/L		20
Colour	Hazen	80	160
Dieldrin	µg/L		0.3
Methylene Blue Active Substances (MBAS)	mg/L		0.5
Nitrogen (Total)	mg/L		10
Oil and Grease	mg/L		10
pH	pH		6.5-8.5
Phosphorus (Total)	mg/L		0.3
Total Suspended Solids	mg/L		50

Stormwater samples are collected by trained Borg personnel and are analysed by NATA certified laboratories. Full results for the 2021/22 reporting period are provided in Appendix C Surface Water Monitoring Data. Table 32 provides a summary of Borg Panels annual average water monitoring results for discharge from EPA Point 1 and Table 33 for EPA Point 28 during the reporting period and for the previous two years for Point 1 only and previous year for Point 28. This shows that for the 2021/22 reporting period, the annual average for all pollutants were generally below the concentration limit set in EPL 3035.

Table 32 Annual Average Water Quality Monitoring Results EPA Point 1

Pollutant	Units of Measure	2018/19	2019/20	2021/22
Aldrin	µg/L	0	0	0
Biochemical Oxygen Demand	mg/L	15.1	8.2	6
Colour	Hazen	120.1	39.2	18
Dieldrin	µg/L	0	0	0
Methylene Blue Active Substances	mg/L	0.3	0.1	0.2
Nitrogen (Total)	mg/L	6.3	3.7	2.3

Oil and Grease	mg/L	7.5	5.1	<5
pH	pH	7.6	7.6	7.38
Phosphorus (Total)	mg/L	0.1	0.1	0.23
Total Suspended Solids	mg/L	31.3	28.9	290

Table 33 Annual Average Water Quality Monitoring Results EPA Point 28

Pollutant	Units of Measure	2020/21	2021/22
Aldrin	µg/L	0	0
Biochemical Oxygen Demand	mg/L	7.7	5.3
Colour	Hazen	68.5	31.1
Dieldrin	µg/L	0	0
Methylene Blue Active Substances	mg/L	0.11	0.2
Nitrogen (Total)	mg/L	8.42	5.7
Oil and Grease	mg/L	5.8	<5
pH	pH	7.72	7.4
Phosphorus (Total)	mg/L	0.09	0.1
Total Suspended Solids	mg/L	23.5	63

One sample (sample event) was collected and analysed at Point 1 and 22 samples collected and analysed at Point 28 during discharge in the 2021/22 reporting period.

One event at Point 1 and four events at Point 28 returned results where water pollution limits noted in Table 31 were exceeded. The EPA and DPIE were notified of all exceedances (see Appendix H Water Quality Exceedances Notification). Appendix C displays the exceedance information for each event including sample date, pollutant and result.

The exceedances experienced during this period were investigated in an attempt to determine potential pollutant sources that may have contributed to the exceedance. This included upstream inspections (Structaflor and Highland Pine Products stormwater infrastructure), assessment of site activities and ERSED controls, and review of rainfall data from the site weather station.

As discussed above in section 4.2.1 Rainfall Data, the site meteorological station recorded 1,085mm of rainfall for the reporting period which was 249.3mm above the annual mean rainfall of 835.7mm for the Oberon region. This excess rainfall combined with heavy snowfall and the significant construction activities that occurred during this reporting period likely contributed to a number of the water quality discharge exceedances discussed below.

Table 34 Annual Average Water Quality Monitoring Results HPP Discharge Point

Pollutant	Units of Measure	2021/2022
Aldrin	µg/L	0
Biochemical Oxygen Demand	mg/L	3.7
Colour	Hazen	57.2
Dieldrin	µg/L	0
Methylene Blue Active Substances	mg/L	0.1
Nitrogen (Total)	mg/L	1.2
Oil and Grease	mg/L	0
pH	pH	7.7
Phosphorus (Total)	mg/L	0.06
Total Suspended Solids	mg/L	14.6

The HPP Discharge Point was not a formally recognised EPA licence discharge location during the reporting period however it was treated the same. Weekly water samples were undertaken by the Environmental Manger during discharge and analysed under the same conditions of the site EPL. Thirty one samples (sample event) were collected and analysed at the HPP Discharge Point during discharge in the 2021/22 reporting period. The water that passes through the discharge location consists of stormwater that passes through the Highland Pine Products site and historic Structaflor site which is opposite Borg Manufacturing. The water travels approximately 1.7km through open swales, pipelines, natural water ways and artificially constructed ERSED controls to filter it. This combination of both natural and artificial filtration has resulted in low levels analysed at the discharge point over the reporting period as can be seen in Table 34.

One sample taken on 3 November 2021 returned an oil and grease result of 17 mg/L which exceeds the EPA licence limit of 10mg/L however after requesting additional analysis (Silica Gel Clean-up on TPH and TRH) the results indicated the elevated oil and grease was due to excess broken down organic matter rather than a petroleum based hydrocarbon.

4.4.1 EPL 3035 Identification Point 1

Water quality discharge limit for Total Suspended Solids (TSS) was exceeded on 5th May 2021 with result being 290mg/l. It is possible that this exceedance was due to a section of the batter at the north eastern section of the swale system eroding resulting in deposition of sediment into the swale during the rain event which occurred immediately prior to sampling. The site weather station recorded 9.4mm on the day of the sample event. All other TSS results were below the EPL upper discharge concentration limit for the remainder of this reporting period

4.4.2 EPL 3035 Identification Point 28

At EPL discharge Point 28 there were three occurrences where water quality discharge limit for Total Suspended Solids (TSS) was exceeded. These occurred on 21 and 28 July and 4 August 2021 with results being 688mg/L, 238mg/L and 135mg/L respectively.

In mid-July 2021, the Construction Coordinator had been monitoring the effectiveness of the erosion and sediment (ERSED) controls within the north-eastern swale, as earthworks (including rectification works to the swale batter) were continuing in this area. Rainfall recorded for the seven-day period preceding this sample event totalled 74.2mm. The significant rainfall during this time would have mobilised the dry sediment within the swale system and runoff from off-site sources. It was noted by the sampler that the water at the sampling location appeared to be turbid but there was no mention of heavy sediment flows or highly disturbed water.
There were two rain events prior to sampling. One on 24 July (10.8mm) and another, significant event, on 25 July (19.4mm). In total, there was 48.4mm of rainfall in the week prior to the second exceedance. In addition to these rain events, a snowfall event prior to the sampling event was noted. The snowmelt when combined with the volume of rainfall (and increase the volume of rainfall) would have mobilised sediment within the swale system and contributed to the second exceedance.

In the seven days preceding the third exceedance, there was a total of 33.8mm of rainfall and one recorded snowfall event. It is our view that the additional controls put in place since the first exceedance reduced the severity of the third exceedance.

Since the TSS exceedances on 21 and 28 July, and 4 August, there have been no other TSS exceedances during this reporting period.

On 6 September 2021 a minor exceedance for oil and grease was reported (13mg/l). No unusual site conditions were recorded for this sample event and 25.2mm of rain was recorded the day prior. After requesting additional analysis (Silica Gel Clean-up on TPH and TRH) the results indicated the elevated oil and grease was due to excess broken down organic matter rather than a petroleum based hydrocarbon. No other exceedances were reported for this event.

4.5 Groundwater

In accordance with EPL 3035, Borg monitor four groundwater bores on site. The locations of groundwater monitoring bores are listed in Table 35 and shown on Figure 7.

Table 35 Location of Groundwater Monitoring Bores

EPA Identification No.	Location Description
14	North western boundary of site
15	East of stormwater treatment pond
16	East of Woodchem
24	Adjacent northern swale

Samples were collected by an appropriately qualified third-party specialist and analysed by NATA certified laboratories. This work is carried out in accordance with statutory requirements and relevant standards. Monitoring equipment is maintained in accordance with the manufacturer's specifications by qualified specialists.

Figure 7 Groundwater Monitoring Locations

Tables 36 - 39 present results for EPA Identification Points 14, 15, 16 and 24 during the reporting period and compares them with the previous two years data. There are no concentration limits for groundwater set in EPL 3035. Laboratory analysis report provided by ALS Environmental is attached as Appendix D.

Table 36 Groundwater Monitoring Results EPA Identification Point 14 (GW05)*

Pollutant	Unit of Measure	Frequency	2019/20	2020/21	2021/22
Aldrin	µg/L	Yearly	-	<0.5	<0.5
Ammonia as N	mg/L	Yearly	-	0.02	0.04
Chemical Oxygen Demand	mg/L	Yearly	-	25	<10
Electrical Conductivity	µS/cm	Yearly	-	220	323
Dieldrin	µg/L	Yearly	-	<0.5	<0.5
Formaldehyde	mg/L	Yearly	-	0.2	<0.1
pH	pH Units	Yearly	-	6.8	7.7
Total Dissolved Solids	mg/L	Yearly	-	210	244
Total Organic Carbon	mg/L	Yearly	-	3	<1
Total Petroleum Hydrocarbons	µg/L	Yearly	-	<50	<50
Total Suspended Solids	mg/L	Yearly	-	606	26
Water Height	m	Yearly	-	1.09	2.21

Table 37 Groundwater Monitoring Results EPA Identification Point 15 (GW02)

Pollutant	Unit of Measure	Frequency	2019/20	2020/21	2021/22
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.02	<0.01	5.95
Chemical Oxygen Demand	mg/L	Yearly	<10	26	23
Electrical Conductivity	µS/cm	Yearly	918	1040	1336
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.1	0.1	1.10
pH	pH Units	Yearly	6.6	7.1	6.7
Total Dissolved Solids	mg/L	Yearly	483	690	982
Total Organic Carbon	mg/L	Yearly	4	3	55
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	2230
Total Suspended Solids	mg/L	Yearly	40	45	43
Water Height	m	Yearly	-	0.98	4.28

At EPA Point 14 (Table 36), it was reported in last years review that the monitoring well had only recently installed, and that excess sediment may have been deposited. As expected, there was a significant decrease in TSS in the 2021/22 sampling results.

Results for EPA Point 15 (Table 37) show a significant increase in Ammonia as N, Total dissolved Solids and Total Organic Carbon from the 2020/21 review period. There was also a notable increase of in Total Petroleum Hydrocarbons between the previous three years.

Table 38 Groundwater Monitoring Results EPA Identification Point 16 (GW01)

Pollutant	Unit of Measure	Frequency	2019/20	2020/21	2021/22
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.03	0	0.03
Chemical Oxygen Demand	mg/L	Yearly	11	26	28
Electrical Conductivity	µS/cm	Yearly	228	257	282
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.1	0.3	<0.2
pH	pH Units	Yearly	6.2	6.3	6.9
Total Dissolved Solids	mg/L	Yearly	127	200	168
Total Organic Carbon	mg/L	Yearly	5	6	8
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	52	173	197
Water Height	m	Yearly	0.74	0.86	2.02

Results for this reporting period for Point 16 are generally consistent with the 2020/21 results.

Table 39 Groundwater Monitoring Results EPA Identification Point 24 (GW26)

Pollutant	Unit of Measure	Frequency	2019/20	2020/21	2021/22
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	<0.01	<0.01	1.12
Chemical Oxygen Demand	mg/L	Yearly	<10	182	37
Electrical Conductivity	µS/cm	Yearly	486	421	428
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	<0.1	0.1	0.1
pH	pH Units	Yearly	6.8	7.3	7.2
Total Dissolved Solids	mg/L	Yearly	283	264	397
Total Organic Carbon	mg/L	Yearly	1	148	3
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	6	142	23
Water Height	m	Yearly	1.52	5.89	6.5

Results show significant decreases in this reporting period at Point 24 for COD, TOC and TSS. All other pollutants remain generally consistent with the previous years results with the exception of ammonia.

4.6 Noise

In accordance with EPL 3035 and site management plans, Borg Panels monitor noise emissions from the facility. Noise from the premises must not exceed the limits noted in Table 44. In accordance with Development Consent SSD 7016 all construction activities related to the development must also comply with the limits in Table 40.

Table 40 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: *Day* – The period from 7:00am to 6:00pm on Monday to Saturday, and 8:00am to 6:00pm on Sundays and Public Holidays
Evening – The period from 6:00pm to 10:00pm
Night – The period from 10:00pm to 7:00am on Monday to Saturday, and 10:00pm to 8:00am on Sundays and Public Holidays
L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent the energy-average of noise levels occurring over a measurement period.

These noise limits apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 meters/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 site meteorological station identified as EPA Identification Point 26 is used to determine meteorological conditions. Temperature inversion conditions (stability category) are to be determined by the sigma-thetas method referred to in Fact Sheet D in the *Noise policy for Industry* EPA 2017.

4.6.1 Operational Noise

EPL 3035 stipulates that noise monitoring to determine compliance must be carried out at least once annually during the day, evening and night time hours specified in Table 40. Noise monitoring must be undertaken in accordance with *Australian Standard AS 2659.1 (1998): Guide to use of sound measuring equipment – portable sound level meters*, and the compliance monitoring guidance provided in the NSW *Noise Policy for Industry* (EPA 2017).

During the 2021/22 reporting period, Global Acoustics were engaged to conduct attended noise monitoring and provide an *Annual Noise Monitoring Report* for operational noise generated by Borg Panels facility. The noise monitoring event was conducted at four sensitive receiver locations as shown in Figure 8 and was undertaken on 30 June and 1 July 2021. Table 41 presents results of the attended annual noise monitoring event**.**

Figure 8 Borg Panels noise monitoring locations

Table 41 Attended Noise Monitoring $L_{Aeq\ (15\ minute)}$

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[2, 3]	Borg LAeq 15 min	Exceedance [5,6]
NM1	01/07/2021 10:43	3.2	B	55	No	51	NA
NM2	01/07/2021 10:00	2	C	55	Yes	46	Nil
NM3	30/06/2021 17:17	1.7	E	55	Yes	NM	Nil
NM4	30/06/2021 17:33	1.8	E	55	Yes	<30	Nil
NM1	30/06/2021 20:47	2	E	50	Yes	46	Nil
NM2	30/06/2021 18:17	1.6	E	50	Yes	47	Nil
NM3	30/06/2021 21:45	1.5	F	50	Yes	NM	Nil
NM4	30/06/2021 21:09	1.4	F	50	Yes	<30	Nil
NM1	30/06/2021 22:54	2.3	F	45	No	46	NA
NM2	30/06/2021 23:20	1.9	F	45	Yes	43	Nil
NM3	30/06/2021 22:03	2.7	D	45	Yes	NM	Nil

NM4	30/06/2021 22:29	3.1	D	45	No	35	NA

NA = Not Applicable means atmospheric conditions outside conditions specified in Development.
NM = Not Measurable means some noise from the source of interest was audible at low levels but could not be quantified.
IA = Inaudible means there was no noise from the source of interest audible at the monitoring location.
1. Atmospheric data is sourced from Borg weather station in Oberon;
2. In accordance with EPL and PA, the noise criteria are to apply under all meteorological conditions except the following:
- Wind speeds greater than 3 m/s at 10 metres above ground level; or
- Stability class F temperature inversion conditions, and wind speeds greater than 2 m/s at 10 metres above ground level; or
- Stability class G temperature inversion conditions.
3. Criterion may or may not apply due to rounding of meteorological data values;
4. Estimated or measured LAeq, 15 minute attributed to the Borg;
5. Bold results in red indicate exceedance of criteria (if applicable); and
6. NA in exceedance column means atmospheric conditions outside conditions specified in development consent and so criterion is not applicable

The attended noise monitoring conducted by Global Acoustics recorded no exceedance of limits identified in Table 40. All measurements were undertaken as per the *Noise policy for Industry* EPA 2017. The report prepared by Global Acoustics for the annual noise monitoring event is attached to this document as Appendix E.

4.6.2 Construction Noise

Borg Panels Construction Noise Management Plan (CNMP) includes for an attended monitoring regime of one event per quarter. Quarterly noise monitoring is not a compliance requirement under EPL 3035 however it is included as a commitment in Borg Panels Construction Noise Management Plan and therefore, a requirement of SSD 7016 condition C3.

Attended monitoring locations are shown in Figure 8. If any exceedances are identified, additional mitigation measures are implemented, and follow-up monitoring undertaken within one week of the exceedance to determine the effectiveness of the additional controls. Global Acoustics conducted the construction noise monitoring for this review period. Tables 42 to 45 show monitoring results for quarterly noise monitoring events. All reference notes are included below Table 45.

Table 42 Construction Noise Quarter 2

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3, 4]
NM1	01/072021 10:43	3.2	B	55	No	51	NA
NM2	01/072021 10:00	2.0	C	55	Yes	46	Nil
NM3	30/06/2021 17:17	1.7	E	55	Yes	NM	Nil
NM4	30/06/2021 17:33	1.8	E	55	Yes	<30	Nil

Table 43 Construction Noise Quarter 3

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	16/09/2021 14:21	1.6	A	55	Yes	43	Nil
NM2	16/09/2021 14:45	1.4	S	55	Yes	44	Nil
NM3	16/09/2021 15:11	1.6	B	55	Yes	35	Nil
NM4	16/09/2021 13:54	1.6	A	55	Yes	34	Nil

Table 44 Construction Noise Quarter 4

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	17/11/2021 11:21	3.1	A	55	No	50	NA
NM2	17/11/2021 10:42	2.1	A	55	Yes	44	Nil
NM3	17/11/2021 11:52	2.3	A	55	Yes	33	Nil
NM4	17/11/2021 12:28	2.3	A	55	Yes	42	Nil

Table 45 Construction Noise Quarter 1

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	10/03/2022 09:46	0.4	C	55	Yes	44	Nil
NM2	10/03/2022 09:10	0.0	D	55	Yes	38	Nil
NM3	10/03/2022 10:57	0.0	B	55	Yes	28	Nil
NM4	10/03/2022 10:20	0.0	C	55	Yes	<25	Nil

NA = Not Applicable means atmospheric conditions outside conditions specified in Development Consent and so criterion is not applicable.
NM = Not Measurable means some noise from the source of interest was audible at low levels but could not be quantified.
IA = Inaudible, there was no noise from the source of interest audible at the monitoring location.
1. Noise criteria are to apply under all meteorological conditions except the following:
- Wind speeds greater than 3 m/s at 10 metres above ground level; or
- Stability class F temperature inversion conditions, and wind speeds greater than 2 m/s at 10 metres above ground level; or
- Stability class G temperature inversion conditions.
2. Site-only LAeq, 15minute attributed to Borg, including modifying factors if applicable;
3. Bold results in red indicate exceedance of criteria (if applicable); and
4. NA in exceedance column means atmospheric conditions outside conditions specified and criterion is not applicable.

No exceedances of EPL 3035 noise limits were recorded during these monitoring events. Reports provided by Global Acoustics for each event are attached to this document as Appendix F.

5 Community Relations

5.1 Environmental Complaints

Twelve community complaints were received during the 2021/22 reporting period. Site investigations were conducted by the Environmental Manager which included a review of plant operational data. Discussions were conducted with Area Managers/Supervisors regarding site activities to determine if the facility was operating within approved conditions as specified in SSD 7016 and EPL 3035 at the time of the complaints.

The NSW EPA advised they had received a complaint on 16 May 2021 from Oberon Council regarding loads of waste being received that were not covered. The Mechanics workshop Manager and Grounds Manager discussed at length a suitable solution and for items to be purchased to ensure loads can safely be covered.

An anonymous complaint was received on 13 September 2021 regarding alleged blue dust pollution and glue odours. The complainant reported that *blue dust pollution fallout* was reportedly *noticed on various occasions* at their premises *from 7.30am* prior to the complaint being made. It was also noted that there was a *blanket fallout on all cars and everything outside*. The Environmental Manager investigated potential sources of dust and odour onsite. He also drove to Tarana Crescent where the complaint was made from and investigated any foreign materials on surfaces, none were identified. A second investigation revealed no evidence of any foreign materials or dust in the area and no unusual odours.

One traffic complaint was received on 19 October 2021 regarding a truck using Clover Lane which had only recently been resurfaced by Oberon Council. The resident was concerned that *the truck may damage the new road surface that had been installed*. Environmental Manager investigated and found no evidence of damage to the road or roadside in Clover Lane. Environmental Manager also informed the truck driver, who was dropping off a work colleague to his residence on Clover Lane, that he is not to use Clover Lane and instead, drop the colleague at Lowes Mount Road/Clover Lane intersection.

Nine complaints received during this reporting period were related to noise from two different residents and locations. One complainant made constant reference to the *sound of banging/crashing* and *drums being thrown into a pit*. Site investigation undertaken by the Environmental Manager found that the source of the noise was the unloading of logs by the Sennebogen into the debarker conveyor. Noise monitoring was undertaken at the address from which the complaints were made from for a two week period, no evidence of noise breaches were identified at any time (day, evening and night period). External noise monitoring was also completed by Global Acoustics within the reporting period with no evidence of breaches identified. The remaining complaint was investigated and found no evidence of noise breaches from the property. No further action was required, no further complaint was made.

For each complaint received, Borg provided a response to the complainant in a timely manner. With respect to noise complaints, regardless of our demonstration of compliance with noise limits via compliance noise monitoring events, Borg will continue to undertake ad hoc attended and unattended noise monitoring where necessary to ensure nil noise nuisance to local residents from site activities.

A complete summary of complaints received during the reporting period is provided in Appendix G.

5.2 Community Liaison

5.2.1 Community Consultative Committee (CCC)

Borg Manufacturing has an established joint Community Consultative Committee (CCC) that meets nominally quarterly to discuss environmental and operational aspects of the facility, and the greater Oberon Timber Complex (OTC). The CCC meetings provide a forum to discuss and address general construction and operational impacts, and mitigation measures for the Borg Panels facility. The CCC meetings also allow for feedback from the local community to Borg Panels and the OTC in relation to environmental performance.

All meetings planned during the reporting period were cancelled due to the coronavirus pandemic. The next meeting is proposed for 27th July 2022 and then on the last Wednesday of every quarter. These will be reported in the future Annual Reviews.

5.2.3 Opportunities for Information Exchange

Borg established the following avenues to record inquiries and complaints related to construction and operational activities:

- A 24-hour free call community liaison line (1800 802 795)
- Postal address for written complaints (Borg Panels, Private Mail Bag 1, Oberon NSW 2787)
- Email address for electronic complaints (oberon_site@borgs.com.au)

The telephone number, postal and email address are displayed on a sign at the entrance to Borg Panels in a position that is clearly visible to the public. This information is also distributed to the local community and is included in public information communications which may include Borg Panels website, local area advertisements, letterbox notifications and project fact sheets.

6 Independent Audit

Development Consent SSD 7016 condition C15 sets out requirements for independent environmental audits of the Development. Borg commissioned environmental consultants Molino Stewart to conduct an Independent Environmental Audit (IEA) of the site for operations and construction for audit period 1 July 2018 to 29 May 2021 aligning with the anniversary of the SSD 7016 consent approval. Borg submitted a letter to DPIE on 7 April 2021 seeking approval for this audit team for the IEA. DPIE endorsed Molino Stewart on 14 April 2021.

Due to the covid pandemic restricting the site visit component of this audit, it was necessary to seek extensions from DPIE for the submission of the final Report. Approval was granted to extend the submission date and was therefore submitted to DPIE on 18 October 2021.

Molino Stewart concluded that the Development was undertaken generally in accordance with SSD 7016, the EIS and RTS, development layout plans and drawings, management and mitigation measures, and documents and drawings of the Existing Development.

The audit considered a total of 161 conditions from the Project Approval and the EPL, of which there were 238 separately assessable sub-conditions (items). In general, the redevelopment works were found to be compliant with the approval consent requirements. There were 23 non-compliances (items) with 13 associated corrective actions raised.

The IEA Report was submitted to DPIE on 18 October 2021.

In accordance with SSD 7016 condition C15 the next IEA is scheduled for 2023.

7 Environmental Incidents & Non-compliances

Environmental incidents are managed through the Borg Panels Pollution Incident Response Management Plan (PIRMP) and are logged in DataStation, Borg's incident management system. Each incident report details the issue, the corrective and preventative actions taken, and the responsibilities and timing for completion of the actions. The report also includes any additional comments relevant to the incident and the completion date of corrective actions.

7.1 Incidents

A pollution incident that requires notification is defined in section 147 of the Protection of the Environment Operations Act 1997 as:

(a) Harm to the environment is material if:
   i. It involves actual of potential harm to the health or safety of human beings or the ecosystems that is not trivial, or
   ii. If results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations),
   and

(b) Loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

During this reporting period, there were no reportable environmental pollution incidents at the Borg Panels facility.

7.2 Non-conformances

Environmental non-conformances related to surface water have been discussed in Section 4.4 of this Review and therefore have not been repeated in this section.

On 20 September 2021 the EPA issued borg with a Show Cause Letter under Section 64 Alleged Failure to Comply with Condition, Breach of Licence Condition, *Protection of the Environment Operations Act 1997* relating to water quality exceedances reported in the 2020/2021 EPA Annual Return. The EPA's review of the Annual Return found the concentration of oil and grease, pH, biological oxygen demand, total nitrogen and total suspended solids reported in the AR exceeded the concentration limits specified in condition L2.5 of the licence (EPL 3035). Borg provided their response to this Letter on 8 October 2021 detailing reasons why the EPA should not take regulatory action in response to the alleged offences. On 22 December 2021 the EPA advised Borg that after considering Borg's response that they would not issue a Penalty Infringement Notice, but instead an Official Caution.

A Show Cause Letter was issued to Borg from the EPA on 28 September 2021 under Section 64 Alleged Failure to Comply with Condition, Breach of Licence Condition, *Protection of the Environment Operations Act 1997* for three alleged offences under condition L2.5 of EPL 3035 occurring on 21 July 2021, 28 July 2021 and 4 August 2021 (incident reports provided to the EPA at the time of each offence being water quality discharge limit exceedance). Each of the three alleged offences were related to water quality discharge concentration limit exceedances for total suspended solids. The EPA invited Borg to provide

a response to the Show Cause Letter. Borg issued the response on 15 October 2021 detailing reasons why the EPA should not take regulatory action. The EPA issued Borg with an Official Caution in regards to this offence on 22 December 2021.

A Show Cause Letter was issued by the EPA on 18 November 2021 alleging failure to comply with licence condition – emission of wood fibre. On 24 September 2021 Borg reported an incident to the EPA's Environment Line. The incident comprised the unintentional release of wood fibre from one of the Conti 1 cyclones to the nearby receiving community. On 8 October 2021 Borg provided the EPA with an incident report in accordance with EPL 3035 condition R3. On 25 October 2021, following a request from the EPA, Borg provided additional information on this incident. The EPA considered that there were reasonable and feasible measures available that could have been taken to eliminate the risk of fibre release. The EPA therefore alleged that there was a failure to comply with licence condition O2.1. The EPA invited Borg to provide any information, facts, or circumstances to the EPA to consider whether to take regulatory action. Borg submitted a response to this Show Cause Letter on 10 December 2021. No response as received from the EPA.

8 Activities Proposed for the next Annual Review Period

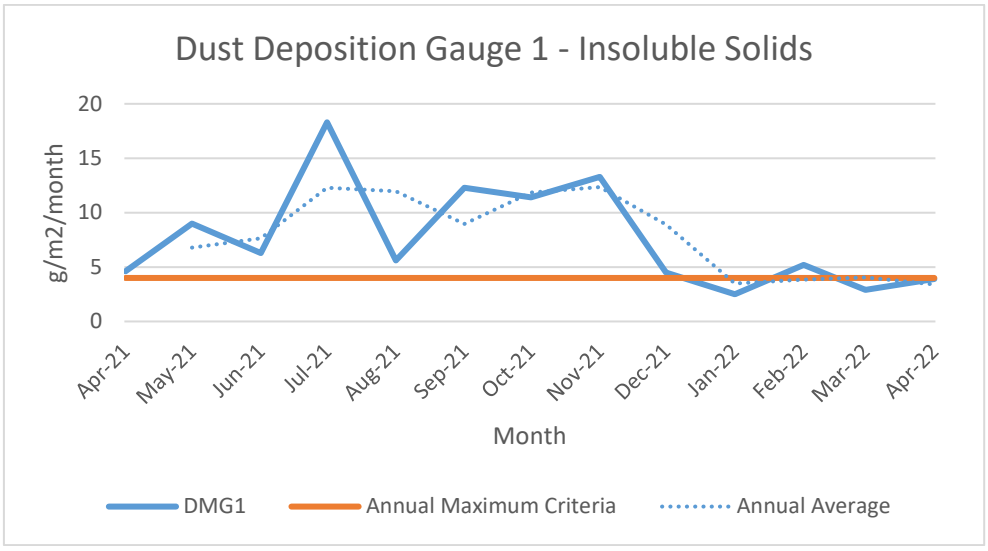
Borg Panels will endeavour to carry out the activities listed in Table 46 during the 2022/23 reporting period to assist with improving the environmental performance of the existing development and the project.

Table 46 Proposed Activities for 2022/23 Reporting Period

Ongoing implementation of Environmental Management Plans for the existing development and the project.
Complete verification studies required for SSD 7016 including modifications
Complete installation of additional material handling equipment
Complete works as approved under Modification 4
Continue erosion and sediment control inspections and rectification works as necessary to manage water quality discharge
Discuss with EPA licensed water discharge points, referencing EPL 3035, to ensure this is fit for purpose
Complete the second Urban Wood Residue trial (recycled wood program) and report back to EPA

APPENDICIES

Appendix A – Depositional Dust Monitoring Data


Dust Deposition Gauge 1 - Insoluble Solids
g/m2/month
20
15
10
5
0
Apr-21
May-21
Jun-21
Jul-21
Aug-21
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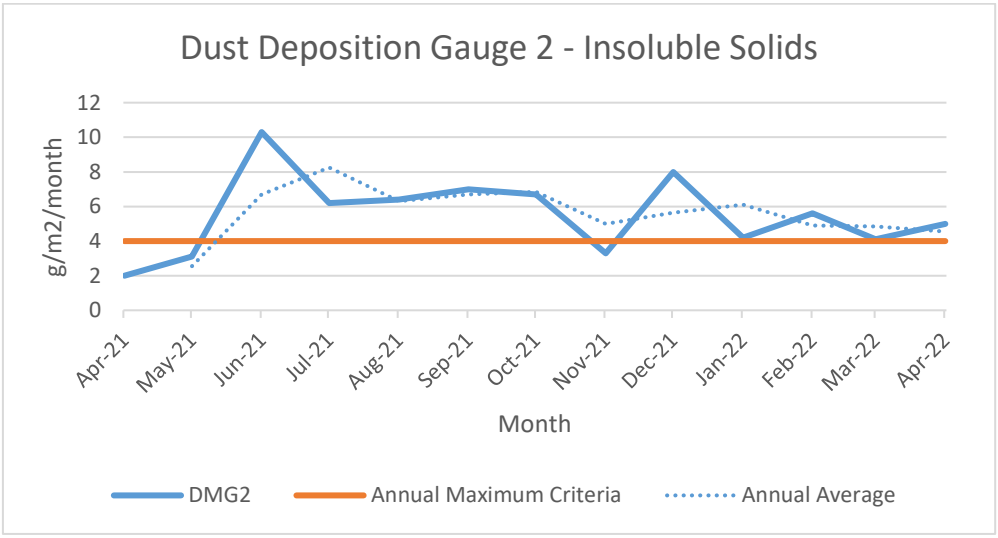
Mar-22
Apr-22
Month
DMG1
Annual Maximum Criteria
Annual Average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g/m2/month
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10
8
6
4
2
0
Apr-21
May-21
Jun-21
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Aug-21
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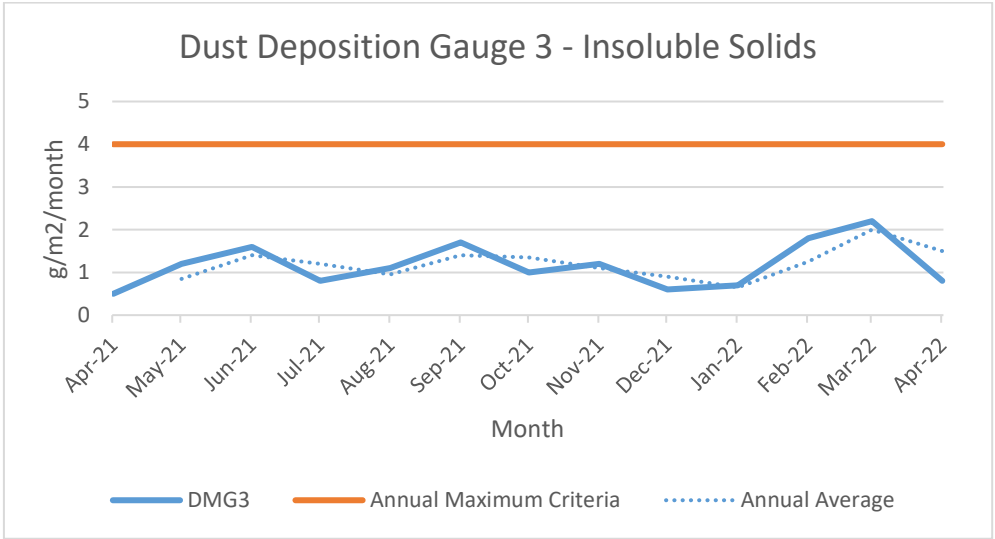
Jan-22
Feb-22
Mar-22
Apr-22
Month
DMG2
Annual Maximum Criteria
Annual Average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g/m2/month
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4
3
2
1
0
Apr-21
May-21
Jun-21
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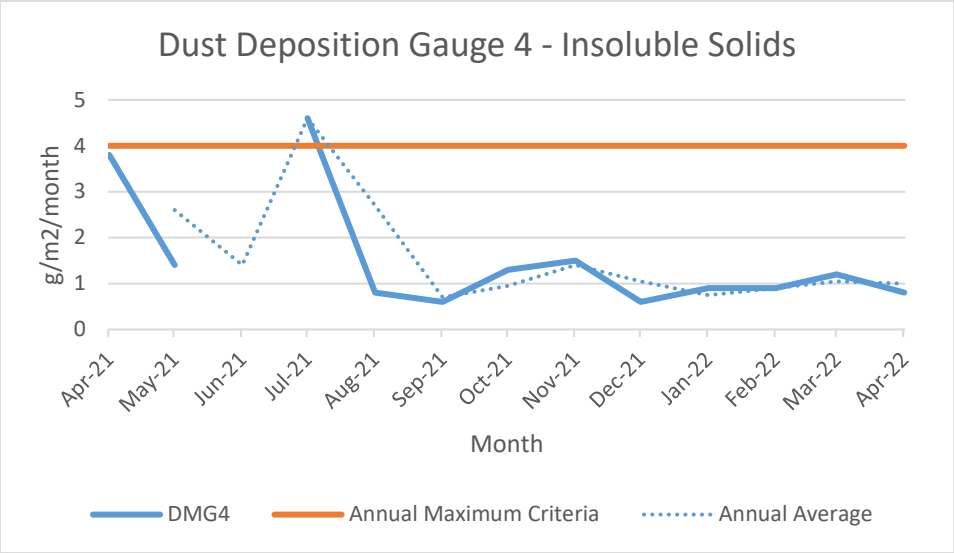
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
Month
DMG3
Annual Maximum Criteria
Annual Average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g/m2/month
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1
2
3
4
5
Apr-21
May-21
Jun-21
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Aug-21
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Jan-22
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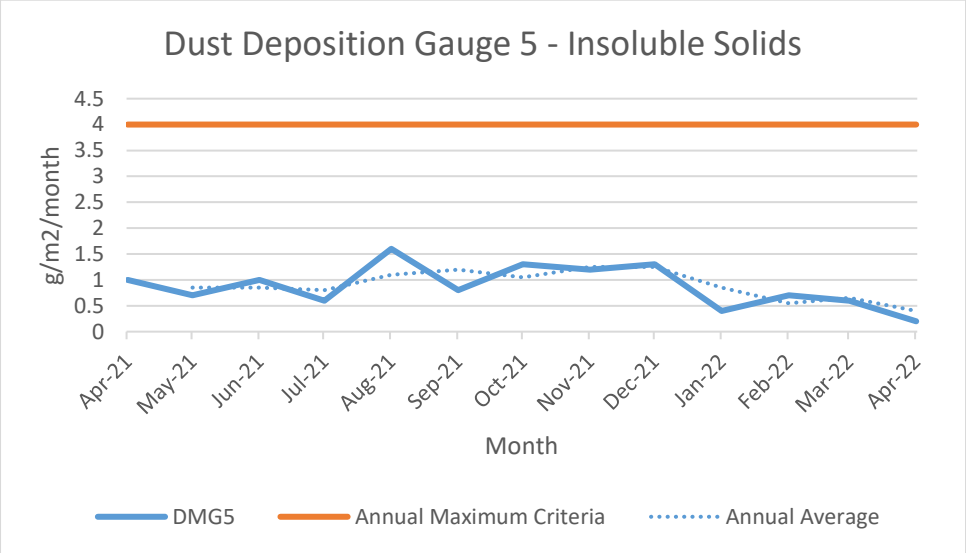
Mar-22
Apr-22
Month
DMG4
Annual Maximum Criteria
Annual Average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g/m2/month
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2.5
3
3.5
4
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May-21
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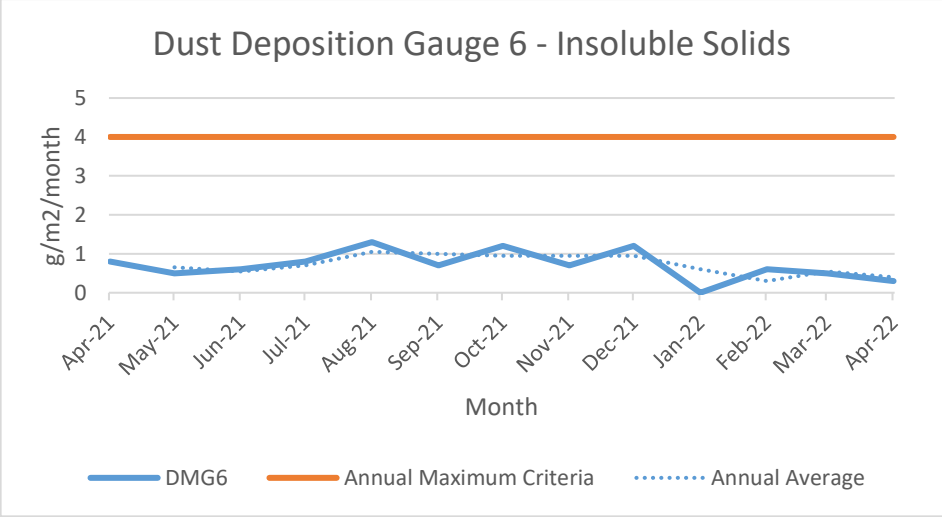
Apr-22
Month
DMG5
Annual Maximum Criteria
Annual Average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g/m2/month
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1
2
3
4
5
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
Month
DMG6
Annual Maximum Criteria
Annual Average

Appendix B – Air Quality Monitoring Report

Ektimo

Borg Manufacturing, Oberon Plant

Annual Emission Testing Report

Report Number R012463-1

Document Information

Template Version 211117

Client Name:	Borg Manufacturing
Report Number:	R012463-1
Date of Issue:	6 July 2022
Attention:	Jacqueline Blomberg
Address:	Lowes Mount Rd Oberon NSW 2787
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Steven Cooper
Senior Air Monitoring Consultant

NATA Accredited Laboratory
No. 14601

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration, and inspection reports.

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation. This does not include comments, conclusions or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.

Table of Contents

1 Executive Summary

1.1 Background

Ektimo was engaged by Borg Manufacturing to perform emission testing at their Oberon plant. Testing was carried out in accordance with Environment Protection Licence 3035.

1.2 Project Objective

The objectives of the project were to conduct a monitoring programme to quantify emissions from nine discharge points to determine compliance with Borg Manufacturing's Environment Protection Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
MDF and Particle Board Plants		
EPA 4 – DC1 Baghouse	3 March 2022	Solid particles (Total) Formaldehyde (CH_2O)
EPA 5 – DC2 Baghouse		
EPA 7 – Conti 2 Stage 1 Dryer Cyclone #1 (West)	10 March 2022	Solid particles (Total) Fine particulate matter (PM_{10}) Formaldehyde (CH_2O) Smoke Nitrogen oxides (as NO_2)
EPA 8 – Conti 2 Stage 1 Dryer Cyclone #2 (East)		
EPA 27 – Conti 2 Press Vent Stack	9 March 2022	
EPA 29 – Forming Line Baghouse	1 March 2022	
EPA 30 – Form Station Baghouse		
EPA 31 – Particle Board Press Extraction System		
EPA 32 – WESP		

* Flow rate, velocity, temperature, and moisture were also determined.

All results are reported on a dry basis at STP.

Plant operating conditions have been noted in the report.

1.3 Licence Comparison

The following licence comparison table shows that all analytes highlighted in green are within the licence limit set by the NSW EPA as per licence 3035 (last amended on 2 February 2022).

EPA No.	Location Description	Pollutant	Units	Licence limit	Detected values
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Total Solid Particles	mg/m^3	200	28
		Formaldehyde	mg/m^3	5	4.2
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Total Solid Particles	mg/m^3	200	25
		Formaldehyde	mg/m^3	5	4.6

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

Refer to the Test Methods table for the measurement uncertainties.

1.4 Result Summary

The following result summary table details results of all analytes for locations tested.

EPA No.	Location Description	Pollutant	Units	Detected Values March 2022
4	DC1 Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	11
5	DC2 Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	5.6
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Solid particles	mg/m^3	28
		Formaldehyde	mg/m^3	4.2
		Nitrogen oxides	mg/m^3	250
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Solid particles	mg/m^3	25
		Formaldehyde	mg/m^3	4.6
		Nitrogen oxides	mg/m^3	220
27	Combined Stack (C2 Press Vents)	Solid particles	mg/m^3	12
		Formaldehyde	mg/m^3	7.2
		Nitrogen oxides	mg/m^3	<4
29	Forming Line Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	4.9
		Nitrogen oxides	mg/m^3	<4
30	Form Station Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	1.3
		Nitrogen oxides	mg/m^3	<4
31	Particle Board Press Extraction System	Solid particles	mg/m^3	30
		Formaldehyde	mg/m^3	1.5
		Nitrogen oxides	mg/m^3	<4
32	WESP	Solid particles	mg/m^3	39
		Formaldehyde	mg/m^3	2.3
		Nitrogen oxides	mg/m^3	210

2 Results

2.1 EPA 4 – DC1 Baghouse

Date	3/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 4 - DC1 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		220218

Sampling Plane Details	
Sampling plane dimensions	1280 x 680 mm
Sampling plane area	0.87 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Elevated work platform 10 m
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	2 8
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal

Comments

The discharge is assumed to be composed of dry air and moisture

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	3.1	
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.98	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0935 & 1050	
Temperature, °C	40	
Temperature, K	313	
Velocity at sampling plane, m/s	9.4	
Volumetric flow rate, actual, m³/s	8.1	
Volumetric flow rate (wet STP), m³/s	6.2	
Volumetric flow rate (dry STP), m³/s	6	
Mass flow rate (wet basis), kg/hour	29000	

Formaldehyde	Results	
Sampling time	0942-1042	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	11	3.9

Isokinetic Results	Results	
Sampling time	0940-1047	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.6
Isokinetic Sampling Parameters		
Sampling time, min	64	
Isokinetic rate, %	97	
Gravimetric analysis date (total particulate)	08-03-2022	

2.2 EPA 5 – DC2 Baghouse

Date	3/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 5 - DC2 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details	
Sampling plane dimensions	2800 x 680 mm
Sampling plane area	1.9 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Elevated work platform 10 m
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	2 14
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal

Comments

The discharge is assumed to be composed of dry air and moisture

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	2.1	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.01	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1115 & 1235	
Temperature, °C	30	
Temperature, K	303	
Velocity at sampling plane, m/s	13	
Volumetric flow rate, actual, m³/s	25	
Volumetric flow rate (wet STP), m³/s	20	
Volumetric flow rate (dry STP), m³/s	19	
Mass flow rate (wet basis), kg/hour	91000	

Aldehydes	Results	
Sampling time	1132-1232	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	5.6	6.4

Isokinetic Results	Results	
Sampling time	1120-1234	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<2
Isokinetic Sampling Parameters		
Sampling time, min	70	
Isokinetic rate, %	101	
Gravimetric analysis date (total particulate)	08-03-2022	

2.3 EPA 7 – Conti 2 Stage 1 Dryer Cyclone #1 (West)

Date	10/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 2 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Fixed ladder 35 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS4323.1 (2021)	Non-conforming

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.

The gas temperature of the sampling plane is below the dew point

The sampling plane is deemed to be non-conforming due to the following reasons:

The gas profile has a cyclonic component which exceeds 15°
The upstream disturbance is <2D from the sampling plane
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D

Stack Parameters		
Moisture content, %v/v	14	
Gas molecular weight, g/g mole	27.7 (wet)	29.3 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.31 (dry)
Gas density at discharge conditions, kg/m³	0.93	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1135 & 1350	
Temperature, °C	48	
Temperature, K	321	
Velocity at sampling plane, m/s	9.9	
Volumetric flow rate, actual, m³/s	48	
Volumetric flow rate (wet STP), m³/s	36	
Volumetric flow rate (dry STP), m³/s	31	
Mass flow rate (wet basis), kg/hour	160000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1155 - 1254		1155 - 1254		1155 - 1254	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	250	470	210	390	280	520

Date	10/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 2 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results	
Sampling time	1145-1245	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.2	7.8

Isokinetic Results	Results	
Sampling time	1140-1345	1140-1345 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	28	52
Fine particulates (PM10)	11	20
D50 cut size, 10µm	9.8	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	102	105
Gravimetric analysis date (total particulate)	24-03-2022	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	24-03-2022	

Smoke Obscuration	Result
Time of assessment	1145-1200
Smoke Obscuration	0

2.4 EPA 8 – Conti 2 Stage 1 Dryer Cyclone #2 (East)

Date	10/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Fixed ladder 35 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS4323.1 (2021)	Non-conforming

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.

The gas temperature of the sampling plane is below the dew point

The sampling plane is deemed to be non-conforming due to the following reasons:

The gas profile has a cyclonic component which exceeds 15°

The upstream disturbance is <2D from the sampling plane

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D

Stack Parameters		
Moisture content, %v/v	14	
Gas molecular weight, g/g mole	27.7 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.93	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0910 & 1125	
Temperature, °C	47	
Temperature, K	320	
Velocity at sampling plane, m/s	10	
Volumetric flow rate, actual, m³/s	50	
Volumetric flow rate (wet STP), m³/s	37	
Volumetric flow rate (dry STP), m³/s	32	
Mass flow rate (wet basis), kg/hour	170000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0925 - 1024		0925 - 1024		0925 - 1024	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	220	430	200	380	250	490

Date	10/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results	
Sampling time	0930-1030	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.6	9

Isokinetic Results	Results	
Sampling time	0915-1120	0915-1120 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	25	49
Fine particulates (PM10)	10	19
D50 cut size, 10µm	10.6	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	97	90
Gravimetric analysis date (total particulate)	24-03-2022	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	24-03-2022	

Smoke Obscuration	Result
Time of assessment	1000 - 1015
Smoke Obscuration	0

2.5 EPA 27 – Combined Conti 2 Press Vent Stack

Date	9/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 27 - Combined Conti 2 Press Vent
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details		
Sampling plane dimensions	2000 mm	
Sampling plane area	3.14 m²	
Sampling port size, number	4" BSP (x2)	
Access & height of ports	Elevated work platform	25 m
Duct orientation & shape	Vertical	Circular
Downstream disturbance	Exit	2.5 D
Upstream disturbance	Junction	4 D
No. traverses & points sampled	2	20
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal	

The sampling plane is deemed to be non-ideal due to the following reasons:
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	2.1	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.03	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1515 & 1710	
Temperature, °C	24	
Temperature, K	297	
Velocity at sampling plane, m/s	10	
Volumetric flow rate, actual, m³/s	32	
Volumetric flow rate (wet STP), m³/s	25	
Volumetric flow rate (dry STP), m³/s	25	
Mass flow rate (wet basis), kg/hour	120000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1525 - 1624		1525 - 1624		1525 - 1624	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	<4	<6	<4	<6	<4	<6

Date	9/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 27 - Combined Conti 2 Press Vent Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results
Sampling time	1535-1635
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	7.2 / 11

Isokinetic Results	Results	
Sampling time	1520-1705	1520-1705 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	12	18
Fine particulates (PM10)	3.4	5.2
D50 cut size, 10µm	9.9	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	100	100
Isokinetic rate, %	104	113
Gravimetric analysis date (total particulate)	24-03-2022	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	24-03-2022	

Smoke Obscuration	Result
Time of assessment	1530 - 1545
Smoke Obscuration	0

2.6 EPA 29 – Forming Line Baghouse

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details		
Sampling plane dimensions	1000 mm	
Sampling plane area	0.785 m²	
Sampling port size, number	4" BSP (x2)	
Access & height of ports	Elevated work platform 10 m	
Duct orientation & shape	Inclined Circular	
Downstream disturbance	Bend 3 D	
Upstream disturbance	Bend 3.5 D	
No. traverses & points sampled	2 16	
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal	

The sampling plane is deemed to be non-ideal due to the following reasons:
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	1.3	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.96	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1540 & 1710	
Temperature, °C	25	
Temperature, K	299	
Velocity at sampling plane, m/s	39	
Volumetric flow rate, actual, m³/s	30	
Volumetric flow rate (wet STP), m³/s	23	
Volumetric flow rate (dry STP), m³/s	23	
Mass flow rate (wet basis), kg/hour	110000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1550 - 1649		1550 - 1649		1550 - 1649	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	<4	<6	<4	<6	<4	<6

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		220218

Formaldehyde	Results
Sampling time	1550-1650
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	4.9 / 6.6

Isokinetic Results	Results
Sampling time	1545-1707 1545-1707 (PM10)
	Concentration mg/m³ / Mass Rate g/min
Solid Particles	<2 / <3
Fine particulates (PM10)	<2 / <3
D50 cut size, 10µm	9.8
Isokinetic Sampling Parameters	Isokinetic / PM10
Sampling time, min	80 / 80
Isokinetic rate, %	103 / 62
Gravimetric analysis date (total particulate)	08-03-2022
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	08-03-2022

Smoke Obscuration	Result
Time of assessment	1600 - 1615
Smoke Obscuration	0

*Isokinetic rate for fine particulate matter (PM_{10}) could not be attained due to the high stack velocity.

2.7 EPA 30 – Form Station Baghouse

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details		
Sampling plane dimensions	545 mm	
Sampling plane area	0.233 m²	
Sampling port size, number	4" BSP (x2)	
Access & height of ports	Elevated work platform 10 m	
Duct orientation & shape	Inclined Circular	
Downstream disturbance	Bend 8 D	
Upstream disturbance	Bend 8 D	
No. traverses & points sampled	2 8	
Sample plane conformance to AS4323.1 (2021)	Ideal sampling plane	

Stack Parameters		
Moisture content, %v/v	0.93	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.97	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1720 & 1835	
Temperature, °C	25	
Temperature, K	298	
Velocity at sampling plane, m/s	29	
Volumetric flow rate, actual, m³/s	6.7	
Volumetric flow rate (wet STP), m³/s	5	
Volumetric flow rate (dry STP), m³/s	5	
Mass flow rate (wet basis), kg/hour	23000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1730 - 1829		1730 - 1829		1730 - 1829	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	<4	<1	<4	<1	<4	<1

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results
Sampling time	1730-1830
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	1.3 / 0.39

Isokinetic Results	Results	
Sampling time	1725-1831	1725-1831 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.5
Fine particulates (PM10)	<3	<0.9
D50 cut size, 10µm	9.8	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	98	84
Gravimetric analysis date (total particulate)	08-03-2022	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	08-03-2022	

Smoke Obscuration	Result
Time of assessment	1600 - 1615
Smoke Obscuration	0

2.8 EPA 31 – Particle Board Press Extraction System

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 31 - Particle Board Press Extraction System
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details		
Sampling plane dimensions	2000 mm	
Sampling plane area	3.14 m²	
Sampling port size, number	4" BSP (x2)	
Access & height of ports	Elevated work platform	30 m
Duct orientation & shape	Vertical	Circular
Downstream disturbance	Exit	2 D
Upstream disturbance	Junction	3 D
No. traverses & points sampled	2	20
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal	

The sampling plane is deemed to be non-ideal due to the following reasons:
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	3.3	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.00	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1255 & 1500	
Temperature, °C	33	
Temperature, K	307	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	35	
Volumetric flow rate (wet STP), m³/s	28	
Volumetric flow rate (dry STP), m³/s	27	
Mass flow rate (wet basis), kg/hour	130000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1315 - 1414		1315 - 1414		1315 - 1414	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	<4	<7	<4	<7	<4	<7

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 31 - Particle Board Press Extraction System
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results	
Sampling time	1320-1420	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.5	2.5

Isokinetic Results	Results	
Sampling time	1315-1457	1315-1457 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	30	48
Fine particulates (PM10)	20	33
D50 cut size, 10µm	10.0	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	100	100
Isokinetic rate, %	100	105
Gravimetric analysis date (total particulate)	08-03-2022	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	08-03-2022	

Smoke Obscuration	Result
Time of assessment	1330 - 1335
Smoke Obscuration	0

2.9 EPA 32 – WESP

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Sampling Plane Details	
Sampling plane dimensions	2520 mm
Sampling plane area	4.99 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Crane 40 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Change in diameter 4 D
No. traverses & points sampled	2 28
Sample plane conformance to AS4323.1 (2021)	Conforming but non-ideal

Comments

The gas temperature of the sampling plane is below the dew point

The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	23	
Gas molecular weight, g/g mole	26.8 (wet)	29.4 (dry)
Gas density at STP, kg/m³	1.20 (wet)	1.31 (dry)
Gas density at discharge conditions, kg/m³	0.85	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0925 & 1155	
Temperature, °C	63	
Temperature, K	336	
Velocity at sampling plane, m/s	15	
Volumetric flow rate, actual, m³/s	77	
Volumetric flow rate (wet STP), m³/s	55	
Volumetric flow rate (dry STP), m³/s	42	
Mass flow rate (wet basis), kg/hour	240000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0945 - 1044		0945 - 1044		0945 - 1044	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	210	520	170	430	240	600

Date	1/03/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R012463	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220218*

Formaldehyde	Results
Sampling time	0940-1040
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	2.3 / 5.7

Isokinetic Results	Results
Sampling time	0930-1152
	Concentration mg/m³ / Mass Rate g/min
Solid Particles	39 / 100
Isokinetic Sampling Parameters	
Sampling time, min	140
Isokinetic rate, %	93
Gravimetric analysis date (total particulate)	08-03-2022

Smoke Obscuration	Result
Time of assessment	0940 - 0955
Smoke Obscuration	0

* Fine particulate matter (PM_{10}) testing could not be undertaken at this location due to excessively saturated gas stream.

3 Plant Operating Conditions

Borg Manufacturing have collated plant operating conditions and will provide them to NSW EPA as required.

See Borg Manufacturing's records for complete process conditions.

4 Test Methods

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling Method	Analysis Method	Uncertainty*	NATA Accredited	
				Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1	NA	NA	✓	NA
Flow rate, temperature and velocity	NSW EPA TM-2	NSW EPA TM-2	8%, 2%, 7%	NA	✓
Moisture content	NSW EPA TM-22	NSW EPA TM-22	8%	✓	✓
Dry gas density	NA	NSW EPA TM-23	not specified	NA	✓
Molecular weight	NA	USEPA Method 3	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24	NSW EPA TM-24	13%	✓	✓
Nitrogen oxides	NSW EPA TM-11	NSW EPA TM-11	12%	✓	✓
Oxygen	NSW EPA TM-25	NSW EPA TM-25	13%	✓	✓
Aldehydes and ketones	Ektimo 332	Ektimo 332	16%	✓	✓†
Particulate matter (PM_{10})	NSW EPA OM-5	NSW EPA OM-5	6%	✓	✓††
Solid particles (total)	NSW EPA TM-15	NSW EPA TM-15	3%	✓	✓††
Blackness of smoke	NA	NSW EPA TM-16	not specified	NA	✓

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† Analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601. Results were reported on
31 March 2022 in report LV-002562
16 March 2022 in report LV-002505
24 March 2022 in report LV-002542
21 March 2022 in report LV-002514

†† Gravimetric analysis conducted at the Ektimo Unanderra, NSW laboratory, NATA accreditation number 14601.

5 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

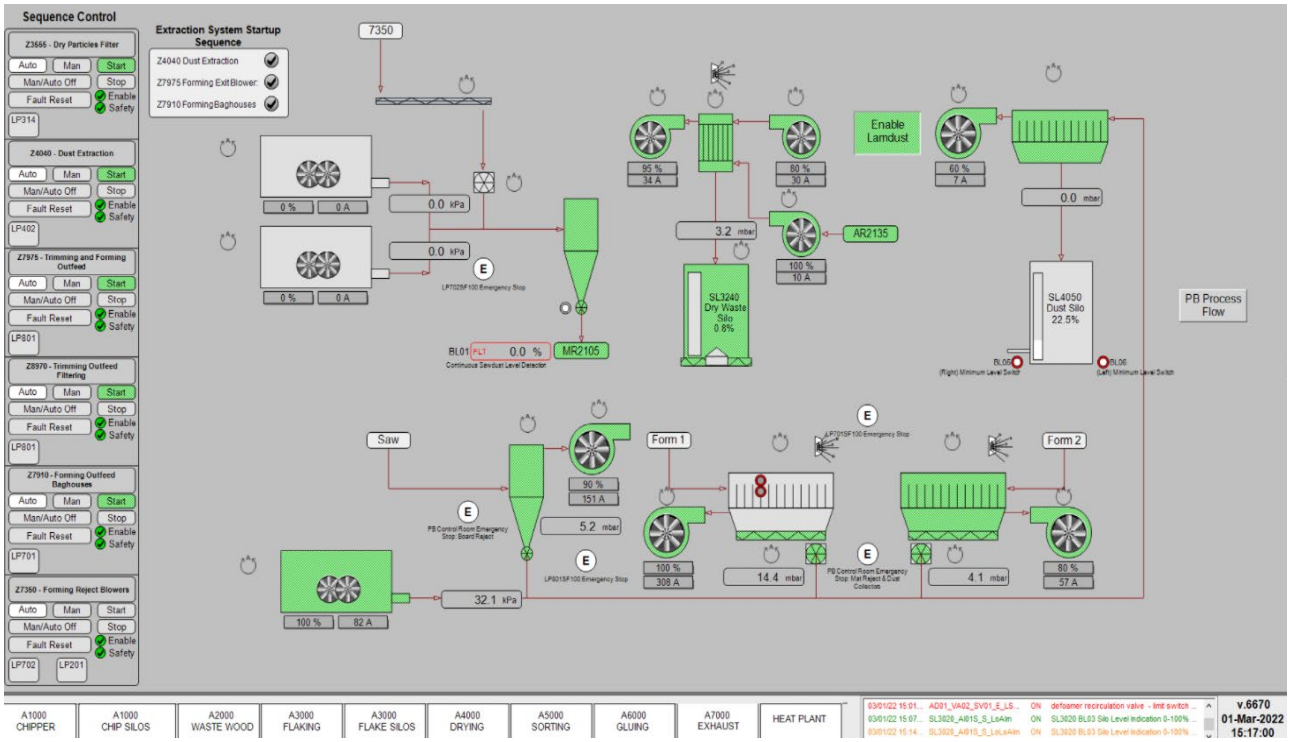
6 Definitions

The following symbols and abbreviations may be used in this test report:

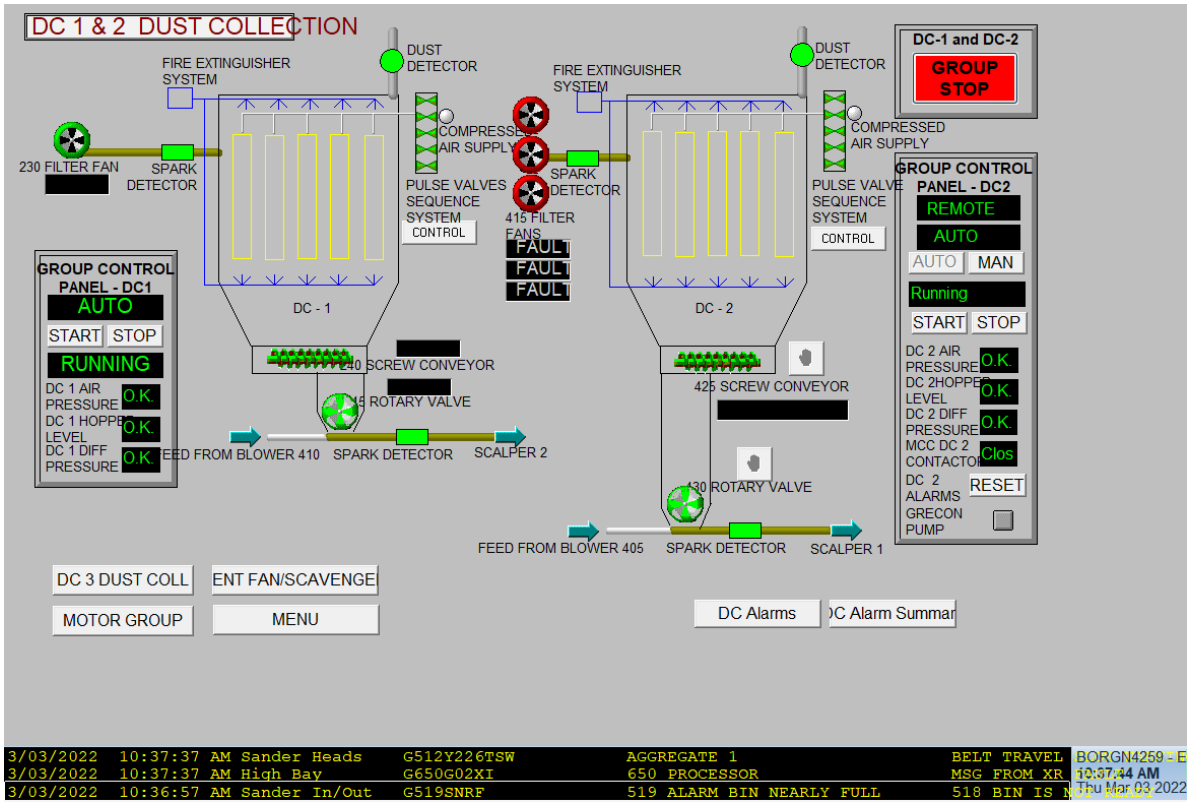
% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
CEM/CEMS	Continuous Emission Monitoring/Continuous Emission Monitoring System
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D_{50}	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D_{50} method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D_{50} of that cyclone and less than the D_{50} of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NT	Not tested or results not required
OM	Other approved method
PM_{10}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
PSA	Particle size analysis. PSA provides a distribution of geometric diameters, for a given sample, determined using laser diffraction.
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those not matching a standard compound), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
TM	Test method
TOC	The sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range.

7 Appendix 1: Operating Conditions

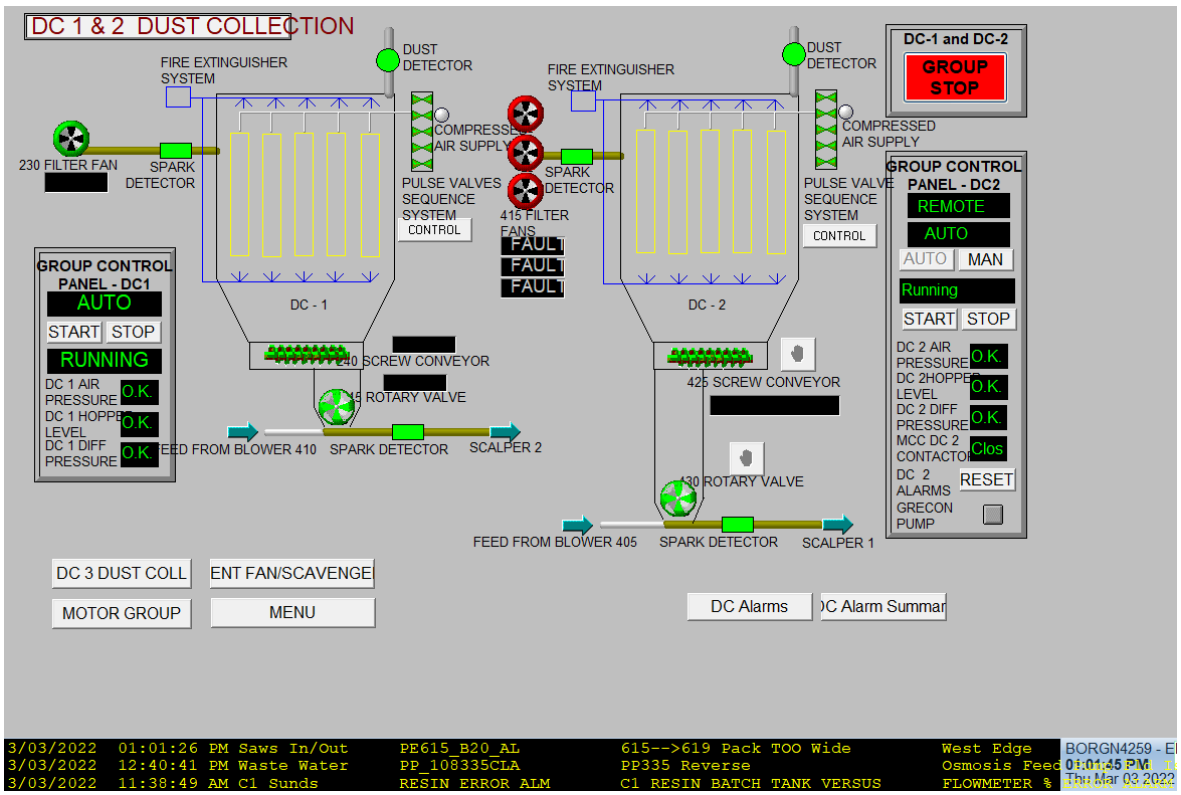
EPA 29 - Forming Line Baghouse (1 March 2022, 15:17)



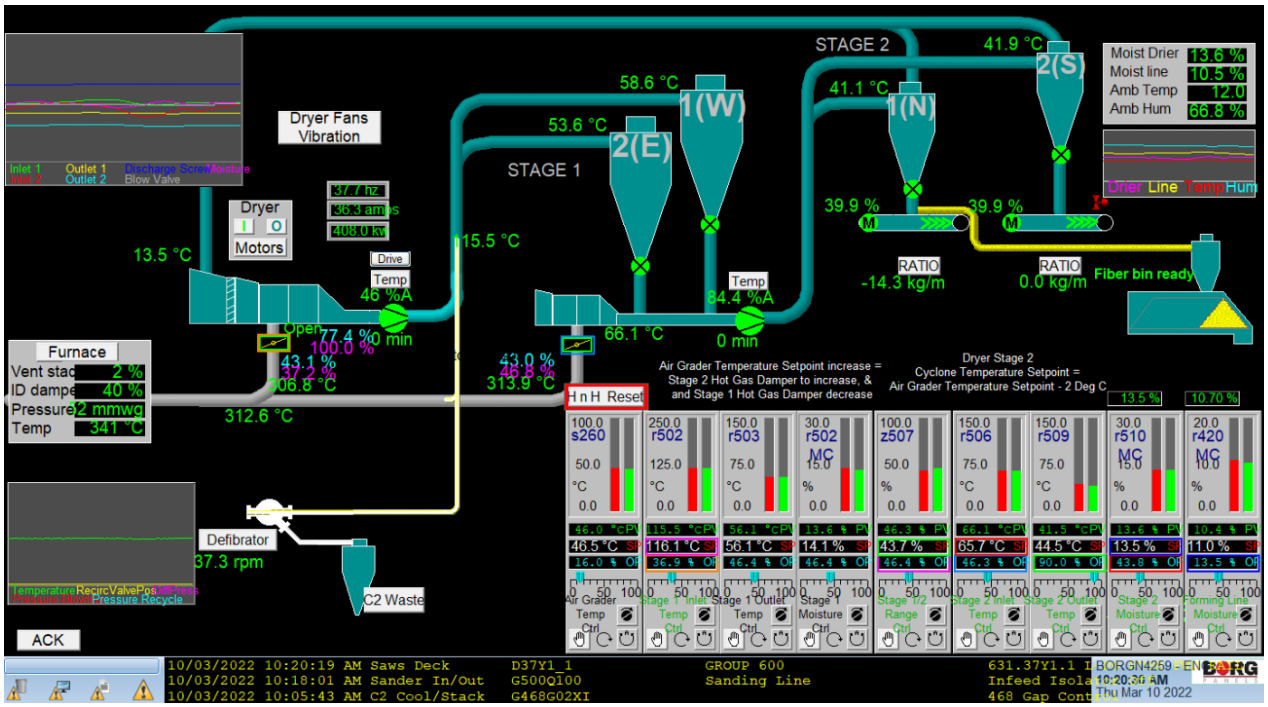
EPA 4 - DC1 Baghouse & EPA 5 - DC2 Baghouse (3 March 2022, 10:37)



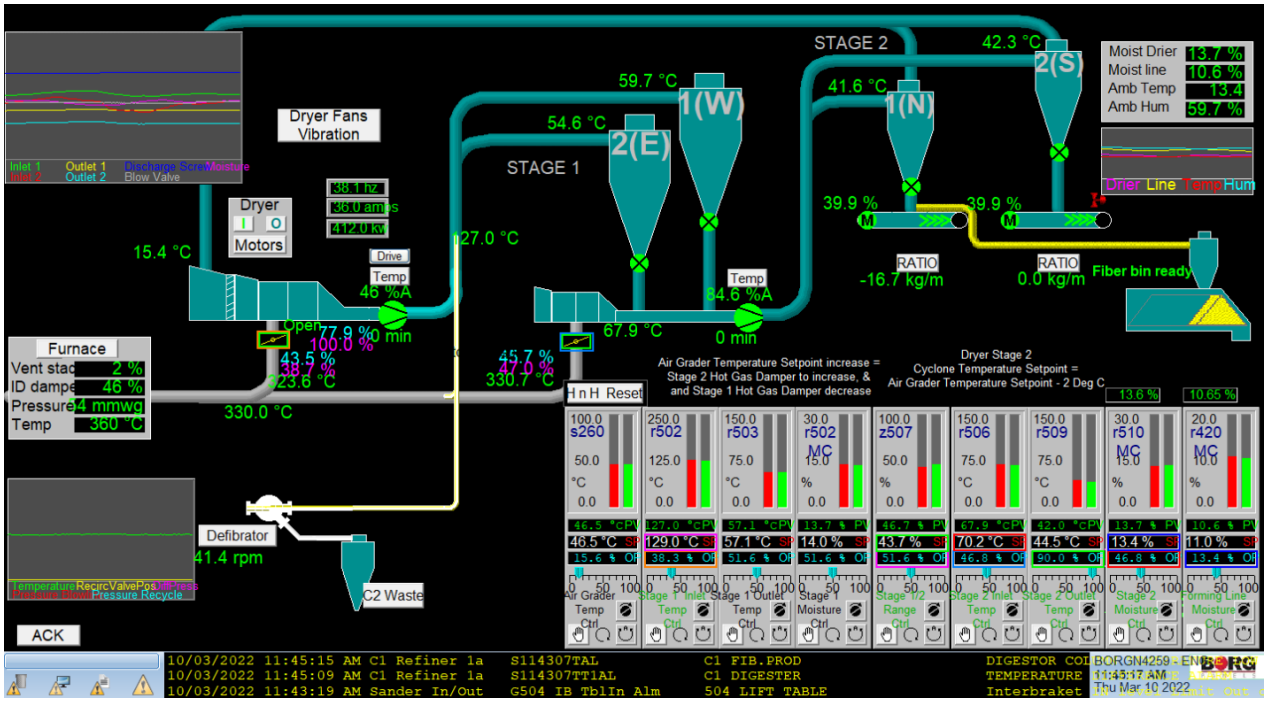
EPA 4 - DC1 Baghouse & EPA 5 - DC2 Baghouse (3 March 2022, 13:01)



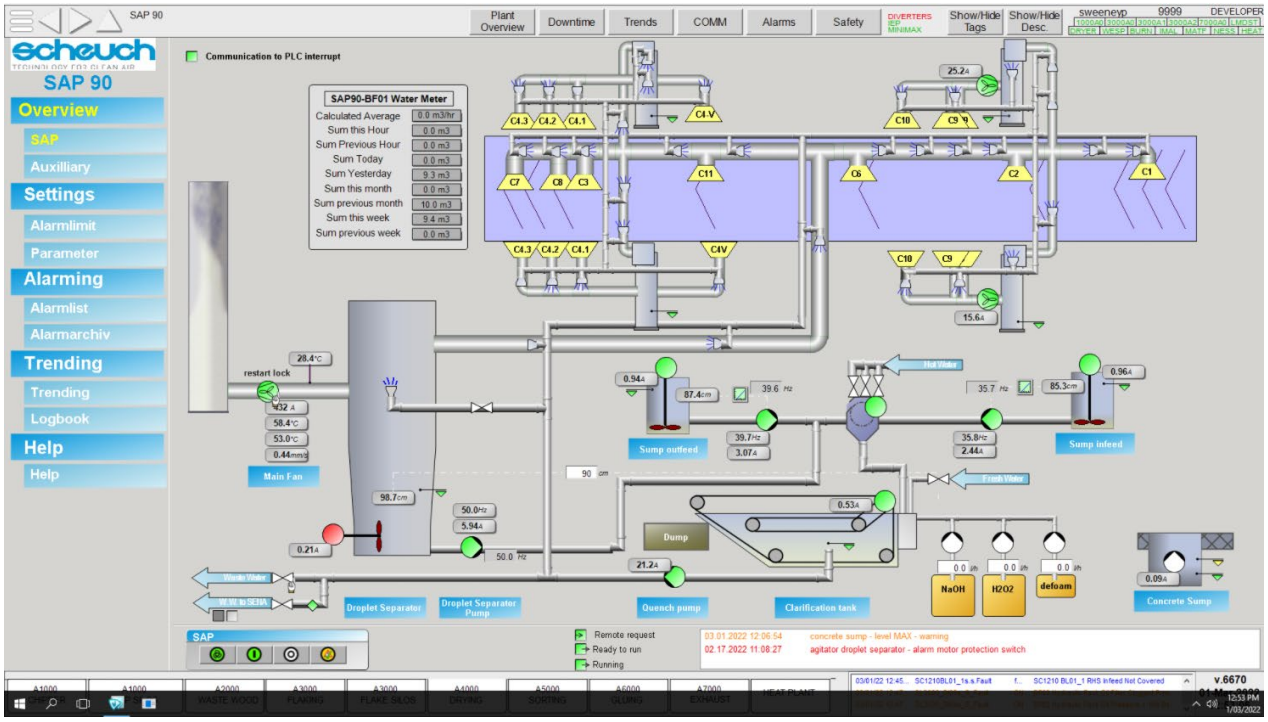
EPA 7 Conti 2 Stage 1 Dryer Cyclone # 1 (West) & EPA 8 Conti 2 Stage 1 Dryer Cyclone # 2 (East) (10 March 2022, 10:20)



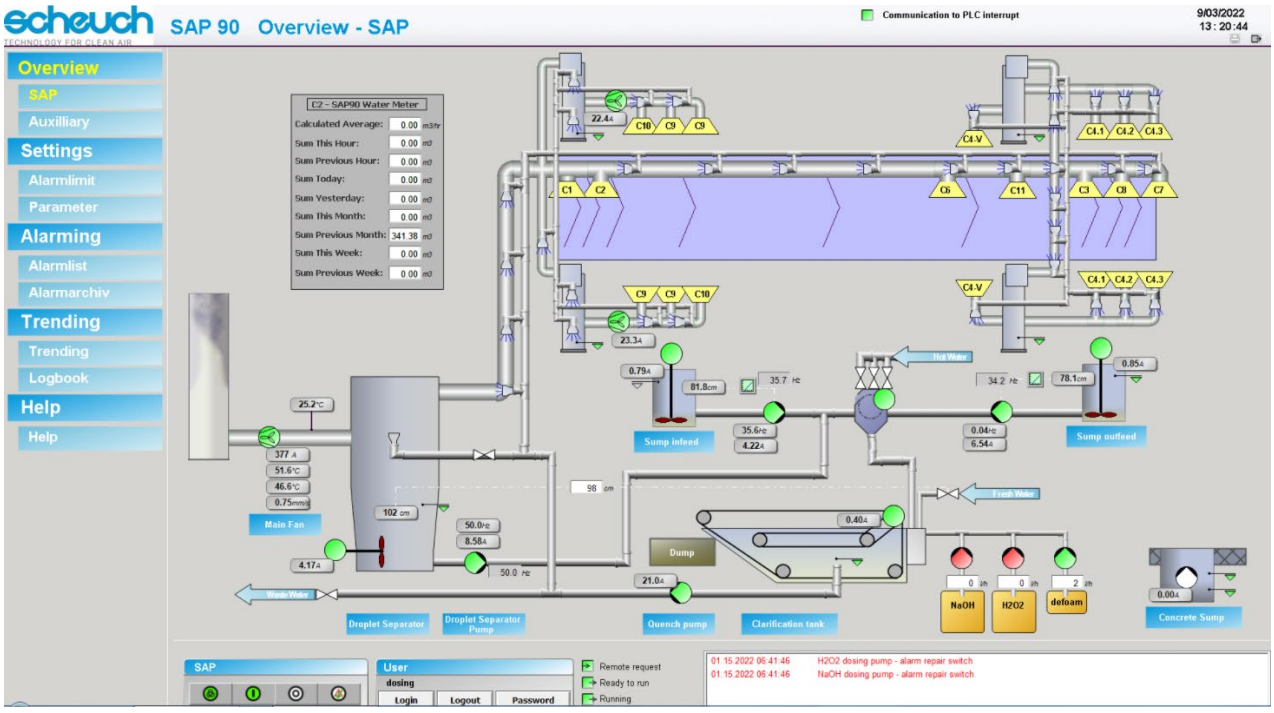
EPA 7 Conti 2 Stage 1 Dryer Cyclone # 1 (West) & EPA 8 Conti 2 Stage 1 Dryer Cyclone # 2 (East) (10 March 2022, 11:45)



SAP 90 (1 March 2022, 12:53)



SAP 90 (9 March 2022, 13:20)



8 Appendix 2. Site Location Photos

EPA 4 – DC1 Baghouse

EPA 5 – DC2 Baghouse

EPA 7 – Conti 2 Stage 1 Dryer Cyclone #1 (West) &
EPA 8 – Conti 2 Stage 1 Dryer Cyclone #2 (East)

EPA 27 – Conti 2 Press Vent Stack

EPA 29 – Forming Line Baghouse

EPA 30 – Form Station Baghouse

EPA 31 – Particle Board Press Extraction System

EPA 32 – WESP

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DRAFT

Ektimo

EPA 9 – Conti 1 Dryer Cyclone 1 (South) & EPA 10 – Conti 1 Dryer Cyclone 2 (North)

REPORT NUMBER R011918[DRAFT]

Emission Testing Report

Borg Manufacturing, Oberon Plant

Document Information

Template Version; 230621

Client Name:	Borg Manufacturing
Report Number:	R011918[DRAFT]
Date of Issue:	29 November 2021
Attention:	Victor Bendevski
Address:	Lowes Mount Rd Oberon NSW 2787
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Adnan Latif **Air Monitoring Consultant**	NATA Accredited Laboratory No. 14601	**Aaron Davis** **Ektimo Signatory**

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation. This does not include comments, conclusions or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.

Table of Contents

1 EXECUTIVE SUMMARY

1.1 Background

Ektimo was engaged by Borg Manufacturing to perform emission testing at their Oberon plant. Testing was carried out in accordance with Environment Protection Licence 3035.

1.2 Project Objective

The objectives of the project were to conduct a monitoring programme to quantify emissions from 2 discharge points to determine compliance with Borg Manufacturing's Environment Protection Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 9 - Conti 1 Dryer Cyclone 1 (South)	9 November 2021	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Nitrogen oxides, oxygen, carbon dioxide
EPA 10 - Conti 1 Dryer Cyclone 2 (North)		

* Flow rate, velocity, temperature and moisture were also determined.

All results are reported on a dry basis at STP.

Plant operating conditions have been noted in the report.

1.3 Licence Comparison

The following licence comparison table shows that all analytes highlighted in green are within the licence limit set by the NSW EPA as per licence 3035 (last amended on 4 September 2019).

EPA No.	Location Description	Pollutant	Units	Licence limit	Detected values Nov-21
9	Conti 1 Dryer Cyclone 1 (South)	Total Solid Particles	mg/m^3	200	12
		Formaldehyde	mg/m^3	5	3.6
10	Conti 1 Dryer Cyclone 2 (North)	Total Solid Particles	mg/m^3	200	17
		Formaldehyde	mg/m^3	5	3.3

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

Refer to the Test Methods table for the measurement uncertainties.

2 RESULTS

2.1 EPA 9 - Conti 1 Dryer Cyclone 1 (South)

Date	9/11/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R011918	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Adnan Latif / Scott Woods	**State**	NSW
Process Conditions	Plant running at normal operating condition		211104

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Fixed ladder 25 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane compliance to AS4323.1	Compliant but non-ideal

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.

The sampling plane is deemed to be non-ideal due to the following reasons:

The gas profile has a cyclonic component which exceeds 15°
The highest to lowest differential pressure ratio exceeds 9:1
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	7.9	
Gas molecular weight, g/g mole	28.1 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.26 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1005 & 1220	
Temperature, °C	53	
Temperature, K	326	
Velocity at sampling plane, m/s	14	
Volumetric flow rate, actual, m³/s	53	
Volumetric flow rate (wet STP), m³/s	39	
Volumetric flow rate (dry STP), m³/s	36	
Mass flow rate (wet basis), kg/hour	180000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1013 - 1112		1013 - 1112		1013 - 1112	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	84	180	76	160	87	190
	Concentration % v/v		Concentration % v/v		Concentration % v/v	
Carbon dioxide	0.7		0.6		0.7	
Oxygen	19.6		19.6		19.7	

Date	9/11/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R011918	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Adnan Latif / Scott Woods	**State**	NSW
Process Conditions	Plant running at normal operating condition		*211104*

Formaldehyde	Results	
Sampling time	1055-1155	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	3.6	7.7

Isokinetic Results	Results	
Sampling time	1010-1210	1010-1212 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	12	25
Fine particulates (PM10)	6.8	15
D50 cut size, 10µm	10.7	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	95	94
Velocity difference, %	9	9
Gravimetric analysis date (total particulate)	11-11-2021	
Gravimetric analysis date (PM_{10})	11-11-2021	

2.2 EPA 10 - Conti 1 Dryer Cyclone 1 (North)

Date	9/11/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R011918	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Adnan Latif / Scott Woods	**State**	NSW
Process Conditions	Plant running at normal operating condition		211104

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Fixed ladder 25 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane compliance to AS4323.1	Compliant but non-ideal

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.

The sampling plane is deemed to be non-ideal due to the following reasons:

The gas profile has a cyclonic component which exceeds 15°
The highest to lowest differential pressure ratio exceeds 9:1
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	9.1	
Gas molecular weight, g/g mole	28.0 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.25 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1250 & 1510	
Temperature, °C	51	
Temperature, K	324	
Velocity at sampling plane, m/s	14	
Volumetric flow rate, actual, m³/s	54	
Volumetric flow rate (wet STP), m³/s	39	
Volumetric flow rate (dry STP), m³/s	36	
Mass flow rate (wet basis), kg/hour	180000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1315 - 1414		1315 - 1414		1315 - 1414	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	48	100	9	19	110	240
	Concentration % v/v		Concentration % v/v		Concentration % v/v	
Carbon dioxide	0.6		<0.4		0.9	
Oxygen	19.9		19.7		20.1	

Date	9/11/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R011918	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Adnan Latif / Scott Woods	**State**	NSW
Process Conditions	Plant running at normal operating condition		*211104*

Formaldehyde	Results
Sampling time	1305-1405
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	3.3 / 7.1

Isokinetic Results	Results	
Sampling time	1300-1502	1300-1502 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	17	36
Fine particulates (PM10)	8.3	18
D50 cut size, 10µm	10.1	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	98	91
Velocity difference, %	-8	-8
Gravimetric analysis date (total particulate)	15-11-2021	
Gravimetric analysis date (PM_{10})	11-11-2021	

3 PLANT OPERATING CONDITIONS

Borg Manufacturing have collated plant operating conditions and will provide them to NSW EPA as required.

See Borg Manufacturing's records for complete process conditions.

4 TEST METHODS

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling Method	Analysis Method	Uncertainty*	NATA Accredited	
				Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1	NA	NA	✓	NA
Flow rate, temperature and velocity	NSW EPA TM-2	NSW EPA TM-2	8%, 2%, 7%	NA	✓
Moisture content	NSW EPA TM-22	NSW EPA TM-22	8%	✓	✓
Molecular weight	NA	NSW EPA TM-23	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24	NSW EPA TM-24	13%	✓	✓
Nitrogen oxides	NSW EPA TM-11	NSW EPA TM-11	12%	✓	✓
Oxygen	NSW EPA TM-25	NSW EPA TM-25	13%	✓	✓
Aldehydes and ketones	Ektimo 332	Ektimo 332	16%	✓	✓†
Particulate matter (PM_{10})	NSW EPA OM-5	NSW EPA OM-5	6%	✓	✓††
Solid particles (total)	NSW EPA TM-15	NSW EPA TM-15	3%	✓	✓††

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* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

† Analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601. Results were reported on 18 November 2021 in report LV-002114.

†† Gravimetric analysis conducted at the Ektimo Unanderra, NSW laboratory, NATA accreditation number 14601.

5 QUALITY ASSURANCE/QUALITY CONTROL INFORMATION

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

6 DEFINITIONS

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
AS	Australian Standard
BSP	British standard pipe
CARB	Californian Air Resources Board
CEM/CEMS	Continuous Emission Monitoring/Continuous Emission Monitoring System
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D_{50}	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D_{50} method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D_{50} of that cyclone and less than the D_{50} of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
DWER	Department of Water and Environmental Regulation (WA)
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
OM	Other approved method
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at standard conditions.
PM_{10}	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
$PM_{2.5}$	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PSA	Particle size analysis
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those not matching a standard compound), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0°C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa, unless otherwise specified.
TM	Test method
TOC	The sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range.

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Appendix C – Surface Water Monitoring Data

SURFACE WATER MONITORING EPL POINT 28

DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin	EPA/DPIE Notified
6/07/2021	7.54	28	30	3.9	0.1	<5	5	<0.1	<0.010	<0.010	
21/07/2021	7	688	35	4.9	0.19	7	9	<0.1	<0.010	<0.010	Y
28/07/2021	7.22	238	30	3.1	0.23	<5	4	<0.1	<0.010	<0.010	Y
4/08/2021	6.88	135	35	2.6	0.16	<5	6	<0.1	<0.010	<0.010	Y
11/08/2021	7.41	50	35	2.8	0.1	<5	<2	<0.1	<0.010	<0.010	
18/08/2021	7.61	37	30	2.8	0.04	<5	<2	0.2	<0.010	<0.010	
23/08/2021	7.53	20	30	3.1	0.06	<5	3	<0.1	<0.010	<0.010	
20/09/2021	7.35	7	30	5.7	0.06	<5	5	<0.1	<0.010	<0.010	
28/09/2021	7.39	6	30	5.7	0.03	<5	<2	0.2	<0.010	<0.010	
11/10/2021	6.75	15	35	6.5	0.06	<5	7	<0.1	<0.010	<0.010	
20/10/2021	7.81	7	35	8.6	0.04	<5	6	<0.1	<0.010	<0.010	
3//11/2021	7.38	20	35	8.3	0.08	<5	4	<0.1	<0.010	<0.010	
9/11/2021	7.82	21	25	6.9	0.1	<5	4	<0.1	<0.010	<0.010	
23/11/2021	7.47	<5	30	5.9	0.09	<5	6	<0.1	<0.010	<0.010	
30/11/2021	7.5	6	35	5.7	0.02	<5	4	<0.1	<0.010	<0.010	
15/12/2021	7.52	16	30	5.7	0.05	<5	<2	<0.1	<0.010	<0.010	
6/01/2022	7.89	14	30	7.3	0.04	<5	<2	<0.1	<0.010	<0.010	
25/01/2022	7.48	14	30	6.4	0.12	<5	<2	<0.1	<0.010	<0.010	
1/02/2022	6.91	7	30	6	0.02	<5	<2	<0.1	<0.010	<0.010	
8/03/2022	7.68	14	5	6.6	0.07	<5	5	<0.1	<0.010	<0.010	
10/05/2022	7.82	7	40	7.3	0.04	<5	5	<0.1	<0.010	<0.010	
23/05/2022	7.85	8	40	7.1	0.03	<5	3	<0.1	<0.010	<0.010	
31/05/2022	7.28	29	30	7.9	0.12	<5	8	<0.1	<0.010	<0.010	
Average	7.4	63.0	31.1	5.7	0.1	<5	5.3	0.2	<0.010	<0.010	
Exceedance											

SURFACE WATER MONITORING EPL POINT 1											
DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin	EPA/DPIE Notified
5/05/2021	7.38	290	18	2.3	0.23	<5	6	0.2	<0.010	<0.010	Y
Average	7.4	290.0	18.0	2.3	0.2	<5	6.0	0.2	<0.010	<0.010	
Exceedance											

SURFACE WATER MONITORING HPP SWALE											
DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin	EPA/DPIE Notified
6/09/2021	6.95	11	55	1	0.06	<5	<2	0.2	<0.010	<0.010	
15/09/2021	7.07	12	35	0.7	<0.01	<5	<2	<0.1	<0.010	<0.010	
20/09/2021	7.43	7	55	0.9	0.03	<5	<2	<0.1	<0.010	<0.010	
27/09/2021	8	8	40	0.6	0.02	<5	<2	0.1	<0.010	<0.010	
6/10/2021	7.89	9	60	1.1	0.02	<5	2	<0.1	<0.010	<0.010	
11/10/2021	7.27	11	70	1.3	0.05	<5	9	<0.1	<0.010	<0.010	
20/10/2021	8.05	8	80	1.7	0.02	<5	<2	<0.1	<0.010	<0.010	
27/10/2021	7.92	14	90	0.4	0.03	<5	<2	<0.1	<0.010	<0.010	
3/11/2021	7.73	27	100	1.6	0.05	17	<2	<0.1	<0.010	<0.010	N
9/11/2021	7.38	8	110	1.7	0.06	<5	4	<0.1	<0.010	<0.010	
17/11/2021	8.07	<5	75	1.2	0.04	<5	<2	<0.1	<0.010	<0.010	
23/11/2021	7.86	6	65	1.3	0.06	<5	4	0.1	<0.010	<0.010	
30/11/2021	7.7	7	100	1.3	0.06	<5	2	<0.1	<0.010	<0.010	
6/12/2021	7.96	12	80	1.9	0.1	<5	5	<0.1	<0.010	<0.010	
15/12/2021	8.08	18	60	1.3	0.08	<5	<2	<0.1	<0.010	<0.010	
22/12/2021	7.01	17	70	1.3	0.06	<5	<2	<0.1	<0.010	<0.010	
6/01/2022	7.68	18	35	1.1	0.05	<5	<2	<0.1	<0.010	<0.010	
12/01/2022	7.5	16	50	1.4	0.09	<5	3	<0.1	<0.010	<0.010	
19/01/2022	7.34	41	60	1.6	0.14	<5	2	<0.1	<0.010	<0.010	
25/01/2022	7.57	11	50	0.9	0.06	<5	<2	<0.1	<0.010	<0.010	
1/02/2022	7.27	11	55	1.5	0.08	<5	2	<0.1	<0.010	<0.010	
9/02/2022	7.4	10	40	1	0.05	<5	2	<0.1	<0.010	<0.010	
15/02/2022	7.81	13	40	1.1	0.05	<5	<2	<0.1	<0.010	<0.010	
22/02/2022	6.99	30	35	0.9	0.07	<5	2	<0.1	<0.010	<0.010	
28/02/2022	7.45	25	30	1.2	0.12	<5	5	<0.1	<0.010	<0.010	
7/03/2022	7.28	16	60	1.6	0.06	5	6	<0.1	<0.010	<0.010	
16/03/2022	7.58	22	60	1.1	0.3	<5	<2	<0.1	<0.010	<0.010	
23/03/2022	7.78	28	40	1.1	0.09	<5	5	<0.1			
30/03/2022	7.83	7	25	2.2	0.05	<5	<2	<0.1	<0.010	<0.010	
5/04/2022	7.43	12	30	1	0.05	<5	<2	0.1	<0.010	<0.010	
11/04/2022	7.35	8	40	0.9	0.04	<5	<2	<0.1	<0.010	<0.010	
26/04/2022	7.7	11	35	0.8	0.06	<5	2	0.1	<0.010	<0.010	
Average	7.6	14.6	57.2	1.2	0.1	11.0	3.7	0.1	0.0	0.0	
Exceedance											

Appendix D – Groundwater Monitoring Data

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

ALS WATER
ANALYSIS AND TESTING REPORT

REPORT TO: Victor Bendevski

REPORT ON: Borg Panels, Oberon
Bore Monitoring Results

REPORT NO: 2400-7228-04

SAMPLED BY: L. Pyne

REPORTED BY: T. MacPhee

Adriana Hernandez
Environmental Project/Quality Officer– Lithgow NSW

NATA
WORLD RECOGNISED ACCREDITATION

Accreditation # 15784
Site # 11436

Accredited for compliance with ISO/IEC 17025.

ACIRL Pty Ltd
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LITHGOW NSW 2790
Phone +61 2 6350 7400 Fax +61 2 6352 3583 www.alsglobal.com
A Campbell Brothers Limited Company

BORG PANELS
Purging of Bores

	Units				
REPORT NO:		2400-7228-04			
ALS Sydney Report No.		ES2211588			
Date of Sample		28/03/2022	28/03/2022	28/03/2022	28/03/2022
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
General Comments/ Observations		**Cloudy**	**Slightly Cloudy**	**Slightly Cloudy**	**Slightly Cloudy**
Water Depth	m	1.85	3.50	6.15	0.68
Volume Purged	Lt	4.000	5.000	4.000	2.000

ALS WATER
ANALYSIS AND TESTING REPORT

BORG PANELS

	Units				
REPORT NO:		2400-7228-04			
ALS Sydney Report No.		ES2211588			
Date of Sample		31/03/2022	31/03/2022	31/03/2022	31/03/2022
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
General Comments/ Observations		**Cloudy**	**Slightly cloudy**	**Slightly cloudy**	**Slightly cloudy**
Temperature	°C	13.4	12.6	12.5	12.5
pH	pH Units	6.9	6.7	7.2	7.7
Electrical Conductivity	µS/cm	282	1336	428	323
Total Suspended Solids	mg/L	197	43	23	26
Total Dissolved Solids	mg/L	168	982	397	244
Water Height	m	2.02	4.28	6.50	2.21
Ammonia as N by Discrete Analyser					
Ammonia as N	mg/L	0.03	5.95	1.12	0.04
Total Organic Carbon (TOC)					
Total Organic Carbon	mg/L	8	55	3	<1
Formaldehyde					
Formaldehyde	mg/L	<0.2	1.1	0.1	<0.1
Chemical Oxygen Demand (Spectrophotometric)					
Chemical Oxygen Demand	mg/L	28	23	37	<10
Organochlorine Pesticides (OC)					
alpha-BHC	µg/L	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L	<0.5	<0.5	<0.5	<0.5
beta-BHC	µg/L	<0.5	<0.5	<0.5	<0.5
gamma-BHC	µg/L	<0.5	<0.5	<0.5	<0.5
delta-BHC	µg/L	<0.5	<0.5	<0.5	<0.5
Heptachlor	µg/L	<0.5	<0.5	<0.5	<0.5
Aldrin	µg/L	<0.5	<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L	<0.5	<0.5	<0.5	<0.5

BORG PANELS

	Units				
REPORT NO:		2400-7228-04			
ALS Sydney Report No.		ES2211588			
Date of Sample		31/03/2022	31/03/2022	31/03/2022	31/03/2022
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
Organochlorine Pesticides (OC) Continued					
trans-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5
cis-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5
Dieldrin	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDE	µg/L	<0.5	<0.5	<0.5	<0.5
Endrin	µg/L	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDD	µg/L	<0.5	<0.5	<0.5	<0.5
Endrin aldehyde	µg/L	<0.5	<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDT	µg/L	<2.0	<2.0	<2.0	<2.0
Endrin ketone	µg/L	<0.5	<0.5	<0.5	<0.5
Methoxychlor	µg/L	<2.0	<2.0	<2.0	<2.0
Total Chlordane (sum)	µg/L	<0.5	<0.5	<0.5	<0.5
Sum of DDD + DDE + DDT	µg/L	<0.5	<0.5	<0.5	<0.5
Sum of Aldrin + Dieldrin	µg/L	<0.5	<0.5	<0.5	<0.5
Organochlorine Pesticide Surrogate					
Dibromo-DDE	%	86.6	80.2	65.1	80.2
Organophosphorus Pesticide Surrogate					
DEF	%	91.8	94.1	69.4	80.4
Total Petroleum Hydrocarbons					
C6 - C9 Fraction	µg/L	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	<50	680	<50	<50
C15 - C28 Fraction	µg/L	<100	1470	<100	<100

BORG PANELS

	Units				
REPORT NO:		2400-7228-04			
ALS Sydney Report No.		ES2211588			
Date of Sample		31/03/2022	31/03/2022	31/03/2022	31/03/2022
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
Total Petroleum Hydrocarbons					
C29 - C36 Fraction	µg/L	<50	80	<50	<50
C10 - C36 Fraction (sum)	µg/L	<50	2230	<50	<50
Total Recoverable Hydrocarbons - NEPM 2013 Fractions					
C6 - C10 Fraction	µg/L	<20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	<20	<20	<20	<20
>C10 - C16 Fraction	µg/L	<100	900	<100	<100
>C16 - C34 Fraction	µg/L	<100	1310	<100	<100
>C34 - C40 Fraction	µg/L	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	µg/L	<100	2210	<100	<100
>C10 - C16 Fraction minus Naphthalene	µg/L	<100	900	<100	<100
BTEXN					
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<2	<2	<2	<2
Ethylbenzene	µg/L	<2	<2	<2	<2
meta- & para-Xylene	µg/L	<2	<2	<2	<2
ortho-Xylene	µg/L	<2	<2	<2	<2
Total Xylenes	µg/L	<2	<2	<2	<2
Sum of BTEX	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<5	<5	<5	<5
TPH(V)/BTEX Surrogates					
1.2-Dichloroethane-D4	%	88.0	106	89.4	89.9
Toluene-D8	%	106	126	102	104
4-Bromofluorobenzene	%	98.5	112	95.8	94.2

METHODS OF WATER ANALYSIS

NATA accreditation covers the following test

TEST	METHOD	Measure of Uncertainty
Electrical Conductivity uS/cm	APHA 2510 B	2.0%
pH value	APHA 4500 H	0.10 pH Units
Total Suspended Solids (mg/l)	APHA 2540 D	± 5.0%
Total Dissolved Soilds (mg/l)	APHA 2540 C	± 8.8%

*** NATA Accreditation does not cover the performance of this test.**

TEST
* Temperature Field

The remaining analysis performed at ALS Environmental, 277-289 Woodpark Rd, Smithfield, NSW 2164.

In accordance with “Standard Methods for the Examination of Water & Wastewater”
APHA, AWWA, WEF and Water & Wastewater
Examination Manual (V. Dean Adams)

ALS Report No: ES2211588

Preservation procedures in accordance with AS/NZS 5667/1 when sampled by
ACIRL staff unless otherwise stated.

Appendix E – Annual Noise Monitoring Report

Borg Panels Facility

Annual Operational Noise Monitoring 2021

Prepared for

Borg Construction Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Borg Panels Facility

Annual Operational Noise Monitoring 2021

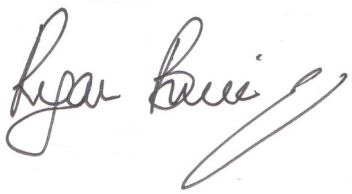
Reference: 21114_R02_RevA
Report date: 26 August 2021

Prepared for

Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared:	Ryan Bruniges Consultant	QA Review:	Jesse Tribby Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct an annual noise survey of operations at the Borg panel manufacturing facility (Borg) at Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

The Operational Noise Management Plan (ONMP) recommends annual noise monitoring be conducted during the winter period, as this season represents the likely worst-case season due to temperature inversions.

Attended environmental noise monitoring described in this report was undertaken during the day, evening and night periods of 30 June/1 July 2021 at four monitoring locations.

1.2 Monitoring Locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1. It should be noted that Figure 1 shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED MONITORING LOCATIONS

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

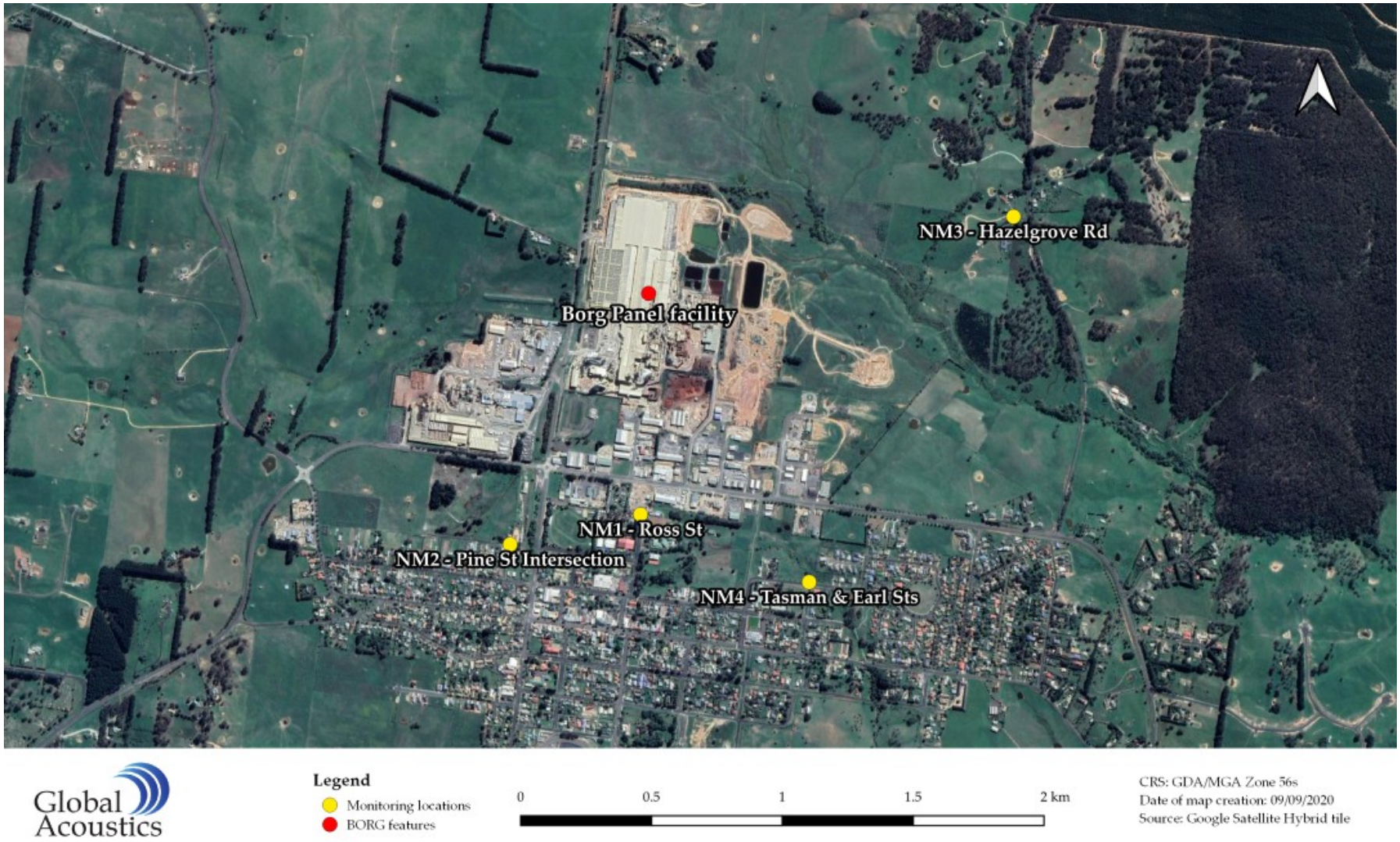

Figure 1: Attended Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations, which may be used in this report, are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
L_A	The A-weighted root mean squared (RMS) noise level at any instant
L_{Amax}	The maximum A-weighted noise level over a time period or for an event
L_{A1}	The noise level which is exceeded for 1 per cent of the time
L_{A10}	The noise level which is exceeded for 10 percent of the time, which is approximately the average of the maximum noise levels
L_{A50}	The noise level which is exceeded for 50 per cent of the time
L_{A90}	The level exceeded for 90 percent of the time, which is approximately the average of the minimum noise levels. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes
L_{Amin}	The minimum A-weighted noise level over a time period or for an event
L_{Aeq}	The average noise energy during a measurement period
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise
SPL	Sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micropascals
Hertz (Hz)	Cycles per second, the frequency of fluctuations in pressure, sound is usually a combination of many frequencies together
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data
IA	Inaudible. When site only noise is noted as IA, there was no noise from the source of interest audible at the monitoring location
NM	Not Measurable. If site only noise is noted as NM, this means some noise from the source of interest was audible at low-levels, but could not be quantified
Day	This is the period 7:00am to 6:00pm
Evening	This is the period 6:00pm to 10:00pm
Night	This is the period 10:00pm to 7:00am

2 REGULATOR REQUIREMENTS AND NOISE CRITERIA

2.1 Development Consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 22 May 2020. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment Protection Licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 4 September 2019. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Noise Management Plan

Noise monitoring requirements are detailed in the Borg Operational Noise Management Plan (ONMP) and Construction Noise Management Plan (CNMP). The most recent version of the ONMP was approved in October 2020. The most recent version of the CNMP was approved in May 2021. Relevant sections of the ONMP are reproduced in Appendix A.

2.4 Noise Criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1: IMPACT ASSESSMENT CRITERIA

Location	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
All sensitive receivers	55	50	45

2.5 Meteorological Conditions

Condition L4.3 of the EPL outlines meteorological conditions required for criteria to be applicable. Noise criteria detailed in the EPL apply under all meteorological conditions except for the following:

(a) *Wind speeds greater than 3 metres/second at 10 metres above the ground level;*

(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.

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been undertaken in accordance with Fact Sheet C of the NPfI.

3 METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg ONMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended Noise Monitoring

During this survey, attended monitoring was undertaken during the day, evening and night period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also undertaken at each monitoring location.

This survey presents noise levels gathered during attended monitoring that are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15minute}$ and $L_{A1,1minute}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfI. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- Site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- Site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- It was not feasible, nor reasonable to employ methods such as move closer and back calculate. Cases

may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

A measurement of $L_{A1,1minute}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this is the highest noise level, or L_{Amax}, received from the site during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of the site only $L_{Aeq,15minute}$ level.

3.3 Modifying Factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB").

If applicable, modifying factors have been reported and added to measured site-only L_{Aeq} noise levels when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} levels if Borg was the only contributing low-frequency noise source.

3.4 Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	3013882	08/02/2023
Pulsar 105 acoustic calibrator	78226	08/02/2023

4 RESULTS

4.1 Total Measured Noise Levels

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1: MEASURED NOISE LEVELS – 2021[1]

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{A50} dB	L_{Aeq} dB	L_{A90} dB	L_{Amin} dB
NM1	30/06/2021 20:47	57	53	48	47	46	45	42
NM1	30/06/2021 22:54	69	62	49	50	46	45	42
NM1	01/07/2021 10:43	66	64	61	56	51	49	47
NM2	30/06/2021 18:17	58	53	49	48	47	46	45
NM2	30/06/2021 23:20	55	49	46	44	44	43	41
NM2	01/07/2021 10:00	67	56	49	48	46	45	43
NM3	30/06/2021 17:17	68	58	45	46	38	36	33
NM3	30/06/2021 21:45	55	47	44	41	41	35	31
NM3	30/06/2021 22:03	49	47	45	42	41	37	32
NM4	30/06/2021 17:33	74	63	53	53	49	44	38
NM4	30/06/2021 21:09	57	55	52	47	41	36	33
NM4	30/06/2021 22:29	56	54	52	48	45	37	35

Notes:

1. *Levels in this table are not necessarily the result of activity at Borg.*

4.2 Modifying Factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfI and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15minute}$ levels from Borg with the project specific noise criteria

Table 4.2: $L_{Aeq,15minute}$ GENERATED BY BORG AGAINST CRITERIA – 2021

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15min}$ dB[2]	Exceedance[3,4]
NM1	30/06/2021 20:47	2.0	E	50	Yes	46	Nil
NM1	30/06/2021 22:54	2.3	F	45	No	46	NA
NM1	01/07/2021 10:43	3.2	B	55	No	51	NA
NM2	30/06/2021 18:17	1.6	E	50	Yes	47	Nil
NM2	30/06/2021 23:20	1.9	F	45	Yes	43	Nil
NM2	01/07/2021 10:00	2.0	C	55	Yes	46	Nil
NM3	30/06/2021 17:17	1.7	E	55	Yes	NM	Nil
NM3	30/06/2021 21:45	1.5	F	50	Yes	NM	Nil
NM3	30/06/2021 22:03	2.7	D	45	Yes	NM	Nil
NM4	30/06/2021 17:33	1.8	E	55	Yes	<30	Nil
NM4	30/06/2021 21:09	1.4	F	50	Yes	<30	Nil
NM4	30/06/2021 22:29	3.1	D	45	No	35	NA

Notes:

1. *Noise criteria apply under all meteorological conditions except those detailed in Section 2.5;*
2. *Site-only $L_{Aeq,15minute}$ attributed to Borg, including modifying factors if applicable;*
3. *Bold results in red indicate exceedance of criterion (if applicable); and*
4. *NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.*

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator during each measurement using a Kestrel hand-held weather meter is shown in Table 4.3. The wind speed, direction and temperature were measured at approximately 1.8 metres. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3: MEASURED ATMOSPHERIC CONDITIONS – 2021

Location	Start Date and Time	Temperature (degrees)	Wind Speed (m/s)	Wind Direction [1]	Cloud Cover (1/8s)
NM1	30/06/2021 20:47	7	1.5	60	8
NM1	30/06/2021 22:54	7	0.7	95	7
NM1	01/07/2021 10:43	7	1.0	70	8
NM2	30/06/2021 18:17	7	0.3	60	0
NM2	30/06/2021 23:20	7	1.5	100	7
NM2	01/07/2021 10:00	7	0.0	-	8
NM3	30/06/2021 17:17	8	0.4	60	0
NM3	30/06/2021 21:45	7	1.0	90	8
NM3	30/06/2021 22:03	8	1.4	50	8
NM4	30/06/2021 17:33	8	0.0	-	0
NM4	30/06/2021 21:09	8	0.3	70	8
NM4	30/06/2021 22:29	7	1.1	70	7

Notes:

1. *"-" indicates calm conditions at monitoring location.*

Meteorological data used for compliance assessment is sourced from the Borg AWS.

5 SUMMARY

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct an annual noise survey of operations at the Borg panel manufacturing facility (Borg) at Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day, evening and night periods of 30 June/1 July 2021 at four monitoring locations.

Borg complied with relevant criteria during the 2021 survey at all monitoring locations. Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Global Acoustics Pty Ltd

APPENDIX

A REGULATOR DOCUMENTS

A.1 DEVELOPMENT CONSENT SSD 7016

NOISE

Hours of Work

B13. The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14. Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:
(a) works that are inaudible at the nearest sensitive receivers;
(b) works agreed to in writing by the Secretary;
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
(d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15. The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:
(a) be prepared by a suitably qualified and experienced noise expert;
(b) be approved by the Secretary prior to the commencement of construction of the Project;
(c) describe procedures for achieving the noise limits in **Table 2**;
(d) describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
(e) include strategies that have been developed with the community for managing noisy works;
(f) describe the community consultation undertaken to develop the strategies in e) above; and
(g) include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16. The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2.**

Table 2: 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.*

Noise Mitigation

B17. 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.

Operational Noise Management Plan

B18. 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:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) describe the measures that will be implemented to minimise noise from the Existing Development including:

(i) all reasonable and feasible measures being employed on site;
(ii) maintain equipment to ensure it is in good order;
(iii) traffic noise is effectively managed;
(iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
(v) compliance with the relevant conditions of this consent;

(c) includes a noise monitoring program that:

(i) must be carried out until otherwise agreed to in writing by the Secretary;
(ii) is capable of evaluating the performance of the Existing Development; and
(iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and

(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.

B19. 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:

(a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; and

(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.

Noise Verification

B20. Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:

(a) be undertaken by a suitably qualified expert;

(b) include an analysis of compliance with noise limits specified in Condition B16;

(c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;

(d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and

(e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B20A. Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:

(a) be undertaken by a suitably qualified expert; and

(b) include an analysis of compliance with noise limits specified in Condition B16;

(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and

(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSD-7016-Mod-3, the Applicant must undertake a Noise Verification Study for the Development to the satisfaction of the Secretary. The Study must:
(a) be undertaken by a suitably qualified expert;
(b) include an analysis of compliance with noise limits specified in Condition B16;
(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21. Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26. Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27. Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

Noise

Attenuation, as detailed in the NIA, will be implemented as follows:

- Conti 1 Dryer Fan air intake redesigned and the fan speed reduced to minimise noise generated. A sound power reduction from LAeq 121 dB to 114 dB or better is required.
- Booster fan will receive additional insulation and a reduction in fan speed. A sound power reduction from LAeq 116 dB to 109 dB or better is required.
- Main fibre transport fan will have a concrete enclosure constructed around it. A sound power reduction from LAeq 110 dB to 104 dB or better is required.

In short, the approach taken by Borg to mitigate noise is based on a number of factors:

1. Continuation of the use of mobile chippers (that is, not to enclose the mobile chippers). However, these are backup items (only to be used when enclosed, electric chippers are not operational), and will not be used in enhancing met conditions.
2. Implementation of additional noise mitigation measures to minimise noise generated by equipment, as detailed above.
3. Provision of sound attenuation structures and enclosures to other equipment where appropriate.

Irrespective of the above, Borg undertakes to meet the existing plant sound power reductions specified in the NIA. If the proposed attenuation measures to the existing plant are found to be insufficient in achieving these reductions, additional works will be undertaken.

A.2 ENVIRONMENT PROTECTION LICENCE

L4 Noise limits

L4.1 Noise from the premises must not exceed:
a) 55 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm); and
b) 50 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) $L_{Aeq\ (15\ minute)}$, 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:

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.

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

a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
b) 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.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

A.3 OPERATIONAL NOISE MANAGEMENT PLAN

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.

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring for the Existing Development at each location 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 regular attended noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Officer 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.

Attended compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the Existing Development 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 Existing Development should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in **Section 9**.

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 6 – 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. 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 Identification 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.

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 DP&E for approval.

A.4 CONSTRUCTION NOISE MANAGEMENT PLAN

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (**Section 2.6**), Development Consent (SSD 7016) conditions (**Section 2.2**), EPL 3035 (**Section 2.4**) and the measured background noise levels (refer Global Acoustics, May 2016), **Table 6** summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day (7am-6pm) LAeq (15 min)	Evening (6pm-10pm) LAeq (15 min)	Night (10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in **Table 6**.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in **Section 10**.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – 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 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather 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. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in Table 6 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.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

APPENDIX

B CALIBRATION CERTIFICATES

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C21058

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	23.5°C	**Ambient Temperature :**	23.3°C
Relative Humidity :	46.7%	**Relative Humidity :**	47.7%
Barometric Pressure :	100.28kPa	**Barometric Pressure :**	100.25kPa

Calibration Technician : Jeff Yu **Secondary Check:** Max Moore
Calibration Date : 8 Feb 2021 **Report Issue Date :** 9 Feb 2021

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.12dB*	*Temperature*	*±0.2°C*
1kHz	*±0.11dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.13dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA
WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator
IEC 60942-2017

Calibration Certificate

Calibration Number C21059

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Pulsar Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	23.3°C
Relative Humidity :	47.7%
Barometric Pressure :	100.27kPa

Calibration Technician :	Jeff Yu	**Secondary Check:**	Max Moore
Calibration Date :	08 Feb 2021	**Report Issue Date :**	9 Feb 2021

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.02	1000.40

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Specific Tests		Least Uncertainties of Measurement - Environmental Conditions	
Generated SPL	*±0.14dB*	*Temperature*	*±0.2°C*
Frequency	*±0.09%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.09%*	*Barometric Pressure*	*±0.015kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

* The tests <1000 kHz are not covered by Acoustic Research Labs Pty Ltd NATA accreditation.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

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Appendix F – Construction Noise Monitoring Reports

Borg Panels Facility

Environmental Noise Monitoring

Quarter 2 2021

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Borg Panels Facility

Environmental Noise Monitoring
Quarter 2 2021

Reference: 21114_R01
Report date: 17 August 2021

Prepared for

Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322

Prepared:	Ryan Bruniges Consultant	QA Review:	Jesse Tribby Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day periods of 30 June and 1 July 2021 at four monitoring locations. Measurements at NM1 and NM2 were conducted on 1 July 2021 due to travel delays and unsuitable weather conditions earlier in the quarter.

1.2 Monitoring Locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1. It should be noted that Figure 1 shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED MONITORING LOCATIONS

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

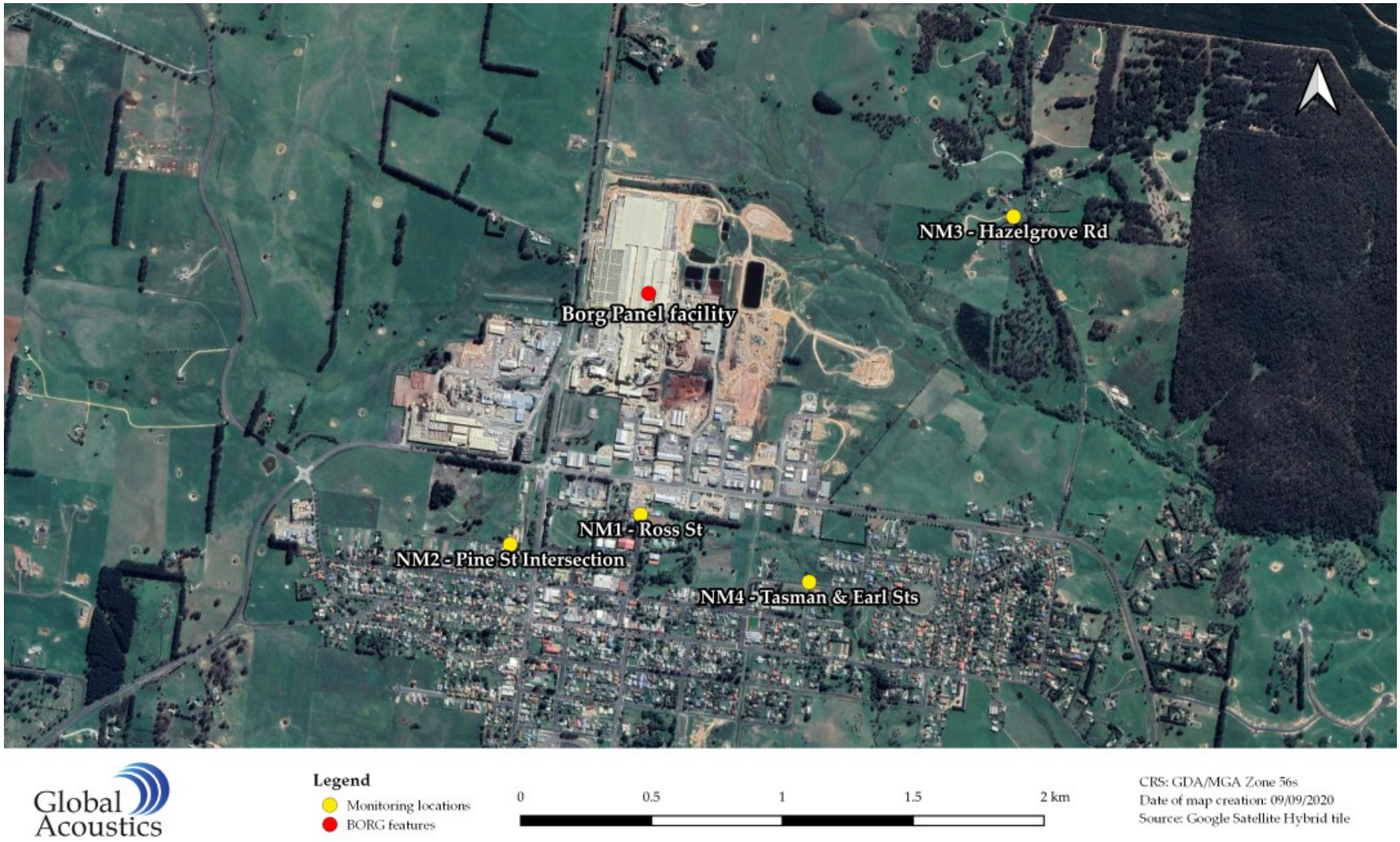

Figure 1: Attended Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
L_{Amax}	The maximum A-weighted noise level over a time period.
L_{A1}	The noise level which is exceeded for 1 per cent of the time.
$L_{A1,1minute}$	The noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The noise level which is exceeded for 10 percent of the time.
L_{Aeq}	The average noise A-weighted energy during a measurement period.
L_{A50}	The noise level which is exceeded for 50 per cent of the time and the median noise level during a measurement period.
L_{A90}	The level exceeded for 90 percent of the time. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00am to 6:00pm.
Evening	This is the period 6:00pm to 10:00pm.
Night	This is the period 10:00pm to 7:00am.

2 REGULATOR REQUIREMENTS AND NOISE CRITERIA

2.1 Development Consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 22 May 2020. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment Protection Licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 4 September 2019. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Noise Management Plan

Noise monitoring requirements are detailed in the Borg Operational Noise Management Plan (ONMP) and Construction Noise Management Plan (CNMP). The most recent version of the ONMP was approved in October 2020. The most recent version of the CNMP was approved in May 2021. Relevant sections of the ONMP and CNMP are reproduced in Appendix A.

2.4 Noise Criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1: IMPACT ASSESSMENT CRITERIA

Location	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
All sensitive receivers	55	50	45

Construction noise criteria for each monitoring location are detailed in Table 2.2 and Table 2.3.

Table 2.2: GENERAL CONSTRUCTION NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
NM1	55	50	45
NM2	55	50	45
NM3	55	50	45
NM4	55	50	45

Table 2.3: ROCK/CONCRETE BREAKING NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB
NM1	75
NM2	75
NM3	75
NM4	75

2.5 Meteorological Conditions

Condition L4.3 of the EPL outlines meteorological conditions required for criteria to be applicable. Noise criteria detailed in the EPL apply under all meteorological conditions except for the following:

(a) *Wind speeds greater than 3 metres/second at 10 metres above the ground level;*

(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.

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been undertaken in accordance with Fact Sheet C of the NPfI.

3 METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg CNMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended Noise Monitoring

During this survey, attended monitoring was undertaken during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also undertaken at each monitoring location.

This survey presents noise levels gathered during attended monitoring that are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15minute}$ and $L_{A1,1minute}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfI. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- Site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- Site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- It was not feasible, nor reasonable to employ methods such as move closer and back calculate. Cases

may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

A measurement of $L_{A1,1minute}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this is the highest noise level, or L_{Amax}, received from the site during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of the site only $L_{Aeq,15minute}$ level.

3.3 Modifying Factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB").

If applicable, modifying factors have been reported and added to measured site-only L_{Aeq} noise levels when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} levels if Borg was the only contributing low-frequency noise source.

3.4 Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	3013882	08/02/2023
Pulsar 105 acoustic calibrator	78226	08/02/2023

4 RESULTS

4.1 Total Measured Noise Levels

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1: MEASURED NOISE LEVELS – QUARTER 2 2021 [1]

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A50} dB	L_{A90} dB	L_{Amin} dB
NM1	01/07/2021 10:43	66	64	61	56	51	49	47
NM2	01/07/2021 10:00	67	56	49	48	46	45	43
NM3	30/06/2021 17:17	68	58	45	46	38	36	33
NM4	30/06/2021 17:33	74	63	53	53	49	44	38

Notes:

1. *Levels in this table are not necessarily the result of activity at Borg.*

4.2 Modifying Factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfI and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15minute}$ levels from Borg with the project specific noise criteria.

Table 4.2: $L_{Aeq,15minute}$ GENERATED BY BORG AGAINST CRITERIA – QUARTER 2 2021

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15min}$ dB[2]	Exceedance[3,4]
NM1	01/07/2021 10:43	3.2	B	55	No	51	NA
NM2	01/07/2021 10:00	2.0	C	55	Yes	46	Nil
NM3	30/06/2021 17:17	1.7	E	55	Yes	NM	Nil
NM4	30/06/2021 17:33	1.8	E	55	Yes	<30	Nil

Notes:

1. *Noise criteria apply under all meteorological conditions except those detailed in Section 2.5;*
2. *Site-only $L_{Aeq,15minute}$ attributed to Borg, including modifying factors if applicable;*
3. *Bold results in red indicate exceedance of criterion (if applicable); and*
4. *NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.*

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator during each measurement using a Kestrel hand-held weather meter is shown in Table 4.3. The wind speed, direction and temperature were measured at approximately 1.8 metres. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3: MEASURED ATMOSPHERIC CONDITIONS – QUARTER 2 2021

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	01/07/2021 10:43	7	1.0	70	8
NM2	01/07/2021 10:00	7	0.3	60	0
NM3	30/06/2021 17:17	8	0.4	60	0
NM4	30/06/2021 17:33	8	0.0	-	0

Notes:

1. *"-" indicates calm conditions at monitoring location.*

Meteorological data used for compliance assessment is sourced from the Borg AWS.

5 SUMMARY

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 30 June and 1 July 2021 at four monitoring locations. Measurements at NM1 and NM2 were conducted on 1 July 2021 due to travel delays and unsuitable weather conditions earlier in the quarter.

Borg complied with the relevant criteria during the Quarter 2 2021 survey at all monitoring locations. Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Global Acoustics Pty Ltd

APPENDIX

A REGULATOR DOCUMENTS

A.1 DEVELOPMENT CONSENT SSD 7016

NOISE

Hours of Work

B13. The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14. Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:
(a) works that are inaudible at the nearest sensitive receivers;
(b) works agreed to in writing by the Secretary;
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
(d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15. The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:
(a) be prepared by a suitably qualified and experienced noise expert;
(b) be approved by the Secretary prior to the commencement of construction of the Project;
(c) describe procedures for achieving the noise limits in **Table 2**;
(d) describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
(e) include strategies that have been developed with the community for managing noisy works;
(f) describe the community consultation undertaken to develop the strategies in e) above; and
(g) include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16. The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2.**

Table 2: 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.*

Noise Mitigation

B17. 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.

Operational Noise Management Plan

B18. 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:
- (a) be prepared by a suitably qualified and experienced noise expert;
- (b) describe the measures that will be implemented to minimise noise from the Existing Development including:
  - (i) all reasonable and feasible measures being employed on site;
  - (ii) maintain equipment to ensure it is in good order;
  - (iii) traffic noise is effectively managed;
  - (iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
  - (v) compliance with the relevant conditions of this consent;
- (c) includes a noise monitoring program that:
  - (i) must be carried out until otherwise agreed to in writing by the Secretary;
  - (ii) is capable of evaluating the performance of the Existing Development; and
  - (iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and
- (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.

B19. 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:
- (a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; and
- (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.
- (c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area.
- (d) details of the noise attenuation measures for the materials handling equipment approved for installation and operation under SSD-7016-Mod-3.

Noise Verification

B20. Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert;
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;
- (d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B20A. Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert; and
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSD-7016-Mod-3, the Applicant must undertake a Noise Verification Study for the Development to the satisfaction of the Secretary. The Study must:
(a) be undertaken by a suitably qualified expert;
(b) include an analysis of compliance with noise limits specified in Condition B16;
(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21. Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26. Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27. Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

Noise

Attenuation, as detailed in the NIA, will be implemented as follows:

- Conti 1 Dryer Fan air intake redesigned and the fan speed reduced to minimise noise generated. A sound power reduction from LAeq 121 dB to 114 dB or better is required.
- Booster fan will receive additional insulation and a reduction in fan speed. A sound power reduction from LAeq 116 dB to 109 dB or better is required.
- Main fibre transport fan will have a concrete enclosure constructed around it. A sound power reduction from LAeq 110 dB to 104 dB or better is required.

In short, the approach taken by Borg to mitigate noise is based on a number of factors:

1. Continuation of the use of mobile chippers (that is, not to enclose the mobile chippers). However, these are backup items (only to be used when enclosed, electric chippers are not operational), and will not be used in enhancing met conditions.
2. Implementation of additional noise mitigation measures to minimise noise generated by equipment, as detailed above.
3. Provision of sound attenuation structures and enclosures to other equipment where appropriate.

Irrespective of the above, Borg undertakes to meet the existing plant sound power reductions specified in the NIA. If the proposed attenuation measures to the existing plant are found to be insufficient in achieving these reductions, additional works will be undertaken.

A.2 ENVIRONMENT PROTECTION LICENCE

L4 Noise limits

L4.1 Noise from the premises must not exceed:
a) 55 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm); and
b) 50 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) $L_{Aeq\ (15\ minute)}$, 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:

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.

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

a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
b) 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.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

A.3 OPERATIONAL NOISE MANAGEMENT PLAN

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.

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring for the Existing Development at each location 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 regular attended noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Officer 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.

Attended compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the Existing Development 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 Existing Development should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in **Section 9**.

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 6 – 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. 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 Identification 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.

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 DP&E for approval.

A.4 CONSTRUCTION NOISE MANAGEMENT PLAN

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (**Section 2.6**), Development Consent (SSD 7016) conditions (**Section 2.2**), EPL 3035 (**Section 2.4**) and the measured background noise levels (refer Global Acoustics, May 2016), **Table 6** summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day (7am-6pm) LAeq (15 min)	Evening (6pm-10pm) LAeq (15 min)	Night (10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in **Table 6**.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in **Section 10**.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – 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 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather 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. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in Table 6 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.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

APPENDIX

B CALIBRATION CERTIFICATES

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C21058

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	23.5°C	**Ambient Temperature :**	23.3°C
Relative Humidity :	46.7%	**Relative Humidity :**	47.7%
Barometric Pressure :	100.28kPa	**Barometric Pressure :**	100.25kPa

Calibration Technician : Jeff Yu **Secondary Check:** Max Moore
Calibration Date : 8 Feb 2021 **Report Issue Date :** 9 Feb 2021

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.12dB*	*Temperature*	*±0.2°C*
1kHz	*±0.11dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.13dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA
WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator
IEC 60942-2017

Calibration Certificate

Calibration Number C21059

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Pulsar Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	23.3°C
Relative Humidity :	47.7%
Barometric Pressure :	100.27kPa

Calibration Technician :	Jeff Yu	**Secondary Check:**	Max Moore
Calibration Date :	08 Feb 2021	**Report Issue Date :**	9 Feb 2021

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.02	1000.40

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Specific Tests		Least Uncertainties of Measurement - Environmental Conditions	
Generated SPL	*±0.14dB*	*Temperature*	*±0.2°C*
Frequency	*±0.09%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.09%*	*Barometric Pressure*	*±0.015kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

* The tests <1000 kHz are not covered by Acoustic Research Labs Pty Ltd NATA accreditation.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

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Borg Panels Facility

Environmental Noise Monitoring
Quarter 3 2021

Prepared for
Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

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Email global@globalacoustics.com.au
ABN 94 094 985 734

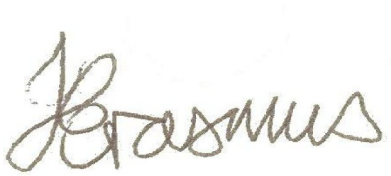
Borg Panels Facility

Environmental Noise Monitoring
Quarter 3 2021

Reference: 21228_R01_RevA
Report date: 26 October 2021

Prepared for
Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by
Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared:	Jonathan Erasmus Consultant	QA Review:	Robert Kirwan Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 16 September 2021 at four monitoring locations around Borg.

1.2 Monitoring Locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1. It should be noted that Figure 1 shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED MONITORING LOCATIONS

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

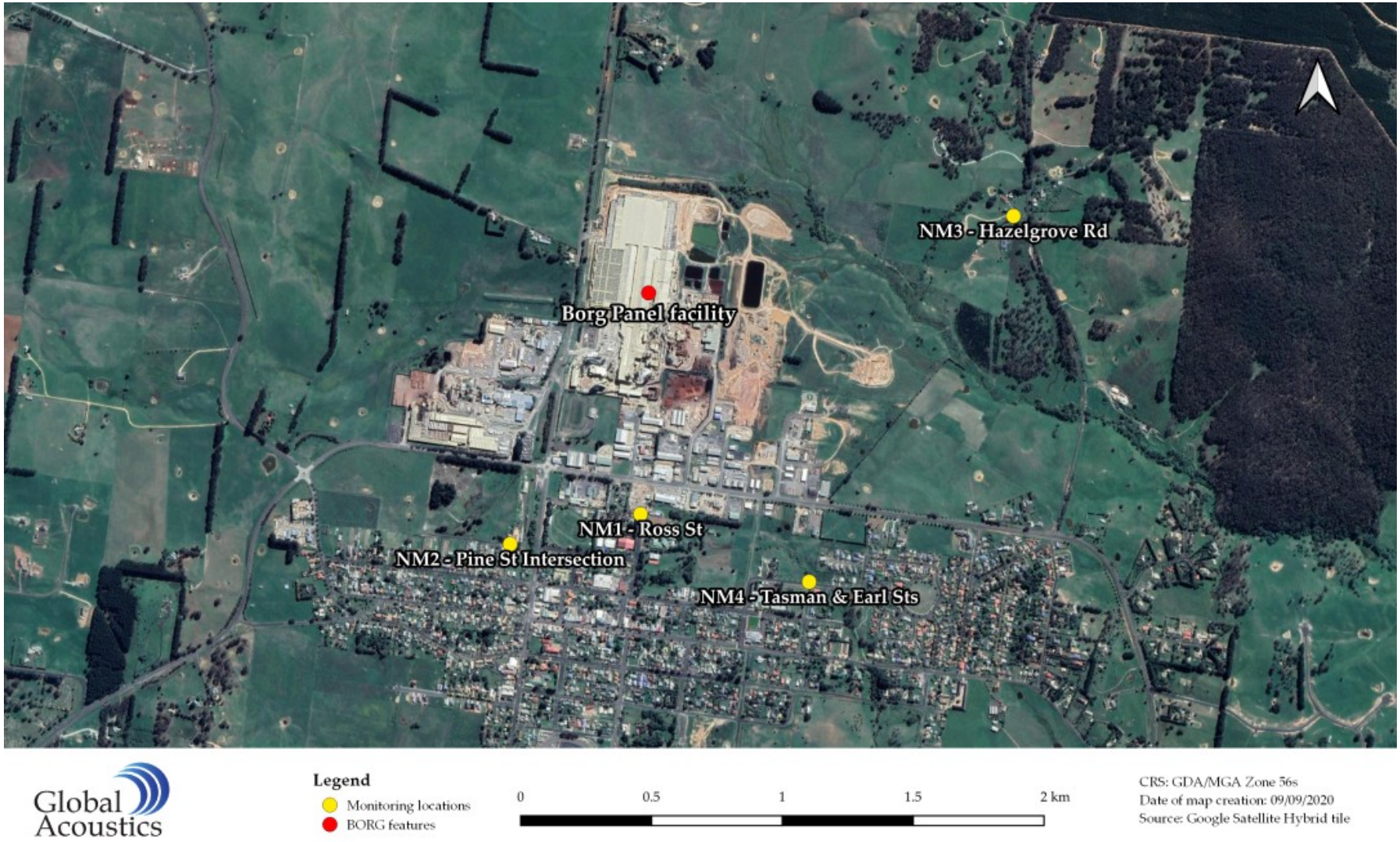

Figure 1: Attended Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
L_{Amax}	The maximum A-weighted noise level over a time period.
L_{A1}	The noise level which is exceeded for 1 per cent of the time.
$L_{A1,1minute}$	The noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The noise level which is exceeded for 10 percent of the time.
L_{Aeq}	The average noise A-weighted energy during a measurement period.
L_{A50}	The noise level which is exceeded for 50 per cent of the time and the median noise level during a measurement period.
L_{A90}	The level exceeded for 90 percent of the time. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00am to 6:00pm.
Evening	This is the period 6:00pm to 10:00pm.
Night	This is the period 10:00pm to 7:00am.

2 REGULATOR REQUIREMENTS AND NOISE CRITERIA

2.1 Development Consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 22 May 2020. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment Protection Licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 4 September 2019. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Operational Noise Management Plan

Noise monitoring requirements are detailed in the Borg Operational Noise Management Plan (ONMP) and Construction Noise Management Plan (CNMP). The most recent version of the ONMP was approved in October 2020. The most recent version of the CNMP was approved in May 2021. Relevant sections of the ONMP and CNMP are reproduced in Appendix A.

2.4 Noise Criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1: IMPACT ASSESSMENT CRITERIA

Location	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
All sensitive receivers	55	50	45

Construction noise criteria for each monitoring location are detailed in Table 2.2 and Table 2.3.

Table 2.2: GENERAL CONSTRUCTION NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
NM1	55	50	45
NM2	55	50	45
NM3	55	50	45
NM4	55	50	45

Table 2.3: ROCK/CONCRETE BREAKING NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB
NM1	75
NM2	75
NM3	75
NM4	75

2.5 Meteorological Conditions

As described in the consent, noise generated by Borg is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy (INP), as follows:

- during rain and 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.

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been undertaken in accordance with Fact Sheet C of the NPfI.

3 METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg ONMP and CNMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended Noise Monitoring

During this survey, attended monitoring was undertaken during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also undertaken at each monitoring location.

This survey presents noise levels gathered during attended monitoring that are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15minute}$ and $L_{A1,1minute}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfI. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- Site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- Site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- It was not feasible, nor reasonable to employ methods such as move closer and back calculate. Cases

may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

A measurement of $L_{A1,1minute}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this is the highest noise level, or L_{Amax}, received from the site during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of the site only $L_{Aeq,15minute}$ level.

3.3 Modifying Factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB").

If applicable, modifying factors have been reported and added to measured site-only L_{Aeq} noise levels when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} levels if Borg was the only contributing low-frequency noise source.

3.4 Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	30131882	08/02/2023
Pulsar 105 acoustic calibrator	78226	08/02/2023

4 RESULTS

4.1 Total Measured Noise Levels

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1: MEASURED NOISE LEVELS – QUARTER 3 2021[1]

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A50} dB	L_{A90} dB	L_{Amin} dB
NM1	16/09/2021 14:21	65	61	58	53	47	43	41
NM2	16/09/2021 14:45	64	53	47	46	44	43	40
NM3	16/09/2021 15:11	63	50	40	39	35	33	31
NM4	16/09/2021 13:54	56	51	47	44	43	38	33

Notes:

1. *Levels in this table are not necessarily the result of activity at Borg.*

4.2 Modifying Factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfI and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15minute}$ levels from Borg with the project specific noise criteria.

Table 4.2: $L_{Aeq,15minute}$ GENERATED BY BORG AGAINST CRITERIA – QUARTER 3 2021

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15min}$ dB[2]	Exceedance[3,4]
NM1	16/09/2021 14:21	1.6	A	55	Yes	43	Nil
NM2	16/09/2021 14:45	1.4	A	55	Yes	44	Nil
NM3	16/09/2021 15:11	1.6	B	55	Yes	35	Nil
NM4	16/09/2021 13:54	1.6	A	55	Yes	34	Nil

Notes:

1. *Noise criteria apply under all meteorological conditions except those detailed in Section 2.5;*
2. *Site-only $L_{Aeq,15minute}$ attributed to Borg, including modifying factors if applicable;*
3. *Bold results in red indicate exceedance of criterion (if applicable); and*
4. *NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.*

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator during each measurement using a Kestrel hand-held weather meter is shown in Table 4.3. The wind speed, direction and temperature were measured at approximately 1.8 metres. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3: MEASURED ATMOSPHERIC CONDITIONS – QUARTER 3 2021

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	16/09/2021 14:21	16	0.0	-	4
NM2	16/09/2021 14:45	16	0.0	-	4
NM3	16/09/2021 15:11	13	0.0	-	3
NM4	16/09/2021 13:54	16	0.0	-	5

Notes:

1. *"-" indicates calm conditions at monitoring location.*

Meteorological data used for compliance assessment is sourced from the Borg AWS.

5 SUMMARY

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 16 September 2021 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 3 2021 survey at all monitoring locations. Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Global Acoustics Pty Ltd

APPENDIX

A REGULATOR DOCUMENTS

A.1 DEVELOPMENT CONSENT SSD 7016

NOISE

Hours of Work

B13. The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14. Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:
(a) works that are inaudible at the nearest sensitive receivers;
(b) works agreed to in writing by the Secretary;
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
(d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15. The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:
(a) be prepared by a suitably qualified and experienced noise expert;
(b) be approved by the Secretary prior to the commencement of construction of the Project;
(c) describe procedures for achieving the noise limits in **Table 2**;
(d) describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
(e) include strategies that have been developed with the community for managing noisy works;
(f) describe the community consultation undertaken to develop the strategies in e) above; and
(g) include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16. The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2.**

Table 2: 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.*

Noise Mitigation

B17. 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.

Operational Noise Management Plan

B18. 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:
- (a) be prepared by a suitably qualified and experienced noise expert;
- (b) describe the measures that will be implemented to minimise noise from the Existing Development including:
  - (i) all reasonable and feasible measures being employed on site;
  - (ii) maintain equipment to ensure it is in good order;
  - (iii) traffic noise is effectively managed;
  - (iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
  - (v) compliance with the relevant conditions of this consent;
- (c) includes a noise monitoring program that:
  - (i) must be carried out until otherwise agreed to in writing by the Secretary;
  - (ii) is capable of evaluating the performance of the Existing Development; and
  - (iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and
- (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.

B19. 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:
- (a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; and
- (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.
- (c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area.
- (d) details of the noise attenuation measures for the materials handling equipment approved for installation and operation under SSD-7016-Mod-3.

Noise Verification

B20. Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert;
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;
- (d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B20A. Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert; and
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSD-7016-Mod-3, the Applicant must undertake a Noise Verification Study for the Development to the satisfaction of the Secretary. The Study must:
(a) be undertaken by a suitably qualified expert;
(b) include an analysis of compliance with noise limits specified in Condition B16;
(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21. Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26. Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27. Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

Noise

Attenuation, as detailed in the NIA, will be implemented as follows:

- Conti 1 Dryer Fan air intake redesigned and the fan speed reduced to minimise noise generated. A sound power reduction from LAeq 121 dB to 114 dB or better is required.
- Booster fan will receive additional insulation and a reduction in fan speed. A sound power reduction from LAeq 116 dB to 109 dB or better is required.
- Main fibre transport fan will have a concrete enclosure constructed around it. A sound power reduction from LAeq 110 dB to 104 dB or better is required.

In short, the approach taken by Borg to mitigate noise is based on a number of factors:

1. Continuation of the use of mobile chippers (that is, not to enclose the mobile chippers). However, these are backup items (only to be used when enclosed, electric chippers are not operational), and will not be used in enhancing met conditions.
2. Implementation of additional noise mitigation measures to minimise noise generated by equipment, as detailed above.
3. Provision of sound attenuation structures and enclosures to other equipment where appropriate.

Irrespective of the above, Borg undertakes to meet the existing plant sound power reductions specified in the NIA. If the proposed attenuation measures to the existing plant are found to be insufficient in achieving these reductions, additional works will be undertaken.

A.2 ENVIRONMENT PROTECTION LICENCE

L4 Noise limits

L4.1 Noise from the premises must not exceed:
a) 55 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm); and
b) 50 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) $L_{Aeq\ (15\ minute)}$, 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:

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.

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

a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
b) 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.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

A.3 OPERATIONAL NOISE MANAGEMENT PLAN

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.

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring for the Existing Development at each location 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 regular attended noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Officer 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.

Attended compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the Existing Development 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 Existing Development should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in **Section 9**.

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 6 – 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. 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 Identification 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.

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 DP&E for approval.

A.4 CONSTRUCTION NOISE MANAGEMENT PLAN

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (**Section 2.6**), Development Consent (SSD 7016) conditions (**Section 2.2**), EPL 3035 (**Section 2.4**) and the measured background noise levels (refer Global Acoustics, May 2016), **Table 6** summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day (7am-6pm) LAeq (15 min)	Evening (6pm-10pm) LAeq (15 min)	Night (10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in **Table 6**.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in **Section 10**.

7.2.2 Management Monitoring

In addition to quarterly compliance monitoring, off-site management noise monitoring by suitably trained site personnel should be undertaken regularly, particularly during periods of meteorological enhancement and on commencement of new construction activities or areas, to ensure relevant noise criteria are adhered to.

Operations should be modified accordingly as required when exceedance or potential exceedances are measured. Modifications may include, but are not limited to, erection of temporary barriers or screens, temporary shutdown of equipment until adverse weather conditions change, or relocating equipment to less sensitive areas when feasible to do so.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – 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 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather 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. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in Table 6 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.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

APPENDIX

B CALIBRATION CERTIFICATES

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C21058

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	23.5°C	**Ambient Temperature :**	23.3°C
Relative Humidity :	46.7%	**Relative Humidity :**	47.7%
Barometric Pressure :	100.28kPa	**Barometric Pressure :**	100.25kPa

Calibration Technician : Jeff Yu
Secondary Check: Max Moore
Calibration Date : 8 Feb 2021
Report Issue Date : 9 Feb 2021

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.12dB*	*Temperature*	*±0.2°C*
1kHz	*±0.11dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.13dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA
WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator
IEC 60942-2017
Calibration Certificate

Calibration Number C21059

Client Details Global Acoustics Pty Ltd
12/16 Huntingdale Drive
Thornton NSW 2322

Equipment Tested/ Model Number : Pulsar Model 105
Instrument Serial Number : 78226

Atmospheric Conditions
Ambient Temperature : 23.3°C
Relative Humidity : 47.7%
Barometric Pressure : 100.27kPa

Calibration Technician : Jeff Yu
Calibration Date : 08 Feb 2021
Secondary Check: Max Moore
Report Issue Date : 9 Feb 2021

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.02	1000.40

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Least Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.14dB*	*Temperature*	*±0.2°C*
Frequency	*±0.09%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.09%*	*Barometric Pressure*	*±0.015kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

* The tests <1000 kHz are not covered by Acoustic Research Labs Pty Ltd NATA accreditation.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

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Borg Panels Facility

Environmental Noise Monitoring

Quarter 4 2021

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Borg Panels Facility

Environmental Noise Monitoring
Quarter 4 2021

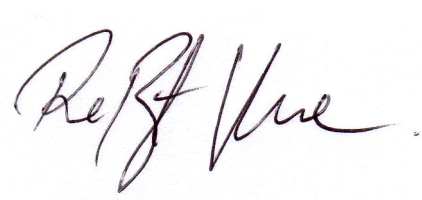
Reference: 21267_R01
Report date: 9 December 2021

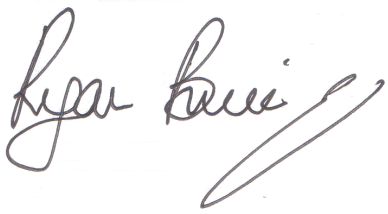
Prepared for

Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322





Prepared:	Robert Kirwan Consultant	QA Review:	Ryan Bruniges Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 17 November 2021 at four monitoring locations around Borg.

1.2 Monitoring Locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1. It should be noted that Figure 1 shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED MONITORING LOCATIONS

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

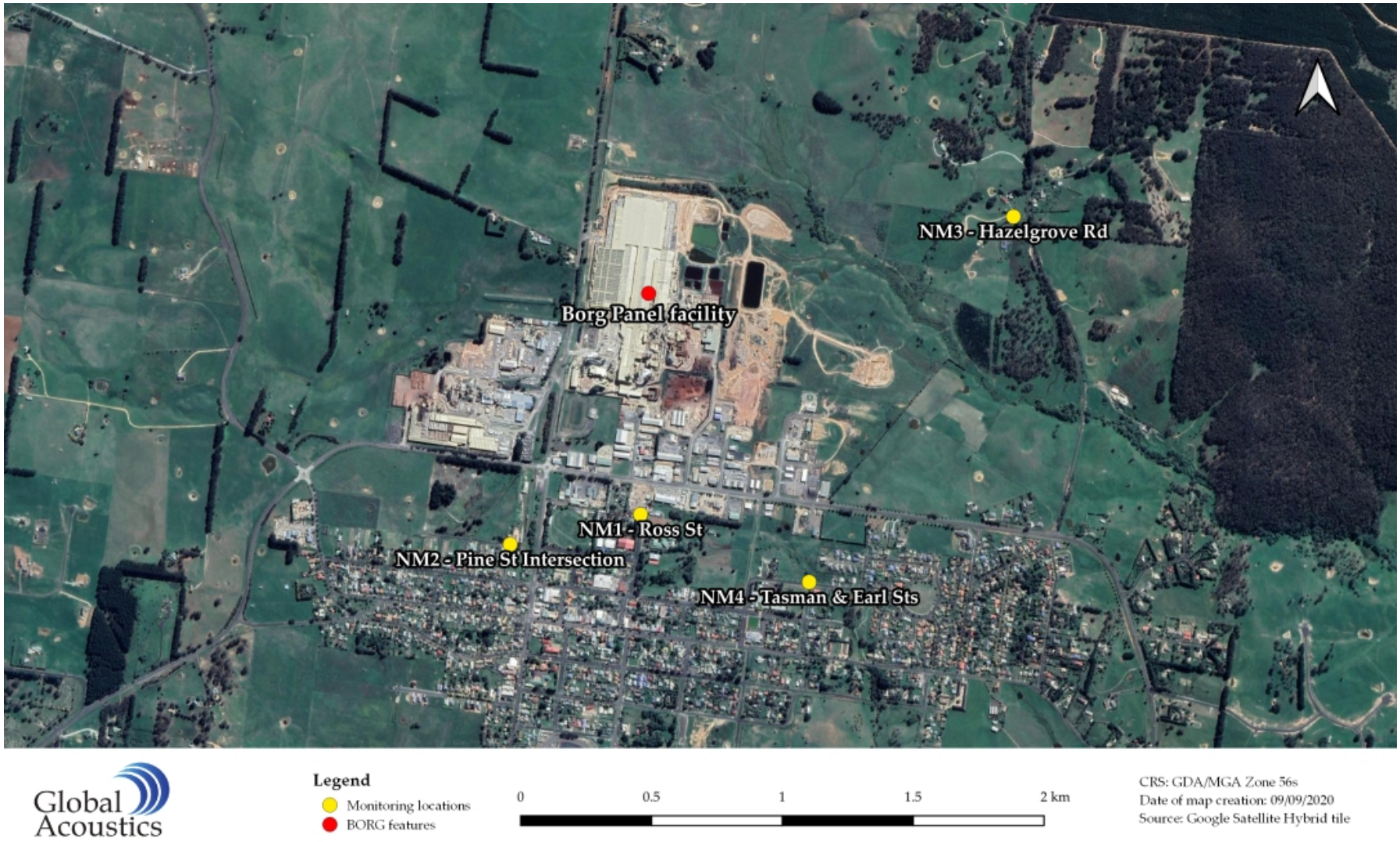

Figure 1: Attended Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
L_{Amax}	The maximum A-weighted noise level over a time period.
L_{A1}	The noise level which is exceeded for 1 per cent of the time.
$L_{A1,1minute}$	The noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The noise level which is exceeded for 10 percent of the time.
L_{Aeq}	The average noise A-weighted energy during a measurement period.
L_{A50}	The noise level which is exceeded for 50 per cent of the time and the median noise level during a measurement period.
L_{A90}	The level exceeded for 90 percent of the time. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00am to 6:00pm.
Evening	This is the period 6:00pm to 10:00pm.
Night	This is the period 10:00pm to 7:00am.

2 REGULATOR REQUIREMENTS AND NOISE CRITERIA

2.1 Development Consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 22 May 2020. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment Protection Licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 4 September 2019. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Operational Noise Management Plan

Noise monitoring requirements are detailed in the Borg Operational Noise Management Plan (ONMP) and Construction Noise Management Plan (CNMP). The most recent version of the ONMP was approved in October 2020. The most recent version of the CNMP was approved in May 2021. Relevant sections of the ONMP and CNMP are reproduced in Appendix A.

2.4 Noise Criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1: IMPACT ASSESSMENT CRITERIA

Location	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
All sensitive receivers	55	50	45

Construction noise criteria for each monitoring location are detailed in Table 2.2 and Table 2.3.

Table 2.2: GENERAL CONSTRUCTION NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
NM1	55	50	45
NM2	55	50	45
NM3	55	50	45
NM4	55	50	45

Table 2.3: ROCK/CONCRETE BREAKING NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB
NM1	75
NM2	75
NM3	75
NM4	75

2.5 Meteorological Conditions

As described in the consent, noise generated by Borg is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy (INP), as follows:

- during rain and 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.

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been undertaken in accordance with Fact Sheet C of the NPfI.

3 METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg ONMP and CNMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended Noise Monitoring

During this survey, attended monitoring was undertaken during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also undertaken at each monitoring location.

This survey presents noise levels gathered during attended monitoring that are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15minute}$ and $L_{A1,1minute}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfI. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- Site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- Site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- It was not feasible, nor reasonable to employ methods such as move closer and back calculate. Cases

may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

A measurement of $L_{A1,1minute}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this is the highest noise level, or L_{Amax}, received from the site during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of the site only noise.

3.3 Modifying Factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB").

If applicable, modifying factors have been reported and added to measured site-only L_{Aeq} noise levels when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} levels if Borg was the only contributing low-frequency noise source.

3.4 Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	1070590	11/06/2022
Pulsar 105 acoustic calibrator	74813	10/06/2022

4 RESULTS

4.1 Total Measured Noise Levels

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1: MEASURED NOISE LEVELS – QUARTER 4 2021[1]

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A50} dB	L_{A90} dB	L_{Amin} dB
NM1	17/11/2021 11:21	61	57	54	52	51	49	47
NM2	17/11/2021 10:42	58	52	48	46	45	43	40
NM3	17/11/2021 11:52	70	61	43	46	37	34	31
NM4	17/11/2021 12:28	65	61	54	51	48	45	41

Notes:

1. *Levels in this table are not necessarily the result of activity at Borg.*

4.2 Modifying Factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfI and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15minute}$ levels from Borg with the project specific noise criteria.

Table 4.2: $L_{Aeq,15minute}$ GENERATED BY BORG AGAINST CRITERIA – QUARTER 4 2021

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15min}$ dB[2]	Exceedance[3,4]
NM1	17/11/2021 11:21	3.1	A	55	No	50	NA
NM2	17/11/2021 10:42	2.1	A	55	Yes	44	Nil
NM3	17/11/2021 11:52	2.3	A	55	Yes	33	Nil
NM4	17/11/2021 12:28	2.3	A	55	Yes	42	Nil

Notes:

1. *Noise criteria apply under all meteorological conditions except those detailed in Section 2.5;*
2. *Site-only $L_{Aeq,15minute}$ attributed to Borg, including modifying factors if applicable;*
3. *Bold results in red indicate exceedance of criterion (if applicable); and*
4. *NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.*

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator during each measurement using a Kestrel hand-held weather meter is shown in Table 4.3. The wind speed, direction and temperature were measured at approximately 1.8 metres. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3: MEASURED ATMOSPHERIC CONDITIONS – QUARTER 4 2021

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	17/11/2021 11:21	13	2.0	10	6
NM2	17/11/2021 10:42	16	0.0	0	6
NM3	17/11/2021 11:52	17	1.1	340	5
NM4	17/11/2021 12:28	18	1.2	Not recorded	5

Notes:

1. *"-" indicates calm conditions at monitoring location.*

Meteorological data used for compliance assessment is sourced from the Borg AWS.

5 SUMMARY

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 17 November 2021 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 4 2021 survey at all monitoring locations. Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Global Acoustics Pty Ltd

APPENDIX

A REGULATOR DOCUMENTS

A.1 DEVELOPMENT CONSENT SSD 7016

NOISE

Hours of Work

B13. The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14. Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:
(a) works that are inaudible at the nearest sensitive receivers;
(b) works agreed to in writing by the Secretary;
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
(d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15. The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:
(a) be prepared by a suitably qualified and experienced noise expert;
(b) be approved by the Secretary prior to the commencement of construction of the Project;
(c) describe procedures for achieving the noise limits in **Table 2**;
(d) describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
(e) include strategies that have been developed with the community for managing noisy works;
(f) describe the community consultation undertaken to develop the strategies in e) above; and
(g) include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16. The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2.**

Table 2: 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.*

Noise Mitigation

B17. 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.

Operational Noise Management Plan

B18. 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:
- (a) be prepared by a suitably qualified and experienced noise expert;
- (b) describe the measures that will be implemented to minimise noise from the Existing Development including:
  - (i) all reasonable and feasible measures being employed on site;
  - (ii) maintain equipment to ensure it is in good order;
  - (iii) traffic noise is effectively managed;
  - (iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
  - (v) compliance with the relevant conditions of this consent;
- (c) includes a noise monitoring program that:
  - (i) must be carried out until otherwise agreed to in writing by the Secretary;
  - (ii) is capable of evaluating the performance of the Existing Development; and
  - (iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and
- (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.

B19. 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:
- (a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; and
- (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.
- (c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area.
- (d) details of the noise attenuation measures for the materials handling equipment approved for installation and operation under SSD-7016-Mod-3.

Noise Verification

B20. Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert;
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;
- (d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B20A. Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:
- (a) be undertaken by a suitably qualified expert; and
- (b) include an analysis of compliance with noise limits specified in Condition B16;
- (c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
- (d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSD-7016-Mod-3, the Applicant must undertake a Noise Verification Study for the Development to the satisfaction of the Secretary. The Study must:
(a) be undertaken by a suitably qualified expert;
(b) include an analysis of compliance with noise limits specified in Condition B16;
(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21. Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26. Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27. Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

Noise

Attenuation, as detailed in the NIA, will be implemented as follows:

- Conti 1 Dryer Fan air intake redesigned and the fan speed reduced to minimise noise generated. A sound power reduction from LAeq 121 dB to 114 dB or better is required.
- Booster fan will receive additional insulation and a reduction in fan speed. A sound power reduction from LAeq 116 dB to 109 dB or better is required.
- Main fibre transport fan will have a concrete enclosure constructed around it. A sound power reduction from LAeq 110 dB to 104 dB or better is required.

In short, the approach taken by Borg to mitigate noise is based on a number of factors:

1. Continuation of the use of mobile chippers (that is, not to enclose the mobile chippers). However, these are backup items (only to be used when enclosed, electric chippers are not operational), and will not be used in enhancing met conditions.
2. Implementation of additional noise mitigation measures to minimise noise generated by equipment, as detailed above.
3. Provision of sound attenuation structures and enclosures to other equipment where appropriate.

Irrespective of the above, Borg undertakes to meet the existing plant sound power reductions specified in the NIA. If the proposed attenuation measures to the existing plant are found to be insufficient in achieving these reductions, additional works will be undertaken.

A.2 ENVIRONMENT PROTECTION LICENCE

L4 Noise limits

L4.1 Noise from the premises must not exceed:
a) 55 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm); and
b) 50 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) $L_{Aeq\ (15\ minute)}$, 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:

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.

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

a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
b) 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.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

A.3 OPERATIONAL NOISE MANAGEMENT PLAN

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.

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring for the Existing Development at each location 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 regular attended noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Officer 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.

Attended compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the Existing Development 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 Existing Development should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in **Section 9**.

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 6 – 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. 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 Identification 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.

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 DP&E for approval.

A.4 CONSTRUCTION NOISE MANAGEMENT PLAN

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (**Section 2.6**), Development Consent (SSD 7016) conditions (**Section 2.2**), EPL 3035 (**Section 2.4**) and the measured background noise levels (refer Global Acoustics, May 2016), **Table 6** summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day (7am-6pm) LAeq (15 min)	Evening (6pm-10pm) LAeq (15 min)	Night (10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in **Table 6**.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in **Section 10**.

7.2.2 Management Monitoring

In addition to quarterly compliance monitoring, off-site management noise monitoring by suitably trained site personnel should be undertaken regularly, particularly during periods of meteorological enhancement and on commencement of new construction activities or areas, to ensure relevant noise criteria are adhered to.

Operations should be modified accordingly as required when exceedance or potential exceedances are measured. Modifications may include, but are not limited to, erection of temporary barriers or screens, temporary shutdown of equipment until adverse weather conditions change, or relocating equipment to less sensitive areas when feasible to do so.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – 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 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather 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. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in Table 6 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.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

APPENDIX

B CALIBRATION CERTIFICATES

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C20331

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	01070590
Microphone Serial Number :	08184
Pre-amplifier Serial Number :	52329

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	21.1°C	**Ambient Temperature :**	21.8°C
Relative Humidity :	57.8%	**Relative Humidity :**	56.5%
Barometric Pressure :	101.27kPa	**Barometric Pressure :**	101.17kPa

Calibration Technician : Jeff Yu
Calibration Date : 11 Jun 2020
Secondary Check: Max Moore
Report Issue Date : 15 Jun 2020
Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.2°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172
Accredited for compliance with ISO/IEC 17025 - calibration

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Calibrator
IEC 60942-2017

Calibration Certificate

Calibration Number C20332

Client Details Global Acoustics Pty Ltd
12/16 Huntingdale Drive
Thornton NSW 2322

Equipment Tested/ Model Number : Pulsar Model 106
Instrument Serial Number : 74813

Atmospheric Conditions
Ambient Temperature : 21.5°C
Relative Humidity : 56.9%
Barometric Pressure : 101.46kPa

Calibration Technician : Jeff Yu
Calibration Date : 10 Jun 2020
Secondary Check: Max Moore
Report Issue Date : 15 Jun 2020

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	93.96	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Least Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.14dB*	*Temperature*	*±0.2°C*
Frequency	*±0.09%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.09%*	*Barometric Pressure*	*±0.015kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

* The tests <1000 kHz are not covered by Acoustic Research Labs Pty Ltd NATA accreditation

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

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Borg Panels Facility

Environmental Noise Monitoring

Quarter 1 2022

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
Telephone +61 2 4966 4333
Email global@globalacoustics.com.au
ABN 94 094 985 734

Borg Panels Facility

Environmental Noise Monitoring
Quarter 1 2022

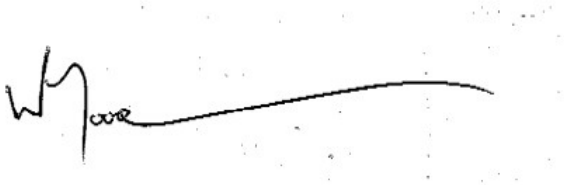
Reference: 22056_R01
Report date: 18 April 2022

Prepared for

Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared:	Will Moore Consultant	QA Review:	Jesse Tribby Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

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Appendices

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 10 March 2022 at four monitoring locations around Borg.

1.2 Monitoring Locations

Monitoring locations are detailed in Table 1.1 and shown in Figure 1. It should be noted that Figure 1 shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED MONITORING LOCATIONS

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

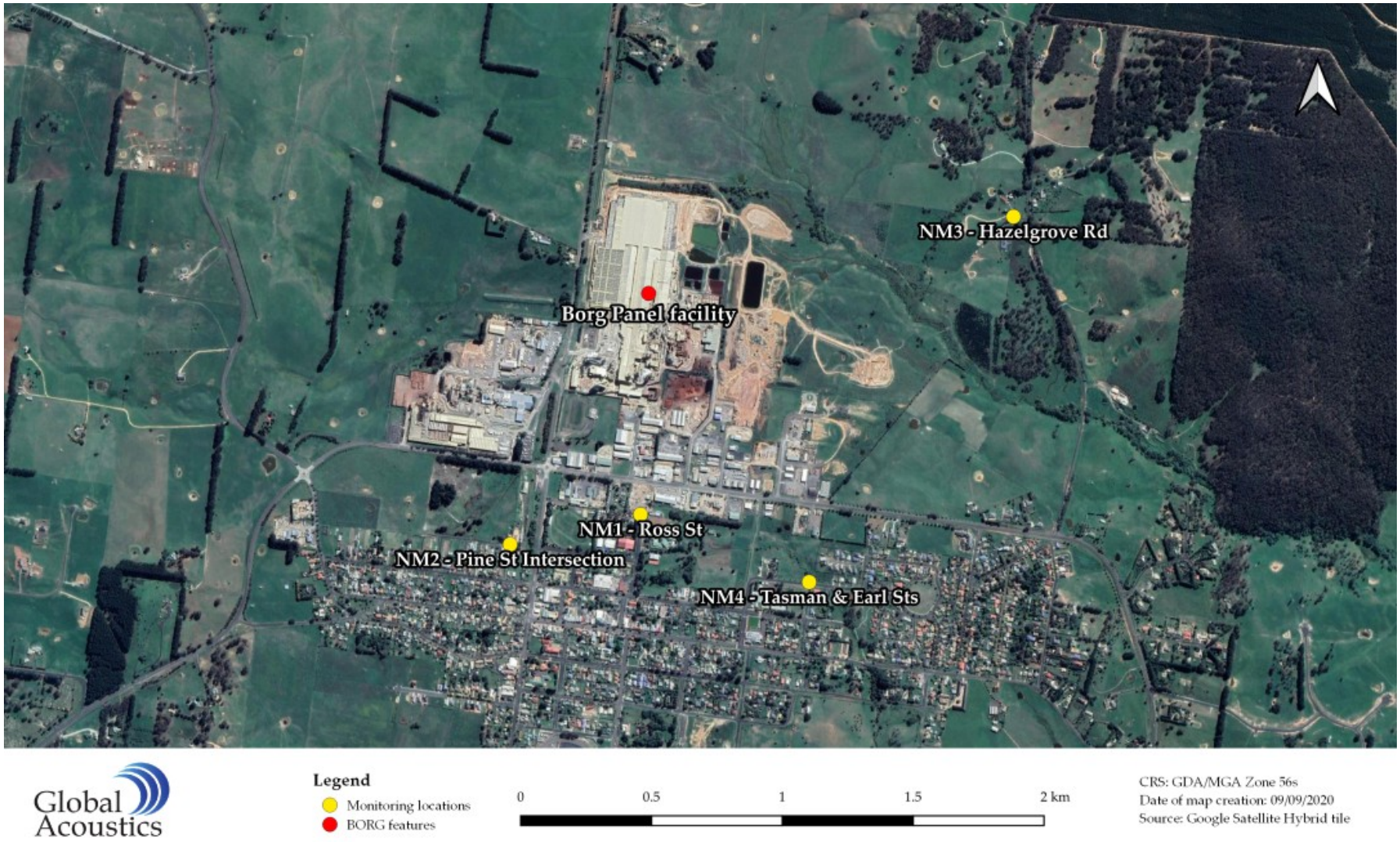

Figure 1: Attended Noise Monitoring Locations

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
L_{Amax}	The maximum A-weighted noise level over a time period.
L_{A1}	The noise level which is exceeded for 1 per cent of the time.
$L_{A1,1minute}$	The noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The noise level which is exceeded for 10 percent of the time.
L_{Aeq}	The average noise A-weighted energy during a measurement period.
L_{A50}	The noise level which is exceeded for 50 per cent of the time and the median noise level during a measurement period.
L_{A90}	The level exceeded for 90 percent of the time. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00am to 6:00pm.
Evening	This is the period 6:00pm to 10:00pm.
Night	This is the period 10:00pm to 7:00am.

2 REGULATOR REQUIREMENTS AND NOISE CRITERIA

2.1 Development Consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 22 May 2020. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment Protection Licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 2 February 2022. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Operational Noise Management Plan

Noise monitoring requirements are detailed in the Borg Operational Noise Management Plan (ONMP) and Construction Noise Management Plan (CNMP). The most recent version of the ONMP was approved in October 2020. The most recent version of the CNMP was approved in May 2021. Relevant sections of the ONMP and CNMP are reproduced in Appendix A.

2.4 Noise Criteria

Noise limits are consistent between the consent and EPL and have been reproduced in Table 2.1 below.

Table 2.1: IMPACT ASSESSMENT CRITERIA

Location	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
All sensitive receivers	55	50	45

Construction noise criteria for each monitoring location are detailed in Table 2.2 and Table 2.3.

Table 2.2: GENERAL CONSTRUCTION NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB	Evening $L_{Aeq,15minute}$ dB	Night $L_{Aeq,15minute}$ dB
NM1	55	50	45
NM2	55	50	45
NM3	55	50	45
NM4	55	50	45

Table 2.3: ROCK/CONCRETE BREAKING NOISE LIMITS

Report Descriptor	Day $L_{Aeq,15minute}$ dB
NM1	75
NM2	75
NM3	75
NM4	75

2.5 Meteorological Conditions

As described in the consent, noise generated by Borg is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy (INP), as follows:

- during rain and 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.

2.6 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP, 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors has been undertaken in accordance with Fact Sheet C of the NPfI.

3 METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was conducted in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements, and the Borg ONMP and CNMP. Meteorological data was obtained from the Borg automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured noise levels.

3.2 Attended Noise Monitoring

During this survey, attended monitoring was undertaken during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also undertaken at each monitoring location.

This survey presents noise levels gathered during attended monitoring that are the result of many sounds reaching the sound level meter microphone during monitoring. Received levels from various noise sources were noted during attended monitoring and particular attention was paid to the extent of Borg's contribution, if any, to measured levels. At each receptor location, Borg's $L_{Aeq,15minute}$ and $L_{A1,1minute}$ (in the absence of any other noise) was measured directly, where possible, or, determined by frequency analysis.

If the exact contribution of the source of interest (in this case Borg) cannot be established, due to masking by other noise sources in a similar frequency range, but site noise levels are observed to be well below (more than 5 dB lower than) any relevant criterion, a maximum estimate of the potential contribution of the site might be made based on other measured site-only noise descriptors in accordance with Section 7.1 of the NPfI. This is generally expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may also be used in this report. When site noise is noted as IA, no site noise was audible at the monitoring location. When site noise is noted as NM, this means some noise was audible but could not be quantified. If site noise was NM due to masking but estimated to be significant in relation to a relevant criterion, we would employ methods (e.g. measure closer and back calculate) to determine a value for reporting.

All sites noted as NM in this report are due to one or more of the following reasons:

- Site noise levels were extremely low and unlikely, in many cases, to be even noticed;
- Site noise levels were masked by another relatively loud noise source that is characteristic of the environment (e.g. breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer; and/or
- It was not feasible, nor reasonable to employ methods such as move closer and back calculate. Cases

may include, but are not limited to, rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

A measurement of $L_{A1,1minute}$ corresponds to the highest noise level generated for 0.6 second during one minute. In practical terms this is the highest noise level, or L_{Amax}, received from the site during the entire measurement period (i.e. the highest level of the worst minute during the 15 minute measurement).

Often extraneous noise events (for example, road traffic pass-bys and dogs) interfere with the measurement of site noise levels in the frequency range of interest. Where required, the sound level meter is paused during these occurrences to aid in quantification of the site only noise.

3.3 Modifying Factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB").

If applicable, modifying factors have been reported and added to measured site-only L_{Aeq} noise levels when meteorological conditions satisfied requirements for site noise criteria to be applicable. Low-frequency modifying factors have only been applied to site-only L_{Aeq} levels if Borg was the only contributing low-frequency noise source.

3.4 Monitoring Equipment

Table 3.1 lists the equipment used to measure environmental noise levels. Calibration certificates are provided in Appendix B.

Table 3.1: ATTENDED NOISE MONITORING EQUIPMENT

Model	Serial Number	Calibration Due Date
Rion NA-28 sound level meter	00370304	24/11/2022
Pulsar 105 acoustic calibrator	81334	29/11/2023

4 RESULTS

4.1 Total Measured Noise Levels

Overall noise levels measured at each location during attended measurements are provided in Table 4.1.

Table 4.1: MEASURED NOISE LEVELS – QUARTER 1 2022 [1]

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A50} dB	L_{A90} dB	L_{Amin} dB
NM1	10/03/2022 09:46	67	56	52	50	49	46	43
NM2	10/03/2022 09:10	58	51	47	45	43	41	39
NM3	10/03/2022 10:57	76	65	44	51	37	35	33
NM4	10/03/2022 10:20	69	60	53	49	45	37	33

Notes:

1. *Levels in this table are not necessarily the result of activity at Borg.*

4.2 Modifying Factors

Measured site-only levels were assessed for the applicability of modifying factors in accordance with the NPfI and methodology described in Section 3.3.

There were no modifying factors, as defined in the NPfI, applicable during the survey.

4.3 Attended Noise Monitoring

Table 4.2 compares measured $L_{Aeq,15minute}$ levels from Borg with the project specific noise criteria.

Table 4.2: $L_{Aeq,15minute}$ GENERATED BY BORG AGAINST CRITERIA – QUARTER 1 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15min}$ dB[2]	Exceedance[3,4]
NM1	10/03/2022 09:46	0.4	C	55	Yes	44	Nil
NM2	10/03/2022 09:10	0.0	D	55	Yes	38	Nil
NM3	10/03/2022 10:57	0.0	B	55	Yes	28	Nil
NM4	10/03/2022 10:20	0.0	C	55	Yes	<25	Nil

Notes:

1. *Noise criteria apply under all meteorological conditions except those detailed in Section 2.5;*
2. *Site-only $L_{Aeq,15minute}$ attributed to Borg, including modifying factors if applicable;*
3. *Bold results in red indicate exceedance of criterion (if applicable); and*
4. *NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.*

4.4 Atmospheric Conditions

Atmospheric condition data measured by the operator during each measurement using a Kestrel hand-held weather meter is shown in Table 4.3. The wind speed, direction and temperature were measured at approximately 1.8 metres. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3: MEASURED ATMOSPHERIC CONDITIONS – QUARTER 1 2022

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	10/03/2022 09:46	13	0.4	340	8
NM2	10/03/2022 09:10	12	0.4	330	8
NM3	10/03/2022 10:57	15	0.7	305	8
NM4	10/03/2022 10:20	14	1.4	320	8

Notes:

1. *"-" indicates calm conditions at monitoring location.*

Meteorological data used for compliance assessment is sourced from the Borg AWS.

5 SUMMARY

Global Acoustics was engaged by Borg Manufacturing Pty Ltd to conduct a noise survey of operations and construction at the Borg panel manufacturing facility (Borg) near Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Attended environmental noise monitoring described in this report was undertaken during the day period of 10 March 2022 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 1 2022 survey at all monitoring locations. Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Global Acoustics Pty Ltd

APPENDIX

A REGULATOR DOCUMENTS

A.1 DEVELOPMENT CONSENT SSD 7016

NOISE

Hours of Work

B13. The Applicant must comply with the hours detailed in **Table 1**, unless otherwise agreed in writing by the Secretary.

Table 1: Hours of Work

Activity	Day	Time
Earthworks and Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 1 pm
Operation	Monday – Sunday	24 hours

B14. Works outside of the hours identified in Condition B13 may be undertaken in the following circumstances:
(a) works that are inaudible at the nearest sensitive receivers;
(b) works agreed to in writing by the Secretary;
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
(d) where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm.

Construction Noise Management Plan

B15. The Applicant must prepare a Construction Noise Management Plan (CNMP) for the Project to manage construction noise. The plan must form part of the CEMP required by Condition C1 and must:
(a) be prepared by a suitably qualified and experienced noise expert;
(b) be approved by the Secretary prior to the commencement of construction of the Project;
(c) describe procedures for achieving the noise limits in **Table 2**;
(d) describe the measures to be implemented to manage noisy works such as rock/concrete breaking activities, in close proximity to sensitive receivers;
(e) include strategies that have been developed with the community for managing noisy works;
(f) describe the community consultation undertaken to develop the strategies in e) above; and
(g) include a complaints management system that would be implemented for the duration of the Project.

Operational Noise Limits

B16. The Applicant must ensure that noise generated by the Development does not exceed the noise limits in **Table 2.**

Table 2: 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.*

Noise Mitigation

B17. 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.

Operational Noise Management Plan

B18. 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:

(a) be prepared by a suitably qualified and experienced noise expert;

(b) describe the measures that will be implemented to minimise noise from the Existing Development including:

(i) all reasonable and feasible measures being employed on site;
(ii) maintain equipment to ensure it is in good order;
(iii) traffic noise is effectively managed;
(iv) the noise impacts of the Existing Development are minimised during any meteorological conditions when the noise criteria in this consent do not apply;
(v) compliance with the relevant conditions of this consent;

(c) includes a noise monitoring program that:

(i) must be carried out until otherwise agreed to in writing by the Secretary;
(ii) is capable of evaluating the performance of the Existing Development; and
(iii) includes a protocol for determining exceedances of the relevant conditions of this consent and responding to complaints; and

(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.

B19. 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:

(a) description of the noise monitoring program to measure the performance of the Development against this consent and the EPL; and

(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.

(c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area.

(d) details of the noise attenuation measures for the materials handling equipment approved for installation and operation under SSD-7016-Mod-3.

Noise Verification

B20. Within 3 months of commencement of operation of the Project, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:

(a) be undertaken by a suitably qualified expert;

(b) include an analysis of compliance with noise limits specified in Condition B16;

(c) demonstrate achievement of the sound power levels in Table 12 of the *Borg Panels Timber Panel Processing Facility Noise and Vibration Impact Assessment*, dated May 2016 and prepared by Global Acoustics;

(d) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and

(e) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B20A. Within three months of the commissioning of the gas turbines and ancillary equipment, the Applicant must undertake a noise verification study for the Development to the satisfaction of the Secretary. The study must:

(a) be undertaken by a suitably qualified expert; and

(b) include an analysis of compliance with noise limits specified in Condition B16;

(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and

(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSD-7016-Mod-3, the Applicant must undertake a Noise Verification Study for the Development to the satisfaction of the Secretary. The Study must:
(a) be undertaken by a suitably qualified expert;
(b) include an analysis of compliance with noise limits specified in Condition B16;
(c) include an outline of management actions to be taken to address any exceedances of the limits specified in Condition B16; and
(d) describe the contingency measures in the event management actions are not effective in reducing noise levels to an acceptable level.

B21. Should the noise verification study indicate the Development has not complied with the noise limits in Condition B16 and applicable EPL requirements, or where the verification indicates that greater impacts than predicted in the EIS may arise, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

B26. Within 3 months of commissioning the two cogeneration units, the Applicant, in consultation with the EPA, must undertake post-commissioning noise monitoring of the cogeneration units to demonstrate the operation of the cogeneration units do not exceed the noise criteria at sensitive receivers as described in Section 7.0 of *Gas Fire Co-generators Noise Impact Assessment* prepared by Vipac Engineers and Scientists, dated 2 July 2015.

Within 1 month of completing the study, the Applicant must submit a report outlining the findings of the study to the Secretary and the EPA.

B27. Should the post-commissioning emissions verification study indicate the two cogeneration units have not demonstrated compliance with the NIA, a detailed investigation and an outline of any management measures necessary to prevent exceedances must be submitted to the Secretary and the EPA, as part of the study.

Noise

Attenuation, as detailed in the NIA, will be implemented as follows:

- Conti 1 Dryer Fan air intake redesigned and the fan speed reduced to minimise noise generated. A sound power reduction from LAeq 121 dB to 114 dB or better is required.
- Booster fan will receive additional insulation and a reduction in fan speed. A sound power reduction from LAeq 116 dB to 109 dB or better is required.
- Main fibre transport fan will have a concrete enclosure constructed around it. A sound power reduction from LAeq 110 dB to 104 dB or better is required.

In short, the approach taken by Borg to mitigate noise is based on a number of factors:

1. Continuation of the use of mobile chippers (that is, not to enclose the mobile chippers). However, these are backup items (only to be used when enclosed, electric chippers are not operational), and will not be used in enhancing met conditions.
2. Implementation of additional noise mitigation measures to minimise noise generated by equipment, as detailed above.
3. Provision of sound attenuation structures and enclosures to other equipment where appropriate.

Irrespective of the above, Borg undertakes to meet the existing plant sound power reductions specified in the NIA. If the proposed attenuation measures to the existing plant are found to be insufficient in achieving these reductions, additional works will be undertaken.

A.2 ENVIRONMENT PROTECTION LICENCE

L4 Noise limits

L4.1 Noise from the premises must not exceed:
a) 55 dB(A) $L_{Aeq(15\ minute)}$ during the day (7am to 6pm); and
b) 50 dB(A) $L_{Aeq(15\ minute)}$ during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) $L_{Aeq\ (15\ minute)}$, 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:

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.

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

a) Data recorded by the meteorological station identified as EPA Licence Point 26 must be used to determine meteorological conditions; and
b) 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.

M7 Other monitoring and recording conditions

M7.1 Noise monitoring to determine compliance with condition L4 must be carried out at least once annually during the day, evening, and night time hours specified by L4.1 at the location(s) specified under condition L4.2 or at the nearest residence, and be undertaken in accordance with Australian Standard AS 2659.1 (1998) Guide to use of sound measuring equipment - portable sound level meters, and the compliance monitoring guidance provided in the NSW Industrial Noise Policy.

A.3 OPERATIONAL NOISE MANAGEMENT PLAN

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.

7.3.1 Compliance Monitoring

It is proposed to conduct compliance monitoring for the Existing Development at each location 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 regular attended noise monitoring is to be investigated. The acoustic consultant undertaking the attended monitoring is to contact the Environment Officer 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.

Attended compliance monitoring is to be undertaken by a suitably qualified noise expert. Appropriate techniques should be applied to determine noise contributions from the Existing Development 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 Existing Development should be fully operational at the time of monitoring.

Operational noise performance is reported as detailed in **Section 9**.

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 6 – 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. 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 Identification 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.

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 DP&E for approval.

A.4 CONSTRUCTION NOISE MANAGEMENT PLAN

5 Construction Noise Management Levels

Construction activities will be undertaken simultaneously with regular operation of the existing site. Borg propose to generally restrict site noise emission from both construction and operational tasks combined to comply with operational noise criteria conditioned in Development Consent SSD 7016 and EPL 3035.

Following consideration of the ICNG (**Section 2.6**), Development Consent (SSD 7016) conditions (**Section 2.2**), EPL 3035 (**Section 2.4**) and the measured background noise levels (refer Global Acoustics, May 2016), **Table 6** summarises the Noise Management Levels (NMLs) for all residential receivers.

Table 6 – Operation and Construction Noise Management Levels

Location	Activity	Day (7am-6pm) LAeq (15 min)	Evening (6pm-10pm) LAeq (15 min)	Night (10pm-7am) LAeq (15 min)
All residential receivers	General Construction	55	50	45
	Rock/ Concrete Breaking	75		

Work outside approved construction hours are not expected, however unforeseen constraints relating to delivery of materials or equipment, or other technical requirements, may see some activities undertaken outside approved hours. Where required, out of hours works will be undertaken to meet the noise management levels in **Table 6**.

Development Consent SSD 7016 Condition B14 requires non-standard construction hour work to be inaudible at the nearest sensitive receivers. The Development Consent takes precedence over the ICNG and will be adopted in this plan.

In this instance, "inaudible" means the activity is not discernible from general operation activities.

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

The following compliance monitoring, to be undertaken during construction by a suitably qualified noise expert, is recommended for the project:

- Periodic attended noise monitoring at the potentially most affected residences during the day period, with a frequency of once per quarter, during the construction phase of the Project; and
- If exceedance of limits is demonstrated, additional mitigation controls are to be implemented, and follow-up monitoring undertaken within one week of the exceedance.

Construction noise performance is reported as detailed in **Section 10**.

7.2.2 Management Monitoring

In addition to quarterly compliance monitoring, off-site management noise monitoring by suitably trained site personnel should be undertaken regularly, particularly during periods of meteorological enhancement and on commencement of new construction activities or areas, to ensure relevant noise criteria are adhered to.

Operations should be modified accordingly as required when exceedance or potential exceedances are measured. Modifications may include, but are not limited to, erection of temporary barriers or screens, temporary shutdown of equipment until adverse weather conditions change, or relocating equipment to less sensitive areas when feasible to do so.

7.3 Monitoring Locations

Four representative locations have been chosen for monitoring as summarised in **Table 8**. Refer to **Figure 2** for these locations.

Table 8 – 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 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

- Before commencing monitoring, ensure the Sound Level Meter's (SLM) laboratory calibration is current (refer to the sticker on the unit).
- If unsure about the functions of the SLM, refer to the instruction sheet in the case. All site environment officers should be trained in the use of the SLM and training documents kept on file.
- Ensure the windscreen is attached and that the SLM settings include a windscreen factor, the SLM is set to A-weighted and fast response.
- Prior to and completing the measurement, the SLM should be field calibrated using the supplied calibrator. Ensure that the pre- and post- measurements do not differ by more than 0.5 dB(A).

7.3.2 Weather 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. Rain and too much wind will elevate the noise level. If there is no choice but to monitor in inclement weather, note the conditions on the field sheet.

NMLs listed in Table 6 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.

Weather conditions measured at the site weather station should be used to determine applicability of meteorological exclusion rules.

APPENDIX

B CALIBRATION CERTIFICATES

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3.2013
Calibration Certificate

Calibration Number C20674

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	00370304
Microphone Serial Number :	10421
Pre-amplifier Serial Number :	60313

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	22°C	**Ambient Temperature :**	21.9°C
Relative Humidity :	50.6%	**Relative Humidity :**	50.1%
Barometric Pressure :	100.08kPa	**Barometric Pressure :**	100.09kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Max Moore
Calibration Date :	24 Nov 2020	**Report Issue Date :**	25 Nov 2020

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Least Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.12dB*	*Temperature*	*±0.2°C*
1kHz	*±0.11dB*	*Relative Humidity*	*±2.4%*
8kHz	*±0.13dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests	*±0.10dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Acoustic Research Labs Pty Ltd
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North Rocks NSW AUSTRALIA 2151
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www.acousticresearch.com.au

Sound Calibrator
IEC 60942:2017

Calibration Certificate

Calibration Number C21832

Client Details Global Acoustics Pty Ltd
12/16 Huntingdale Drive
Thornton NSW 2322

Equipment Tested/ Model Number : Pulsar Model 105
Instrument Serial Number : 81334

Atmospheric Conditions
Ambient Temperature : 25°C
Relative Humidity : 49.6%
Barometric Pressure : 100.8kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 29 Nov 2021
Secondary Check: Harrison Kim
Report Issue Date : 2 Dec 2021

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.19	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.11dB*	*Temperature*	*±0.1°C*
Frequency	*±0.07%*	*Relative Humidity*	*±1.9%*
Distortion	*±0.50%*	*Barometric Pressure*	*±0.014kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

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Appendix G – Community Complaints

Complaint No	Category	Date Received	Property	Detail	Follow Up Actions
112	Transport	6/05/2021	Oberon Council	EPA received complaint from Council Depot that an uncovered load of waste had been received at their site	Environmental Manager discussed with relevant Borg personnel solution to ensure all waste was covered before leaving site. Items purchased by site to solve this issue.
113	Noise	25/05/2021	Not provided	Low frequency noise being heard over the past few months, suggested coming from site	WHS Coordinator investigated and found no unusual site conditions Annual compliance noise monitoring scheduled for June. Manager will review results.
114	Noise	1/09/2021	O'Connell Rd OBERON	Resident phoned to complain about ongoing noise, seemingly coming from site	Environmental Manager followed up with resident. Undertook unattended noise monitoring at resident's property. Insufficient evidence of breach found. May undertake further noise monitoring in consultation with resident.
115	Dust and odour	13/09/2021	Tarana Crescent OBERON	Blue dust pollution and glue odours from Borg Panels. Blue dust pollution fallout was noticed on Thu 9/9/21 morning, Fri 10/9/21 morning and Sat 11/9/21 morning from 7.30am. There is a blanket fallout on all cars and everything outside- this happens at night times, this is causing a lot of respiratory problems. Caller heard from someone there was a problem with saw dust being blown into the paddock on Sat 11/9/21, the blue saw dust is from treated wood. This has happened previously in the past 1-2 months and the glue odours are at night times	Check weathermation data for wind direction and speed. Try to obtain more specific details about reported incident. Investigate potential sources of dust and odour onsite. Drive to Tarana Crescent and investigate any foreign materials on surfaces. No further follow up required. Second investigation revealed no evidence of any foreign materials or dust in the area and no unusual odours identified.

116	Traffic	19/10/2021	Clover Lane OBERON	Resident called when he noticed a Borg truck using Clover Lane which had recently been resurfaced by Oberon Council. Resident was concerned that the truck may damage the new surface.	Construction Manager discussed with the truck driver who advised he was dropping off a work colleague to his residence on Clover Lane. Environmental Manager inspected Clover Lane and found no damage to the road.
117	Noise	9/02/2022	Anonymous	“Freight train through house”	Monitor plant conditions and operational hours. Toolboxed department managers.
118	Noise	10/02/2022	Dart Street, Oberon	“Loud banging of metal”	Attempted to contact resident for more details. Monitor plant conditions and operational hours. Toolboxed department managers.
119	Noise	17/02/2022	Dart Street, Oberon	“Big plates”	Attempted to contact resident for more details. Monitored plant conditions and operational hours. Contacted suppliers to ensure no tile deliveries before 7am.
121	Noise	20/02/2022	Dart Street, Oberon	“Barrels into pit”	Attempted to contact resident for more details. Monitor plant conditions and operational hours. Particle board chipper started after 9:50am.
122	Noise	21/02/2022	Dart Street, Oberon	“Since 6am”	Attempted to contact resident for more details. Monitor plant conditions and operational hours. Particle board chipper started after 7:10am. Toolboxed department managers. Arranged noise monitoring investigation with resident.
123	Noise	17/03/2022	Dart Street, Oberon	"Freight trains running through the house again today and banging and crashing”	Organise internal monitoring to investigate potential noise.
124	Noise	17/04/2022	Dart Street, Oberon	"Thursday Friday today noise is unbelievable from Borg.”	Review CCTV footage and continue with noise monitoring investigations.

Appendix H – Water Quality Exceedance Notifications

Borg Panels Pty Ltd
ABN: 54 139 584 900

2 Wella Way
Somersby NSW 2250
Australia

Ph: 02 4340 9800
Fax: 02 4340 5841

18 May 2021

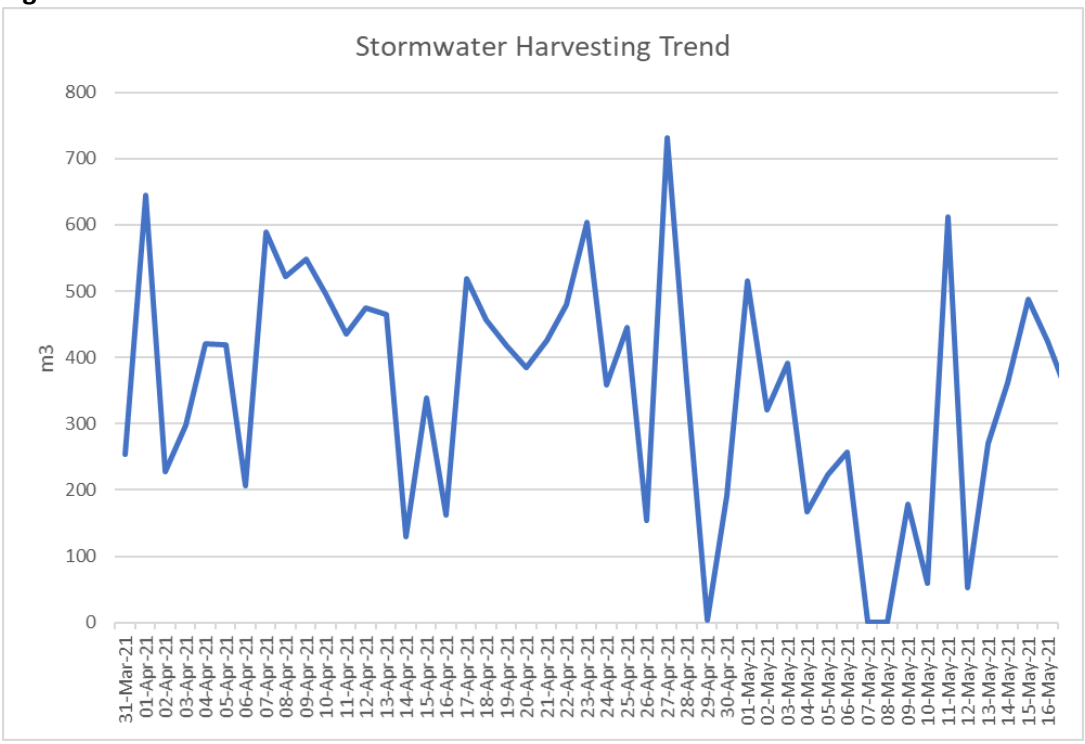
EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Suspended Solids (TSS) for stormwater sample event undertaken on 5th May 2021 at EPL identification point 1 (v-notch). Results reviewed from ALS Environmental on 17th May reports exceedance for TSS at 290mg/l (L2.5 concentration limit 50mg/l).

Fill works to the north eastern hardstand area were complete with the hardstand and batter compacted however, it is possible that this exceedance was due to a section of the batter eroding resulting in deposition of sediment into the swale during rain event which occurred prior to sampling. The site weather station recorded 9.4mm at 9am on the day of the sample event.

To control site discharge going forward, civil works to the stormwater management system were escalated. This involved closing off the v-notch and diverting the stormwater to the new EPL identification point 28 in an attempt to create a nil discharge site as water from this basin (point 28) is harvested and used in the production at site. Figure 1 below displays stormwater harvesting trends from 31st March 2021 to 16th May 2021. Using this data, the average volume harvested is 351m3/day. This date range has been selected as 31st March was the last date a sample event was performed at point 28 confirming nil discharge from this location.

Figure 1



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The works to the stormwater management system commenced week beginning 10th May with the v-notch 'closed' on 11th May (see photos below). Since 11th May there has been no discharge from either point 1 or point 28.

Blocking V-notch with geofabric

Earthworks to 'close' ponds

V-notch nil discharge

Swale conveying pond water to first flush basin

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No other exceedances of pollutants listed in condition L2.5 of EPL 3035 were reported for this sampling event.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Jacqueline Blomberg
Environmental Manager
Borg Manufacturing

Post Approval

Proponent Details

Personal Details

Title	Mrs
First Name	Jacqueline
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Email	blombergj@borgs.com.au
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Company Details

Applying as a company/business?

Yes

Company Name	BORG MANUFACTURING PTY LIMITED
ABN	31003246357
Branch Name	

Primary Contact

Title	Mr
First Name	Victor
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Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-37

Name of Document

Water Quality Discharge Limit Exceedance

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

exceedance of discharge limit of TSS for sample event on 5th May 2021

Applicable Conditions

Schedule	Condition
2	B31

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Notification - EPL 3035 Water Quality Exceedance.pdf	Post Approval Document

Borg Panels Pty Ltd
ABN: 54 139 584 900

2 Wella Way
Somersby NSW 2250
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Ph: 02 4340 9800
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30 July 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Suspended Solids for stormwater sample event undertaken on 21 July 2021. Results reviewed from ALS Environmental reports exceedance for TSS at 688mg/l (L2.5 concentration limit 50mg/l).

Construction activities to the site stormwater swale system are currently underway with ERSED controls installed as works progress. Significant rain events leading up to the sampling would have mobilised sediment within the swales and contributed to this result (total 65.8mm, on site rain gauge).

No other exceedances of pollutants listed in condition L2.5 of EPL 3035 were reported for this sampling event.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Jacqueline Blomberg
Environmental Manager
Borg Manufacturing

Post Approval

Proponent Details

Personal Details

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Company Details

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Yes

Company Name	BORG MANUFACTURING PTY LIMITED
ABN	31003246357
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Title	Mr
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Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-49

Name of Document

Water Quality Exceedance Notification

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

notification of water quality discharge limit for total suspended solids on 21 July 2021

Applicable Conditions

Schedule	Condition
2	B31

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Notification - EPL 3035 Water Quality Exceedance.pdf	Post Approval Document

Borg Panels Pty Ltd
ABN: 54 139 584 900

2 Wella Way
Somersby NSW 2250
Australia

Ph: 02 4340 9800
Fax: 02 4340 5841

5 August 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Suspended Solids for stormwater sample event undertaken on 28 July 2021. Results reviewed from ALS Environmental show that the concentration limit for Total Suspended Solids of 50mg/L was exceeded by 188mg/L.

There was a snowfall event and two significant rain events (i.e. >10mm) prior to sampling which would have increased stormwater flow and mobilised sediment within the swales contributing to this result. With construction activities continuing, additional ERSED controls have been installed within the swale system and flocking agents have been ordered to assist with management of this issue.

No other exceedances of pollutants listed in condition L2.5 of EPL 3035 were reported for this sampling event.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Jacqueline Blomberg
Environmental Manager
Borg Manufacturing

Post Approval

Proponent Details

Personal Details

Title	Mrs
First Name	Jacqueline
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Company Details

Applying as a company/business?

Yes

Company Name	BORG MANUFACTURING PTY LIMITED
ABN	31003246357
Branch Name	

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Title	Mr
First Name	Victor
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Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-50

Name of Document

water quality discharge limit exceedance

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

notification of water quality discharge limit exceedance for TSS on 28 July 2021

Applicable Conditions

Schedule	Condition
2	C12
2	C13

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Notification - EPL 3035 Water Quality Exceedance.pdf	Post Approval Document

Borg Panels Pty Ltd
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2 Wella Way
Somersby NSW 2250
Australia

Ph: 02 4340 9800
Fax: 02 4340 5841

13 August 2021

EPL 3035 Water Quality Discharge Limit Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Suspended Solids for stormwater sample event undertaken on 4 August 2021. Results reviewed from ALS Environmental show that the concentration limit for Total Suspended Solids of 50mg/L was exceeded by 85mg/L.

There was a snowfall event and one significant rain event (i.e. >10mm) prior to sampling. This would have increased stormwater flow and mobilise sediment within the swales contributing to this result. With construction activities continuing to the site swale system, flocking agents have been applied and additional ERSED controls have been installed. Further flocking agents have been ordered to assist with management of this issue.

All other pollutants listed in condition L2.5 of EPL 3035 were within their discharge concentration limits.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Jacqueline Blomberg
Environmental Manager
Borg Manufacturing

Post Approval

Proponent Details

Personal Details

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Email	blombergj@borgs.com.au
Phone	0436609556
Role/Position	Environmental Manager
Address	2 WELLA WAY SOMERSBY New South Wales 2250 AUS

Company Details

Applying as a company/business?

Yes

Company Name	BORG MANUFACTURING PTY LIMITED
ABN	31003246357
Branch Name	

Primary Contact

Title	Mr
First Name	Victor
Last Name	Bendevski
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Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-51

Name of Document

Water quality discharge limit exceedance

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

exceedance of water quality discharge limit for TSS on 4 August 2021

Applicable Conditions

Schedule	Condition
2	B31

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
Notification - EPL 3035 Water Quality Exceedance.pdf	Post Approval Document

Borg Panels Pty Ltd
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24 November 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of discharge concentration limit for oil & grease for stormwater sample event undertaken on 3 November 2021 from the site surface water discharge point identified as the HPP Discharge Point. Results received from ALS Environmental on 18 of November showed that the concentration limit for oil & grease of 10mg/L was exceeded by 7mg/L.

The sampler did not notice any hydrocarbon sheen during the sampling event and so upon receiving the results on 18 November, requested ALS run TPH and TRH with Silica Gel clean-up on the sample to determine the nature of this exceedance. These results were received on 22 November 2021 and indicate that organic content was the more likely source of the oil & grease result rather than hydrocarbon.

No other exceedances of pollutants listed in condition L2.5 of EPL 3035 were reported for this sampling event.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Andrew Brady
Environmental Manager
Borg Manufacturing