Annual Review 2022/23

Borg Manufacturing Oberon

124 Lowes Mount Road, Oberon NSW

Borg Manufacturing

31 July 2023

Revision History

Rev No.	Revision Date	Author / Position	Details	Authorised	
				Name / Position	Signature
1	31/07/2023	Andrew Brady Environmental Manager	For submission to DPE	Victor Bendevski Environmental and Regulatory Compliance	

Table of Contents

Annual Review Title Block

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

I, Victor Bendevski, certify that this audit report is a true and accurate record of the compliance status of Borg Manufacturing Oberon for the period 1st May 2022 to 30th April 2023 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	31/07/2023

1 Introduction

1.1 Scope

This Annual Review has been prepared for the Borg Manufacturing Oberon site and covers the twelve-month reporting period from 1 May 2022 to 30 April 2023. This Annual Review has been prepared to satisfy condition C11 of Development Consent SSD 7016 issued by the Minister for Planning on 29 May 2017.

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

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

BORG - Oberon NSW (borgs.com.au)

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

Table 1 Compliance

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

1.2 Introduction

The Borg Manufacturing 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 facilities.

Condition A26 of SSD 7016 required Borg to modify DA27/95. Borg submitted a Section 96 Modification Application requesting removal of condition A26 as compliance with it was not possible. 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).

Modification of Development Consent SSD 7016 MOD 2 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.

Modification of Development Consent SSD 7016 MOD 3 included 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 were also proposed under MOD 3. These included 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.

Modification of Development Consent SSD 7016 MOD 4 was submitted to the Department of Planning and Environment on 26 October 2021. Activities proposed under MOD 4 included the following:

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

Approval was provided by the Minister of Planning for MOD 4 on 20 May 2022.

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

Table 2 Borg Manufacturing Development Consents

Consent Description	Approval Date	Approval Authority	Approved Development
Development Consent SSD 7016	29 May 2017	NSW Minister for Planning	Construction and operation of a particle board facility and continuation of, and alterations and additions to, the existing medium density fibreboard facility.
Development Consent SSD 7016 MOD 1	20 November 2018	NSW Minister for Planning	Site layout changes Surrender of DA27/95
Development Consent SSD 7016 MOD 2	29 November 2019	NSW Minister for Planning	Installation of an electricity generating gas turbine and ancillary equipment
Development Consent SSD 7016 MOD 3	22 May 2020	NSW Minister for Planning	Additional material handling equipment, extension to the Northern Warehouse, changes to the site surface water system and construction of further hardstand.
Development Consent SSD 7016 MOD 4	20 May 2022	NSW Minister for Planning	Reclamation of the spring fed dam, increase in hardstand at the north eastern corner of the site, relocation of existing mechanic's workshop, modernisation of multidaylight press and changes to its exhaust air emissions, addition of an enclosure to water treatment biological tanks, installation of reverse osmosis filtered water production, construction of chemical storage shed, construction of a lined effluent storage dam and construction of a new road.

1.4 Annual Review Requirements

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

Table 3 Annual Review Requirements

Development Consent SSD 7016 – Condition C11	Section of Annual Review
By 31 July 2017, and each year thereafter, unless otherwise agreed by the Secretary, the Applicant must review and submit a report to the Secretary detailing the environmental performance of the Development to the satisfaction of the Secretary. This review must:	This Report
(a) describe the development that was carried out during the reporting period, and the development that is proposed to be carried out over the next reporting period;	Section 2 Section 8

Development Consent SSD 7016 – Condition C11	Section of Annual Review
(b) include a comprehensive review of the monitoring results and complaints records of the Development over the previous reporting period, which includes a comparison of these results against the: i. relevant statutory requirements, limits or performance measures/criteria; ii. requirements of any plan or program required under this consent; iii. the monitoring results of previous years; and iv. the relevant predictions in the EIS;	Section 4 Section 5
(c) identify any non-compliance during the reporting period, and describe what actions were (or are being) taken to ensure compliance;	Section 4 Section 7
(d) identify any trends in the monitoring data over the life of the Development;	Section 4
(e) identify any discrepancies between the predicted and actual impacts of the Development, and analyse the potential cause of any significant discrepancies; and	Section 4
(f) describe what measures will be implemented over the next reporting period to improve the environmental performance of the Development.	Section 8

1.5 Environment Protection Licence

Borg Manufacturing 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 24 March 2023.

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

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

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

Following the conclusion of the trial a report was to be prepared and submitted to the EPA assessing the results of the trial, providing commentary on the effectiveness of the QA/QC Plan, and any deficiencies or problems encountered during the trial and what actions were taken to manage them. The EPA approved the report and its findings, a formal resource recovery order and exemption was not issued during the period covered by this report.

1.6 Water Licences

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

Table 4 Water Licences

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

1.7 Trade Waste Licence

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

1.8 Environmental Management Plans

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

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

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

1.9 Contacts

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

Table 5 Site Personnel

Name	Title	Contact Details
Richard Kaine	Facility Manager	0409 151 094
Victor Bendevski	Environmental and Regulatory Compliance	(02) 4340 9800
Andrew Brady	Environmental Manager	0447 765 913

1.10 Actions Required from Previous Annual Review

The actions listed in Table 6 were identified in the 2021/22 Annual Review for implementation during this 2022/23 reporting period.

Table 6 Proposed Activities in 2022/23 Reporting Period

Activities Proposed in 2022/23 Reporting Period	Results achieved in 2022/23 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 are undertaken at least monthly. Inspections recorded identified issues and actions assigned accordingly, DataStation software package is used 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.
Complete installation of additional material handling equipment	Materials handling building construction and installation works were completed including commissioning.
Complete verification studies required for SSD 7016 including modifications	Condition B20A, undertake a noise verification study for the materials handling building and associated wastewood equipment was completed and submitted to DPIE on 1 September 2022. DPIE considered the Study satisfied condition B20A.
Complete reporting requirements related to the commissioning of Materials handling building.	The noise verification study under B20A was completed, no reporting requirements were triggered in this reporting period.
Continue with implementation of various management and mitigation measures as detailed in the development consent, including additional items provided in SSD 7016 MOD 1, MOD 2, MOD 3 and MOD 4	As reported in this Annual Review. All additional conditions imposed by modifications have been incorporated into Borg's tracking document OBERON Approvals and Licensing Compliance Register.
Complete works as approved under MOD 4	Works commenced once approval was granted. Works will continue into the next reporting period. No other projects associated with MOD 4 were commenced.
Undertake rehabilitation works to areas disturbed by construction activities	Stormwater swales impacted by construction activities established good groundcover to assist with managing erosion control and sediment mobilisation which can affect stormwater quality discharge.
Discuss with EPA licensed water discharge points, referencing EPL 3035, to ensure this is fit for purpose	Discussions with EPA were conducted within this reporting period. They were generally satisfied with the current sampling locations and plan as a short-term solution. Further discussions to be undertaken
Complete the second Urban Wood Residue trial (recycled wood program) and report back to EPA	The second trial was completed, and the positive results were discussed with EPA. A report was submitted.

2 Operations during the Reporting Period

2.1 Production

Development Consent SSD 7016 allows for production of up to 380,000 m^3 of MDF and 500,000 m^3 of particleboard per calendar year. During this reporting period Borg manufactured 280,415m^3 of MDF and 343,215m^3 of particleboard and had a total intake of 69,411 tonnes of UWR.

2.2 Facility Improvements

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

- Installation of Dust Blow line from Particle Board to MDF dust silo. Removing the need for manual transportation of dust. Stopping mess when removing and reducing Natural Gas usage in MDF burner.
- Installation and commissioning of ECS (Eddy current separator/Non-Ferrous material) waste wood Particle board.
- Installation of a conveyor and blow line for removal of oversize material from Particle Board Air graders. Removes the need for open bins that require manual removal.
- Commenced commissioning of Conti 4
- Conti 4. Upgraded screw conveyor for Air grader heavy's removal. Removed blockages and operator intervention and reducing downtime.
- Conti 4. Install heating duct to main fibre bin to eliminate condensation build up causing reject and down time.
- Chip Reclaimer No:1 upgrade. Install new outfeed conveyor and steel structure for chip supply to Conti 1 & 4
- Rebuild and repair of MDF chipper base
- Installation of new enclosed Energy plants fuel feed conveyors and cleaning magnet.

See Figure 2 for location of site infrastructure.

2.3 Site Activities

The following activities associated with the modifications to existing operations occurred during the reporting period:

- Alterations to the site surface water channels at the southern area of the site to facilitate high flows from neighbouring sources and to divert the flows away from the Woodchem facility to improve flood mitigation
- Extensive erosion and sediment control works to the northern and eastern swale systems to improve discharge water quality including rectification to eroded sections, installation/repair of rock check dams in areas of high flow and improvements to the inflow path to the first flush basin; and
- Continued to receive recycled wood material under *The Borg Panels Urban Wood Residue order and exemption March 2021* for inclusion in the production of particleboard.
- Installation of an additional larger reverse osmosis (RO) plant at the water treatment plant for improved water utilisation and recycling
- Commenced works under Modification 4 including partial filling of the spring dam and increase in hardstand in the north eastern corner of the site in preparation for the proposed mechanics workshop

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

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

2.4 Wood Recycling Program

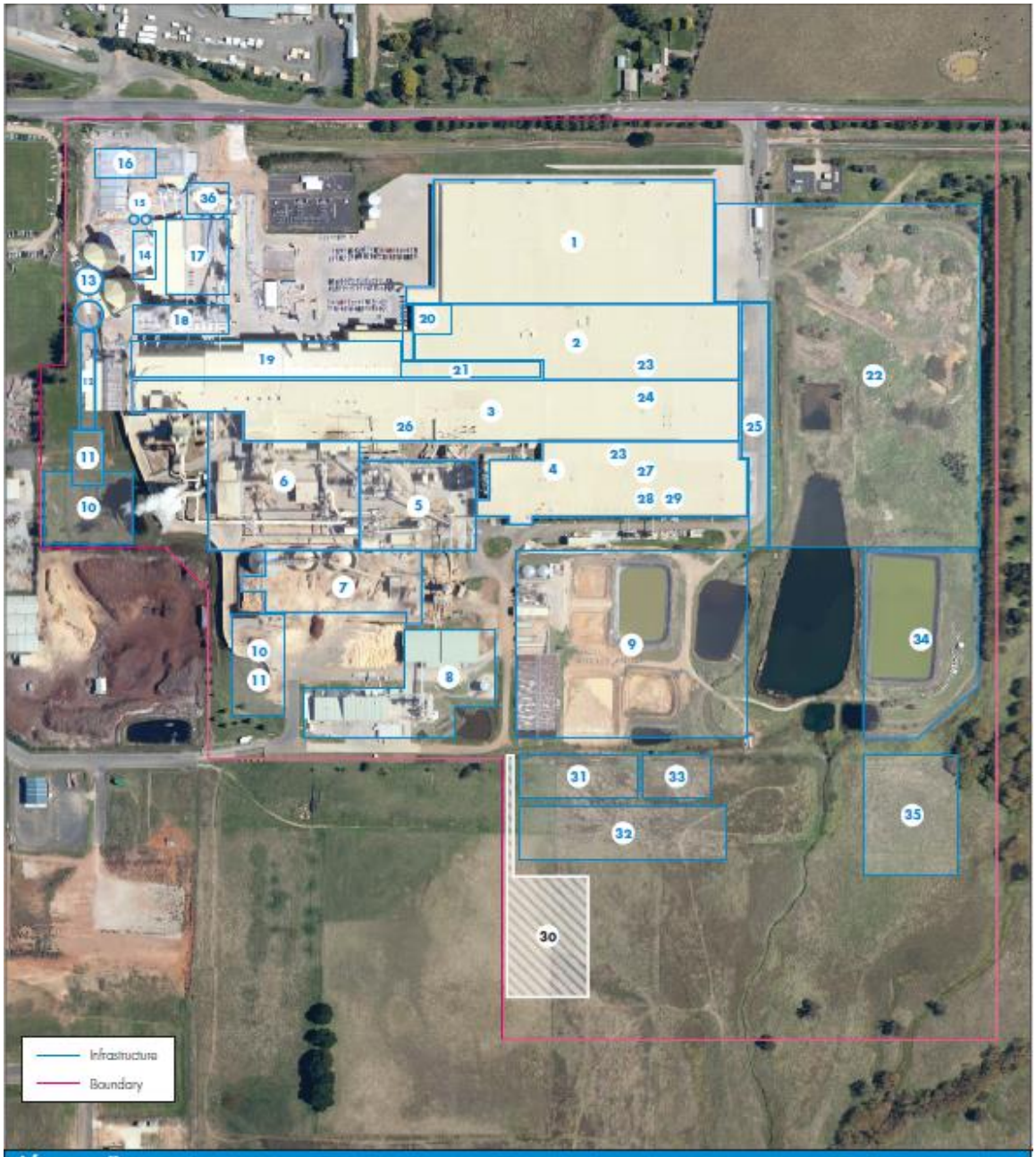
During this reporting period Borg continued to accept recycled wood materials in accordance with *The Borg Panels Urban Wood Residue order and exemption March 2021.* Approximately 69,000t of UWR was received on site for inclusion in the production of particleboard. The recycled material is aggregated at one of two Borg sites located in Sydney where it is inspected prior to delivery to Oberon. When this material arrives at Oberon via truck transport it is further inspected as it enters the site, this is conducted by spreading the materials out on a hardstand before being incorporated into the manufacture of particleboard.

Air emission sampling was conducted on the 26th, 27th and 28th of October 2022, 31st of January, 2nd of February 7th, 8th and 9th March 2023 in accordance with EPL 3035 condition M2.2 which included license discharge points 29, 30, 31 and 32 (points associated with air emissions from the recycled wood program) for the following pollutants:

- Total solid particles
- Fine particulate matter (PM10)
- Formaldehyde
- Nitrogen oxides
- Smoke
- Type 1 and 2 substances

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

Figure 2 SSD 7016 Approved Development Area



Infrastructure Key

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

3 Waste Management

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

3.1 Solid Waste

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

Table 7 Waste Management 2022/23

Month	Description				Destination
	Litres	m^3	Tonnes	Waste	
Apr 2023		595		general	Oberon Council Waste Depot
			65.3	waste requiring burial	Bathurst Regional Council
Mar 2023		60		general	Oberon Council Waste Depot
	11900			waste oil	Cleanaway/Nationwide Oil
		47.44		waste requiring burial	Bathurst Regional Council
Feb 2023		640		general	Oberon Council Waste Depot
			1.86	waste requiring burial	Bathurst Regional Council
Jan 2023		440		general	Oberon Council Waste Depot
			19.98	waste requiring burial	Bathurst Regional Council
Dec 2022		600		general	Oberon Council Waste Depot
			23.16	waste requiring burial	Bathurst Regional Council
Nov 2022		470		general	Oberon Council Waste Depot
	16700			waste oil	Cleanaway/Nationwide Oil
			20.74	waste requiring burial	Bathurst Regional Council
Oct 2022		590		general	Oberon Council Waste Depot
			47.72	waste requiring burial	Bathurst Regional Council
Sep 2022		550		general	Oberon Council Waste Depot
			9.74	sludge bi product	Bathurst Regional Council

			26.06	waste requiring burial	Bathurst Regional Council
Aug 2022		620		general	Oberon Council Waste Depot
			33.44	waste requiring burial	Bathurst Regional Council
Jul 2022		740		general	Oberon Council Waste Depot
			47.16	waste requiring burial	Bathurst Regional Council
Jun 2022		572		general	Oberon Council Waste Depot
			7.84	sludge bi product	Bathurst Regional Council
	6800			waste oil	Cleanaway/Nationwide Oil
			1.96	waste requiring burial	Bathurst Regional Council
May 2022		730		general	Oberon Council Waste Depot
	6000			waste oil	Cleanaway/Nationwide Oil
			32.14	waste requiring burial	Bathurst Regional Council
TOTAL		**47.44**	**319.52**	**Waste requiring Burial**	**Bathurst Regional Council**
			17.58	**Sludge bi product**	**Bathurst Regional Council**
		6,607		**General Waste**	**Oberon Council Waste Depot**
	41,400			**Waste Oil**	**Cleanaway/Nationwide oil**
				Mixed Commercial	**Bathurst Regional Council**
				Ash	**Oberon Council Waste Depot**

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. All waste oil is considered trackable. All waste oil collected during the reporting period was collected by waste transporter EPL 7100 and taken to waste facility EPL 854.

3.2 Trade Waste

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

4 Environmental Monitoring and Performance

4.1 Environmental Management System

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

Environmental monitoring is conducted in accordance with the requirements of SSD 7016, its subsequent modifications (MOD1, MOD2, MOD3 & MOD4), and EPL 3035. Environmental monitoring is an integral part of Borg's environmental management system. The measurement and evaluation of monitoring results allows for the assessment of performance against quantitative and qualitative standards and assists in the identification of any non-conformances or areas that may require additional attention.

4.2 Meteorological Data

Borg Manufacturing operate and maintain a meteorological monitoring station located east of the existing Spring Dam (EPA Point 26). The meteorological station was inspected and serviced on 30 March 2023 by a trained third-party consultant from Envirodata Weather Stations Pty Ltd

The following section summarises the meteorological data for the 2022/23 reporting period.

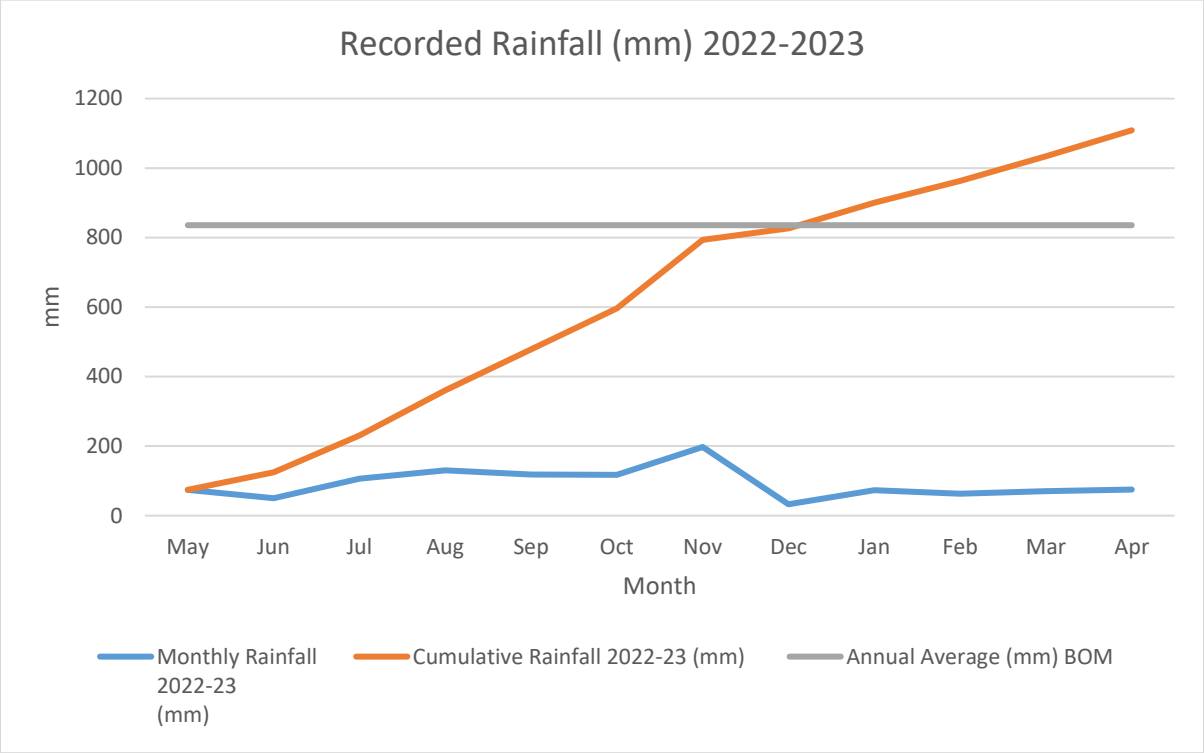
4.2.1 Rainfall

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 1,108.8mm. This is 273.1mm above the annual mean rainfall of 835.7mm for the Oberon region (Bureau of Meteorology, Oberon Springbank Site No. 063063).

Table 8 Recorded Rainfall 2022/23

Total Monthly Rainfall (mm)												
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**Total**
74.4	50.2	106	130	118	117.6	197.6	32.8	73.6	63.2	70.6	74.8	1108.8
Number of Rain Days (≥0.2mm)												
18	21	16	15	16	14	19	24	18	25	20	22	228

Figure 3 Recorded Rainfall (mm) at Borg Manufacturing Meteorological Station 2022/23



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 2022/23

Minimum and Maximum Monthly Temperatures (°C)											
May	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
-0.7	-2.9	-2.3	-2.3	-2.3	-0.2	0.3	-0.2	6.7	4.9	3	2.1
19.1	13.2	15.2	16.1	16.1	19.2	24.1	28.9	30.9	32	33.7	19.6

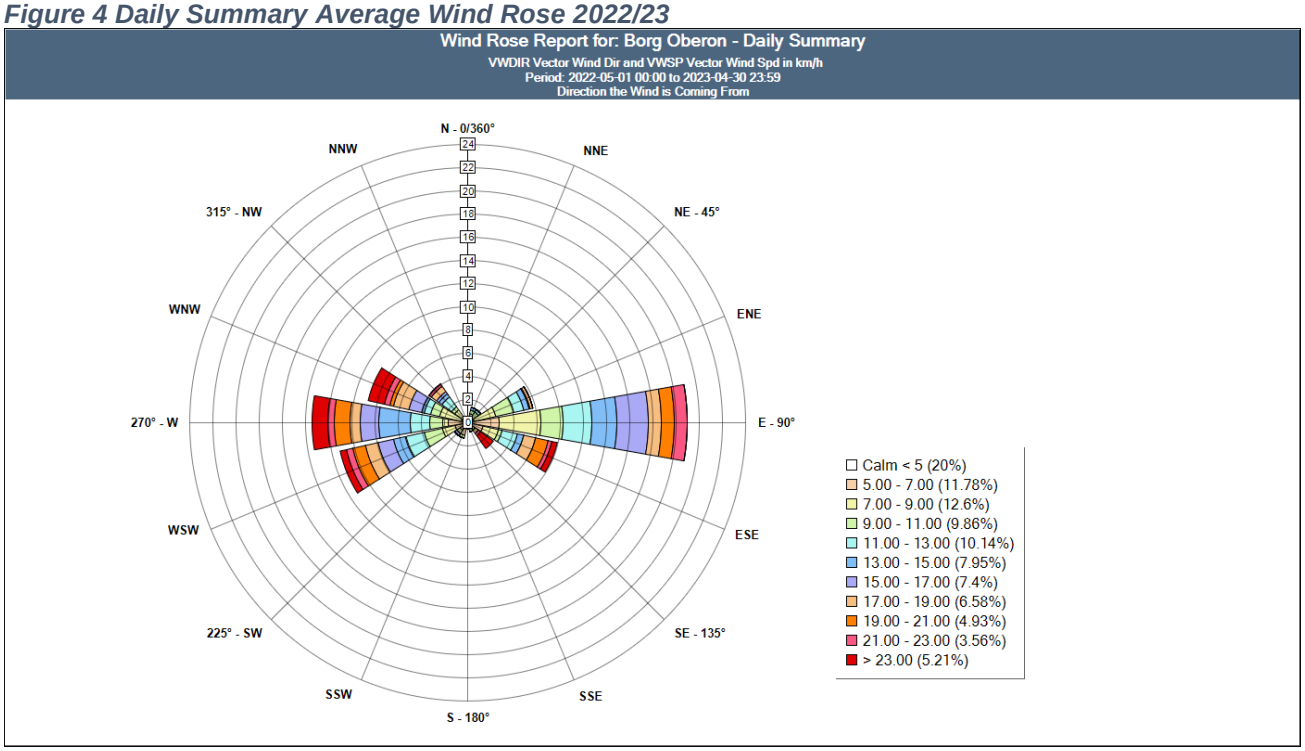
4.2.3 Wind Speed and Direction

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

Table 10 Monthly Daily Wind Data 2022/23

Month	Maximum Wind Speed (km/hr)	Mean Wind Speed (km/hr)	Dominant Wind Direction
May 2022	19.1	12.5	269° (W)
June 2022	11.6	14.7	250° (WSW)
July 2022	13.2	16.6	110° (ESE)
August 2022	15.2	14.1	296° (WNW)
September 2022	16.1	13.5	73° (ENE)
October 2022	19.2	13.8	87° (E)
November 2022	20.5	13.3	269° (W)
December 2022	28.9	12.1	99° (E)
January 2023	30.9	12.2	91° (E)
February 2023	30.7	12	99° (E)
March 2023	33.7	11.4	91° (E)
April 2023	19.6	10.9	92° (E)

Figure 4 Daily Summary Average Wind Rose 2022/23



4.3 Air Quality

4.3.1 Dust Depositional Gauges

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

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

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

Table 11 Air Quality Criteria Deposited Dust

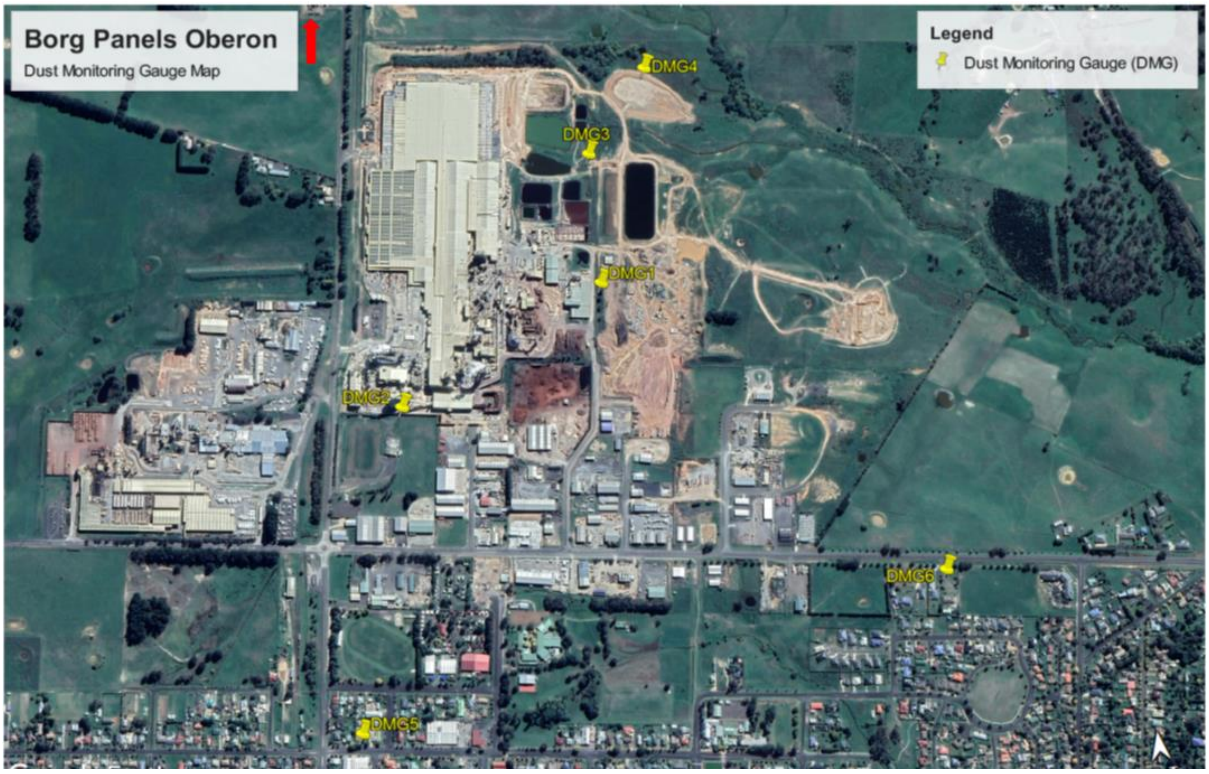
Averaging Period	Impact	Criteria
Annual	Incremental	2 g/m^2/month
	Total	4 g/m^2/month

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

Table 12 Location of Dust Depositional Gauges

Dust Depositional Gauge	Location Description
DMG 1	Borg Manufacturing 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 Manufacturing Plant
DMG 6	Albion Street, East of Borg Manufacturing plant

Figure 5 Depositional Dust Gauge Locations



DMGs 1 to 4 are located on the periphery of the site. DMG 1 is located within the operational boundary of the site immediately adjacent to an unsealed laydown area and in general proximity of an unsealed road. DMG 2 is located adjacent to the materials handling building. DMG 4 is located towards the northern boundary in an area of unsealed compacted surfaces used for storage of large pieces of machinery and reusable material such as steel.

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

Table 13 Dust Depositional Gauges Annual Average

No.	Location	Annual Average Insoluble Solids (g/m^2/month) 2020/21	Annual Average Insoluble Solids (g/m^2/month) 2021/22	Annual Average Insoluble Solids (g/m^2/month) 2022/23
DMG 1	Borg Manufacturing eastern boundary with Woodchem	5.0	7.9	5.9
DMG 2	Materials handling building	2.4	5.8	5.1
DMG 3	Water treatment plant	1.3	1.2	1.3
DMG 4	Northern boundary	1.7	1.3	1.0
DMG 5	Highlands Motor Inn	0.6	0.9	0.9
DMG 6	Albion Street east of Borg Manufacturing plant	0.6	0.8	1.0

Table 13 shows DMG 1, and DMG 2 returned exceedances of the annual average criteria of $4g/m^2$ for insoluble solids however, both locations had a decrease in the annual average when compared to last year's reporting period. DMG 1 is exposed to regular traffic and day-to-day activities adjacent internal dirt roads. DMG 2 is adjacent the materials handling building which can produce wood dust.

DMG 4 is also exposed to machinery traffic on the unsealed road and adjacent pad however had a low annual average for insoluble solids and was the lowest result in three years. DMG 3 and DMG 6 both had a very slight increase in average insoluble solids when compared to the previous year's reporting period. As gauges DMG 1-4 are on-site gauges the criteria noted in Table 11 does not apply.

There was no exceedance of the dust deposition criteria ($4g/m^2$) at locations DMG 3, DMG 4, DMG 5 and DMG 6 for the 2022/23 reporting period.

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 24 March 2023 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. Plant associated with these points has previously been dormant however it was the subject of MOD4 and will be added back to the license once Conti 4 has been commissioned and in operation.
Points 11 and 17 do not produce flow. The exhaust for Conti 2 heat plant (Point 11) is ducted back into Conti 2 dryer cyclones (Points 7&8), and exhaust for Conti 1 heat plant (Point 17) is ducted back into the Conti 1 production system (Points 9&10).

4.3.3 Air Monitoring

Environment Protection Licence 3035 sets pollution concentration limits for emission Points 7, 8, 9 and 10 as shown in Table 15. All plant and equipment must comply with the relevant concentration standards listed in Schedule 2, 3 and 4 of the *Protection of the Environment Operations (Clean Air) Regulation 2022* where pollution limits are not specified in the EPL. Monitoring results are assessed against these criteria to determine compliance with air emission limits.

Table 15 EPL 3035 Air Concentration Limits

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

Source: EPL 3035 (24 March 2023)

Air emission monitoring was undertaken by trained specialists and samples analysed by NATA accredited laboratories. Monitoring equipment is maintained by the consultant and calibrated in accordance with the manufacturer's specifications by qualified specialists. This monitoring is performed in accordance with the methodologies as specified in the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* and the requirements of EPL 3035. USEPA Method GD-008 is the approved method for determining flow rate and sampling for particulate matter in cyclonic flow from licenced discharge Points 7, 8, 9 & 10.

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

Table 16 Air Emissions Monitoring Results EPA Identification Point 4

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	<2	<2	<12
Formaldehyde	mg/m^3	Yearly	1.5	11	4.2

Table 17 Air Emissions Monitoring Results EPA Identification Point 5

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	<2	<2	<3
Formaldehyde	mg/m^3	Yearly	2.5	5.6	4.1

Table 18 Air Emissions Monitoring Results EPA Identification Point 7

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	79	28	*38*
Formaldehyde	mg/m^3	Yearly	1.6	4.2	21
Nitrogen oxides	mg/m^3	Yearly	140	250	220
PM10	mg/m^3	Yearly	8.9	11	12
Smoke	Obscuration	Every 6 months	0	0	0

Table 19 Air Emissions Monitoring Results EPA Identification Point 8

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	68	25	47
Formaldehyde	mg/m^3	Yearly	3	4.6	1.3
Nitrogen Oxides	mg/m^3	Yearly	210	220	230
PM10	mg/m^3	Yearly	28	10	16
Smoke Emissions	Obscuration	Every 6 months	0	0	0

Table 20 Air Emissions Monitoring Results EPA Identification Point 9

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	38	12	32
Formaldehyde	mg/m^3	Yearly	4.8	3.6	3.7
Nitrogen Oxides	mg/m^3	Yearly	260	84	160
PM10	mg/m^3	Yearly	26	6.8	21
Smoke Emissions	Obscuration	6 Monthly	0	0	0

Table 21 Air Emissions Monitoring Results EPA Identification Point 10

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	41	17	190
Formaldehyde	mg/m^3	Yearly	4.7	3.3	3.2
Nitrogen Oxides	mg/m^3	Yearly	73	48	140
PM10	mg/m^3	Yearly	27	8.3	47
Smoke Emissions	Obscuration	6 Monthly	0	0	0

Tables 16, 17, 19 and 21 show a decrease in formaldehyde at EPA Points 4,5,8 and 20. Formaldehyde emissions can vary depending on plant operating conditions and which product is being processed at the time of sampling. No change in total solid particles (TSP) was shown in Tables 16 and 17 with results remaining below the level of reporting when compared to the previous two years data however, an increase in TSP was noted in Tables 18-21. An increase in PM10 and Nitrogen Oxides was also noted in Tables 18, 20 and 21 (Points 7,9 and 10) when compared to last the previous year's data.

All results shown in Tables 16 to 21 are within EPL 3035 limits as well as the *Protection of the Environment Operations (Clean Air) Regulation 2022.*

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

Pollutant	Units	Frequency	2020/21	2021/2022	2022/23
Total Solid Particles	mg/m^3	Every 3 years	3.3	-	-
Formaldehyde	mg/m^3	Every 3 years	5.4	-	-
Nitrogen Oxides	mg/m^3	Every 3 years	<4	-	-
PM10	mg/m^3	Every 3 years	<3	-	-

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

Pollutant	Units	Frequency	2020/21	2021/2022	2022/23
Total Solid Particles	mg/m^3	Every 3 years	7.2	-	-
Formaldehyde	mg/m^3	Every 3 years	6.5	-	-
Nitrogen Oxides	mg/m^3	Every 3 years	<4	-	-
PM10	mg/m^3	Every 3 years	4.8	-	-

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

Pollutant	Units	Frequency	2020/21	2021/2022	2022/23
Total Solid Particles	mg/m^3	Every 3 years	19	-	-
Formaldehyde	mg/m^3	Every 3 years	3.8	-	-
Nitrogen Oxides	mg/m^3	Every 3 years	<4	-	-
PM10	mg/m^3	Every 3 years	13	-	-

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

Pollutant	Units	Frequency	2020/21	2021/2022	2022/23
Total Solid Particles	mg/m^3	Every 3 years	28	-	-
Formaldehyde	mg/m^3	Every 3 years	1.2	-	-
Nitrogen Oxides	mg/m^3	Every 3 years	<4	-	-
PM10	mg/m^3	Every 3 years	20	-	-

Table 26 Air Emissions Monitoring Results EPA Identification Point 27

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	7.6	12	4.5
Formaldehyde	mg/m^3	Yearly	1.9	7.2	1.6
Nitrogen Oxides	mg/m^3	Yearly	<4	<4	<4
PM10	mg/m^3	Yearly	5.2	3.4	<4

Table 26 shows a decrease in TSP, Formaldehyde and PM10 in comparison to the previous two years data. These results remain within EPL 3035 and *Protection of the Environment Operations (Clean Air) Regulation 2022* limits.

Table 27 Air Emissions Monitoring Results EPA Identification Point 29

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	<2	<2	<2
Formaldehyde	mg/m^3	Yearly	1.7	4.9	1.5
Nitrogen Oxides	mg/m^3	Yearly	<4	<4	<4
PM10	mg/m^3	Yearly	<2	<2	<3
Smoke Emissions	Obscuration	Yearly	0	0	0

Table 28 Air Emissions Monitoring Results EPA Identification Point 30

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	<2	<2	2.3
Formaldehyde	mg/m^3	Yearly	1.5	1.3	1.0
Nitrogen Oxides	mg/m^3	Yearly	<4	<4	<4
PM10	mg/m^3	Yearly	<4	<3	<3
Smoke Emissions	Obscuration	Yearly	0	0	0

Table 29 Air Emissions Monitoring Results EPA Identification Point 31

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	46	30	49
Formaldehyde	mg/m^3	Yearly	4.6	1.5	0.86
Nitrogen Oxides	mg/m^3	Yearly	<4	<4	<4
PM10	mg/m^3	Yearly	40	20	19
Smoke	Obscuration	Yearly	0	0	0

Table 30 Air Emissions Monitoring Results EPA Identification Point 32

Pollutant	Units	Frequency	2020/21	2021/22	2022/23
Total Solid Particles	mg/m^3	Yearly	30	39	34
Formaldehyde	mg/m^3	Yearly	0.21	2.3	0.032
Nitrogen Oxides	mg/m^3	Yearly	210	210	190
PM10	mg/m^3	Yearly	*	*	*
Smoke Emissions	Obscuration	Yearly	0	0	0

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

Points 29 to 32 have remained fairly consistent with the previous year's results. Generally, there has been a decrease in Formaldehyde across the locations in comparison to the previous years. The results remain within EPL 3035 and Protection of the Environment Operations (Clean Air) Regulation 2022 limits.

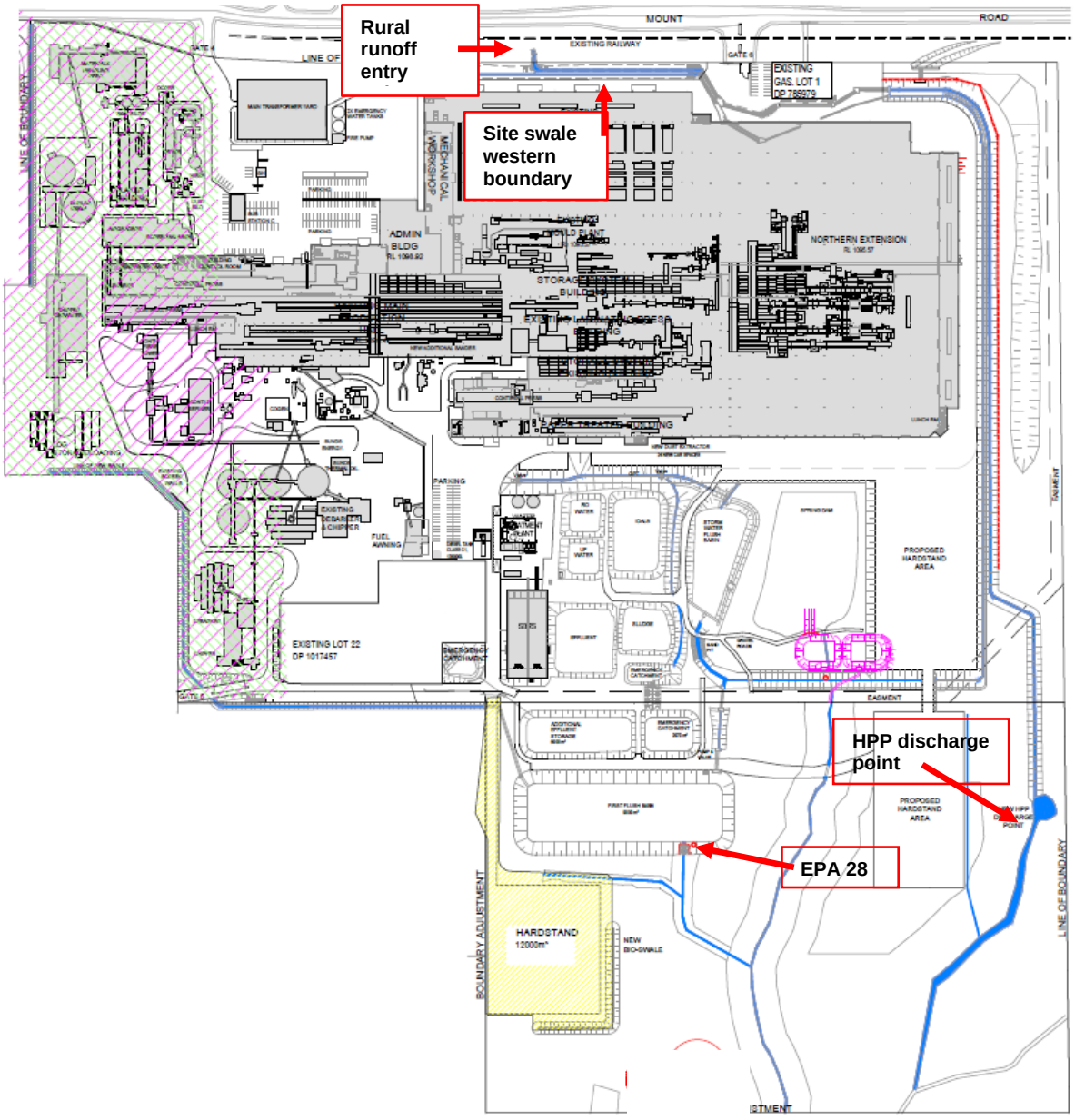
4.4 Surface Water

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

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

- Any overflow from the existing stormwater flush basin is directed into the first flush basin
- Water captured in the basins is harvested by the site water treatment plant for reuse in the production system.
- Stormwater harvesting averaged 82m3/day over the reporting period the largest recorded volume of water harvested in one day was 294m^3
- Runoff from construction areas is managed in accordance with Erosion Sediment Control Plans as part of the CEMP for SSD7016. Surface water from these zones is directed into the site swale then on to the stormwater basin
- Water discharges from EPL discharge Point 28, and HPP discharge point to a tributary of Kings Stockyard Creek (shown on Figure 6)

Figure 6 Surface water management system - SSD 7016



In accordance with EPL 3035, water quality monitoring is undertaken weekly during discharge to maintain compliance with discharge requirements. During this reporting period water

discharge was monitored from EPA Point 28, additionally samples were taken at the HPP discharge point.

The HPP discharge point was enabled due to earthworks and powerline realignment. Powerlines have been run underground, however the connection back into the grid still needs to occur before the above ground lines can be made redundant and removed before the swale work is completed. At the time of writing this report, the HPP discharge point was not an EPL discharge point though it was managed in accordance with EPL 3035 requirements. Discussion with the EPA have commenced regarding the HPP discharge point and licensing requirements.

EPA Point 1 sampling location has been removed during construction and diversion works for as part of the Mod 4 spring dam reclamation. The removal of Point 1 from the EPL 3035 has been discussed but a formal license variation has not yet been completed to remove the conditions from the licence. This will be completed during the 2023/2024 reporting period.

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

Table 31 EPA Identification Point 1 and Point 28 Water pollution limits (also adopted for HPP Swale sampling location)

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 2022/23 reporting period are provided in Appendix C Surface Water Monitoring Data.

Table 32 provides a summary of Borg Manufacturing historic annual average water monitoring results for discharge from EPA Point 1. No samples were taken from the discharge point as diversion works had commenced in the previous year reporting period.

Table 32 Annual Average Water Quality Monitoring Results EPA Point 1

Pollutant	Units of Measure	2019/20	2020/21
Aldrin	µg/L	0	0
Biochemical Oxygen Demand	mg/L	8.2	6
Colour	Hazen	39.2	18
Dieldrin	µg/L	0	0
Methylene Blue Active Substances	mg/L	0.1	0.2
Nitrogen (Total)	mg/L	6.3	3.7
Oil and Grease	mg/L	7.5	5.1
pH	pH	7.6	7.6
Phosphorus (Total)	mg/L	0.1	0.1
Total Suspended Solids	mg/L	31.3	28.9

Table 33 provides a summary of Borg Manufacturing historic annual average water monitoring results for discharge from EPA Point 28. This shows that for the 2022/23 reporting period, the annual average for all pollutants were generally below the concentration limit set in EPL 3035.

Table 33 Annual Average Water Quality Monitoring Results EPA Point 28

Pollutant	Units of Measure	2020/21	2021/22	2022/23
Aldrin	µg/L	0	0	<0.01
Biochemical Oxygen Demand	mg/L	7.7	5.3	5.8
Colour	Hazen	68.5	31.1	36.0
Dieldrin	µg/L	0	0	<0.01
Methylene Blue Active Substances	mg/L	0.11	0.2	0.2
Nitrogen (Total)	mg/L	8.42	5.7	7.8
Oil and Grease	mg/L	5.8	<5	6.0
pH	pH	7.72	7.4	7.6
Phosphorus (Total)	mg/L	0.09	0.1	0.1
Total Suspended Solids	mg/L	23.5	63	19.3

No samples (sample event) were collected at Point 1 and 15 samples collected and analysed at Point 28 during discharge in the 2022/23 reporting period.

Three additional samples were analysed from Point 28 during the reporting period that were not included in the averages provided. The three additional samples were taken at times of nil discharge and were taken as a precautionary measure due to heavy rains being forecast. One event at Point 28 and one event at the HPP discharge point returned results where water pollution limits noted in Table 31 were exceeded. The EPA and DPIE were notified of the

exceedance (see Appendix I Water Quality Exceedances Notification). Appendix C displays the exceedance information for the events 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 exceedances. This included upstream inspections (Council, Structaflor and Highland Pine Products stormwater infrastructure), assessment of site activities and ERSED controls, and review of rainfall data from the site weather station.

As discussed above in section 4.2.1 Rainfall Data, the site meteorological station recorded 1,108.8mm of rainfall for the reporting period which was 273.1mm above the annual mean rainfall of 835.7mm for the Oberon region. This excess rainfall combined with heavy snowfall and the significant construction activities that occurred during this reporting period likely contributed to a number of the water quality discharge exceedances discussed below.

Table 34 Annual Average Water Quality Monitoring Results HPP Swale Discharge Point

Pollutant	Units of Measure	2021/2022	2022/23
Aldrin	µg/L	0	<0.010
Biochemical Oxygen Demand	mg/L	3.7	4.2
Colour	Hazen	57.2	39.1
Dieldrin	µg/L	0	<0.010
Methylene Blue Active Substances	mg/L	0.1	<0.1
Nitrogen (Total)	mg/L	1.2	1
Oil and Grease	mg/L	0	0.8
pH	pH	7.7	7.6
Phosphorus (Total)	mg/L	0.06	0.1
Total Suspended Solids	mg/L	14.6	16.8

The HPP Discharge Point was not a formally recognised EPA licence discharge location during the reporting period however it was treated the same. Weekly water samples were undertaken by the Environmental Manger during discharge and analysed under the same conditions of the site EPL. Forty nine samples (sample event) were collected and analysed at the HPP Discharge Point during discharge in the 2022/23 reporting period. The water that passes through the discharge location consists of stormwater that passes through the Highland Pine Products site and historic Structaflor site which is opposite Borg Manufacturing. The water travels approximately 1.7km through open swales, pipelines, natural water ways and artificially constructed ERSED controls to filter it. This combination of both natural and artificial filtration has resulted in low levels analysed at the discharge point over the reporting period as can be seen in Table 34.

One sample taken on 7 June 2022 returned a Total Suspended Solids (TSS) result of 186 mg/L which exceeds the EPA licence limit of 50mg/L. It was noted on the stormwater recording

sheet that the water had moderate to high discharge quantity, appeared disturbed due to high in and outflows following 55.6mm rain and snow event in previous week, no sheen was visible and lots of organic matter floating and suspended in sample. TSS had not previously been an issue in the drainage system. Less than one week after the exceedance event the same discharge point was sampled again and returned a result for TSS of <5.

4.4.1 EPL 3035 Identification Point 28

At EPL discharge Point 28 there was one occurrence where water quality discharge limit for Total Nitrogen (Total N) was exceeded. This occurred on 27 September 2022 with the result being 11.7mg/L. There were significant rain events (i.e. >10mm) in the days prior to monitoring being undertaken. 31.8mm of rain was recorded on site in the 6 days prior to the monitoring event. It is plausible that the exceedance was due to the mobilisation of wood material from site during the rain event which may show that the Total N result is due to organic matter in the sample. A sample was also collected offsite, approximately 800m downstream from Point 28 for analysis on the same day. The point at which the sample was taken incorporates all onsite water activities and returned a result 0.6mg/L for Total Nitrogen.

4.5 Groundwater

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

Table 35 Location of Groundwater Monitoring Bores

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

Samples were collected by an appropriately qualified third-party specialist and analysed by NATA accredited laboratories in accordance with “Standard Methods for the Examination of Water & Wastewater,” APHA, AWWA, WEF and Water & Wastewater and Examination Manual (V. Dean Adams). Monitoring equipment is maintained in accordance with the manufacturer’s specifications by qualified specialists.

Figure 7 Groundwater Monitoring Locations

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

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

Pollutant	Unit of Measure	Frequency	2020/21	2021/22	2022/23
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0.02	0.04	0.06
Chemical Oxygen Demand	mg/L	Yearly	25	<10	16
Electrical Conductivity	µS/cm	Yearly	220	323	266
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.2	<0.1	0.40
pH	pH Units	Yearly	6.8	7.7	7.3
Total Dissolved Solids	mg/L	Yearly	210	244	201
Total Organic Carbon	mg/L	Yearly	3	<1	3
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	606	26	21
Water Height	m	Yearly	1.09	2.21	0.92

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

Pollutant	Unit of Measure	Frequency	2020/21	2021/22	2022/23
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	<0.01	5.95	4.14
Chemical Oxygen Demand	mg/L	Yearly	26	23	296
Electrical Conductivity	µS/cm	Yearly	1040	1336	1527
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.1	1.10	0.60
pH	pH Units	Yearly	7.1	6.7	6.6
Total Dissolved Solids	mg/L	Yearly	690	982	985
Total Organic Carbon	mg/L	Yearly	3	55	101
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	2230	2290.00
Total Suspended Solids	mg/L	Yearly	45	43	55
Water Height	m	Yearly	0.98	4.28	4.80

At EPA Point 14 (Table 36), it was reported in the last reporting period that the monitoring well had only recently been reinstated, and that excess sediment may have been deposited. As expected, there was a significant decrease in TSS in the 2021/22 followed by a further decrease in the 2022/23 sampling results. A slight increase in Formaldehyde was identified, however a general decrease in all other analytes was shown.

Results for EPA Point 15 (Table 37) show a decrease in Ammonia as N and Formaldehyde in comparison to the last reporting period. All other analytes showed an increase in comparison to the 2021/22 review period.

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

Pollutant	Unit of Measure	Frequency	2020/21	2021/22	2022/23
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	0	0.03	0.06
Chemical Oxygen Demand	mg/L	Yearly	26	28	26
Electrical Conductivity	µS/cm	Yearly	257	282	250
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.3	<0.2	4.60
pH	pH Units	Yearly	6.3	6.9	6.8
Total Dissolved Solids	mg/L	Yearly	200	168	176
Total Organic Carbon	mg/L	Yearly	6	8	4
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	173	197	54
Water Height	m	Yearly	0.86	2.02	2.34

Results for this reporting period for Point 16 are generally consistent with the 2021/22 results, however an increase in Formaldehyde was noted and a significant decrease in Total Suspended Solids

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

Pollutant	Unit of Measure	Frequency	2020/21	2021/22	2022/23
Aldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Ammonia as N	mg/L	Yearly	<0.01	1.12	0.09
Chemical Oxygen Demand	mg/L	Yearly	182	37	28
Electrical Conductivity	µS/cm	Yearly	421	428	374
Dieldrin	µg/L	Yearly	<0.5	<0.5	<0.5
Formaldehyde	mg/L	Yearly	0.1	0.1	<0.1
pH	pH Units	Yearly	7.3	7.2	6.7
Total Dissolved Solids	mg/L	Yearly	264	397	340
Total Organic Carbon	mg/L	Yearly	148	3	4
Total Petroleum Hydrocarbons	µg/L	Yearly	<50	<50	<50
Total Suspended Solids	mg/L	Yearly	142	23	19
Water Height	m	Yearly	5.89	6.5	3.0

Results show decreases at Point 24 for COD, TOC and TSS in this reporting period. All other pollutants remain generally consistent with the previous years results with the exception of Ammonia as N which significantly decreased.

4.6 Noise

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

Table 40 Noise Limits dB(A)

Location	Day $L_{Aeq(15\ minute)}$	Evening $L_{Aeq(15\ minute)}$	Night $L_{Aeq(15\ minute)}$
All sensitive receivers	55	50	45

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

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

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

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

4.6.1 Operational Noise

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

During the 2022/23 reporting period, EMM (Formally Global Acoustics) was engaged to conduct attended noise monitoring and provide an *Annual Noise Monitoring Report* for operational noise generated by Borg Manufacturing facility. The noise monitoring event was conducted at four sensitive receiver locations as shown in Figure 8 on 28th and 29th June 2022. Table 41 presents results of the attended annual noise monitoring event**.**

Figure 8 Borg Manufacturing noise monitoring locations

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

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[2, 3]	Borg LAeq 15 min	Exceedance [5,6]
NM1	28/6/2022	2.7	D	50	Yes	43	Nil
NM2	28/06/2022	3.0	D	50	Yes	42	Nil
NM3	28/06/2022	3.3	E	50	No	IA	NA
NM4	28//06/2022	2.9	D	50	Yes	<30	Nil
NM1	28/06/2022	3.9	D	45	No	45	NA
NM2	28/06/2022	4.3	D	45	No	41	NA
NM3	28/06/2022	2.8	D	45	Yes	<25	Nil
NM4	28/06/2022	2.7	E	45	Yes	<30	Nil
NM1	29/06/2022	5.2	D	55	No	48	NA
NM2	29/06/2022	5.7	D	55	No	NM	NA
NM3	29/06/2022	5.2	C	55	No	40	NA

NM4	29/06/2022	5.5	D	55	No	45	NA

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

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

4.6.2 Construction Noise

Borg Manufacturing Construction Noise Management Plan (CNMP) includes 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 Manufacturing 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. EMM conducted the construction noise monitoring for this review period. Tables 42 to 45 show monitoring results for quarterly noise monitoring events. All reference notes are included below Table 45.

Table 42 Construction Noise Quarter 2

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies2, 3	Borg LAeq 15 min dB4	Exceedance 5,6
NM1	29/06/2022 10:30	5.2	D	55	No	48	NA
NM2	29/06/2022 10:00	5.7	D	55	No	NM	NA
NM3	29/06/2022 11:37	5.2	C	55	No	40	NA
NM4	29/06/2022 11:06	5.5	D	55	No	45	NA
NM1	28/06/2022 19:05	2.7	D	50	Yes	43	Nil
NM2	28/06/2022 18:35	3.0	D	50	Yes	42	Nil
NM3	28/06/2022 20:15	3.3	E	50	No	IA	NA

NM4	28/06/2022 19:36	2.9	D	50	Yes	<30	Nil
NM1	28/06/2022 22:27	3.9	D	45	No	45	NA
NM2	28/06/2022 22:00	4.3	D	45	No	41	NA
NM3	28/06/2022 23:32	2.8	D	45	Yes	<25	Nil
NM4	28/06/2022 23:00	2.7	E	45	Yes	<30	Nil

Table 43 Construction Noise Quarter 3

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	20/09/2022 10:45	2.5	B	55	Yes	48	Nil
NM2	20/09/2022 11:15	3.5	B	55	No	46	NA
NM3	20/09/2022 12:16	2.9	A	55	Yes	NM	Nil
NM4	20/09/2022 11:41	3.2	A	55	No	41	NA

Table 44 Construction Noise Quarter 4

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	10/11/2022 13:10	2.6	A	55	Yes	46	Nil
NM2	10/11/2022 13:33	2.7	A	55	Yes	IA	Nil
NM3	10/11/2022 12:41	1.6	A	55	Yes	<25	Nil
NM4	10/11/2022 13:56	1.3	A	55	Yes	<25	Nil

Table 45 Construction Noise Quarter 1

Location	Start Date and time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies[1]	Borg LAeq(15 min)[2]	Exceedance[3,4]
NM1	30/03/2023 09:40	5.7	C	55	No	44	NA
NM2	30/03/2023 10:02	5.7	C	55	No	NM	NA

NM3	30/03/2023 10:28	5.2	B	55	No	NM	NA
NM4	30/03/2023 10:52	5.3	B	55	No	NM	NA

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 EMM for each event are attached to this document as Appendix F.

5 Community Relations

5.1 Environmental Complaints

Ten community complaints were received during the 2022/23 reporting period. Site investigations were conducted by the Environmental Manager and team leaders which included a review of plant operational data, noise monitoring and visual inspections. Discussions were conducted with Area Managers/Supervisors regarding site activities to determine if the facility was operating within approved conditions as specified in SSD 7016 and EPL 3035 at the time of the complaints.

One noise complaint was made from the Oberon Football fields on 20 November 2022. The complainant wanted to remain anonymous and said that there was constant noise which disrupted a christening at the venue. It was later discovered the complaint was made by a staff member not a party attendant and when contact was made with the party organiser; they said they did not have any complaints and had an enjoyable day at the venue.

One dust complaint was made directly to the EPA by resident on 20 June 2022. The EPA contacted Borg Manufacturing on 7 July 2022 to notify them of the complaint. The allegations were that there were wood fibres present on a vehicle in Carrington Avenue. Onsite weather data was reviewed for the estimated timeframe. wind was blowing to the west. Aerial maps indicated the likely location of complaint was south-southwest. An inspection of the roads in that general area conducted on the day of notification on 7 July 2022 and no fibre or dust was identified.

Two separate complaints were made from the Oberon Football fields on 30 July 2022 same day in relation to the same incident. Complaints were related to material fallout and emissions from the south western corner of the site. The Particle Board shift leader was contacted who immediately stopped works at the flaker building. The Facility Manager and Environmental manager were also contacted, and investigations were initiated by undertaking detailed site inspections across the Football fields and along Lowes Mount Road up to Albion Street. No evidence of foreign materials were identified during investigation. A second follow up inspection

was conducted at approximately 3:30pm by the site team leader, where he walked Lowes Mount Road, the football fields and Albion Street and found no evidence of foreign materials.

Six complaints received during this reporting period were related to noise from one resident. The complainant also made multiple complaints in the previous reporting period, all of which were investigated and no breaches were identified. This reporting period and rolling over into next years the complainant has become quite persistent with complaints calling sometimes twice a week. The complainant has given very little to no detail leaving messages for the complaints line such as “Back of Borg near BP.” The complainant has become very difficult to work with, not answering or returning phone calls and so following up these complaints has been quite difficult. A specific site noise investigation project has commenced which will be available in the next reporting period report, which includes ongoing spot checks, detailed noise monitoring and mapping of the surrounding area to build evidence against unsubstantiated illegitimate complaints.

External noise monitoring was completed by EMM quarterly within the reporting period with no evidence of breaches identified.

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

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

5.2 Community Liaison

5.2.1 Community Consultative Committee (CCC)

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

Borg hosted three CCC meetings during the reporting period on the 27th of July 2022, 23rd November 2022 and 31st March 2023. All meetings were held in the boardroom of the administration building on the Borg Manufacturing site where members of the community, local council, the mayor and neighbouring businesses (Highland Pine Products and Woodchem) attended and contributed. Some community members also joined online via video call on Teams.

A copy of the Meeting Minutes from this reporting period are attached to this document as Appendix H. The major discussion points relating to Borg Manufacturing in 2022/2023 were:

- Lack of housing and accommodation in Oberon for new employees causing some recruitment struggles.
- Gas outages
- Company assistance with the floods in Forbes/Eugowra
- Increased utilisation of UWR
- Discussions about the proposed Biodigester project
- Transport struggles

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 Manufacturing, 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 Manufacturing 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 Manufacturing website, local area advertisements, letterbox notifications and project fact sheets.

6 Independent Audit

Development Consent SSD 7016 condition C15 sets out requirements for independent environmental audits of the Development. Borg commissioned environmental consultants Molino Stewart to conduct an Independent Environmental Audit (IEA) of the site for operations and construction for audit period 1 July 2018 to 29 May 2021. In accordance with SSD 7016 condition C15 the next IEA is scheduled for 2024.

7 Environmental Incidents & Non-compliances

Environmental incidents are managed through the Borg Manufacturing 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 three reportable environmental pollution incidents at the Borg Manufacturing facility.

7.2 Non-conformances

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

On 27 February 2023 Borg reported an incident to the EPA's Environment Line. The incident comprised the unintentional release of wood fibre from one of the Conti 1 cyclones to the nearby receiving community. On 6 March 2023 Borg provided the EPA with an incident report in accordance with EPL 3035 condition R3. Following the submission of the R3 report EPA a Show Cause Letter was issued by the EPA on 15 March 2023. The Show Cause Letter alleged that there had been a contravention of s 64 of the Protection of the Environment Operations Act 1997 (**Act**) due to a failure to comply with Condition O2.1 of Environment Protection Licence 3035.

On 21 June 2023, a request for further information and Draft Notice of Variation to License 3035 was requested by the EPA. Borg collated additional information on the incident and prepared a progress report which was submitted on 21 July 2023. No EPA response has been received as of yet.

8 Activities Proposed for the next Annual Review Period

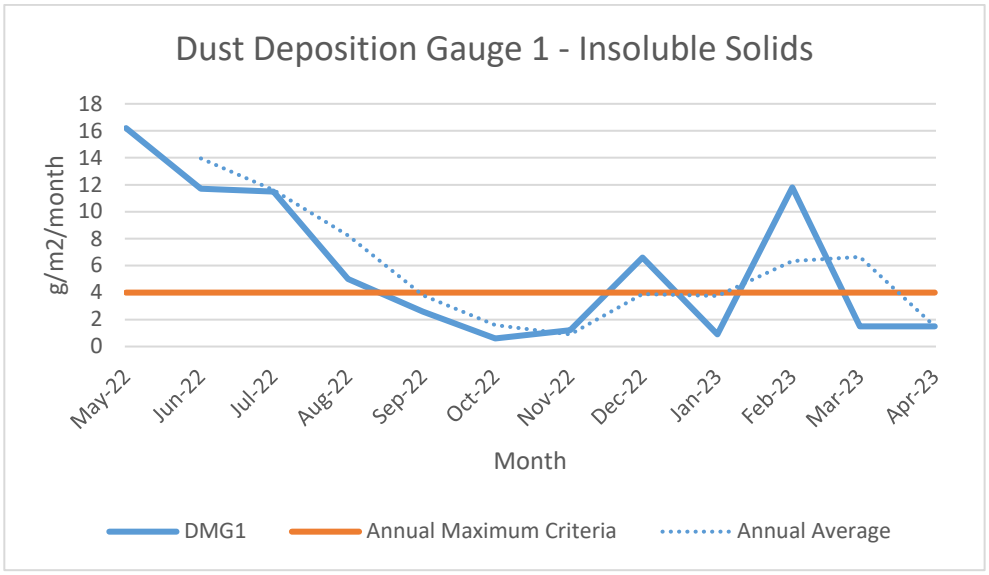
Borg Manufacturing will endeavour to carry out the activities listed in Table 46 during the 2023/24 reporting period to assist with improving the environmental performance of the existing development and the project.

Table 46 Proposed Activities for 2023/24 Reporting Period

Ongoing implementation of Environmental Management Plans for the existing development and the project.
Complete verification studies required for SSD 7016 including modifications
Complete installation of additional material handling equipment
Complete works as approved under Modification 4
Continue erosion and sediment control inspections and rectification works as necessary to manage storm water quality discharge as well as reinstate the original HPP swale design once high voltage electrical works have been completed (movement of powerlines from above ground to below).
Discuss with EPA licensed water discharge points, referencing EPL 3035, to ensure this is fit for purpose
Implement requirements of the new Resource Recovery order and Exemption as a flow on from the completion of the second Urban Wood Residue trial (recycled wood program) and report back to EPA
Ongoing implementation of Environmental Awareness standards training. Finalise an online version for more efficient roll out and traceability.

APPENDICIES

Appendix A – Depositional Dust Monitoring Data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14
12
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4
2
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Jun-22
Jul-22
Aug-22
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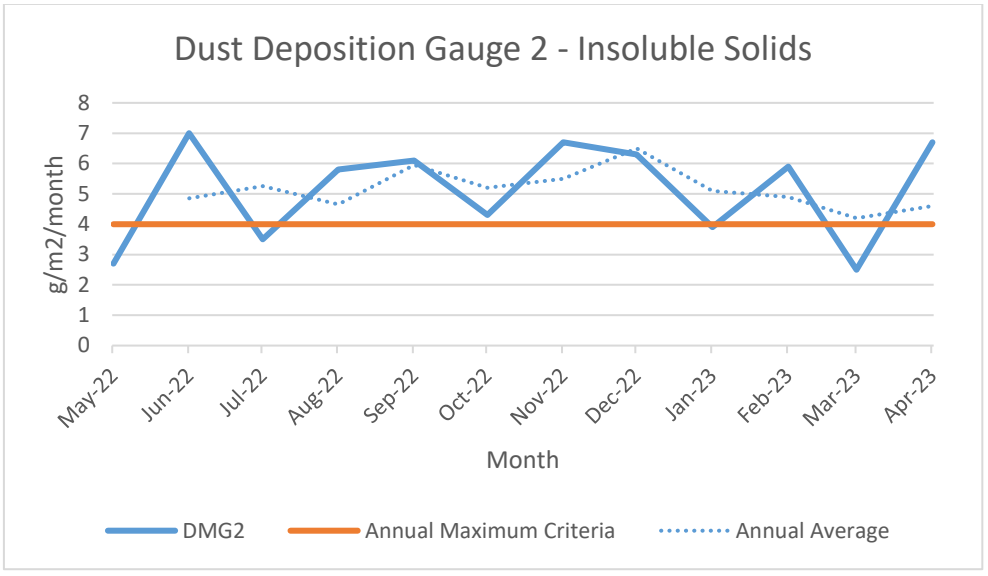
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
Month
DMG1
Annual Maximum Criteria
Annual Average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May-22
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Jul-22
Aug-22
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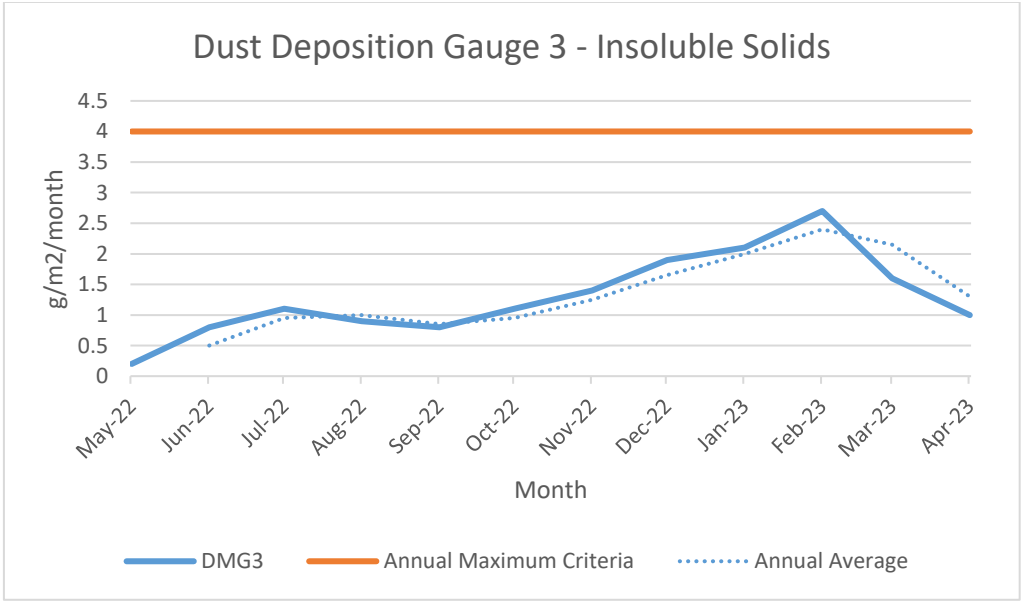
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
Month
DMG2
Annual Maximum Criteria
Annual Average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Jul-22
Aug-22
Sep-22
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Dec-22
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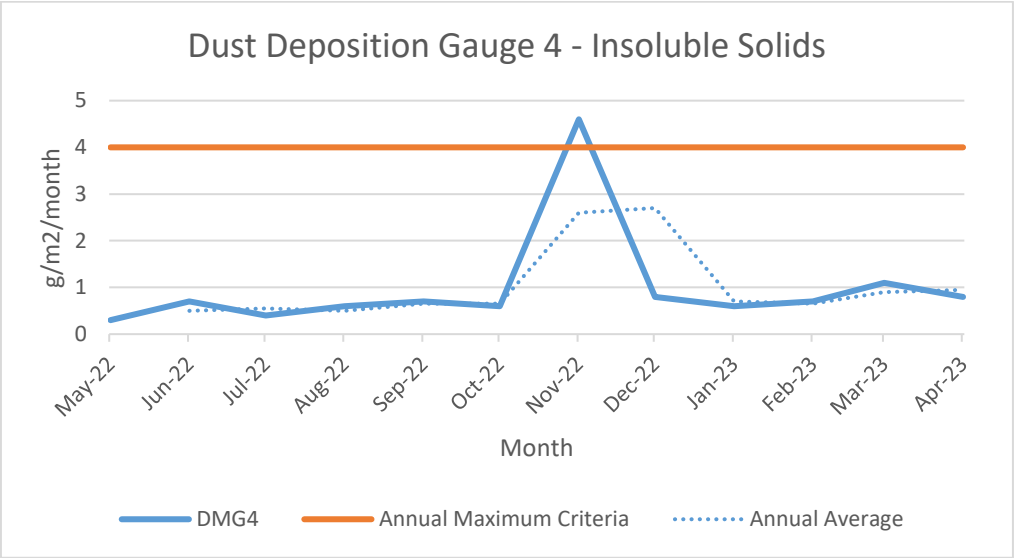
Feb-23
Mar-23
Apr-23
Month
DMG3
Annual Maximum Criteria
Annual Average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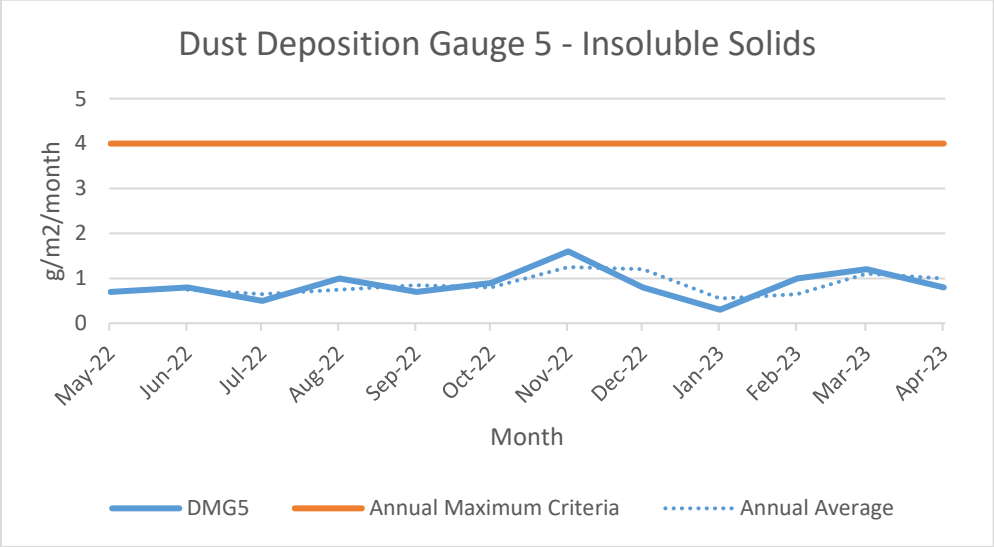
Month
DMG4
Annual Maximum Criteria
Annual Average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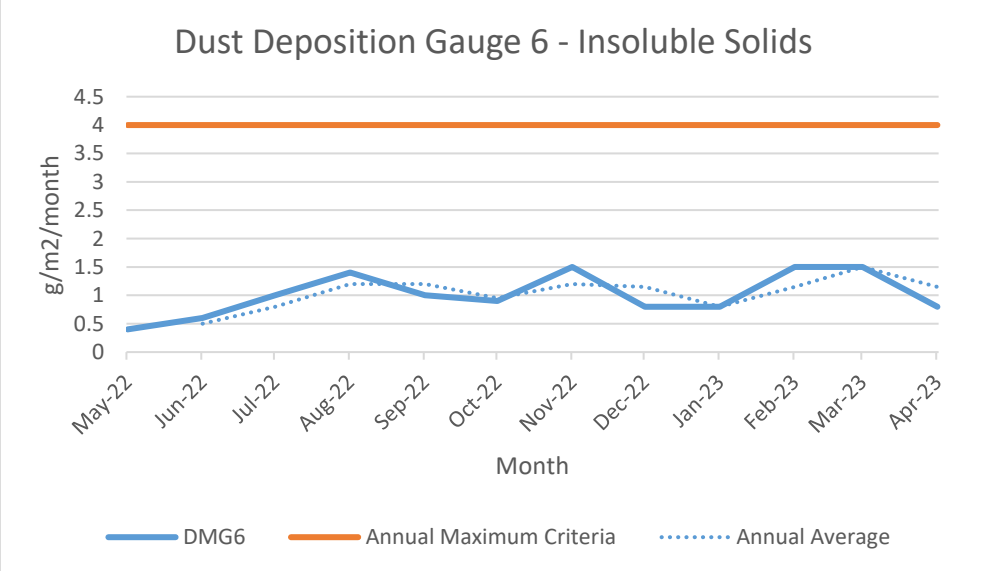
Month
DMG5
Annual Maximum Criteria
Annual Average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Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-23
Month
DMG6
Annual Maximum Criteria
Annual Average

Appendix B – Air Quality Monitoring Report

Ektimo

Borg Manufacturing, Oberon Plant

Emission Testing Report

Report Number R013663

Document Information

Template Version 130223

Client Name:	Borg Manufacturing Pty Ltd
Report Number:	R013663
Date of Issue:	6 June 2023
Attention:	Victor Bendevski
Address:	Lowes Mount Rd Oberon NSW 2787
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Aaron Davis
Senior Air Monitoring Consultant

NATA Accredited Laboratory
No. 14601

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

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.

Table of Contents

1 Executive Summary

1.1 Background

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

1.2 Project Objective & Overview

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	31 January 2023	Total solid particles Formaldehyde
EPA 5 – DC2 Baghouse		
EPA 7 – Conti 2 Stage 1 Dryer Cyclone 1 (West)	7 March 2023	Total solid particles, fine particulate matter (PM_{10}) Smoke Nitrogen oxides, oxygen, carbon dioxide
	8 March 2023	Formaldehyde Oxygen, carbon dioxide
EPA 8 – Conti 2 Stage 1 Dryer Cyclone 2 (East)	7 March 2023	Total solid particles, fine particulate matter (PM_{10}) Smoke Nitrogen oxides, oxygen, carbon dioxide
	8 March 2023	Formaldehyde Oxygen, carbon dioxide
EPA 9 – Conti 1 Dryer Cyclone 1 (South)	27 October 2022	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
	8 March 2023	Formaldehyde Oxygen, carbon dioxide
EPA 10 – Conti 1 Dryer Cyclone 2 (North)	27 October 2022	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
	8 March 2023	Formaldehyde Oxygen, carbon dioxide

Continued next page

Location	Test Date	Test Parameters*
EPA 19 – Conti 4 Dryer	2 February 2023	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke
EPA 20 – DC11 Reject Cyclone		Total solid particles Formaldehyde
EPA 21 – DC11A Reject Cyclone		
EPA 27 – Conti 2 Press Vent Stack	9 March 2023	Total solid particles, fine particulate matter (PM_{10}) Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide
EPA 29 – Forming Line Baghouse	28 October 2022	
EPA 30 – Form Station Baghouse	26 October 2022	
EPA 31 – Particle Board Press Stack	1 February 2023	
EPA 32 – WESP	26 October 2022	Total solid particles Formaldehyde Smoke Nitrogen oxides, oxygen, carbon dioxide

* 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 and all analytes highlighted in red are outside the licence limit set by the NSW EPA as per licence 3035 (last amended prior to this round of testing on 4 September 2019).

EPA No.	Location Description	Pollutant	Units	Licence limit	Detected values	
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Total Solid Particles	mg/m^3	200	38 [2]	
		Formaldehyde	mg/m^3	5	21 [3]	
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Total Solid Particles	mg/m^3	200	47 [2]	
		Formaldehyde	mg/m^3	5	1.3 [3]	
9	Conti 1 Dryer Cyclone 1 (South)	Total Solid Particles	mg/m^3	200	32 [1]	
		Formaldehyde	mg/m^3	5	3.7 [1]	0.51 [3]
10	Conti 1 Dryer Cyclone 2 (North)	Total Solid Particles	mg/m^3	200	190 [1]	
		Formaldehyde	mg/m^3	5	3.2 [1]	1.0 [3]

1) Testing 27/10/22
2) Testing 7/3/23
3) Testing 8/3/23

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 Results Summary

The following summary table details results of analytes tested for at locations with no limits as stated in NSW EPA licence 3035 as well as NOx for EPA 7-10.

EPA No.	Location Description	Pollutant	Units	Testing Date	Detected Values
4	DC1 Baghouse	Solid particles	mg/m^3	31/01/2023	<2
		Formaldehyde	mg/m^3	31/01/2023	4.2
5	DC2 Baghouse	Solid particles	mg/m^3	1/02/2023	<3
		Formaldehyde	mg/m^3	1/02/2023	4.1
7	Conti 2 Stage 1 Dryer Cyclone 1 (West)	Nitrogen oxides	mg/m^3	7/03/2023	220
8	Conti 2 Stage 1 Dryer Cyclone 2 (East)	Nitrogen oxides	mg/m^3	7/03/2023	230
9	Conti 1 Dryer Cyclone 1 (South)	Nitrogen oxides	mg/m^3	27/10/2022	160
10	Conti 1 Dryer Cyclone 2 (North)	Nitrogen oxides	mg/m^3	27/10/2022	140
19	Conti 4 Dryer	Solid particles	mg/m^3	2/02/2023	45
		Formaldehyde	mg/m^3	2/02/2023	1.6
20	DC11 Reject Cyclone	Solid particles	mg/m^3	2/02/2023	<2
		Formaldehyde	mg/m^3	2/02/2023	3.9
21	DC11A Reject Cyclone	Solid particles	mg/m^3	2/02/2023	<2
		Formaldehyde	mg/m^3	2/02/2023	2.6
27	Combined Stack (C2 Press Vents)	Solid particles	mg/m^3	9/03/2023	4.5
		Formaldehyde	mg/m^3	9/03/2023	1.6
		Nitrogen oxides	mg/m^3	9/03/2023	<4
29	Forming Line Baghouse	Solid particles	mg/m^3	28/10/2022	<2
		Formaldehyde	mg/m^3	28/10/2022	1.5
		Nitrogen oxides	mg/m^3	28/10/2023	<4
30	Form Station Baghouse	Solid particles	mg/m^3	26/10/2022	2.3
		Formaldehyde	mg/m^3	26/10/2022	1.0
		Nitrogen oxides	mg/m^3	26/10/2022	<4
31	Particle Board Press Extraction System	Solid particles	mg/m^3	1/02/20223	49
		Formaldehyde	mg/m^3	1/02/2023	0.86
		Nitrogen oxides	mg/m^3	1/02/2023	<4
32	WESP	Solid particles	mg/m^3	26/10/2022	34
		Formaldehyde	mg/m^3	26/10/2022	0.032
		Nitrogen oxides	mg/m^3	26/10/2022	190

2 Results

2.1 EPA 4 – DC1 Baghouse

Date	31/01/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 4 - DC1 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	1280 x 680 mm
Sampling plane area	0.87 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	2 8
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

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

Stack Parameters		
Moisture content, %v/v	2.4	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.97	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1410 & 1525	
Temperature, °C	40	
Temperature, K	313	
Velocity at sampling plane, m/s	8.9	
Volumetric flow rate, actual, m³/s	7.8	
Volumetric flow rate (wet STP), m³/s	5.9	
Volumetric flow rate (dry STP), m³/s	5.8	
Mass flow rate (wet basis), kg/hour	27000	

Non-isokinetics	Results	
Sampling time	1415-1515	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.2	1.4

Isokinetic Results	Results	
Sampling time	1415-1522	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.7
Isokinetic Sampling Parameters		
Sampling time, min	64	
Isokinetic rate, %	99	
Gravimetric analysis date (total particulate)	14-02-2023	

2.2 EPA 5 – DC2 Baghouse

Date	31/01/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 5 - DC2 Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	2800 x 680 mm
Sampling plane area	1.9 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	2 14
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

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

Stack Parameters		
Moisture content, %v/v	2.4	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.98	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1535 & 1700	
Temperature, °C	36	
Temperature, K	309	
Velocity at sampling plane, m/s	14	
Volumetric flow rate, actual, m³/s	27	
Volumetric flow rate (wet STP), m³/s	21	
Volumetric flow rate (dry STP), m³/s	21	
Mass flow rate (wet basis), kg/hour	97000	

Non-isokinetics	Results	
Sampling time	1540-1640	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	4.1	5.1

Isokinetic Results	Results	
Sampling time	1540-1655	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<3	<3
Isokinetic Sampling Parameters		
Sampling time, min	70	
Isokinetic rate, %	100	
Gravimetric analysis date (total particulate)	14-02-2023	

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

Date	7/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Non-conforming

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.
The gas temperature of the sampling plane is below the dew point

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

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

Stack Parameters		
Moisture content, %v/v	11	
Gas molecular weight, g/g mole	28.0 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.25 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0935 & 1100	
Temperature, °C	50	
Temperature, K	324	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	54	
Volumetric flow rate (wet STP), m³/s	40	
Volumetric flow rate (dry STP), m³/s	36	
Mass flow rate (wet basis), kg/hour	180000	

Date	7/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0940 - 1057		0940 - 1057		0940 - 1057	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	220	470	160	350	280	600
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	1.7		1.4		2.1	
Oxygen	19.1		18.6		19.4	

Isokinetic Results	Results	
Sampling time	0940-1057	0940-1057 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	38	76
Fine particulates (PM10)	12	24
D50 cut size, 10µm	10.3	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	71	72
Isokinetic rate, %	99	110
Gravimetric analysis date (total particulate)	16-03-2023	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	16-03-2023	

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

Date	8/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 7 - Conti 2 Stage 1 Dryer Cyclone 1 (West)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Non-conforming

Comments

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

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

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

The gas profile has a cyclonic component which exceeds 15°
The highest to lowest differential pressure ratio exceeds 9:1 or the highest to lowest gas velocity ratio exceeds 3:1
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	11	
Gas molecular weight, g/g mole	27.9 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.93	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1520 & 1640	
Temperature, °C	47	
Temperature, K	320	
Velocity at sampling plane, m/s	9.9	
Volumetric flow rate, actual, m³/s	48	
Volumetric flow rate (wet STP), m³/s	36	
Volumetric flow rate (dry STP), m³/s	32	
Mass flow rate (wet basis), kg/hour	160000	

Gas Analyser Results	Average	Minimum	Maximum
Sampling time	1528 - 1637	1528 - 1637	1528 - 1637
	Concentration %v/v	Concentration %v/v	Concentration %v/v
Carbon dioxide	1.1	0.6	1.5
Oxygen	19.8	19.4	20.4

Non-isokinetics	Results	
Sampling time	1525-1639	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	21	40

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

Date	7/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Non-conforming

Comments

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

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

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

The gas profile has a cyclonic component which exceeds 15°

The upstream disturbance is <2D from the sampling plane

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

Stack Parameters		
Moisture content, %v/v	11	
Gas molecular weight, g/g mole	27.9 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.25 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1105 & 1225	
Temperature, °C	50	
Temperature, K	324	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	54	
Volumetric flow rate (wet STP), m³/s	40	
Volumetric flow rate (dry STP), m³/s	35	
Mass flow rate (wet basis), kg/hour	180000	

Date	7/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1110 - 1223		1110 - 1223		1110 - 1223	
	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)	230	490	170	370	270	570
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	1.9		1.4		2.3	
Oxygen	18.8		18.4		19.5	

Isokinetic Results	Results	
Sampling time	1110-1223	1110-1223 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	47	92
Fine particulates (PM10)	16	31
D50 cut size, 10µm	10.4	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	71	73
Isokinetic rate, %	103	106
Gravimetric analysis date (total particulate)	16-03-2023	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	16-03-2023	

Smoke Obscuration	Result
Time of assessment	1120 - 1135
Smoke Obscuration	0

Date	8/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 8 - Conti 2 Stage 1 Dryer Cyclone 2 (East)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2480 mm
Sampling plane area	4.83 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Junction 0.5 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Non-conforming

Comments

Please note that in response to the cyclonic flow, Borg Manufacturing has a NSW EPA approved method deviation to AS4323.2 to conduct particulate matter sampling at this location.
The gas temperature of the sampling plane is below the dew point

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

The gas profile has a cyclonic component which exceeds 15°
The 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	11 (saturated)	
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 density at discharge conditions, kg/m³	0.93	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1655 & 1815	
Temperature, °C	46	
Temperature, K	319	
Velocity at sampling plane, m/s	10	
Volumetric flow rate, actual, m³/s	49	
Volumetric flow rate (wet STP), m³/s	37	
Volumetric flow rate (dry STP), m³/s	32	
Mass flow rate (wet basis), kg/hour	160000	

Gas Analyser Results	Average	Minimum	Maximum
Sampling time	1700 - 1811	1700 - 1811	1700 - 1811
	Concentration %v/v	Concentration %v/v	Concentration %v/v
Carbon dioxide	1.3	1.1	1.5
Oxygen	19.7	19.5	19.8

Non-isokinetics	Results	
Sampling time	1700-1814	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.3	2.6

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

Date	27/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

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

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

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

The gas profile has a cyclonic component which exceeds 15°

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	14	
Gas molecular weight, g/g mole	27.6 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.23 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.90	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1200 & 1430	
Temperature, °C	54	
Temperature, K	327	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	45	
Volumetric flow rate (wet STP), m³/s	33	
Volumetric flow rate (dry STP), m³/s	28	
Mass flow rate (wet basis), kg/hour	150000	

Date	27/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1305 - 1404		1305 - 1404		1305 - 1404	
	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)	160	270	130	220	180	300
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	2.3		1.9		2.6	
Oxygen	18.9		18.4		19.4	

Non-isokinetics	Results	
Sampling time	1230-1330	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	3.7	6.3

Isokinetic Results	Results	
Sampling time	1215-1421	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	32	53
Isokinetic Sampling Parameters		
Sampling time, min	121	
Isokinetic rate, %	103	
Gravimetric analysis date (total particulate)	02-11-2022	

Smoke Obscuration	Result
Time of assessment	1230 - 1245
Smoke Obscuration	0

Date	27/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*221025*

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

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

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

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

The gas profile has a cyclonic component which exceeds 15°

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	27.5 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.23 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.89	
Gas Flow Parameters		
Temperature, °C	54	
Temperature, K	327	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	46	
Volumetric flow rate (wet STP), m³/s	33	
Volumetric flow rate (dry STP), m³/s	28	
Mass flow rate (wet basis), kg/hour	150000	

Isokinetic Results	Results	
Sampling time	1435-1640 (PM10)	
	Concentration mg/m³	Mass Rate g/min
Fine particulates (PM10)	21	35
Isokinetic Sampling Parameters		
Sampling time, min	120	
Isokinetic rate, %	108	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	02-11-2022	

Date	8/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 9 - Conti 1 Dryer Cyclone 1 (South)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Conforming 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 gas temperature of the sampling plane is below the dew point

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

The gas profile has a cyclonic component which exceeds 15°
The highest to lowest gas velocity ratio exceeds 1.6:1
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	12	
Gas molecular weight, g/g mole	27.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0900 & 1025	
Temperature, °C	48	
Temperature, K	321	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	42	
Volumetric flow rate (wet STP), m³/s	31	
Volumetric flow rate (dry STP), m³/s	27	
Mass flow rate (wet basis), kg/hour	140000	

Gas Analyser Results	Average	Minimum	Maximum
Sampling time	0908 - 1020	0908 - 1020	0908 - 1020
	Concentration % v/v	Concentration % v/v	Concentration % v/v
Carbon dioxide	0.5	<0.4	0.6
Oxygen	20.4	20.3	20.9

Non-isokinetics	Results	
Sampling time	0905-1020	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	**0.51**	**0.84**

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

Date	27/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

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

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

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

The gas profile has a cyclonic component which exceeds 15°

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	14	
Gas molecular weight, g/g mole	27.6 (wet)	29.2 (dry)
Gas density at STP, kg/m³	1.23 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.90	
Gas Flow Parameters		
Temperature, °C	51	
Temperature, K	325	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	46	
Volumetric flow rate (wet STP), m³/s	34	
Volumetric flow rate (dry STP), m³/s	29	
Mass flow rate (wet basis), kg/hour	150000	

Date	27/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*221025*

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0925 - 1024		0925 - 1024		0925 - 1024	
Combustion Gases	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Nitrogen oxides (as NO_2)	140	240	110	200	170	300
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	2		1.8		2.3	
Oxygen	19.1		18.8		19.4	

Non-isokinetics	Results	
Sampling time	0930-1030	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	3.2	5.4

Isokinetic Results	Results	
Sampling time	0910-1115	0910-1115 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	190	320
Fine particulates (PM10)	47	82
D50 cut size, 10µm	10.6	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	121	120
Isokinetic rate, %	105	95
Gravimetric analysis date (total particulate)	02-11-2022	
Gravimetric analysis date (PM_{10})	02-11-2022	

Smoke Obscuration	Result
Time of assessment	0920 - 935
Smoke Obscuration	0

Date	8/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 10 - Conti 1 Dryer Cyclone 2 (North)
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2230 mm
Sampling plane area	3.91 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1 D
Upstream disturbance	Junction 2 D
No. traverses & points sampled	2 24
Sample plane conformance to AS 4323.1	Conforming 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 gas temperature of the sampling plane is below the dew point

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

The gas profile has a cyclonic component which exceeds 15°
The highest to lowest gas velocity ratio exceeds 1.6:1
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	11	
Gas molecular weight, g/g mole	27.8 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	0.92	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1100 & 1220	
Temperature, °C	46	
Temperature, K	320	
Velocity at sampling plane, m/s	10	
Volumetric flow rate, actual, m³/s	40	
Volumetric flow rate (wet STP), m³/s	30	
Volumetric flow rate (dry STP), m³/s	26	
Mass flow rate (wet basis), kg/hour	130000	

Gas Analyser Results	Average	Minimum	Maximum
Sampling time	1106 - 1219	1106 - 1219	1106 - 1219
	Concentration %v/v	Concentration %v/v	Concentration %v/v
Carbon dioxide	0.5	0.4	0.5
Oxygen	20.4	20.3	20.5

Non-isokinetics	Results	
Sampling time	1105-1219	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1	1.6

2.7 EPA 19 – Conti 4 Dryer

Date	2/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 19 - Conti 4 Dryer Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details		
Sampling plane dimensions	1620 mm	
Sampling plane area	2.06 m²	
Sampling port size, number	4" BSP (x2) ext thread	
Duct orientation & shape	Vertical Circular	
Downstream disturbance	Exit 4 D	
Upstream disturbance	Junction 8 D	
No. traverses & points sampled	2 16	
Sample plane conformance to AS 4323.1	Ideal sampling plane	

Stack Parameters		
Moisture content, %v/v	3.2	
Gas molecular weight, g/g mole	28.8 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.90	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1100 & 1235	
Temperature, °C	62	
Temperature, K	336	
Velocity at sampling plane, m/s	29	
Volumetric flow rate, actual, m³/s	61	
Volumetric flow rate (wet STP), m³/s	43	
Volumetric flow rate (dry STP), m³/s	41	
Mass flow rate (wet basis), kg/hour	200000	

Non-isokinetics	Results	
Sampling time	1105-1230	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.6	4

Date	2/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 19 - Conti 4 Dryer Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	1620 mm
Sampling plane area	2.06 m²
Sampling port size, number	4" BSP (x2) ext thread
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 4 D
Upstream disturbance	Junction 8 D
No. traverses & points sampled	2 16
Sample plane conformance to AS 4323.1	Ideal sampling plane

Stack Parameters		
Moisture content, %v/v	3.5	
Gas molecular weight, g/g mole	28.7 (wet)	29.1 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	0.89	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0850 & 1025	
Temperature, °C	69	
Temperature, K	342	
Velocity at sampling plane, m/s	28	
Volumetric flow rate, actual, m³/s	58	
Volumetric flow rate (wet STP), m³/s	40	
Volumetric flow rate (dry STP), m³/s	39	
Mass flow rate (wet basis), kg/hour	190000	

Isokinetic Results	Results	
Sampling time	0855-1020	0855-1020 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	45	110
Fine particulates (PM10)	26	61
D50 cut size, 10µm	9.7	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	80	79
Isokinetic rate, %	98	100
Gravimetric analysis date (total particulate)	14-02-2023	
Gravimetric analysis date (PM_{10})	14-02-2023	

Smoke Obscuration	Result
Time of assessment	0900 - 0915
Smoke Obscuration	0

2.8 EPA 20 – DC11 Reject Cyclone

Date	2/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 20 - Reject Cyclone DC11
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	680 x 1140 mm
Sampling plane area	0.775 m²
Sampling port size, number	4" BSP (x3)
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	3 9
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

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

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

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

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

Stack Parameters		
Moisture content, %v/v	2	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.00	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1315 & 1435	
Temperature, °C	32	
Temperature, K	305	
Velocity at sampling plane, m/s	14	
Volumetric flow rate, actual, m³/s	11	
Volumetric flow rate (wet STP), m³/s	8.7	
Volumetric flow rate (dry STP), m³/s	8.5	
Mass flow rate (wet basis), kg/hour	40000	

Non-isokinetics	Results	
Sampling time	1320-1420	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	3.9	2

Isokinetic Results	Results	
Sampling time	1320-1431	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.8
Isokinetic Sampling Parameters		
Sampling time, min	63	
Isokinetic rate, %	98	
Gravimetric analysis date (total particulate)	14-02-2023	

2.9 EPA 21 – DC11A Reject Cyclone

Date	2/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	Reject Cyclone DC11A
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	680 x 1140 mm
Sampling plane area	0.775 m²
Sampling port size, number	4" BSP (x3)
Duct orientation & shape	Vertical Rectangular
Downstream disturbance	Exit 1 D
Upstream disturbance	Bend 3 D
No. traverses & points sampled	3 9
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

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

Stack Parameters		
Moisture content, %v/v	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 density at discharge conditions, kg/m³	1.00	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1455 & 1610	
Temperature, °C	31	
Temperature, K	304	
Velocity at sampling plane, m/s	15	
Volumetric flow rate, actual, m³/s	12	
Volumetric flow rate (wet STP), m³/s	9.2	
Volumetric flow rate (dry STP), m³/s	9.1	
Mass flow rate (wet basis), kg/hour	43000	

Non-isokinetics	Results	
Sampling time	1500-1600	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	2.6	1.4

Isokinetic Results	Results	
Sampling time	1500-1605	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<0.9
Isokinetic Sampling Parameters		
Sampling time, min	63	
Isokinetic rate, %	98	
Gravimetric analysis date (total particulate)	14-02-2023	

2.10 EPA 27 – Conti 2 Press Vent Stack

Date	9/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 27 - Combined Conti 2 Press Vent Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details		
Sampling plane dimensions	2000 mm	
Sampling plane area	3.14 m²	
Sampling port size, number	4" BSP (x2)	
Duct orientation & shape	Vertical Circular	
Downstream disturbance	Exit 2.5 D	
Upstream disturbance	Junction 4 D	
No. traverses & points sampled	2 20	
Sample plane conformance to AS 4323.1	Conforming but non-ideal	

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

Stack Parameters		
Moisture content, %v/v	2.5	
Gas molecular weight, g/g mole	28.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.01	
Gas Flow Parameters		
Temperature, °C	31	
Temperature, K	304	
Velocity at sampling plane, m/s	9.5	
Volumetric flow rate, actual, m³/s	30	
Volumetric flow rate (wet STP), m³/s	24	
Volumetric flow rate (dry STP), m³/s	23	
Mass flow rate (wet basis), kg/hour	110000	

Date	9/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 27 - Combined Conti 2 Press Vent Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0906 - 1011		0906 - 1011		0906 - 1011	
	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	20.9		20.8		20.9	

Isokinetic Results	Results	
Sampling time	0904-1006	0904-1006 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	4.5	6.2
Fine particulates (PM10)	<4	<6
D50 cut size, 10µm	10.5	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	60	60
Isokinetic rate, %	100	117
Gravimetric analysis date (total particulate)	16-03-2023	
Gravimetric analysis date (PM_{10}/$PM_{2.5}$)	16-03-2023	

Smoke Obscuration	Result
Time of assessment	0910 - 0925
Smoke Obscuration	0

Date	9/03/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 27 - Combined Conti 2 Press Vent Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*230302*

Sampling Plane Details	
Sampling plane dimensions	2000 mm
Sampling plane area	3.14 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2.5 D
Upstream disturbance	Junction 4 D
No. traverses & points sampled	2 20
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

Stack Parameters		
Moisture content, %v/v	2.5	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.30 (dry)
Gas density at discharge conditions, kg/m³	1.01	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1030 & 1135	
Temperature, °C	29	
Temperature, K	302	
Velocity at sampling plane, m/s	9.5	
Volumetric flow rate, actual, m³/s	30	
Volumetric flow rate (wet STP), m³/s	23	
Volumetric flow rate (dry STP), m³/s	23	
Mass flow rate (wet basis), kg/hour	110000	

Non-isokinetics	Results	
Sampling time	1032-1134	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.6	2.2

2.11 EPA 29 – Forming Line Baghouse

Date	28/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*221025*

Sampling Plane Details		
Sampling plane dimensions	1000 mm	
Sampling plane area	0.785 m²	
Sampling port size, number	4" BSP (x2)	
Duct orientation & shape	Inclined Circular	
Downstream disturbance	Bend 3 D	
Upstream disturbance	Bend 3.5 D	
No. traverses & points sampled	2 16	
Sample plane conformance to AS 4323.1	Conforming 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	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 density at discharge conditions, kg/m³	0.98	
Gas Flow Parameters		
Temperature, °C	17	
Temperature, K	291	
Velocity at sampling plane, m/s	35	
Volumetric flow rate, actual, m³/s	28	
Volumetric flow rate (wet STP), m³/s	21	
Volumetric flow rate (dry STP), m³/s	21	
Mass flow rate (wet basis), kg/hour	98000	

Date	28/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 29 - Forming Line Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	0959 - 1058		0959 - 1058		0959 - 1058	
Combustion Gases	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
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	

Non-isokinetics	Results	
Sampling time	1340-1440	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1.5	1.8

Isokinetic Results	Results	
Sampling time	0940-1105	0940-1105 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	<2	<3
Fine particulates (PM10)	<3	<3
D50 cut size, 10µm	10.1	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	80	80
Isokinetic rate, %	103	63
Gravimetric analysis date (total particulate)	02-11-2022	
Gravimetric analysis date (PM_{10})	02-11-2022	

Smoke Obscuration	Result
Time of assessment	1340 - 1355
Smoke Obscuration	0

2.12 EPA 30 – Form Station Baghouse

Date	26/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Sampling Plane Details	
Sampling plane dimensions	545 mm
Sampling plane area	0.233 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 8 D
Upstream disturbance	Bend 8 D
No. traverses & points sampled	2 8
Sample plane conformance to AS 4323.1	Ideal sampling plane

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 density at discharge conditions, kg/m³	0.97	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1330 & 1445	
Temperature, °C	34	
Temperature, K	308	
Velocity at sampling plane, m/s	27	
Volumetric flow rate, actual, m³/s	6.2	
Volumetric flow rate (wet STP), m³/s	4.7	
Volumetric flow rate (dry STP), m³/s	4.6	
Mass flow rate (wet basis), kg/hour	22000	

Date	26/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 30 - Form Station Baghouse
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		221025

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1340 - 1439		1340 - 1439		1340 - 1439	
	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	

Non-isokinetics	Results	
Sampling time	1340-1440	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	1	0.28

Isokinetic Results	Results	
Sampling time	1335-1442	1335-1443 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	2.3	0.63
Fine particulates (PM10)	<3	<0.9
D50 cut size, 10µm	10.1	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	64	64
Isokinetic rate, %	97	89
Gravimetric analysis date (total particulate)	02-11-2022	
Gravimetric analysis date (PM_{10})	02-11-2022	

Smoke Obscuration	Result
Time of assessment	1340 - 1355
Smoke Obscuration	0

2.13 EPA 31 – Particle Board Press Stack

Date	1/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 31 - Particle Board Press Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	2000 mm
Sampling plane area	3.14 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Junction 3 D
No. traverses & points sampled	2 20
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

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

Stack Parameters		
Moisture content, %v/v	4.7	
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 density at discharge conditions, kg/m³	0.99	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1020 & 1255	
Temperature, °C	33	
Temperature, K	306	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	35	
Volumetric flow rate (wet STP), m³/s	27	
Volumetric flow rate (dry STP), m³/s	26	
Mass flow rate (wet basis), kg/hour	120000	

Date	1/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 31 - Particle Board Press Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1112 - 1237		1112 - 1237		1112 - 1237	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	<4	<7	<4	<7	10	16
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	<0.4		<0.4		<0.4	
Oxygen	20.7		20.6		20.7	

Isokinetic Results	Results	
Sampling time	1105-1250	1105-1250 (PM10)
	Concentration mg/m³	Mass Rate g/min
Solid Particles	49	75
Fine particulates (PM10)	19	30
D50 cut size, 10µm	9.8	
Isokinetic Sampling Parameters	Isokinetic	PM10
Sampling time, min	100	100
Isokinetic rate, %	100	106
Gravimetric analysis date (total particulate)	14-02-2023	
Gravimetric analysis date (PM_{10})	14-02-2023	

Smoke Obscuration	Result
Time of assessment	1130 - 1145
Smoke Obscuration	0

Date	1/02/2023	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 31 - Particle Board Press Stack
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Scott Woods	**State**	NSW
Process Conditions	Please refer to client records		230116

Sampling Plane Details	
Sampling plane dimensions	2000 mm
Sampling plane area	3.14 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Junction 3 D
No. traverses & points sampled	2 20
Sample plane conformance to AS 4323.1	Conforming but non-ideal

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

Stack Parameters		
Moisture content, %v/v	3.2	
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 density at discharge conditions, kg/m³	1.00	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0825 & 1020	
Temperature, °C	32	
Temperature, K	305	
Velocity at sampling plane, m/s	11	
Volumetric flow rate, actual, m³/s	34	
Volumetric flow rate (wet STP), m³/s	27	
Volumetric flow rate (dry STP), m³/s	26	
Mass flow rate (wet basis), kg/hour	120000	

Non-isokinetics	Results	
Sampling time	0830-1015	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	0.86	1.3

2.14 EPA 32 – WESP

Date	26/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220920*

Sampling Plane Details		
Sampling plane dimensions	2520 mm	
Sampling plane area	4.99 m²	
Sampling port size, number	4" BSP (x2)	
Duct orientation & shape	Vertical Circular	
Downstream disturbance	Exit 2 D	
Upstream disturbance	Change in diameter 4 D	
No. traverses & points sampled	2 28	
Sample plane conformance to AS 4323.1	Conforming but non-ideal	

Comments

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

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

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

Stack Parameters		
Moisture content, %v/v	28 (saturated)	
Gas molecular weight, g/g mole	26.3 (wet)	29.5 (dry)
Gas density at STP, kg/m³	1.17 (wet)	1.31 (dry)
Gas density at discharge conditions, kg/m³	0.82	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0935 & 1210	
Temperature, °C	64	
Temperature, K	338	
Velocity at sampling plane, m/s	16	
Volumetric flow rate, actual, m³/s	79	
Volumetric flow rate (wet STP), m³/s	55	
Volumetric flow rate (dry STP), m³/s	40	
Mass flow rate (wet basis), kg/hour	230000	

Date	26/10/2022	**Client**	Borg Manufacturing Pty Ltd
Report	R013663	**Stack ID**	EPA 32 - WESP
Licence No.	3035	**Location**	Oberon
Ektimo Staff	Aaron Davis / Ahmad Ramiz	**State**	NSW
Process Conditions	Please refer to client records.		*220920*

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1038 - 1137		1038 - 1137		1038 - 1137	
	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)	190	460	150	350	220	530
	Concentration %v/v		Concentration %v/v		Concentration %v/v	
Carbon dioxide	4.2		3.2		4.6	
Oxygen	17		16.5		18.1	

Non-isokinetics	Results	
Sampling time	0950-1050	
	Concentration mg/m³	Mass Rate g/min
Formaldehyde	0.032	0.077

Isokinetic Results	Results	
Sampling time	0940-1205	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	34	81
Isokinetic Sampling Parameters		
Sampling time, min	140	
Isokinetic rate, %	102	
Gravimetric analysis date (total particulate)	01-11-2022	

Smoke Obscuration	Result
Time of assessment	0950 - 1005
Smoke Obscuration	0

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

3 Plant Operating Conditions

See Borg Manufacturing Pty Ltd records for complete process conditions.
Borg Manufacturing have collated plant operating condition and will provide them to NSW EPA as required.

From information received from the site operator, unless otherwise noted it is our understanding that samples were collected during normal plant operations. Unless otherwise noted all samples were collected in compliance with Ektimo's QA/QC standards.

4 Test Methods

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

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited	
				Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1 (AS 4323.1)	NA	NA	✓	NA
Flow rate, temperature & velocity	NSW EPA TM-2 (USEPA Method 2)	NSW EPA TM-2 (USEPA Method 2)	8%, 2%, 7%	NA	✓
Moisture content	NSW EPA TM-22 (USEPA Alt-Method 008)	NSW EPA TM-22 (USEPA Alt-Method 008)	19%	✓	✓
Moisture content	NSW EPA TM-22 (USEPA Method 4)	NSW EPA TM-22 (USEPA Method 4)	8%	✓	✓
Molecular weight	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24 (USEPA Method 3A)	NSW EPA TM-24 (USEPA Method 3A)	13%	✓	✓
Nitrogen oxides	NSW EPA TM-11 (USEPA Method 7E)	NSW EPA TM-11 (USEPA Method 7E)	12%	✓	✓
Oxygen	NSW EPA TM-25 (USEPA Method 3A)	NSW EPA TM-25 (USEPA Method 3A)	13%	✓	✓
Aldehydes & ketones	Ektimo 332	Ektimo 332	16%	✓	✓†
Particulate matter (PM_{10} & $PM_{2.5}$)	NSW EPA OM-5 (USEPA Method 201A)	NSW EPA OM-5 (USEPA Method 201A)	6%	✓	✓††
Solid particles (total)	NSW EPA TM-15 (AS 4323.2)	NSW EPA TM-15 (AS 4323.2)	3%	✓	✓††
Blackness of smoke	NA	NSW EPA TM-16	not specified	NA	✓

230404

† Analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601. Results were reported on
15 November 2022 in report number LV-003561
15 February 2023 in report number LV-003925
27 March 2023 in report number LV-004170

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

† Sampling has been conducted according to Ektimo Method 332 which uses the same principle as USEPA TO11A stipulated in NSW EPA method OM-11. Analysis has been conducted according to Ektimo Method 332 which uses the same principle (HPLC – high pressure liquid chromatography) as USEPA SW--846 (Method 0011).

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 to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director. NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

6 Definitions

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

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
AS	Australian Standard
BaP-TEQ	Benzo(a)pyrene toxic equivalents
BSP	British standard pipe
CARB	Californian Air Resources Board
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D_{50}	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D_{50} method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D_{50} of that cyclone and less than the D_{50} of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
DWER	Department of Water and Environmental Regulation (WA)
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environment Protection Authority
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
I-TEQ	International toxic equivalents
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
OM	Other approved method
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at standard conditions.
PM_{10}	Particulate matter having an equivalent aerodynamic diameter less than or equal to 10 microns (µm).
$PM_{2.5}$	Particulate matter having an equivalent aerodynamic diameter less than or equal to 2.5 microns (µm).
PSA	Particle size analysis. PSA provides a distribution of geometric diameters, for a given sample, determined using laser diffraction.
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those for which an analytical standard is not available), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
TOC	Total organic carbon. This is the sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
WHO05-TEQ	World Health Organisation toxic equivalents
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range.

7 Appendices

7.1 Appendix 1: Laboratory Chains of Custody

7.2 Appendix 2: Laboratory Results

7.1 Appendix 1. Laboratory Chains of Custody

Ektimo

Checked at Ektimo Dispatch by: SAM 6/3 (Sign/Date)

Fully received 08/02/23 - APe.

Only 8 received, 07/02/2023 - logged APe.

Samples received in good order: (Sign/Date)

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 17752	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Blank Solution	
N 17753	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Blank Filter in Solution	
N 17754	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17755	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Filter In solution	
N 17756	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17757	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Filter In solution	
N 17758	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17759	R013663	Formaldehyde	ug/litre	Ektimo		Aaron Davis	Filter In solution	
N 17772	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Blank Tube	
N 17773	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17774	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17775	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17776	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17777	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17778	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	
N 17779	R013663	Formaldehyde	ug/sample	Ektimo		Aaron Davis	Tube A	

(8) Rcd 08/02/23

(8)

Ektimo

Checked at Ektimo Dispatch by: 13-3-23 (Sign/Date)

Samples received in good order: (Sign/Date)

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 17843	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Blank Tube	
N 17844	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Tube	
N 17845	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Tube	
N 17846	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Tube	
N 17847	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Tube	
N 17848	R013663	HCOH	ug/sample	Ektimo		Aaron Davis	Tube	
N 17849	R013663	HCOH	ug/sample	Ektimo		Aaron Davis		

logged Alco 14/3/23

logged 16/03/23 - APe

Ektimo

Checked at Ektimo Dispatch by: 13-3-23 (Sign/Date)

Samples received in good order: (Sign/Date)

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 17829	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Blank Solution	
N 17830	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17831	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17832	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17833	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17834	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17835	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Imp A+B	
N 17836	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Blank Filter in DNPH	
N 17837	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	
N 17838	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	
N 17839	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	
N 17840	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	
N 17841	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	
N 17842	R013663	HCOH	ug/litre	Ektimo		Aaron Davis	Filter in DNPH	

(14)

7.2 Appendix 2. Laboratory Results

Ektimo

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CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo 26 Redland Drive Mitcham, VIC 3132
Report Number:	LV-003561
Job Number:	R013663
Date of Issue:	15/11/2022
Attention:	Ektimo Adminstration
Address:	26 Redland Dr Mitcham, VIC, 3132
Date samples received:	2/11/2022
Number of samples received:	6
Date samples analysed:	14/11/2022
No of samples analysed:	6
Test method(s) used:	Ektimo 330

Comments

QC Acceptance Criteria:

Parameter	Criteria	Pass/Fail
Standard Curve	$R^2 > 0.99$	Pass
Range	All samples <110% of highest standard	Pass
Repeat samples	Between 80% - 120%	Pass
Method Blanks	All method blanks < PQL	Pass
QC sample	2 standard deviations of theoretical	Pass
Chemical Expiry	All chemicals within expiry date	Pass
Verification samples	Between 80% - 120% of 'normal' samples	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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NATA is a member of APAC (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 world –wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

REPORT AUTHORISATION

Version 211220

Aimen Perry
Laboratory Technician

Matthew Cook
Laboratory Manager

NATA Accredited Laboratory 14601

Ektimo

Analytical Results

Version no. 211220

µg

Report No. LV-003561

Job No. R013663

Client Name: Borg Manufacturing

Parameter	Units	N 17226 - All - Blank Tube - R013663	N 17227 - EPA-32 WESP - Tube A - R013663	N 17228 - EPA-30 Form Station Bag house - Tube A - R013663	N 17232 - EPA-10 C1 Cyc (N) - Tube A - R013663	N 17233 - EPA-9 C1 Cyc (S) - Tube A - R013663	N 17234 - EPA-29 Forming Line - Tube A - R013663
Version no. 211220	PQL:	0.04	0.04	0.04	0.08	0.08	0.04
Formaldehyde	µg	<0.04	0.81	10	75	90	15

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

NATA accredited laboratory 14601

Ektimo

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CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo 26 Redland Drive Mitcham, VIC 3132
Report Number:	LV-003925
Job Number:	R013663
Date of Issue:	15/02/2023
Attention:	Ektimo Adminstration
Address:	26 Redland Dr Mitcham, VIC, 3132
Date samples received:	8/02/2023
Number of samples received:	16
Date samples analysed:	14/02/2023
No of samples analysed:	16
Test method(s) used:	Ektimo 330

Comments

QC Acceptance Criteria:

Parameter	Criteria	Pass/Fail
Standard Curve	$R^2 > 0.99$	Pass
Range	All samples <110% of highest standard	Pass
Repeat samples	Between 80% - 120%	Pass
Method Blanks	All method blanks < PQL	Pass
QC sample	2 standard deviations of theoretical	Pass
Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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REPORT AUTHORISATION

Version 221129

Aimen Perry
Laboratory Technician

Matthew Cook
Laboratory Manager

NATA Accredited Laboratory 14601

Ektimo

Analytical Results

Report Results

Version no. 221129

Change Units µg

Report No. LV-003925

Job No. R013663

Client Name: Borg Manufacturing Pty Ltd

Parameter		Units	N 17772 - All Locations - Blank Tube - R013663	N 17773 - EPA 32-WESP - Tube A - R013663	N 17774 - EPA 31- PB Press - Tube A - R013663	N 17775dil - EPA 4-DC1 - Tube A - R013663 1:2	N 17776dil - EPA5-DC2 - Tube A - R013663 1:2	N 17777 - EPA 19-C4 Dryer - Tube A - R013663	N 17778dil - EPA20-DC11 - Tube A - R013663 1:2	N 17779 - DC 11 A - Tube A - R013663
Version no. 221129		PQL:	0.04	0.04	0.04	0.08	0.08	0.04	0.08	0.04
Formaldehyde		µg	<0.04	31	32	72	77	45	95	46

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

NATA accredited laboratory 14601

Ektimo

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CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo 26 Redland Drive Mitcham, VIC 3132
Report Number:	LV-004170
Job Number:	R013663
Date of Issue:	27/03/2023
Attention:	Ektimo Adminstration
Address:	26 Redland Dr Mitcham, VIC, 3132
Date samples received:	16/03/2023
Number of samples received:	21
Date samples analysed:	22/03/2023
No of samples analysed:	21
Test method(s) used:	Ektimo 330

Comments

QC Acceptance Criteria:

Parameter	Criteria	Pass/Fail
Standard Curve	$R^2 > 0.99$	Pass
Range	All samples <110% of highest standard	Pass
Repeat samples	Between 80% - 120%	Pass
Method Blanks	All method blanks < PQL	Pass
QC sample	2 standard deviations of theoretical	Pass
Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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REPORT AUTHORISATION

Version 230216

Aimen Perry
Laboratory Technician

Matthew Cook
Laboratory Chemist

NATA Accredited Laboratory 14601

Ektimo

Analytical Results

Job No. R013663

Parameter	PQL	N 17843 - Blank - Blank Tube - R013663	N 17844 - EPA 7 - C2 CYC1 (W) - Tube - R013663
		0.02	2.00
Formaldehyde		<0.02	510
Acetaldehyde		<0.02	15
Acrolein		<0.02	<2
Propionaldehyde		<0.02	87
Butrylaldehyde		<0.02	14
Valeraldehyde		<0.02	19
Hexaldehyde		<0.02	25

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

Ektimo

Analytical Results

Parameter	PQL		N 17845 - EPA 8 - C2 CYC2 (E) - Tube - R013663	N 17846 - EPA 9 - C1 CYC1 (S) - Tube - R013663	N 17847 - EPA 10 - C1 CYC2 (N) - Tube - R013663	N 17848 - EPA 27 - C2 PRESS - Tube - R013663	N 17849 - EPA 27 - C2 PRESS (UREATRIC) - Tube - R013663
		PQL:	0.20	0.04	0.04	0.04	0.20
Formaldehyde		µg	52	16	25	25	32
Acetaldehyde		µg	8.7	13	11	3.4	4.7
Acrolein		µg	<0.2	<0.04	0.86	<0.04	<0.2
Propionaldehyde		µg	13	6.2	7.7	1.3	<0.2
Butrylaldehyde		µg	0.47	<0.04	1.4	<0.04	<0.2
Valeraldehyde		µg	1.3	1.2	1.3	0.54	0.4
Hexaldehyde		µg	0.83	2.4	1.7	0.96	1.4

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.

Ektimo

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VIC 3132
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PERTH
52 Cooper Road
Cockburn Central
WA 6164
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BRISBANE
3/109 Riverside Place
Morningside
QLD 4170
AUSTRALIA

Appendix C – Surface Water Monitoring Data

SURFACE WATER MONITORING EPL POINT 28											
DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin	EPA/DPIE Notified
10/05/2022	7.82	7	40	7.3	0.04	<5	5	<0.1	<0.010	<0.010	
23/05/2022	7.85	8	40	7.1	0.03	<5	3	<0.1	<0.010	<0.010	
31/05/2022	7.28	29	30	7.9	0.12	<5	8	<0.1	<0.010	<0.010	
7/06/2022	7.43	40	30	6.9	0.37	6	<2	<0.1	<0.010	<0.010	
13/07/2022	7.55	<5	40	6.3	0.05	6	6	0.1	<0.010	<0.010	
2/08/2022	7.82	26	30	8.9	0.04	6	8	<0.1	<0.010	<0.010	
22/08/2022	7.68	27	30	9.7	0.09	<5	9	<0.1	<0.010	<0.010	
27/09/2022	7.61	<5	30	11.7	0.05	<5	7	0.2	<0.010	<0.010	Y
11/10/2022	7.49	23	35	8.9	0.18	<5	8	<0.1	<0.010	<0.010	
25/10/2022	7.2	5	30	3.8	0.03	<5	4	<0.1	<0.010	<0.010	
3/11/2022	7.15	36	35	6.9	0.07	<5	<2	<0.1	<0.010	<0.010	
9/11/2022	7.9	6	50	8.6	0.09	<5	6	<0.1	<0.010	<0.010	
16/11/2022	7.71	16	40	7.2	0.05	<5	3	<0.1	<0.010	<0.010	
23/11/2022	7.75	<5	50	7	0.07	<5	6	<0.1	<0.010	<0.010	
1/03/2023	7.57	8	30	8.6	0.06	<5	3	<0.1	<0.010	<0.010	
Exceedance											
lowest	7.15	<5	30	3.8	0.03	<5	<2	<0.1	<0.010	<0.010	
Average	7.6	19.3	36.0	7.8	0.1	6.0	5.8	<0.1	<0.010	<0.010	
Highest	7.9	40	50	11.7	0.37	6	9	0.2	<0.010	<0.010	
Total samples required	15										
Total no. samples collected	18										

SURFACE WATER MONITORING HPP SWALE											
DATE	pH	TSS	True Colour	Total N	Total P	Oil & Grease	BOD	MBAS	Aldrin	Dieldrin	EPA/ DPIE Notifi
2/05/2022	7.1	14	60	1.2	0.1	<5	2	<0.1	<0.010	<0.010	
10/05/2022	7.72	<5	40	0.8	0.05	<5	5	<0.1	<0.010	<0.010	
18/05/2022	7.62	6	60	1.2	0.07	6	3	<0.1	<0.010	<0.010	
23/05/2022	7.51	<5	40	0.8	0.07	<5	<2	<0.1	<0.010	<0.010	
31/05/2022	6.93	26	60	1.4	0.14	<5	5	<0.1	<0.010	<0.010	
7/06/2022	7.34	186	60	1.2	0.16	6	<2	<0.1	<0.010	<0.010	Y
15/06/2022	7.49	<5	40	0.8	0.03	<5	<2	<0.1	<0.010	<0.010	
20/06/2022	7.06	<5	35	0.8	0.03	8	<2	<0.1	<0.010	<0.010	
27/06/2022	7.48	5	40	0.9	0.04	<5	8	<0.1	<0.010	<0.010	
6/07/2022	7.24	16	60	1.8	0.09	<5	2	<0.1	<0.010	<0.010	
13/07/2022	7.73	6	60	1.6	0.08	<5	4	<0.1	<0.010	<0.010	
20/07/2022	7.66	9	30	0.9	0.03	<5	<2	<0.1	<0.010	<0.010	
28/07/2022	7.58	8	40	1.3	0.06	<5	2	<0.1	<0.010	<0.010	
2/08/2022	7.49	11	35	1	0.04	<5	2	<0.1	<0.010	<0.010	
9/08/2022	7.03	8	40	0.9	0.04	<5	2	<0.1	<0.010	<0.010	
15/08/2022	7.82	10	40	0.9	0.06	<5	<2	<0.1	<0.010	<0.010	
22/08/2022	7.77	7	40	0.9	0.04	<5	2	<0.1	<0.010	<0.010	
29/08/2022	7.94	6	35	0.8	0.03	9	<2	<0.1	<0.010	<0.010	
6/09/2022	7.68	<5	35	1	0.03	<5	<2	<0.1	<0.010	<0.010	
13/09/2022	7.95	9	40	1	0.04	<5	3	<0.1	<0.010	<0.010	
19/09/2022	7.81	<5	35	0.8	0.04	<5	<2	<0.1	<0.010	<0.010	
26/09/2022	7.57	<5	40	0.8	0.04	<5	4	<0.1	<0.010	<0.010	
4/10/2022	7.38	<5	40	0.7	0.04	<5	2	<0.1	<0.010	<0.010	
11/10/2022	7.81	<5	50	1	0.04	<5	3	<0.1	<0.010	<0.010	
25/10/2022	7.93	6	40	1	0.06	<5	<2	<0.1	<0.010	<0.010	
3/11/2022	7.29	8	50	1	0.05	<5	<2	<0.1	<0.010	<0.010	
9/11/2022	7.89	6	40	0.8	0.06	<5	<2	<0.1	<0.010	<0.010	
16/11/2022	7.88	8	50	1	0.06	<5	2	<0.1	<0.010	<0.010	
23/11/2022	7.86	<5	35	0.8	0.04	<5	2	<0.1	<0.010	<0.010	
30/11/2022	7.96	<5	45	0.8	0.06	<5	4	<0.1	<0.010	<0.010	
7/12/2022	7.84	10	35	1	0.04	<5	2	<0.1	<0.010	<0.010	
12/12/2022	7.85	15	35	0.8	0.05	<5	2	<0.1	<0.010	<0.010	
20/12/2022	8.05	8	35	0.8	0.1	<5	3	<0.1	<0.010	<0.010	
5/01/2023	6.97	5	35	0.9	0.05	8	3	<0.1	<0.010	<0.010	
11/01/2023	7.77	12	35	0.8	0.04	<5	2	<0.1	<0.010	<0.010	
18/01/2023	7.36	9	40	1.4	0.09	<5	32	<0.1	<0.010	<0.010	N
24/01/2023	6.9	5	35	1	0.06	<5	<2	<0.1	<0.010	<0.010	
30/01/2023	7.64	15	30	1.2	0.08	<5	2	<0.1	<0.010	<0.010	
7/02/2023	7.31	10	35	1	0.1	<5	2	<0.1	<0.010	<0.010	
14/02/2023	7.5	23	25	1.2	0.08	<5	2	<0.1	<0.010	<0.010	
21/02/2023	7.23	20	25	1.3	0.1	<5	3	<0.1	<0.010	<0.010	
1/03/2023	7.72	16	35	1.2	0.11	<5	7	<0.1	<0.010	<0.010	
6/03/2023	7.36	51	35	1.8	0.13	<5	5	<0.1	<0.010	<0.010	N
15/03/2023	7.97	6	30	1	0.06	<5	2	<0.1	<0.010	<0.010	
29/03/2023	7.42	26	35	1	0.1	<5	<2	<0.1	<0.010	<0.010	
4/04/2023	7.34	10	25	0.9	0.1	<5	11	<0.1	<0.010	<0.010	
12/04/2023	7.21	12	30	1.3	0.07	<5	<2	<0.1	<0.010	<0.010	
19/04/2023	7.44	<5	25	0.8	0.06	<5	2	<0.1	<0.010	<0.010	
24/04/2023	7.9	12	20	0.8	0.08	<5	<2	<0.1	<0.010	<0.010	
Average	7.6	16.8	39.1	1.0	0.1	7.4	4.2				
Exceedance											

Appendix D – Groundwater Monitoring Data

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ALS Coal Division
BORG PANELS AIRBORNE DUST
ANALYSIS AND TESTING REPORT

REPORT TO:	Victor Bendevski 2 Lowes Mount Rd, Oberon NSW 2787
REPORT ON:	Borg Panels, Oberon Bore Monitoring Results
REPORT NO:	2400-7292-03-01
SAMPLED BY:	J.Sharp & A.McManus
REPORTED BY:	T. MacPhee
DATE:	6/04/2023

These reported results only relate to the items sampled and tested

Sampling and Analysis performed by: ACIRL Lithgow NSW NATA Accreditation No. 15784, Site No. 11436 in accordance with **AS** Standards listed on Page 6.

Adriana Hernandez
Environmental Project/Quality Officer– Lithgow NSW

NATA Accredited for compliance with ISO 17025 - Testing
Accreditation Number 15784

right solutions.
right partner.

Purging of Bores

	Units				
REPORT NO:		2400-7292-03-01			
ALS Sydney Report No.		ES2310562			
Date of Sample		29/03/2023	29/03/2023	29/03/2023	29/03/2023
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
General Comments/ Observations		**Cloudy**	**Cloudy**	**Clear**	**Clear**
Water Depth	m	2.34	4.80	5.20	0.92
Volume Purged	Lt	3.0	3.0	3.0	3.0

	Units				
REPORT NO:		2400-7292-03-01			
ALS Sydney Report No.		ES2310562			
Date of Sample		29/03/2023	29/03/2023	29/03/2023	29/03/2023
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
General Comments/ Observations		**Cloudy**	**Cloudy**	**Clear**	**Clear**
Temperature	°C	6.8	7.8	8.2	8.1
pH	pH Units	6.8	6.6	6.7	7.3
Electrical Conductivity	µS/cm	250	1527	374	266
Total Suspended Solids	mg/L	54	55	19	21
Total Dissolved Solids	mg/L	176	985	340	201
Water Height	m	2.34	4.80	5.20	0.92
Ammonia as N by Discrete Analyser					
Ammonia as N	mg/L	0.06	4.14	0.09	0.06
Total Organic Carbon (TOC)					
Total Organic Carbon	mg/L	4	101	4	3
Formaldehyde					
Formaldehyde	mg/L	4.6	0.6	<0.1	0.4
Chemical Oxygen Demand (Spectrophotometric)					
Chemical Oxygen Demand	mg/L	26	296	28	16
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

	Units				
REPORT NO:		2400-7292-03-01			
ALS Sydney Report No.		ES2310562			
Date of Sample		29/03/2023	29/03/2023	29/03/2023	29/03/2023
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
Organochlorine Pesticides (OC) Continued					
trans-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5
cis-Chlordane	µg/L	<0.5	<0.5	<0.5	<0.5
Dieldrin	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDE	µg/L	<0.5	<0.5	<0.5	<0.5
Endrin	µg/L	<0.5	<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDD	µg/L	<0.5	<0.5	<0.5	<0.5
Endrin aldehyde	µg/L	<0.5	<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L	<0.5	<0.5	<0.5	<0.5
4.4`-DDT	µg/L	<2.0	<2.0	<2.0	<2.0
Endrin ketone	µg/L	<0.5	<0.5	<0.5	<0.5
Methoxychlor	µg/L	<2.0	<2.0	<2.0	<2.0
Total Chlordane (sum)	µg/L	<0.5	<0.5	<0.5	<0.5
Sum of DDD + DDE + DDT	µg/L	<0.5	<0.5	<0.5	<0.5
Sum of Aldrin + Dieldrin	µg/L	<0.5	<0.5	<0.5	<0.5
Organochlorine Pesticide Surrogate					
Dibromo-DDE	%	65.0	70.9	67	68.6
Organophosphorus Pesticide Surrogate					
DEF	%	69	74.8	68.9	69.8
Total Petroleum Hydrocarbons					
C6 - C9 Fraction	µg/L	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	<50	580	<50	<50
C15 - C28 Fraction	µg/L	<100	1620	<100	<100

	Units				
REPORT NO:		2400-7292-03-01			
ALS Sydney Report No.		ES2310562			
Date of Sample		29/03/2023	29/03/2023	29/03/2023	29/03/2023
Site Name #1		**GW01**	**GW02**	**GW03**	**GW05**
Site Name #2		**Woodchem**	**Pond**	**Fence**	**Drain**
Total Petroleum Hydrocarbons					
C29 - C36 Fraction	µg/L	<50	90	<50	<50
C10 - C36 Fraction (sum)	µg/L	<50	2290	<50	<50
Total Recoverable Hydrocarbons - NEPM 2013 Fractions					
C6 - C10 Fraction	µg/L	<20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	<20	<20	<20	<20
>C10 - C16 Fraction	µg/L	<100	830	<100	<100
>C16 - C34 Fraction	µg/L	<100	1430	<100	<100
>C34 - C40 Fraction	µg/L	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	µg/L	<100	2260	<100	<100
>C10 - C16 Fraction minus Naphthalene	µg/L	<100	830	<100	<100
BTEXN					
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<2	<2	<2	<2
Ethylbenzene	µg/L	<2	<2	<2	<2
meta- & para-Xylene	µg/L	<2	<2	<2	<2
ortho-Xylene	µg/L	<2	<2	<2	<2
Total Xylenes	µg/L	<2	<2	<2	<2
Sum of BTEX	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<5	<5	<5	<5
TPH(V)/BTEX Surrogates					
1.2-Dichloroethane-D4	%	87.4	111	106	108.0
Toluene-D8	%	86.4	110	106	104
4-Bromofluorobenzene	%	86.9	108	107	104

ALS Coal Division
BORG PANELS AIRBORNE DUST
ANALYSIS AND TESTING REPORT

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.

REPORT NO: 2400-7292-03-01
ALS Report No: ES2310562

Low yielding bores have been purged to dryness, otherwise bores purged to constant Electrical Conductivity

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

Samples were analysed in accordance with the following Australian Standards or equivalent:

Australian Standards	Description
AS/NZS 5667.1	Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of
IS0 5667-3	Part 3: Preservaion and handling of water samples
AS/NZS 5667.11	Part 11: Guidance on sampling of ground waters

Appendix E – Annual Noise Monitoring Report

Global Acoustics

NOW PART OF EMM

creating opportunities

Borg Panels Facility

Noise Verification Study of Material Handling Equipment

Prepared for Borg Construction Pty Ltd

August 2022

Borg Panels Facility

Noise Verification Study of Material Handling Equipment

Borg Construction Pty Ltd

E22075 RP#1

August 2022

Version	Date	Prepared by	Approved by	Comments
0.1	24/08/2022	Will Moore	Jesse Tribby	Draft

Approved by

Jesse Tribby
Senior Acoustic Consultant
24/08/2022

Level 3 175 Scott Street
Newcastle NSW 2300

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Appendices

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Figures

1 Introduction

1.1 Background

Global Acoustics (now part of EMM) was engaged by Borg Manufacturing Pty Ltd to undertake a noise verification study for commissioning of a gas turbine and ancillary equipment at the Borg panel manufacturing facility (Borg) at Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Condition B20(B) of the Borg Development Consent SSD 7016 requires a noise validation survey within three months of commissioning of material handling equipment, with assessment against noise limits specified in Condition B16. Commissioning of the material handling equipment was completed on 1 June 2022.

Attended environmental noise monitoring described in this report was done during the day, evening, and night periods of 28 and 29 June 2022 at four monitoring locations. Borg was confirmed to be fully operating during all measurements.

1.2 Monitoring locations

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

Table 1.1 Attended monitoring locations

Location Descriptor	Monitoring Locations
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 1.1 **Borg noise monitoring locations**

1.3 Terminology and abbreviations

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

Table 1.2 Terminology and 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 consents

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. Relevant conditions of the consent, requiring commissioning testing described in this report, are reproduced in Appendix B.

2.2 Environment protection licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 2 February 2022.

2.3 Operational Noise Management Plan

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

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

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 done in accordance with Fact Sheet C of the NPfI.

3 Methodology

3.1 Overview

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

3.2 Attended noise monitoring

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

This survey presents noise levels gathered during attended monitoring that can be 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 $L_{Aeq,15minute}$ (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 (eg. 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 (eg breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer.
- 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.

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

3.3 Modifying factors

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

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

If applicable, modifying factors have been reported and added to measured site only L_{Aeq} 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} if Borg was the only contributing low-frequency noise source.

3.4 Attended noise monitoring equipment

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix A.

Table 3.1 Attended noise monitoring equipment

Model	Serial number	Calibration due date
Rion NA-28 sound level meter	01070590	09/06/2024
Pulsar 106 acoustic calibrator	74813	09/06/2024

4 Results

4.1 Total measured noise levels

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

Table 4.1 Measured noise levels[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	28/06/2022 19:05	53	50	48	46	46	45	43
NM1	28/06/2022 22:27	55	49	47	46	45	44	42
NM1	29/06/2022 10:30	65	60	55	52	51	49	27
NM2	28/06/2022 18:35	52	49	48	46	46	45	43
NM2	28/06/2022 22:00	50	46	45	43	43	41	39
NM2	29/06/2022 10:00	60	54	50	48	47	45	43
NM3	28/06/2022 20:15	73	65	44	50	42	40	35
NM3	28/06/2022 23:32	58	52	43	42	39	36	30
NM3	29/06/2022 11:37	76	70	58	57	46	44	41
NM4	28/06/2022 19:36	44	40	36	34	33	31	29
NM4	28/06/2022 23:00	46	41	37	35	34	33	31
NM4	29/06/2022 11:06	61	54	50	48	48	45	42

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, appliable during the survey.

4.3 Attended noise monitoring results

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

Table 4.2 $L_{Aeq,15minute}$ generated by Borg against criteria

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15minute}$ dB[2]	Exceedance[3 4]
NM1	28/06/2022 19:05	2.7	D	50	Yes	43	Nil
NM1	28/06/2022 22:27	3.9	D	45	No	45	NA
NM1	29/06/2022 10:30	5.2	D	55	No	48	NA
NM2	28/06/2022 18:35	3.0	D	50	Yes	42	Nil
NM2	28/06/2022 22:00	4.3	D	45	No	41	NA
NM2	29/06/2022 10:00	5.7	D	55	No	NM	NA
NM3	28/06/2022 20:15	3.3	E	50	No	IA	NA
NM3	28/06/2022 23:32	2.8	D	45	Yes	<25	Nil
NM3	29/06/2022 11:37	5.2	C	55	No	40	NA
NM4	28/06/2022 19:36	2.9	D	50	Yes	<30	Nil
NM4	28/06/2022 23:00	2.7	E	45	Yes	<30	Nil
NM4	29/06/2022 11:06	5.5	D	55	No	45	NA

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).
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 are 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

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	28/06/2022 19:05	6	0.0	-	0
NM1	28/06/2022 22:27	6	1.1	250	8
NM1	29/06/2022 10:30	7	2.8	80	4
NM2	28/06/2022 18:35	5	1.2	270	0
NM2	28/06/2022 22:00	6	1.6	240	7
NM2	29/06/2022 10:00	6	3.1	130	3
NM3	28/06/2022 20:15	5	0.4	260	3
NM3	28/06/2022 23:32	6	1.1	250	8
NM3	29/06/2022 11:37	11	2.0	100	3
NM4	28/06/2022 19:36	4	0.6	300	0
NM4	28/06/2022 23:00	6	3.3	270	8
NM4	29/06/2022 11:06	9	2.7	80	3

1. "-" indicates calm conditions at monitoring location

Meteorological data for compliance assessment is sourced from Borg AWS.

5 Summary

Global Acoustics (now part of EMM) was engaged by Borg Manufacturing Pty Ltd to undertake a noise verification study for commissioning of a gas turbine and ancillary equipment at the Borg panel manufacturing facility (Borg) at Oberon, NSW. The purpose of the survey was to quantify and describe the acoustic environment around the site and compare results with specified limits.

Condition B20(B) of the Borg Development Consent SSD 7016 requires a noise validation survey within three months of commissioning of material handling equipment, with assessment against noise limits specified in Condition B16. Commissioning of the material handling equipment was completed on 1 June 2022.

Attended environmental noise monitoring described in this report was done during the day, evening, and night periods of 28 and 29 June 2022 at four monitoring locations. Borg was confirmed to be fully operating during all measurements.

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

Appendix A
Calibration certificates

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A.1 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 C22373

Client Details	EMM Consulting Suite 6, Level 1, 146 Hunter Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	01070590
Microphone Serial Number :	08184
Pre-amplifier Serial Number :	52329

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	25.7°C	**Ambient Temperature :**	25.4°C
Relative Humidity :	31.9%	**Relative Humidity :**	32.4%
Barometric Pressure :	100.18kPa	**Barometric Pressure :**	100.11kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Max Moore
Calibration Date :	9 Jun 2022	**Report Issue Date :**	20 Jun 2022
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.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

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

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

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

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

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Sound Calibrator
IEC 60942:2017

Calibration Certificate

Calibration Number C22374

Client Details	EMM Consulting Suite 6, Level 1, 146 Hunter Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Pulsar Model 106
Instrument Serial Number :	74813

Atmospheric Conditions

Ambient Temperature :	25.8°C
Relative Humidity :	33.6%
Barometric Pressure :	100.19kPa

Calibration Technician : Lucky Jaiswal
Secondary Check: Max Moore
Calibration Date : 09 Jun 2022
Report Issue Date : 20 Jun 2022
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	94.09	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10dB*	*Temperature*	*±0.1°C*
Frequency	*±0.13%*	*Relative Humidity*	*±1.9%*
Distortion	*±0.20%*	*Barometric Pressure*	*±0.014kPa*

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

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

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

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

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.

Appendix B
Regulatory requirements

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B.1 Development Consent SSD 7016 MOD 4

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.*

B20B Within three months of commissioning the materials handling equipment approved for installation and operation under SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department 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.

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Appendix F – Construction Noise Monitoring Reports

Borg Manufacturing Facility

Quarter 1 - Construction noise monitoring

Prepared for Borg Manufacturing Pty Ltd

April 2023

Borg Manufacturing Facility

Quarter 1 - Construction noise monitoring

Borg Manufacturing Pty Ltd

E221226 RP1

April 2023

Version	Date	Prepared by	Reviewed by	Comments
1	17/04/2023	Will Moore	Tony Welbourne	

Approved by

Tony Welbourne
Associate Director
21 April 2023

Level 3 175 Scott Street
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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of construction at the Borg panel manufacturing facility (Borg, the site) located near Oberon, NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the day period of 30 March 2023 at four monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location descriptor	Description	Coordinates (MGA 55)	
		Easting	Northing
NM1	Oberon Caravan Park	764986	6267411
NM2	Intersection of Pine Street and Herborn Street	764474	6267289
NM3	127 Hazelgrove Road	766477	6268464
NM4	Intersection of Tasman Street and Earl Street	765602	6267117

Figure 1.1 **Attended noise monitoring locations**

1.3 Terminology and abbreviations

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

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1 per cent of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1 per cent of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10 percent of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50 per cent of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90 percent of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy 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.
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	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 8 September 2022. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Construction noise management plan

Noise monitoring requirements are detailed in the Borg Construction Noise Management Plan (CNMP). The most recent version of the CNMP was approved in August 2022. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on the consent and EPL are provided in Table 2.1.

Table 2.1 Impact assessment criteria, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
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, dB

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

Table 2.3 Rock/concrete breaking noise limit, dB

Location	Day $L_{Aeq,15minute}$
All sensitive receivers	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.

3 Methodology

3.1 Overview

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

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the day period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range, but they were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of it may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as NM in this report were due to one or more of the following:

- Site noise levels were extremely low and unlikely, in many cases, to be noticed
- Site noise levels were masked by other more dominant noise sources that are characteristic of the environment, such as breeze in foliage or continuous road traffic noise, that cannot be eliminated by monitoring at an alternate or intermediate location
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include 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.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq} noise levels.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} levels if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

3.4 Instrumentation

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix C.

Table 3.1 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
B&K 2250 sound level meter	3008201	26/07/2023	IEC 61672-1:2002
SV36 Svantek acoustic calibrator	106879	17/03/2024	IEC 60942:2003

4 Results

4.1 Total measured noise levels and atmospheric conditions

Overall noise levels measured at each location during attended measurements are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels – Quarter 1 2023 [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	30/03/2023 09:40	72	65	55	54	52	49	47
NM2	30/03/2023 10:02	61	52	46	44	43	41	38
NM3	30/03/2023 10:28	76	68	52	55	48	46	43
NM4	30/03/2023 10:52	67	61	52	51	48	46	43

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.2 Measured atmospheric conditions – Quarter 1 2023

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north [1]	Cloud cover 1/8s
NM1	30/03/2023 09:40	15	2.0	230	6
NM2	30/03/2023 10:02	15	1.9	215	6
NM3	30/03/2023 10:28	15	2.0	235	6
NM4	30/03/2023 10:52	14	2.8	200	5

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

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

4.2.2 Monitoring results

Table 4.3 provides site noise levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.3 Site noise levels and limits – Quarter 1 2023

Location	Start Date and Time	Wind		Stability Class	Limits apply? [1]	Limits, dB	Site levels, dB	Exceedances, dB [1]
		Speed m/s	Direction [3]			$L_{Aeq,15minute}$	$L_{Aeq,15minute}$ [2]	$L_{Aeq,15minute}$
NM1	30/03/2023 09:40	5.7	254	C	No	55	44	NA
NM2	30/03/2023 10:02	5.7	248	C	No	55	NM	NA
NM3	30/03/2023 10:28	5.2	250	B	No	55	NM	NA
NM4	30/03/2023 10:52	5.3	250	B	No	55	NM	NA

Notes: 1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 3.3. NA in exceedance column indicates that limits were not applicable due to weather conditions

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was undertaken and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1000 Hz, while industrial noise is observed at frequencies less than 1000 Hz.

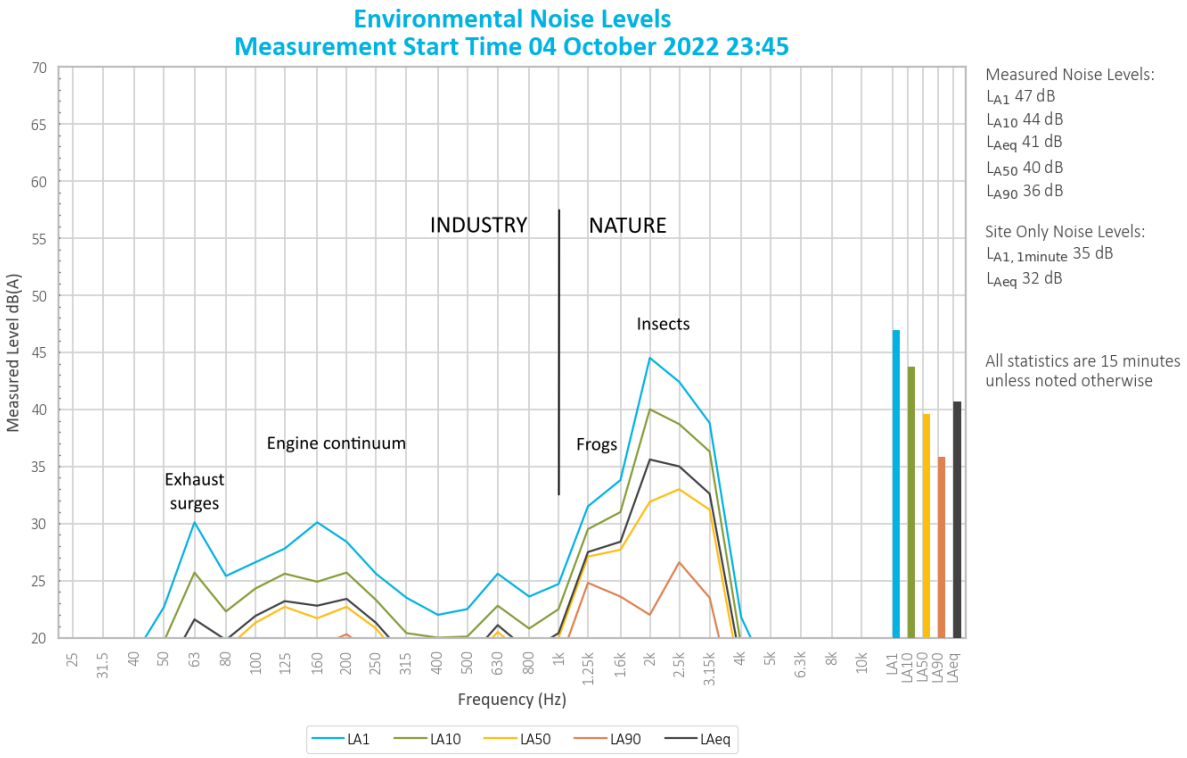

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 NM1

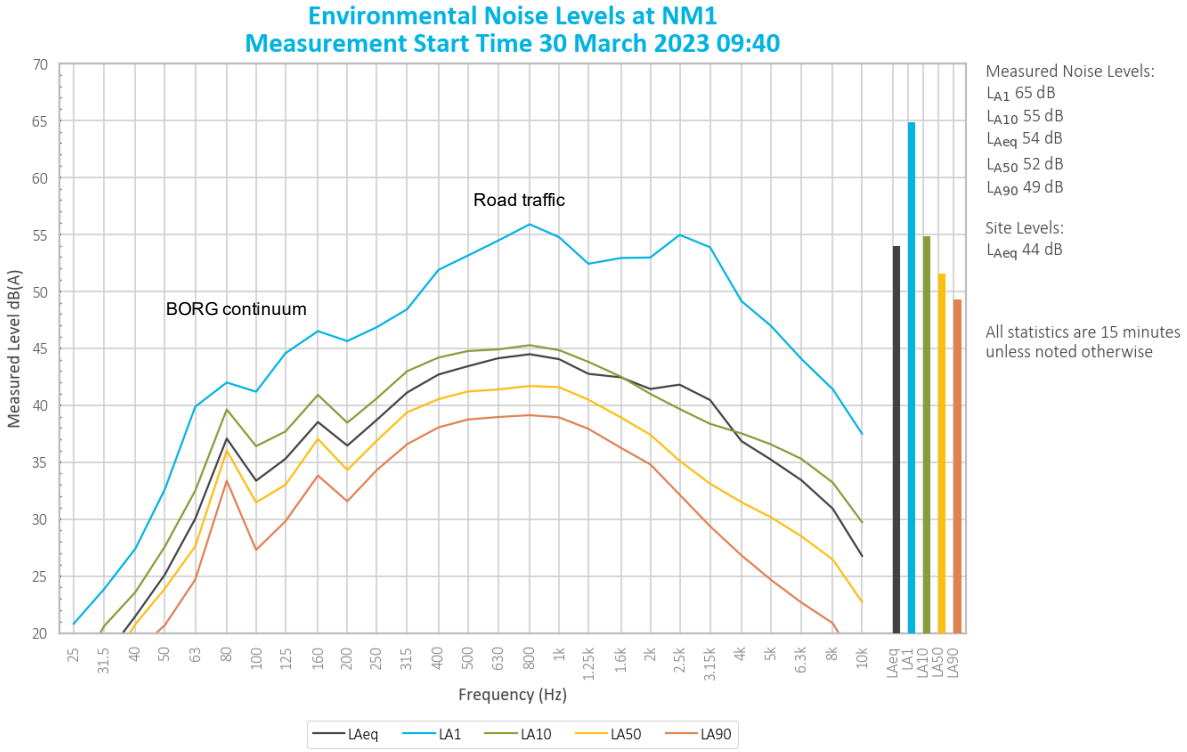

Figure 5.2 Environmental Noise Levels - NM1, Oberon caravan park

A construction continuum from Borg was audible throughout the measurement, generating a site-only L_{Aeq} of 44 dB.

Road traffic generated measured noise levels. Birds contributed to the measured L_{A1}.

5.3 NM2

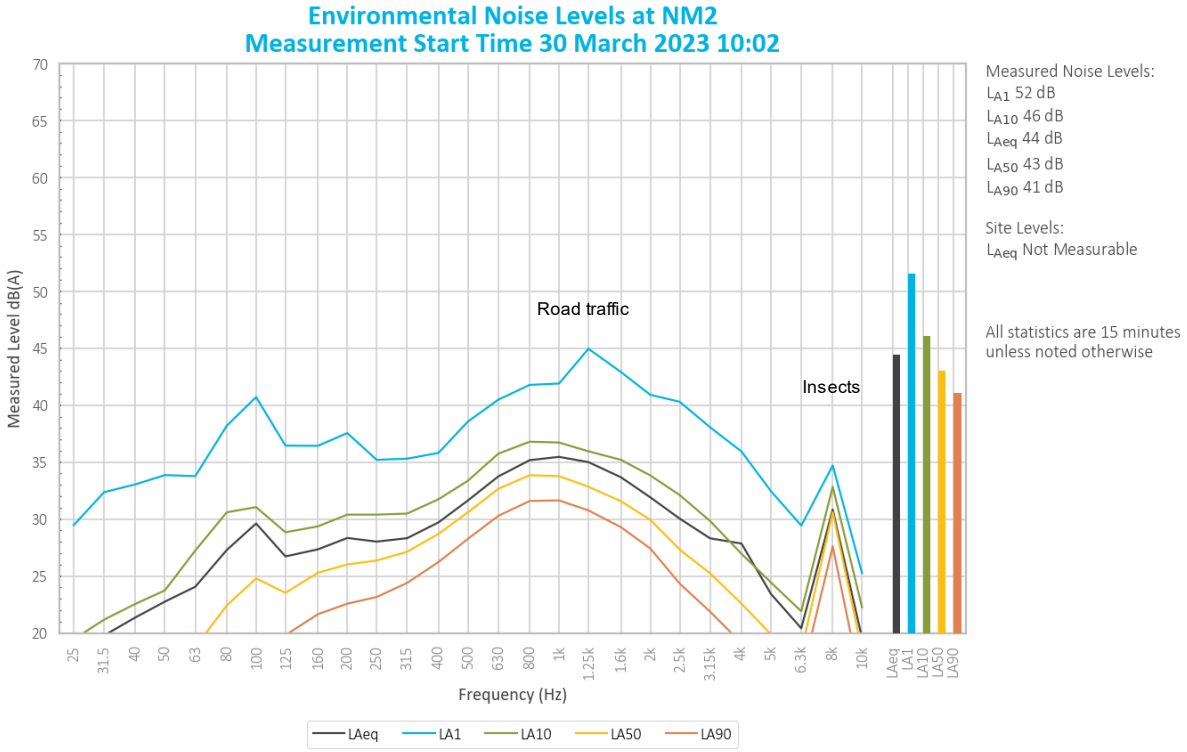

Figure 5.3 Environmental Noise Levels – NM2, Intersection of Pine Street and Herborn Street

A construction continuum from Borg was audible throughout the measurement, however it was not measurable due to the continuum of road traffic nearby.

Road traffic generated measured noise levels. Birds contributed to the measured L_{A1} and insects contributed to the measured L_{A50} and L_{A90}.

Noise from dogs was also noted.

5.4 NM3

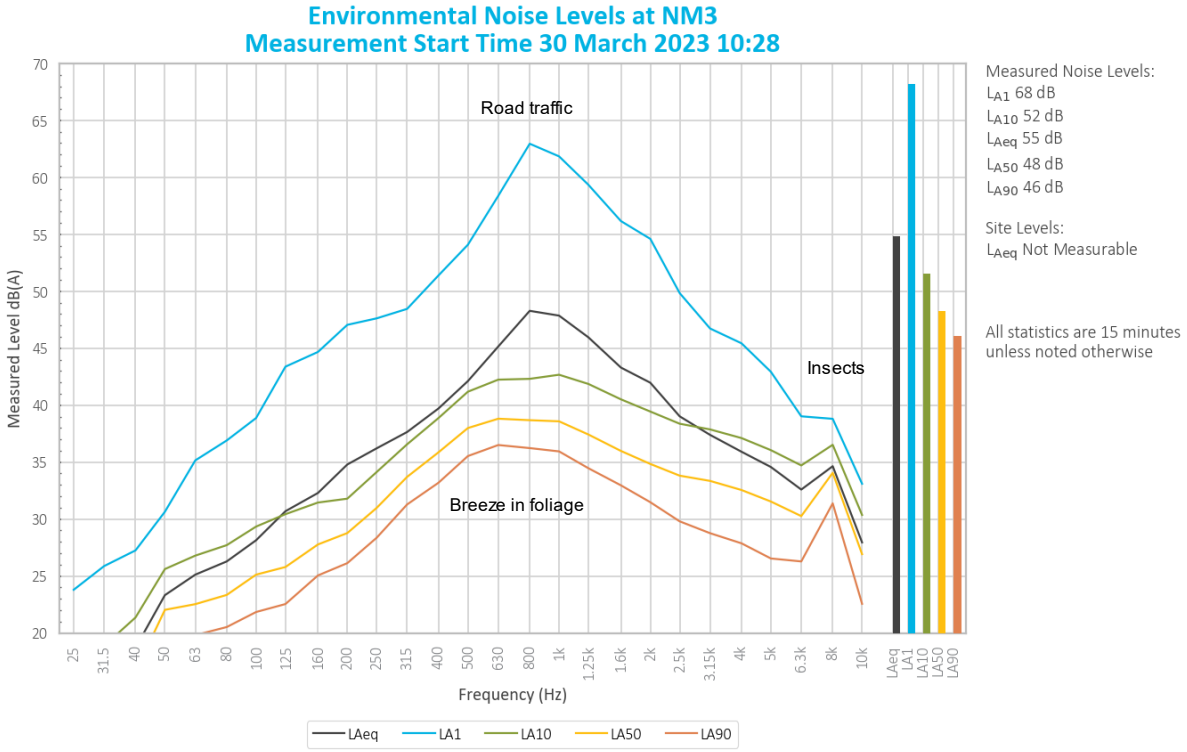

Figure 5.4 Environmental Noise Levels – NM3, 127 Hazelgrove Road

A construction continuum from Borg was audible throughout the measurement, however it was not measurable due to the continuous breeze in nearby foliage.

Road traffic generated the measured L_{A1}, L_{A10} and L_{Aeq}. Breeze in the nearby foliage generated the measured L_{A50} and L_{A90}. Dogs contributed to the L_{A1} and L_{A10}.

Noise from birds and insects was also noted.

5.5 NM4

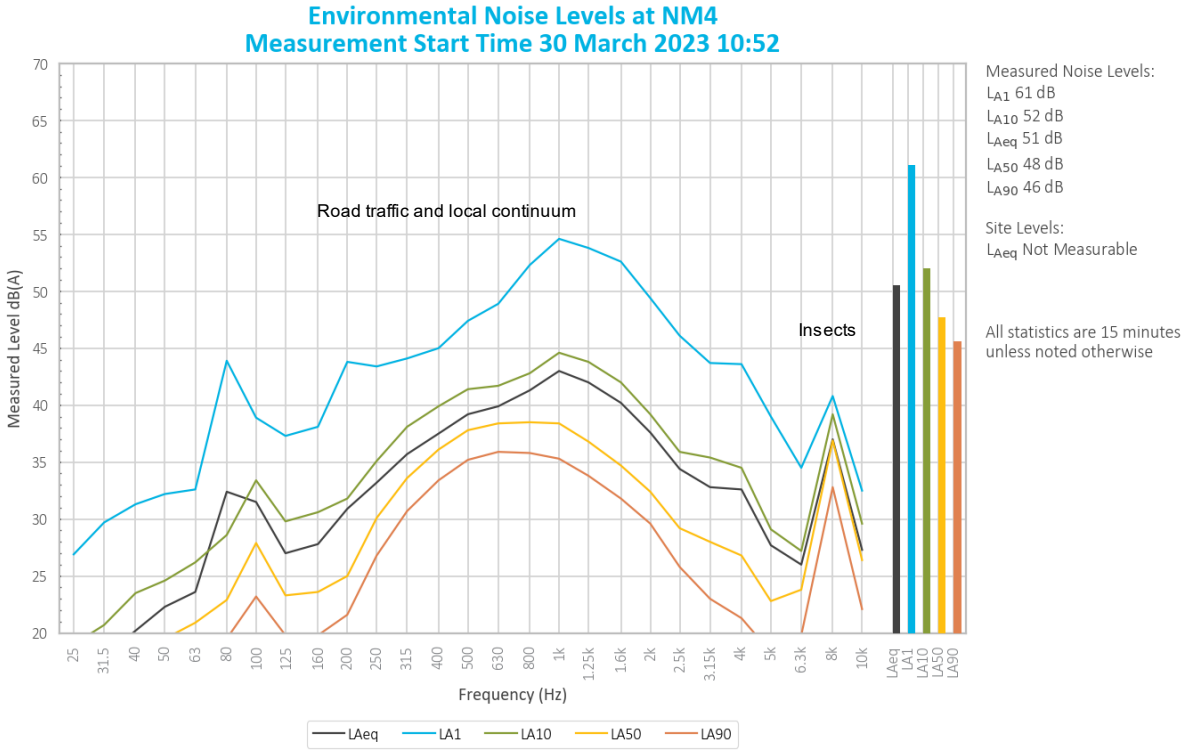

Figure 5.5 Environmental Noise Levels – NM4, Intersection of Tasman Street and Earl Street

A construction continuum from Borg was audible throughout the measurement, however it was not measurable due to the local continuum and road traffic nearby.

A local continuum and road traffic generated measured noise levels. Insects contributed to the measured L_{A50} and L_{A90}.

Noise from birds was also noted.

6 Summary

EMM was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of construction at the Borg panel manufacturing facility. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the day period of 30 March 2023 at four monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the Quarter 1 survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

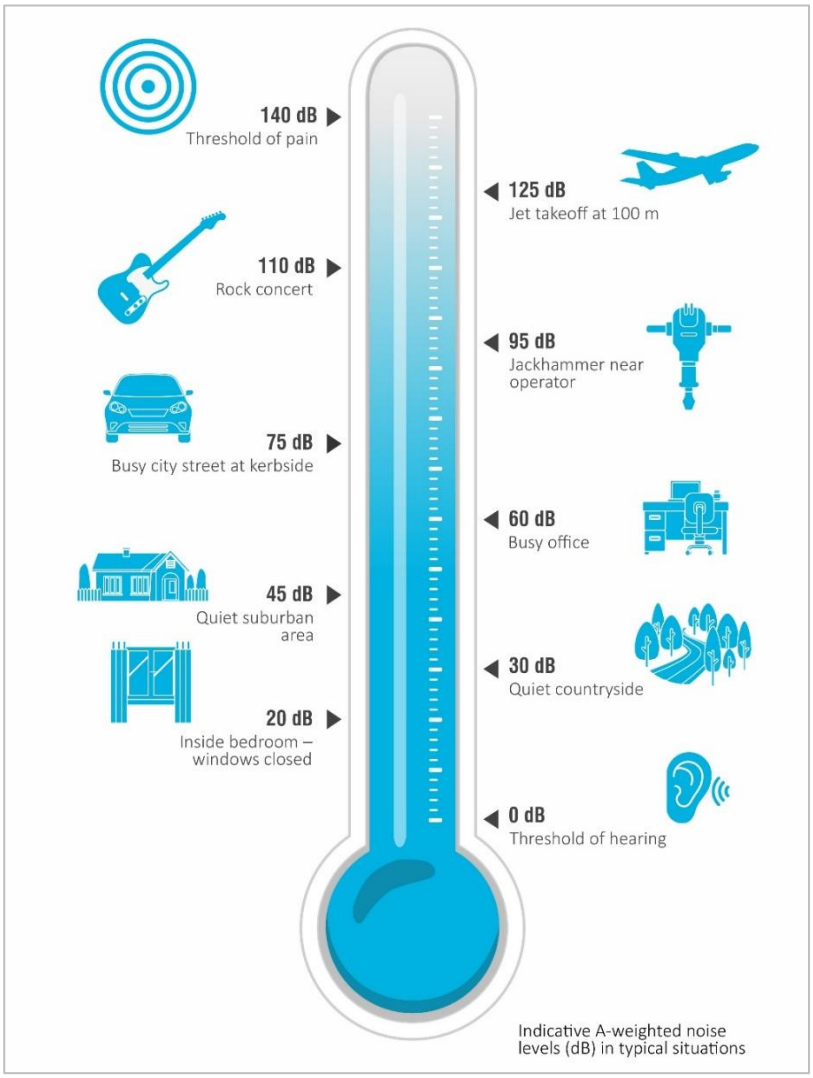

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.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~~.~~; and
(c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area~~.; and~~
(d) details of the noise attenuations 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 Department 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 SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department 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.

B.2 Environmental 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.

B.3 Construction noise management plan

5 Construction Noise Management Levels

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

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

Table 6 – Operation and Construction Noise Management Levels

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

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

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

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

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

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

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

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

7.2.2 Management Monitoring

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

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

7.3 Monitoring Locations

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

Table 8 – Noise Monitoring Locations

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

Noise management levels for each monitoring location are provided in **Table 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

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

7.3.2 Weather Conditions

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

NMLs listed in Table 6 apply under all meteorological conditions except for the following:

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

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

Appendix C
Calibration certificates

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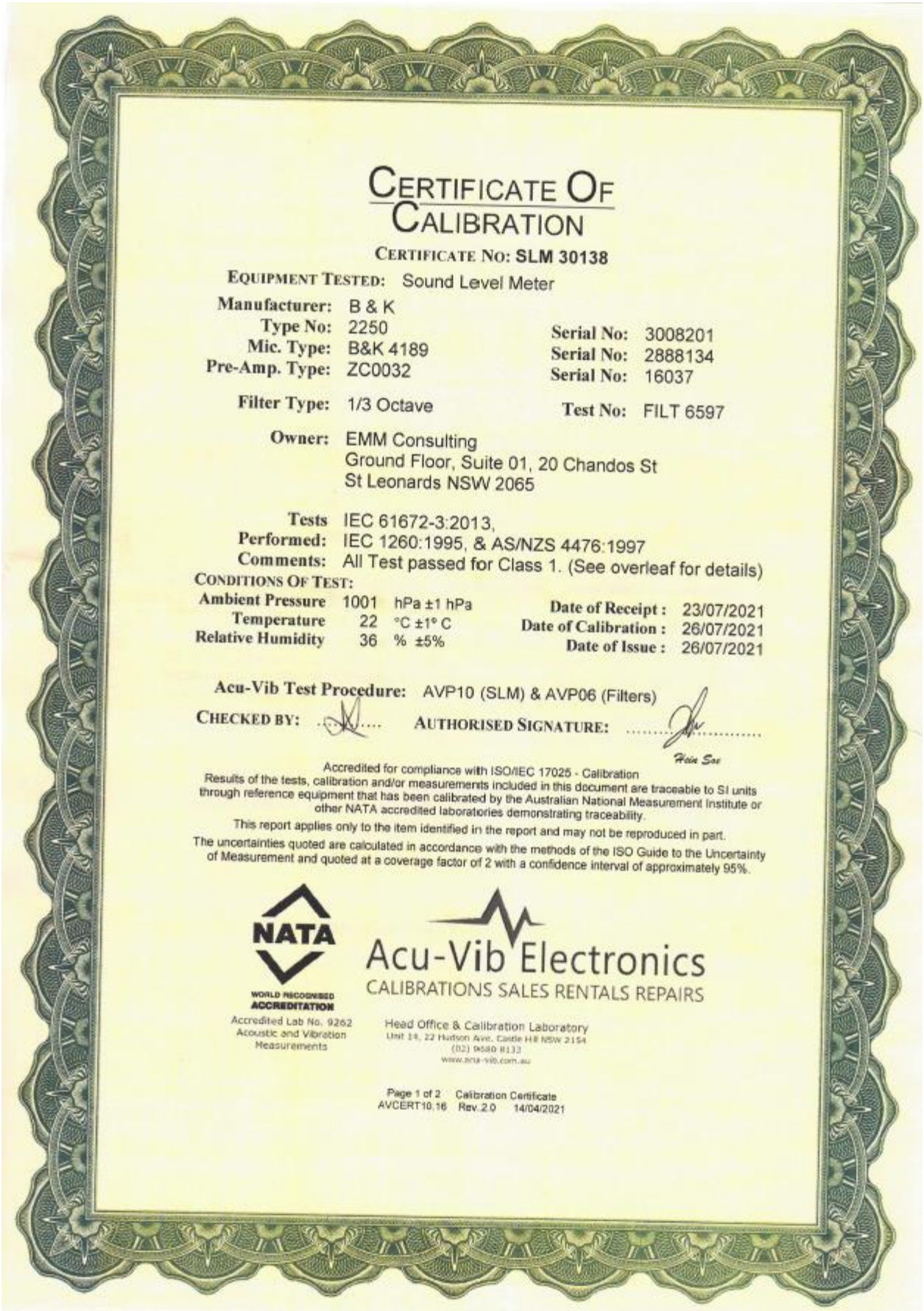
C.1 Calibration certificates



CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM 30138

EQUIPMENT TESTED: Sound Level Meter

Manufacturer:	B & K		
Type No:	2250	**Serial No:**	3008201
Mic. Type:	B&K 4189	**Serial No:**	2888134
Pre-Amp. Type:	ZC0032	**Serial No:**	16037
Filter Type:	1/3 Octave	**Test No:**	FILT 6597

Owner: EMM Consulting
Ground Floor, Suite 01, 20 Chandos St
St Leonards NSW 2065

Tests Performed: IEC 61672-3:2013,
IEC 1260:1995, & AS/NZS 4476:1997

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	1001	hPa ±1 hPa	**Date of Receipt :** 23/07/2021
Temperature	22	°C ±1° C	**Date of Calibration :** 26/07/2021
Relative Humidity	36	% ±5%	**Date of Issue :** 26/07/2021

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Acoustic and Vibration Measurements

Acu-Vib Electronics
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Head Office & Calibration Laboratory
Unit 18, 22 Hudson Ave, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

Page 1 of 2 Calibration Certificate
AVCERT10.16 Rev 2.0 14/04/2021

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C32071

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek
Type No: SV-36 **Serial No:** 106879
Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details overleaf. All Test Passed.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	94.05 dB	999.99 Hz	0.50 %
Level2:	NA	N	114.03 dB	999.98 Hz	0.50 %
Uncertainty			±0.11 dB	±0.05%	±0.20 %
Uncertainty (at 95% c.l.) k=2					

CONDITION OF TEST:

Ambient Pressure 1001 hPa ±1 hPa
Temperature 22 °C ±1° C
Relative Humidity 52 % ±5%

Date of Receipt : 17/03/2022
Date of Calibration : 17/03/2022
Date of Issue : 17/03/2022

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....

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AVCIERT02.1 Rev.2.0 14.04.2021

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Spring Hill QLD 4000
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Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
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Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 8.03 Level 8
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

PERTH
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Perth WA 6000
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Borg Panels Facility

Environmental Noise Monitoring

Q2 2022

Prepared for Borg Manufacturing Pty Ltd

Borg Panels Facility

Environmental Noise Monitoring

Q2 2022

Borg Manufacturing Pty Ltd

22075 RP# 1

Version	Date	Prepared by	Approved by	Comments
1	04/07/2022	Will Moore	Tony Welbourne	

Approved by

Tony Welbourne
Associate Director
5 July 2022

Level 3 175 Scott Street
Newcastle NSW 2300

TABLE OF CONTENTS

Appendices

Tables

Figures

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 done during the day, evening and night period of 28/29 June 2022 at four monitoring locations around Borg.

1.2 Attended noise monitoring locations

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

Table 1.1 Attended monitoring locations

Location Descriptor	Monitoring Locations
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 1.1 Borg noise monitoring locations

1.3 Terminology and abbreviations

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

Table 1.2 Terminology and 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 consents

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. The sections of the consent relating to noise are reproduced in Appendix A.

2.2 Environment protection licence

Borg holds Environment Protection Licence (EPL) No. 3035 issued by the Environment Protection Authority (EPA) most recently on 2 February 2022. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Operational Noise Management Plan

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

2.4 Noise Criteria

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

Table 2.1 Impact assessment criteria

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

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

Table 2.2 General construction noise limits

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

Table 2.3 Rock/Concrete breaking noise limits

Location	Day $L_{Aeq,15minute}$
All sensitive receivers	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 done 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 done during the day, evening and night period at each location. The duration of each measurement was 15 minutes. Atmospheric condition measurement was also done at each monitoring location.

This survey presents noise levels gathered during attended monitoring that can be 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 $L_{Aeq,15minute}$ (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 (eg. 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 (eg breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer.
- 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.

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

3.3 Modifying factors

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

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

If applicable, modifying factors have been reported and added to measured site only L_{Aeq} 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} if Borg was the only contributing low-frequency noise source.

3.4 Attended noise monitoring equipment

Equipment used to measure environmental noise levels is detailed in Table 3.1. 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	01070590	09/06/2024
Pulsar 106 acoustic calibrator	74813	09/06/2024

4 Results

4.1 Total measured noise levels

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

Table 4.1 Measured noise levels - Q2 2022

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
				Day				
NM1	29/06/2022 10:30	65	60	55	52	51	49	27
NM2	29/06/2022 10:00	60	54	50	48	47	45	43
NM3	29/06/2022 11:37	76	70	58	57	46	44	41
NM4	29/06/2022 11:06	61	54	50	48	48	45	42
				Evening				
NM1	28/06/2022 19:05	53	50	48	46	46	45	43
NM2	28/06/2022 18:35	52	49	48	46	46	45	43
NM3	28/06/2022 20:15	73	65	44	50	42	40	35
NM4	28/06/2022 19:36	44	40	36	34	33	31	29
				Night				
NM1	28/06/2022 22:27	55	49	47	46	45	44	42
NM2	28/06/2022 22:00	50	46	45	43	43	41	39
NM3	28/06/2022 23:32	58	52	43	42	39	36	30
NM4	28/06/2022 23:00	46	41	37	35	34	33	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, appliable during the survey.

4.3 Attended noise monitoring results

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

Table 4.2 $L_{Aeq,15minute}$ generated by Borg against criteria - Q2 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15minute}$ dB[2]	Exceedance[3 4]
			Day				
NM1	29/06/2022 10:30	5.2	D	55	No	48	NA
NM2	29/06/2022 10:00	5.7	D	55	No	NM	NA
NM3	29/06/2022 11:37	5.2	C	55	No	40	NA
NM4	29/06/2022 11:06	5.5	D	55	No	45	NA
			Evening				
NM1	28/06/2022 19:05	2.7	D	50	Yes	43	Nil
NM2	28/06/2022 18:35	3.0	D	50	Yes	42	Nil
NM3	28/06/2022 20:15	3.3	E	50	No	IA	NA
NM4	28/06/2022 19:36	2.9	D	50	Yes	<30	Nil
			Night				
NM1	28/06/2022 22:27	3.9	D	45	No	45	NA
NM2	28/06/2022 22:00	4.3	D	45	No	41	NA
NM3	28/06/2022 23:32	2.8	D	45	Yes	<25	Nil
NM4	28/06/2022 23:00	2.7	E	45	Yes	<30	Nil

Notes: 1. Noise criteria apply under all meteorological conditions except those detailed in Section 0;

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 are 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 – Q2 2022

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction °Magnetic North[1]	Cloud Cover 1/8s
			Day		
NM1	29/06/2022 10:30	7	2.8	80	4
NM2	29/06/2022 10:00	6	3.1	130	3
NM3	29/06/2022 11:37	11	2.0	100	3
NM4	29/06/2022 11:06	9	2.7	80	3
			Evening		
NM1	28/06/2022 19:05	6	0.0	-	0
NM2	28/06/2022 18:35	5	1.2	270	0
NM3	28/06/2022 20:15	5	0.4	260	3
NM4	28/06/2022 19:36	4	0.6	300	0
			Night		
NM1	28/06/2022 22:27	6	1.1	250	8
NM2	28/06/2022 22:00	6	1.6	240	7
NM3	28/06/2022 23:32	6	1.1	250	8
NM4	28/06/2022 23:00	6	3.3	270	8

Notes: 1. "-" indicates calm conditions at monitoring location

Meteorological data for compliance assessment is sourced from 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 is 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 done during the day, evening, and night periods of 28/29 June 2022 at four monitoring locations around Borg.

Borg operations complied with all relevant criteria during the Q2 2022 survey, at all monitoring locations.

Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Appendix A
Regulator documents

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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~~.~~; and
(c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area~~.~~; ~~and~~
(d) details of the noise attenuations 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 Department 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 SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department 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.

A.2 Environmental 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 Operations Noise Management Plan

7.3 Attended Noise Monitoring

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

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

7.3.1 Compliance Monitoring

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

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

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

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

The Existing Development should be fully operational at the time of monitoring.

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

7.4 Monitoring Locations

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

Table 6 – Noise Monitoring Locations

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

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

7.5 Meteorological Conditions

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

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

10 ONMP Review

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

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

Revisions to the ONMP will be submitted to the Secretary DP&E for approval.

A.4 Construction Noise Management Plan

5 Construction Noise Management Levels

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

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

Table 6 – Operation and Construction Noise Management Levels

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

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

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

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

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

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

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

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

7.2.2 Management Monitoring

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

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

7.3 Monitoring Locations

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

Table 8 – Noise Monitoring Locations

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

Noise management levels for each monitoring location are provided in **Table 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

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

7.3.2 Weather Conditions

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

NMLs listed in Table 6 apply under all meteorological conditions except for the following:

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

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

Appendix B
Calibration certificates

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B.1 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 C22373

Client Details	EMM Consulting Suite 6, Level 1, 146 Hunter Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	01070590
Microphone Serial Number :	08184
Pre-amplifier Serial Number :	52329

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	25.7°C	**Ambient Temperature :**	25.4°C
Relative Humidity :	31.9%	**Relative Humidity :**	32.4%
Barometric Pressure :	100.18kPa	**Barometric Pressure :**	100.11kPa

Calibration Technician : Lucky Jaiswal
Calibration Date : 9 Jun 2022
Secondary Check: Max Moore
Report Issue Date : 20 Jun 2022
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.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

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

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

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

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

Acoustic Research Labs Pty Ltd
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Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
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Sound Calibrator
IEC 60942:2017
Calibration Certificate

Calibration Number C22374

Client Details	EMM Consulting Suite 6, Level 1, 146 Hunter Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Pulsar Model 106
Instrument Serial Number :	74813

Atmospheric Conditions

Ambient Temperature :	25.8°C
Relative Humidity :	33.6%
Barometric Pressure :	100.19kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Max Moore
Calibration Date :	09 Jun 2022	**Report Issue Date :**	20 Jun 2022

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	94.09	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10dB*	*Temperature*	*±0.1°C*
Frequency	*±0.13%*	*Relative Humidity*	*±1.9%*
Distortion	*±0.20%*	*Barometric Pressure*	*±0.014kPa*

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

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

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

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

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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Global Acoustics

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Borg Manufacturing Facility

Quarter 3 - Construction Noise Monitoring

Prepared for Borg Manufacturing Pty Ltd

October 2022

Borg Manufacturing Facility

Quarter 3 - Construction Noise Monitoring

Borg Manufacturing Pty Ltd

E220481 RP#1

October 2022

Version	Date	Prepared by	Approved by	Comments
1	11/10/2022	Harry Flick	Tony Welbourne	Final

Approved by

Tony Welbourne
Associate Director
11 October 2022

Level 3 175 Scott Street
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Appendices

Tables

Figures

1 Introduction

1.1 Background

Global Acoustics (now part of EMM) was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of 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 done during the day period of 20 September at four monitoring locations around Borg.

1.2 Attended noise monitoring locations

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

Table 1.1 Attended monitoring locations

Location Descriptor	Monitoring Locations
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 1.1 **Borg noise monitoring locations**

1.3 Terminology and abbreviations

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

Table 1.2 Terminology and 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 consents

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. 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 8 September 2022. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Construction Noise Management Plan

Noise monitoring requirements are detailed in the Borg Construction Noise Management Plan (CNMP). The most recent version of the CNMP was approved in May 2021. Relevant sections of the 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 $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
All sensitive receivers	55	50	45

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

Table 2.2 General construction noise limits

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

Table 2.3 Rock/Concrete breaking noise limits

Location	Day $L_{Aeq,15minute}$
All sensitive receivers	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 done in accordance with Fact Sheet C of the NPfI.

3 Methodology

3.1 Overview

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

3.2 Attended noise monitoring

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

This report presents noise levels gathered during attended monitoring that can be 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 $L_{Aeq,15minute}$ (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 (eg breeze in foliage or continuous road traffic noise) that cannot be eliminated by moving closer.
- 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.

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 site only noise.

3.3 Modifying factors

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

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

If applicable, modifying factors have been reported and added to measured site only L_{Aeq} 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} if Borg was the only contributing low-frequency noise source.

3.4 Attended noise monitoring equipment

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix B.

Table 3.1 Attended noise monitoring equipment

Model	Serial number	Calibration due date
Brüel & Kjær 2250 Type 1 sound analyser	2759405	02/02/2023
Svantek SV-36 calibrator	86311	20/10/2022

4 Results

4.1 Total measured noise levels

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

Table 4.1 Measured noise levels - Q3 2022

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	20/09/2022 10:45	62	55	52	50	49	47	43
NM2	20/09/2022 11:15	67	54	50	48	47	45	42
NM3	20/09/2022 12:16	77	72	63	61	57	53	47
NM4	20/09/2022 11:41	64	59	50	47	42	39	36

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 results

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

Table 4.2 $L_{Aeq,15minute}$ generated by Borg against criteria – Q3 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15minute}$ dB[2]	Exceedance[3 4]
NM1	20/09/2022 10:45	2.5	B	55	Yes	48	Nil
NM2	20/09/2022 11:15	3.5	B	55	No	46	NA
NM3	20/09/2022 12:16	2.9	A	55	Yes	NM	Nil
NM4	20/09/2022 11:41	3.2	A	55	No	41	NA

Notes: 1. Noise criteria apply under all meteorological conditions except those detailed in Section 0;

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 observations made by the operator during each measurement are shown in Table 4.3. Wind speed, direction and cloud cover were observed by the operator and temperature was taken from Borg AWS. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Observed atmospheric conditions – Q3 2022

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction °Magnetic North[1]	Cloud Cover 1/8s
NM1	20/09/2022 10:45	12	Light	360	0
NM2	20/09/2022 11:15	14	Calm	-	0
NM3	20/09/2022 12:16	15	Light	20	0
NM4	20/09/2022 11:41	14	Light	20	0

Notes: 1. "-" indicates calm conditions at monitoring location

Meteorological data for compliance assessment is sourced from 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 is 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 done during the day period of 20 September 2022 at four monitoring locations around Borg.

Borg operations complied with all relevant criteria during the Q3 2022 survey, at all monitoring locations.

Criteria may not always be applicable due to meteorological conditions at the time of monitoring.

Appendix A
Regulator documents

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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~~.~~; and
(c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area~~.; and~~
(d) details of the noise attenuations 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 Department 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 SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department 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.

A.2 Environmental 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 Construction Noise Management Plan

5 Construction Noise Management Levels

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

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

Table 6 – Operation and Construction Noise Management Levels

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

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

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

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

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

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

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

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

7.2.2 Management Monitoring

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

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

7.3 Monitoring Locations

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

Table 8 – Noise Monitoring Locations

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

Noise management levels for each monitoring location are provided in **Table 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

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

7.3.2 Weather Conditions

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

NMLs listed in Table 6 apply under all meteorological conditions except for the following:

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

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

Appendix B
Calibration certificates

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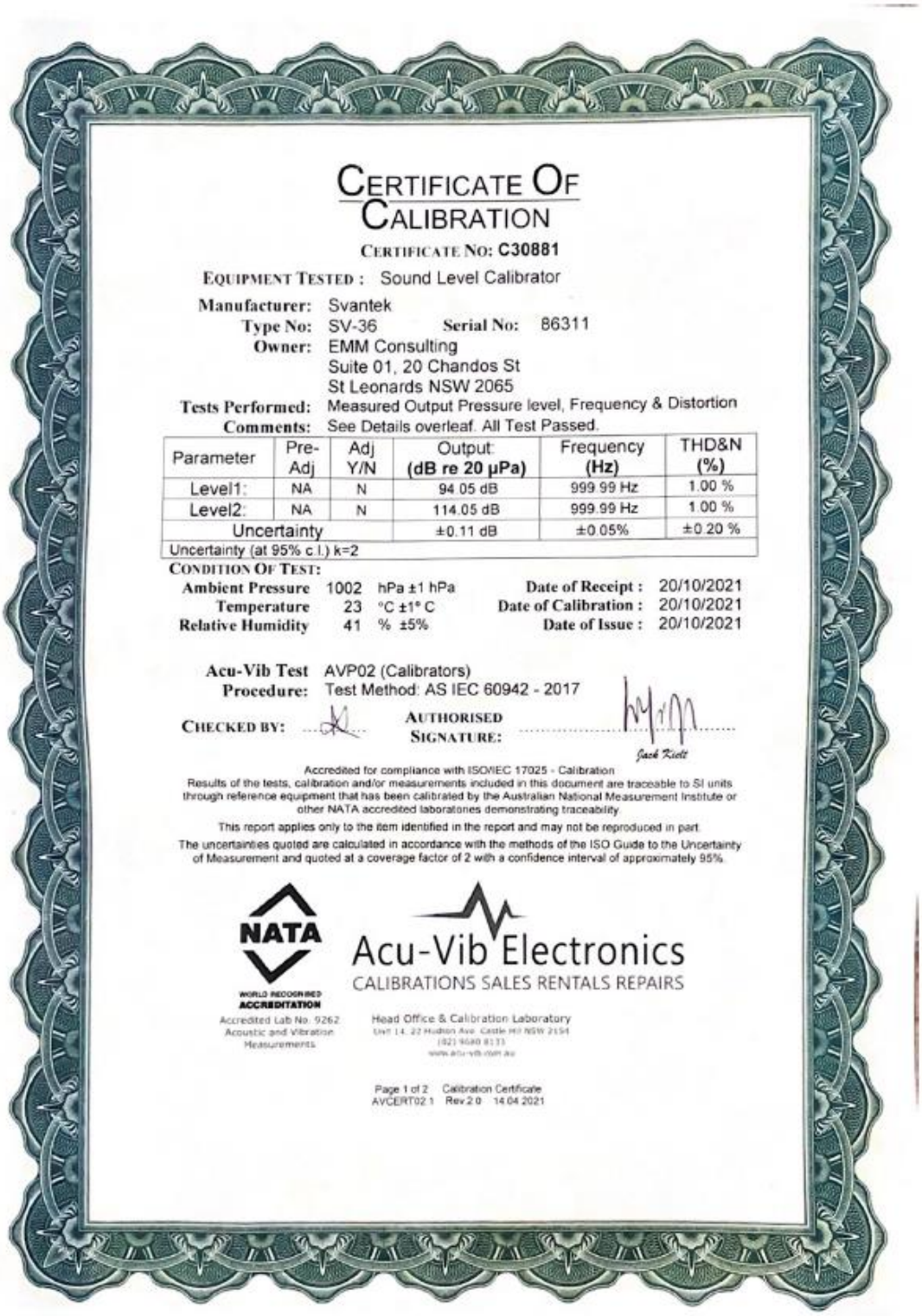
B.1 Calibration Certificates



CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C30881

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek
Type No: SV-36 **Serial No:** 86311
Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details overleaf. All Test Passed.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	94.05 dB	999.99 Hz	1.00 %
Level2:	NA	N	114.05 dB	999.99 Hz	1.00 %
Uncertainty			±0.11 dB	±0.05%	±0.20 %

Uncertainty (at 95% c.l.) k=2

CONDITION OF TEST:

Ambient Pressure 1002 hPa ±1 hPa
Temperature 23 °C ±1° C
Relative Humidity 41 % ±5%

Date of Receipt : 20/10/2021
Date of Calibration : 20/10/2021
Date of Issue : 20/10/2021

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....
Jack Riolt

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.
This report applies only to the item identified in the report and may not be reproduced in part.
The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

NATA
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Accredited Lab No. 9262
Acoustic and Vibration Measurements

Acu-Vib Electronics
CALIBRATIONS SALES RENTALS REPAIRS

Head Office & Calibration Laboratory
Unit 14, 22 Hudson Ave, Castle Hill NSW 2154
(02) 9680 8133
www.acu-vib.com.au

Page 1 of 2 Calibration Certificate
AVCERT02.1 Rev 2.0 14.04.2021

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: SLM31670

EQUIPMENT TESTED: Sound Level Meter

Manufacturer:	B & K	**Serial No:**	2759405
Type No:	2250	**Serial No:**	2983733
Mic. Type:	4189	**Serial No:**	22666
Pre-Amp. Type:	ZC0032		
Filter Type:	1/3 Octave	**Test No:**	F031671

Owner: EMM Consulting
Level 3, 175 Scott Street
Newcastle, NSW 2300

Tests Performed: IEC 61672-3:2013 & IEC 61260-3:2016

Comments: All Test passed for Class 1. (See overleaf for details)

CONDITIONS OF TEST:

Ambient Pressure	992	hPa ±1 hPa	**Date of Receipt :**	02/02/2022
Temperature	26	°C ±1° C	**Date of Calibration :**	02/02/2022
Relative Humidity	48	% ±5%	**Date of Issue :**	03/02/2022

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: ..... **AUTHORISED SIGNATURE:** .....

Jack Kielt

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Page 1 of 2 Calibration Certificate
AVCERT10.14 Rev.2.0 14/04/2021

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Global Acoustics

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Borg Manufacturing Facility

Quarter 4 - Construction Noise Monitoring

Prepared for Borg Manufacturing Pty Ltd

November 2022

Borg Manufacturing Facility

Quarter 4 - Construction Noise Monitoring

Borg Manufacturing Pty Ltd

E220481 RP#1

November 2022

Version	Date	Prepared by	Approved by	Comments
1.0	14/11/2022	Will Moore	Jesse Tribby	Final

Approved by

Jesse Tribby
Senior Acoustic Consultant
15 November 2022

Level 3 175 Scott Street
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TABLE OF CONTENTS

Appendices

Tables

Figures

1 Introduction

1.1 Background

Global Acoustics (now part of EMM) was engaged by Borg Manufacturing Pty Ltd to conduct a quarterly noise survey of 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 done during the day period of 10 November 2022 at four monitoring locations around Borg.

1.2 Attended noise monitoring locations

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

Table 1.1 Attended monitoring locations

Location Descriptor	Monitoring Locations
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 1.1 Borg noise monitoring locations

1.3 Terminology and abbreviations

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

Table 1.2 Terminology and 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 consents

The most current development consent associated with activities at Borg is Development Consent SSD 7016 (the consent), most recently modified 20 May 2022. 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 8 September 2022. Relevant sections of the EPL are reproduced in Appendix A.

2.3 Construction Noise Management Plan

Noise monitoring requirements are detailed in the Borg Construction Noise Management Plan (CNMP). The most recent version of the CNMP was approved in August 2022. Relevant sections of the 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 $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$
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

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

Table 2.3 Rock/Concrete breaking noise limits

Location	Day $L_{Aeq,15minute}$
All sensitive receivers	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 done in accordance with Fact Sheet C of the NPfI.

3 Methodology

3.1 Overview

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

3.2 Attended noise monitoring

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

This report presents noise levels gathered during attended monitoring that can be 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 $L_{Aeq,15minute}$ (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 (eg 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 (eg 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.

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 site only noise.

3.3 Modifying factors

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

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

If applicable, modifying factors have been reported and added to measured site only L_{Aeq} 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} if Borg was the only contributing low-frequency noise source.

3.4 Attended noise monitoring equipment

Equipment used to measure environmental noise levels is detailed in Table 3.1. Calibration certificates are provided in Appendix B.

Table 3.1 Attended noise monitoring equipment

Model	Serial number	Calibration due date
Rion NA-28 sound level meter	00370304	31/10/2024
Pulsar 105 acoustic calibrator	81334	29/11/2023

4 Results

4.1 Total measured noise levels

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

Table 4.1 Measured noise levels – Quarter 4 2022

Location	Start Date and Time	L_{Amax} dB	L_{A1} dB	L_{A10} dB	L_{Aeq} dB	L_{A50} dB	L_{A90} dB	L_{Amin} dB
NM1	10/11/2022 13:10	61	54	51	48	48	45	43
NM2	10/11/2022 13:33	63	57	49	47	45	42	40
NM3	10/11/2022 12:41	80	75	57	60	37	34	31
NM4	10/11/2022 13:56	74	60	52	50	45	38	33

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

4.2 Modifying factors

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

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

4.3 Attended noise monitoring results

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

Table 4.2 $L_{Aeq,15minute}$ generated by Borg against criteria – Quarter 4 2022

Location	Start Date and Time	Wind Speed m/s	Stability Class	Criterion dB	Criterion Applies?[1]	Borg $L_{Aeq,15minute}$ dB[2]	Exceedance[3 4]
NM1	10/11/2022 13:10	2.6	A	55	Yes	46	Nil
NM2	10/11/2022 13:33	2.7	A	55	Yes	IA	Nil
NM3	10/11/2022 12:41	1.6	A	55	Yes	<25	Nil
NM4	10/11/2022 13:56	1.3	A	55	Yes	<25	Nil

Notes: 1. Noise criteria apply under all meteorological conditions except those detailed in Section 2.5.

2. Site only $L_{Aeq,15minute}$ attributed to Borg including modifying factors if applicable.

3. Bold results in red indicate exceedance of criterion (if applicable).

4. NA in exceedance column means atmospheric conditions outside conditions specified, therefore criterion was not applicable.

4.4 Atmospheric conditions

Atmospheric condition observations made by the operator during each measurement are shown in Table 4.3. Wind speed, direction and cloud cover were observed by the operator and temperature was taken from Borg AWS. Attended noise monitoring is not undertaken during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Observed atmospheric conditions – Quarter 4 2022

Location	Start Date and Time	Temperature °C	Wind Speed m/s	Wind Direction ° Magnetic North[1]	Cloud Cover 1/8s
NM1	10/11/2022 13:10	19	1.1	220	2
NM2	10/11/2022 13:33	27	0.7	230	2
NM3	10/11/2022 12:41	30	1.3	220	2
NM4	10/11/2022 13:56	22	2.2	240	2

Notes: 1. "-" indicates calm conditions at monitoring location

Meteorological data for compliance assessment is sourced from 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 is 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 done during the day period of 10 November 2022 at four monitoring locations around Borg.

Borg operations complied with relevant criteria during the Quarter 4 2022 survey at all monitoring locations.

Appendix A
Regulator documents

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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~~.~~; and
(c) details of the noise attenuation measures for the gas turbine and ancillary equipment associated with the particleboard material handling area~~.; and~~
(d) details of the noise attenuations 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 Department 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 SSE 7016 MOD 3, the Applicant must undertake a Noise Verification Study for the Department 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.

A.2 Environmental 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 Construction Noise Management Plan

5 Construction Noise Management Levels

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

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

Table 6 – Operation and Construction Noise Management Levels

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

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

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

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

7.2 Monitoring Frequency

7.2.1 Compliance Monitoring

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

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

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

7.2.2 Management Monitoring

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

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

7.3 Monitoring Locations

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

Table 8 – Noise Monitoring Locations

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

Noise management levels for each monitoring location are provided in **Table 6**. Where these are exceeded by construction-related noise sources, the exceedance should be investigated (as discussed in **Section 10**) to determine the cause and any necessary mitigation.

7.3.1 Instrumentation

The following requirements should be observed whilst monitoring:

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

7.3.2 Weather Conditions

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

NMLs listed in Table 6 apply under all meteorological conditions except for the following:

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

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

Appendix B
Calibration certificates

EMM
creating opportunities

B.1 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

Octave Band Filter
IEC 61260-3:2016
Calibration Certificate

Calibration Number C22699A

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Filter Model Number :	Rion NA-28
Filter Serial Number :	N/A
Instrument Serial Number :	00370304
Microphone Serial Number :	10421
Pre-amplifier Serial Number :	60313
Firmware Version :	2.0

Atmospheric Conditions

Ambient Temperature :	23.8°C
Relative Humidity :	47.8%
Barometric Pressure :	98.77kPa

Calibration Technician :	Lucky Jaiswal	**Secondary Check:**	Dhanush Bonu
Calibration Date :	31 Oct 2022	**Report Issue Date :**	31 Oct 2022

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
Midband Relative Attenuation (Clause 10)	Pass	Operating Range Lower Limit (Clause 12)	Pass
Linearity, Range and Overload (Clause 11)	Pass	Relative Attenuation (Clause 13)	Pass

The filter submitted for testing successfully completed the periodic tests of IEC 61260-3, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the filter to the full specifications of IEC 61260-1:2014 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of filter fully conformed to the class 1 specifications in IEC 61260-1:2014 and (b) because the periodic tests of IEC 61260-3 cover only a limited subset of the specifications in IEC 61260-1:2014.

Uncertainties of Measurement -

Electrical Tests		Environmental Conditions	
-5dB < ΔA(Ω) ≤ 40dB	*±0.12dB*	*Temperature*	*±0.1°C*
40dB < ΔA(Ω) ≤ 120dB	*±0.2dB*	*Relative Humidity*	*±1.9%*
		Barometric Pressure	*±0.014kPa*

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

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

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

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

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.

PAGE 1 OF 1

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 C21832

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

Equipment Tested/ Model Number : Pulsar Model 105
Instrument Serial Number : 81334

Atmospheric Conditions
Ambient Temperature : 25°C
Relative Humidity : 49.6%
Barometric Pressure : 100.8kPa

Calibration Technician : Lucky Jaiswal
Secondary Check: Harrison Kim
Calibration Date : 29 Nov 2021
Report Issue Date : 2 Dec 2021

Approved Signatory : Ken Williams

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

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.19	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.11dB*	*Temperature*	*±0.1°C*
Frequency	*±0.07%*	*Relative Humidity*	*±1.9%*
Distortion	*±0.50%*	*Barometric Pressure*	*±0.014kPa*

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

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

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Accredited for compliance with ISO/IEC 17025 - Calibration.

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Level 3 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE
Level 1 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

CANBERRA
Suite 2.04 Level 2
15 London Circuit
Canberra City ACT 2601

ADELAIDE
Level 4 74 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE
Suite 8.03 Level 8
454 Collins Street
Melbourne VIC 3000
T 03 9993 1900

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Perth WA 6000
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60 W 6th Ave Suite 200
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emmconsulting.com.au

Appendix G – Community Complaints

Complaint No	Category	Date Received	Property	Detail	Follow Up Actions
125	Fibre/Dust	22/06/2022	Carrington Avenue, Oberon	Resident directly contacted EPA about wood fibres present on a vehicle in Carrington Avenue, Oberon around 20/6/22. EPA notified Borg Oberon on 7/722 via email	Reviewed onsite weather data for the estimated timeframe. wind was blowing to the west. Aerial maps indicated the likely location of complaint was south-southwest. Road was driven and no fibre or dust was identified.
126	Noise	12/07/2022	Dart Street, Oberon	"Sounds like a hot air balloon, loud metal banging like a drum being thrown into a pit"	Called relevant department managers to ensure site is doing all they can (roller doors etc closed) insufficient evidence of breach. Recent external noise monitoring found no breaches for daytime, evening and night period monitoring. Also drove around the site and location of complaint.
127	Material fallout and smoke	30/07/2022	Oberon Football Fields	"Stacks creating cloud football field, Dropping sediment on top of the field"	Contacted PB shift leader who immediately stopped works at the flaker building. Contacted Facility Manager and Environmental manager and walked across the fields, Lowes Mount Road up to Albion Street. No evidence of foreign materials were identified during investigation. Second team leader did a follow up inspection at approximately 3:30pm where he walked Lowes Mount Road, the football fields and Albion Street and found no evidence of foreign materials.
128	Material fallout	30/07/2022	Oberon Football Fields	“Wood particle emissions coming from site to the football fields.”	Shift leader contacted Facility Manager and Environmental manager and walked across the fields, Lowes Mount Road up to Albion Street. No evidence of foreign materials were identified during. Second team leader did a follow up inspection at approximately 3:30pm where he walked Lowes Mount Road, the football fields and Albion Street and found no evidence of foreign materials. Emailed the complainants regarding the issue.

129	Noise	20/11/2022	Oberon Football Fields	"Christening party/first bday 10am-3pm, noise is constant has disrupted the party."	Complaint was made by a staff member not a party attendant. Spoke to party organiser who said they did not have any complaints about the noise being generated and had an enjoyable day at the venue.
130	Noise	11/02/2023	Dart Street, Oberon	"Back of Borg Near BP"	MDF Team leader went for a walk immediately to try and identify the source of the noise. As no detail was given it was hard to determine the source. No obvious noise was identified during walk around. Monitoring of conditions continuing, noise monitors set up off site. no evidence of noise breaches identified.
131	Noise	18/03/2023	Dart Street, Oberon	"Alarm going off sounds like its at the front door of Conti 1 & Conti 2"	MDF team leader did a site walk around/investigation at time of the complaint. Monitor operating conditions and ensure roller doors are closed. Conti 1 was not in operation and no record of alarms going off on site.
132	Noise	15/04/2023	Dart Street, Oberon	"Steam been escaping - noise on Lowes Mount Road and Albion Street."	Particle board Coordinator investigated at time of complaint. No obvious signs of noise from site. Steam production is a regular part of the industry and is covered under the EPA license requirements set for the site.
133	Fibre/Dust	28/04/2023	Dart Street, Oberon	Fibre or dust on car in the morning	Check plant operating conditions. Inspect town for any signs of fibre or dust. Secondary inspection across town for signs of dust or fibre. Very windy in Oberon on day of the complaint. Dust and debris was present all over town source could not be identified as one location.
134	Noise		Dart Street, Oberon	“Last two nights noise on Albion Street has been unbelievable.”	Check plant operating condition. Ensure that the license requirements are continuing to be met.

Appendix H – Community Consultative Committee Meeting Minutes

Community Consultative Committee

Agenda/Minutes

Meeting: Community Consultative Committee Meeting

Venue: Borg Panels Board Room

Date: Wednesday 27th July 2022

:Time: 4.00 pm – 17:30

1. **Welcome**

   Richard Witham, Andrew Brady, Mike Bitzer, Spiro Kavalieros, Bryan Dellow, Ian and Trish Gordon, Damian O'Shaughnessy, Fran and Tim Charge

2. **Apologies**
   Mark Kellem, Julie Booth

3. **Minutes from last meeting and follow-up**

   Accepted

4. **Community Issues** – complaints and concerns All
   Borg had received noise complaints throughout the year. Investigations found no breaches.

5. **Site Updates**

HPP update - M Bitzer

Renewed 10-year forestry contract. Demolition works underway across the site of old buildings and offices, over 300 tonnes of steel recycled, reclaiming all old timber for reuse. Over 2000 tonnes of concrete at rubble masters Bathurst for reuse. 1000 tonnes of ash recycled per year into fertiliser. Looking to bring all storage onsite with new dispatch warehouse. Southern noise berm proposed to minimise noise impacts on the town. Schools and gap year programmes to bring new employment. Reduced injuries by 30%. Down 20% on employees with 10%vaccencies over duration of covid had to shut site for 14 days.

Borg Update - R Whitham

Northern extension finished, to new lam lines looking to commission a new thinboard line. Struggles with employment and covid. Energy price increases plus freight and imports taking a toll on production at times. New 9Megawatt solar farm helping to take the toll off the grid. Employed 29 people in last two months. Currently at 330 full time staff approx. 400 in total. Lack of electrical and mechanical trade qualified staff. Approx 30% women staff at laminating-push to see more women in the industry. Large focus on waste wood due to timber shortages and recycling goals.

6. **General Business and Questions**

   Potential plans for heritage train line to push product and minimise truck traffic. Constant battles with timber – sourcing from as far as Walka, mount gambier and Tumut. Staffing issues are ongoing but slowly improving now for both sites. Contact council prior to taking loads of paper to the tip to ensure adequate prep work can be done. Council looking to get some concrete crushed for reuse at the tip. Both sites confirmed that tours are welcomed and encouraged moving forward.

7. **Next Meeting Date & Close of Meeting**

   4pm, Wednesday 26th October 2022

Community Consultative Committee

Agenda/Minutes

Meeting: Community Consultative Committee Meeting

Venue: Borg Panels Board Room

Date: Wednesday 23rd November 2022

:Time: 4.00 pm – 17:30

1. **Welcome**

   Richard Whitham, Andrew Brady, Mike Bitzer, Spiro Kavalieros, Brian Dellow, Ian and Trish Gordon, Damian O'Shannassy, Mark Kellam

2. **Apologies**
   Mike Bitzer

3. **Minutes from last meeting and follow-up**

   Accepted Ian Gordon and Brian Dellow

4. **Community Issues** – complaints and concerns
   One noise complaint from Oberon Leagues Club.
   Borg is looking to change the complaints line by having its own phone line directly to Borg.

5. **Site Updates**

6.

HPP update - M Bitzer

Report from July 2022

Renewed 10-year forestry contract. Demolition works underway across the site of old buildings and offices, over 300 tonnes of steel recycled, reclaiming all old timber for reuse. Over 2000 tonnes of concrete at rubble masters Bathurst for reuse. 1000 tonnes of ash recycled per year into fertiliser. Looking to bring all storage onsite with new dispatch warehouse. Southern noise berm proposed to minimise noise impacts on the town. Schools and gap year programmes to bring new employment. Reduced injuries by 30%. Down 20% on employees with 10%vaccencies over duration of covid had to shut site for 14 days.

Borg Update - R Whitham

The gas outage caused a significant impact to the business
Lack of housing and accommodation in Oberon for new employees causing some recruitment struggles.
Improvement in wood supply and accessibility to the forests. The Particle Board line itself can consume 700 tonnes a day.
We are currently able to consume about 50% urban waste which is helping with the processes and raw materials. We are still learning the mixing process for the waste to achieve maximum consistency.
The Company has employees helping with the flood disaster at Forbes and the affected areas.
The northern extension now completed.
We are seeing the new lines starting to produce volume running at approximately 60% uptime.
The new Conti IV line is currently at 20%-30% capacity.
No real issues with commissioning.
The Company will be having its Christmas party again this year on the 10th of December @4pm at the Oberon League ground.
The site is looking to introduce a new evacuation process with the tunnel now completed.

General Business and Questions

Mark Kellam wanted to congratulate Borg on the handling and their help with a job well done during the trying gas shortage.
Mark Kellam asked regarding the leaflet being circulated in the township around waste and energy and had already received comments regarding the digester and the concerns around waste/feed coming into the town.
Questions were asked about how it would arrive and what the effects will be.
Concern is also odour and rodent pests.
Highly recommend community consultation with facts and information presented as awareness and answers can often alleviate concerns and factual information helps the town to understand fully what this means for their township.
21st February meeting for information to council.
The council recognises the accommodation/housing shortage and with new rezoning planning in the pipeline it may help with new housing and accommodation.
On the18th of December there is an open day for all museums in Oberon which are well worth visiting with historical and informative equipment, photos etc.
Believe it would be beneficial for a site tour to be organised for councillors, and the CCC committee to see the new lines and site processes.

7. **Next Meeting Date & Close of Meeting**
   4pm, Wednesday 22nd February 2023

Community Consultative Committee

Agenda/Minutes

Meeting: Community Consultative Committee Meeting

Venue: Borg Panels Board Room

Date: Friday 31st March 2023

:Time: 3:30pm

1. **Welcome**

   Richard Whitham, Julie Booth, Andrew Brady, Mike Bitzer, Spiro Kavalieros, Brian Dellow, Ian and Trish Gordon, Damian O'Shannassy, Mark Kellam, Peter Hartland, Lauren Trembath, Fran Charge, Tim Charge

2. **Apologies**

3. **Minutes from last meeting and follow-up**

   Accepted Ian Gordon and Brian Dellow

4. **Community Issues** – Fibre stack issue
   Hotline not getting response
   Noise complaint – on a Sunday
   Fibre spill from Conti 1 hatch released, causing fibre to be released. Clean up completed and talked to neighbours. E.P.A coming to site.
   Damian O'Shannassy – Poor communication from Borgs regarding follow up and communication to council.
   Mark Kellam – Needs better expectation on and how the hot line is to work. When people ring the hotline, they are treated poorly.
   Fran Charge noise complaints tough as the facility is a 24x7 operation and people have brought or built since the factory was open

   Digester
   Meetings were not a success. As far as Borgs, Victor didn't even introduce himself and technically sounded a bit ill prepared. Need a good presentation. Much larger than expected and people could not hear. Victor trying to do a good job, but message not getting out there. Details not circulated correctly and very poor communication. Share the information if you want buy in.

Brian Dellow – People were rude. Victor didn't have a chance.
Intentions were honourable but not thought through.
Lauren Trembath – Mayor should prepare a letter to CEO of re-Direct to express concerns.
Richard Whitham to pass on feedback to the Head Office.

5. **Site Updates**

HPP update - M Bitzer

Report from March 2023

Safety - No major incidents 30% reduction in incidents this year. Safety awareness very good now
Not fully manned for 2.5 years. Turnover rate high.
Noise complaint recently, first in years since I have been here horn sound used to clean was the issue.
E.P.A on site Tuesday for annual visit, received really good feedback.
Taking our ash from site and taking to farmlands as a great nutrient agent instead of taking to landfill.
Automated grading system in the dry mill helping also with manual handling.
New Helix Spiral Feeder to reduce noise. Noise from dry mill drastically reduced with machines.
Production going well. Market conditions awful on our end with a dramatic decline in sales. Labour shortages not helping
Green mill going down at Easter for 1 week, going to redeploy employees to other areas.
Demolishing old Boral site with the steel from the site being recycled. Timber given to Borg for use. Hardwood being recycled and deploying to employees and charities.
Tim Charge question, asked as to build up of trucks trying to get into gate 3?

Borg Update - R Whitham

Short shut at Christmas started up 10/01/23 with a good start up.
Our market is still strong.
Change of shift structure to consolidate skills.
2 new lines commissioned and running paint line operation and Shelving Line.
Cyclone issue causing fibre discharge issue should be resolved to prevent any other incidents as all new cyclones to replace old cyclones.
Waste wood usage 60% → 75% waste and recycled timber in the process.
Big push on recycling and shredding of material for production.
People update we are still struggling to employ trades.
Taking down time now to avoid Easter so will run through Easter.
Richard Kaine our new Facility Manager coming 3rd April.

Woodchem Update – P Hartland

Busy suppling and keeping up with supply to MDF. Projects underway to help with manufacturing.

General Business and Questions

Question asked as to whether the Borg Facility would be open to allow those in the public to be able to go through the factory to get an understanding of how the facility works.

6. **Next Meeting Date & Close of Meeting**
   4pm, Date to be confirmed

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

10 October 2022

EPL 3035 Water Quality Exceedance

This is to advise you that Borg Manufacturing Oberon had an exceedance of concentration limit for Total Nitrogen for stormwater sample event undertaken on 27 September 2022. Results reviewed from ALS Environmental show that the concentration limit for Total Nitrogen of 10mg/L was exceeded by 1.7mg/L.

There were significant rain events (i.e. >10mm) in the days prior to monitoring. 31.8mm of rain was recorded on site in the 6 days prior to the monitoring event.

It is plausible that this exceedance was due to the mobilisation of wood material from site during the rain event which may show that the Total N result is due to organic matter in the sample.

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

A sample was also collected onsite, approximately 800m downstream from Point 28 for analysis on the same day. The point that the sample was taken from incorporates all onsite water activities and returned a result for Total Nitrogen at 0.6mg/L.

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

Regards

Andrew Brady
Environmental and Safety Manager
Borg Manufacturing

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 2023

Re: Borg Panels Oberon Environmental Incident

This notification has been prepared in accordance with SSD 7016 condition C12.

On Monday 27th of Feb 2023 at approximately 6:30am it was identified by site operators that there had been a discharge of fugitive fibre at the Borg Panels site with potential for some off site fibre discharge.

Borg Panels Environmental Manager was immediately contacted and commenced an inspection of the surrounding community area to determine the extent of the discharge and coordinate clean up.

A site investigation has commenced to determine the cause of the discharge. DPIE will be kept informed of any outcomes from the investigation.

Oberon Council and the NSW EPA were immediately informed of this incident.

Yours sincerely

Andrew Brady
Environmental Manager
Borg Manufacturing
Mobile: 0447 765 913