Annual Review 2020/21

Borg Panels Oberon

124 Lowes Mount Road, Oberon NSW

Borg Panels Pty Ltd

23 JULY 2021

Revision History

Rev No.	Revision Date	Author / Position	Details	Authorised	
				Name / Position	Signature
0	17/06/2021	Jacqueline Blomberg Environmental Manager	Draft for review		
1	23/07/2021	Jacqueline Blomberg Environmental Manager	For submission to DPIE	Victor Bendevski Environmental and Regulatory Compliance	

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Annual Review Title Block

Name of operation	Borg Panels Pty Ltd.
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 Panels Oberon for the period 1st May 2020 to 30th April 2021 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	23/07/2021

1 Introduction

1.1 Scope

This Annual Review has been prepared for the Borg Panels Oberon site and covers the twelve-month reporting period from 1 May 2020 to 30 April 2021. 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 Panels 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. During this reporting period Borg undertook a trial of the receipt, processing and use of urban wood residue (UWR) as an alternative raw material to be used in the production of particleboard. The trial was conducted over a 12-month period and concluded on 30th August 2020 under EPL 3035 section 8 Special Conditions.

This Annual Review is submitted to NSW Department of Planning, Industry and Environment (DPIE), 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 Panels website:

https://www.borgmanufacturing.com.au/oberon-panels-site-information/

Borg Panels generally maintained compliance with necessary approvals and licenses with the exception of EPL 3035 condition L2.5 as listed in Table 1. These non-compliance items are discussed in Section 4.4 Surface Water. There were no EPA reportable incidents during this review period.

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		

1.2 Background

In March 2010, Borg Panels acquired the former Carter Holt Harvey MDF and mouldings plant at Oberon. In 2012 Borg Panels 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).

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.

Figure 1 Regional context

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 Panels 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.

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

Table 2 Borg Panels 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 7
(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 6
(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 7

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 04 September 2019.

1.6 Water Licences

Borg Panels 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 Panels 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:

- Operational Environmental Management Plan
- Operational Noise Management Plan
- Operational Air Quality Management Plan
- Surface Water Management Plan
- Erosion and Sediment Control Plan
- Waste 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
Tony Truscott	Facility Manager	+61 436 613292
Victor Bendevski	Environmental and Regulatory Compliance	(02) 4340 9827
Jacqueline Blomberg	Environmental Manager	+61 436 609 556

1.10 Actions Required from Previous Annual Review

The actions listed in Table 6 were identified in the 2019/20 Annual Review for implementation during this 2020/21 reporting period.

Table 6 Proposed Activities in 2019/20 Reporting Period

Activities Proposed in 2019/20 Reporting Period	Results achieved in 2020/21 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 comprehensive Hazard Audit (SSD 7016 condition B42	Hazard Audit undertaken and findings submitted to DPIE on 17 December 2020. DPIE issued an RFI which Borg provided a response to on 11 March 2021. DPIE were satisfied with the response and no further information was required (DPIE response letter dated 1 April 2021).
Complete verification studies required for the particleboard plant under SSD 7016 conditions of consent	• B11 Air Emission Verification Study, DPIE approval provided on 8 February 2021 • B20 Noise Verification Study, DPIE approval provided on 11 January 2021 • B23 Cogen Noise Study submitted to EPA for consultation(via Major Project portal) on 26 November 2020 (SSD-7016-PA-18). Email correspondence with EPA on 20 January 2021 and 1 June 2021 requesting update on review. Advised review still underway.
Complete reporting requirements related to the commissioning of particleboard plant under SSD 7016 conditions of consent	• B9 Cogen Post Commissioning Report, response from DPIE received 4 August 2020. Ongoing (annual) air monitoring required as per EPA direction. • B41 Post Start Up Compliance Report, acceptance letter from DPIE received 18 December 2020
Continue with implementation of various management and mitigation measures as detailed in the development consent, including additional items provided in SSD 7016 MOD 1 and MOD 2	As reported in this Annual Review. All additional conditions pertaining to MODs have been incorporated into Borg document OBERON Approvals and Licencing Compliance Register.
Complete the installation of the gas turbine and construction of the associated ancillary infrastructure (MOD 2)	Construction activities were completed during this reporting period. Commissioning to occur during next reporting period.
Install Cleaning tower for recycled wood	Construction was not complete during this reporting period
Undertake required environmental monitoring associated with the newly installed gas turbine	To be undertaken during next reporting period
Continue research into plant/equipment with potential to further reduce pollutants emitted from the facility	Pollution Reduction Program undertaken by Todoroski Air Science Pty Ltd. Report issued 27 November 2020.

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 Panels manufactured 258,936m^3 of MDF and 334,874m^3 of particleboard.

2.2 Facility Improvements

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

- Reclamation of the effluent overflow process water dam to allow for construction of further hardstand to facilitate further parking and improve operability of the site;

- Reinstatement of effluent overflow process water dam adjacent the water treatment plant;
- Addition of enclosed awning to the northern extension where loading and unloading activities occur, to better minimise potential noise disturbance;
- Creation of additional emergency catchment dam and associated site drainage channels;
- Commence stormwater harvesting from first flush basin; and
- Installation of roof top solar panels to the northern extension building.

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:

- major earthworks at the northern boundary complete.
- construction of storage warehouse and northern building extension complete. Infrastructure points 22 and 25 in Figure 2.
- installation of new electricity generating gas turbine and ancillary equipment complete. Infrastructure point 36 in Figure 2.
- commenced construction of sorting tower at the materials handling area
- completed construction of northern warehouse extension awning. Included as part of Infrastructure point 22 in Figure 2.
- commenced construction of further hardstand at the northern section of site
- continue alterations to the existing site surface water system.

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

As mentioned above in section 1.1 Scope, as a sustainability initiative Borg undertook a trial of the receipt, processing and use of urban wood residue (UWR) as an alternative raw material used in the production of particleboard during this reporting period. Authority for the trial of UWR was provided by the EPA and was included in Special Condition E.1 of EPL 3035. The EPA also issued The Borg Panels Urban Wood Residue trial order and exemption September 2019 under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 for this initiative.

Borg developed a Quality Control Plan (QCP) to define a standard approach for ensuring that the quality of recovered UWR received by Borg during this trial met with our specified requirements, our EPA licence conditions (EPL 3035) and Development Consent SSD 7016 as well as relevant NSW Government statutory regulations, and policies. The trial was conducted over a period of 12 months and concluded on 30 August 2020.

During the trial Borg utilised 11,000 tonnes of UWR – diverting this waste material from landfill into productive use in new and high-quality particleboard products. As UWR has a much lower moisture content compared to virgin forest wood fibre, this initiative also resulted in an energy saving of approximately 8,000 MW, a substantial reduction in our natural gas consumption and greenhouse gas emissions.

Air emission sampling and testing were required to be undertaken in accordance with the sampling method, units of measure and sampling frequency specified in condition M2.2 of EPL 3035 at licence discharge points 29, 30, 31 and 32 for the following analytes:

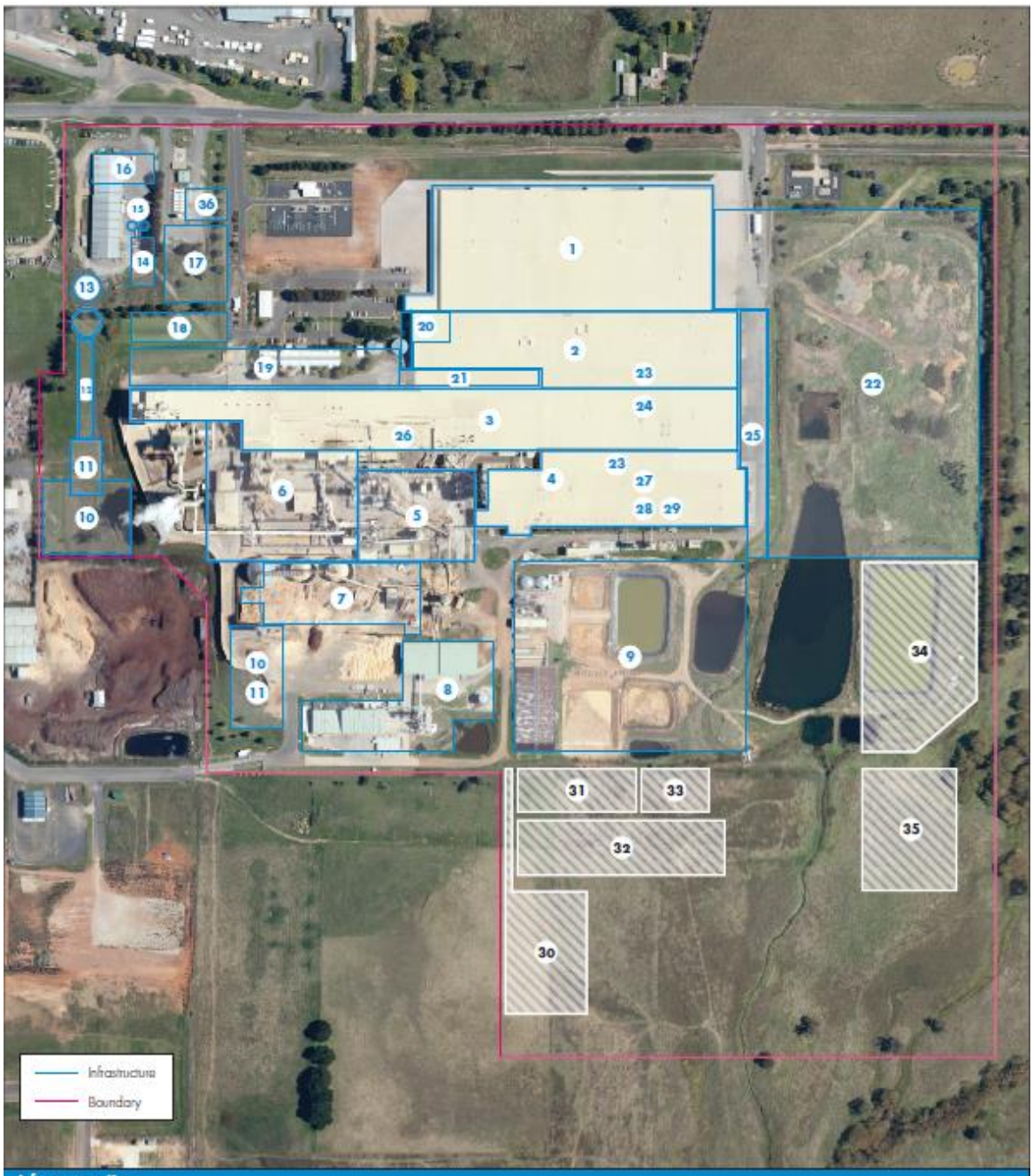
- Formaldehyde
- Nitrogen Oxides
- PM10
- Smoke Emissions
- Total Solid Particles

Following the conclusion of the trial a report was submitted to the EPA assessing the results of the UWR characterisation and air emission sampling, and also providing commentary on whether the UWR Quality Control Plan (QC Plan) was 'fit for purpose' over the period of the trial. The report also identified, where appropriate, any deficiencies or problems encountered during the trial and actions taken to prevent a recurrence.

The report concluded that the use of UWR collected to our specification made little or no difference to air emissions, and the UWR QC Plan, with some refinements, was ‘fit for purpose’ over the trial period.

The EPA issued *The Borg Panels Urban Wood Residue order March 2021(RRO)* and *The Borg Panels Urban Wood Residue exemption March 2021(RRE)* on 30 March 2021. The order and exemption commenced on 30 March 2021 and are valid until 30 March 2023.

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 Panels 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 Panels during the reporting period is provided in Table 7.

Table 7 Waste Management 2020/21

Month	Description				Destination
	Litres	m^3	Tonnes	Waste	
May 2020		870		General	Oberon Council Waste Depot
			34.32	Waste requiring burial	Bathurst Regional Council
June 2020		600		General	Oberon Council Waste Depot
			22.76	Waste requiring burial	Bathurst Regional Council
July 2020		860		General	Oberon Council Waste Depot
			21.02	Waste requiring burial	Bathurst Regional Council
August 2020	3100			Oil	Nationwide Oil
		850		General	Oberon Council Waste Depot
			1.88	Waste requiring burial	Bathurst Regional Council
September 2020	9000			Oil	Nationwide Oil
		820		General	Oberon Council Waste Depot
			32.84	Waste requiring burial	Bathurst Regional Council
October 2020		680		General	Oberon Council Waste Depot
			53.52	Waste requiring burial	Bathurst Regional Council
November 2020	4700			Oil	Nationwide Oil
		820		General	Oberon Council Waste Depot
		60		Building/demolition	Oberon Council Waste Depot
			15.18	Waste requiring burial	Bathurst Regional Council
December 2020	5900			Oil	Nationwide Oil
		450		General	Oberon Council Waste Depot

Month	Description				Destination
	Litres	m^3	Tonnes	Waste	
January 2021		550		General	Oberon Council Waste Depot
			13.3	Waste requiring burial	Bathurst Regional Council
February 2021	2100			Oil	Nationwide Oil
		590		General	Oberon Council Waste Depot
			13.64	Waste requiring burial	Bathurst Regional Council
March 2021	4900			Oil	Nationwide Oil
		860		General	Oberon Council Waste Depot
			43.92	Waste requiring burial	Bathurst Regional Council
April 2021		542		General	Oberon Council Waste Depot
TOTAL		**8492**		**General Waste**	**Oberon Council Waste Depot**
		60		**Building/Demolition Waste**	**Oberon Council Waste Depot**
			252.38	**Waste requiring Burial**	**Bathurst Regional Council**
	29700			**Waste Oil**	**Nationwide Oil Pty Ltd**

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 Panels 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 Panels 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 Panels 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 2020/21 reporting period.

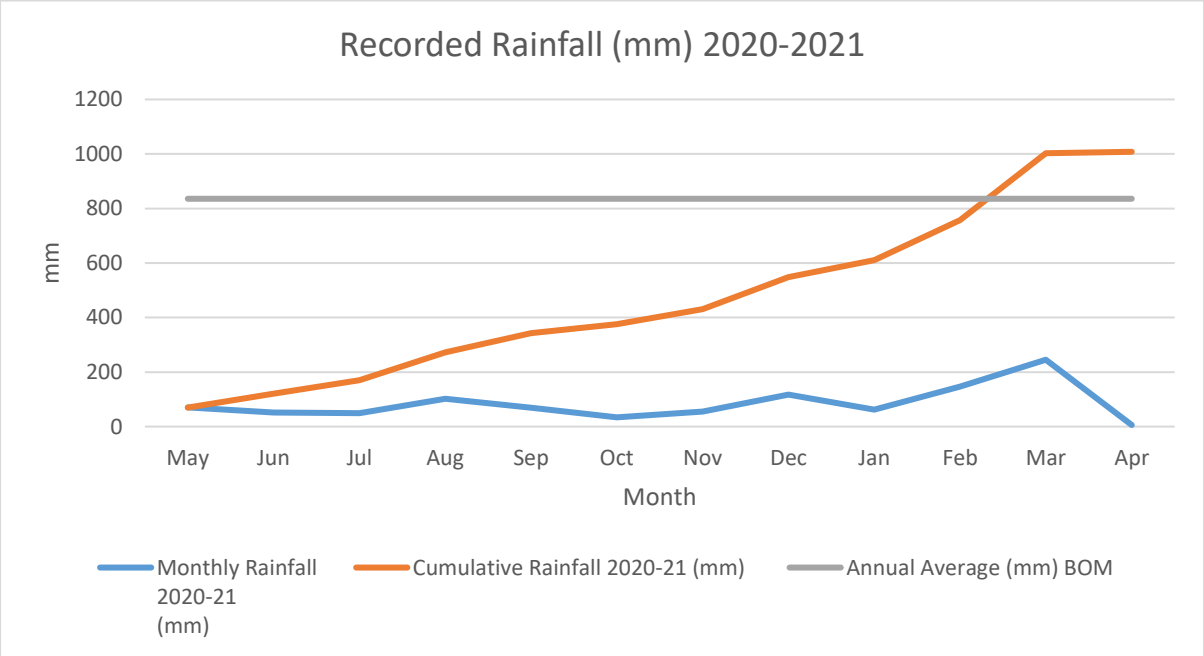
4.2.1 Rainfall

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 1,008mm.This is 172.3mm above the annual mean rainfall of 835.7mm for the Oberon region (Bureau of Meteorology, Oberon Springbank Site No. 063063).

Table 8 Recorded Rainfall 2020/21

Total Monthly Rainfall (mm)												
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Total**
69.8	51	49.6	102.4	69.4	33.8	55.2	117.2	62.2	146.4	245.2	5.8	1008
Number of Rain Days (≥0.2mm)												
8	9	10	16	11	8	9	11	11	11	13	3	120

Figure 3 Recorded Rainfall (mm) at Borg Panels Meteorological Station 2020/21



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 2020/21

Minimum and Maximum Monthly Temperatures (°C)											
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
-4.2	-4.7	-5.2	-4.7	-3.5	-0.1	2.4	0.6	5.1	8.7	2.1	-2.6
16.7	14.5	13.5	16.9	21	22.8	30.4	31.6	33.4	27.7	26.4	24

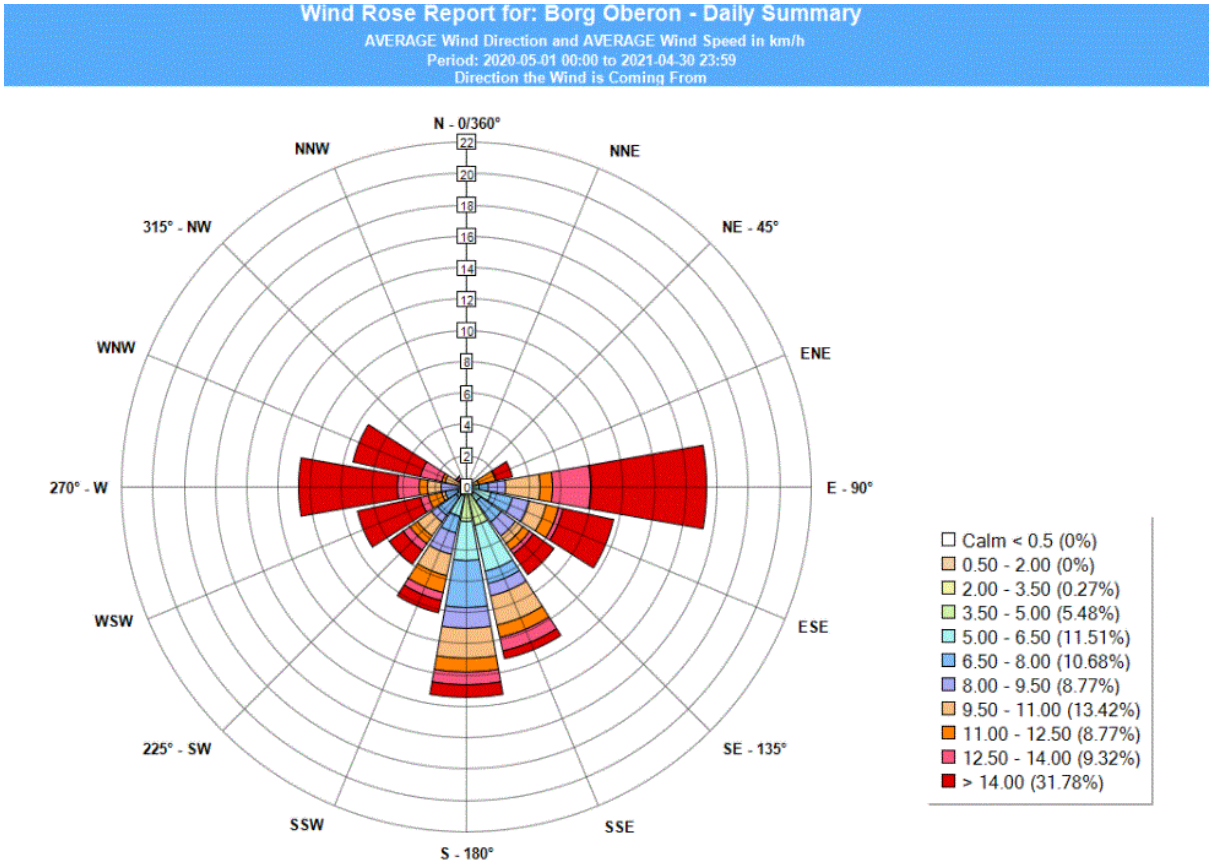
4.2.3 Wind Speed and Direction

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.

Table 10 Monthly Daily Wind Data 2020/21

Month	Maximum Wind Speed (km/hr)	Mean Wind Speed (km/hr)	Dominant Wind Direction
May 2020	54.4	11.9	184° (S)
June 2020	42.4	11.4	180° (S)
July 2020	50.5	10.2	183° (S)
August 2020	56.5	14.4	222° (SW)
September 2020	52.8	13	201° (SSW)
October 2020	71.5	12.4	180° (S)
November 2020	57.3	11	184° (S)
December 2020	53.8	14.9	165° (SSE)
January 2021	53.8	13	156° (SSE)
February 2021	45.8	13.5	141° (SE)
March 2021	51.5	13.7	160° (SSE)
April 2021	42.2	9.1	179° (S)

Figure 4 Daily Summary Average Wind Rose 2020/21



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

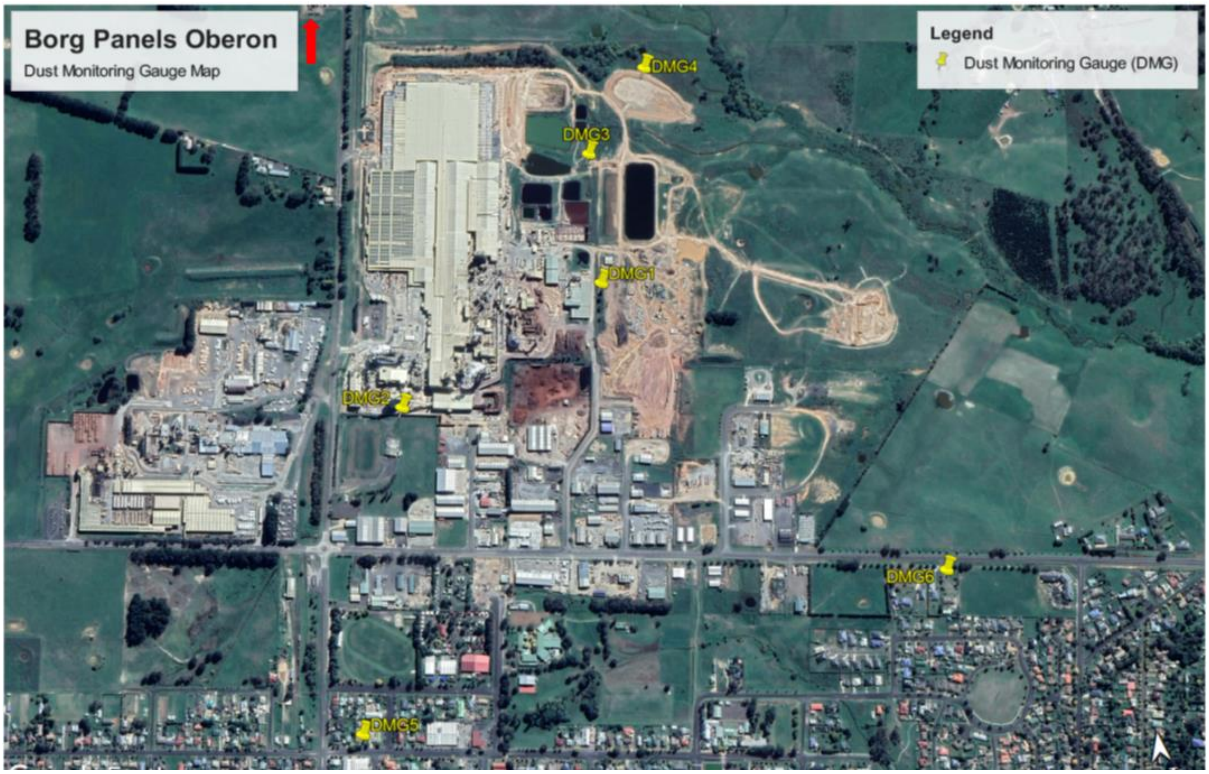
Averaging Period	Impact	Criteria
Annual	Incremental	2 g/m^2/month
	Total	4 g/m^2/month

There are six dust depositional gauges (DMG) located in and around the site. Five were sampled from May to November 2020 as the sixth (DMG4) had been removed to allow completion of construction activities in the immediate location of DMG4. This dust gauge was ultimately relocated further east of its original location on the northern boundary as the initial location was no longer suitable to access. 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 1 and DMG 2 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 DMG2 near the materials handling building which can produce wood dust. 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 provides a summary of Borg Panels annual average results for insoluble solids during the reporting period and for the previous two years. Monthly data and rolling annual average data is provided in Appendix A.

Dust management measures are listed in Section 7.5 Air Quality (Dust) Management within the CEMP. Measures include but are not limited to evaluation of weather conditions (wind speed and direction), use of water cart to spray unsealed surfaces and stockpiles, limited stockpile heights, and clear communication to workers regarding their responsibilities to assist with managing dust via toolbox meetings and environmental training sessions.

Table 13 Dust Depositional Gauges Annual Average

No.	Location	Annual Average Insoluble Solids (g/m^2/month) 2018/19	Annual Average Insoluble Solids (g/m^2/month) 2019/20	Annual Average Insoluble Solids (g/m^2/month) 2020/21
DMG 1	Borg Panels eastern boundary with Woodchem	9.3	7.1	5.0
DMG 2	Materials handling building	5.2	4.6	2.4
DMG 3	Water treatment plant	2.7	2.8	1.3
DMG 4	Northern boundary	2.9	3.9	1.7
DMG 5	Highlands Motor Inn	1.9	2.3	0.6
DMG 6	Albion Street east of Borg Panels plant	1.7	2.4	0.6

Table 13 generally shows a reduction in average annual insoluble solids over time across all dust gauge locations.

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 4 September 2019. Note there are two additional monitoring points identified in Table 14 which are not listed on the current version of EPL 3035. These points were provided by the EPA as a result of the Cogen Plant Post Commissioning Report dated 23 June 2020 (condition B9 of SSD 7016), to allow Borg to demonstrate ongoing compliance with air quality standards at these locations. Annual air emission monitoring included these two new locations being EPA Identification Points 33 and 34.

There are no air emission monitoring requirements under SSD 7016. 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)
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)
33	Cogeneration Unit 1
34	Cogeneration Unit 2

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).

EPL 3035 licence version date 4 September 2019 removed the requirement to monitor for volatile organic compounds (VOCs) from monitoring points 7, 8, 9 and 10. Under this EPL additional monitoring requirements (pollutants) were included for Points 7 and 8, and new licence and discharge monitoring points 29, 30, 31, 32, 33 and 34 as described in Table 14.

4.3.3 Air Monitoring

Environment Protection Licence 3035 sets pollution concentration limits for emission Points 7, 8, 9, 10, 33 and 34 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
Nitrogen Oxides	33,34	mg/m^3	450	Dry, 273K, 101.3kPa	5%	1 hour
VOC (as n-propane equivalents)	33,34	mg/m^3	20	Dry, 273K, 101.3kPa	5%	1 hour

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 Panels 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 16-35.

Table 16 Air Emissions Monitoring Results EPA Identification Point 4

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	3.3	<2	<2
Formaldehyde	mg/m^3	Yearly	2.8	2.4	1.5

Table 17 Air Emissions Monitoring Results EPA Identification Point 5

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	3.1	<2	<2
Formaldehyde	mg/m^3	Yearly	1.5	1.1	2.5

Table 18 Air Emissions Monitoring Results EPA Identification Point 7

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	43	45	79
Formaldehyde	mg/m^3	Yearly	-	2	1.6
Nitrogen oxides	mg/m^3	Yearly	-	210	140
PM10	mg/m^3	Yearly	-	32	8.9
Smoke	Obscuration	Every 6 months	-	0	0

Table 19 Air Emissions Monitoring Results EPA Identification Point 8

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	43	26	68
Formaldehyde	mg/m^3	Yearly	-	2.8	3
Nitrogen Oxides	mg/m^3	Yearly	-	170	210
PM10	mg/m^3	Yearly	-	24	28
Smoke Emissions	Obscuration	Every 6 months	-	0	0

Table 20 Air Emissions Monitoring Results EPA Identification Point 9

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	21	71	38
Formaldehyde	mg/m^3	Yearly	4.8	1.5	4.8
Nitrogen Oxides	mg/m^3	Yearly	88	190	260
PM10	mg/m^3	Yearly	18	9.1	26
Smoke Emissions	Obscuration	6 Monthly	0	0	0
Volatile Organic Compounds	mg/m^3	Yearly	5.5	-	-

Table 21 Air Emissions Monitoring Results EPA Identification Point 10

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	28	110	41
Formaldehyde	mg/m^3	Yearly	4.9	2	4.7
Nitrogen Oxides	mg/m^3	Yearly	63	200	73
PM10	mg/m^3	Yearly	23	21	27
Smoke Emissions	Obscuration	6 Monthly	0	0	0
Volatile Organic Compounds	mg/m^3	Yearly	8.2	-	-

Table 20 and Table 21 show an increase in Total Solid Particles from the 2018/2019 to the 2019/2020 data. This is likely due to a reduced fan velocity at these dryer cyclones which was necessary as part of an investigation into a power reduction program for the site. As a result of this, the cyclones were readjusted with effectiveness evident in the 2020/21 TSP results.

Table 22 Air Emissions Monitoring Results EPA Identification Point 11

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
* Total Solid Particles	mg/m^3	Yearly	140*	-	-
Formaldehyde	mg/m^3	Yearly	0.34	-	-
Nitrogen Oxides	mg/m^3	Yearly	550	-	-
*PM10	mg/m^3	Yearly	78*	-	-

Volatile Organic Compounds	mg/m^3	Yearly	0.4	-	-
Smoke Emissions	Obscuration	6 Monthly	0	-	-

Note: *Corrected to 6.5% CO_2 mg/m^3

Table 23 Air Emissions Monitoring Results EPA Identification Point 12 Vent 1

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
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 24 Air Emissions Monitoring Results EPA Identification Point 12 Vent 2

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
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 25 Air Emissions Monitoring Results EPA Identification Point 12 Vent 3

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
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 26 Air Emissions Monitoring Results EPA Identification Point 12 Vent 4

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
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 27 Air Emissions Monitoring Results EPA Identification Point 18

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Every 3 years	Dormant	Dormant	Dormant
Formaldehyde	mg/m^3	Every 3 years	Dormant	Dormant	Dormant
Volatile Organic Compounds	mg/m^3	Every 3 years	Dormant	Dormant	Dormant
Velocity	mg/sec	Every 3 years	Dormant	Dormant	Dormant

Table 28 Air Emissions Monitoring Results EPA Identification Point 19

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	Dormant	Dormant	Dormant
Nitrogen Oxides	mg/m^3	Yearly	Dormant	Dormant	Dormant
Volatile Organic Compounds	mg/m^3	Yearly	Dormant	Dormant	Dormant
Velocity	mg/sec	Yearly	Dormant	Dormant	Dormant

Table 29 Air Emissions Monitoring Results EPA Identification Point 27

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	5.3	13	7.6
Formaldehyde	mg/m^3	Yearly	2.1	1.6	1.9
Nitrogen Oxides	mg/m^3	Yearly	<20	<3	<4
PM10	mg/m^3	Yearly	2.2	9.6	5.2

Table 30 Air Emissions Monitoring Results EPA Identification Point 29

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	5.3	<2	<2
Formaldehyde	mg/m^3	Yearly	2.1	0.8	1.7
Nitrogen Oxides	mg/m^3	Yearly	<20	<3	<4
PM10	mg/m^3	Yearly	2.2	<2	<2
Smoke Emissions	Obscuration	Yearly	0.66	0	0

Table 31 Air Emissions Monitoring Results EPA Identification Point 30

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	5.3	1.8	<2
Formaldehyde	mg/m^3	Yearly	2.1	0.87	1.5
Nitrogen Oxides	mg/m^3	Yearly	<20	<3	<4
PM10	mg/m^3	Yearly	2.2	<3	<4
Smoke Emissions	Obscuration	Yearly	0.66	0	0

Table 32 Air Emissions Monitoring Results EPA Identification Point 31

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	5.3	27	46
Formaldehyde	mg/m^3	Yearly	2.1	0.57	4.6
Nitrogen Oxides	mg/m^3	Yearly	<20	<3	<4

PM10	mg/m^3	Yearly	2.2	25	40
Smoke Emissions	Obscuration	Yearly	0.66	0	0

Table 33 Air Emissions Monitoring Results EPA Identification Point 32

Pollutant	Units	Frequency	2018/19	2019/20	2020/21
Total Solid Particles	mg/m^3	Yearly	5.3	3.6	30
Formaldehyde	mg/m^3	Yearly	2.1	0.63	0.21
Nitrogen Oxides	mg/m^3	Yearly	<20	180	210
PM10	mg/m^3	Yearly	2.2	*	*
Smoke Emissions	Obscuration	Yearly	0.66	0	0

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

Table 34 Air Emissions Monitoring Results EPA Identification Point 33

Pollutant	Units	Frequency	2020/21		
Nitrogen Oxides	mg/m^3	Yearly	320		
VOC	mg/m^3	Yearly	0.8		

Table 35 Air Emissions Monitoring Results EPA Identification Point 34

Pollutant	Units	Frequency	2020/21		
Nitrogen Oxides	mg/m^3	Yearly	390		
VOC	mg/m^3	Yearly	0.16		

There were nil exceedances of air concentration limits during this reporting period.

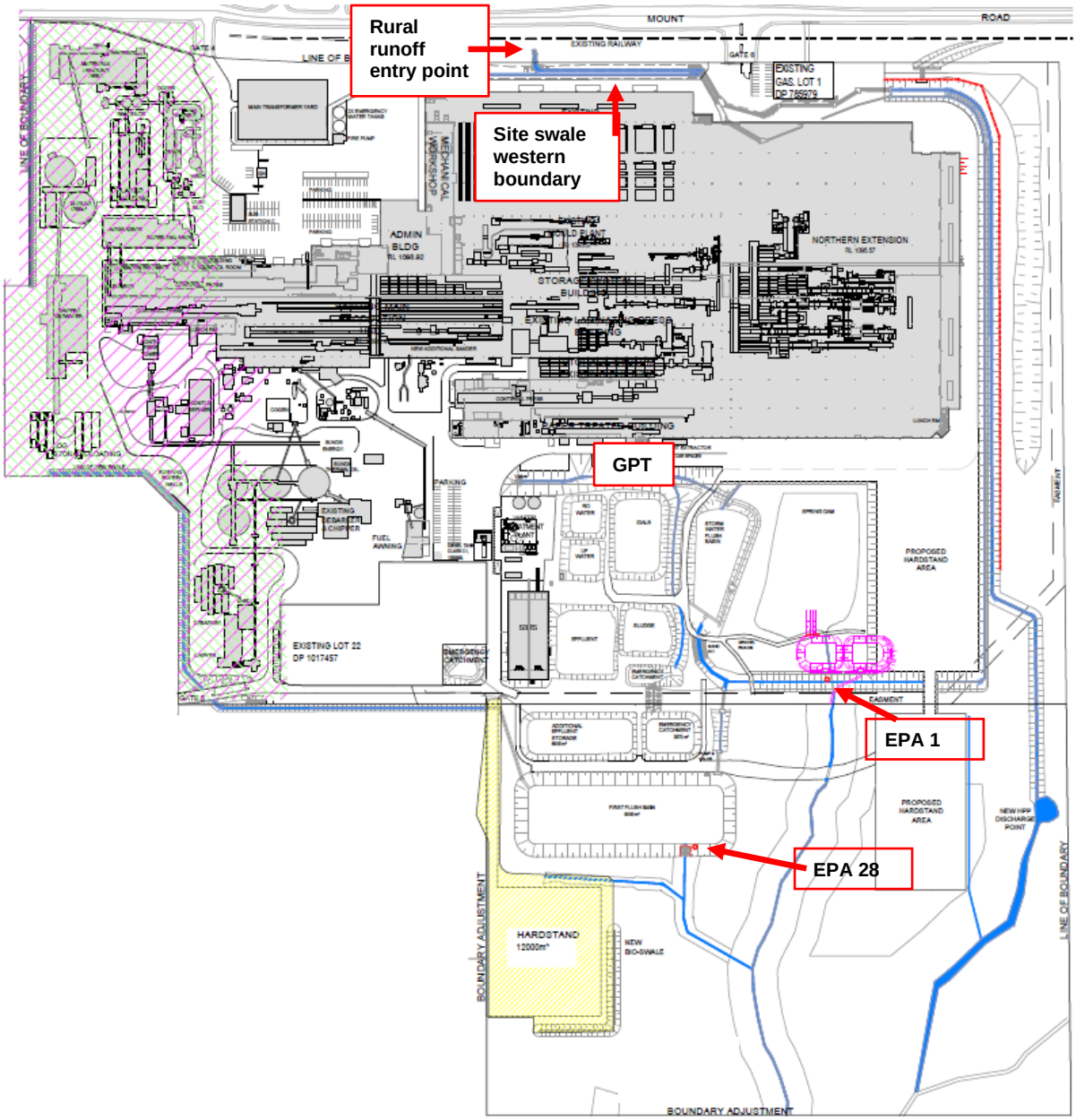
4.4 Surface Water

The existing surface water management system 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 to a tributary of Kings Stockyard Creek
- Borg Panels roof and surface runoff from the western side of the facility is directed into the boundary swale and transferred into the existing stormwater 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 existing 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 222m3/day over the reporting period
- 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 to a tributary of Kings Stockyard Creek (shown on Figure 6)

Figure 6 Surface water management system - SSD 7016



In accordance with EPL 3035, Borg Panels undertakes water quality monitoring weekly during discharge to manage compliance requirements. During this reporting period water discharge was from EPA Point 1 and Point 28. The concentration limit of a pollutant discharged from EPA Point 1 & 28 in EPL 3035 is shown below in Table 36.

Table 36 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 2020/21 reporting period are provided in Appendix C Surface Water Monitoring Data. Table 37 provides a summary of Borg Panels annual average water monitoring results for discharge from EPA Point 1 and Table 38 for EPA Point 28 during the reporting period and for the previous two years (Point 1 only, no data for Point 28). This shows that for the 2020/21 reporting period, the annual average for all pollutants were below the concentration limit set in EPL 3035.

Table 37 Annual Average Water Quality Monitoring Results EPA Point 1

Pollutant	Units of Measure	2018/19	2019/20	2020/21
Aldrin	µg/L	0	0	0
Biochemical Oxygen Demand	mg/L	15.1	8.2	3.37
Colour	Hazen	120.1	39.2	42.65
Dieldrin	µg/L	0	0	0
Methylene Blue Active Substances	mg/L	0.3	0.1	0.10
Nitrogen (Total)	mg/L	6.3	3.7	1.3
Oil and Grease	mg/L	7.5	5.1	5.23
pH	pH	7.6	7.6	7.62
Phosphorus (Total)	mg/L	0.1	0.1	0.06
Total Suspended Solids	mg/L	31.3	28.9	35.91

Table 38 Annual Average Water Quality Monitoring Results EPA Point 28

Pollutant	Units of Measure	2020/21		
Aldrin	µg/L	0		
Biochemical Oxygen Demand	mg/L	7.7		
Colour	Hazen	68.5		
Dieldrin	µg/L	0		
Methylene Blue Active Substances	mg/L	0.11		
Nitrogen (Total)	mg/L	8.42		
Oil and Grease	mg/L	5.8		
pH	pH	7.72		
Phosphorus (Total)	mg/L	0.09		
Total Suspended Solids	mg/L	23.5		

Forty-three samples (sample events) were collected and analysed at Point 1 and ten samples collected and analysed at Point 28 during discharge in the 2020/21 reporting period.

Six events at Point 1 and five events at Point 28 returned results where water pollution limits noted in Table 36 were exceeded. The EPA and DPIE were notified of all exceedances (see Appendix I 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 1008mm of rainfall for the reporting period which was 172.3mm above the annual mean rainfall of 835.7mm for the Oberon region. This excess rainfall combined with the significant construction activities that occurred during this reporting period likely contributed to a number of the water quality discharge exceedances discussed below.

4.4.1 EPL 3035 Identification Point 1

Water quality discharge limit for Total Suspended Solids (TSS) was exceeded on 15th June 2020 with result being 78mg/l. The two weeks preceding this the sample event were relatively dry. A significant rain event (13.4mm) occurred the day before sampling which likely mobilised sediments in the swale system. Sample event undertaken one week later on 25th June did not show exceedance for TSS.

Water quality discharge limit for Biological Oxygen Demand (BOD) was exceeded for sample event undertaken on 23rd September 2020 were results showed BOD at 32mg/l. There were no unusual site conditions recorded during this sample event. All other pollutant levels were within the concentration limits set in EPL 3035.

Water quality discharge limit for pH was exceeded for sample event undertaken on 21st October 2020. Results showed pH at 8.86. No other exceedances were reported for this event. No unusual site conditions were recorded for this event.

On 20th January 2021 water quality discharge limit for pH was exceeded with result showing pH at 8.63. All other pollutants were well below discharge concentration limits. No unusual site conditions were identified.

Results for stormwater sample event undertaken on 24th February 2021 show TSS at 656mg/l. A site investigation commenced with the Environmental Manager coordinating with the site WHSE Coordinator and Construction Coordinator to determine causal factors. Construction were undertaking minor earthwork activities at the northern swale for the stormwater system when an unexpected rain event occurred. This was a significant rain event in that it was greater than 10mm. A sizeable area was required to be exposed for this portion of work, staging was not an option however this increased the potential for sediment laden runoff. Rock check dams and sediment fence had been installed to manage the work area. The Construction Coordinator advised that he checks the weather forecast daily which assists in determining the days/weeks scope of works though as stated, this was an unexpected event. An attempt was made by the WHSE Coordinator to inspect downstream of the site discharge point (i.e. Kings Stockyard Creek off Hazelgrove Road) however the vegetation was too thick to access to visually inspect the Creek. Works to this section of site were escalated by the Construction Coordinator to 'close up' this area in addition to the scheduling of spray grass application to the western and northern swales. In this reporting period, there have been no other TSS exceedances at this EPL Point 1.

On 16th March 2021 water quality discharge limit for Oil & Grease (O&G) was exceeded with result showing O&G at 15mg/l. During the two days preceding the sample event, the site weather station recorded two significant rain events totalling 45.2mm which likely contributed to this exceedance given the volume of runoff into the site swales from both on-site and off-site surfaces. For the remainder of this reporting period, there were no other exceedances of O&G at this monitoring location.

4.4.2 EPL 3035 Identification Point 28

At EPL discharge point 28 there were three occurrences where water quality discharge limit for Total Nitrogen (TN) was exceeded. These occurred on 10th, 17th and 24th February 2021 with results being 11.9mg/l, 15.8mg/l and 15.5mg/l respectively. For the minor exceedance on 10th February, no unusual site conditions were identified which could have contributed to this exceedance. When results for the 17th February again showed an exceedance for this same pollutant, the WHSE Coordinator conducted an inspection of the whole of site and identified an amount of wood material which had escaped the debarker/chipper building and surrounds. This organic matter could have contributed to this exceedance. Supporting this assumption is the result for True Colour being 70PCU. While not an exceedance of EPL 3035 50 or 100 percentile limit, it may show a correlation between organic matter and the TN result. Upon receiving results for sample event undertaken on 24th February, a site investigation commenced in an attempt to determine if site contributors other than organic material potentially contributed to the exceedance. It was identified that at the UWR stockpile area adjacent the materials handling building, an amount of particleboard chip was stockpiled on the pad outside of the building and possibly leaching resin during rain events which could be the cause of the TN results. Upon this identification a site instruction was given that all particleboard chip be stored inside the building. Other than organic matter, no other possible contributors were identified. Since that time there have been no further exceedances of TN in stormwater sample results.

On 16th March 2021 a minor exceedance for Oil & Grease was reported (11mg/l). No unusual site conditions were recorded for this sample event. No other exceedances were reported for this event. There was a minor exceedance for Total Suspended Solids (54mg/l) from water sample event undertaken on 24th March 2021. No unusual site conditions were recorded for this sample event. No other exceedances were reported for this event.

4.5 Groundwater

In accordance with EPL 3035, Borg Panels monitor four groundwater bores on site. The locations of groundwater monitoring bores are listed in Table 39 and shown on Figure 7.

Table 39 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

Figure 7 Groundwater Monitoring Locations

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.

Tables 40-43 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 40 Groundwater Monitoring Results EPA Identification Point 14 (GW05)*

Pollutant	Unit of Measure	Frequency	2018/19	2019/20	2020/21
Aldrin	µg/L	Yearly	<0.5	-	<0.5
Ammonia as N	mg/L	Yearly	0.02	-	0.02
Chemical Oxygen Demand	mg/L	Yearly	<10	-	25
Electrical Conductivity	µS/cm	Yearly	377	-	220
Dieldrin	µg/L	Yearly	<0.5	-	<0.5
Formaldehyde	mg/L	Yearly	<0.1	-	0.2
pH	pH Units	Yearly	6.8	-	6.8
Total Dissolved Solids	mg/L	Yearly	180	-	210
Total Organic Carbon	mg/L	Yearly	<1	-	3
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	-	<50
Total Suspended Solids	mg/L	Yearly	13	-	606
Water Height	m	Yearly	6.7	-	1.09

Table 41 Groundwater Monitoring Results EPA Identification Point 15 (GW02)

Pollutant	Unit of Measure	Frequency	2018/19	2019/20	2020/21
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.03	0.02	<0.01
Chemical Oxygen Demand	mg/L	Yearly	15	<10	26
Electrical Conductivity	µS/cm	Yearly	1032	918	1040
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	<0.1	0.1	0.1
pH	pH Units	Yearly	6.2	6.6	7.1
Total Dissolved Solids	mg/L	Yearly	500	483	690
Total Organic Carbon	mg/L	Yearly	4	4	3
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	46	40	45
Water Height	m	Yearly	2.5	-	0.98

At EPA Point 14 (Table 40), an increase in Chemical Oxygen Demand and Total Suspended Solids is evident from the 2018/19 review period. As this monitoring well had only been recently reinstated/developed prior to the sample event, there may have been excess sediment deposited in the well during development works. The data from the 2021/22

monitoring event will be reviewed to determine if the level of TSS has returned to usual low levels. All other analytes are similar to the 2018/19 period.

Results for EPA Point 15 (Table 41) show an increase notably in Chemical Oxygen Demand, Electrical Conductivity and Total Dissolved Solids between the 2019/20 and 2020/21 periods though the 2020/21 and 2018/19 results appear more similar. All other analytes remained relatively constant with the 2019/20 records.

Table 42 Groundwater Monitoring Results EPA Identification Points 16 (GW01)

Pollutant	Unit of Measure	Frequency	2018/19	2019/20	2020/21
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.04	0.03	0
Chemical Oxygen Demand	mg/L	Yearly	<10	11	26
Electrical Conductivity	µS/cm	Yearly	189	228	257
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	<0.1	0.1	0.3
pH	pH Units	Yearly	6.6	6.2	6.3
Total Dissolved Solids	mg/L	Yearly	98	127	200
Total Organic Carbon	mg/L	Yearly	2	5	6
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	73	52	173
Water Height	m	Yearly	0.9	0.74	0.86

Table 43 Groundwater Monitoring Results EPA Identification Points 24 (GW26)

Pollutant	Unit of Measure	Frequency	2018/19	2019/20	2020/21
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.03	<0.01	<0.01
Chemical Oxygen Demand	mg/L	Yearly	<10	<10	182
Electrical Conductivity	µS/cm	Yearly	244	486	421
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	<0.1	<0.1	0.1
pH	pH Units	Yearly	6.2	6.8	7.3
Total Dissolved Solids	mg/L	Yearly	142	283	264
Total Organic Carbon	mg/L	Yearly	1	1	148
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	24	6	142
Water Height	m	Yearly	1.5	1.52	5.89

EPA Point 16 (Table 42) also shows as increase in Chemical Oxygen Demand, Electrical Conductivity, Total Dissolved Solids and Total Suspended Solids when compared with the previous two periods. There is a decrease in Ammonia when compared with the previous two periods and the remaining analytes appear similar to the previous reporting period.

At EPA Point 24 (Table 43) there is a significant increase in Chemical Oxygen Demand, Total Organic Carbon and Total Suspended Solids. A correlation between these three analytes can

be made and it can be assumed these are organic in nature and probably caused by insufficient purging of this bore.

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 44.

Table 44 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 44. 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 2020/21 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 24th June 2020. Table 45 presents results of the attended annual noise monitoring event**.**

Figure 8 Borg Panels noise monitoring locations

Table 45 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 dB[4]	Exceedance [5,6]
NM1	24/06/2020 15:02	3.6	D	55	No	46	NA
NM2	24/06/2020 15:27	3.0	D	55	Yes	46	Nil
NM3	24/06/2020 16:14	2.7	D	55	No	42	NA
NM4	24/06/2020 14:38	3.0	C	55	Yes	38	Nil
NM1	24/06/2020 20:28	2.2	E	50	Yes	42	Nil
NM2	24/06/2020 20:49	2.2	E	50	Yes	38	Nil
NM3	24/06/2020 19:45	2.7	D	50	Yes	37	Nil
NM4	24/06/2020 20:07	2.7	D	50	Yes	31	Nil
NM1	24/06/2020 22:49	2.9	D	45	Yes	43	Nil
NM2	24/06/2020 23:14	2.9	D	45	Yes	<30	Nil

NM3	24/06/2020 22:01	3.2	D	45	No	39	NA
NM4	24/06/2020 22:25	2.8	E	45	Yes	32	Nil

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 44. 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 46 to 49 show monitoring results for quarterly noise monitoring events. All reference notes are included below Table 49.

Table 46 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	24/06/2020 15:02	3.6	D	55	No	46	NA
NM2	24/06/2020 15:27	3.0	D	55	Yes	46	Nil
NM3	24/06/2020 16:14	2.7	D	55	No	42	NA
NM4	24/06/2020 14:38	3.0	C	55	Yes	38	Nil

Table 47 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	28/09/2020 09:57	1.4	A	55	Yes	44	Nil
NM2	28/09/2020 10:39	1.8	A	55	Yes	NM	Nil
NM3	28/09/2020 09:08	1.1	A	55	Yes	31	Nil
NM4	28/09/2020 09:32	1.1	A	55	Yes	35	Nil

Table 48 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	13/01/2021 14:56	3.7	A	55	No	46	NA
NM2	13/01/2021 15:19	3.5	B	55	No	NM	NA
NM3	13/01/2021 14:07	3.2	A	55	No	<25	NA
NM4	13/01/2021 14:33	4.0	B	55	No	36	NA

Table 49 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	03/03/2021 14:28	2.1	A	55	Yes	43	Nil
NM2	03/03/2021 14:48	2.3	A	55	Yes	IA	Nil
NM3	03/03/2021 13:45	1.6	A	55	Yes	33	Nil
NM4	03/03/2021 14:09	1.6	A	55	Yes	36	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

Eight community complaints were received during the 2020/21 reporting period. Site investigations were conducted by the WHSE Coordinator which included review of plant operational data. Discussions were had 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.

An anonymous complaint was received by the EPA alleging continuous emission of smoke from the site over a period of one week. The EPA sought opinion from a third party within Oberon and they stated that there seemed to be some issue on 9th June 2020. An investigation revealed that one of the sites furnaces stopped for a short period of time on 9th June for maintenance works. Upon start up, some smoke is generated and is reasonable for this activity. This response was provided to the EPA who advised that they would close this complaint in their system. No further action was required.

A complaint was received from a resident regarding the condition of the cycle path that runs parallel to the site at Lowes Mount Road. It was necessary to deviate this path near Gate 6 to allow for construction activities to occur. Gravel was temporarily placed in lieu of bitumen for a period of approximately 1 week. The WHSE Coordinator contacted the resident advising that the path would be reinstated by the following week. No further correspondence was received from the resident.

Three complaints were related to noise. Two of these were related to construction activities where reversing alarm beepers could be heard by the resident. Site investigation undertaken by the Construction Manager and WHS Coordinator found items of plant that had not had the reversing alarm beepers changed out for the non-tonal squawkers. In both instances, this was rectified immediately with those items of plant removed from service, taken to the site workshop where the beepers were replaced with the squawkers. The remaining complaint was investigated and found valid as a section of the roof of the chipper building had been removed and was awaiting replacement which occurred the next day. This was communicated to the complainant. No further action was required, no further complaint was made.

The EPA received a ‘mixed’ complaint’ from a resident regarding noise, odour and smoke emission from the facility stacks. The Environmental Manager followed up with the Facility Manager and Production Manager and was able to determine that there was no evidence of any breach of operating conditions to support this complaint. The EPA did not request any action to be taken by Borg.

One traffic complaint was received where a member of the public informed Borg that a company truck had pulled out in front of their car. The truck was able to be identified and the Logistics Manager counselled the driver.

One complainant phoned the WHSE Coordinator to complain about soot deposits on their car. The WHSE Coordinator and Log Yard Manager attended to the complainant’s house to inspect the car and found black marks which more resembled tar stains. The WHSE Coordinator explained to the complainant that if the deposits had come from Borg facility it would more likely be a dusty, wood deposit which would be removed easily, and the resident agreed. No further action was required.

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 Panels 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 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 Panels 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.

A CCC meeting was held on 24th June 2020 though no community members were in attendance. No minutes were taken. Meetings were planned between September 2020 and January 2021 however were cancelled due to the coronavirus pandemic. A meeting was scheduled for 31st March 2021 though was delayed to 14th April 2021. See Appendix H for meeting minutes.

The next meeting is planned for 29th June 2021 and will be reported in the next Annual Review.

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 Panels commissioned Umwelt (Australia) Pty Limited to conduct an independent audit of the Borg Panels site for operations and construction for audit period 29 May 2017 to 30 June 2018.

Umwelt 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.

Eleven non-compliances were identified in this audit. These non-compliances have been closed out and were included in the previous reporting period Annual Review and therefore not repeated in this Review.

In accordance with SSD 7016 condition C15 the next independent audit is scheduled for 2021. Environmental consultants Molino Stewart have been engaged by Borg to undertake this audit and were endorsed by DPIE on 14th April 2021. The findings of this audit will be included in the 2021/22 Annual Review.

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.

There were no other non-conformances during this review period.

8 Activities Proposed for the next Annual Review Period

Borg Panels will endeavour to carry out the activities listed in Table 50 during the 2021/22 reporting period to assist with improving the environmental performance of the existing development and the project.

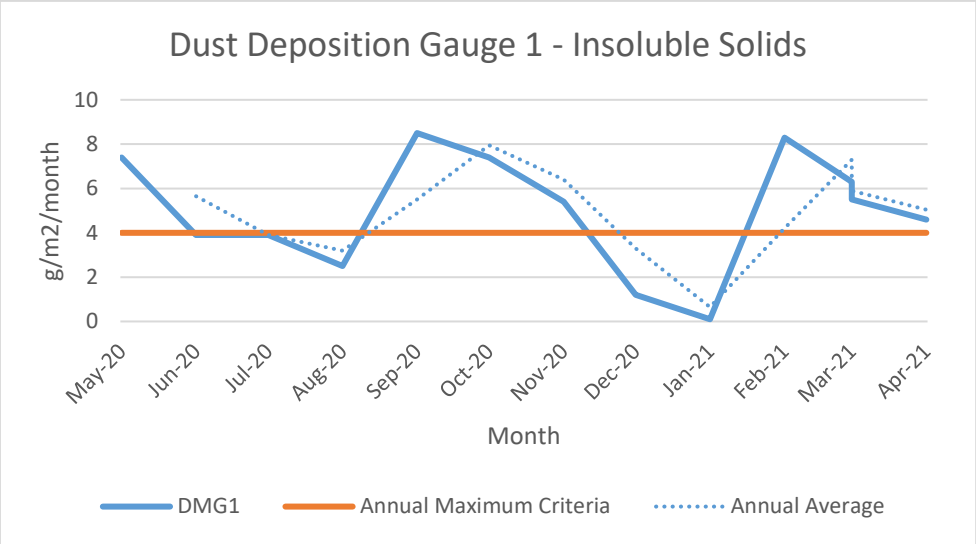
Table 50 Proposed Activities for 2021/22 Reporting Period

Activities Proposed in 2020/21 Reporting Period
Ongoing implementation of Environmental Management Plans for the existing development and the project.
Carry out independent environmental audit as per condition C15
Complete verification studies required for SSD 7016 including modifications

Complete reporting requirements related to the commissioning of particleboard plant
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
Complete commissioning of the gas turbine (MOD 2)
Complete construction of sorting tower for recycled wood (MOD 3)
Undertake required environmental monitoring associated with the newly installed gas turbine
Undertake rehabilitation works to areas disturbed by construction activities

APPENDICIES

Appendix A – Depositional Dust Monitoring Data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6
4
2
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Jun-20
Jul-20
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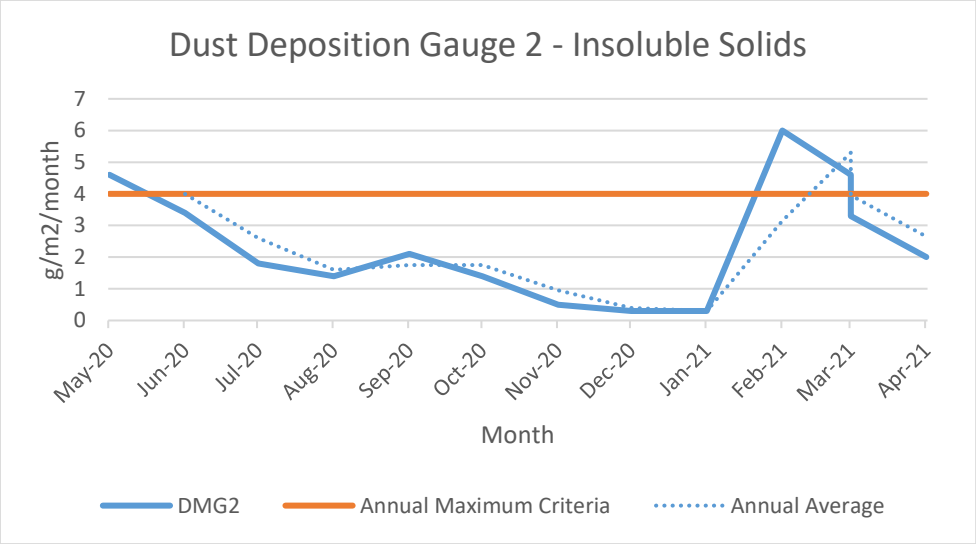
Jan-21
Feb-21
Mar-21
Apr-21
Month
DMG1
Annual Maximum Criteria
Annual Average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6
5
4
3
2
1
0
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
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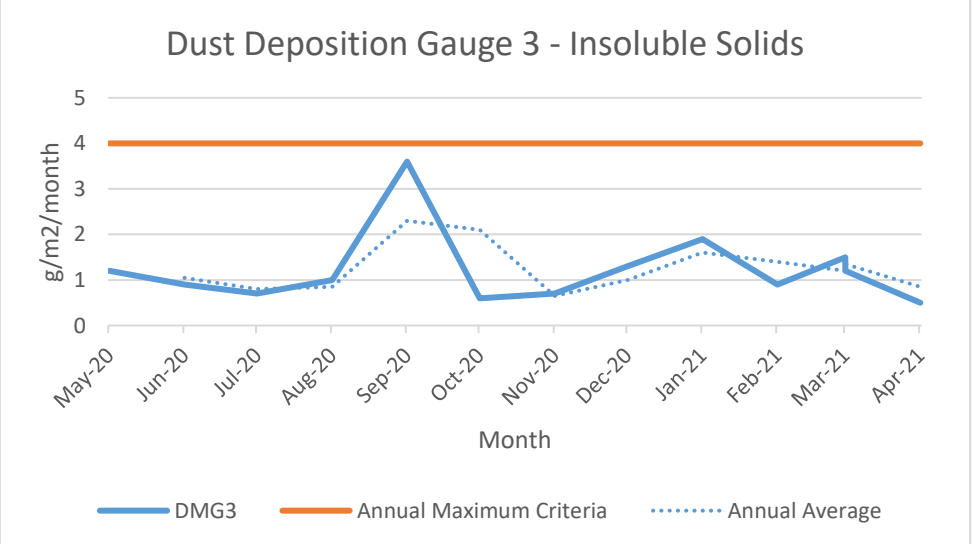
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
Month
DMG2
Annual Maximum Criteria
Annual Average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1
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Jun-20
Jul-20
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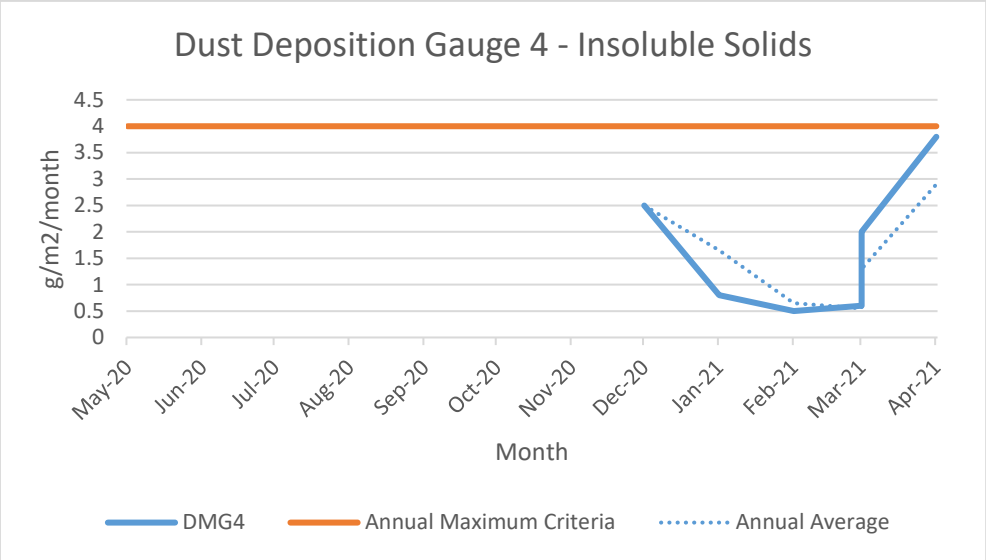
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
Month
DMG3
Annual Maximum Criteria
Annual Average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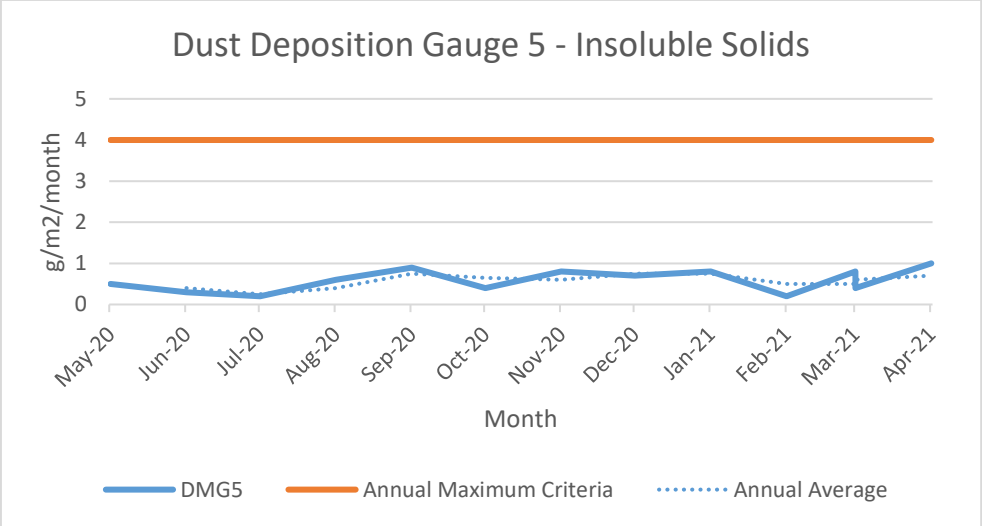
DMG4
Annual Maximum Criteria
Annual Average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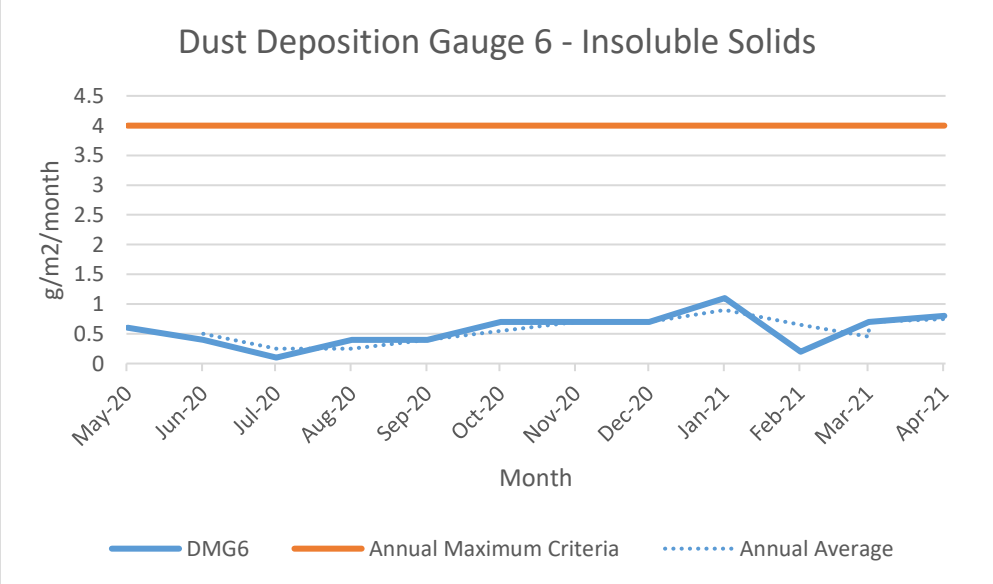
Month
DMG5
Annual Maximum Criteria
Annual Average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Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
Month
DMG6
Annual Maximum Criteria
Annual Average

Appendix B – Air Quality Monitoring Report

REPORT NUMBER R010598

Emission Testing Report
Borg Manufacturing, Oberon Plant

Document Information

Template Version; 240920

Client Name:	Borg Manufacturing
Report Number:	R010598
Date of Issue:	23 April 2021
Attention:	Jacqueline Blomberg
Address:	Lowes Mount Rd OBERON NSW 2787
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

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 Objectives*

The objectives of the project were to conduct a monitoring programme to quantify emissions from 14 discharge points to determine compliance with Borg Manufacturing's Environment Protection Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 4 - DC1 Baghouse	26 February 2021	Total solid particles Formaldehyde
EPA 5 - DC2 Baghouse		
EPA 7 - Conti 2 Dryer Cyclone 1 (West)	24 February 2021	Metals (type 1 & 2 substances) Hydrogen chloride, chlorine, total fluoride Formaldehyde Volatile organic compounds (VOC's) Nitrogen oxides, oxygen, carbon dioxide Smoke
	25 February 2021	Total solid particles, fine particulate matter (PM_{10}) Sulfuric acid mist & sulfur trioxide, sulfur dioxide
EPA 8 - Conti 2 Dryer Cyclone 2 (East)	23 February 2021	Total solid particles, fine particulate matter (PM_{10}) Sulfuric acid mist & sulfur trioxide, sulfur dioxide Metals (type 1 & 2 substances) Hydrogen chloride, chlorine, total fluoride Formaldehyde Volatile organic compounds (VOC's) Nitrogen oxides, oxygen, carbon dioxide Smoke
EPA 9 - Conti 1 Dryer Cyclone 1 (South)	3 March 2021	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
EPA 10 - Conti 1 Dryer Cyclone 2 (North)		
EPA 12 – Conti 1 Press Vents (1, 2, 3 & 4)	5 March 2021	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Nitrogen oxides, oxygen, carbon dioxide

Location	Test Date	Test Parameters*
EPA 27 – Combined Conti 2 Press Vent Stack	3 March 2021	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Nitrogen oxides, oxygen, carbon dioxide
EPA 29 - Forming Line Baghouse	2 March 2021	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
EPA 30 - Form Station Baghouse		
EPA 31 – Particle Board Press Extraction System		
EPA 32 - WESP	2 March 2021	Total solid particles Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
EPA 33 Cogeneration Plant 1 Stack	4 March 2021	Volatile organic compounds (VOC's) Nitrogen oxides, oxygen, carbon dioxide
EPA 34 Cogeneration Plant 2 Stack		

* 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 Feb-Mar 2021
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Total Solid Particles	mg/m^3	200	79
		Formaldehyde	mg/m^3	5	1.6
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Total Solid Particles	mg/m^3	200	68
		Formaldehyde	mg/m^3	5	3
9	Conti 1 Dryer Cyclone 1 (South)	Total Solid Particles	mg/m^3	200	38
		Formaldehyde	mg/m^3	5	4.8
10	Conti 1 Dryer Cyclone 2 (North)	Total Solid Particles	mg/m^3	200	41
		Formaldehyde	mg/m^3	5	4.7

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 *Proposed Licence Amendment*

As indicated by Borg, licence amendments have been proposed which indicate that EPA 33 and 34 may be subject to the concentration limits set out in the table below.

Results from this stack emission monitoring program indicate that Borg Manufacturing **was** compliant with the proposed emission limits.

EPA No.	Location Description	Pollutant	Units	Proposed Emission Limit	Detected Values 4 March 2021	Detected Values 4 March 2021 5 % Oxygen correction
33	Cogeneration Plant 1 Stack	Nitrogen oxides	mg/m^3	450	230	320
		Total VOCs (as n-propane)	mg/m^3	20	0.57	0.8
34	Cogeneration Plant 2 Stack	Nitrogen oxides	mg/m^3	450	270	390
		Total VOCs (as n-propane)	mg/m^3	20	0.11	0.16

1.5 *Results Summary*

The following summary table details results of all analytes tested for locations with no limits stated in NSW EPA licence 3035.

EPA No.	Location Description	Pollutant	Units	Detected Values February-March 2021
4	DC1 Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	1.5
5	DC2 Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	2.5
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Sulfur dioxide	mg/m^3	0.21
		Sulfur trioxide and/or sulfurc acid (as SO3)	mg/m^3	0.19
		Total VOCs (as n-propane)	mg/m^3	3.9
		Nitrogen oxides	mg/m^3	140
		Chloride (as HCl)	mg/m^3	<0.02
		Chlorine	mg/m^3	0.0089
		Total Fluoride (as HF)	mg/m^3	<0.02
		Type 1 & 2 Substances (Aggregate)	mg/m^3	≤0.068
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Sulfur dioxide	mg/m^3	<0.02
		Sulfur trioxide and/or sulfurc acid (as SO_3)	mg/m^3	0.074
		Total VOCs (as n-propane)	mg/m^3	9.7
		Nitrogen oxides	mg/m^3	210
		Chloride (as HCl)	mg/m^3	<0.02
		Chlorine	mg/m^3	0.01
		Total Fluoride (as HF)	mg/m^3	<0.03
		Type 1 & 2 Substances (Aggregate)	mg/m^3	≤0.12
9	Conti 1 Dryer Cyclone 1 (South)	Nitrogen oxides	mg/m^3	260
10	Conti 1 Dryer Cyclone 2 (North)	Nitrogen oxides	mg/m^3	73
12	Conti 1 Press Vent 1	Solid particles	mg/m^3	3.3
		Formaldehyde	mg/m^3	5.4
		Nitrogen oxides	mg/m^3	<4
	Conti 1 Press Vent 2	Solid particles	mg/m^3	7.2
		Formaldehyde	mg/m^3	6.5
		Nitrogen oxides	mg/m^3	<4
	Conti 1 Press Vent 3	Solid particles	mg/m^3	19
		Formaldehyde	mg/m^3	3.8
		Nitrogen oxides	mg/m^3	<4
	Conti 1 Press Vent 4	Solid particles	mg/m^3	28
		Formaldehyde	mg/m^3	1.2
		Nitrogen oxides	mg/m^3	<4
27	Combined Stack (C2 Press Vents)	Solid particles	mg/m^3	7.6
		Formaldehyde	mg/m^3	1.9
		Nitrogen oxides	mg/m^3	<4
29	Forming Line Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	1.7
		Nitrogen oxides	mg/m^3	<4
30	Form Station Baghouse	Solid particles	mg/m^3	<2
		Formaldehyde	mg/m^3	1.5
		Nitrogen oxides	mg/m^3	<4
31	Particle Board Press Extraction System	Solid particles	mg/m^3	46
		Formaldehyde	mg/m^3	4.6
		Nitrogen oxides	mg/m^3	<4
32	WESP	Solid particles	mg/m^3	30
		Formaldehyde	mg/m^3	0.21
		Nitrogen oxides	mg/m^3	210

2 RESULTS

2.1 *EPA 4 – DC1 Baghouse*

Date	26/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 4 - DC1 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper	**State**	NSW
Process Conditions	Plant operating normally		211219

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 compliance to AS4323.1	Compliant but non-ideal

Comments

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	5.1	
Gas molecular weight, g/g mole	28.5 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.27 (wet)	1.29 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0909 & 1028	
Temperature, °C	38	
Temperature, K	311	
Velocity at sampling plane, m/s	9.2	
Volumetric flow rate, actual, m³/s	8	
Volumetric flow rate (wet STP), m³/s	6.2	
Volumetric flow rate (dry STP), m³/s	5.9	
Mass flow rate (wet basis), kg/hour	28000	

Formaldehyde	Results	
Sampling time	0921-1021	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.5	0.54

Isokinetic Results	Results	
Sampling time	0915-1021	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.6
Isokinetic Sampling Parameters		
Sampling time, min	64	
Isokinetic rate, %	105	
Velocity difference, %	<1	

2.2 *EPA 5 – DC2 Baghouse*

Date	26/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 5 - DC2 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper	**State**	NSW
Process Conditions	Plant operating normally		211219

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 compliance to AS4323.1	Compliant but non-ideal

Comments

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	1.9	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	1050 & 1220	
Temperature, °C	33	
Temperature, K	306	
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	20	
Mass flow rate (wet basis), kg/hour	92000	

Formaldehyde	Results	
Sampling time	1101-1201	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	2.5	2.9

Isokinetic Results	Results	
Sampling time	1058-1212	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<2
Isokinetic Sampling Parameters		
Sampling time, min	70	
Isokinetic rate, %	100	
Velocity difference, %	-3	

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

Date	24/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		*211219*

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 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-compliant 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 highest to lowest gas velocity ratio exceeds 1.6:1
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	16	
Gas molecular weight, g/g mole	27.4 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.22 (wet)	1.30 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1101 & 1430	
Temperature, °C	57	
Temperature, K	330	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	57	
Volumetric flow rate (wet STP), m³/s	41	
Volumetric flow rate (dry STP), m³/s	35	
Mass flow rate (wet basis), kg/hour	180000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1242 - 1345		1242 - 1345		1242 - 1345	
	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)	140	290	110	230	160	340
	Concentration % v/v		Concentration % v/v		Concentration % v/v	
Carbon dioxide	1.9		1.3		2.5	
Oxygen	18.5		18.1		18.7	

Date	24/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results	
Sampling time	1312-1412	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.6	3.4

Isokinetic Results	Results	
Sampling time	1122-1425	
	Concentration mg/m³	Mass Rate g/min
Chloride (as HCl)	<0.02	<0.04
Chlorine	0.0089	0.018
Total fluoride (as HF)	<0.02	<0.05
Isokinetic Sampling Parameters		
Sampling time, min	120	
Isokinetic rate, %	102	
Velocity difference, %	9	

Date	24/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 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-compliant 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 highest to lowest gas velocity ratio exceeds 1.6:1
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	16	
Gas molecular weight, g/g mole	27.4 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.22 (wet)	1.30 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1101 & 1430	
Temperature, °C	57	
Temperature, K	330	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	57	
Volumetric flow rate (wet STP), m³/s	41	
Volumetric flow rate (dry STP), m³/s	35	
Mass flow rate (wet basis), kg/hour	180000	

Date	24/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

Isokinetic Results	Results	
Sampling time	1122-1425	
	Concentration mg/m³	Mass Rate g/min
Antimony	<0.003	<0.005
Arsenic	0.0015	0.0031
Beryllium	<0.0003	<0.0007
Cadmium	<0.0003	<0.0005
Chromium	0.00069	0.0014
Cobalt	<0.0004	<0.0008
Lead	0.004	0.0081
Manganese	0.051	0.11
Mercury	<0.0003	<0.0007
Nickel	0.0014	0.0028
Selenium	<0.003	<0.006
Tin	0.0015	0.0031
Vanadium	<0.0007	<0.001
Type 1 & 2 Substances		
Upper Bound		
Total Type 1 Substances	≤0.0087	≤0.018
Total Type 2 Substances	≤0.059	≤0.12
Total Type 1 & 2 Substances	≤0.068	≤0.14
Isokinetic Sampling Parameters		
Sampling time, min	120	
Isokinetic rate, %	101	
Velocity difference, %	9	

Date	24/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

Smoke Obscuration	Result
Time of assessment	1325 - 1345
Smoke Obscuration	0

Total VOCs (as n-Propane)	Results	
Sampling time	1317-1417	
	Concentration mg/m³	Mass Rate g/min
Total	3.9	8.1

VOC (speciated)	Results	
Sampling time	1317-1417	
	Concentration mg/m³	Mass Rate g/min
Detection limit(1)	<0.2	<0.3
α-Pinene	6	13
β-Pinene	5	10
D-Limonene	0.99	2.1

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Dichloromethane, Ethanol, Isopropanol, 1,1-Dichloroethene, trans-1,2-Dichloroethene, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloroethylene, Toluene, 1,1,2-Trichloroethane, Tetrachloroethene, Chlorobenzene, Ethylbenzene, m +p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 1,2,3-Trimethylbenzene, Acetone, Pentane, Acrylonitrile, Methyl ethyl ketone, n-Hexane, Ethyl acetate, Cyclohexane, 2-Methylhexane, Isopropyl acetate, 2,3-Dimethylpentane, 3-Methylhexane, Heptane, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 2-Hexanone, Octane, Butyl acetate, 1-Methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, Decane, 3-Carene, Undecane, Dodecane, Tridecane, Tetradecane

Date	25/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 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-compliant 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 highest to lowest gas velocity ratio exceeds 1.6:1
The gas temperature of the sampling plane is below the dew point
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	8.6	
Gas molecular weight, g/g mole	28.2 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.26 (wet)	1.30 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1145 & 1415	
Temperature, °C	45	
Temperature, K	318	
Velocity at sampling plane, m/s	13	
Volumetric flow rate, actual, m³/s	61	
Volumetric flow rate (wet STP), m³/s	46	
Volumetric flow rate (dry STP), m³/s	42	
Mass flow rate (wet basis), kg/hour	210000	

Isokinetic Results	Results	
Sampling time	1201-1406	1201-1406 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	79	190
Fine particulates (PM10)	8.9	21
D50 cut size, 10µm	10.0	
Sulfur dioxide	0.21	0.49
Sulfur trioxide and/or Sulfuric acid (as SO3)	0.19	0.46
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	94	90
Velocity difference, %	1	1

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

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		2.11.2.19

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 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 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	17	
Gas molecular weight, g/g mole	27.4 (wet)	29.3 (dry)
Gas density at STP, kg/m³	1.22 (wet)	1.31 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1002 & 1348	
Temperature, °C	57	
Temperature, K	330	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	58	
Volumetric flow rate (wet STP), m³/s	42	
Volumetric flow rate (dry STP), m³/s	35	
Mass flow rate (wet basis), kg/hour	190000	

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

Isokinetic Results	Results	
Sampling time	1108-1312	1108-1312 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	68	130
Fine particulates (PM10)	28	54
D50 cut size, 10µm	10.0	
Sulfur dioxide	<0.02	<0.03
Sulfur trioxide and/or Sulfuric acid (as SO3)	0.074	0.14
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	102	98
Velocity difference, %	6	6

Total VOCs (as n-Propane)	Results
Sampling time	1208-1309
	Concentration mg/m³	Mass Rate g/min
Total	9.7	20

VOC (speciated)	Results	
Sampling time	1208-1309	
	Concentration mg/m³	Mass Rate g/min
Detection limit(1)	<0.2	<0.3
α-Pinene	15	31
β-Pinene	13	28
D-Limonene	1.8	3.8

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Dichloromethane, Ethanol, Isopropanol, 1,1-Dichloroethene, trans-1,2-Dichloroethene, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloroethylene, Toluene, 1,1,2-Trichloroethane, Tetrachloroethene, Chlorobenzene, Ethylbenzene, m + p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 1,2,3-Trimethylbenzene, Acetone, Pentane, Acrylonitrile, Methyl ethyl ketone, n-Hexane, Ethyl acetate, Cyclohexane, 2-Methylhexane, Isopropyl acetate, 2,3-Dimethylpentane, 3-Methylhexane, Heptane, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 2-Hexanone, Octane, Butyl acetate, 1-Methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, Decane, 3-Carene, Undecane, Dodecane, Tridecane, Tetradecane

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 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 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	17	
Gas molecular weight, g/g mole	27.4 (wet)	29.3 (dry)
Gas density at STP, kg/m³	1.22 (wet)	1.31 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1348 & 1835	
Temperature, °C	56	
Temperature, K	329	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	58	
Volumetric flow rate (wet STP), m³/s	43	
Volumetric flow rate (dry STP), m³/s	35	
Mass flow rate (wet basis), kg/hour	190000	

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		211219

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1426 - 1612		1426 - 1612		1426 - 1612	
	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	440	180	380	230	490
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	2.8		2.4		3.2	
Oxygen	17.9		17.6		18.3	

Formaldehyde	Results	
Sampling time	1316-1416	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	3	6.4

Isokinetic Results	Results	
Sampling time	1423-1625	
	Concentration mg/m³	Mass Rate g/min
Chloride (as HCl)	<0.02	<0.05
Chlorine	0.01	0.021
Total fluoride (as HF)	<0.03	<0.06
Isokinetic Sampling Parameters		
Sampling time, min	120	
Isokinetic rate, %	103	
Velocity difference, %	8	

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		2 11 2 19

Sampling Plane Details		
Sampling plane dimensions	2480 mm	
Sampling plane area	4.83 m^2	
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 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 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	17	
Gas molecular weight, g/g mole	27.4 (wet)	29.3 (dry)
Gas density at STP, kg/m^3	1.22 (wet)	1.31 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1348 & 1835	
Temperature, °C	56	
Temperature, K	329	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m^3/s	58	
Volumetric flow rate (wet STP), m^3/s	43	
Volumetric flow rate (dry STP), m^3/s	35	
Mass flow rate (wet basis), kg/hour	190000	

Date	23/02/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Ed Camilleri	**State**	NSW
Process Conditions	Please refer to client records.		2 11 2 19

Isokinetic Results	Results	
Sampling time	1544-1748	
	Concentration mg/m³	Mass Rate g/min
Antimony	<0.004	<0.008
Arsenic	0.0049	0.01
Beryllium	<0.0005	<0.001
Cadmium	<0.0004	<0.0008
Chromium	0.013	0.027
Cobalt	<0.0006	<0.001
Lead	0.013	0.027
Manganese	0.07	0.15
Mercury	<0.0005	<0.001
Nickel	0.0087	0.018
Selenium	<0.004	<0.009
Tin	0.0042	0.0088
Vanadium	<0.001	<0.002
Type 1 & 2 Substances		
Upper Bound		
Total Type 1 Substances	≤0.023	≤0.047
Total Type 2 Substances	≤0.1	≤0.21
Total Type 1 & 2 Substances	≤0.12	≤0.26
Isokinetic Sampling Parameters		
Sampling time, min	120	
Isokinetic rate, %	109	
Velocity difference, %	8	

Smoke Obscuration	Result
Time of assessment	1541 - 1601
Smoke Obscuration	0

2.5 *EPA 9 – Conti 1 Dryer Cyclone 1 (South)*

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 gas temperature of the sampling plane is below the dew point
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	12	
Gas molecular weight, g/g mole	27.8 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.30 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1401 & 1635	
Temperature, °C	53	
Temperature, K	326	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	47	
Volumetric flow rate (wet STP), m³/s	35	
Volumetric flow rate (dry STP), m³/s	31	
Mass flow rate (wet basis), kg/hour	160000	

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1412 - 1526		1412 - 1526		1412 - 1526	
	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)	260	470	94	170	310	570
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	1.3		1.1		1.4	
Oxygen	19.8		19.6		20	

Formaldehyde	Results	
Sampling time	1430-1530	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.8	8.8

Isokinetic Results	Results	
Sampling time	1428-1632	1428-1632 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	38	67
Fine particulates (PM10)	26	46
D50 cut size, 10µm	9.8	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	120
Isokinetic rate, %	97	94
Velocity difference, %	-4	-4

Smoke Obscuration	Result
Time of assessment	1430-1445
Smoke Obscuration	0

2.6 *EPA 10 – Conti 1 Dryer Cyclone 2 (North)*

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 gas temperature of the sampling plane is below the dew point
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	15	
Gas molecular weight, g/g mole	27.4 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.22 (wet)	1.30 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1155 & 1422	
Temperature, °C	58	
Temperature, K	331	
Velocity at sampling plane, m/s	13	
Volumetric flow rate, actual, m³/s	53	
Volumetric flow rate (wet STP), m³/s	38	
Volumetric flow rate (dry STP), m³/s	32	
Mass flow rate (wet basis), kg/hour	170000	

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1218 - 1335		1218 - 1335		1218 - 1335	
	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)	73	140	53	100	110	200
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	0.8		0.7		1	
Oxygen	20.1		19.9		20.3	

Formaldehyde	Results	
Sampling time	1224-1324	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.7	9

Isokinetic Results	Results	
Sampling time	1215-1418	1215-1418 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	41	79
Fine particulates (PM10)	27	52
D50 cut size, 10µm	10.0	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	120	119
Isokinetic rate, %	100	90
Velocity difference, %	-9	-9

Smoke Obscuration	Result
Time of assessment	1220 - 1240
Smoke Obscuration	0

2.7 *EPA 12 – Conti 1 Press Vent 1*

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 1
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Stairs 20 m
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Exit 5 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1	Ideal

Stack Parameters		
Moisture content, %v/v	1	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	1158 & 1308	
Temperature, °C	66	
Temperature, K	339	
Velocity at sampling plane, m/s	5.1	
Volumetric flow rate, actual, m³/s	1.4	
Volumetric flow rate (wet STP), m³/s	1	
Volumetric flow rate (dry STP), m³/s	1	
Mass flow rate (wet basis), kg/hour	4700	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1205 - 1304		1205 - 1304		1205 - 1304	
	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	<0.2	<4	<0.2	<4	<0.2
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 1
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	1200-1300
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	5.4 / 0.33

Isokinetic Results	Results	
Sampling time	1200-1306	1200-1306 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	3.3	0.2
Fine particulates (PM10)	<3	<0.2
D50 cut size, 10µm	10.8	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	65
Isokinetic rate, %	99	98
Velocity difference, %	2	2

2.8 *EPA 12 – Conti 1 Press Vent 2*

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 2
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Stairs 20 m
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Exit 5 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1	Compliant but non-ideal

Comments
The sampling plane is deemed to be non-ideal due to the following reasons:
The gas velocity at some or all sampling points is less than 3 m/s

Stack Parameters		
Moisture content, %v/v	1.2	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	1040 & 1148	
Temperature, °C	40	
Temperature, K	313	
Velocity at sampling plane, m/s	2.8	
Volumetric flow rate, actual, m³/s	0.8	
Volumetric flow rate (wet STP), m³/s	0.61	
Volumetric flow rate (dry STP), m³/s	0.6	
Mass flow rate (wet basis), kg/hour	2800	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1025 - 1124		1025 - 1124		1025 - 1124	
	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	<0.1	<4	<0.1	<4	<0.1
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 2
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	1042-1142
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	6.5 / 0.24

Isokinetic Results	Results	
Sampling time	1042-1147	1042-1147 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	7.2	0.26
Fine particulates (PM10)	4.8	0.17
D50 cut size, 10µm	10.7	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	98	161
Velocity difference, %	<1	<1

2.9 *EPA 12 – Conti 1 Press Vent 3*

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 3
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Stairs 20 m
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Exit 5 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1	Compliant but non-ideal

Comments
The sampling plane is deemed to be non-ideal due to the following reasons:
The gas velocity at some or all sampling points is less than 3 m/s

Stack Parameters		
Moisture content, %v/v	1.7	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0921 & 1030	
Temperature, °C	39	
Temperature, K	312	
Velocity at sampling plane, m/s	2.8	
Volumetric flow rate, actual, m³/s	0.8	
Volumetric flow rate (wet STP), m³/s	0.61	
Volumetric flow rate (dry STP), m³/s	0.6	
Mass flow rate (wet basis), kg/hour	2800	

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)	<4	<0.1	<4	<0.1	<4	<0.1
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 3
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	0923-1023
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	3.8 / 0.14

Isokinetic Results	Results	
Sampling time	0923-1029	0923-1029 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	19	0.68
Fine particulates (PM10)	13	0.45
D50 cut size, 10µm	10.7	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	98	159
Velocity difference, %	-1	-1

2.10 *EPA 12 – Conti 1 Press Vent 4*

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 4
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m²
Sampling port size, number	4" BSP (x2)
Access & height of ports	Stairs 20 m
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Exit 5 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1	Compliant but non-ideal

Comments
The sampling plane is deemed to be non-ideal due to the following reasons:
The gas velocity at some or all sampling points is less than 3 m/s

Stack Parameters		
Moisture content, %v/v	3.2	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	0800 & 0911	
Temperature, °C	39	
Temperature, K	312	
Velocity at sampling plane, m/s	1.9	
Volumetric flow rate, actual, m³/s	0.55	
Volumetric flow rate (wet STP), m³/s	0.42	
Volumetric flow rate (dry STP), m³/s	0.41	
Mass flow rate (wet basis), kg/hour	1900	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0805 - 0904		0805 - 0904		0805 - 0904	
	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	<0.1	<4	<0.1	<4	<0.1
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	5/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 12 - Conti 1 Press Vent 4
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	0805-0905
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	1.2 / 0.029

Isokinetic Results	Results	
Sampling time	0805-0910	0805-0910 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	28	0.68
Fine particulates (PM10)	20	0.5
D50 cut size, 10µm	10.9	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	100	226
Velocity difference, %	<1	<1

2.11 *EPA 27 - Combined Conti 2 Press Vent Stack*

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 27 - Combined Stack (C2 Press Vents)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 compliance to AS4323.1	Compliant but non-ideal

Comments

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	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	0858 & 1055	
Temperature, °C	30	
Temperature, K	303	
Velocity at sampling plane, m/s	10	
Volumetric flow rate, actual, m³/s	33	
Volumetric flow rate (wet STP), m³/s	26	
Volumetric flow rate (dry STP), m³/s	25	
Mass flow rate (wet basis), kg/hour	120000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0917 - 1020		0917 - 1020		0917 - 1020	
	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
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.7		20.5		20.8	

Date	3/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 27 - Combined Stack (C2 Press Vents)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	0914-1014
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	1.9 / 2.8

Isokinetic Results	Results	
Sampling time	0908-1052	0908-1052 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	7.6	11
Fine particulates (PM10)	5.2	7.9
D50 cut size, 10µm	10.5	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	100	100
Isokinetic rate, %	99	84
Velocity difference, %	8	8

2.12 *EPA 29 – Forming Line Baghouse*

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 compliance to AS4323.1	Compliant but non-ideal	

Comments

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	0.68	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	1508 & 1640	
Temperature, °C	41	
Temperature, K	314	
Velocity at sampling plane, m/s	38	
Volumetric flow rate, actual, m³/s	30	
Volumetric flow rate (wet STP), m³/s	22	
Volumetric flow rate (dry STP), m³/s	22	
Mass flow rate (wet basis), kg/hour	100000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1515 - 1614		1515 - 1614		1515 - 1614	
	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	<5	<4	<5	<4	<5
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Foramldehyde	Results
Sampling time	1535-1635
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	1.7 / 2.2

Isokinetic Results	Results	
Sampling time	1512-1635	1512-1635 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<3
Fine particulates (PM10)	<2	<3
D50 cut size, 10µm	9.7	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	55	79
Isokinetic rate, %	142	84
Velocity difference, %	<1	<1

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

2.13 *EPA 30 – Form Station Baghouse*

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 compliance to AS4323.1	Ideal

Stack Parameters		
Moisture content, %v/v	<0.4	
Gas molecular weight, g/g mole	29.0 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1700 & 1815	
Temperature, °C	39	
Temperature, K	312	
Velocity at sampling plane, m/s	28	
Volumetric flow rate, actual, m³/s	6.4	
Volumetric flow rate (wet STP), m³/s	4.8	
Volumetric flow rate (dry STP), m³/s	4.8	
Mass flow rate (wet basis), kg/hour	22000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1705 - 1804		1705 - 1804		1705 - 1804	
	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
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	1702-1802
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	1.5 / 0.42

Isokinetic Results	Results	
Sampling time	1702-1810	1702-1810 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.5
Fine particulates (PM10)	<4	<1
D50 cut size, 10µm	10.0	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	99	91
Velocity difference, %	2	2

Smoke Obscuration	Result
Time of assessment	1730 - 1745
Smoke Obscuration	0

2.14 *EPA 31 – Particle Board Press Extraction System*

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 31 - Particle Board Press Extraction System
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 compliance to AS4323.1	Compliant but non-ideal

Comments
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	3.4	
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 Flow Parameters		
Flow measurement time(s) (hhmm)	1245 & 1455	
Temperature, °C	35	
Temperature, K	308	
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	24	
Mass flow rate (wet basis), kg/hour	120000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1305 - 1431		1305 - 1431		1305 - 1431	
	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	6.8	9.9
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.9		20.9		20.9	

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 31 - Particle Board Press Extraction System
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results
Sampling time	1315-1415
	Concentration mg/m³ / Mass Rate g/min
Formaldehyde	4.6 / 6.8

Isokinetic Results	Results	
Sampling time	1305-1450	1305-1450 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	46	66
Fine particulates (PM10)	40	58
D50 cut size, 10µm	10.2	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	100	100
Isokinetic rate, %	92	86
Velocity difference, %	5	5

Smoke Obscuration	Result
Time of assessment	1334 - 1354
Smoke Obscuration	0

2.15 *EPA 32 – WESP*

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

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 compliance to AS4323.1	Compliant but non-ideal

Comments

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

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

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

Stack Parameters		
Moisture content, %v/v	24	
Gas molecular weight, g/g mole	26.6 (wet)	29.3 (dry)
Gas density at STP, kg/m³	1.19 (wet)	1.31 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0835 & 1115	
Temperature, °C	62	
Temperature, K	335	
Velocity at sampling plane, m/s	15	
Volumetric flow rate, actual, m³/s	73	
Volumetric flow rate (wet STP), m³/s	52	
Volumetric flow rate (dry STP), m³/s	40	
Mass flow rate (wet basis), kg/hour	220000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0852 - 1030		0852 - 1030		0852 - 1030	
	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	510	140	320	320	760
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	3.2		2.5		4	
Oxygen	17.3		17		18	

Date	2/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Please refer to client records.		211219

Formaldehyde	Results	
Sampling time	0900-1001	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	0.21	0.5

Isokinetic Results	Results	
Sampling time	0850-1112	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	30	73
Isokinetic Sampling Parameters		
Sampling time, min	140	
Isokinetic rate, %	99	
Velocity difference, %	-9	

Smoke Obscuration	Result
Time of assessment	0944 - 1004
Smoke Obscuration	0

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

2.16 *EPA 33 – Cogeneration Plant 1 Stack*

Date	4/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	Cogeneration Plant 1 Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Engine running between 700-750kW		*211219*

Sampling Plane Details		
Sampling plane dimensions	270 mm	
Sampling plane area	0.0573 m²	
Sampling port size, number	4" BSP (x1)	
Access & height of ports	Stairs & fixed ladder	8 m
Duct orientation & shape	Vertical	Circular
Downstream disturbance	Exit	>6 D
Upstream disturbance	Junction	6 D
No. traverses & points sampled	1	2
Sample plane compliance to AS4323.1	Ideal	

Comments
Note approval of single port testing (NSW EPA Our reference: SF20/16003; DOC20/163969-8 "Non-compliant sampling plane")

Stack Parameters		
Moisture content, %v/v	8.8	
Gas molecular weight, g/g mole	28.6 (wet)	29.7 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.32 (dry)
% Oxygen correction & Factor	5 %	1.41
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1440 & 1548	
Temperature, °C	405	
Temperature, K	678	
Velocity at sampling plane, m/s	35	
Volumetric flow rate, actual, m³/s	2	
Volumetric flow rate (wet STP), m³/s	0.71	
Volumetric flow rate (dry STP), m³/s	0.65	
Mass flow rate (wet basis), kg/hour	3300	
Velocity difference, %	4	

Gas Analyser Results	Average			Minimum			Maximum		
Sampling time	1443 - 1544			1443 - 1544			1443 - 1544		
	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min
Combustion Gases									
Nitrogen oxides (as NO_2)	230	320	8.9	220	300	8.4	300	430	12
	Concentration % v/v			Concentration % v/v			Concentration % v/v		
Carbon dioxide	7.3			7.2			7.3		
Oxygen	9.6			9.5			9.7		

Total VOCs (as n-Propane)	Results		
Sampling time	1444-1544		
	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min
Total	0.57	0.8	0.022

VOC (speciated)	Results		
Sampling time	1444-1544		
	Concentration mg/m³	Corrected to 5% O2 mg/m³	Mass Rate g/min
Detection limit(1)	<0.1	<0.2	<0.005
Isopropanol	0.68	0.96	0.027
α-Pinene	0.093	0.13	0.0036
β-Pinene	0.12	0.17	0.0048

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Dichloromethane, Ethanol, 1,1-Dichloroethene, trans-1,2-Dichloroethene, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloroethylene, Toluene, 1,1,2-Trichloroethane, Tetrachloroethene, Chlorobenzene, Ethylbenzene, m + p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 1,2,3-Trimethylbenzene, Acetone, Pentane, Acrylonitrile, Methyl ethyl ketone, n-Hexane, Ethyl acetate, Cyclohexane, 2-Methylhexane, Isopropyl acetate, 2,3-Dimethylpentane, 3-Methylhexane, Heptane, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 2-Hexanone, Octane, Butyl acetate, 1-Methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, Decane, 3-Carene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

2.17 *EPA 34 – Cogeneration Plant 2 Stack*

Date	4/03/2021	**Client**	Borg Manufacturing Pty Ltd
Report	R010598	**Stack ID**	Cogeneration Plant 2 Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Steven Cooper & Aaron Davis	**State**	NSW
Process Conditions	Engine running between 700-750kW		211219

Sampling Plane Details	
Sampling plane dimensions	270 mm mm
Sampling plane area	0.0573 m^2
Sampling port size, number	4" BSP (x1)
Access & height of ports	Stairs & fixed ladder 8 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit >6 D
Upstream disturbance	Junction 6 D
No. traverses & points sampled	1 2
Sample plane compliance to AS4323.1	Ideal

Comments
Note approval of single port testing (NSW EPA Our reference: SF20/16003; DOC20/163969-8 "Non-compliant sampling plane")

Stack Parameters		
Moisture content, %v/v	9.7	
Gas molecular weight, g/g mole	28.5 (wet)	29.7 (dry)
Gas density at STP, kg/m^3	1.27 (wet)	1.32 (dry)
% Oxygen correction & Factor	5 %	1.42
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1305 & 1435	
Temperature, °C	400	
Temperature, K	673	
Velocity at sampling plane, m/s	35	
Volumetric flow rate, actual, m^3/s	2	
Volumetric flow rate (wet STP), m^3/s	0.72	
Volumetric flow rate (dry STP), m^3/s	0.65	
Mass flow rate (wet basis), kg/hour	3300	
Velocity difference, %	-2	

Gas Analyser Results	Average			Minimum			Maximum		
Sampling time	1331 - 1432			1331 - 1432			1331 - 1432		
	Concentration mg/m^3	Corrected to 5% 02 mg/m^3	Mass Rate g/min	Concentration mg/m^3	Corrected to 5% O2 mg/m^3	Mass Rate g/min	Concentration mg/m^3	Corrected nto 5% 02 mg/m^3	Mass Rate g/min
Combustion Gases									
Nitrogen oxides (as NO_2)	270	390	11	260	370	10	280	400	11
		Concentration %v/v			Concentration %v/v			Concentration %v/v	
Carbon dioxide		7.2			7.2			7.2	
Oxygen		9.7			9.7			9.8	

Total VOCs (as n-Propane)	Results		
Sampling time	1332-1432		
	Concentration mg/m^3	Corrected to 5% O2 mg/m^3	Mass Rate g/min
Total	0.11	0.16	0.0045

VOC (speciated)	Results		
Sampling time	1332-1432		
	Concentration mg/m^3	Corrected to 5% O2 mg/m^3	Mass Rate g/min
Detection limit[1]	<0.1	<0.2	<0.005
α-Pinene	0.16	0.23	0.0064
β-Pinene	0.19	0.27	0.0074

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Dichloromethane, Ethanol, Isopropanol, 1,1-Dichloroethene, trans-1,2-Dichloroethene, cis-1,2-Dichloroethene, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloroethylene, Toluene, 1,1,2-Trichloroethane, Tetrachloroethene, Chlorobenzene, Ethylbenzene, m + p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, Propylbenzene, 1,3,5-Trimethylbenzene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, 1,2,3-Trimethylbenzene, Acetone, Pentane, Acrylonitrile, Methyl ethyl ketone, n-Hexane, Ethyl acetate, Cyclohexane, 2-Methylhexane, Isopropyl acetate, 2,3-Dimethylpentane, 3-Methylhexane, Heptane, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 2-Hexanone, Octane, Butyl acetate, 1-Methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, Decane, 3-Carene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

3 PLANT OPERATING CONDITIONS

Borg Manufacturing have collated plant operating condition 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
Sample plane criteria	NSW TM-1	NA	NA	✓	NA
Flow rate, temperature and velocity	NSW TM-2	NSW TM-2	8%, 2%, 7%	NA	✓
Moisture content	NSW TM-22	NSW TM-22	8%	✓	✓
Molecular weight	NA	NSW TM-23	not specified	NA	✓
Dry gas density	NA	NSW TM-23	not specified	NA	✓
Carbon dioxide	NSW TM-24	NSW TM-24	13%	✓	✓
Nitrogen oxides	NSW TM-11	NSW TM-11	12%	✓	✓
Oxygen	NSW TM-25	NSW TM-25	13%	✓	✓
Aldehydes and ketones	NSW TM-34	Ektimo 332	16%	✓	✓†
Sulfur dioxide	NSW TM-3	Ektimo 235	16%	✓	✓†
Speciated volatile organic compounds (VOC's)	NSW TM-34[d]	Ektimo 344	19%	✓	✓†
Chlorine	NSW TM-7	Ektimo 235	14%	✓	✓†
Fluorine	NSW TM-9	ALS Method QWI-EN/EA144C & Ektimo 240	25%	✓	✓#,†
Hydrogen chloride	NSW TM-8	Ektimo 235	14%	✓	✓†
Solid particles (total)	NSW TM-15	NSW TM-15††	3%	✓	✓
Sulfuric acid mist and/or sulfur trioxide	NSW TM-3	Ektimo 235	16%	✓	✓†
Total (gaseous and particulate) metals and metallic compounds	NSW TM-12, NSW TM-13, NSW TM-14	Envirolab inhouse Metals-006, Metals-022, Metals-021	15%	✓	✓‡
Type 1 substances (Sb, As, Cd, Pb, Hg)	NSW TM-12	Envirolab inhouse Metals-006, Metals-022, Metals-021	15%	✓	✓‡
Type 2 substances (Be, Cr, Co, Mn, Ni, Se, Sn, V)	NSW TM-13	Envirolab inhouse Metals-006, Metals-022	15%	✓	✓‡
Smoke	NSW TM-16	NA	not specified	NA	✓

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* Uncertainty values cited in this table 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
5 March 2021 in report number LV-001163.
16 March 2021 in report number LV-001201.
16 March 2021 in report number LV-001190.
18 March 2021 in report number LV-001211.
18 March 2021 in report number R010598-ISE F.

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

‡ Analysis performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 2 March 2021 in report number 263156.

Analysis (solid fluoride only) performed by Australian Laboratory Services Pty Ltd, NATA accreditation number 825. Results were reported to Ektimo on 15 March 2021 in report number EN2101736.

d Excludes recovery study as specified in section 8.4.3 of USEPA Test Method 18.

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 APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of 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	Continuous Emission Monitoring
CEMS	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 defined as the particle diameter at which the cyclone achieves a 50% collection efficiency ie. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. 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
Lower Bound	Defines values reported below detection as equal to zero.
Medium Bound	Defines values reported below detection are equal to half 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	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
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 will be determined by matching the integrated 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 afterflows.
Vic EPA	Victorian Environment Protection Authority
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
XRD	X-ray Diffractometry
Upper Bound	Defines values reported below detection are 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: SITE LOCATIONS

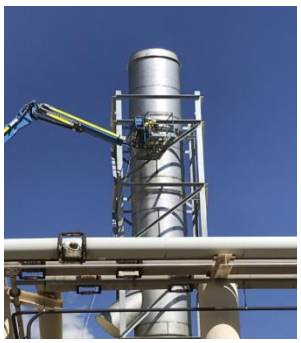
EPA 4 – DC1 Baghouse

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

EPA 12 – Conti 1 Press Vents (1, 2, 3, 4)



EPA 27 – Combined Conti 2 Press Vent Stack

EPA 29 – Forming Line Baghouse

EPA 30 – Foam Station Baghouse

EPA 31 – Particle Board Press Extraction System

EPA 32 – WESP

Cogeneration Plant 1 Stack & Cogeneration Plant 2 Stack

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VIC NSW WA QLD

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Appendix C – Surface Water Monitoring Data

SURFACE WATER MONITORING EPL POINT 1

SAMPLE DATE	pH	TSS mg/l	True Colour hazen	Total N mg/l	Total P mg/l	Oil & Grease mg/l	BOD mg/l	MBAS mg/l	Aldrin µg/l	Dieldrin µg/l
04-May-20	7.36	17	30	1.4	0.06	5	4	0.1	0.01	0.01
03.June-20	8.11	11	20	1.1	0.05	5	2	0.1	0.01	0.01
15-Jun-20	7.36	78	24	1.2	0.09	5	3	0.1	0.01	0.01
25-Jun-20	8.03	24	15	1.3	0.07	5	2	0.1	0.01	0.01
01-Jul-20	7.83	10	20	1	0.1	5	2	0.1	0.01	0.01
08-Jul-20	7.68	14	20	1.1	0.02	5	2	0.1	0.01	0.01
15-Jul-20	7.67	7	20	1.2	0.06	5	2	0.2	0.01	0.01
20-Jul-20	7.97	5	15	1.2	0.01	5	2	0.1	0.01	0.01
29-Jul-20	7.65	50	50	1.4	0.11	5	5	0.1	0.01	0.01
6-Aug-20	7.98	13	20	1.1	0.04	5	2	0.1	0.01	0.01
11-Aug-20	7.5	28	20	1.4	0.08	5	6	0.1	0.01	0.01
19-Aug-20	7.46	15	25	1.3	0.06	5	3	0.1	0.01	0.01
26-Aug-20	7.44	8	80	1.9	0.08	5	4	0.1	0.01	0.01
1-Sep-20	7.73	7	45	1.8	0.04	5	2	0.1	0.01	0.01
9-Sep-20	7.72	5	35	1.8	0.03	5	3	0.1	0.01	0.01
16-Sep-20	7.88	8	45	1.5	0.03	5	2	0.1	0.01	0.01
23-Sep-20	6.89	22	100	2.1	0.08	5	32	0.1	0.01	0.01
30-Sep-20	7.3	6	50	1.3	0.03	5	2	0.1	0.01	0.01
8-Oct-20	8.01	9	30	1	0.01	5	2	0.1	0.01	0.01
14-Oct-20	7.02	6	30	0.9	0.03	5	3	0.1	0.01	0.01
21-Oct-20	8.86	10	45	0.9	0.01	5	2	0.1	0.01	0.01
28-Oct-20	7.92	14	100	1.6	0.06	5	4	0.1	0.01	0.01
19-Nov-20	6.82	33	45	1.1	0.06	5	2	0.1	0.01	0.01
25-Nov-20	6.86	41	50	1.2	0.07	5	5	0.1	0.01	0.01
2-Dec-20	7.95	31	30	1.7	0.08	5	3	0.1	0.01	0.01
9-Dec-20	7.78	10	50	1	0.03	5	2	0.1	0.01	0.01
16-Dec-20	7.23	13	1	1.9	0.04	5	3	0.1	0.01	0.01

21-Dec-20	7.08	47	25	1.2	0.08	5	4	0.1	0.01	0.01
4-Jan-21	7.42	18	50	1.6	0.02	5	2	0.1	0.01	0.01
12-Jan-21	6.58	14	50	1	0.06	5	2	0.1	0.01	0.01
20-Jan-21	8.63	6	40	0.9	0.03	5	3	0.1	0.01	0.01
1-Feb-21	7.68	27	40	1.5	0.05	5	5	0.1	0.01	0.01
10-Feb-21	7.44	40	30	1.1	0.06	5	3	0.1	0.01	0.01
17-Feb-21	7.45	48	50	0.9	0.07	5	2	0.1	0.01	0.01
24-Feb-21	7.55	656	30	2.3	0.24	5	2	0.1	0.01	0.01
4-Mar-21	7.95	36	30	1	0.05	5	2	0.1	0.01	0.01
9-Mar-21	7.81	43	25	0.8	0.06	5	2	0.1	0.01	0.01
16-Mar-21	7.95	23	125	0.9	0.05	15	2	0.1	0.01	0.01
24-Mar-21	7.6	22	150	1.6	0.007	5	2	0.1	0.01	0.01
31-Mar-21	7.98	12	100	1.8	0.09	5	2	0.1	0.01	0.01
14-Apr-21	8.14	20	40	1	0.04	5	2	0.1	0.01	0.01
20-Apr-21	6.59	15	20	1	0.02	5	2	0.1	0.01	0.01
28-Apr-21	7.9	22	14	1.1	0.02	5	2	0.1	0.01	0.01

SURFACE WATER MONITORING EPL POINT 28

DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin
28-Oct-20	7.96	27	70	6.2	0.07	5	8	0.1	0.01	0.01
4-Nov-20	7.51	8	110	6.3	0.03	5	18	0.2	0.01	0.01
4-Jan-21	7.71	23	55	3.8	0.04	5	2	0.1	0.01	0.01
2-Feb-21	7.53	22	30	4.8	0.06	5	16	0.1	0.01	0.01
10-Feb-21	7.9	12	60	11.9	0.08	5	6	0.1	0.01	0.01
17-Feb-21	7.4	34	70	15.8	0.13	7	4	0.1	0.01	0.01
24-Feb-21	7.93	12	70	15.5	0.07	5	2	0.1	0.01	0.01
16-Mar-21	7.79	34	70	8.3	0.14	11	5	0.1	0.01	0.01
24-Mar-21	7.54	54	75	5.2	0.14	5	9	0.1	0.01	0.01
31-Mar-21	7.89	9	75	6.4	0.14	5	4	0.1	0.01	0.01

Exceedance of EPL 3035 discharge limit

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: 24006973-09

SAMPLED BY: L. Pyne & E. Felton

REPORTED BY: T.MacPhee

Stephanie Thompson
Environmental Sampling Supervisor

NATA
WORLD RECOGNISED ACCREDITATION

Accreditation # 15784
Site # 11436

Accredited for compliance with ISO/IEC 17025.

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A Campbell Brothers Limited Company

ALS WATER
ANALYSIS AND TESTING REPORT

BORG PANELS

	Units					
ALS Sydney Report No.		ES2032433				
Date of Sample		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020
Site Name #1		**GW01**	**GW02**	**GW05**	**GW26**	**GW26**
Site Name #2		**Woodchem**	**Pond**	**Hill**	**Paddock - River**	**Paddock - Fence**
General Comments/ Observations		**Cloudy**	**Clear**	**Cloudy**	**Dry**	**Cloudy**
Temperature	°C	13.4	13.7	25.0		14.0
pH	pH Units	6.3	7.1	6.8		7.3
Electrical Conductivity	µS/cm	257	1040	220		421
Total Suspended Solids	mg/L	173	45	606		142
Total Dissolved Solids	mg/L	200	690	210		264
Water Height	m	0.86	0.98	1.09		5.89
Ammonia as N by Discrete Analyser						
Ammonia as N	mg/L	0.02	<0.01	0.02		<0.01
Total Organic Carbon (TOC)						
Total Organic Carbon	mg/L	6	3	3		148
Formaldehyde						
Formaldehyde	mg/L	0.3	0.1	0.2		0.1
Chemical Oxygen Demand (Spectrophotometric)						
Chemical Oxygen Demand	mg/L	26	<10	25		182
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
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

ALS WATER
ANALYSIS AND TESTING REPORT

BORG PANELS

	Units					
ALS Sydney Report No.		ES2032433				
Date of Sample		11/09/2020	11/09/2020	11/09/2020	11/09/2020	11/09/2020
Site Name #1		**GW01**	**GW02**	**GW05**	**GW26**	**GW26**
Site Name #2		**Woodchem**	**Pond**	**Hill**	**Paddock - River**	**Paddock - Fence**
Organochlorine Pesticide Surrogate						
Dibromo-DDE	%	78.0	85.6	91.2		85.4
Organophosphorus Pesticide Surrogate						
DEF	%	73.2	80.3	80.3		77.8
Total Petroleum Hydrocarbons						
C6 - C9 Fraction	µg/L	<20	<20	<20		2680
C10 - C14 Fraction	µg/L	<50	<50	<50		<50
C15 - C28 Fraction	µg/L	<100	<100	<100		<100
C29 - C36 Fraction	µg/L	<50	<50	<50		<50
C10 - C36 Fraction (sum)	µg/L	<50	<50	<50		<50
Total Recoverable Hydrocarbons - NEPM 2013 Fractions						
C6 - C10 Fraction	µg/L	<20	<20	<20		2610
C6 - C10 Fraction minus BTEX (F1)	µg/L	<20	<20	<20		2600
>C10 - C16 Fraction	µg/L	<100	<100	<100		<100
>C16 - C34 Fraction	µg/L	<100	<100	<100		<100
>C34 - C40 Fraction	µg/L	<100	<100	<100		<100
>C10 - C40 Fraction (sum)	µg/L	<100	<100	<100		<100
>C10 - C16 Fraction minus Naphthalene	µg/L	<100	<100	<100		<100
BTEXN						
Benzene	µg/L	<1	<1	<1		<1
Toluene	µg/L	<2	<2	<2		6
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		6
Naphthalene	µg/L	<5	<5	<5		<5
TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4	%	94.7	96.2	96.8		96.4
Toluene-D8	%	113	109	109		112
4-Bromofluorobenzene	%	109	109	105		114

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: ES2032433

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

Environmental Noise Monitoring

Quarter 2 and Annual 2020

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
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Borg Panels Facility

Environmental Noise Monitoring
Quarter 2 and Annual 2020

Reference: 20153_R01
Report date: 19 August 2020

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:	Tambalyn Durney 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, evening, and night periods of 24 June 2020 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 29 November 2019 (MOD 2). 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 December 2017. The most recent version of the CNMP was approved in June 2017. 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, 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 analyser	30131882	05/02/2021
Pulsar 105 acoustic calibrator	78226	11/03/2022

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 2 AND ANNUAL 2020[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	L_{Ceq} dB
NM1	24/06/2020 15:02	79	61	52	52	47	45	42	65
NM1	24/06/2020 20:28	57	48	44	43	42	41	40	59
NM1	24/06/2020 22:49	57	47	45	44	43	42	39	59
NM2	24/06/2020 15:27	66	60	51	49	46	43	39	62
NM2	24/06/2020 20:49	54	47	41	39	38	36	33	59
NM2	24/06/2020 23:14	50	43	41	39	38	37	34	58
NM3	24/06/2020 16:14	72	61	48	49	43	41	38	61
NM3	24/06/2020 19:45	53	42	40	38	38	36	34	53
NM3	24/06/2020 22:01	55	49	45	42	41	38	36	55
NM4	24/06/2020 14:38	68	58	45	46	40	38	36	58
NM4	24/06/2020 20:07	48	43	36	34	32	30	28	51
NM4	24/06/2020 22:25	48	41	36	34	32	31	29	52

Notes:

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

4.2 Modifying Factors

Modifying factors, as defined in the NPfI, were not applicable during the time of monitoring.

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 AND ANNUAL 2020

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	24/06/2020 15:02	3.6	D	55	No	46	NA
NM1	24/06/2020 20:28	2.2	E	50	Yes	42	Nil
NM1	24/06/2020 22:49	2.9	D	45	Yes	43	Nil
NM2	24/06/2020 15:27	3.0	D	55	Yes	46	Nil
NM2	24/06/2020 20:49	2.2	E	50	Yes	38	Nil
NM2	24/06/2020 23:14	2.6	D	45	Yes	<30	Nil
NM3	24/06/2020 16:14	5.1	D	55	No	42	NA
NM3	24/06/2020 19:45	2.7	D	50	Yes	37	Nil
NM3	24/06/2020 22:01	3.2	D	45	No	39	NA
NM4	24/06/2020 14:38	3.0	C	55	Yes	38	Nil
NM4	24/06/2020 20:07	2.7	D	50	Yes	31	Nil
NM4	24/06/2020 22:25	2.8	E	45	Yes	32	Nil

Notes:

1. *Noise criteria 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 $L_{Aeq,15minute}$ 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 AND ANNUAL 2020

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	24/06/2020 15:02	7	0.7	220	8
NM1	24/06/2020 20:28	5	0.9	180	8
NM1	24/06/2020 22:49	5	0.0	-	8
NM2	24/06/2020 15:27	7	0.7	170	8
NM2	24/06/2020 20:49	5	1.4	190	8
NM2	24/06/2020 23:14	5	1.0	260	8
NM3	24/06/2020 16:14	5	2.1	190	8
NM3	24/06/2020 19:45	5	0.7	190	8
NM3	24/06/2020 22:01	5	0.6	245	8
NM4	24/06/2020 14:38	7	0.7	190	8
NM4	24/06/2020 20:07	5	0.4	280	0
NM4	24/06/2020 22:25	6	0.0	-	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 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, evening, and night periods of 24 June 2020 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 2 and Annual 2020 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.

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.

Borg will implement reasonable and practical measures to avoid or minimise impacts to the environment that may arise as a result of the project.

Borg will carry out the proposed works in accordance with the EIS, RTS and the approval conditions.

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

L3 Noise limits

L3.1 Noise from the premises must not exceed:
a) 55 dB(A) LAeq(15 minute) during the day (7am to 6pm); and
b) 50 dB(A) LAeq(15 minute) during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) LAeq (15 minute), except as expressly provided by this licence.

Where LAeq means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L3.2 To determine compliance with condition L3.1, noise must be measured at or computed for "Oorong" or any other noise sensitive location (such as a residence/school) along Herbourne or West Cunynghame Street, Oberon. A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy" (January 2000).

L3.3 The noise emission limits identified in this licence apply under all meteorological conditions except:

a) during rain and wind speeds (at 10m height) greater than 3m/s; and
b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

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.

7.3.2 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
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
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 C19073

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	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 :	24.5°C	**Ambient Temperature :**	23.6°C
Relative Humidity :	54.5%	**Relative Humidity :**	51%
Barometric Pressure :	99.39kPa	**Barometric Pressure :**	99.36kPa

Calibration Technician : Charlie Neil
Calibration Date : 5 Feb 2019
Secondary Check: Lewis Boorman
Report Issue Date : 6 Feb 2019

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	
31.5 Hz to 8kHz:	*±0.15dB*
12.5kHz:	*±0.2dB*
16kHz:	*±0.29dB*
Electrical Tests	
31.5 Hz to 20 kHz:	*±0.11dB*

Environmental Conditions	
Temperature	*±0.2°C*
Relative Humidity	*±2.4%*
Barometric Pressure	*±0.015kPa*

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.

NATA

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 Australian/national standards.

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 C20155

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

Atmospheric Conditions

Ambient Temperature :	23.4°C
Relative Humidity :	53.8%
Barometric Pressure :	101.2kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Alannah Squires
Calibration Date :	11 Mar 2020	**Report Issue Date :**	12 Mar 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	94.13	1000.37

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.

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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Appendix F – Construction Noise Monitoring Reports

Borg Panels Facility

Environmental Noise Monitoring

Quarter 2 and Annual 2020

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 and Annual 2020

Reference: 20153_R01
Report date: 19 August 2020

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:	Tambalyn Durney 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, evening, and night periods of 24 June 2020 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 29 November 2019 (MOD 2). 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 December 2017. The most recent version of the CNMP was approved in June 2017. 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, 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 analyser	30131882	05/02/2021
Pulsar 105 acoustic calibrator	78226	11/03/2022

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 2 AND ANNUAL 2020[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	L_{Ceq} dB
NM1	24/06/2020 15:02	79	61	52	52	47	45	42	65
NM1	24/06/2020 20:28	57	48	44	43	42	41	40	59
NM1	24/06/2020 22:49	57	47	45	44	43	42	39	59
NM2	24/06/2020 15:27	66	60	51	49	46	43	39	62
NM2	24/06/2020 20:49	54	47	41	39	38	36	33	59
NM2	24/06/2020 23:14	50	43	41	39	38	37	34	58
NM3	24/06/2020 16:14	72	61	48	49	43	41	38	61
NM3	24/06/2020 19:45	53	42	40	38	38	36	34	53
NM3	24/06/2020 22:01	55	49	45	42	41	38	36	55
NM4	24/06/2020 14:38	68	58	45	46	40	38	36	58
NM4	24/06/2020 20:07	48	43	36	34	32	30	28	51
NM4	24/06/2020 22:25	48	41	36	34	32	31	29	52

Notes:

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

4.2 Modifying Factors

Modifying factors, as defined in the NPfI, were not applicable during the time of monitoring.

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 AND ANNUAL 2020

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	24/06/2020 15:02	3.6	D	55	No	46	NA
NM1	24/06/2020 20:28	2.2	E	50	Yes	42	Nil
NM1	24/06/2020 22:49	2.9	D	45	Yes	43	Nil
NM2	24/06/2020 15:27	3.0	D	55	Yes	46	Nil
NM2	24/06/2020 20:49	2.2	E	50	Yes	38	Nil
NM2	24/06/2020 23:14	2.6	D	45	Yes	<30	Nil
NM3	24/06/2020 16:14	5.1	D	55	No	42	NA
NM3	24/06/2020 19:45	2.7	D	50	Yes	37	Nil
NM3	24/06/2020 22:01	3.2	D	45	No	39	NA
NM4	24/06/2020 14:38	3.0	C	55	Yes	38	Nil
NM4	24/06/2020 20:07	2.7	D	50	Yes	31	Nil
NM4	24/06/2020 22:25	2.8	E	45	Yes	32	Nil

Notes:

1. *Noise criteria 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 $L_{Aeq,15minute}$ 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 AND ANNUAL 2020

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	24/06/2020 15:02	7	0.7	220	8
NM1	24/06/2020 20:28	5	0.9	180	8
NM1	24/06/2020 22:49	5	0.0	-	8
NM2	24/06/2020 15:27	7	0.7	170	8
NM2	24/06/2020 20:49	5	1.4	190	8
NM2	24/06/2020 23:14	5	1.0	260	8
NM3	24/06/2020 16:14	5	2.1	190	8
NM3	24/06/2020 19:45	5	0.7	190	8
NM3	24/06/2020 22:01	5	0.6	245	8
NM4	24/06/2020 14:38	7	0.7	190	8
NM4	24/06/2020 20:07	5	0.4	280	0
NM4	24/06/2020 22:25	6	0.0	-	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 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, evening, and night periods of 24 June 2020 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 2 and Annual 2020 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.

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.

Borg will implement reasonable and practical measures to avoid or minimise impacts to the environment that may arise as a result of the project.

Borg will carry out the proposed works in accordance with the EIS, RTS and the approval conditions.

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

L3 Noise limits

L3.1 Noise from the premises must not exceed:
a) 55 dB(A) LAeq(15 minute) during the day (7am to 6pm); and
b) 50 dB(A) LAeq(15 minute) during the evening (6pm to 10pm); and
c) at all other times 45 dB(A) LAeq (15 minute), except as expressly provided by this licence.

Where LAeq means the equivalent continuous noise level - the level of noise equivalent to the energy-average of noise levels occurring over a measurement period.

L3.2 To determine compliance with condition L3.1, noise must be measured at or computed for "Oorong" or any other noise sensitive location (such as a residence/school) along Herbourne or West Cunynghame Street, Oberon. A modifying factor correction must be applied for tonal, impulsive or intermittent noise in accordance with the "Environmental Noise Management - NSW Industrial Noise Policy" (January 2000).

L3.3 The noise emission limits identified in this licence apply under all meteorological conditions except:

a) during rain and wind speeds (at 10m height) greater than 3m/s; and
b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

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.

7.3.2 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
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
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 C19073

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	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 :	24.5°C	**Ambient Temperature :**	23.6°C
Relative Humidity :	54.5%	**Relative Humidity :**	51%
Barometric Pressure :	99.39kPa	**Barometric Pressure :**	99.36kPa

Calibration Technician : Charlie Neil
Calibration Date : 5 Feb 2019
Secondary Check: Lewis Boorman
Report Issue Date : 6 Feb 2019

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	
31.5 Hz to 8kHz:	*±0.15dB*
12.5kHz:	*±0.2dB*
16kHz:	*±0.29dB*
Electrical Tests	
31.5 Hz to 20 kHz:	*±0.11dB*

Environmental Conditions	
Temperature	*±0.2°C*
Relative Humidity	*±2.4%*
Barometric Pressure	*±0.015kPa*

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.

NATA

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 Australian/national standards.

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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Sound Calibrator
IEC 60942-2017

Calibration Certificate

Calibration Number C20155

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

Atmospheric Conditions

Ambient Temperature :	23.4°C
Relative Humidity :	53.8%
Barometric Pressure :	101.2kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Alannah Squires
Calibration Date :	11 Mar 2020	**Report Issue Date :**	12 Mar 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	94.13	1000.37

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.

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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Borg Panels Facility

Environmental Noise Monitoring

Quarter 3 2020

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

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Borg Panels Facility

Environmental Noise Monitoring
Quarter 3 2020

Reference: 20238_R01
Report date: 27 October 2020

Prepared for

Borg Manufacturing Pty Ltd
124 Lowes Mount Road
Oberon 2787 NSW

Prepared by

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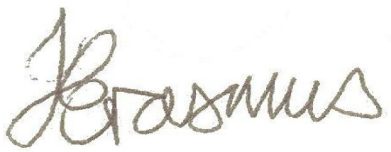
Thornton NSW 2322



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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 periods of 28 September 2020 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

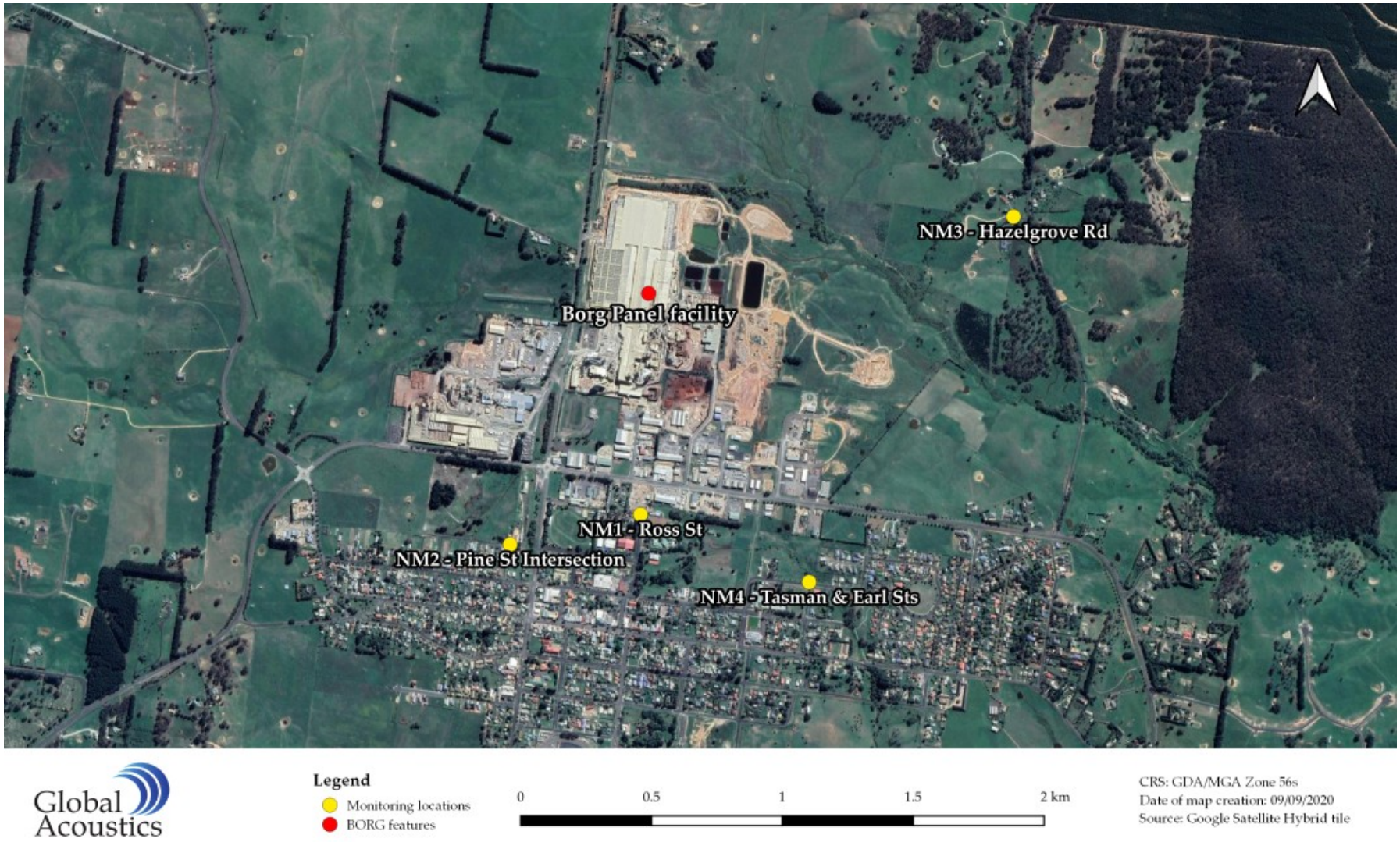

Figure 1: Attended Noise Monitoring Locations

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 December 2017. The most recent version of the CNMP was approved in June 2017. 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	05/02/2021
Pulsar 105 acoustic calibrator	78226	01/02/2021

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 2020[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	28/09/2020 09:57	61	54	49	47	45	44	41
NM2	28/09/2020 10:39	67	55	47	46	43	40	37
NM3	28/09/2020 09:08	69	52	43	42	37	33	31
NM4	28/09/2020 09:32	65	56	45	44	36	34	31

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 2020

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	28/09/2020 09:57	1.4	A	55	Yes	44	Nil
NM2	28/09/2020 10:39	1.8	A	55	Yes	NM	Nil
NM3	28/09/2020 09:08	1.1	A	55	Yes	31	Nil
NM4	28/09/2020 09:32	1.1	A	55	Yes	35	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 2020

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	28/09/2020 09:57	10	2.0	320	1
NM2	28/09/2020 10:39	9	1.1	350	1
NM3	28/09/2020 09:08	12	-	-	1
NM4	28/09/2020 09:32	14	-	-	1

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 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 28 September 2020 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 3 2020 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.

7.3.2 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
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
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 C19073

Client Details	Global Acoustics Pty Ltd 12/16 Huntingdale Drive Thornton NSW 2322
Equipment Tested/ Model Number :	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 :	24.5°C	**Ambient Temperature :**	23.6°C
Relative Humidity :	54.5%	**Relative Humidity :**	51%
Barometric Pressure :	99.39kPa	**Barometric Pressure :**	99.36kPa

Calibration Technician : Charlie Neil
Calibration Date : 5 Feb 2019
Secondary Check: Lewis Boorman
Report Issue Date : 6 Feb 2019

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	
31.5 Hz to 8kHz	*±0.15dB*	*Temperature*	*±0.2°C*
12.5kHz	*±0.2dB*	*Relative Humidity*	*±2.4%*
16kHz	*±0.29dB*	*Barometric Pressure*	*±0.015kPa*
Electrical Tests			
31.5 Hz to 20 kHz	*±0.11dB*		

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 Australian/national standards.

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
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
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 C19074

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

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

Atmospheric Conditions
Ambient Temperature : 23.8°C
Relative Humidity : 53.7%
Barometric Pressure : 100.09kPa

Calibration Technician : Charlie Neil
Calibration Date : 1 Feb 2019
Secondary Check: Lewis Boorman
Report Issue Date : 6 Feb 2019
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
Pre Adjustment	94.0	1000.0	94.4	1000.38
Post Adjustment	94.0	1000.0	94.1	1000.39

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	*±0.11dB*	*Temperature*	*±0.2°C*
Frequency	*±0.01%*	*Relative Humidity*	*±2.4%*
Distortion	*±0.48%*	*Barometric Pressure*	*±0.015kPa*

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 Australian/national standards.

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PAGE 1 OF 1

Borg Panels Facility

Environmental Noise Monitoring

Quarter 4 2020

Prepared for

Borg Manufacturing Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

Global Acoustics Pty Ltd
PO Box 3115 | Thornton NSW 2322
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Email global@globalacoustics.com.au
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Borg Panels Facility

Environmental Noise Monitoring
Quarter 4 2020

Reference: 20289_R01_RevA
Report date: 1 February 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:	Tambalyn Durney 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 at four monitoring locations around Borg. Due to unscheduled shut downs and sustained periods of inclement weather including elevated winds and rainfall, Q4 monitoring scheduled for Q4 2020 was delayed until 13 Janurary 2021.

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

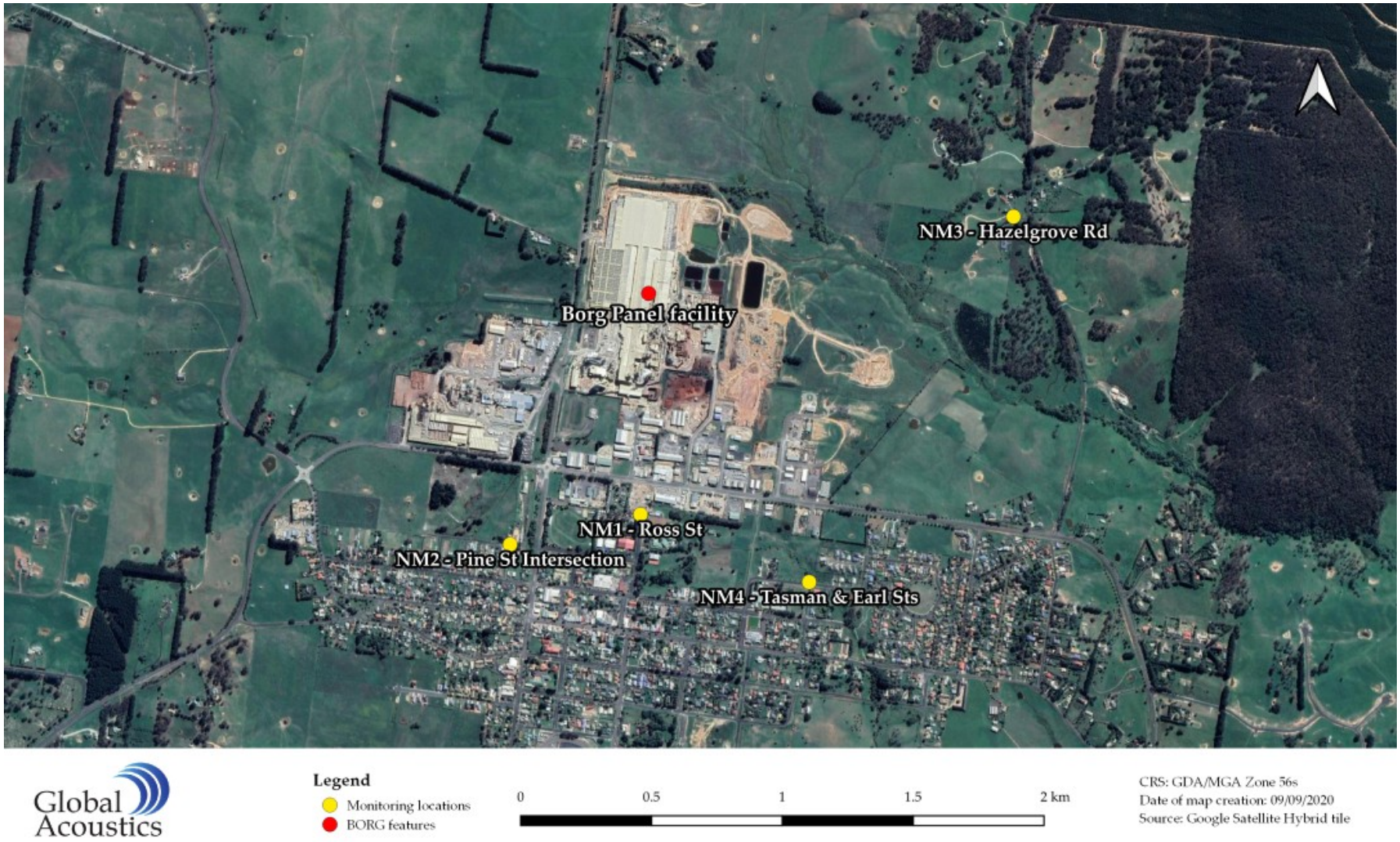

Figure 1: Attended Noise Monitoring Locations

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 June 2017. 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	3013882	05/02/2021
Pulsar 105 acoustic calibrator	78226	11/03/2022

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 2020[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	13/01/2021 14:56	73	61	54	51	49	45	43
NM2	13/01/2021 15:19	66	62	58	53	49	44	41
NM3	13/01/2021 14:07	68	56	41	43	36	32	29
NM4	13/01/2021 14:33	67	51	44	44	40	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 – QUARTER 4 2020

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	13/01/2021 14:56	3.7	A	55	No	46	NA
NM2	13/01/2021 15:19	3.5	B	55	No	NM	NA
NM3	13/01/2021 14:07	3.2	A	55	No	<25	NA
NM4	13/01/2021 14:33	4.0	B	55	No	36	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 – QUARTER 4 2020

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	13/01/2021 14:56	29	1.7	85	1
NM2	13/01/2021 15:19	30	0.5	30	3
NM3	13/01/2021 14:07	27	1.0	60	3
NM4	13/01/2021 14:33	27	3.8	20	2

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 13 Janurary 2021 at four monitoring locations around Borg. Due to unscheduled shut downs and sustained periods of inclement weather including elevated winds andrainfall, Q4 monitoring scheduled for Q4 2020 was delayed until 13 Janurary 2021.

Borg operations complied with the relevant criteria during the Quarter 4 2020 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.

7.3.2 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
Level 7 Building 2 423 Pennant Hills Rd
Pennant Hills NSW AUSTRALIA 2120
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 C19073

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

Equipment Tested/ Model Number : NA-28
Instrument Serial Number : 30131882
Microphone Serial Number : 04739
Pre-amplifier Serial Number : 11942

Pre-Test Atmospheric Conditions
Ambient Temperature : 24.5°C
Relative Humidity : 54.5%
Barometric Pressure : 99.39kPa

Post-Test Atmospheric Conditions
Ambient Temperature : 23.6°C
Relative Humidity : 51%
Barometric Pressure : 99.36kPa

Calibration Technician : Charlie Neil
Calibration Date : 5 Feb 2019
Secondary Check: Lewis Boorman
Report Issue Date : 6 Feb 2019

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
31.5 Hz to 8kHz ±0.15dB
12.5kHz ±0.2dB
16kHz ±0.29dB
Electrical Tests
31.5 Hz to 20 kHz ±0.11dB

Environmental Conditions
Temperature ±0.2°C
Relative Humidity ±2.4%
Barometric Pressure ±0.015kPa

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 Australian/national standards.

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 C20155

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

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

Atmospheric Conditions
Ambient Temperature : 23.4°C
Relative Humidity : 53.8%
Barometric Pressure : 101.2kPa

Calibration Technician : Lucky Jaiswal **Secondary Check:** Alannah Squires
Calibration Date : 11 Mar 2020 **Report Issue Date :** 12 Mar 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	94.13	1000.37

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.

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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Borg Panels Facility

Environmental Noise Monitoring

Quarter 1 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 1 2021

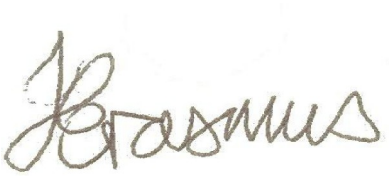
Reference: 21013_R01
Report date: 31 March 2021

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:	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

Table of Contents

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 3 March 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

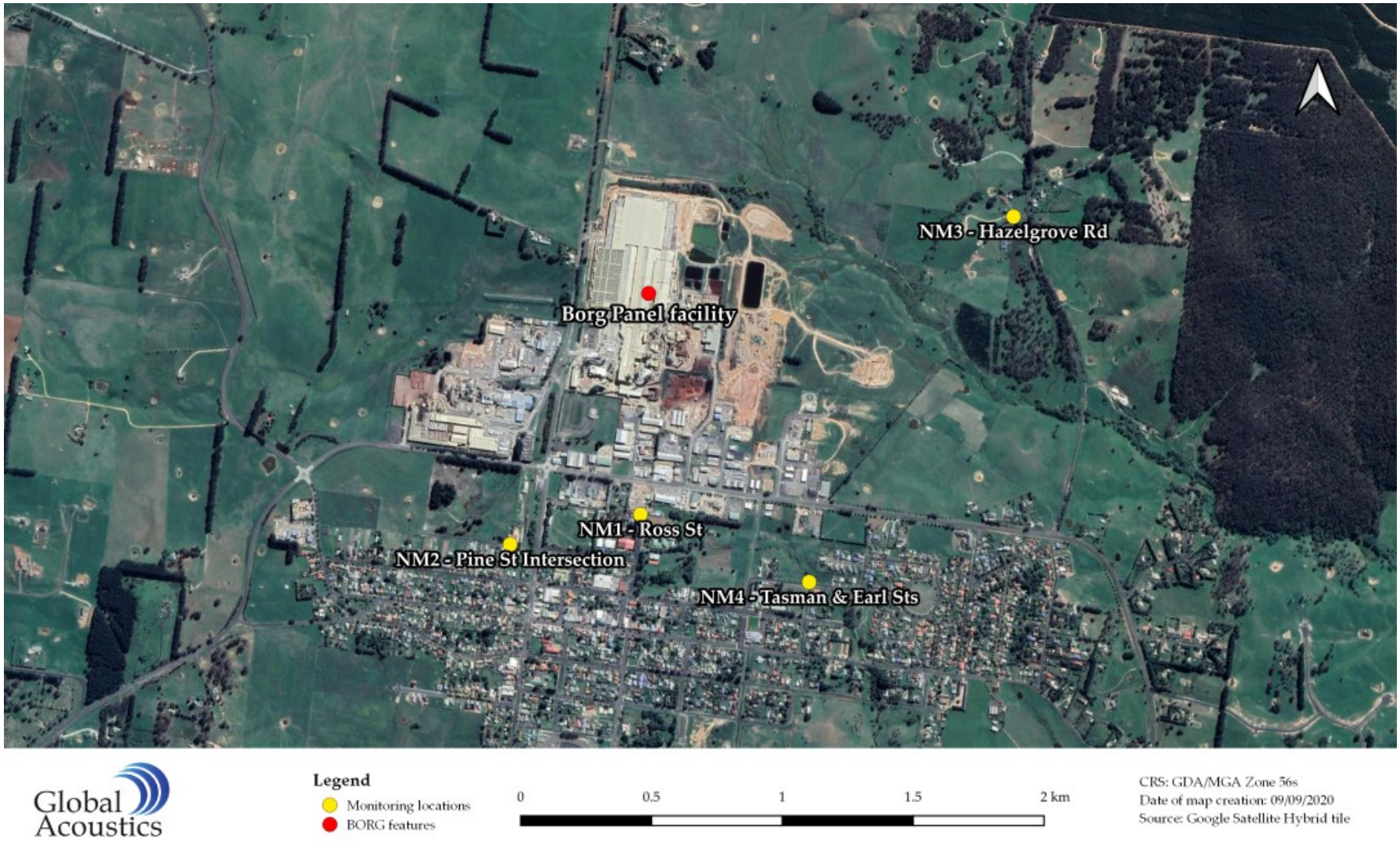


Figure 1: Attended Noise Monitoring Locations

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 June 2017. 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 1 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	03/03/2021 14:28	65	56	50	48	46	43	40
NM2	03/03/2021 14:48	68	55	48	46	45	43	40
NM3	03/03/2021 13:45	56	45	41	40	40	38	35
NM4	03/03/2021 14:09	56	49	46	44	44	42	40

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 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	03/03/2021 14:28	2.1	A	55	Yes	43	Nil
NM2	03/03/2021 14:48	2.3	A	55	Yes	IA	Nil
NM3	03/03/2021 13:45	1.6	A	55	Yes	33	Nil
NM4	03/03/2021 14:09	1.6	A	55	Yes	36	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 2021

Location	Start Date and Time	Temperature ° C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	03/03/2021 14:28	22	1.2	360	4
NM2	03/03/2021 14:48	23	0.7	300	5
NM3	03/03/2021 13:45	22	0.0	-	4
NM4	03/03/2021 14:09	21	1.3	270	4

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 3 March 2021 at four monitoring locations around Borg.

Borg operations complied with the relevant criteria during the Quarter 1 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.

7.3.2 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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Appendix G – Community Complaints

Complaint No	Category	Date Received	Property	Detail	Follow Up Actions
102	Smoke	11/06/2020	Not provided	EPA anonymous complaint alleging continuous smoke emissions from site	Investigation with Site Managers found a furnace stopped for maintenance and when started up some smoke was generated which is normal for this activity. Provided EPA with response. EPA advised they would close this out in their system. No further action required.
103	Pathway beside Borg plant	20/06/2020	Fox Lane, Oberon	Complainant had bicycle incident due to the deviation of the cycle path, wanted to know when path would be reinstated.	WHSE Coordinator contacted resident to apologise and inform him that the temporary gravel path would be reinstated with bitumen within one week. No further correspondence received from complainant.
105	Noise	4/07/2020	Clover Lane, Oberon	Loud beeping noise heard from site	WHS Coordinator investigated and found that some EWPs had reversing alarm beepers fitted. WHS Coordinator advised Fleet who replaced beepers with non-tonal squawkers. WHS Coordinator advised resident of issue identified and action taken.
106	Noise	25/08/2020	Clover Lane, Oberon	Neighbouring resident contacted Construction Manager to complain about beeping noise	Construction Manager investigated and found an EWP with its horn enabled. Immediately took this out of service and Fleet disabled horn and fitted non-tonal squawker.
107	Noise, odour, smoke	1/09/2020	Herborn Street. Oberon	EPA received complaint for smoke emissions pouring out of a stack, pungent odour and loud noise after 8.30pm.	Discussion with Site Managers found no evidence to support the complainant's issues. Environmental Manager discussed complaint with EPA Officer who advised that no actions were required at this time.
108	Traffic	1/12/2020	Not provided	Borg truck pulled out in front of car	Environmental Manager advised Logistics Manager who counselled the truck driver.
110	Soot deposit on car	23/02/2020	Cunningham Street, Oberon	Resident complained that there were black soot spots on her car	WHSE Coordinator and Log Yard Manager met with resident to discuss complaint and informed resident that it would be more likely to have wood dust deposit on her car it this had come from Borg Panels. The resident agreed with this. No further action required. No evidence of breach found.

Complaint No	Category	Date Received	Property	Detail	Follow Up Actions
111	Noise	2/03/2021	Clover Lane, Oberon	Loud noise during the night Loud banging what sounded like bins being emptied	WHSE Coordinator contacted Log Yard Manager who advised that a section of the MDF chipper roof required replacement and had been removed. The Log Yard Manager contacted the resident to apologise and advise that the roof was being replaced that day. WHSE Coordinator inspected site area adjacent the resident and found no bins in that area that require emptying during the evening/night period.

Note: numbers 104 & 109 have been deleted due to duplicate in reporting

Appendix H – Community Consultation Minutes

Oberon Timber Complex

Community Consultative Committee

Minutes

Meeting: Community Consultative Committee Meeting
Venue: Borg Panels Conference Room – Chaired by Tony Truscott
Date: 14 April 2021
Time: 4.00pm
Present: Julie Booth, Tony Truscott, Mike Bitzer, Ian Gordon, Trish Gordon,

Apologies: Fran Charge, Tim Charge, Kathy Sajowitz,

Meeting opened. 4pm

Apologies submitted

Previous minutes reviewed and accepted.

Complaints

Panels Melamine complaint and noise complaint at Clover Lane from Construction.

HPP No recorded complaints from HPP.

Site Updates

HPP Report

Mike Bitzer

Safety Update

- One safety incident – employee was pinched between packs. An ambulance and Safe Work called.
- Drug and Alcohol policy fully implemented and testing now taking place, as well as incident testing.
- Update: Upset conditions – we update gate for any complaints.
- T.I. – Safety perspective – 2 injuries
- LTI – employee with broken figure on rail of loader

Environment

- Site 1: Plan in place to clean up the site in 2022.

- HPP Website up and running.

Market

- 4 year deal with employees for the EA – enables us to move on.
- Hauling logs from Wagga to keep the mill up to high volume – Forestry Commission wood.
- Bushfires caused low volumes in some areas.
- Aggressive Capital expenditure mostly focusing on noise and modernisation.
- AKD exited warehouse on road – less traffic.
- Sweep around the mill every 2 weeks to clean up.
- Market insane with the highest sales month in May.
- If immigration stays negative, then nervousness is caused.
- Tumut and Tumbarumba timber in short supply for mills.

Borg Panels
(Including Woodchem and Structaflor)

Environment

- 2 as per earlier – melamine and noise complaint.
- Trying to keep chip and dirt off roads and streets.

General Business

- Difficult 12-15 months with market volatility. Highs and lows effected different areas of the business and at different times.
- Covid 19 has made Imports, like parts etc, difficult to get in.
- Market is strong and has been busy.
- Long term, John Borg hasn't stopped investing and growing the business for sustainability, with a New LPM line with 12 new employees, a Thin Board line and a major warehouse extension.
- 6 new apprentices employed this year as well as contractors from overseas.
- Overall, 28 new employees.
- Council raised the question if we need more Community representation or feedback.

No issues from the Community.

Meeting Closed: 5.05

Next Meeting:

29 July 2021 at 4pm

Appendix I – 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

23 June 2020

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for TSS and stormwater sample event undertaken on 15 June 2020. Results reviewed from ALS Environmental on 23 June reports exceedance for TSS at 78mg/l (L2.5 concentration limit 50mg/l).

The two weeks preceding the sample event was a relatively dry period. A significant rain event the day before sampling occurred with the Site rain gauge recording 13.4mm.

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
Last name	Blomberg
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
Email	bendevskiv@borgs.com.au
Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-9

Name of Document

EPL 3035 Water Quality 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 exceedance of water quality concentration discharge limit for TSS as set in EPL 3035

Applicable Conditions

Schedule	Condition
Schedule 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

2 October 2020

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for BOD for stormwater sample event undertaken on 23 September 2020. Results reviewed from ALS Environmental on 2 October reports exceedance for BOD at 32mg/l (L2.5 concentration limit 20mg/l).

No unusual conditions were recorded during this sample event.

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
Last name	Blomberg
Email	blombergj@borgs.com.au
Phone	0436609556
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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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Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-13

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 exceedance of water quality concentration discharge limit for BOD as set in EPL 3035

Applicable Conditions

Schedule	Condition
Schedule 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

29 October 2020

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for pH for stormwater sample event undertaken on 21 October 2020. Results reviewed from ALS Environmental on 29 October reports exceedance for pH at 8.86 (L2.5 concentration limit between 6.5 and 8.5).

No unusual conditions were recorded during this sample event.

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
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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:

Oberon Borg Timber Complex - SSD-7016-PA-16

Name of Document

Water Quality 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

water quality exceedance notification

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

1 February 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for pH for stormwater sample event undertaken on 20 January 2021. Results received from ALS Environmental on 29 January 2021 reports exceedance for pH at 8.63pH. L2.5 concentration limit is between 6.5 and 8.5pH.

No unusual conditions were recorded during this sample event.

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
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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
Last Name	Bendevski
Email	bendevskiv@borgs.com.au
Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-24

Name of Document

Water Quality 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

water quality discharge exceedance notification

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
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Ph: 02 4340 9800
Fax: 02 4340 5841

19 February 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Nitrogen for stormwater sample event undertaken on 10 February 2021. Results reviewed from ALS Environmental on 19 February reports exceedance for Total N at 11.9mg/l (L2.5 concentration limit 10mg/l).

No unusual conditions were recorded during this sample event.

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
Last name	Blomberg
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
Email	bendevskiv@borgs.com.au
Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-28

Name of Document

Water Quality 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

Water quality discharge limit exceedance for Total N

Applicable Conditions

Schedule	Condition

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

1 March 2021

EPL 3035 Water Quality Exceedance

This notification is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Nitrogen for stormwater sample event undertaken on 17 February 2021. Results received from ALS Environmental reports exceedance for Total N at 15.8mg/l. EPL 3035 condition L2.5 concentration limit is 10mg/l.

No other exceedances were reported.

There was a significant rain event (i.e. >10mm) prior to this monitoring event. It is plausible that this exceedance is due to the mobilisation of wood material from site during the rain event.

Supporting this assumption is the result for Colour at 70 PCU. Though this is not an exceedance of EPL 3035 discharge limit, it may show that the Total N result is due to organic matter in the sample.

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	

Primary Contact

Title	Mr
First Name	Victor
Last Name	Bendevski
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Phone	0410327635
Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-29

Name of Document

Water Quality 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

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
Fax: 02 4340 5841

8 March 2021

EPL 3035 Water Quality Exceedance

This notification 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 24 February 2021 at sample point identified as EPA 1 V-notch weir.

Results received from ALS Environmental reports exceedance for TSS at 656mg/l. EPL 3035 condition L2.5 concentration discharge limit is 50mg/l.

Construction were undertaking activities to the northern swale for the stormwater system component of works when an unexpected rain event occurred. This was a significant rain event that was greater than 10mm. Construction had installed sufficient erosion and sediment controls to this area as shown in Attachment 1 consisting of sediment fence and ballast in an attempt to manager their work area. A fairly large area of earth is required to be exposed for this portion of works, staging was not an option, this increased the potential for sediment laden runoff. The Construction Coordinator has advised that he checks the weather forecast daily which assists in determining the days/weeks scope of works though as stated, this event was unexpected.

An attempt was made by the site WHSE Coordinator to inspect downstream of the Borg discharge point (i.e. Kings Stockyard Creek off Hazelgrove Road) however the vegetation was too thick to get through to visually inspect the Creek.

No other exceedances were reported for this sample location.

This information will be included in EPL 3035 Annual Return and SSD 7016 Annual Review.

Regards

Jacqueline Blomberg
Environmental Manager
Borg Manufacturing

Borg Panels Pty Ltd
ABN: 54 139 584 900

2 Wella Way
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Ph: 02 4340 9800
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ATTACHMENT 1 – PHOTO LOG

ERSED Controls to the Northern Swale

Post Approval

Proponent Details

Personal Details

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Role/Position	Environmental Manager
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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
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Role/Position	Administrator

Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-30

Name of Document

Water Quality 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

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
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Australia

Ph: 02 4340 9800
Fax: 02 4340 5841

5 March 2021

EPL 3035 Water Quality Exceedance

This notification is to advise you that Borg Panels Oberon had an exceedance of concentration limit for Total Nitrogen for stormwater sample event undertaken on 24 February 2021.

Results received from ALS Environmental reports exceedance for Total N at 15.5mg/l. EPL 3035 condition L2.5 concentration limit is 10mg/l.

No other exceedances were reported.

There was a significant rain event (i.e. >10mm) prior to this monitoring event.

A site investigation has commenced in an attempt to determine if site contributors other than organic material potentially contributed to this exceedance.

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
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Company Details

Applying as a company/business?

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Company Name	BORG MANUFACTURING PTY LIMITED
ABN	31003246357
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Post Approval Details

Project:

Oberon Borg Timber Complex - SSD-7016-PA-31

Name of Document

Water Quality 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

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
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Ph: 02 4340 9800
Fax: 02 4340 5841

30 March 2021

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Panels Oberon had an exceedance of concentration limit for oil and grease for stormwater sample events undertaken on 16 March 2021 at EPA Point 1 and Point 28. Results reviewed from ALS Environmental reports exceedance for oil and grease at Point 1 at 15mg/l and at Point 2, 11mg/l (L2.5 concentration limit 10mg/l).

No other exceedances of pollutants listed in condition L2.5 of EPL 3035 were reported for these sampling events.

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
Last name	Blomberg
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
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Title	Mr
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Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-33

Name of Document

Water Quality 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

water quality discharge limit exceedances

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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9 April 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 24 March 2021. Results reviewed from ALS Environmental on 9 April reports exceedance for TSS at 54mg/l (L2.5 concentration limit 50mg/l).

No unusual conditions were recorded during this sample event.

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
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Company Details

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Yes

Company Name	BORG MANUFACTURING PTY LIMITED
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Title	Mr
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Role/Position	Administrator

Post Approval Details

Project:

Borg Timber Complex Oberon - SSD-7016-PA-34

Name of Document

Water Quality 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 exceedance of water quality discharge limit

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