

# DUNMORE SAND AND SOIL

## AIR QUALITY MANAGEMENT PLAN INCORPORATING A DUST MONITORING PROGRAM



## DOCUMENT CONTROL

	Rev.	Author	Date	Approval	Reason for Change	Next Review
<b>Air Quality Monitoring Program</b>	0	R.W. Corkery & Co. Pty Limited	29/09/2005	J. Worden	Initial Document	Following comments from DEC
	1	R.W. Corkery & Co. Pty Limited	2/12/2005	J. Worden	Internal Edits	1/12/2008*
	2	R.W. Corkery & Co. Pty Limited	7/8/2006	J. Worden	Response to government agency comments	1/12/2008*
	3	R. Lawton (Env. Coordinator)	1/8/2006	B. Subotic (Quarry Manager)	Document format update Internal edits Update of monitoring locations	31/7/2017*
	4	R. Lawton (Env. Coordinator)	12/12/2016	R. Lawton	Response to DPE review comments	14/12/2017*
	5	R. Lawton (Env. Coordinator)	28/02/2017	(Env. Coordinator)	Response to DPE review comments	Feb 2017*
<b>Air Quality Management Plan</b>	0	RWDI Australia	04/06/2021		Incorporation of Mod 2 Development Consent	
	1	N. Hall (RWDI Australia)	21/06/2021		Response to DPIE review comments	

\* Or following any substantial adjustment arising from monitoring results.

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# 1 INTRODUCTION

This Air Quality Management Plan (AQMP) has been prepared for Dunmore Sand and Soil Pty Limited (DSS) and covers aspects of air quality management for the Dunmore Lakes Sand Project (DLSP), hereafter referred to as the Project.

Environmental impact assessments were undertaken for the Project and its modifications (Modifications 1 to 3) prior to the granting of a ministerial Consent for DA 195-8-2004 and its consolidated versions. The conditions of the consolidated Development Consent are based on the information compiled during the various assessments, noting only the original environmental impact assessment conducted for the Project and that associated with Modification 2 include air quality impact assessments.

It is recognised that the operation of the DLSP has the potential to impact on local air quality beyond the boundaries of the site. The AQMP has been developed to address matters relevant to the management of air emissions generated by the Project and development and implementation of the air quality monitoring program.

## 1.1 Purpose and Scope

The scope of the AQMP applies to all existing and future activities undertaken by DSS within the DLSP site and adjacent land owned or under control of DSS. The Project includes extractive activities at Stages 2, 3, 4, 5A and 5B of the Dunmore sand resource and processing and handling of extracted material.

The primary purpose of this AQMP is to:

- a) describe the air quality management system and measures to be implemented to ensure:
  - compliance with the air quality criteria and operating conditions in the Consent;
  - leading practice management is being employed;
  - air quality impacts of the development are minimised during adverse meteorological conditions;
- b) include a protocol for distinguishing air quality emissions of the development from other nearby or neighbouring developments; and
- c) include a monitoring program that:
  - is capable of evaluating the performance of the development against air quality criteria;
  - monitors air quality at the nearest and/or most affected residences or other representative monitoring locations set out in the Air Quality Management Plan;
  - adequately supports the air quality management system; and
  - includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and notifying the Department and relevant stakeholders of any such event.

## 1.2 Report Authors

This report was prepared by RWDI Australia (RWDI) in consultation with DSS, Department of Planning, Industry & Environment (DPIE) and NSW Environmental Protection Agency (EPA). RWDI is a specialist consulting firm and is a member of the Clean Air Society of Australia and New Zealand (CASANZ). Nic Hall (RWDI) is the main author of this report, whose appointment was endorsed by DPIE in its letter to Boral dated 17 June 2021 (see Appendix A).

## 2 STATUTORY REQUIREMENTS

### 2.1 Development Consent

Table 1 includes the relevant conditions considered in the development of the AQMP and indicates where each component of the relevant conditions requirements is addressed within this Plan.

**Table 1: Relevant Conditions of Approval**

Condition of Approval	Condition Requirements	Where Addressed in this Document
<b>Operation of Plant and Equipment</b>		
Condition 10 / Schedule 2	The Applicant must ensure that all plant and equipment at the site, or used in connection with the development, are: <ol style="list-style-type: none"> <li>a) Maintained in a proper and efficient condition; and,</li> <li>b) Operated in a proper and efficient manner.</li> </ol>	Section 5.2
<b>Air Quality Criteria</b>		
Condition 19 / Schedule 3	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 3 of the consent <sup>1</sup> at any residence on privately-owned land.	Section 4.1
Condition 20 / Schedule 3	The air quality criteria in Table 3 of the consent <sup>1</sup> do not apply if the Applicant has an agreement with the owner/s of the relevant residence or infrastructure to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	Section 4.1
<b>Air Quality Operating Conditions</b>		
Condition 20A / Schedule 3	The Applicant must:	
	<ol style="list-style-type: none"> <li>a) take all reasonable steps to:                             <ul style="list-style-type: none"> <li>• minimise odour, fume and particulate matter (including PM10 and PM2.5) emissions of the development;</li> <li>• minimise visible off-site air pollution generated by the development; and</li> <li>• minimise the extent of potential dust generating surfaces exposed on the site at any given point in time;</li> </ul> </li> </ol>	Section 5.2
	<ol style="list-style-type: none"> <li>b) operate an air quality management system to guide the day to day planning of quarrying operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent;</li> </ol>	Section 5
	<ol style="list-style-type: none"> <li>c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events;</li> </ol>	Section 5
	<ol style="list-style-type: none"> <li>d) carry out regular air quality monitoring to determine whether the development is complying with the relevant conditions in this consent; and</li> </ol>	Section 6
	<ol style="list-style-type: none"> <li>e) regularly assess meteorological and air quality monitoring data and relocate, modify or stop operations on the site to ensure compliance with the relevant conditions of this consent.</li> </ol>	Section 5.3
<b>Air Quality Management Plan</b>		

Condition of Approval	Condition Requirements	Where Addressed in this Document
Condition 20B / Schedule 3	The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	
	a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary	Section 1.2
	b) describe the measures to be implemented to ensure: <ul style="list-style-type: none"> <li>compliance with the air quality criteria and operating conditions in this consent;</li> <li>leading practice management is being employed (including in respect of minimisation of greenhouse gas emissions from the site); and</li> <li>air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;</li> </ul>	Section 5
	c) describe the air quality management system; and	Section 5
	d) include an air quality monitoring program that: <ul style="list-style-type: none"> <li>is capable of evaluating the performance of the development against the air quality criteria;</li> <li>adequately supports the air quality management system; and</li> <li>includes a protocol for identifying any air quality-related exceedance, incident or non-compliance and notifying the Department and relevant stakeholders of any such event</li> </ul>	Section 6
Condition 20C / Schedule 3	The Applicant must implement the Air Quality Management Plan as approved by the Planning Secretary	Section 8.2
<b>Odour</b>		
Condition 21 / Schedule 3	The Applicant must not cause or permit the emission of offensive odour from the site.	Section 4.1
<b>Meteorological Monitoring</b>		
Condition 36 / Schedule 3	<p>Prior to the commencement of construction within the Stage 5 areas and for the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in close proximity to the site that:</p> <p>a) complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007); and</p> <p>b) is capable of measuring meteorological conditions in accordance with the NSW Noise Policy for Industry (EPA, 2017), unless a suitable alternative is approved by the Planning Secretary following consultation with the EPA.</p>	Section 6.2.2
<b>Notification of Landowners/Tenants</b>		
Condition 4 / Schedule 4	<p>Prior to entering into any tenancy agreement for any land owned by the Applicant that is predicted to experience exceedances of the recommended dust and/or noise criteria, the Applicant must:</p> <p>a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the fact sheet entitled "Mine Dust and You" (NSW Health, 2017); and</p> <p>b) advise the prospective tenants of the rights they would have under this consent, to the satisfaction of the Planning Secretary.</p>	Section 8.5



Condition of Approval	Condition Requirements	Where Addressed in this Document
<b>Notification of Exceedances</b>		
Condition 5 / Schedule 4	As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise or air quality criterion in Schedule 3 of this consent, the Applicant must provide the details of the exceedance to any affected landowners, tenants and the CCC.	Section 7.2
Condition 6 / Schedule 4	For any exceedance of any air quality criterion in Schedule 3 of this consent, the Applicant must also provide to any affected land owners and/or tenants a copy of the fact sheet entitled "Mine Dust and You" (NSW Health, 2017).	Section 6.4
<b>Independent Review</b>		
Condition 7 / Schedule 4	If a landowner considers the development to be exceeding any relevant noise or air quality criterion in Schedule 3 of this consent, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their residence or land.	Section 7.4
Condition 8 / Schedule 4	If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.	Section 7.4
Condition 9 / Schedule 4	If the Planning Secretary is satisfied that an independent review is warranted, within 3 months, or other timeframe agreed by the Planning Secretary and the landowner, of the Planning Secretary's decision, the Applicant must: <ul style="list-style-type: none"> <li>a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to: <ul style="list-style-type: none"> <li>(i) consult with the landowner to determine their concerns;</li> <li>(ii) conduct monitoring to determine whether the development is complying with the relevant criterion in Schedule 3 of this consent; and</li> <li>(iii) if the development is not complying with the relevant criterion, identify measures that could be implemented to ensure compliance with the relevant criterion; and</li> </ul> </li> <li>b) give the Planning Secretary and landowner a copy of the independent review; and</li> <li>c) comply with any written requests made by the Planning Secretary to implement any findings of the review</li> </ul>	Section 7.4
<b>Management Plan Requirements <sup>2</sup></b>		
Condition 2 / Schedule 5	The Applicant must ensure that the Management Plans required under this consent are prepared in accordance with any relevant guidelines, and include: <ul style="list-style-type: none"> <li>a) detailed baseline data;</li> </ul>	Sections 3 and 3.1
	<ul style="list-style-type: none"> <li>b) a description of: <ul style="list-style-type: none"> <li>• the relevant statutory requirements (including any relevant approval, licence or lease conditions);</li> <li>• any relevant limits or performance measures/criteria; and</li> <li>• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</li> </ul> </li> </ul>	Sections 2 and 4.1

Condition of Approval	Condition Requirements	Where Addressed in this Document
	c) any relevant commitments or recommendations identified in the document/s listed in condition 2(c) of Schedule 2;	Section 5.2
	d) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Section 5.2
	e) a program to monitor and report on the: <ul style="list-style-type: none"> <li>impacts and environmental performance of the development; and</li> <li>effectiveness of any management measures (see (c) above);</li> </ul>	Section 6
	f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 7.2 and Appendix B
	g) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 8.7
	h) a protocol for managing and reporting any: <ul style="list-style-type: none"> <li>incidents;</li> <li>complaints;</li> <li>non-compliances with statutory requirements; and</li> <li>exceedances of the impact assessment criteria and/or performance criteria; and</li> </ul>	Section 7, Appendices A and B
	i) a protocol for periodic review of the plan.	Section 8.7
<b>Revision of Strategies, Plans &amp; Programs</b>		
Condition 3 / Schedule 5	Within 3 months of: <ul style="list-style-type: none"> <li>a) the submission of an incident report under condition 7 below;</li> <li>b) the submission of an Annual Review under condition 9 below;</li> <li>c) the submission of an audit report under condition 10 below; and</li> <li>d) the approval of any modifications to this consent (unless the conditions require otherwise),</li> </ul> the Applicant must review the suitability of existing strategies, plans, and programs required under this consent	Section 8.7
Condition 4 / Schedule 5	If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans, and programs required under this consent must be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review.	Section 8.7
<b>Adaptive Management</b>		
Condition 5 / Schedule 5	The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.  Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity: <ul style="list-style-type: none"> <li>a) take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;</li> <li>b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those</li> </ul>	Section 7.2 and Appendix B

Condition of Approval	Condition Requirements	Where Addressed in this Document
	<p>options and any preferred remediation measures or other course of action; and</p> <p>c) implement remediation measures as directed by the Planning Secretary, to the satisfaction of the Planning Secretary.</p>	
<b>Incident Notification</b>		
Condition 7 / Schedule 5	<p>The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing through the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.</p>	Section 7.1
<b>Non-Compliance Notification</b>		
Condition 7A / Schedule 5	<p>Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing through the Department's Major Projects Website and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance</p>	Section 7.2 and Appendix B
<b>Regular Reporting</b>		
Condition 8 / Schedule 5	<p>The Applicant must provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.</p>	Section 6.4
<b>Annual Review</b>		
Condition 9 / Schedule 5	<p>By the end of September each year, or other timing as may be agreed by the Planning Secretary, the Applicant must review the environmental performance of the development to the satisfaction of the Planning Secretary. This review must:</p> <p>a) describe the development (including rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;</p> <p>b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against:</p> <ul style="list-style-type: none"> <li>• the relevant statutory requirements, limits or performance measures/criteria;</li> <li>• requirements of any plan or program required under this consent;</li> <li>• the monitoring results of previous years; and</li> <li>• the relevant predictions in the documents listed in condition 2(c) of Schedule 2;</li> </ul> <p>c) identify any non-compliance or incident which occurred in the previous financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;</p> <p>d) evaluate and report on:</p> <ul style="list-style-type: none"> <li>• the effectiveness of the noise and air quality management systems;</li> </ul> <p>and</p>	Section 8.7

Condition of Approval	Condition Requirements	Where Addressed in this Document
	<ul style="list-style-type: none"> <li>• compliance with the performance measures, criteria and operating conditions of this consent;</li> <li>e) identify any trends in the monitoring data over the life of the development;</li> <li>f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</li> <li>g) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.</li> </ul> <p>The Applicant must ensure that copies of the Annual Review are submitted to the Planning Secretary and Council and are available to the Community Consultative Committee (see condition 6 of Schedule 5) and any interested person upon request.</p>	
<b>Independent Environmental Audit</b>		
Condition 10 / Schedule 5	<p>By 30 September 2017, and every 3 years thereafter, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:</p> <ul style="list-style-type: none"> <li>a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Planning Secretary;</li> <li>b) include consultation with the relevant agencies and the CCC;</li> <li>c) assess the environmental performance of the development and whether it is complying with the relevant requirements in this consent and any relevant EPL and/or Water Licence (including any assessment, plan or program required under these approvals);</li> <li>d) review the adequacy of any approved strategy, plan or program required under these approvals; and</li> <li>e) recommend measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under these approvals.</li> </ul>	Section 8.8
Condition 11 / Schedule 5	<p>Within 6 weeks of commissioning this audit, or as otherwise agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, Council, EPA and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.</p>	Section 8.8
<b>Access to Information</b>		
Condition 12 / Schedule 5	<p>By 30 November 2016, unless otherwise agreed by the Planning Secretary, the Applicant must:</p> <ul style="list-style-type: none"> <li>a) make the following information publicly available on its website: <ul style="list-style-type: none"> <li>• the documents listed in condition 2(c) of Schedule 2;</li> <li>• current statutory approvals for the development;</li> <li>• approved strategies, plans or programs;</li> <li>• a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;</li> <li>• minutes of CCC meetings;</li> </ul> </li> </ul>	Section 8.9

Condition of Approval	Condition Requirements	Where Addressed in this Document
	<ul style="list-style-type: none"> <li>a summary of the current phase and progress of the development;</li> <li>contact details to enquire about the development or to make a complaint;</li> <li>a complaints register, which is to be updated on a monthly basis;</li> <li>the Annual Reviews of the development;</li> <li>reports prepared as part of any independent environmental audit, and the Applicant's response to the recommendations in any audit report;</li> <li>any other matter required by the Planning Secretary; and</li> </ul> <p>b) keep this information up-to-date, to the satisfaction of the Planning Secretary</p>	

Notes:

1. Table 3 of Consent is reproduced in Table 2 of the Plan.
2. The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for the Air Quality Management Plan.

**Table 2: Air Quality Criteria**

Pollutant	Averaging Period	Criterion
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	a, c 25 µg/m <sup>3</sup>
	24 hour	b 50 µg/m <sup>3</sup>
Particulate matter < 2.5 µm (PM <sub>2.5</sub> )	Annual	a, c 8 µg/m <sup>3</sup>
	24 hour	b 25 µg/m <sup>3</sup>
Total suspended particulate (TSP) matter	Annual	a, c 90 µg/m <sup>3</sup>

Notes:

- a. Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
- b. Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
- c. Excluded extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

## 3 BASELINE DATA

Baseline data for the AQMP was obtained from the original environmental assessment undertaken for the Project (Stages 2-4 operations) and that associated with Modification 2 (Stages 5A and 5B operations), namely:

- Dunmore Lakes Sand Extraction Proposal Stage 2,3 and 4 Specialists Consultant Studies Compendium (R.W Corkery & Co, 2004);
- Dunmore Lakes Sand Extraction Proposal Stages 2,3 and 4 Environmental Impact Statement (R.W Corkery & Co, 2004);
- Dunmore Lakes Sand Extraction Project – Modification 2 – Environmental Assessment and Response to Submissions (RtS) (Element Environment, 2019); and,
- Boral Dunmore Quarry Air Quality Management Plan v4 (Boral 2019)

### 3.1 Existing Environment

#### 3.1.1 Local Climatic Conditions

Long-term climatic data from the Bureau of Meteorology (BoM) weather station at Albion Park (Shellharbour Airport) (Site No. 068241) were used to characterise the local climate in proximity of the Project. The Albion Park (Shellharbour Airport) Automatic Weather Station (AWS) is located approximately 7.5 kilometres (km) north-northwest of the Project.

Table 1 and Figure 2 and present a summary of data from the Albion Park (Shellharbour Airport) AWS collected over an approximate 11 to 22 year period for the various meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 27.0 degrees Celsius (°C) and July as the coldest month with a mean minimum temperature of 6.3°C.

The average annual rainfall is 911.7 millimetres (mm) over 79.7 days. The data indicate that February is the wettest month with an average rainfall of 142.7 mm over 8.5 days and September is the driest month with an average rainfall of 41.8 mm over 5.1 days.

Mean 9am humidity levels range from 57 per cent (%) in September to 76% in March. Mean 3pm humidity levels range from 49% in August to 67% in February.

Wind speeds during the warmer months have a greater spread between the 9am and 3pm conditions compared to the colder months. Mean 9am wind speeds range from 8.1 kilometres per hour (km/h) in March to 15.3km/h in September. Mean 3pm wind speeds range from 17.1km/h in May to 22.6km/h in September.

**Table 3: Average Monthly Weather Data**

Obs.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>9 am Mean Observations</b>													
<b>Temp (°C)</b>	22.5	22.0	20.2	19.2	15.8	13.0	12.5	14.0	17.1	19.0	19.7	21.4	18.0
<b>Hum (%)</b>	68	74	76	68	69	73	68	61	57	58	67	66	67
<b>3 pm Mean Observations</b>													
<b>Temp (°C)</b>	24.8	24.5	23.5	21.3	18.8	16.7	16.2	17.3	19.3	20.4	21.6	23.5	20.7
<b>Hum (%)</b>	63	67	64	61	58	57	54	49	53	58	63	61	59
<b>Daily Minimum and Maximum Temperature</b>													
<b>Min (°C)</b>	17.1	17.2	15.6	12.1	8.8	7.2	6.3	6.5	8.5	10.9	13.4	15.3	11.6
<b>Max (°C)</b>	27.0	26.3	25.3	23.3	20.7	18.1	17.8	18.8	21.4	23.1	24.2	25.7	22.6
<b>Rainfall</b>													
<b>Rain (mm)</b>	77.7	142.7	127.6	68.3	53.1	90.6	54.2	58.5	41.8	67.9	79.3	63.6	911.7
<b>Rain (days)</b>	8.0	8.5	8.4	6.8	4.9	6.4	4.8	4.4	5.1	6.8	7.8	7.8	79.7

Source: Bureau of Meteorology (May 2021)

### 3.1.2 Local Meteorological Conditions

The onsite Dunmore weather station has been used to represent local meteorological conditions that would be experienced within the vicinity of the Project.

Annual and seasonal windroses prepared from data collected for the period May 2015 to January 2020 are presented in Figure 1.

On an annual basis, winds are predominately from the west-southwest. Autumn and spring follow similar distributions to the annual trends with winds most frequently from the west-southwest. In summer, winds are predominately from the west-southwest and north-northeast sectors. The winter period is dominated by winds from the west-southwest with fewer winds from the north-northeast than the annual distribution.

The windroses show a wind distribution pattern which is generally typical of the expected patterns for this area.

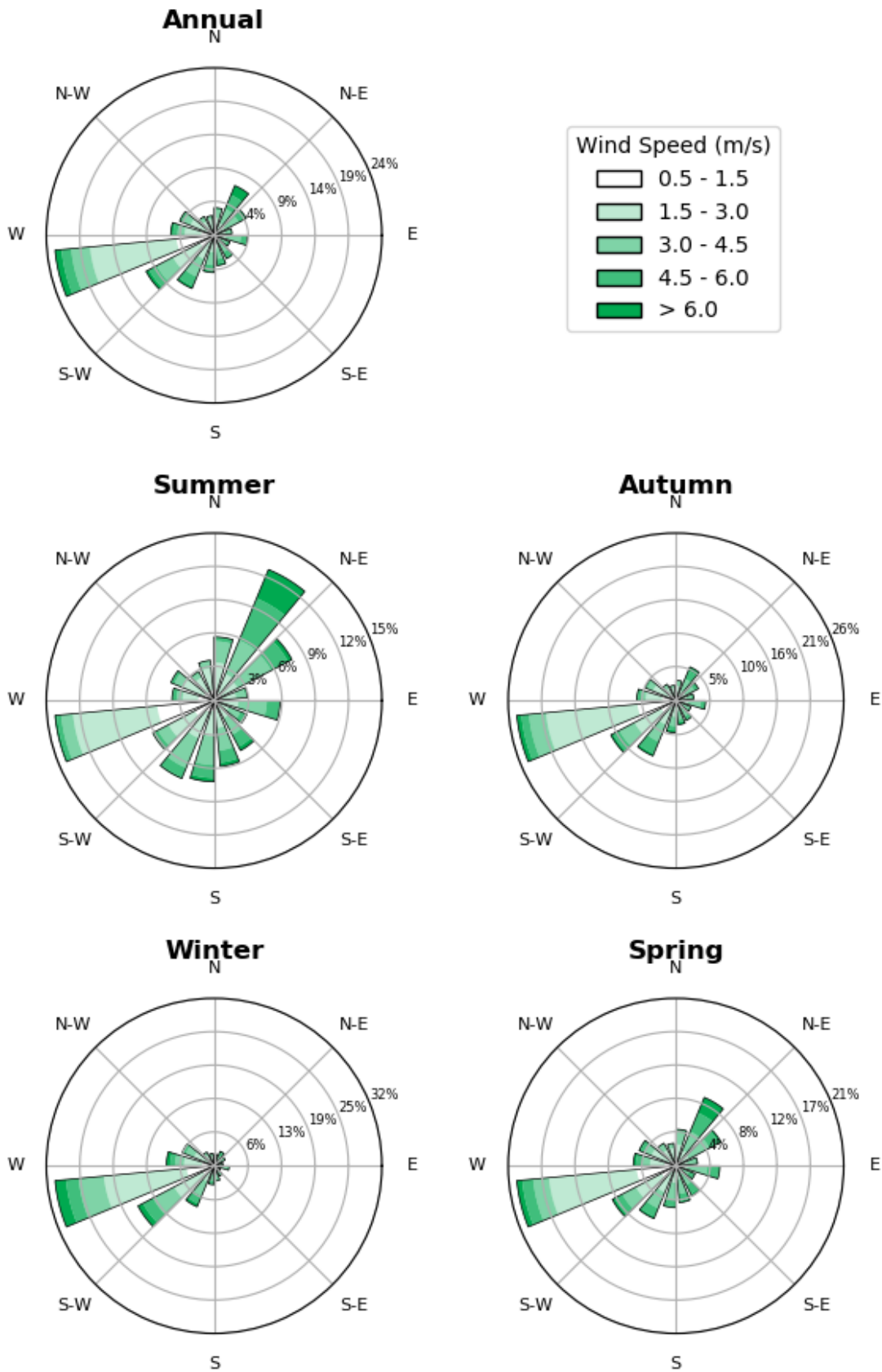


Figure 1: Annual and Seasonal Windroses



### 3.1.3 Local Air Quality

#### 3.1.3.1 DPIE Monitoring Data

Available data from the Albion Park South station operated by DPIE can be used to quantify the baseline air quality in the vicinity of the Project. The DPIE air quality monitoring station at Albion Park South is located approximately 7 km northwest of the Project site.

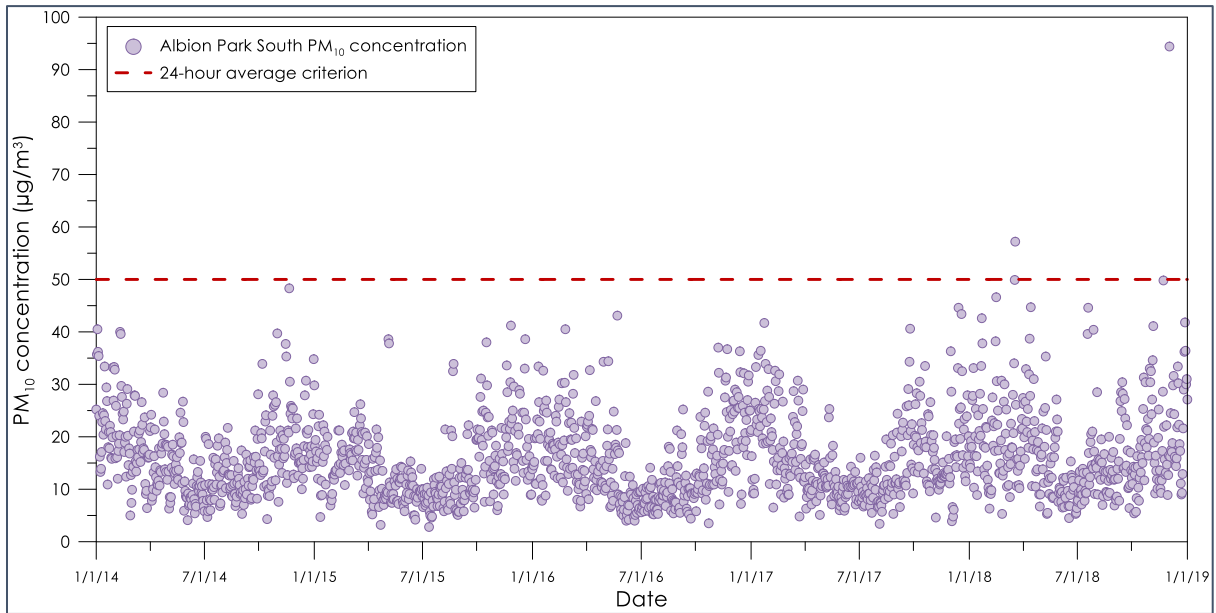
A summary of the available PM<sub>10</sub> data from the Albion Park South monitoring site is presented Table 4. A review of Table 4 indicates that the annual average PM<sub>10</sub> and PM<sub>2.5</sub> concentrations at Albion Park South were below the relevant criterion of 25 µg/m<sup>3</sup> and 8µg/m<sup>3</sup> respectively, except during 2019 when the annual average PM<sub>2.5</sub> concentrations exceeded 8 µg/m<sup>3</sup>.

The table shows that the maximum 24-hour average PM<sub>10</sub> concentrations recorded at Albion Park South were above the relevant criterion of 50 µg/m<sup>3</sup> in 2018, 2019 and 2020 on two, 14 and 10 occasions (days), respectively. The maximum 24-hour average PM<sub>2.5</sub> concentrations recorded at Albion Park South were above the relevant criterion of 25 µg/m<sup>3</sup> in 2016, 2018, 2019 and 2020 for two, one, 12 and 10 occasions, respectively.

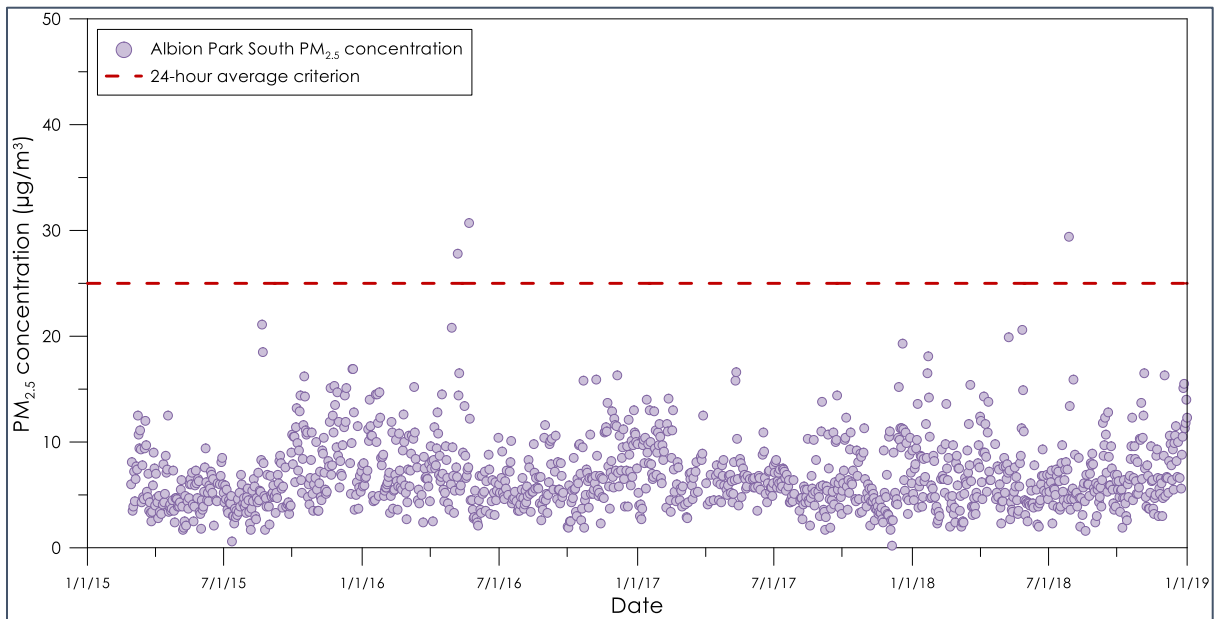
**Table 4: Summary of PM<sub>10</sub> and PM<sub>2.5</sub> Levels from Albion Park South (µg/m<sup>3</sup>)**

Year	PM <sub>10</sub>	PM <sub>2.5</sub>
<b>Annual Average</b>		
2016	14.9	7.2
2017	15.3	6.6
2018	17.8	6.8
2019	19.5	<b>8.6</b>
2020	17.1	6.8
<b>Maximum 24-hour Average (Number of Days Above Criteria)</b>		
2016	43.1 (0)	<b>30.7 (2)</b>
2017	44.6 (0)	19.3 (0)
2018	<b>94.4 (2)</b>	<b>29.4 (1)</b>
2019	<b>104.3 (14)</b>	<b>49.4 (12)</b>
2020	<b>153.3 (10)</b>	<b>96.3 (10)</b>

Recorded 24-hour average PM<sub>10</sub> and PM<sub>2.5</sub> concentrations are presented in Figure 2 and Figure 3, respectively. Generally 24-hour PM<sub>10</sub> concentrations are higher during the summer months and lower in the wintertime, a common trend in most rural locations.



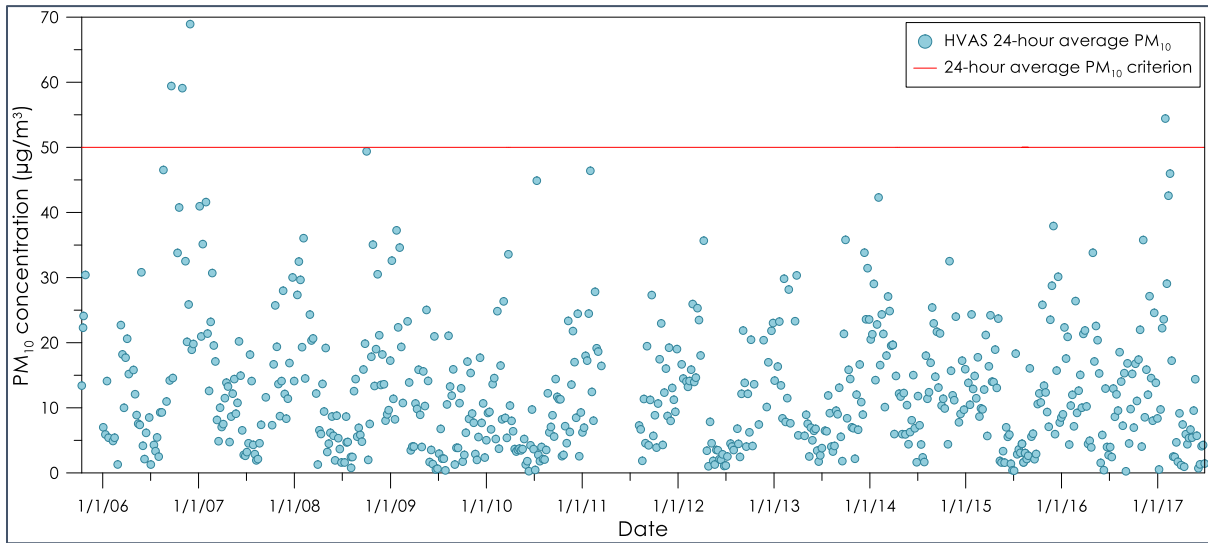
**Figure 2: DPIE Albion Park South PM<sub>10</sub> Data (2014 – 2019)**



**Figure 3: DPIE Albion Park South PM<sub>2.5</sub> Data (2014 – 2019)**

*3.1.3.2 HVAS Monitoring*

Dunmore quarry operates a High Volume Air Sampler (HVAS) for monitoring PM<sub>10</sub> in ambient air (monitor location shown in Figure 1). Figure 6 graphically presents the long-term 24-hour PM<sub>10</sub> monitoring data from October 2005 to June 2017. The figure indicates that generally the 24-hour PM<sub>10</sub> levels are higher during the summer months and lower in the wintertime. On occasion the recorded 24-hour PM<sub>10</sub> levels exceeded the criterion of 50 µg/m<sup>3</sup>.



**Figure 4: HVAS PM<sub>10</sub> Data**

### 3.2 Sensitive Receivers

The nearest and most potentially affected sensitive receivers near Stages 2-4 are shown in Figure 5 and comprise:

- Sensitive Receiver A – 4 Swamp Road, Dunmore (under negotiated noise and dust agreement)
- Sensitive Receiver B – 183 James Road, Dunmore
- Sensitive Receiver C – Dunmore Village (represented by 31 Dunmore Road, Dunmore)
- Sensitive Receiver D – 40 Swamp Road, Dunmore (also identified as Receiver R20)

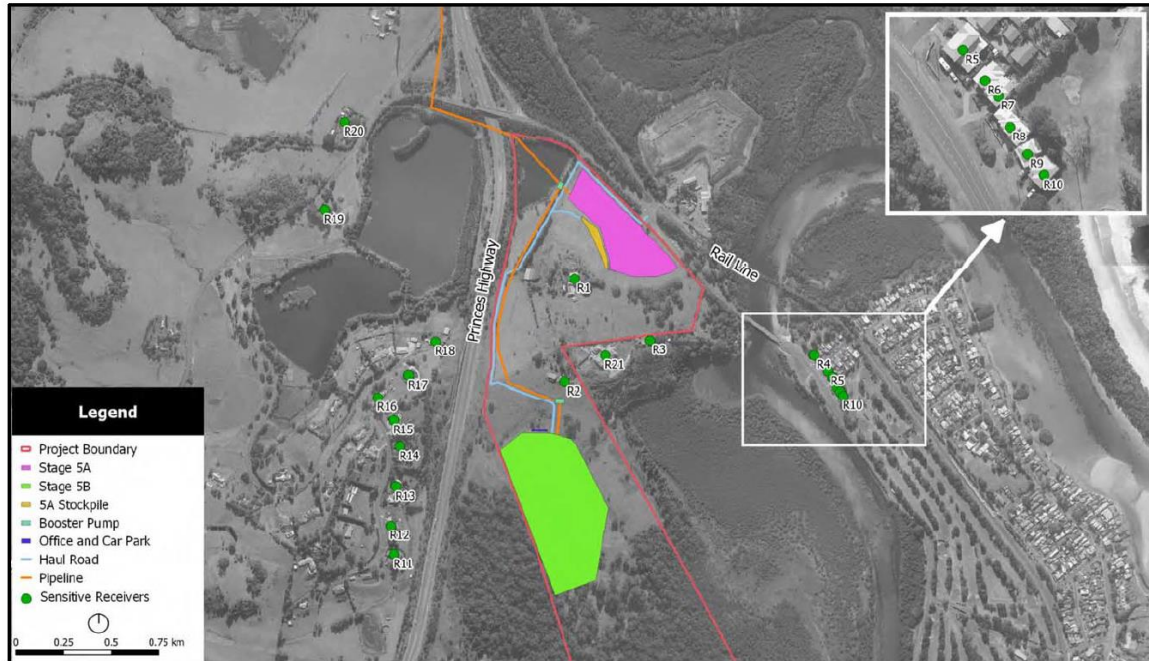


**Figure 5: Sensitive Receivers – Stages 2-4**

The nearest and most potentially affected sensitive receivers near Stages 5A and 5B are described in Table 5 and shown in Figure 6.

**Table 5: Sensitive Receivers – Stages 5A and 5B**

Receiver	Address	Lot/DP Number
R1	471 Riverside Drive, Dunmore	Lot 501 DP 1174897
R2	69 Fig Hill Lane, Dunmore	Lot 51 DP 1012246
R3	431 Riverside Drive, Dunmore	Lot 1 DP 219199
R4	2 The Village, Minnamurra	Lot 1 DP 225638
R5	1 The Village, Minnamurra	Lot 2 DP 1196150
R6	306 Riverside Drive, Minnamurra	Lot 2 DP 1192433
R7	304 Riverside Drive, Minnamurra	Lot 4 DP 1192433
R8	302 Riverside Drive, Minnamurra	Lot 1 DP 224542
R9	300 Riverside Drive, Minnamurra	Lot 2 DP 224542
R10	298 Riverside Drive, Minnamurra	Lot 3 DP 224542
R11	17 Allawah Place, Dunmore	Lot 32 DP 285417
R12	15 Allawah Place, Dunmore	Lot 33 DP 285417
R13	13 Allawah Place, Dunmore	Lot 18 DP 285417
R14	11 Allawah Place, Dunmore	Lot 19 DP 285417
R15	9 Allawah Place, Dunmore	Lot 20 DP 285417
R16	1 Allawah Place, Dunmore	Lot 21 DP 285417
R17	16 Fuller Drive, Dunmore	Lot 22 DP 285417
R18	18 Fuller Drive, Dunmore	Lot 34 DP 285417
R19	63 Swamp Road, Dunmore	Lot 17 DP 607791
R20	40 Swamp Road, Dunmore	Lot 1 DP 745632
R21	71 Fig Lane, Dunmore	Lot 3 DP 717776



**Figure 6: Sensitive Receivers – Stages 5A and 5B**

The landowners at receivers R1 and R2 have entered into a negotiated agreement on noise and dust impacts with Boral.

### 3.3 Emissions Inventory

The significant dust generating activities associated with Modification 2 are identified as the initial preparation of each stage for extraction, and the importation of VENM material to backfill and rehabilitate the extraction areas. The activity of dredging sand from the extraction areas and pumping of the sand to the Stage 2 area is a wet process and would not generate any significant level of emissions.

A potential worst-case scenario in terms of dust emissions would arise where activity is occurring at both Stage 5A and Stage 5B. This would occur following the completion of sand extraction from Stage 5A and with the VENM backfill and rehabilitation occurring and the initial preparation of Stage 5B commencing.

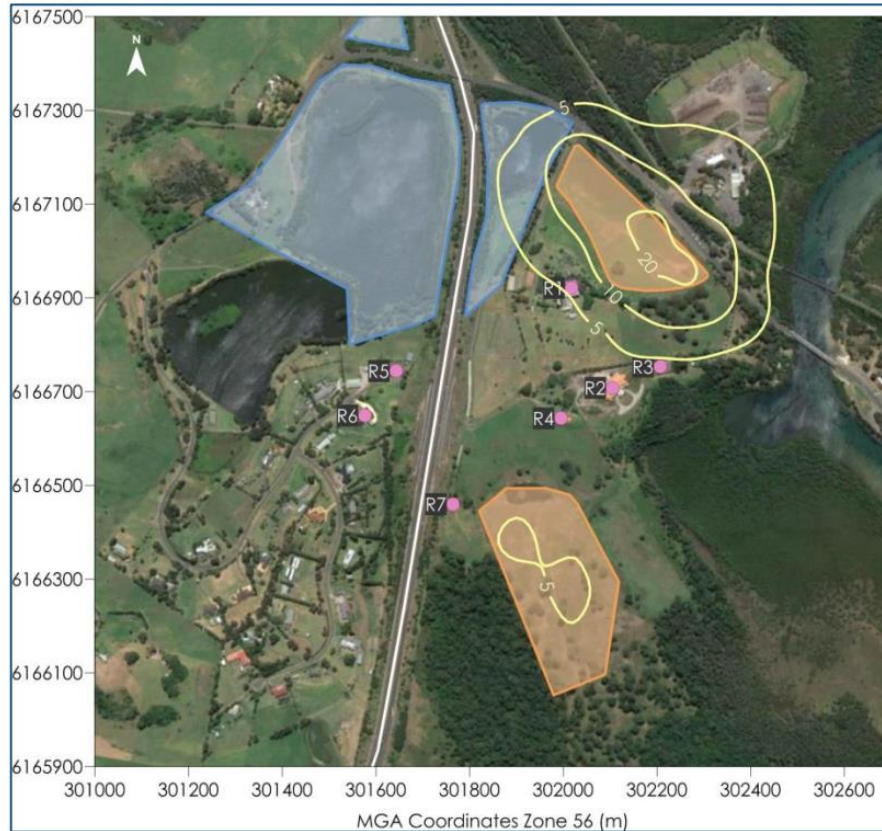
The estimated dust emissions representing activity occurring at both Stage 5A and Stage 5B are presented in Table 6. The emission inventories account for all significant dust generating activities including the handling and transport of topsoil and VENM, wind erosion from stockpiles and diesel exhaust from trucks and plant equipment.

**Table 6: Estimated Dust Emissions for the Project**

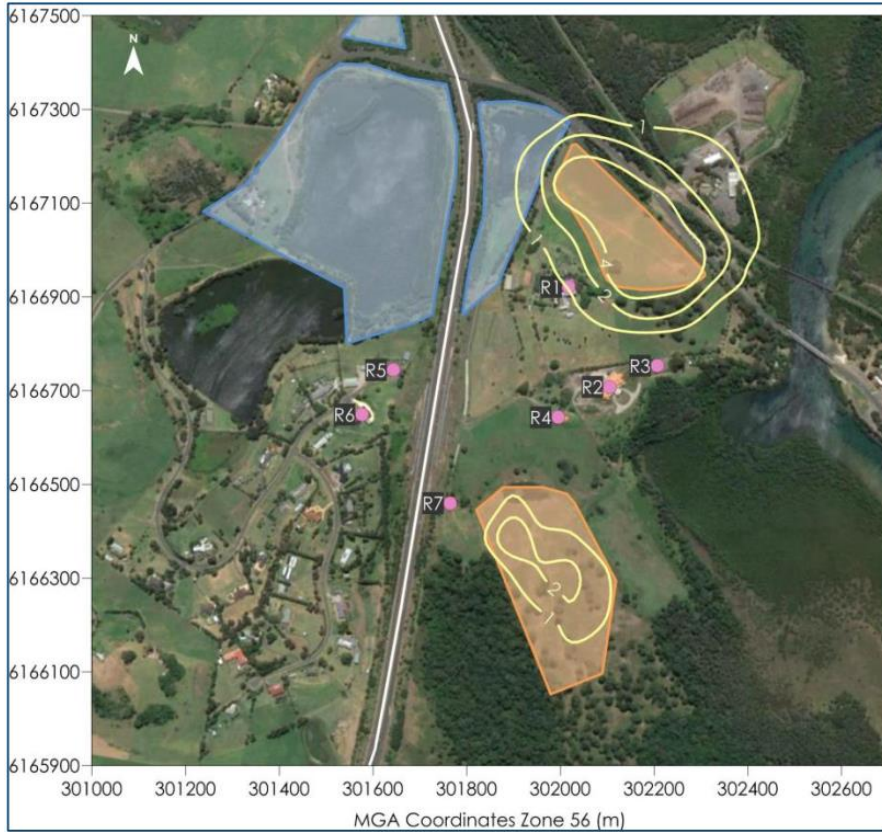
Location	Activity	Emissions (kg/year)		
		TSP	PM <sub>10</sub>	PM <sub>2.5</sub>
Stage 5A	Hauling fill material to stage 5A	2,255	575	57
	Unloading processed fill material to rehab area Stage 5A	610	288	44
	Rehandle processed fill material at rehab area Stage 5A	122	58	9
	Dozer on VENM	19,580	4,732	2,056
	Exhaust emissions	77	77	75
	<b>Total Stage 5A Emissions</b>	<b>22,644</b>	<b>5,729</b>	<b>2,241</b>
Stage 5B	Excavator stripping topsoil and loading to haul truck	335	159	24
	Hauling to topsoil stockpile	2,492	635	64
	Emplacing at topsoil stockpile	335	159	24
	Wind erosion of topsoil stockpile	231	106	16
	Dredging sand (wet process – no emissions)	-	-	-
	Pumping sand to processing area (wet process – no emissions)	-	-	-
	Exhaust emissions	294	294	285
	<b>Total Stage 5B Emissions</b>	<b>3,669</b>	<b>1,352</b>	<b>412</b>
<b>Total Project Emissions (Stage 5A + Stage 5B)</b>		<b>26,312</b>	<b>7,082</b>	<b>2,653</b>

### 3.4 Predicted Incremental Ground Level Concentrations

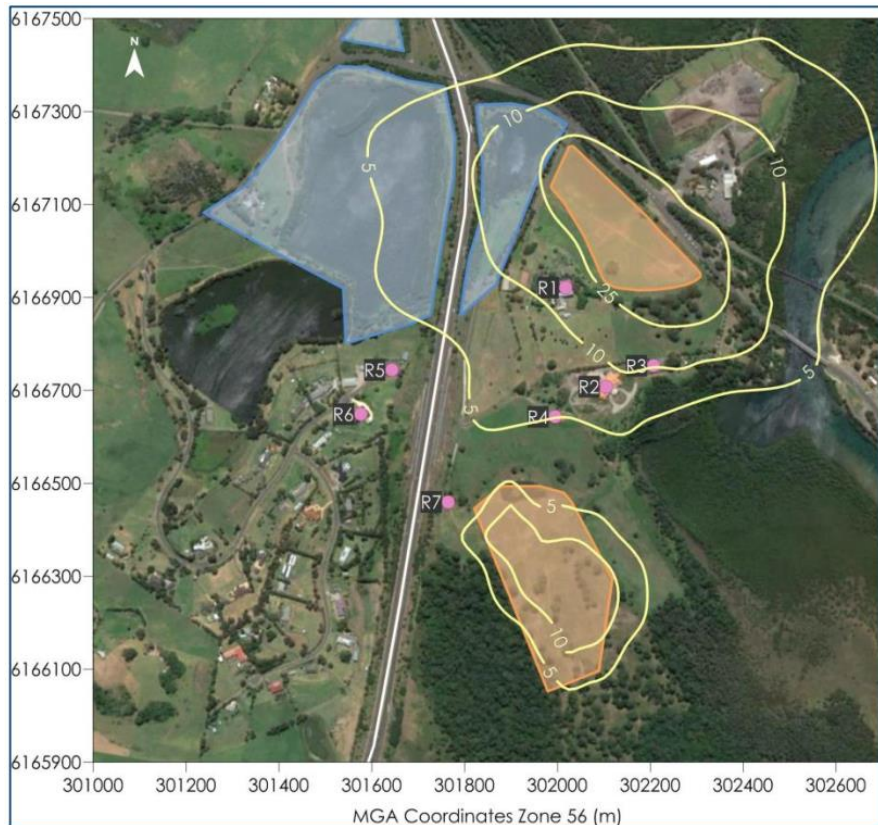
Predicted incremental ground level particulate matter concentrations associated with the Project are presented by way of contour plots in Figure 7 through Figure 11. These contour plots were presented in the addendum air quality assessment prepared during the RtS phase of the Modification 2 application, prepared by Todoroski Air Sciences. These contour plots correspond to the Project emissions presented in Table 6.



**Figure 7: Predicted Incremental Maximum 24-hour Average PM<sub>2.5</sub> Concentrations (µg/m<sup>3</sup>)**

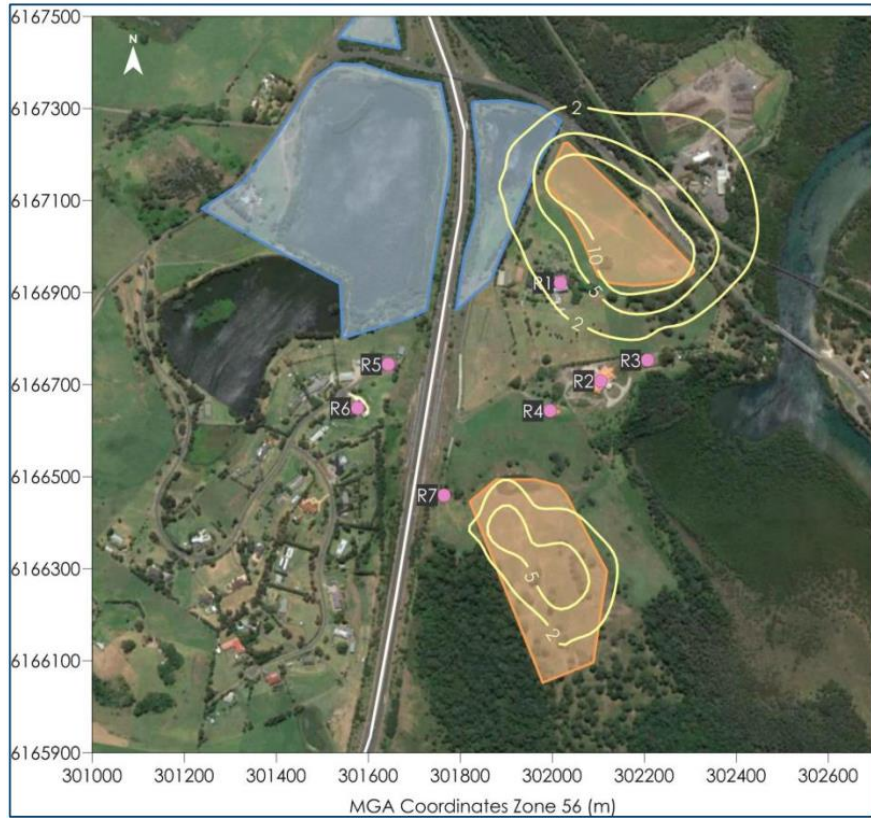


**Figure 8: Predicted Incremental Annual Average PM<sub>2.5</sub> Concentrations ( $\mu\text{g}/\text{m}^3$ )**

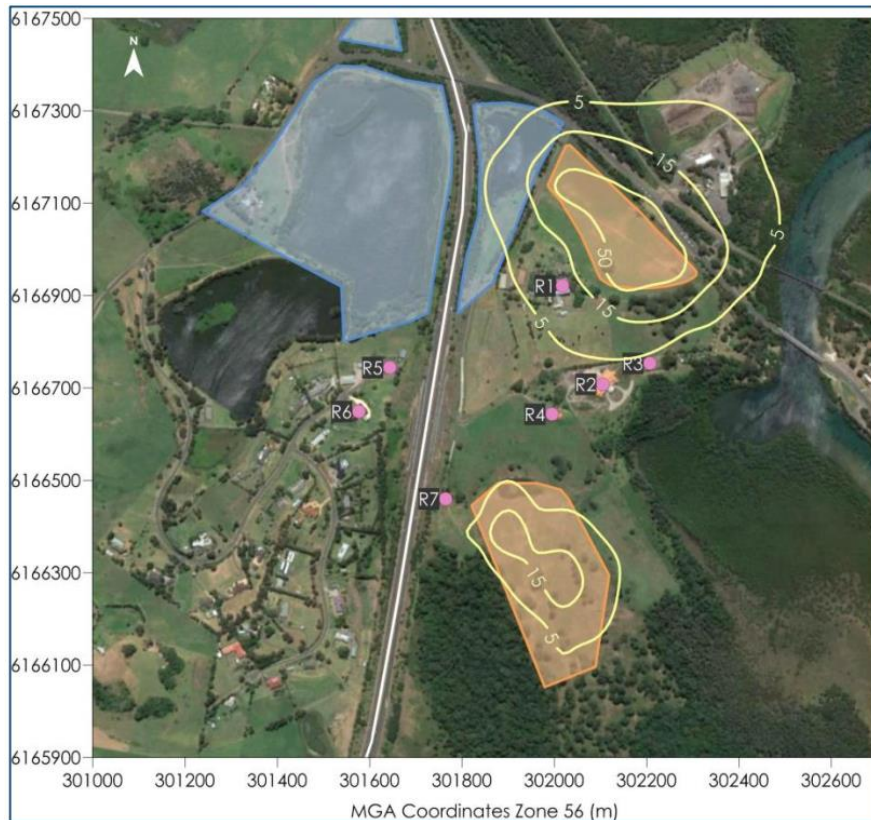


**Figure 9: Predicted Incremental Maximum 24-hour Average PM<sub>10</sub> Concentrations ( $\mu\text{g}/\text{m}^3$ )**





**Figure 10: Predicted Incremental Annual Average PM<sub>10</sub> Concentrations ( $\mu\text{g}/\text{m}^3$ )**



**Figure 11: Predicted Incremental Annual Average TSP Concentrations ( $\mu\text{g}/\text{m}^3$ )**

## 4 PERFORMANCE CRITERIA & OPERATING HOURS

### 4.1 Air Quality Criteria

Air quality criteria for the Project have been established in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (EPA, 2016). Condition 20 (Schedule 3) of the Consent stipulates that the Applicant must ensure that particulate matter emissions generated by the development does not cause exceedances of the criteria specified in Table 7 at any residence on privately-owned land.

DSS will ensure that particulate matter emissions generated by the DLSP does not exceed these criteria.

**Table 7: Air Quality Criteria**

Pollutant	Averaging Period	Criteria <sup>d</sup>
Particulate matter < 10 µm (PM <sub>10</sub> )	Annual	<sup>a, c</sup> 25 µg/m <sup>3</sup>
	24 hour	<sup>b</sup> 50 µg/m <sup>3</sup>
Particulate matter < 2.5 µm (PM <sub>2.5</sub> )	Annual	<sup>a, c</sup> 8 µg/m <sup>3</sup>
	24 hour	<sup>b</sup> 25 µg/m <sup>3</sup>
Total suspended particulate (TSP) matter	Annual	<sup>a, c</sup> 90 µg/m <sup>3</sup>

Notes:

- Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
- Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
- Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.
- The air quality criteria in Table 7 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or infrastructure to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Condition 21 (Schedule 3) of the Consent stipulates that the Applicant must not cause or permit the emission of offensive odour from the site. It is noted that no significant odour sources have been identified for the Project. Notwithstanding, DSS will ensure that no offensive odours will be emitted from the site.

## 4.2 Operating Hours

DSS will ensure that the DLSP operates within the hours specified in Table 8.

**Table 8: Operating Hours**

Activity	Day	Time
<b>Dredging and processing</b>	Monday – Saturday	6:00am to 6:00pm
	Sunday and Public Holidays	8:00am to 4:00pm
<b>Excavator extraction</b>	Monday – Saturday	6:30am to 6:00pm
	Sunday and Public Holidays	Nil
<b>Delivery, distribution and maintenance</b>	Monday – Friday	5:00am to Midnight
	Saturday	6:00am to 6:00pm
	Sunday and Public Holidays	8:00am to 4:00pm
<b>Delivery and distribution via Shellharbour Road and Riverside Drive</b>	Monday – Friday	7:00am to 10:00pm
	Saturday	7:00am to 6:00pm
	Sunday and Public Holidays	8:00am to 4:00pm
<b>Maintenance (if inaudible at neighbouring residences)</b>	Anytime	Anytime

The following activities may be carried out at the premises outside the hours specified in Table 8:

- a) the delivery or dispatch of materials as requested by Police or other public authorities for safety reasons; and
- b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

In such circumstances DSS would notify the Department and affected residents prior to undertaking the works, or within a reasonable period in the case of emergency.

## 4.3 Construction Hours

DSS will ensure approved construction and site establishment works will be undertaken during standard construction hours (7.00 am to 6.00 pm, Monday to Friday, and 8.00 am to 1.00 pm on Saturdays), unless the Planning Secretary agrees otherwise.

## 5 AIR QUALITY CONTROLS AND MANAGEMENT PROCEDURES

To ensure that particulate matter generation during operational activities is managed in a best practice manner and any potential off-site impacts are minimised, appropriate operational and physical mitigation measures will be utilised, as set out below.

### 5.1 Particulate Emission Sources

Sources of air emissions from operational activities are identified as follows:

- Bulldozer operations;
- Wind erosion of exposed areas and stockpiles;
- Handling of materials including loading/unloading;
- Material processing (i.e. crushing and screening);
- Vehicle movement and hauling; and,
- Engine exhaust of vehicles and plant.

### 5.2 Particulate Mitigation Measures

The primary dust mitigation measures that are to be applied are outlined below. These measures are applied to the on-site activities to minimise the generation and hence potential for dust impacts at the nearby sensitive receivers and in the surrounding environment. The mitigation measures identified below are generally consistent with those recommended in the Air Quality Impact Assessment (prepared by Todoroski Air Sciences) for Modification 2.

#### 5.2.1 General

Site induction for all site staff to include air quality management requirements to ensure awareness of potential air quality impacts;

- Activities are to be assessed during adverse weather conditions or extraordinary events and modified as required (e.g. increase watering, or reduce any unnecessary activities). For the purpose of this plan, adverse wind conditions are defined to occur when there has been no rain in the past 72 hours and temperatures are above 38 degrees Celsius and wind speeds are above 8 m/s blowing towards the sensitive receivers (15 minute average); and,
- Visual surveillance of dust plumes from all activity, at least daily by Site Manager or supervisors.

#### 5.2.2 Wind erosion of exposed areas and stockpiles

- The area of exposed surfaces will be minimised where practicable, such as by minimising unpaved road widths, shaping stockpiles in a manner which reduces the exposed surface area, or by covering exposed surfaces with coarse material (>10mm);
- Exposed active areas and active stockpiles will be watered on a daily basis (or more frequently as required) to keep surface moisture levels sufficient to stabilise the surface of stockpiles and minimise wind erosion. Where required, a final application of water at the end of the day will be applied under hot and windy conditions;

- Dusty material stockpiles will be located as far away from sensitive receivers as possible; and,
- Ancillary vehicles will be kept within active, controlled areas, and off other exposed or inactive areas to avoid potential additional disturbance of these surface in these areas.

### 5.2.3 Handling of material

- When loading and unloading material, the drop height of the material will be minimised as far as is practical, for example the front end loader will tip the bucket only when it is close to the ground, the bed of the truck or the material pile being added to, or trucks will “block dump” loads partially onto existing piles;
- Minimise spillage from loading/unloading and clean up any spillage of silty/ dusty materials on hard surfaces as soon as practicable;
- Use of watering to ensure moisture content of material handled is sufficient to minimise dust generation; and,
- During periods of adverse conditions, or high wind speeds (above 8 m/s) and winds blowing towards the sensitive receivers, the material handling activities will be minimised or ceased when excessive visible plumes of dust cannot be abated and a visible plume of dust reaches over the site boundary.

### 5.2.4 Bulldozer operations

- Modify operations to minimise extent of visible dust plumes generated.

### 5.2.5 Vehicle movement and hauling materials

- Haul roads will be watered using water carts such that the road surface has sufficient moisture to minimise on-road dust generation but not so much as to cause mud/dirt track out to occur. The key is to aim for frequent, but light watering of the main haul road, or occasional heavy watering of less frequently used roads;
- Regularly inspect haul roads and maintain surfaces to remove potholes or depressions;
- Vehicle traffic will be restricted to designated routes that can be managed by regular watering;
- To minimise mud or dirt track out onto public roads, vehicles will be cleaned of any excess “parasitic” dirt, sand and other materials adhering to the outside of trucks, hitches, bogies etc. prior to leaving the site. (this is minimised by careful loading to prevent spillage);
- Vehicle loads will be secured and covered when transporting materials off-site. The exposed surface of dusty materials in trucks will also be watered if necessary;
- Site speed limits (<40km/hr) will be enforced;
- Materials will be loaded onto vehicles in a uniform, level manner and not able to spill from the vehicle; and,
- The number of trips will be minimised by maximising the vehicle load (but not overloading).

### 5.2.6 Engine exhaust of vehicles and plant

- Plant and equipment will be maintained and operated in an efficient manner;
- Where possible, the use of vehicles and plant will be minimised by maximising utilisation of plant load capacity;
- When not in use, engines of on-site vehicles and plant will be switched off; and,
- Vehicles and plant including any fitted pollution reduction devices, will be maintained and serviced according to manufacturer's specifications.

## 5.3 Reactive Management

The air quality monitoring network is used to inform reactive management of the Project. Table 9 presents the Trigger Action Response Plan (TARP) which provides suggested particulate trigger levels and sets out the corresponding response if the trigger is reached.

The suggested particulate trigger levels will be refined and modified on an ongoing basis as the actual performance is confirmed, operational experience increases and as the operations change over time. Consideration of the prevailing winds and dispersion conditions is paramount in this method of analysis and it is anticipated that as operator experience with the operations and surrounding influences develops, more appropriate trigger levels will be developed over time.

Reactive controls will include operational measures such as scheduling certain operations during favourable meteorological conditions or to alternative areas and will, in extreme cases, require all dust generating activities to cease operations. Appropriate actions will take into account the type of dust source (i.e. wind sensitive or wind insensitive) and the prevailing meteorological conditions in undertaking dust mitigating action.

**Table 9: Trigger Action Response Plan**

Trigger Level	Trigger	Response
<b>1 - Alert Level</b>	<ul style="list-style-type: none"> <li>1-hour average PM<sub>2.5</sub> &gt; 25 µg/m<sup>3</sup> where monitor is downwind of Project</li> <li>1-hour average PM<sub>10</sub> &gt; 50 µg/m<sup>3</sup> where monitor is downwind of Project</li> </ul>	<ul style="list-style-type: none"> <li>Check weather forecast for that day</li> <li>Identify potential operational risk areas</li> <li>Notify operational managers to be on alert</li> </ul>
<b>2 - Remedial Action Level</b>	<ul style="list-style-type: none"> <li>Rolling 24-hour average PM<sub>10</sub> &gt;50 µg/m<sup>3</sup> for 3 consecutive hours</li> <li>1-hour average PM<sub>10</sub> &gt;150 µg/m<sup>3</sup> where monitor is downwind of Project</li> <li>Rolling 24-hour average PM<sub>2.5</sub> &gt;25 µg/m<sup>3</sup> for 3 consecutive hours</li> <li>1-hour average PM<sub>2.5</sub> &gt;75 µg/m<sup>3</sup> where monitor is downwind of Project</li> </ul>	<ul style="list-style-type: none"> <li>Increase watering</li> <li>Where possible relocate dust generating activities away from downwind receivers</li> <li>Reduce haul distances where possible</li> </ul>
<b>3 - Action Level</b>	<ul style="list-style-type: none"> <li>Rolling 24-hour average PM<sub>10</sub> &gt;50 µg/m<sup>3</sup> for 6 consecutive hours</li> <li>1-hour average PM<sub>10</sub> &gt;150 µg/m<sup>3</sup> where monitor is downwind of Project for 3 consecutive hours</li> <li>Rolling 24-hour average PM<sub>2.5</sub> &gt;25 µg/m<sup>3</sup> for 6 consecutive hours</li> <li>1-hour average PM<sub>2.5</sub> &gt;75 µg/m<sup>3</sup> where monitor is downwind of Project for 3 consecutive hours</li> </ul>	<ul style="list-style-type: none"> <li>Cease some or all dust generating activities when the elevated dust concentrations are not caused by an external regional pollution event such as bushfires, prescribed burning, dust storms or fire incidents and cannot be overcome by level 1 and 2 actions.</li> </ul>

## 6 AIR QUALITY MONITORING

The purpose of the air quality monitoring network is to measure the environmental performance of the Project and to facilitate effective management of air quality impacts.

Boral operates a network of portable real-time “DustTrak” particulate monitors which simultaneously measure TSP, PM<sub>10</sub> and PM<sub>2.5</sub> size fractions to allow effective real-time reactive management of both the Quarry and existing Dunmore Sand & Soil operations.

In addition to the real-time monitors, the quarry operates a High Volume Air Sampler (HVAS) for monitoring PM<sub>10</sub> for compliance and reporting purposes.

### 6.1 Air Quality Monitoring Locations

The current locations of the HVAS and real-time monitors are summarised in Table 10 and shown on Figure 12. The monitor locations have been configured based on the dominant wind trends to capture both upwind and downwind levels relative to the existing operations and allow for the quantification of dust levels leaving the site towards receivers, in the event of any observable dust or for complaint investigation.

**Table 10: Dust Monitoring Locations**

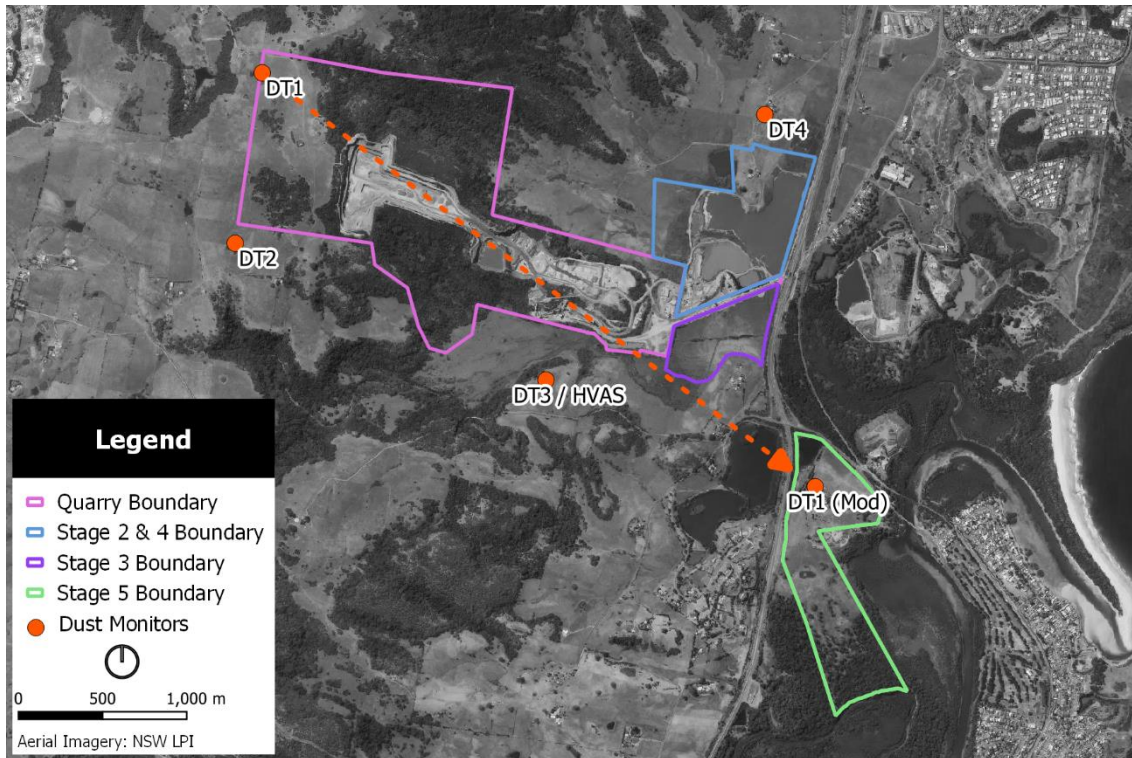
Monitor	Easting (m)	Northing (m)	Parameter(s)
<b>Current Locations</b>			
HVAS	300,350	6,167,601	PM <sub>10</sub>
DustTrak DT1	298,632	6,169,400	TSP, PM <sub>10</sub> , PM <sub>2.5</sub>
DustTrak DT2	298,489	6,168,383	TSP, PM <sub>10</sub> , PM <sub>2.5</sub>
DustTrak DT3	300,350	6,167,601	TSP, PM <sub>10</sub> , PM <sub>2.5</sub>
DustTrak DT4	301,623	6,169,204	TSP, PM <sub>10</sub> , PM <sub>2.5</sub>
<b>Proposed Locations</b>			
DustTrak DT1 (Mod)	301,961	6,166,994	TSP, PM <sub>10</sub> , PM <sub>2.5</sub>

The DustTrak monitor locations may be modified as required for effective management purposes. To facilitate reactive management of dust generate by activities on the Stage 5 site, it is proposed to relocate monitor DT1 to a location on the R1 property. This new location is denoted as “DT1 (Mod)” in Figure 12. Indicative coordinates for DT1 (Mod) are provided in Table 10.

Based on the predicted incremental ground level particulate matter concentrations associated with Stage 5, as presented in Section 3.4, monitoring location DT1 (Mod) is considered to be spatially adequate to monitor dust generated during both Stage 5A and Stage 5B activities.

DT1 has been chosen for relocation as it is located in an area with no nearby receivers and, as shown in the windrose plot in Figure 1, south-easterly winds are not a common feature of the area, indicating that off-site dust impacts to the north west of the current DT1 monitoring location are unlikely.





**Figure 12: Monitoring Network**

## 6.2 Monitoring Methods and Sampling Instruments

Monitoring is undertaken per the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007) where applicable.

### 6.2.1 Air Quality Monitoring

A DustTrak is a light scattering laser photometer monitor that can be used to continuously measure concentrations of particulates including TSP, PM10 and PM2.5 fractions. The monitors are portable and can be moved as required for operational air quality management purposes.

The real-time monitors are used for monitoring operational trends, such as upwind-downwind differences to determine the relative dust contribution. The monitors tend to drift, in terms of their baseline reading, this needs occasional validation to maintain adequate performance (see Section 3.5).

### 6.2.2 Meteorological Monitoring

In accordance with Condition 36 (Schedule 3) of the Consent, the on-site meteorological station complies with requirements outlined in *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (NSW DEC, 2007) and is capable of continuous measurement of meteorological conditions in accordance with the *NPfl*. Stability Category is determined using the sigma-theta method outlined in Fact Sheet D of the *NPfl*.

## 6.3 Protocol for Determining Exceedances

Where monitoring results meet or are below the air quality criteria stipulated in the Consent (see Table 2), no further action is needed, and the recorded results are reported as compliant.

Where monitoring results are above the levels indicated in Table 2 an exceedance has occurred. Further analysis will be used to determine if the Project contributed to the elevated level or the reading was due to other sources or causes. The analysis may include the following evaluation steps, however alternative means may also be used as most appropriate to the situation.

- An investigation of the meteorological data and monitoring data for the relevant period will be conducted to determine the likelihood of the Project causing or contributing to the elevated levels above the assessment criteria.
- For HVAS or dust gauge results, the analysing laboratory will be contacted to ensure no error has been made in storing, analysing or recording the sample or result and if any potential contamination of the sample may have occurred.
- Data from real-time monitors will be analysed to determine if the monitors were functioning and operating correctly.
- A review of natural factors such as dust storms and bushfires, along with anthropogenic activity factors such as hazard reduction burns, will be made to determine if these factors may have affected the reading.
- Operations logs will be reviewed for the relevant period to identify what activities were occurring in proximity to monitoring locations.

## 6.4 Data Reporting

The results of any air quality monitoring commissioned by DSS will be made available to the DPIE and the EPA and presented in the relevant Annual Review and Annual Return Environmental Monitoring Report to be posted on the Project's website. DSS will ensure that copies of the Annual Review are submitted to the Planning Secretary and Council and are available to the Community Consultative Committee (CCC) and any interested person upon request.

The Annual Review and Annual Return Environmental Monitoring Report will include the following information:

- Summary of all air quality monitoring results (including meteorological conditions);
- Analysis of monitoring results against performance criteria;
- Analysis of monitoring results against previous monitoring results to establish trends in particulate matter levels;
- Mitigation investigation and implementation and effectiveness of mitigation measures;
- Statement of compliance/non-compliance; and
- Details of any complaints relating to air quality and their state of resolution.

The results of monitoring will be reviewed annually and any proposed change to frequency to be approved by the Secretary.

On identification of an exceedance of the air quality criteria presented in Table 2, the Response to Exceedance of Performance Criteria Protocol, located in **Appendix B** of this Plan, will be followed.

Any exceedance of the criteria in Table 2 is an incident that will be immediately notified to the Secretary and any other relevant agencies.

Within 7 days of the date of the incident, Boral will provide the Secretary and any relevant agencies with a detailed report on the incident including any exceedance investigation conducted, and any further reports as may be requested.

As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any criteria in Table 7 Boral will:

- provide to any affected landowners and tenants, and
- publish on its website, the full details of the exceedance.

For any exceedance of the air quality criteria Boral will also provide to any affected landowners and tenants a copy of the fact sheet entitled *Mine Dust and You* (NSW Minerals Council, 2011) fact sheet (as may be updated from time to time).

## 7 INCIDENTS, NON-COMPLIANCE, COMPLAINTS & INDEPENDENT REVIEWS

### 7.1 Incidents

The Consent defines an 'incident' to be "an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance".

Incidents will be entered into the site incident tracking register SEquence. An incident notification form will be completed and circulated to senior management to ensure incident notification procedures are completed as per consent requirements. In accordance with Condition 7/Schedule 5, DSS will immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing through the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident.

### 7.2 Non-Compliance

DSS will manage and report non-compliances relevant against statutory requirements in accordance with Schedule 4 Condition 5. Within seven days of becoming aware of a non-compliance, DSS will notify the Department (in writing through the Department's Major Projects Website), any affected landowners, tenants and the CCC of the non-compliance. The notification must identify the development (including the development application number and name), set out the condition of this Consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known), and what actions have been, or will be, undertaken to address the non-compliance.

Compliance with all approvals, plans and procedures will be the responsibility of all personnel (staff and contractors) employed on or in association with the DSLP, and will be promoted through direct consultation and direction of site management; namely the Site Manager and Environmental Site Representative. .

Regular inspections and/or internal audits will be undertaken as required under the direction of the Site Environmental Manager, to identify any remediation/rectification work required, and areas of actual or potential non-compliance.

The Environmental Permit Planner (EPP) will be updated to track the compliance commitments relating to the Air Quality Management Plan and will be audited monthly by site management; namely the Site Manager and Site Environmental Representative. A review of DSS's compliance with all conditions of the Consent, mining leases and all other approvals and licences will be undertaken prior to (and included within) each Annual Review. The Annual Review will be made publicly available on DSS's website.

On identification of an exceedance of the performance criteria presented in **Section 4**, the Response to Exceedance of Performance Criteria Protocol, located in **Appendix B** of this Plan, will be followed.

## 7.3 Air Quality Complaints

All complaints are to be considered and recorded. Any incident or plausible complaint regarding dust will be investigated to identify wherever possible the specific cause and corrective action will be implemented where necessary and feasible to do so including follow up with the complainant which will be documented. The following would be conducted where required:

- Review of management practices to systematically identify and implement options to modify site practices, to ensure effective control of dust generating activities so as to achieve compliance with the relevant criteria; and,
- All complaints will be documented by appropriate personnel on the complaints register, including the correction action taken where needed and follow up with the complainant

As part of the complaints handling procedure DSS will:

- Ensure a publicly advertised telephone number for operational hours ((02) 4237 8414) and email address (feedback@boral.com.au) is utilised as part of existing operation to receive complaints during operating hours and record complaints at other times;
- ensure all complaints are entered into a logbook; and
- ensure an initial response is provided within 24 hours of receipt of the complaint except in the event of complaints recorded when the mine is not operational.

The complaints record will include the following details for air quality complaints:

- The date and time of complaint;
- The method through which the complaint was communicated e.g. Telephone, Email;
- The nature of the complaint;
- Any action taken by DSS in relation to the complaint, including any follow up contact with the complainant; and
- If no follow up action is taken by DSS, the reason why no action was taken.

The complaints register will be made publicly available on the website and updated on a quarterly basis. A summary of complaints received, and actions taken will be presented to the CCC as part of the operational performance review.

A summary of complaints received, and actions taken will also be included in the Annual Review and the Annual Return as will be available to regulatory authorities on request and provided in the Annual Environmental Management Reports (AEMRs).

To ensure an appropriate and consistent level of reporting, response and follow-up to any complaints is adopted by DSS, a Complaints Handling and Reporting Protocol will be followed as specified in **Appendix C**.

Based on the nature of the complaint, specific contingency measures will be implemented to the (reasonable) satisfaction of the complainant. The Quarry Manager retains ultimate responsibility to ensure that complaints received are properly recorded and addressed appropriately.

## 7.4 Independent Reviews

If a landowner considers the development to be exceeding any relevant air quality criteria specified in Table 2, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their residence or land.

If the Planning Secretary is satisfied that an independent review is warranted, within three months, or other timeframe agreed by the Planning Secretary and the landowner, of the Planning Secretary's decision, DSS must:

- a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to:
  - (i) consult with the landowner to determine their concerns;
  - (ii) conduct monitoring to determine whether the development is complying with the air quality criteria specified in Table 2; and
  - (iii) if the development is not complying with the air quality criteria specified in Table 2, identify measures that could be implemented to ensure compliance with the relevant criteria; and
- b) give the Planning Secretary and landowner a copy of the independent review; and
- c) comply with any written requests made by the Planning Secretary to implement any findings of the review.

## 8 PLAN ADMINISTRATION

### 8.1 Roles and Responsibilities

Environment and community management is regarded as part of the responsibilities of all DLSP personnel. The roles and function of the main personnel responsible for the implementation of environmental and community management including the Plan. Procedures and action plans contained in this Plan are outlined in DSS's Management Operating System.

### 8.2 Resources Required

Management shall ensure that the appropriate resources are made available to achieve the implementation of the Plan, as approved by the Planning Secretary.

It is the role of the Group Environment Manager to ensure that these requirements are communicated to DSS Management.

### 8.3 Training

All training and inductions conducted are to be undertaken as per the DSS training procedures.

#### 8.3.1 Staff Training – Air Quality Management

Staff training will be undertaken as detailed in the PEMS. This consists of three levels of training applicable to different types of staff:

- Level 1 - High level training on environmental requirement – Management. This training would include the key compliance elements of this Plan and their implementation.
- Level 2 - Operational level training - Project Managers, Supervisors, Surface Personnel – detailed training on the implementation of the key compliance elements of this Plan and their implementation.
- Level 3 - Basic environmental awareness – All other site personnel Staff – induction level awareness.

#### 8.3.2 Inductions – Air Quality Management

All new personnel, contractors and associated subcontractors will be required to participate in site induction prior to the commencement of work.

### 8.4 Record Keeping and Control

Environmental records are to be managed in accordance with the Boral document and data control procedure.

All records of the PEMS and this Plan will be stored so that they are readily retrievable and suitably protected from deterioration or loss. Archiving will be managed in accordance with the data control procedure.

A current master copy of each Management Plan document including all appendices and supporting information is to be held on the DSS Document management system.

Specifically, records of the monitoring associated with the environmental performance measures will be placed on the DSS website as available.

## 8.5 Consultation

Information on air quality management and the results of air quality monitoring is to be provided to external stakeholders. Communication can include:

- Written correspondence – through newsletters and fact sheets;
- Electronic correspondence (via the company website);
- Verbal correspondence (community meetings/information sessions); and
- DSLP CCC.

Prior to entering into any tenancy agreement for any land owned by DSS that is predicted to experience exceedances of the recommended air quality criteria, DSS will:

- advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the fact sheet entitled “Mine Dust and You” (NSW Health, 2017); and
- advise the prospective tenants of the rights they would have under the Consent, to the satisfaction of the Planning Secretary.

## 8.6 Distribution

This Plan will be distributed to DPIE for comment prior to update and distribution to:

- EPA; and
- any other agency required by DPIE.

DSS will make this Plan publicly available on the DSS website and will be responsible for its maintenance. A hard copy will also be kept at the DSLP site.

Any revisions undertaken will be the responsibility of DSS and any notifications will be sent accordingly. DSS will not be responsible for maintaining uncontrolled copies beyond ensuring the most recent version is maintained on DSS's computer system, website, and hard copy at the DSLP site.

## 8.7 Plan Revision

### 8.7.1 Annual Review

By the end of September each year, or other timing as may be agreed by the Planning Secretary, DSS will review the environmental performance of the development to the satisfaction of the Planning Secretary. The Annual Review will:

- a) describe the development (including rehabilitation) that was carried out in the previous financial year, and the development that is proposed to be carried out over the current financial year;
- b) include a comprehensive review of the monitoring results and complaints records of the development over the previous financial year, which includes a comparison of these results against:
  - relevant statutory requirements, limits or performance measures/criteria;



- requirements of any plan or program required under the Consent;
  - monitoring results of previous year(s); and
  - relevant predictions in the Stages 2-4 and Modification 2 environmental assessments.
- c) identify any non-compliance or incident which occurred in the previous financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;
- d) evaluate and report on:
- the effectiveness of the noise and air quality management systems; and
  - compliance with the performance measures, criteria and operating conditions of this Consent;
- e) identify any trends in the monitoring data over the life of the development;
- f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
- g) describe what measures will be implemented over the next financial year to improve the environmental performance of the development.

DSS will ensure that copies of the Annual Review are submitted to the Planning Secretary and Council and are available to the CCC and any interested person upon request.

## 8.7.2 Plan Revision

This Plan will be reviewed within three months of:

- The submission of an annual review.
- The submission of an incident report.
- The submission of an independent environmental audit.
- The approval of any modification of the conditions of the Consent (unless the conditions require otherwise).

If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the Plan must be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review.

## 8.8 Auditing

An Independent Environmental Audit will be undertaken by a suitably qualified auditor and include experts in any field specified by the Secretary every three years.

This audit must:

- be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
- include consultation with the relevant agencies and the CCC;
- assess the environmental performance of the development and whether it is complying with the relevant requirements in the Consent and any relevant EPL and/or Water Licence (including any assessment, plan or program required under these approvals);
- review the adequacy of any approved strategy, plan or program required under these approvals; and
- recommend measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under these approvals.

The audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Planning Secretary.

Within six weeks of commissioning an audit, or as otherwise agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, Council, EPA and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.

## 8.9 Access to Information

Unless otherwise agreed by the Planning Secretary, DSS will continue to:

- a) make the following information publicly available on its website:
  - the documents listed in condition 2(c) of Schedule 2 of the Consent;
  - current statutory approvals for the development;
  - approved strategies, plans or programs;
  - a summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this Consent;
  - minutes of CCC meetings;
  - a summary of the current phase and progress of the development;
  - contact details to enquire about the development or to make a complaint;
  - a complaints register, which is to be updated on a monthly basis;
  - the Annual Reviews of the development;
  - reports prepared as part of any independent environmental audit, and the Applicant's response to the recommendations in any audit report;
  - any other matter required by the Planning Secretary; and
- b) keep this information up-to-date,

to the satisfaction of the Planning Secretary.

# APPENDIX A: DPIE APPROVAL OF EXPERT APPOINTMENT



Planning,  
Industry &  
Environment

Kate Jackson  
Regional Manager – NSW/ACT  
Boral Land & Property Group  
Boral Australia  
Level 18, 15 Blue Street  
North Sydney, NSW, 2059

17/06/2021

Dear Ms Jackson

**Dunmore Lakes Quarry Project (DA195-8-2004)  
Endorsement of Experts – Noise and Air Quality**

I refer to your request (DA195-8-2004-PA-27) for the Planning Secretary's approval of suitably qualified persons to prepare the Noise Management Plan and Air Quality Management Plan for the Dunmore Lakes Quarry Project (DA195-8-2004).

The Department has reviewed the nominations and information you have provided and is satisfied that the experts are suitably qualified and experienced. Consequently, I can advise that the Planning Secretary approves the appointments of Mr Roman Haverkamp of RWDI to prepare the Noise Management Plan and Mr Nic Hall, also of RWDI, to prepare the Air Quality Management Plan.

If you wish to discuss the matter further, please contact Nagindar Singh on 8289 6873 or via email at [nagindar.singh@planning.nsw.gov.au](mailto:nagindar.singh@planning.nsw.gov.au).

Yours sincerely

A handwritten signature in black ink, appearing to read 'M Sprott'.

Matthew Sprott  
Director  
Resource Assessments (Coal & Quarries)

as nominee of the Planning Secretary

# APPENDIX B: RESPONSE TO EXCEEDANCE OF PERFORMANCE CRITERIA PROTOCOL

## 1. Confirmation of Exceedance

The analysing laboratory or consultant will be contacted to ensure no error has been made in storing, analysing or recording the sample or result. Should this investigation conclude the treatment, analysis and result recording for the sample are satisfactory; DSS will proceed to the notification step of the protocol (2).

## 2. Notification (of exceedance)

In the case where the nominated criteria contained within Schedule 3 of DA195-8-2004 or EPL11147 is exceeded, the Environmental Coordinator or environmental representative will notify the Secretary, DPIE and EPA (where appropriate) and affected land owners within seven days as to the nature of the exceedance. An exceedance of a compliance criteria value will require the preparation of a corrective action plan.

## 3. Corrective Action

- a) A sample from the monitoring site from which the exceedance was recorded will be re-sampled where possible and re-assessed to confirm an exceedance of criteria. A compliant result following reassessment will be considered a sufficient response; however, the monitoring point and parameter will be noted for reference in the event a future exceedance is recorded. A second non-compliant result will require further corrective actions (see 3(b)).
- b) DSS will prepare a corrective action plan to return the component of the overall operation to compliance. Preparation of the action plan may require the assistance of a specialist consultant in the relevant field. Details regarding the preparation of the corrective action plan will be included in the relevant Annual Review and Environment Protection Licence Annual Return and to the DPIE prior to implementation, if requested.

## 4. Independent Review

- a) If a landowner (excluding quarry owned properties) considers that the operations of the quarry are exceeding the nominated criteria of Schedule 3 (DA195-8-2004), then he/she may request from the Secretary an independent review of the impacts of the development on his/her land. If the Secretary is satisfied that an independent review is warranted, DSS will, within 3 months of the Secretary advising that an independent review is warranted:
  - i. consult with the landowner to determine his/her concerns;
  - ii. commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to conduct monitoring on the land, to determine whether the development is complying with the relevant criteria in Schedule 3, and identify the source(s) and scale of any impact on the land, and the development's contribution to this impact; and
  - iii. give the Secretary and landowner a copy of the independent review.

- b) If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then DSS may discontinue the independent review with the approval of the Secretary.
- c) If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, then DSS will:
  - i. prepare a corrective action plan (as described in 3(b)) which will take all practicable measures, in consultation with the landowner, to ensure that the development returns to compliance with the relevant criteria; and
  - ii. conduct further monitoring to determine whether these measures ensure compliance; or
  - iii. secure a written agreement with the landowner to allow exceedances of the relevant criteria in schedule 3, to the satisfaction of the Secretary.

If the additional monitoring referred to above (4(c)(ii)) determines that the operations are complying with the relevant criteria in Schedule 3, then the independent review will be discontinued with the approval of the Secretary.

If the monitoring determines the development as non-compliant with the relevant criteria of DA195- 8-2004 or EPL11147, and an agreement between DSS and the affected land owner is unable to be reached, the matter may be referred to the Secretary by either DSS or the affected landowner for resolution.

If the matter cannot be resolved within 21 days, the Secretary shall refer the matter to an Independent Dispute Resolution Process.

- d) If the independent review determines that the operations are not complying with the relevant criteria in Schedule 3, but that another operation or operations are contributing to this non-compliance, then DSS will, with the agreement of the landowner and other quarry(s), prepare and implement a Cumulative Noise and/or Air Quality Impact Management Plan to the satisfaction of the Secretary. This Plan must provide details of the joint approach to be adopted by DSS and other operations to manage cumulative air quality and/or noise impacts at the landowner's dwelling.

If DSS is unable to finalise an agreement with the landowner and/or other quarry(s), and/or prepare a Cumulative Noise and/or Air Quality Impact Management Plan, then DSS or the affected landowner may refer the matter to the Secretary for resolution.

If the matter cannot be resolved within 21 days, the Secretary shall refer the matter to an Independent Dispute Resolution Process.

- e) If the landowner disputes the results of the independent review, either DSS or the landowner may refer the matter to the Secretary for resolution.

If the matter cannot be resolved within 21 days, the Secretary shall refer the matter to an Independent Dispute Resolution Process.

## **5. Reassessment**

Non-compliance with environmental criteria will require re-assessment to demonstrate a return to compliance by re-sampling and re-analysing the particular parameter(s) from the offending site following the completion of the action plan. Should scheduled monitoring occur within 2 weeks of completion of the action list, the re-sampling can be delayed. A third exceedance will require a return to Step 2 of the protocol and automatic assistance of a specialist consultant in Step 3.

## **6. Notification (of compliance)**

DSS will notify the Secretary, DPIE and other relevant government agency(ies) and local stakeholder(s) of the return to compliance following the successful completion of Step 4.

## **7. Reporting**

The recorded exceedance, corrective actions and reassessment will be reported to the CCC and included in each relevant AEMR.

# APPENDIX C: COMPLAINTS RECORDING AND HANDLING PROTOCOL

## INTRODUCTION

The Complaints Recording and Handling Protocol was initially prepared in response to Condition No. 6 of the Development Consent issued for the Dunmore Lakes Sand Quarry – Stage 1. This document presents a protocol that is simple and well understood by Dunmore Sand & Soil (DS&S) and surrounding residents. This will ensure that, in the event a complaint is made in relation to an activity on the site or relating to approved activities, simple and consistent procedures can be followed in response to the complaint.

Part A: An outline of Procedures to be followed by a Complainant.

Part B: Documentation to be maintained by DS&S about each complaint.

Part C: A complaints register.

Part D: Complaints Reporting Procedures.

The format of this protocol was accepted at the initial meeting of the Community Consultative Committee on 17 May 2000. It was accepted with the recognition that improvements to the protocol could be suggested at any time in the future by DS&S or community representatives to ensure the protocol followed is appropriate



## PART A: PROCEDURES TO LODGE A COMPLAINT

Complaints can be made in two ways:

1. Writing to Quarry Manager

Dunmore Sand & Soil Pty Ltd

38 Tabbitta Rd Dunmore 2529

2. Telephoning the Complaints Line on (02) 4237 8414 (landline) or via email [feedback@boral.com.au](mailto:feedback@boral.com.au). Both phone numbers will be operational during the approved working hours. A message bank will operate on the email at all times, particularly outside the approved working hours and all calls will be returned as soon as practical or in accordance with the preference of the complainant. The email will capture calls outside approved working hours and when the line is engaged during approved working hours. The recorded message requests the following information to be recorded by the complainant.

- The Complainant's name.
- Telephone number.
- Preferred time to contact.
- Nature of the complaint.

Details of each call to the Complaints Line will be recorded, together with the nature of the complaint. Each complaint will be passed on immediately to Company management to respond to the complaint. All complaints will be handled in an efficient and courteous manner

## PART B: COMPLAINTS RECORD SHEET

<b>COMPLAINT RECEIVED BY</b>			
Name:	Date & Time:	<input type="checkbox"/> In Writing	<input type="checkbox"/> Via phone
<b>DETAILS OF COMPLAINT</b>			
<b>Complainant Details</b>			
Name:	Phone No:		
Address:			
<b>Nature of the Complaint:</b> (Detail as much information as possible – Date/Time, weather, etc.)			
<b>Entered into Complaints Register &amp; SEquence</b>			Date:
<b>INVESTIGATION OF COMPLAINT</b>			
<b>Investigator Name:</b>			
<b>Investigation Results:</b> (Details as much information as possible)			
<b>Measures Required to Overcome Concern:</b>			
<b>Response / Commitment(s) to Complainant:</b>			
<b>Complainant Comments:</b>			
<b>Entered into Complaints Register &amp; SIMS</b>			Date:
<b>Investigator Sign off:</b>			Date:
<b>Copy to:</b>	<input type="checkbox"/> Complainant (if requested)	<input type="checkbox"/> Community Committee	<input type="checkbox"/> DSS File

**PART C: COMPLAINTS REGISTER**

No.	Date	Time	Shoulder 6am-7am	Day 7am-6pm	Evening 6pm-10pm	Night 10pm-6am	Complainant Details (Name, contact details)	Reason	Description of Complaint	Action Taken

\* Note: All complaints, with associated corrective actions and responsibilities, need to be entered into the Boral Safety Information Management System (SIMS).

## **PART D: COMPLAINTS REPORTING PROCEDURES**

DS&S will report all complaints received and acted upon in the following manner:

1. A copy of each completed Complaints Record Sheet (Part B) will be supplied to each complainant – if requested.
2. The EPA will be notified within 7 days of receiving the complaint - if the Boral NSW environment manager deems the complaint is notifiable.
3. Copies of any record sheets for the period since the previous meeting will be tabled at each meeting of the Community Consultative Committee.
4. A copy of the relevant section of the Complaints Register (Part C) will be incorporated into the following Annual Review together with appropriate commentary/evaluation.
5. A copy of the relevant section of the Complaints Register (Part C) will be uploaded onto the DLSP Website each quarter.