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Boral Dunmore Quarry

Air Quality Management Plan v4

December 2019

Document Control

Report Version	Date	Prepared by	Reviewed by	Updates
DRAFT - 001	21/02/2019	K Trahair & P Henschke (TAS)	A Todoroski (TAS)	Initial Draft
FINAL - 001	28/02/2019	K Trahair (TAS)	P Henschke (TAS)	Revised following Boral comments
FINAL - 002	09/05/2019	P Henschke (TAS)	P Henschke (TAS)	Revised following DPIE feedback
FINAL - 003	14/05/2019	K Trahair (TAS)	P Henschke	Revised following Boral feedback and approved by DPIE
V4.0	4/12/2019	Ben Williams Environmental Co-ordinator Dunmore	Rod Johnson Environmental Operation Manager (NSW/ACT)	Updated to incorporate Dunmore Concrete Batching Plant into the Management Plan

Contents

1. Introduction

The Dunmore Quarry (hereafter referred to as the Project) is located on Princess Highway at Dunmore, New South Wales (NSW). It is owned and operated by Boral Resources (NSW) Pty Ltd (Boral).

The Project has approval to produce up to 2.5 million tonnes of quarry products in a calendar year.

The latest modification (Modification 9) has been approved to extend the existing Croome Farm Pit by approximately 13.74 hectares (ha) to enable extraction within the "Croome West Pit".

This plan is based on information presented in the following documents:

- Environmental Assessment Dunmore Hard Rock Quarry Modification 9 Croome West Extension (EMM, 2017);
- Environment Protection Licence (EPL) 77; and,
- Development Consent DA 470-11-2003, (originally approved in September 2004 and subsequently modified).
- Dunmore Concrete Batching Plant DA No.0530/2018 issued by Shellharbour City Council
- Dunmore Concrete Batching Plant Production Increase Environmental Impact Statement (RPS 2018),
- Dunmore Quarry Air Quality Management Plan v3 as prepared by Todoroski Air Sciences

2. Air Quality Statutory Requirements

This plan has been prepared in accordance with the current DA 470-11-2003. The relevant air quality conditions are outlined below.

Schedule 3 Administrative Conditions

Operation of Plant and Equipment

12. The Applicant must ensure that all plant and equipment at the site, or used in connection with the development, are:

(a) maintained in a proper and efficient condition; and
(b) operated in a proper and efficient manner.

Compliance

13. The Applicant must ensure that all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.

Schedule 4 Specific Environmental Conditions

Air Quality

Impact Assessment Criteria

22. The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 7 at any residence on privately-owned land.

Table 7: Air Quality Impact Assessment Criteria

Pollutant	Averaging period	Criterion	
Particulate matter < 10 µm (PM10)	Annual	[a,d] 25 µg/m³	
Particulate matter < 10 µm (PM10)	24 hour	[b] 50 µg/m³	
Particulate matter < 2.5 µm (PM10)	Annual	[a,d] 8 µg/m³	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m³	
[c] Deposited dust	Annual	[b] 2 g/m²/month	[a,d] 4 g/m²/month

Notes:
a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.
c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

Management

23. The Applicant must:

(a) take all reasonable steps to minimise dust, fume and greenhouse gas emissions of the development;

(b) 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;

(c) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note d to Table 7 above); and

(d) minimise any visible off-site air pollution, to the satisfaction of the Secretary.

24. The Applicant must implement all reasonable and feasible measures to stabilise the surface of stockpiles of crusher fines to minimise wind-blown dust emissions, erosion and sedimentation.

Note: Fines are < 4mm in diameter.

Air Quality Management Plan

25. The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:

(a) be submitted to the Secretary for approval within 6 months of the determination of Modification 9, unless otherwise agree by the Secretary;

(b) describe the measures to be implemented to ensure:

- *compliance with the air quality criteria and operating conditions of this consent;*
- *best practice management is being employed; and*
- *the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;*

(c) describe the proposed air quality management system;

(d) include an air quality monitoring program that:

- *is capable of evaluating the performance of the development and informing day to day management decisions;*
- *includes a protocol for determining any exceedances of the relevant conditions of consent; and*
- *effectively supports the air quality management system.*

The Applicant must implement the approved Air Quality Management Plan as approved by the Secretary.

Meteorological Monitoring

26. For the duration of the development, the Applicant must ensure that there is a suitable meteorological station operating in close proximity to the site that:

(a) complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007) (as may be updated or replaced from time to time); and

(b) is capable of continuous real-time measurement of atmospheric stability category determined by the sigma theta method in accordance with the NSW Industrial Noise Policy (EPA, 2000), (as may be updated or replaced from time to time) unless a suitable alternative is approved by the Secretary following consultation with the EPA.

Schedule 4A Additional Procedures

Notification of Exceedances

As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any criteria in Schedule 4 the Applicant must:

(a) provide to any affected landowners and tenants; and,

(b) publish on its website the full details of the exceedance.

Any exceedance of any criteria in Schedule 4 is an incident that must be notified to the Department in accordance with condition 7 of Schedule 5 of this consent.

For any exceedance of the air quality criteria or air quality measures in Schedule 4, the Applicant must 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).

Independent Review

If a landowner considers the development to be exceeding the relevant criteria in Schedule 4, they may ask the Secretary in writing for an independent review of the impacts of the development on their land.

If the Secretary is satisfied that an independent review is warranted, within 2 months of the Secretary's decision, the Applicant must:

(a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:

- *consult with the landowner to determine their concerns;*
- *conduct monitoring to determine whether the development is complying with the relevant criteria in Schedule 3; and*
- *if the development is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria; and*

(b) give the Secretary and landowner a copy of the independent review; and

(c) comply with any written requests made by the Secretary to implement any findings of the review.

Schedule 5 Environmental Management, Monitoring, Auditing and Reporting

Management Plan Requirements

2. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:

(a) detailed baseline data;

(b) a description of:

- *the relevant statutory requirements (including any relevant approval, licence or lease conditions);*
- *any relevant limits or performance measures/criteria; and*
- *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;*

(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;

(d) a program to monitor and report on the:

- *impacts and environmental performance of the development; and*
- *effectiveness of any management measures (see (c) above);*

(e) 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;

(f) a program to investigate and implement ways to improve the environmental performance of the development over time;

(g) a protocol for managing and reporting any:

- *incidents;*
- *complaints;*
- *non-compliances with statutory requirements; and*
- *exceedances of the impact assessment criteria and/or performance criteria;*

(h) a protocol for periodic review of the plan; and

(i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of people who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.

Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Application of Existing Strategies, Plans or Programs

3A. The Applicant must continue to apply existing approved strategies, management plans, or monitoring programs that have most recently been approved under this consent, until the approval of a similar strategy, plan or program under this consent.

Updating & Staging Submission of Strategies, Plans or Programs

3. To ensure the strategies, plans or programs under this consent are updated on a regular basis, and that they incorporate any appropriate mitigation measures to improve the environmental performance of the development, the Applicant may at any time submit revised strategies, plans or programs to the Secretary for approval. With the agreement of the Secretary, the Applicant may also submit any strategy, plan or program required by this consent on a staged basis.

With the agreement of the Secretary, the Applicant may revise any strategy, plan or program approved under this consent without consulting with all the parties nominated under the applicable conditions of consent.

Notes:

- *While any strategy, plan or program may be submitted on a staged basis, the Applicant will need to ensure that the existing operations associated with the development are covered by suitable strategies, plans or programs at all times.*

- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage/s of the development to which the strategy, plan or program applies; the relationship of this stage/s to any future stages; and the trigger for updating the strategy, plan or program.*

Revision of Strategies, Plans & Programs

4. Within 3 months of the submission of an:

(a) incident report under condition 7 below;

(b) Annual Review under condition 9 below;

(c) audit report under condition 10 below; and

(d) any modifications to this consent,

the Applicant must review, and if necessary revise, the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the development.

Adaptive Management

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 4. 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:

(a) take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;

(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and

(c) implement remediation measures as directed by the Secretary,

to the satisfaction of the Secretary.

Reporting

Incident Reporting

7. The Applicant must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Applicant must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. 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.

Annual Review

9. By the end of September each year, or other timing as may be agreed by the Secretary, the Applicant must submit a report to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must:

(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 the:

- *relevant statutory requirements, limits or performance measures/criteria;*
- *requirements of any plan or program required under this consent;*
- *monitoring results of previous years; and*
- *relevant predictions in the documents listed in condition 2 of Schedule 3;*

(c) identify any non-compliance over the last financial year, and describe what actions were (or are being) taken to ensure compliance;

(d) identify any trends in the monitoring data over the life of the development;

(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

(f) describe what measures will be implemented over the current financial year to improve the environmental performance of the development.

The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 6 of Schedule 5) and any interested person upon request.

Independent Environmental Audit

10. Prior to 1 April 2017, and every three years thereafter, unless the Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:

(a) be conducted by suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;

(b) include consultation with the relevant agencies and the CCC;

(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 Licences (including any assessment, plan or program required under these approvals);

(d) review the adequacy of any approved strategies, plans or programs required under the abovementioned approvals;

(e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any assessment, plan or program required under the abovementioned approvals; and

(f) be conducted and reported to the satisfaction of the Secretary.

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

11. Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report.

Access to Information

12. By 31 December 2016, unless otherwise agreed by the Secretary, the Applicant must:

(a) make the following information publicly available on its website:

- *the documents listed in condition 2 of Schedule 3;*
- *current statutory approvals for the development;*
- *approved strategies, plans or programs required under the conditions of this consent;*
- *a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;*
- *a complaints register, updated quarterly;*
- *the Annual Reviews (over the last 5 years);*
- *any independent environmental audit, and the Applicant's response to the recommendations in any audit;*
- *any other matter required by the Secretary; and*

(b) keep this information up-to-date,

to the satisfaction of the Secretary.

The Dunmore Concrete Batching Plant has the following conditions relating to air quality within Development Application No. 0530/2018 Lot 3, DP 1030504, 36-38 Tabbitta Road, Dunmore

Air Quality

22. Prior to production at the concrete batching plant increasing to over 30,000 tonnes per annum,

an Air Quality Management Plan must be prepared by a suitably qualified air quality professional to address the proposed increased production. The plan must recommend control measures and procedures required to meet criteria set out in the NSW EPA (2017) Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales for the following parameters:

- *Total Suspended Particulates (TSP);*
- *Particulate Matter (PM10 and PM2.5); and,*
- *Deposited Dust (DD).*

Management actions included within the plan must include measures regarding air quality as listed in Table 28 of the Dunmore Concrete Batching Plant Production Increase Environmental Impact Statement (RPS 2018), including but not limited to:

- *Paved areas must be kept clean;*
- *Water carts must be used on all unpaved roads;*
- *Agitators must continue to be loaded in a semi-enclosed area with curtains around the*
- *vehicle;*
- *Cement and other admixtures must be kept in a closed system, fitted with dust extraction; and*
- *Aggregate bins and stockpiles must be well bunded.*
- *Excess aggregate must be stored in aggregate storage bins, enclosed on three sides to control airborne dust;*
- *The filter vent pipes within the storage silos must be maintained so that the cleaned*
- *conveying air is disposed of at one metre above ground level; and,*
- *Any dust generated by the dry materials being batched into the transit mixed must be*
- *suppressed by water sprays.*

2.1. Summary of Consultation with EPA

On 18 July 2018 Boral met with the EPA in its Wollongong office to discuss an outline of the proposed real time air quality monitoring program. To summarise:

- EPL 77 will be updated in a transitional way. It is likely that deposited dust gauges will remain a licence condition until the real-time monitoring system is in place and working effectively. It is likely that a new licence condition will be added which will require a TARP with the actual values and associated detail sitting outside the EPL.

- The EPA was satisfied that four monitoring locations would provide adequate coverage of the upwind and downwind directions. The number of monitoring locations may be changed

over time depending on operational changes, monitoring results and/or future incorporation of Dunmore Sand and Soil operations.

- Of greater concern to the EPA were the management responses to triggers rather than the trigger values themselves. It was agreed that trigger actions may evolve overtime following the implementation and operation of the real-time monitoring system based on site observations and analysis of data.

3. Air Quality Monitoring Network

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.

The Project's existing air quality monitoring network currently consists of four deposited dust gauges, one HVAS monitor and an on-site metrological station.

Boral intends to replace the deposited dust gauges with a series of portable real-time particulate monitors which simultaneously measure TSP, PM_{10} and $PM_{2.5}$ size fractions to allow effective real-time reactive management of the Project. Real-time monitors will be situated at upwind/downwind locations to enable a quantifiable assessment of the relative particulate contribution downwind from quarry operations.

During the transitional phase of moving to real-time monitoring, the use of gravimetric dust gauges will be continued at the pre-existing monitoring locations to help assess the effectiveness of the new monitoring network. This will also ensure compliance under the existing EPL and consented limits within Condition 22 of the consent. After a period of review and consultation with the EPA and DPE it is expected that EPL 77 and Condition 22 of DA 470-11-2003 will be updated as per the arrangements discussed in Section 2.1.

3.1. Existing Monitoring Locations

Figure 1 presents a summary of the current monitoring network including the deposited dust gauges (marked in purple), HVAS and weather station.

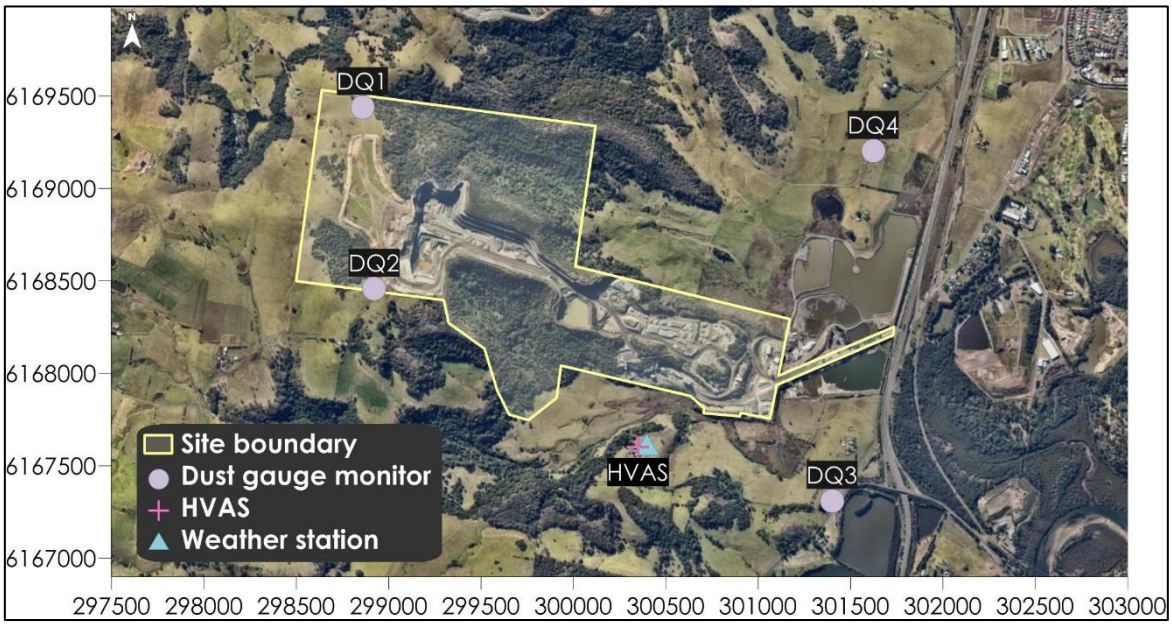

Figure 1 Location of Existing Monitoring Points

3.2. Baseline Data

3.2.1. Local Climatic Conditions

Long-term climatic data from the Bureau of Meteorology (BoM) weather station at Albion Park (Wollongong Airport) (Site No. 068241) were used to characterise the local climate in proximity of the Project. The Albion Park (Wollongong Airport) Automatic Weather Station (AWS) is located approximately 4.5 kilometres (km) north-northwest of the Project.

Table 1 and Figure 2 and present a summary of data from the Albion Park (Wollongong Airport) AWS collected over an approximate 11 to 20 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 (ºC) and July as the coldest month with a mean minimum temperature of 6.2ºC.

The average annual rainfall is 909.6 millimetres (mm) over 79.8 days. The data indicate that February is the wettest month with an average rainfall of 140.5mm over 8.6 days and September is the driest month with an average rainfall of 42.4 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 1 Average Monthly Weather Data

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Temperature													
Mean max. temp. (°C)	27.0	26.3	25.3	23.3	20.6	18.1	17.7	18.8	21.4	23.0	24.0	25.6	22.6
Mean min. temp. (°C)	16.9	17.1	15.6	12.2	8.8	7.2	6.2	6.5	8.5	10.8	13.4	15.3	11.5
Rainfall													
Rainfall (mm)	72.9	140.5	122.3	73.8	55.8	93.7	49.0	53.5	42.4	66.7	83.5	66.1	909.6
No. of rain days	8.1	8.6	7.9	7.1	4.7	6.4	4.6	4.4	5.1	6.8	8.1	8.0	79.8
9am conditions													
Mean temp. (°C)	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
Mean R.H. (%)	68	74	76	68	69	73	68	61	57	58	67	66	67
Mean W.S. (km/h)	11.6	9.8	8.1	10.7	12.4	13.6	14.4	15.0	15.3	14.4	12.9	12.7	12.6
3pm conditions													
Mean temp. (°C)	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
Mean R.H. (%)	63	67	64	61	58	57	54	49	53	58	63	61	59
Mean W.S. (km/h)	21.6	20.0	18.9	17.7	17.1	17.6	18.1	21.8	22.6	20.9	20.9	21.5	19.9

Source: **Bureau of Meteorology (January 2019)**

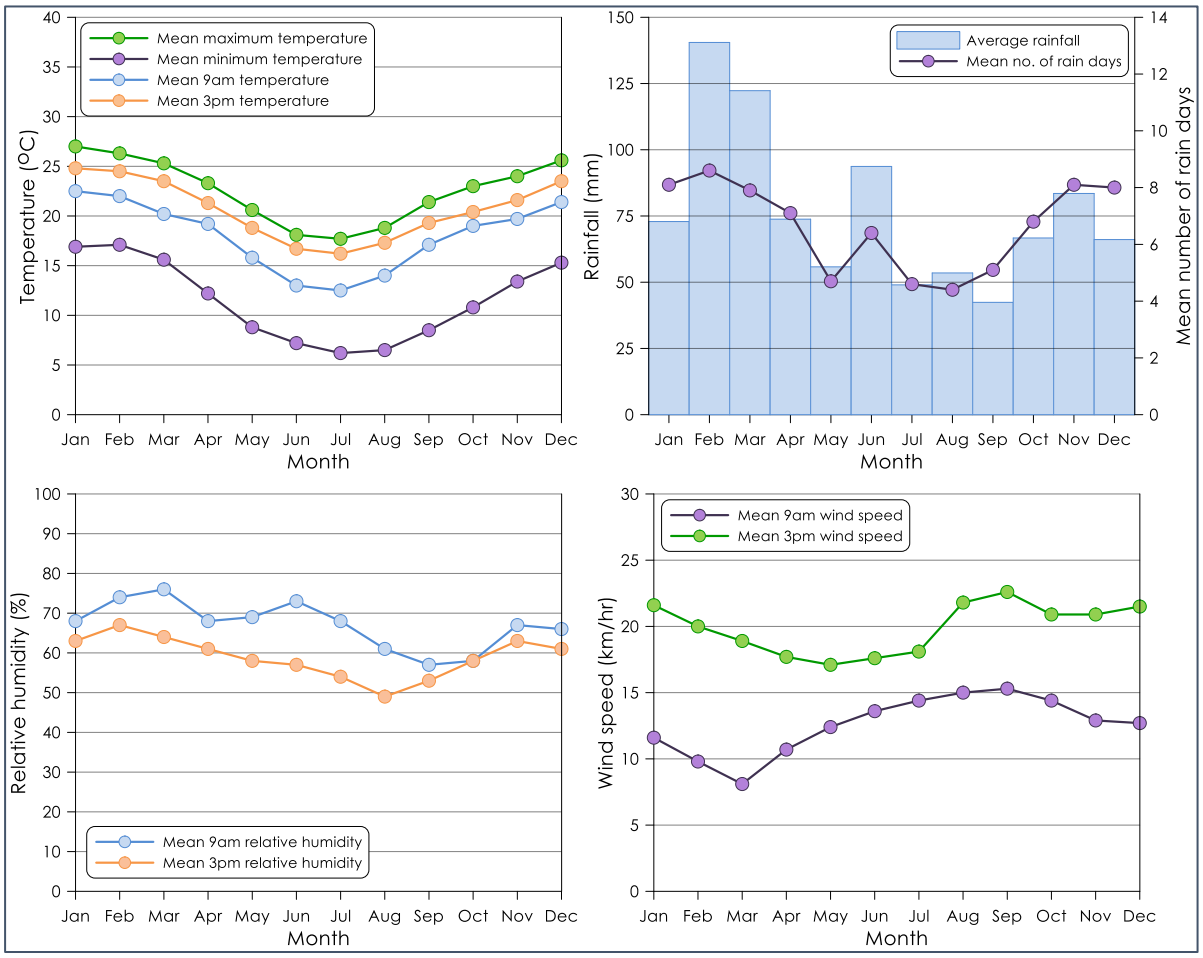

Figure 2 Average Weather Data Albion Park

3.2.2. 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 2014-2018 years are presented in Figure 3.

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.

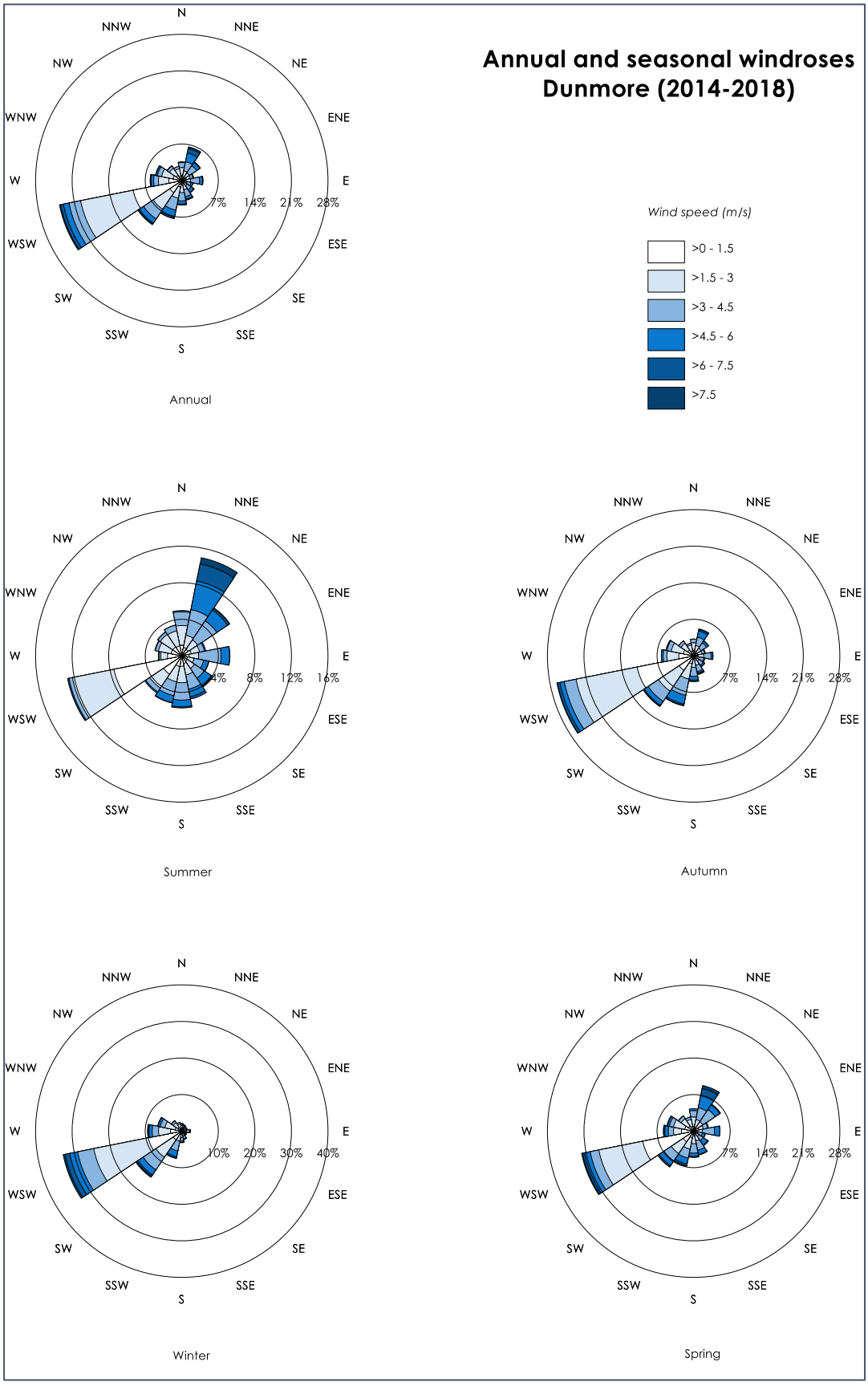

Figure 3 Seasonal Wind Roses

3.2.3. Local Air Quality

3.2.3.1. OEH monitoring data

Available data from the Albion Park South station operated by the NSW Office of Environment and Heritage (OEH) can be used to quantify the baseline air quality in the vicinity of the Project.

The NSW OEH air quality monitoring station at Albion Park South is located approximately 3.5km northwest of the Project site.

A summary of the available PM_{10} data from the Albion Park South monitoring site is presented Table 2. A review of Table 2 indicates that the annual average PM_{10} and $PM_{2.5}$ concentrations at Albion Park South were below the relevant criterion of 50µg/m^3 and 25µg/m^3 respectively.

The table shows that the maximum 24-hour average PM_{10} concentrations recorded at Albion Park South were above the relevant criterion of 50µg/m^3 in 2018 on two occasions (days). The maximum 24-hour average $PM_{2.5}$ concentrations recorded at Albion Park South were above the relevant criterion of 25µg/m^3 in 2016 and 2018 for two and one occasions respectively.

Table 2 Summary of PM_{10} and $PM_{2.5}$ levels from Albion Park South station (µg/m^3)

Year	PM_{10}	$PM_{2.5}$
Annual average		
2014	16.2	-
2015	14.0	6.4
2016	14.9	7.2
2017	15.3	6.6
2018	17.8	6.8
Maximum 24-hour average (number of days above criteria)		
2014	48.3 (0)	-
2015	41.2 (0)	21.1 (0)
2016	43.1 (0)	**30.7** (2)
2017	44.6 (0)	19.3 (0)
2018	**94.4** (2)	**29.4** (1)

Recorded 24-hour average PM_{10} and $PM_{2.5}$ concentrations are presented in Figure 4 and Figure 5 respectively. Generally 24-hour PM_{10} concentrations are higher during the summer months and lower in the wintertime, a common trend in most rural locations.

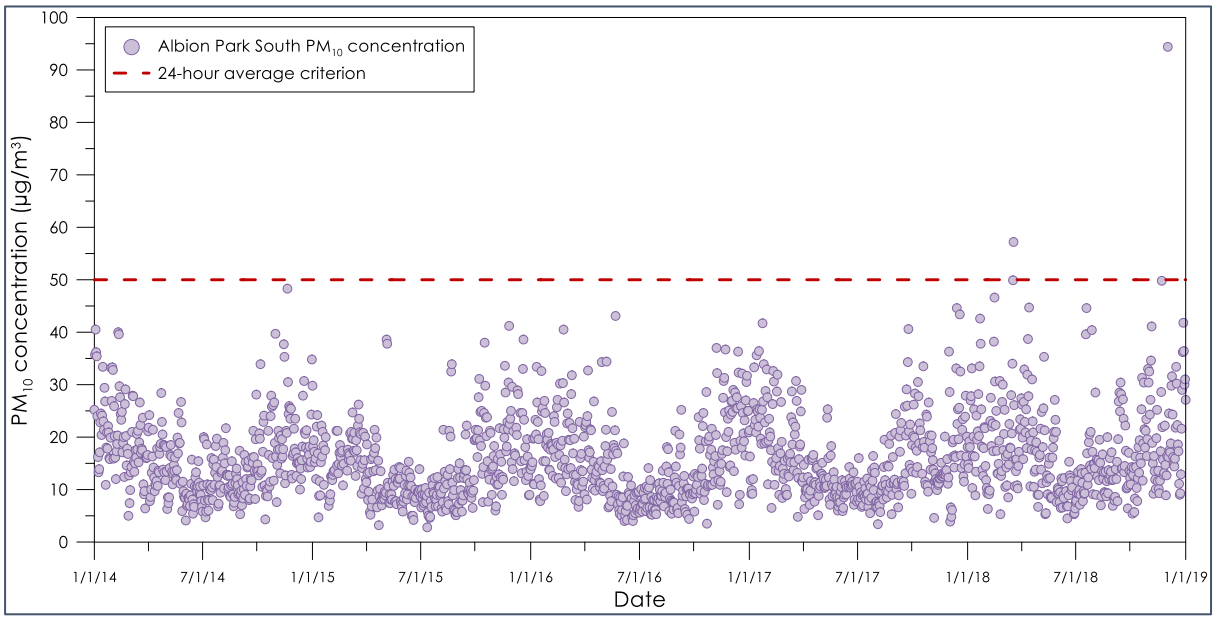

Figure 4 Albion Park South PM_{10} data (2015-2018)

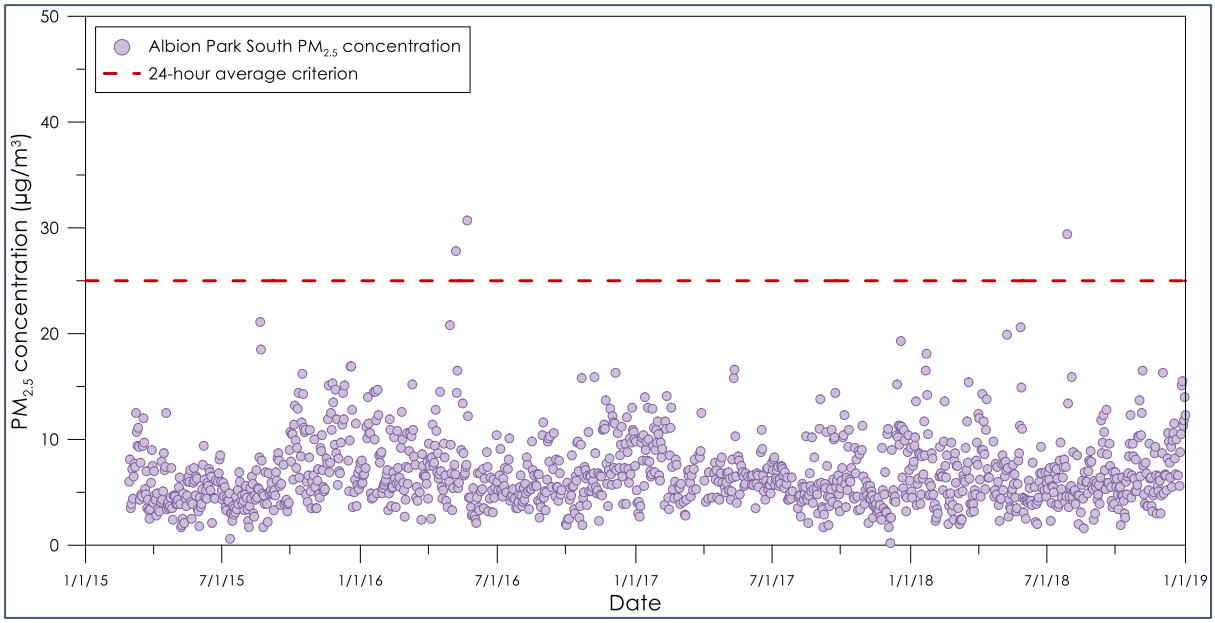

Figure 5 Albion Park South $PM_{2.5}$ data (2015-2018)

3.2.3.2. HVAS monitoring

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

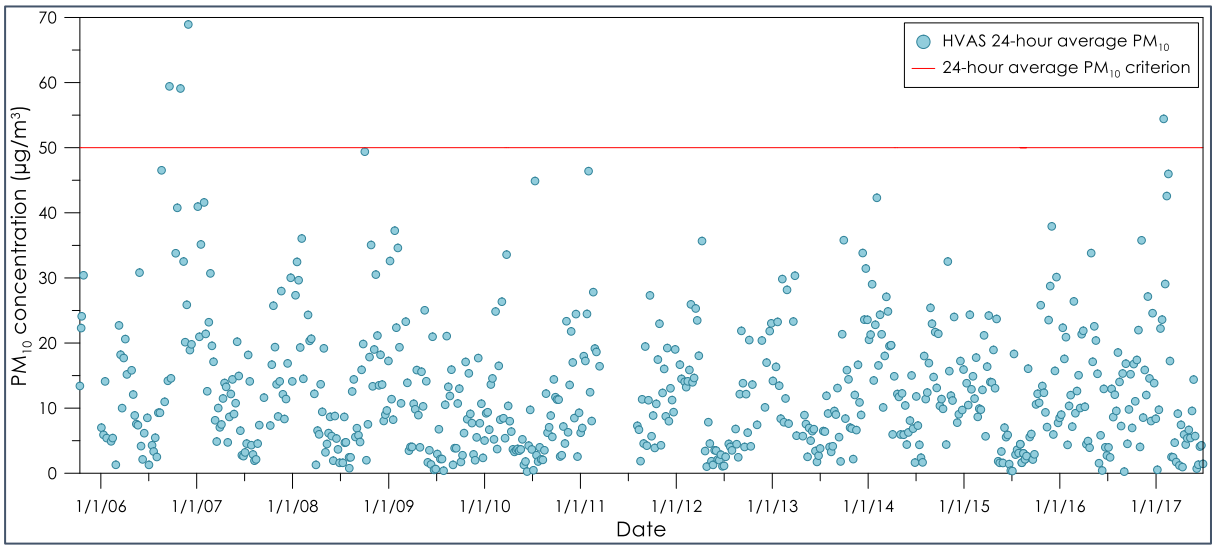

Figure 6 HVAS PM_{10} data (13/5/2005 – 29/6/2017)

3.2.3.3. Deposited dust monitoring

The current dust depositional monitoring locations are shown in Figure 1. Table 3Error! Reference source not found. presents a summary of the long-term annual average deposited dust data which includes the insoluble solids fraction and the ash fraction of the deposited dust sample.

The table indicates that the insoluble solids fraction are above the annual average criterion of 4g/m^2/month in some years at one or more of the monitors but were below 4g/m^2/month for the ash fraction of the deposited dust sample in all years with the exception of DQ3 in 2015/16 due to the monitors location in the immediate vicinity to adjacent Dunmore Sand and Soil Stage 3 extraction footprint. In 2016 DQ3 was relocated further south into its current position shown in Figure 1.

Table 3 Summary of annual average deposited dust data (g/m^2/month)

Year	DQ1		DQ2		DQ3		DQ4	
	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash	Insoluble Solids	Ash
2002/2003	2.99	1.84	2.92	1.85	3.64	2.24	3.16	1.91
2003/2004	3.19	2.02	3.29	1.64	3.52	2.41	3.35	2.38
2004/2005	3.48	2.21	3.17	1.68	4.90	2.78	3.77	2.20
2005/2006	5.85	2.66	4.48	1.67	4.85	2.22	3.90	1.92
2006/2007	5.40	2.13	3.13	1.84	4.11	2.08	5.32	2.69
2007/2008	3.26	1.67	2.37	1.30	3.89	2.90	5.55	3.17
2008/2009	6.60	2.63	3.01	2.10	3.12	2.17	2.71	1.66
2009/2010	3.82	2.30	3.48	1.75	5.02	3.49	2.55	1.77
2010/2011	3.35	1.43	3.28	2.18	3.43	2.09	2.53	1.60
2011/2012	3.74	1.92	3.28	1.70	5.03	3.44	2.75	1.81
2012/2013	3.73	1.65	2.61	1.65	5.87	3.60	3.36	2.36
2013/2014	7.57	3.30	3.63	1.79	4.61	3.28	3.20	2.00
2014/2015	4.40	1.99	2.38	1.44	5.70	3.37	3.10	1.98
2015/2016	5.75	2.09	3.12	1.77	7.20	4.45	3.01	1.84
2016/2017	2.20	1.42	4.52	2.74	2.28	1.56	2.01	1.30

A deposited dust sample is non-discriminate and the surrounding land use in the vicinity of the monitors is predominately farmland and/or wetlands. As a result, there is potential for organic material not associated with quarry activities such as, vegetation, bird droppings and dead insects to contribute to the insoluble solids fraction of the sample. The quarry produces non-combustible latite and assessing the ash fraction is used as a means to minimise some of the influences on the deposited dust sample from the combustible organic material mentioned above. A comparison of the ash fraction of the dust sample provides an indication of potential quarry contribution if these external contaminants were absent from the sample

3.3. 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.

3.3.1. Deposited dust

Deposited dust is assessed as insoluble solids as defined by Standards Australia AS/NZS 3580.10.1:2016: "Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric Method". The sampling period for a dust gauge is approximately a month (30 days ±2). A NATA accredited analytical laboratory conducts gravimetric analysis of the material collected in the gauge to determine the total insoluble matter in $g/m^2/month$.

3.3.2. HVAS

A High Volume Air Sampler (HVAS) is used to measure PM_{10} concentrations in the ambient air. HVAS monitoring is conducted every 6 days for a 24-hour monitoring period. A NATA accredited analytical laboratory conducts gravimetric analysis of the filter papers to determine the PM_{10} level.

3.3.3. Real-time monitoring

A DustTrak is a light scattering laser photometer monitor that can be used to continuously measure concentrations of particulates including TSP, PM_{10} and $PM_{2.5}$ 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**).

3.4. Transition phase for monitoring network

The real-time monitoring network for the Project is proposed to eventually replace the deposited dust and HVAS monitoring. A transition phase would occur with an overlap of real-time monitoring and deposited dust and HVAS monitoring.

During the transition phase, the existing HVAS monitor would continue to be operated and be used to validate real-time monitoring network, as outlined in **Section 3.5**.

The transition phase is expected to occur over an approximate a six month period and would allow for sufficient time to validate real-time monitoring network with the HVAS. During the transition phase, the existing deposited dust network and HVAS will be used to assess the compliance of the project. After the transition phase is complete, Boral will decommission the deposited dust network and HVAS.

An indicative timeline for the transition phase is outlined in Figure 7.

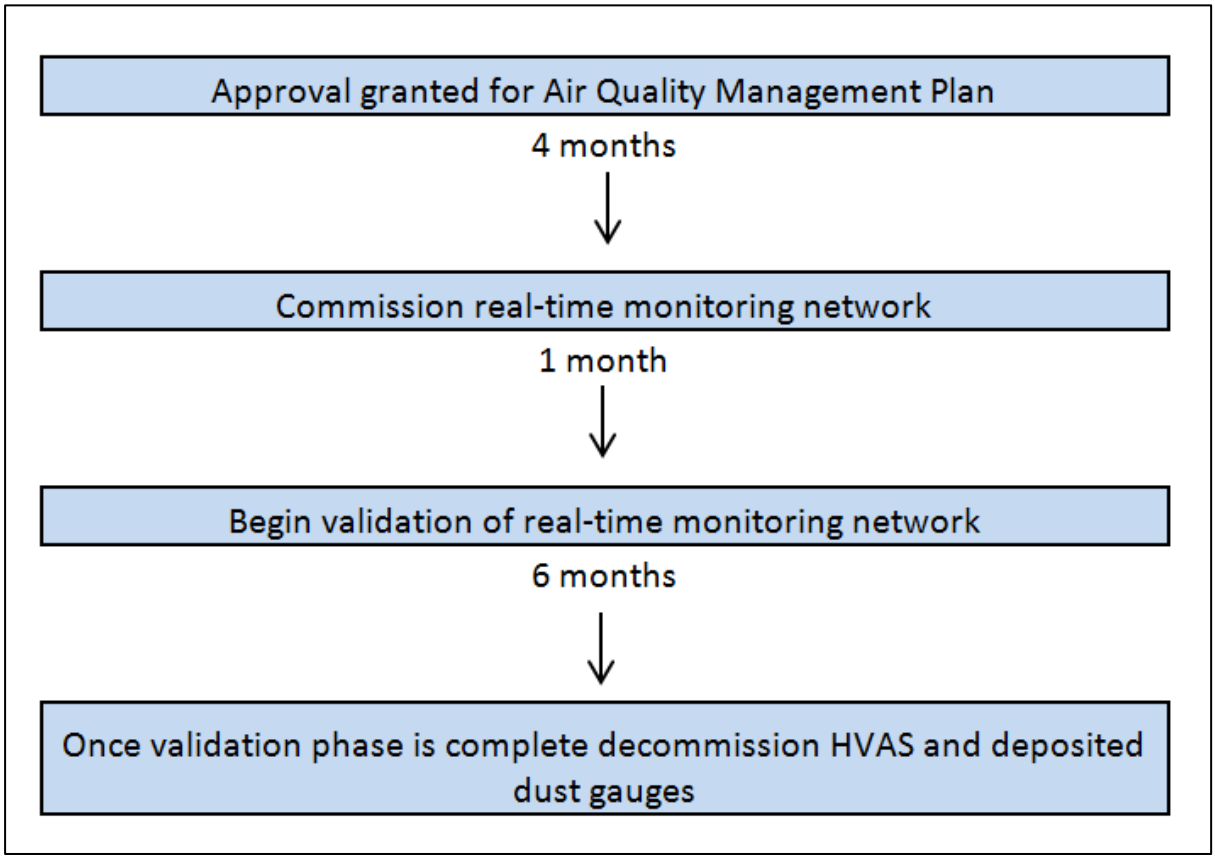

Figure 7 Timeline for transition phase for monitoring network

3.5. Real-time monitor validation procedure

Prior to installation, all of the DustTrak monitors would be calibrated against the existing HVAS monitor to determine a k-factor for each machine. How to input the k-factor into the settings of the instrument is detailed in the operation manual for the DustTrak monitor.

The DustTrak monitors are to be sited in close proximity to the HVAS monitor. The HVAS monitor is to be run for five consecutive 24-hour periods (including one formal 6th monitoring day from midnight to midnight), changing the filter paper after each 24-hour interval. The non-formal run days would need the filter paper changed nominally 30-60 minutes later each day, allowing for a full 24-hour average value to be measured by both the HVAS and DustTraks to determine the appropriate k-factor.

The DustTrak monitors are to be calibrated against the HVAS regularly. A specific DustTrak instrument co-located with the HVAS can be rotated as required.

3.6. Proposed monitoring locations

Table 4 presents the position coordinates for the proposed air quality monitoring sites and Error! Reference source not found. shows the proposed locations relative to the quarry.

The DustTrak monitors measure $PM_{2.5}$, PM_{10} and TSP, and would replace the existing dust gauges.

The proposed monitor locations have been configured based on the dominant wind trends to capture both upwind and downwind levels relative to the quarry and allow for the quantification of dust levels leaving the site towards receptors, in the event of any observable dust or for complaint investigation. It is noted that consideration has also been given to the Dunmore Sand & Soil monitoring network when selecting these locations, to ensure compatibility between the two activities.

The DustTrak monitor locations may be modified as required for effective management purposes.

Table 4 Proposed air quality monitoring locations

Monitor	Easting	Northing	Parameter	Status
HVAS	300350	6167601	PM_{10}	Existing
DustTrak DT1	298632	6169400	TSP, PM_{10}, $PM_{2.5}$	Proposed
DustTrak DT2	298489	6168383	TSP, PM_{10}, $PM_{2.5}$	Proposed
DustTrak DT3	300350	6167601	TSP, PM_{10}, $PM_{2.5}$	Proposed
DustTrak DT4	301623	6169204	TSP, PM_{10}, $PM_{2.5}$	Proposed

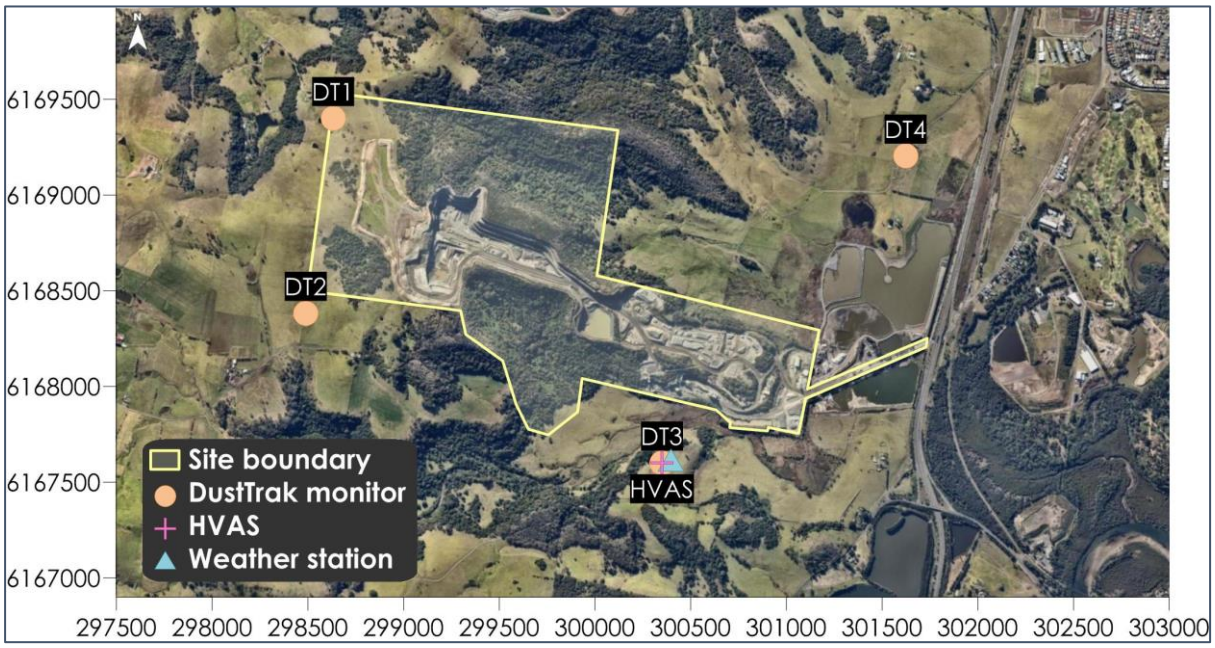

Figure 8 Proposed monitoring locations

3.7. Meteorological monitoring

The meteorological parameters that the weather station monitors are outlined in Table 5.

Table 5 Meteorological monitoring parameters

Parameter	Units of measure	Sample frequency	Averaging period	Method
Wind speed at 10m	m/s	Continuous	15 minute	AM-2
Wind direction at 10m	Degrees	Continuous	15 minute	AM-2
Sigma Theta at 10m	Degrees	Continuous	15 minute	*
Temperature at 2m	Kelvin	Continuous	15 minute	AM-4
Temperature at 10m	Kelvin	Continuous	15 minute	AM-4
Rainfall	mm/hr	Continuous	15 minute	AM-4

*The atmospheric stability category is to be determined by the sigma theta method in accordance with the NSW Noise Policy for Industry (EPA, 2017), (as may be updated or replaced from time to time).

3.8. Data reporting

As per Schedule 5 Condition 9, air quality monitoring results are to be reported in the Project's Annual Review. Each year, the results of the air quality monitoring program are analysed and presented with reference to the prevailing meteorological data and concurrent site activities. The Annual Review compares the monitoring results with the relevant criteria, examines the long-term monitoring results and predictions made in the Environmental Assessment (EA).

In accordance with Schedule 5 Conditions 8 and 12, a summary of the air quality monitoring results is made publicly available on the Project's website.

4. Air Quality Controls and Management Procedures

Past measurements of deposited dust, along with an evaluation of wind data, indicate Dunmore Quarry is not a major contributor to local deposited dust levels. The high density of the latite extracted and processed at the quarry means that any dust generated by the quarry settles out quickly near its source. Dust control measures are employed by the quarry to take reasonable and practicable measures to prevent and minimise excessive generation of dust emissions which may affect the surrounding environment.

To ensure that dust 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 would be utilised, as set out below.

4.1. Dust emission sources

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

- Drilling and blasting of material;
- 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.

4.2. Dust 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 receptors and in the surrounding environment.

4.2.1. 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, temperatures are above 38 degrees Celsius and wind speeds are above 8m/s blowing towards the sensitive receptors (15 minute average); and,

- Visual surveillance of dust plumes from all activity, at least daily by Site Manager or supervisors.

4.2.2. Wind erosion of exposed areas and stockpiles

- The area of exposed surfaces should 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 such as crusher fines stockpiles should 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. A final application of water at the end of the day may be needed under hot and windy conditions;

- Dusty material stockpiles should be located as far away from sensitive receptors as possible; and,

- Ancillary vehicles should be kept within active, controlled areas, and off other exposed or inactive areas to avoid potential additional disturbance of these surface in these areas.

4.2.3. Handling of material

- When loading and unloading material, the drop height of the material should be minimised as far as is practical, for example the front end loader should 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 should “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 8m/s) and winds blowing towards the sensitive receptors, the material handling activities should be minimised or ceased when excessive visible plumes of dust cannot be abated and a visible plume of dust reaches over the site boundary.

4.2.4. Drilling and blasting

- All drill rigs equipped with dust suppression/filtration systems;
- Inspection of drill dust suppression systems to ensure they are fully operational before use; and,
- Review of blast management procedures prior to blasting.

4.2.5. Bulldozer operations

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

4.2.6. Material processing

- Water sprays used on crushers and screens;
- Overloading of the crushers and screens should be prevented to avoid spillage;
- Water sprays on plant hopper; and,
- Water sprays on conveyor transfer points.

4.2.7. Vehicle movement and hauling materials

- Haul roads should 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 should be restricted to designated routes that can be managed by regular watering;

- To minimise mud or dirt track out onto public roads, vehicles are to 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 should be secured and covered when transporting materials on or off-site. The exposed surface of dusty materials in trucks may also be watered if necessary;
- Site speed limits (<40km/hr) are to be enforced;
- Materials should be loaded onto vehicles in a uniform, level manner and not able to spill from the vehicle; and,
- The number of trips should be minimised by maximising the vehicle load (but not overloading).

4.2.8. Engine exhaust of vehicles and plant

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

4.2.9. Dunmore Concrete Batching Plant

The Dunmore Concrete Batching Plant DA 530/2018 outlines a list of air quality management procedures which are undertaken at the DCBP these are listed in Table 28 of the Dunmore Concrete Batching Plant Production Increase Environmental Impact Statement (RPS 2018), including but not limited to:

- Paved areas must be kept clean;
- Water carts must be used on all unpaved roads;
- Agitators must continue to be loaded in a semi-enclosed area with curtains around the vehicle;

- Cement and other admixtures must be kept in a closed system, fitted with dust extraction;
- Aggregate bins and stockpiles must be well bunded.
- Excess aggregate must be stored in aggregate storage bins, enclosed on three sides to control airborne dust;
- The filter vent pipes within the storage silos must be maintained so that the cleaned conveying air is disposed of at one metre above ground level; and,
- Any dust generated by the dry materials being batched into the transit mixed must be suppressed by water sprays

4.3. Reactive management

The air quality monitoring network is used to inform reactive management of the Project. Table 6 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 would be developed over time.

Reactive controls may include operational measures such as scheduling certain operations during favourable meteorological conditions or to alternative areas and may, in extreme cases, require all dust generating activities to cease operations. Appropriate actions should 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 6 Trigger Action Response Plan

Trigger level	Trigger	Response
1 – Alert level	• 1-hour average $PM_{2.5}$ >25 µg/m^3 where monitor is downwind of quarry • 1-hour average PM_{10} >50 µg/m^3 where monitor is downwind of quarry	• Check forecast for that day • Identify potential operational risk areas • Notify operational managers to be on alert

2 – Remedial action level	• Rolling 24-hour average PM_{10} >50 µg/m^3 for 3 consecutive hours • 1-hour average PM_{10} >150 µg/m^3 where monitor is downwind of quarry • Rolling 24-hour average $PM_{2.5}$ >25 µg/m^3 for 3 consecutive hours • 1-hour average $PM_{2.5}$ >75 µg/m^3 where monitor is downwind of quarry	• Increase watering • Where possible relocate dust generating activities away from downwind receptors • Reduce haul distances where possible
3 – Action level	• Rolling 24-hour average PM_{10} >50 µg/m^3 for 6 consecutive hours • 1-hour average PM_{10} >150 µg/m^3 where monitor is downwind of quarry for 3 consecutive hours • Rolling 24-hour average $PM_{2.5}$ >25 µg/m^3 for 6 consecutive hours • 1-hour average $PM_{2.5}$ >75 µg/m^3 where monitor is downwind of quarry for 3 consecutive hours	• 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.

4.4. Assessing compliance

4.4.1. Performance criteria

Table 7 presents the relevant air quality impact assessment criteria as per Schedule 4 Condition 22. Boral must ensure that particulate matter emissions generated by the Project do not cause exceedances of the air quality impact assessment criteria at any residence on privately-owned land.

Air quality monitoring network data recorded at locations representative of residences on privately-owned land are assessed against the impact assessment criteria to evaluate the performance of the Project.

Table 7 Air Quality Assessment Criteria

Pollutant	Averaging period	Criterion	
Particulate matter < 10 µm (PM_{10})	Annual	[a,d] 25 µg/m³	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m³	
Particulate matter < 2.5 µm (PM_{10})	Annual	[a,d] 8 µg/m³	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m³	
[c] Deposited dust	Annual	[b] 2 g/m²/month	[a,d] 4 g/m²/month

[a] Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
[b] Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.
[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

4.4.1.1. Protocol for determining exceedances

Where monitoring results meet or are below the relevant criteria in Table 7, no further action is needed, and the recorded results are reported as compliant.

Where monitoring results are above the levels indicated in Table 7 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.

4.4.2. Incident notification and reporting

Any exceedance of the criteria in Table 7 is an incident that must be immediately notified to the Secretary and any other relevant agencies.

Within 7 days of the date of the incident, Boral must 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 must:

- 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 must 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).

4.4.3. Independent review

If a landowner considers the development to be exceeding the relevant criteria in Table 7, they may ask the Secretary in writing for an independent review of the impacts of the development on their land.

If the Secretary is satisfied that an independent review is warranted, within 2 months of the Secretary's decision, Boral must:

- commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
- consult with the landowner to determine their concerns;
- conduct monitoring to determine whether the development is complying with the relevant criteria; and
- if the development is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria;
- give the Secretary and landowner a copy of the independent review; and

- comply with any written requests made by the Secretary to implement any findings of the review.

4.4.4. Future approach to assessing compliance

- Currently approved methods for determining compliance using deposited dust bottles and HVAS outlined in **Section** Error! Reference source not found. do not allow for any adjustment of operational activity in response to elevated dust levels. The EPA desires that real-time monitoring is undertaken to facilitate a more pro-active approach to dust management as described in **Section** Error! Reference source not found..

- The current monitoring network will be retained at the present time during the transitional phase to assess the compliance status of the operations as described in **Section 4.4.1** However after the transitional phase is complete Boral intends to decommission the deposited dust gauges and HVAS.

- The EPA have already indicated that it is likely that a new licence condition will be added to the EPL which will require a TARP, with the actual trigger values and associated detail sitting outside of the EPL.

4.5. Adaptive management

Where the compliance evaluation indicates an exceedance with the air quality criteria the following actions will be undertaken at the earliest opportunity to the satisfaction of the Secretary:

- Identify activities occurring during non-compliance;
- Determine the most likely source of the emissions;
- Review the existing process and current dust controls;
- Take all reasonable and feasible measures to ensure that the exceedance ceases;
- Consider all reasonable and feasible options for remediation (where relevant) to ensure that the exceedance does not reoccur and submit a report to the Department of Planning and Environment describing those options and any preferred remediation measures or other course of action; and,
- Implement remediation measures as directed by the Secretary.

- Adaptive management may involve supplementary monitoring to identify the source of the non-compliance, or may involve modification of activities to avoid any recurrence or minimise its adverse effects.

4.6. Contingency plan

This following contingency plan is used 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.

Table 8 is to be implemented in the event that unpredicted or unforeseen air quality impacts are identified.

Table 8 Contingency Plan

Step	Procedure
1	Review the unpredicted impact with consideration of any relevant activities and monitoring data
2	Identify the most likely source of the unpredicted impact
3	Review the existing process and current dust controls
4	Implement appropriate mitigation measures

4.7. Roles and responsibilities

Management roles and responsibilities are listed in Table 9.

Table 9 Staff Roles and Responsibilities

Role	Responsibility
General Manager	• Provide sufficient resources to manage dust related risks and to progress opportunities for improvement. • Identify and allocate sufficient resources to manage dust related risks by supporting AQMP implementation.
On-site Manager	• Oversee the implementation, monitoring and review of the AQMP in accordance with applicable requirements. • Record, investigate and respond to dust related incidents and complaints in accordance with complaint and incident management procedures. • Periodically assess dust management performance (annually and whenever a process change is put in place).

Role	Responsibility
	• Provide training to employees and contractors for the implementation of dust management related controls, systems and procedures. • Implement, monitor and review programs, systems and procedures linked to dust management.
Employees and Contractors	• Conduct work activities within training and induction parameters. • Immediately reporting incidents and complaints to the Site Supervisor.

4.8. Training

Boral will provide training commensurate with the roles and responsibilities of personnel outlined in Table 9.

Staff training implemented at the site with respect to dust management includes the following:

- Awareness of the consent conditions relevant to their respective activities;
- Site familiarisation inductions provided to all new employees and contractors;
- General environmental awareness provided to all employees and contractors; and,
- Issue specific training sessions provided to employees and contractors as required.

4.9. Complaints protocol

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.
- The complaints register will document the following information of each complaint:

- Date and time complaint was lodged;
- Method by which the complaint was made;
- Details of complainant (if provided);
- Nature of the complaint;
- Likely cause of the complaint;
- Action taken and reasoning behind action; (if no action was taken, the reasoning behind no action); and

- Follow up with the complainant.
  - The complainant will be advised of any actions implemented or proposed and their feedback sought in this regard.

The complaint record will be kept for at least five years after the complaint was made, and a summary of complaints, their causes and corrective actions each financial year shall be provided in the Annual Review.

The complaints register is to be made publicly available via the Project website and is to be updated quarterly.

4.10. Annual review reporting

As per Schedule 5 Condition 9 an annual review (financial year) is submitted to the Department of Planning and Environment, who review the environmental performance of the Project, by the end of September each year, or as otherwise agreed by the Secretary.

The annual review is also to be submitted to Council, be available to the Community Consultative Committee and any interested person upon request. Annual review reports from the latest five years are publicly available on the Project website.

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.

The annual review report is to include the following:

- A description of 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;
- 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 the:
    - relevant statutory requirements, limits or performance measures/criteria;
    - requirements of this plan;
    - monitoring results of previous years; and
    - relevant predictions in the Environmental Assessment report;
- Identification of any non-compliance over the last financial year, and description of what actions were (or are being) taken to ensure compliance;
- Identification of any trends in the monitoring data over the life of the development;
- Identification of any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
- A description of what measures will be implemented over the current financial year to improve the environmental performance of the development.

4.11. Independent environmental audit

As per Schedule 5 Condition 10 of the Consent, an independent environmental audit is to be conducted every three years unless otherwise directed by the Secretary.

The audit must be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary.

The independent environmental audit is to include the following to the satisfaction of the Secretary:

- Consultation with the relevant agencies and Community Consultative Committee;
- An assessment of the environmental performance of the Project and whether it is complying with the relevant consent requirements and any relevant EPL requirements;

- A review of the adequacy of this plan; and
- Recommendations of appropriate measures or actions to improve the environmental performance of the Project.

Any independent environmental audit, and response to the recommendations in any audit are to be submitted to the Secretary and any other NSW agency that requests it within 12 weeks of the audit commencement. Audits and audit responses are to be made publicly available on the Project website.

4.12. Document review and continuous improvement

This document will be reviewed and updated on a regular basis in accordance with the requirements of Schedule 5 Conditions 2.f, 2.h, 3 and 4 of the Consent to improve the environmental performance of the Project.

A review and update of this plan is to be conducted within 3 months of the submission of an incident report, annual review, independent environmental audit or any modification to the consent conditions incorporating any appropriate mitigation measures to the satisfaction of the Secretary.

A copy of the current version of this plan is to be made publicly available on the Project website.

5. References

Bureau of Meteorology (2019)

Climate statistics for Australian locations, Bureau of Meteorology website, accessed November 2018. http://www.bom.gov.au/climate/averages

EMM (2017)

"Environmental Assessment Dunmore Hard Rock Quarry Modification 9 Croome West Extension, EMM February 2017

NSW EPA (2017)

"Noise Policy for Industry", NSW Environment Protection Authority, October 2017.

NSW Minerals Council (2011)

"Mine Dust and You", NSW Minerals Council developed in conjunction with NSW Health, April 2017.