

Lynwood Quarry Air Quality Management Plan

August 2023

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1. Introduction

1.1 Background

Holcim (Australia) Pty Ltd (Holcim) was granted development consent in December 2005 (DA 128-5-2005) (Development Consent) by the then NSW Minister for Planning for the construction and operation of a hard rock quarry known as Lynwood Quarry west of Marulan in the Southern Tablelands region of NSW (refer to **Figure 1**). There have been 5 modifications approved to the Development Consent since 2005, the latest in 2017, with all Conditions incorporated into this Air Quality Management Plan (AQMP).

1.2 Project Description

The location of Lynwood Quarry and extent of the approved 30 year quarry pit is shown in **Figure 1**. The quarry has existing Development Consent (DA 128-5-2005) approval to produce up to five million tonnes per annum (Mtpa) of saleable quarry product until 1 January 2038. The target resource has an expected life in excess of 90 years. Some of the material extracted as part of the quarrying process is not suitable for processing and sale, consequently emplacement areas are required (see **Figure 1**).

1.3 Purpose and Scope

This AQMP outlines the air quality monitoring and management to be undertaken at Lynwood Quarry. The program addresses the requirements contained in Lynwood Quarry's modified Development Consent (DA-128-5-2005) and the Lynwood Quarry Environment Protection Licence (EPL) no. 12939.

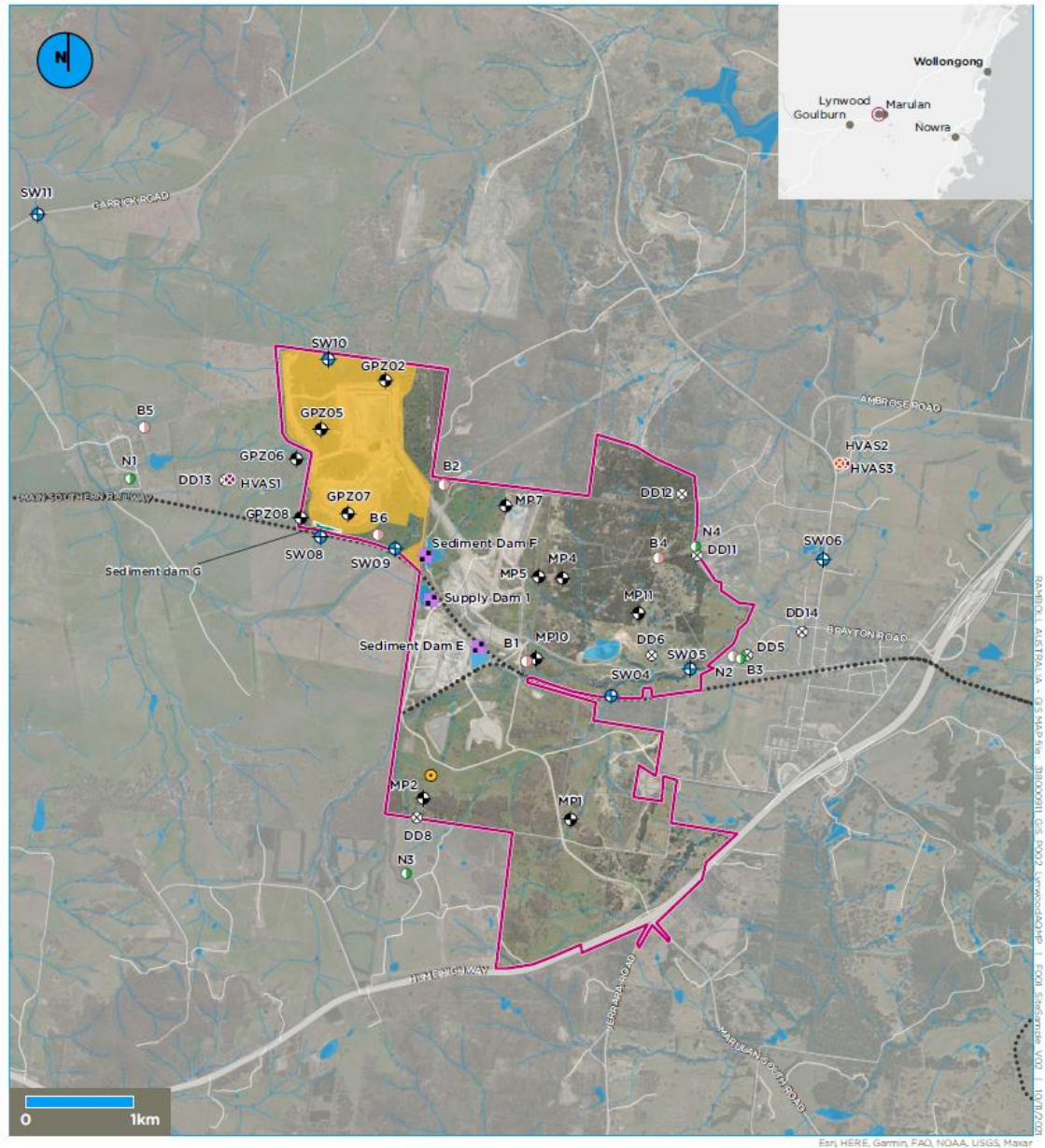
A revision history and the basis for amendment is provided in Review and Improvement, Section 10.

1.4 Objectives

The objectives of this plan in relation to air quality management are to:

- Detail the controls to be implemented to minimise dust generation from Lynwood Quarry;
- Establish an air quality monitoring system to assess the air quality performance against the specific air quality impact assessment criteria;
- Provide a mechanism to assess monitoring results against air quality impact assessment criteria;
- Provide a protocol for determining exceedances of the relevant criteria;
- To detail the requirements for reporting air quality criteria exceedance to the relevant stakeholders; and
- Manage air quality related community complaints in a timely and effective manner.

Figure 1 Current Air Quality Monitoring Network



Legend

- Approved project area
- Granite pit disturbance footprint
- Cadastral boundary (NSW Spatial Service, 2021)
- Waterway (NSW Spatial Service, 2021)
- ♾ Marulan Childrens Centre
- 🏫 Marulan Public School
- 🏠 Residence location
- 🌡 Meteorological station
- 📍 Blasting monitoring location
- 🔊 Noise monitoring location

- Sample locations**
- ⊗ Dust deposition sample location
 - ⊗ HVAS PM2.5 sample location
 - ⊗ HVAS PM10 sample location
 - 🏠 Dam sample location
 - ⊕ Surface water sample location
 - ⊕ Groundwater sample location

A4
150,000

Figure 1 : Site layout and sample locations

2. Stakeholder Consultation

2.1 Pre 2019/2020 Consultation

In accordance with Schedule 3 Condition 15 of the Development Consent, this AQMP was prepared in consultation with the NSW Environment Protection Authority (EPA). The plan was then submitted to the DPE for approval.

2.2 2019/2020 Consultation

A copy of the 2019 updated management was sent to DPE and the EPA for review and approval.

DPE provided a response on the AQMP to Holcim on 17 December 2019. The EPA were provided with a copy of the AQMP on 25 January 2020. With no comments received by the EPA, the AQMP was finalised and resubmitted to DPE on 18 February 2020.

2.3 2021 Consultation

A copy of the 2021 updated management plan was sent to DPE and EPA for review and approval in November 2021, with comments received on 2 September 2022. EPA responded with two observations, copied below:

- The AQMP provides reference to a previous version of the *NSW EPA Approved methods for Sampling and analysis of Air Pollutants and the Protection of the Environment Operations (Clean Air) Regulation 2010*.
- Pollution Reduction Program (PRP), Condition U1 for PM2.5 Monitoring Program under Environment Protection Licence 12939 is not included in section 6.2 of the AQMP.

Although the EPA acknowledges that the date of the AQMP review is prior to date of issue for the above listed regulatory instruments, it advises of the importance to consider any changes to these instruments and incorporate all regulatory requirements into its quarry operations and plans accordingly.

These comments have been addressed in the AQMP.

2.4 2022 Consultation

A copy of the October 2022 (Version 5) AQMP was sent to DPE for review. A summary of the requested actions is provided in **Appendix 1** with response and confirmation of amendment in blue.

3. Statutory Requirements

3.1 Legislation

Legislation relevant to air quality management includes:

- *Environmental Planning and Assessment Act 1979 (EP&A Act)*;
- *Protection of the Environment Operations Act 2022 (POEO Act)*; and
- *Protection of the Environment Operations (Clean Air) Regulation 2021*.

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in the Environmental Management Strategy (EMS).

3.2 Guidelines and Standards

The main guidelines, specifications and policy documents relevant to this AQMP include:

- *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (NSW EPA, 2022);*
- *AS/NZS 3580.1.1:2016: Method for sampling and analysis of ambient air – Guide to siting air monitoring equipment;*
- *AS/NZS 3580.10.1:2016: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method;*
- *AS/NZS 3580.9.14:2013: Methods for sampling and analysis of ambient air – Determination of particulate matter – PM₁₀ high volume sampler with size selective inlet – Gravimetric method;*
- *AS/NZS 3580.9.14:2013 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{2.5} high volume sampler with size selective inlet – Gravimetric method;*
- *AS/NZS 3580.9.11:2016: Method for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ beta attenuation monitors; and*
- *Holcim Environmental Standards for Aggregate Operations (May, 2014).*

3.3 Development Consent Requirements

A summary of the relevant Development Consent requirements are outlined in the table below.

Table 1 - Summary of Development Consent Requirements (as modified May 2017)

Conditions	Addressed in Section
Schedule 3 of Development Consent	
Air Quality Impact Assessment Criteria	

Conditions		Addressed in Section																								
<p>Schedule 3 Condition 12</p> <p>The Applicant must ensure that dust generated by the development does not cause additional exceedances of the criteria listed in Tables 6-8 at any residence that exists on the date of this consent, or on more than 25 percent of any privately owned land.</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Total suspected particulate (TSP) matter</td> <td>Annual</td> <td>90µg/m³</td> </tr> <tr> <td>Particulate matter < 10µm (PM₁₀)</td> <td>Annual</td> <td>30µg/m³</td> </tr> </tbody> </table> <p><i>Table 6: Long term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10µm (PM₁₀)</td> <td>24 hour</td> <td>50µg/m³</td> </tr> </tbody> </table> <p><i>Table 7: Short term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Maximum increase in deposited dust level</th> <th>Maximum total deposited dust level</th> </tr> </thead> <tbody> <tr> <td>Deposited dust</td> <td>Annual</td> <td>2/g/m²/month</td> <td>4g/m²/month</td> </tr> </tbody> </table> <p><i>Table 8: Long term impact assessment criteria for deposited dust</i></p> <p>Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.0-1991: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates - Deposited Matter – Gravimetric Method.</p>		Pollutant	Averaging period	Criterion	Total suspected particulate (TSP) matter	Annual	90µg/m ³	Particulate matter < 10µm (PM ₁₀)	Annual	30µg/m ³	Pollutant	Averaging period	Criterion	Particulate matter < 10µm (PM ₁₀)	24 hour	50µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	Deposited dust	Annual	2/g/m ² /month	4g/m ² /month	Section 5	
Pollutant	Averaging period	Criterion																								
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Operating Conditions																										
<p>Schedule 3 Condition 13</p> <p>The Applicant must:</p>																										
a) Implement best practice management to minimise the dust emissions of the development		Section 6																								
b) Carry out periodic air quality monitoring to determine whether the development is complying with the relevant conditions of this consent;		Section 7																								

Conditions	Addressed in Section
c) Regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria for this consent;	Noted. Section 6
d) Minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events; and	Noted. Section 6
e) Minimise the area of surface disturbance and maximize progressive rehabilitation of the site, to the satisfaction of the Secretary.	Section 6 Also see Rehabilitation and Landscape Management Plan
Quarry-owned Land	
Schedule 3 Condition 14 The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not causes exceedance of the criteria in Tables 6-8 at any occupied residence on quarry-owned land unless;	Section 6.4
a) The tenant has been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of this consent; and	Section 6.4
b) The tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice, to the Satisfaction of the Secretary.	Section 6.4
Air Quality Management Plan	
Schedule 3 Condition 15 The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plan (see condition 2 of Schedule 5) this plan must:	Entire Document
a) Be submitted to the Secretary of approval by 30 November 2016, unless otherwise agree by the Secretary.	
b) Be prepared in consultation with the EPA;	Section 2
c) describe the measures that would be implemented to ensure: <ul style="list-style-type: none"> ● compliance with the relevant 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; 	Section 3 Section 6
d) Describe the proposed air quality management system; and	Section 6
e) Include an air quality monitoring program that: <ul style="list-style-type: none"> ● Is capable of evaluating the performance of the development ● Includes a protocol for determining any exceedance of the relevant conditions of consent; ● Effectively supports the air quality management system; and ● Evaluated and reports on the adequacy of the air quality management system. 	Section 7
Meteorological Conditions	

Conditions	Addressed in Section
<p>Schedule 3 Condition 15A</p> <p>For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air pollutants in New South Wales.</p>	Section 7
<p>Schedule 3 Condition 15B</p> <p>The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.</p>	Section 6.3
Schedule 5	
Management Plan Requirements	
<p>Schedule 5 Condition 2</p> <p>The Applicant must ensure that the Management Plan required under this consent are prepared in accordance with any relevant guidelines, and include:</p>	
a) Detailed baseline data;	Appendix 2
<p>b) A description of:</p> <ul style="list-style-type: none"> ● 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; 	Section 3 and 5
c) A description of the measures that would be implemented to comply with the relevant statutory requirements, limits of performance measures/criteria	Section 6
<p>d) A program to monitor and report on the:</p> <ul style="list-style-type: none"> ● Impacted and environmental performance of the development; and ● Effectiveness of any management measures (see (c) above); 	Section 7
e) A contingency plan to manage any unpredicted impacts and their consequences	Section 9
f) A program to investigate and implement ways to improve the environmental performance of the development over time;	Section 9
<p>g) A protocol for managing and reporting any:</p> <ul style="list-style-type: none"> ● Incidents; ● Complaints; ● Non-compliances with statutory requirement: and ● Exceedance of the impact assessment criteria and/or performance criteria 	Section 8
h) A protocol for periodic review of the plan	Section 10
<p>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</p>	

Conditions	Addressed in Section
<p>Schedule 5 Condition 3</p> <p>Prior to approval of management plans required under Schedule 3, all existing management plans, monitoring programs, strategies, programs, protocols, etc. approved as at the date of approval of Modification 4 shall continue to have full force and effect, and may be revised under the requirements of condition 5 below as if subject to the conditions of this consent that applied prior to approval of Modification 4, or otherwise with the approval of the Secretary.</p>	<p>Noted. Nothing further to complete at this stage</p>

3.4 EIS Statement of Commitments and Environmental Protection Licence (EPL 12939)

The table below outlined the Statement of Commitment requirements and EPL Monitoring Conditions.

Table 2- EIS Statement of Commitment Requirements and EPL Monitoring Conditions

Commitment	Addressed in Section
<p>Air Quality</p> <p>Holcim Australia will continue to implement the existing air quality management and monitoring systems in place at Lynwood Quarry which includes both engineering and operations control measures as outlines in Section 6.5.5 of the EA (Mod 4).</p> <p>The existing air quality monitoring program will be revised as operations commence in the Granite Pit with monitoring locations revised as indicated in Figure 2.5 of the Response to Submissions report. This monitoring program may be revised over the life of the Project with any changes outlined in the Air Quality Management Plan.</p>	<p>Section 6 and Section 7</p>
<p>EPL Conditions</p> <p>P1.2</p> <p>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.</p>	<p>Section 1, Figure 1 Section 7, Table 8</p>

<p>M2.1</p> <p>For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns</p>	<p>Section 7, Table 8</p>
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4. Potential Air Quality Impacts

Activities undertaken at Lynwood Quarry utilising various heavy machinery, plant and equipment, likely to generate dust are identified below:

- Clearing;
- Earthworks;
- Drilling and blasting;
- Crushing and screening;
- Stockpiling; and
- Material handling and dispatch.

Air emissions other than dust, which may be generated include:

- Vehicle and plant emissions; and
- Emissions from asphalt plant operation.

5. Air Quality Assessment Criteria

Schedule 3 Condition 12, of the Development Consent provides the air quality impact assessment criteria for operation of Lynwood Quarry.

5.1 Particulate matter (as PM₁₀ and TSP)

Goals for dust concentration are referred to as long term (annual average) and short term (24 hour average) goals. The TSP and PM₁₀ annual average goals and 24-hour average goals relate to the total cumulative dust in the air and not just the dust from quarry operations. Schedule 3 Condition 12 of the Development Consent specifies the air quality criteria for Lynwood Quarry. The Development Consent criterion for particulate matter is outlined in **Table 3** and **Table 4**.

Table 3 - Long Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Total Suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10µm (PM ₁₀)	Annual	30 µg/m ³ *

* Note the PM₁₀ annual National Environmental Protection Measure (NEPM) criteria was revised to 25 µg/m³ in 2016 but this update is not captured in the 2017 Development Consent

Table 4 - Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion
Particulate matter < 10µm (PM ₁₀)	24 hour	50 µg/m ³

The monitoring of particulate matter against the criterion stipulated in **Table 4** and **Table 5** is to exclude samples where the impact of extraordinary events listed below are likely to have influenced the monitoring results:

- Bushfires;
- Prescribed burning;
- Dust storms;
- Sea fog;
- Fire incidents;
- Illegal activities; or
- Any other activity agreed to by the Secretary of DPE, in consultation with the EPA.

5.2 Dust Deposition

Dust deposition levels refer to the quantity of dust particles which settle out of the air as insoluble solids measured in grams per square metre per month (g/m²/month) at a particular location. Schedule 3 Condition 12 of the Development Consent outlines maximum allowable limits in terms of an acceptable increase in dust deposition over the existing background levels.

Table 5 - Long Term Impact Assessment Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS3580.10.1-1991:

Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method. This standard was updated in 2016, where the definition remains the same.

6. Air Quality Management Controls

6.1 General Air Quality Controls

This AQMP has been designed in a manner that enables Lynwood Quarry to demonstrate compliance with the air quality criteria specified in the Development Consent. Holcim is committed to implementing all reasonable and feasible air quality mitigation measures, to reduce the potential impact of the operation on sensitive receivers. In order to mitigate potential air quality impacts from the operation, a number of air quality management controls have been, are currently, or will be, implemented. Air quality controls are outlined in **Table 6**.

Table 6 - Air Quality Controls

Mitigation ID	Mitigation Measure	Reference Document	When Required/Status	Responsibility
Engineering Controls				
AQ1	Enclosed conveyors	Original EA and MOD 3	Complete. At all times until closure	Engineering Manager for maintenance
AQ2	Using belt scrapers to clean and prevent potential buildup of material which could lead to dust generation	Original EA and MOD 3	At all times until closure Maintenance as required	Engineering Manager for maintenance
AQ3	Enclosing the majority of crushing and screening plant.	Original EA and MOD 3	Complete. At all times until closure.	Engineering Manager for maintenance
AQ4	Fitting a dust extraction system at the crushing and screening plant.	Original EA and MOD 3	Complete (installed during construction). System does not work effectively, additional controls being installed	Engineering Manager for maintenance
AQ5	Fitting drill rigs with either water sprays or dry dust collection devices. Upgraded encapsulation of dust generating points, upgraded water spray nozzles, install fogging cannons in each building and install real time dust level monitoring instruments in each building.	Original EA and MOD 3	Required for all drilling.	Pit Manager and drilling contractor.
AQ6	Using the wheel wash station for vehicles leaving the quarry.	Original EA and MOD 3	Ongoing during operations	All staff and contractors
AQ7	Water sprays throughout the plant and on stockpiles.	Original EA and MOD 3	Ongoing during operations. System operation is weather dependent.	The extent to which the water sprays operate through the plant is at the Quarry Manager discretion, operation of fixed sprays on stockpiles is linked to wind speed.
Operational Controls				

Mitigation ID	Mitigation Measure	Reference Document	When Required/Status	Responsibility
AQ8	Watering haul roads and hardstand areas as required.	Original EA and MOD 3	Occurs throughout the day, frequency is at Pit Managers discretion & dependant on weather conditions.	Quarry Manager
AQ9	Sealing the quarry access road.	Original EA and MOD 3	Completed as part of construction	Quarry Manager
AQ10	Keeping unsealed haul road lengths to a minimum.	Original EA and MOD 3	Ongoing during operations	Quarry Manager
AQ11	Keeping exposed areas to a minimum. Only the area required for active operations has been cleared.	Original EA and MOD 3	Ongoing during operations	Quarry Manager
AQ12	Removing and rehabilitating unused roads.	Original EA and MOD 3	Roads required during operations	Quarry Manager
AQ13	Confining HME traffic to identified haul routes.	Original EA and MOD 3	Ongoing during operations	Pit Manager
AQ14	Rehabilitating exposed areas in accordance with the approved Rehabilitation and Landscape Management Plan. Minimise the area of surface disturbance and maximise progressive rehabilitation of the site.	Original EA and MOD 3	Rehabilitation to be assessed annually through inspections	Quarry Manager
AQ15	Using dust suppression sprays on fine material stockpiles and the primary crusher.	Original EA and MOD 3	Ongoing during operations. System operation is weather dependent	Quarry Manager
AQ16	Reviewing meteorological conditions prior to blasting to avoid adverse conditions and minimise blast emissions.	Original EA and MOD 3	Prior to blasting	Pit Manager and Blast Contractor
AQ17	Use of adequate stemming in blast holes.	Original EA and MOD 3	During blast design	Pit Manager and Blast Contractor
AQ18	Regular inspections for visible dust and implementation of appropriate controls when excessive dust is observed.	Original EA and MOD 3	Ongoing during operations	Quarry and Pit Managers (assisted by Support Services Supervisor)
AQ19	Ongoing assessment of meteorological conditions to identify specific conditions that are conducive to excessive dust generation.	Original EA and MOD 3	Ongoing during operations	Quarry Manager
AQ20	Ceasing or restricting as necessary dust generating activities during periods of high winds.	Original EA and MOD 3	Ongoing during operations	Quarry Manager and all staff and contractors

Mitigation ID	Mitigation Measure	Reference Document	When Required/Status	Responsibility
AQ21	Providing dust minimisation training as part of the Lynwood Quarry induction.	Original EA and MOD 3	Ongoing during operations	Quarry Manager and Holcim Environment and Community team
AQ22	Speed limits as per the Traffic Management Plan.	At all times	At all times	Quarry and Pit Managers

6.2 Pollution Reduction Program Controls

Holcim successfully implemented a Pollution Reduction Program (PRP) between September 2019 and August 2020 in consultation with the EPA. The EPL was amended during this time to include a series of pollution control measures to meet the requirements of U1.1. These pollution reduction program measures are outlined below in **Table 7**, With currently only item number 16 outstanding, which is due to be completed during Spring 2020. The EPA was satisfied with the outcome of the PRP and such removed it from the EPL through a notice of variation dated 28 August 2020.

A PRP was issued under Condition U1 for PM2.5 Monitoring Program under Environment Protection Licence 12939, copied below. The monitoring campaign was completed from October 2021 to October 2022. An air quality consultant was engaged during October 2022 to prepare an independent report on the results for submission to EPA. The outcome of the review and analysis of the monitoring data as reported by the commissioned consultancy (Ramboll) indicates the concentrations was estimated to be below the health-based community exposure guideline.

6.3 Greenhouse Gas Emissions

In accordance with Schedule 3, Condition 15B of the Development Consent, Holcim manages greenhouse gas emissions associated with its operation by implementing the following measures to minimise the release of greenhouse gases from the site:

- Fitting 5 minutes idling timers on loaders and excavators. Each equipment shall automatically shut down after 5 minutes of idling, thereby reducing emissions from the equipment when not in use;
- Submitting annual emission reports to Government:
 - National Greenhouse and Energy Reporting (NGER), and
 - National Pollutant Inventory Report (NPI);
- Implementing a fuel usage management system known as “iSite”, to track operational use of fuel, identify gaps, trends and performance;
- Scheduling equipment servicing in line with maintenance guide of the Original Equipment Manufacturer (OEM);
- Holcim End-of-Life asset management of equipment. This enables timely decommissioning and replacement of old equipment especially those which due age are potential cause of greenhouse gas emission during use;
- Regular inspections for visible emissions and proactively implementing actions to resolve the cause.

Table 7 - Pollution Reduction Program Measures

Item	Action	When	Status Update as at September 2021
1	Treat stockpiles and sales area floor with crusting agent (keep record of stockpiles treated on aerial photo)	Complete	Treatment complete on stockpiles & sales floor. Areas where treatment was not effective have been re treated. Observation is that this treatment is now working.
2	Retreat piles with crusting agent if crust is disturbed	Complete (Ongoing)	Dye in the crusting agent is now visible on the treated stockpiles, making it easier to assess when retreatment is required.
3	Establish bund across western end of Excess granite Man Sand Stockpile and Crust	Complete	The change to the tipping method on this stockpile & use of crusting agents has provided the necessary control for windblown dust generated at this stockpile.
4	Install additional spray rings (ESS) on discharge to: 311-ST01	Complete	Modifications required to improve effectiveness in high wind.
	331-BC15 (860)	Complete	Modifications required to improve effectiveness in high wind.
	321-ST04 (460)	Complete	Modifications required to improve effectiveness in high wind.
	392-ST01 (900)	Complete	Software updated to improve management of water addition to sand on this belt.
	321-BI01 (220) - water sprays on 321-BC01 to wet material being transferred into this surge bin	Complete	Water sprays fitted.
	Automate operation & link to wind speed	Complete	Ongoing review & fine tuning of activation parameters.

Item	Action	When	Status Update as at September 2021
5	Investigate adding water to sand along 331-BC14 to dampen material prior to discharge	Complete	Automated water addition system to be developed.
6	Install water cannons to wet back of primary surge and automate operation	Complete	Installation of water cannons is complete.
7	Install ESS spray heads at key locations around plant to replace existing	Complete	Sprays heads fitted.
8	<ul style="list-style-type: none"> a. Re-establish automated controls (linked to wind speed) for aerial sprays and water cannon on 860. b. Set up so that the system will re-initialise to automatic mode after a set time of being turned to manual. c. Optimise the duty cycle for sprays / cannons wetting the back of the Man Sand stockpile 	Complete	Reviewing effectiveness of changes and fine tuning as required.
9	Ensure manual checks being carried out on operation of above sprays while automation is being re-established	Complete	Complete
10	Review dust controls in Air Management Plan and ensure they are being implemented	Complete	Actions 14 and 15 added to this plan
11	Pursue distributing CCC contacts via Discover Marulan newsletter	Complete	Contact details for committee members being provided to local newsletter for publication.
12	Develop community feedback plan	Complete	Community information evening held mid - December, communication plan in place.
13	Confirm availability of fogging system from Brisbane for trial in crusher house and arrange to get on site. If not available submit RfA for new system	Complete	System available late October. Decision made to be proceed with different type of equipment in the crusher house. Installed three fogging systems and ordered an additional five.
14	Review and set "cease to operate criteria" in adverse weather conditions	Complete	Quarry Manager and Project Manager to assess conditions with regards to ceasing operations when wind speeds >30kph experienced. PLC to be set to sound alarm for wind speeds > 30kph.

Item	Action	When	Status Update as at September 2021
15	Include dust minimisation training in site induction	Complete	Toolbox complete. Now part of the induction process for new starters. Items to be added to site safety rules.
16	Plant trees to form a long term wind break (determine location and appropriate species, if planting not feasible in this spring will need to be next autumn).	Complete	Ripping, spraying and planting completed Spring 2020
17	Review dust controls for processing plant buildings and seek funding to upgrade (linked to item13)	Complete	Majority of works completed, with a positive effect. Conveyor encapsulation taking longer than anticipated. Arrangements being made to trial a foaming agent to minimise dust generation in the processing plant. Also assessing dust collection system proposal.
18	Determine & implement method for controlling windblown dust from the north & south faces of the Man Sand stockpile over the rail loadout reclaim tunnel	Complete	Water Cannon on South side of stockpile implemented to control windblown dust
19	Arrange independent review of effectiveness of control measures being implemented	Complete	Site inspection complete, report received.
20	Controls for Train Loadout	Complete	Sprays in loading building upgraded. Modified departure procedure agreed with Pacific National to ensure all sand & roadbase wagons are sprayed prior to departure

8 Pollution Studies and Reduction Programs

U1 PM2.5 monitoring program

U1.1 Commencing no later than 31 December 2021, the licensee must undertake a minimum of 12 months continuous monitoring of PM2.5, as per the recommendations of the Independent Health Assessment Report: Respirate Crystalline Silica in the Community, Lynwood Quarry (EnRiskS, 2020).

U1.2 Monitoring must be undertaken at HVAS1 and HVAS 2 as described in Condition P1.2

U1.3 Monitoring must be undertaken using the same methodology as described in Condition M2.2.

U1.4 No more than three months following the end of the monitoring period (as defined in Conditions U1.1.) the licensee must engage a suitably qualified person to undertake an independent review of monitoring data collected and submit a report to the EPA which:

a. Undertakes an analysis of the PM2.5 monitoring data collected over this period.

b. review the findings of these data against the findings of previous 2018 PM2.5 monitoring by the licensee, historic air quality data and the EnRiskS 2020 report;

c. reviews the findings of this data in relation to the risk of long-term community exposure to silica dust from operations at Lynwood Quarry;

d. nominates any recommendations in relation to the findings of this independent assessment.



Figure 2 **Location of Spray Rings**

6.4 Quarry-Owned Land Controls

All reasonable and feasible avoidance and mitigation measures will be employed so that particulate matter emissions generated by Lynwood Quarry do not cause exceedances of the air quality criteria at any occupied residence on quarry-owned land unless:

- The tenant has been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of the Consent and;
- The tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice.

7. Air Quality Monitoring

7.1 Inspections

Routine inspections by the Quarry Manager (or delegate) of air quality controls and monitoring equipment will occur throughout the operational lifetime of the development. Detail on the nature and frequency of these inspections are documented in Section 9 of the EMS.

The Lynwood Quarry Manager (or delegate) will undertake monthly formal inspections of environmental management controls. Checklists have been developed to guide these inspections. Any issues arising from these inspections will be reported in Holcim's Incident Management System (INX) as non-conformances and will be managed in accordance with site incident procedures and actioned as necessary to resolve the non-conformance.

The inspections cover the full site including the quarry pit, infrastructure areas and rehabilitation areas. Inspections are completed by different Holcim personnel including the Quarry Manager, Production and Pit Managers, Support Services Supervisor and all other site supervisors.

7.2 Monitoring Locations and Methodology

To assess compliance against dust deposition and dust concentration criteria for Lynwood Quarry, depositional dust and PM₁₀ will be monitored at the locations shown on **Figure 1**.

Monitoring consists of the following:

- Seven dust deposition gauges located at locations representative of the nearest residential receivers;
- One high volume air sampler (HVAS) with PM₁₀ size selective inlet to the east of Lynwood Quarry (Brayton Road); and
- One high volume air sampler (HVAS) with PM₁₀ size selective inlet to the west of Lynwood Quarry (Lockersleigh).

Additionally, a PM_{2.5} HVAS was installed at Brayton Road from Q4 2021 for an annual period as requested by EPA.

The air quality monitoring undertaken at Lynwood Quarry is detailed in **Table 8**.

Table 8 - Current Lynwood Quarry Air Quality Monitoring Program

Site No.	Parameters Monitored	Units of Measure	Averaging Period	Sampling Frequency	Sampling Method
DD5	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD6 (Internal Gauge)	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD8	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD11	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD12	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD13	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
DD14	Deposited dust	g/m ² /month	Month, annual	Monthly	AS/NZS 3580.10.1
PM10 – 1 (Lockersleigh)	PM ₁₀ by HVAS	µg/m ³	24 hour, annual	24 hours, every 6 days	AS/NZS 3580.9.14
PM10 – 2 (Brayton Road)	PM ₁₀ by HVAS	µg/m ³	24 hour, annual	24 hours, every 6 days	AS/NZS 3580.9.11
PM2.5 (Brayton Road) – temporary, since removed	PM _{2.5} by HVAS	µg/m ³	24 hour, annual	24 hours, every 6 days	AS/NZS 3580.9.14
N/A*	TSP by calculation	µg/m ³	Annual	Calculated from PM ₁₀	Calculated

Note: DD = Depositional Dust monitoring location, HVAS = High Volume Air Sampler, BAM = Beta attenuation monitor.

*It should be noted that TSP is not directly monitored by Holcim and is calculated from PM₁₀ results. This was approved by DPE as part of the 2010 Environmental Monitoring Program (Umwelt 2010).

7.3 Monitoring Standards and Record Keeping

Air quality monitoring at Lynwood Quarry is undertaken, as far as practicable, in accordance with all relevant Australian Standards, legislation and EPA approved methods for sampling. The Australian Standards and EPA approved methods relevant to the AQMP are listed below:

- All sampling and analysis will be undertaken in accordance with the Protection of the Environment Operations (Clean Air) Regulation 2021 and the guidelines specified in the NSW EPA publication "Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (2022)";
- Monitoring sites have been selected, as far as practicable, in accordance with AS/NZS 3580.1.1:2016: Method for sampling and analysis of ambient air – Guide to siting air monitoring equipment;
- All dust deposition gauges will be sampled monthly for insoluble matter and ash in accordance with AS/NZS 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air - Determination of Particles - Deposited Matter - Gravimetric Method;
- HVAS PM₁₀ will be measured and analysed, as far as practicable, in accordance with AS/NZS 3580.9.14:2013 Methods for sampling and analysis of ambient air – Determination of particulate matter – PM₁₀ high volume sampler with size selective inlet – Gravimetric method
- HVAS PM_{2.5} will be measured and analysed, as far as practicable, in accordance with AS/NZS 3580.9.14:2013 Methods for sampling and analysis of ambient air – Determination of

suspended particulate matter – PM_{2.5} high volume sampler with size selective inlet – Gravimetric method; and

- BAM PM₁₀ monitoring will be measured and analysis, as far as practicable, in accordance with AS/NZS 3580.9.11:2016: *Method for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ beta attenuation monitors.*

To comply with monitoring and recording conditions included in EPL 12939 for Lynwood Quarry, all monitoring records required to be kept by the licence will be:

- In a legible form, or in a form that can readily be reduced to a legible form;
- Kept for at least four years; and
- Produced in a legible form to any authorised officer of EPA who asks to see them.

The following records will also be kept in respect of air quality monitoring undertaken:

- The dates on which the monitoring was undertaken;
- The times at which the monitoring was undertaken;
- The point at which the monitoring was undertaken;
- The name of the person who undertook the monitoring; and
- Relevant calibration and servicing details, consistent with the relevant Australian Standard.

7.4 Meteorological Monitoring

A meteorological station is installed at Lynwood Quarry as detailed on **Figure 1** in accordance with the requirements of Schedule 3 Condition 15A of the Development Consent. The data will be used to assess any dust related compliance or complaints as well as to inform proactive management.

8. Reporting and Compliance Management

Reporting requirements are outlined below. This includes:

- **Annual Review** – completed each March, covering the previous calendar year;
- **Reporting of exceedances of air quality results** – see below for details.

8.1 Evaluation of Air Quality Results

The Quarry Manager will review monitoring results against the air quality criteria cited in Section 5. In the event of the monitoring results exceeding the air quality criteria, the Quarry Manager or delegate will review:

- Meteorological data;
- The occurrence of any extraordinary events during the sampling period;
- The location and duration of activities on site during the sampling period; and
- Any other activities within the immediate region of Lynwood Quarry.

If the monitoring results are found to be outside the sites air quality criteria the Quarry Manager will initiate the following protocol:

- As soon as becoming aware of the breach of monitoring results the Quarry Manager will notify the Holcim NSW Planning and Environment Manager and enter the incident into INX;
- The Quarry Manager will notify the Secretary of the DPE and the EPA of the incident as soon practicable;
- A report will be prepared and submitted by the Quarry Manager to the DPE and EPA within 7 days of becoming aware of the incident, this report will include:
 - Cause of the non-compliance;
 - Environmental Harm caused due to the non-compliance; and
 - Actions undertaken to rectify the non-compliance and ensure.
- Following the reporting of subsequent review, should it be concluded that the Quarry is the source of elevated pollutant levels, the continuous improvement process outlined in Section 10 of the EMS is to be implemented and corrective actions identified.

8.2 External Reporting

A summary of air quality monitoring results will be provided in the Lynwood Quarry Annual Review. The Annual Review will be prepared and submitted to the Secretary, in accordance with Schedule 5 Condition 10 of the Lynwood Quarry Development Consent. The Annual Review will be made available to the public through the Lynwood Quarry web site.

In addition, in accordance with Protection of the Environment Legislation Amendment Act 2022 (Amendment Act) and Schedule 5 Condition 13 of the Development Consent, Holcim will also publish air quality monitoring results on the Holcim website <http://www.holcim.com.au>.

Performance monitoring, which includes an assessment of the effectiveness of air quality monitoring and compliance with the relevant Development Consent and EPL conditions, may be discussed at Community Consultative Committee (CCC) meetings.

The effectiveness of the dust management controls utilised at Lynwood Quarry will be reported to DPE within the Annual Review by the reporting of monitoring data. The Annual Review will also identify whether any additional dust management controls are required to be implemented at Lynwood Quarry or whether there are any technological advancements in dust control which are suitable for implementation at Lynwood Quarry.

Any investigations related to exceedances will be detailed in the Annual Review and EPL Annual Returns.

8.3 Community Complaints and Independent Review

8.3.1 Community complaints

Complaints relating to air quality from Lynwood Quarry are to be managed in accordance with the requirements of the Lynwood Quarry EMS. A summary of complaints will be published on the Lynwood Quarry website and provided in the Annual Review.

8.3.2 Independent Review

In the event a landowner considers Lynwood Quarry is exceeding air quality criteria at his or her property, the landowner may request an independent review of the air quality impacts at the property. The independent review will be conducted in accordance with the procedure described in Schedule 4 Condition 3 of the Development Consent.

8.4 Training

All employees and contractors working on site will undergo a site induction and training, which will cover issues relating to air quality management, including:

- The existence and requirements of this Plan;
- Dust control measures;
- Location of sensitive receivers;
- Internal speed limits; and
- Complaints reporting.

Further details regarding staff induction and training are outlined in the EMS.

9. Adaptive Management

In accordance with Schedule 5 Condition 6 of the Development Consent, Holcim will assess and manage air quality related risks to ensure compliance with the criteria outlined in **Section 6**.

Where a non-compliance relating to air quality criteria has occurred, Holcim will to the satisfaction of the secretary of the DPE:

- Take all reasonable and feasible measures to ensure the exceedance ceases and does not recur;
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the DPE describing those options and any preferred remediation measures or other course of action; and
- Implement remediation measures as directed by the Secretary of DPE.

Table 9 outlines the Trigger Action Response Plan for this management plan with this prepared to meet Schedule 5 Condition 2 of the Development Consent.

Table 9 – Trigger Action Response Plan – Air Quality

Key Element	Trigger Response /	Condition Green	Condition Amber	Condition Red
Above Annual Criteria: <ul style="list-style-type: none"> • Dust deposition; • TSP; and • PM₁₀ 	Trigger	Dust Deposition Annual Average is <2 g/m ² /month	Dust Deposition Annual Average is >2 g/m ² /month; but <4 g/m ² /month	Dust Deposition Annual Average is >4 g/m ² /month
		Calculated TSP Annual Average is <60 µg/m ³ rolling average (calculated monthly)	Calculated TSP Annual Average is >60 µg/m ³ /month but <90ug/m ³ rolling average (calculated monthly)	Calculated TSP Annual Average is >90 µg/m ³ rolling average (calculated monthly)
PM ₁₀ Annual Average is <20 µg/m ³ rolling average (calculated monthly)		PM ₁₀ Annual Average is >20 µg/m ³ /month but <30 ug/m ³ rolling average (calculated monthly)	PM ₁₀ Annual Average is >30 µg/m ³ rolling average (calculated monthly)	
	Response	No response required. Continue monitoring program.	Review and investigate operational activities and respective control measures. Implement additional remedial measures as per Section 6.	<ul style="list-style-type: none"> • Review and investigate operational activities and respective control measures. Implement additional controls if due to Holcim operational activities as per Section 6; • Consider need to engage an air quality consultant if non compliances are due to Holcim activities. Review of trends; • Reporting of non - compliance in the Annual Review; and • Submit an incident report to DPE as per Schedule 5 Condition 6 and 8 of the Project Approval.
Above Short Term PM ₁₀ Criteria:	Trigger	PM ₁₀ result is <40 µg/m ³ for 24-h criteria	PM ₁₀ result is >40 µg/m ³ but <50 ug/m ³ for 24-h criteria	PM ₁₀ result is > 24-h criteria of 50 µg/m ³

Key Element	Trigger Response /	Condition Green	Condition Amber	Condition Red
	Response	No response required. Continue monitoring program.	Review and investigate operational activities and respective control measures. Implement additional remedial measures, such as: <ul style="list-style-type: none"> • Deployment of additional water sprays; • Relocation or modification of dust-generating sources. 	<ul style="list-style-type: none"> • Submit an incident report to DPE as per Schedule 5 Condition 6 and 8 of the Project Approval; • Review and investigate operational activities and respective control measures. Implement additional controls if due to Holcim operational activities; • Consider need to engage an air quality consultant if non-compliances are due to Holcim activities; and • Reporting of non-compliance in the Annual Review.
Visual Dust	Trigger	Wind Speeds below 15 km/h.	Wind Speeds between 15 and 30 km/h.	Wind Speeds > 30 km/h.
	Response	Continue AQMP implementation.	Support Services Supervisor reviews effectiveness of control measures. Implement additional remedial measures, such as: <ul style="list-style-type: none"> • Deployment of additional water cart / water sprays; • Relocation or modification of dust-generating sources; and • Temporary halting of dust generating activities. 	Inspection of site by Production and Quarry Managers to determine if there is a need to halt dust generating activities. <ul style="list-style-type: none"> • Halted activities do not recommence until remedial measures or additional remedial measures are in place or wind speeds drop to acceptable levels; and • Record as a non-compliance in the incident report.
Crusher plant dust	Trigger	No dust is seen coming from crusher or site plant.	A moderate amount of dust is seen coming from the crusher or site plant.	Excessive dust is seen coming from the crusher and other site plant.

Key Element	Trigger / Response	Condition Green	Condition Amber	Condition Red
	Response	Continue AQMP implementation.	<ul style="list-style-type: none"> • Increase sprinklers; • Monitor weather conditions; • Review the adequacy of screening; and • Review the operational settings of the crusher plant. 	<ul style="list-style-type: none"> • Stop crushing; • Increase sprinklers; • Monitor weather conditions; • Review the adequacy of screening; • Review the operational settings of the crusher plant; and • Only recommence activities if mitigation measures have been reviewed and are effective.
In pit dust	Trigger	No dust is seen coming from quarrying (in pit) activities	A moderate amount of dust is being generated from quarrying (in pit) activities. Dust is not leaving the pit.	Excessive dust is being generated from quarrying (in pit) activities. Dust is leaving the pit.
	Response	Continue AQMP implementation.	<ul style="list-style-type: none"> • Additional water carts / water sprays; • Monitor weather conditions; and • Review operational activities. • Additional use of dust suppression agents 	<ul style="list-style-type: none"> • Stop quarrying; • Additional water carts; • Monitor weather conditions; • Review operational activities; and • Only recommence activities if mitigation measures have been reviewed and are effective.
Haul road dust	Trigger	No dust is seen coming from transport along haul roads.	A moderate amount of dust is seen coming from haul roads.	Excessive dust is seen coming from transport along haul roads. Dust is leaving site.
	Response	Continue AQMP implementation.	<ul style="list-style-type: none"> • Additional water carts / water sprays; • Monitor weather conditions; • Review operational activities. • Additional use of dust suppression agents 	<ul style="list-style-type: none"> • Stop haulage; • Additional water carts; • Monitor weather conditions; • Review operational activities; and • Only recommence activities if mitigation measures have been reviewed and are effective.

10. Review and Improvement

This AQMP will be reviewed, and revised as necessary, in accordance with the requirements of Schedule 5 Condition 5 of the Development Consent which states “*within 3 months of the submission of an:*

(a) incident report under condition 8 below;

(b) Annual Review under condition 10 below;

(c) audit report under condition 11 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.”

A summary of air quality monitoring results will be outlined in the Annual Review.

In terms of sub clause b), the requirement to review and update management plans will be assessed during the preparation of each Annual Review. The Annual Review will state which management plans require updating and which management plans do not require updating. Details on the requirements to prepare Annual Reviews are outlined in the Environmental Management Strategy.

Updated versions of management plans will be put on the website.

11. Definitions

The terminology utilised within this AQMP is defined in **Table 10** below.

Table 10 - Definitions

Term	Definition
AS/NZS	Australian Standard / New Zealand Standard
Dust Deposition	Dust particles that settle out from the air – measured in grams per square per unit time ($\text{g/m}^2/\text{month}$) of insoluble matter
BAM	Beta attenuation monitor
HVAS	High Volume Air Sampler.
Non-Compliance	Occurs when environmental monitoring results do not comply with Development Consent Criteria.
PM ₁₀	Particulate matter less than 10 micrometres (μm) in size.
PM _{2.5}	Particulate matter less than 2.5 micrometres (μm) in size.
TSP	Total Suspended Particulate ($\mu\text{g/m}^3$). The nominal size of this fraction has particles with a diameter of up to 50 micrometres (μm).
$\mu\text{g/m}^3$	Micrograms per cubic metre.

12. Roles and Responsibilities

Environmental roles and responsibilities for Lynwood Quarry personnel are outlined below.

Table 11 - Roles and Responsibilities

Personnel	Responsibilities
Quarry Manager	Provide that sufficient resources are allocated for the implementation of this Plan.
Line Manager	Have a working knowledge of this AQMP. Be aware of the environmental legislative requirements associated with the Lynwood Quarry and take measures to ensure compliance.
Support Services Supervisor	Coordinate the air quality monitoring requirements of this plan. Evaluate and report monitoring results as required. Coordinate air quality related incident investigations and reporting as required by legislation and internal standards and guidelines. Assist with the review of this plan.
All employees and contractors	Comply with all requirements of this AQMP. Report all potential environmental incidents to the Quarry Manager immediately. Seek approval from the Quarry Manager prior to making changes to infrastructure/processes which may result in increased air quality emissions.

13. References

NSW EPA 2022. Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.

National Environment Protection Council (NEPC), 2003. Advisory reporting standards for PM_{2.5}.

NSW Minerals Council, 2000. Technical Paper- Particulate Matter and Mining Interim Report

Standards Australia, AS/NZS 3580.10.1:2016 Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

Standards Australia, AS/NZS 3580.9.14:2013: Methods for sampling and analysis of ambient air – Determination of particulate matter – PM₁₀ high volume sampler with size selective inlet – Gravimetric method

Standards Australia, AS/NZS 3580.9.14:2013 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{2.5} high volume sampler with size selective inlet – Gravimetric method

Standards Australia, AS/NZS 3580.9.11:2016: Method for sampling and analysis of ambient air – Determination of suspended particulate matter – PM₁₀ beta attenuation monitors

Standards Australia, AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment.

Umwelt (Australia) Pty Limited, 2010. Environmental Impact Statement, Readymix Holdings Pty Ltd, Proposed Lynwood Quarry, Marulan.

Umwelt (Australia) Pty Limited, 2010. Environmental Assessment, Holcim (Australia) Pty Limited - Proposed Modification to Lynwood Quarry, Marulan.

14. Change Information

Table 12 summarises the main changes in the management plan updates.

Table 12 - Summary of Document Changes

Version	Date	Change Summary
1	October 2016	Update for MOD 5 Modification
2	October 2019	<p>Review of the template for all Lynwood management plans;</p> <ul style="list-style-type: none"> ● General structure updates throughout the document; ● Section 2- Consultation (new section added); ● Section 3 – Statutory requirements – separate section; ● Section 4 – update to baseline information; ● Section 5 – Addition of potential impacts section; ● Section 7 – inclusion of responsibilities and timing for controls. Information provided regarding the pollution reduction program ● Section 10 – addition of TARP; and ● Section 15 – inclusion of change information. <p>The following did not change:</p> <ul style="list-style-type: none"> ● No change to monitoring or reporting requirements; and ● No change to figures.
3	February 2020	Response to DPE comments. Addition of EPA 2020 consultation.
4	November 2021	Technical review (air quality consultant, G. Laing, Ramboll) and update to proposed PM ₁₀ monitoring technique at Lockersleigh (HVAS to BAM)
5	October 2022	Incorporation of consultation comments from NSW EPA, dated 22 September 2022 (air quality consultant, G. Laing, Ramboll)
6	February 2023	Incorporation of consultation comments from Department of Planning Industry & Environment dated 19 January 2023 (air quality consultant, G. Laing, Ramboll)
7	June 2023	Removal of DD6 monitoring location. This is an internal comparison point monitor only and not used to measure offsite air quality or intended for reporting as part of the monitoring network. It was not included in the original AQMP, nor is it a requirement of EPL 12939. It was added to a previous revision of the AQMP through error.
8	August 2023	Incorporated comments from DPE as reviewed by Keren Halliday dated 19 July 2023.



a. Appendix 1 - DPE and EPA Consultation

Lynwood Quarry
Post Approval Review
Plan name: Air Quality Management Plan
Version: October 2022
Reviewer: Ellena Tsanidis – Department of Planning Industry & Environment
Date Reviewed: 19/01/23

<i>Air Quality Impact Assessment Criteria Conditions, condition 12, Schedule 3</i>	Satisfactory (Yes/no/partial)	Document reference and comment	Action Required
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<p>Schedule 3 Condition 1.2</p> <p>The Applicant must ensure that dust generated by the development does not cause additional exceedances of the criteria listed in Tables 6-8 at any residence that exists on the date of this consent, or on more than 25 percent of any privately owned land.</p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Total suspected particulate (TSP) matter</td> <td>Annual</td> <td>90µg/m³</td> </tr> <tr> <td>Particulate matter < 10µm (PM₁₀)</td> <td>Annual</td> <td>30µg/m³</td> </tr> </tbody> </table> <p><i>Table 6: Long term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Criterion</th> </tr> </thead> <tbody> <tr> <td>Particulate matter < 10µm (PM₁₀)</td> <td>24 hour</td> <td>50µg/m³</td> </tr> </tbody> </table> <p><i>Table 7: Short term impact assessment criteria for particulate matter</i></p> <table border="1"> <thead> <tr> <th>Pollutant</th> <th>Averaging period</th> <th>Maximum increase in deposited dust level</th> <th>Maximum total deposited dust level</th> </tr> </thead> <tbody> <tr> <td>Deposited dust</td> <td>Annual</td> <td>2g/m²/month</td> <td>4g/m²/month</td> </tr> </tbody> </table> <p><i>Table 8: Long term impact assessment criteria for deposited dust</i></p> <p>Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.0-1991: Methods for Sampling and Analysis of Ambient Air – Determination of Particulates - Deposited Matter – Gravimetric Method.</p>	Pollutant	Averaging period	Criterion	Total suspected particulate (TSP) matter	Annual	90µg/m ³	Particulate matter < 10µm (PM ₁₀)	Annual	30µg/m ³	Pollutant	Averaging period	Criterion	Particulate matter < 10µm (PM ₁₀)	24 hour	50µg/m ³	Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level	Deposited dust	Annual	2g/m ² /month	4g/m ² /month	<p>Yes</p>	<p>Section 5.</p>	<p>N/A</p>
Pollutant	Averaging period	Criterion																								
Total suspected particulate (TSP) matter	Annual	90µg/m ³																								
Particulate matter < 10µm (PM ₁₀)	Annual	30µg/m ³																								
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Deposited dust	Annual	2g/m ² /month	4g/m ² /month																							
<p><i>Air Quality Operating Conditions, condition 13, Schedule 3</i></p>	<p>Satisfactory (Yes/no/partial)</p>	<p>Document reference and comment</p>	<p>Action Required</p>																							

(a) implement best practice management to minimise the dust emissions of the development;	Yes	Noted in Table 6	N/A
(b) carry out periodic air quality monitoring to determine whether the development is complying with the relevant conditions of this consent;	Yes	Section 7 Details of inspections noted in Table 8 and Table 9	N/A
(c) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;	Yes	Section 7.4	N/A
(d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events; and	Yes	Section 7.4	N/A
(e) minimise the area of surface disturbance and maximise progressive rehabilitation of the site, to the satisfaction of the Secretary.	Partial	No commitment made within the AQMP	Include commitment within the AQMP Response GL: explicitly stated in AQ14 mitigation measure (Section 6)
Quarry Owned Land, condition 14, Schedule 3	Satisfactory (Yes/no/partial)	Document reference and comment	Action Required
14. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedance of the criteria in Tables 6-8 at any occupied residence on quarry-owned land unless;	Yes	Section 6	N/A

<p>(a) The tenant has been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of this consent and;</p>	<p>No</p>	<p>Not explicitly addressed.</p>	<p>Amend document to address this condition. Response GL: Added new section to capture this condition, Section 6.3</p>
<p>(b) The tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice, to the Satisfaction of the Secretary.</p>	<p>No</p>	<p>Not explicitly addressed.</p>	<p>Amend document to address this condition. Response GL: Added new section to capture this condition, Section 6.3</p>
<p><i>Air Quality Management Plan, condition 15, Schedule 3</i></p>	<p>Satisfactory (Yes/No/Partial)</p>	<p>Document reference and comment</p>	<p>Action Required</p>
<p>15. The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. In addition to the standard requirements for management plans (see condition 2 of Schedule 5) this plan must:</p>			
<p>(a) be submitted to the Secretary for approval by 30 November 2016, unless otherwise agreed by the Secretary;</p>	<p>Yes</p>		<p>N/A</p>

(b) be prepared in consultation with the EPA;	Yes	Section 2	N/A
(c) describe the measures that would be implemented to ensure: <ul style="list-style-type: none"> compliance with the relevant 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; 	Yes	Section 3 and Section 7	N/A
(d) describe the proposed air quality management system; and	Yes	Section 7 and Section 8	N/A
(e) include an air quality monitoring program that: <ul style="list-style-type: none"> is capable of evaluating the performance of the development; includes a protocol for determining any exceedances of the relevant conditions of consent; effectively supports the air quality management system; and evaluates and reports on the adequacy of the air quality management system. 	Yes	Section 7	
Meteorological Monitoring Condition 15A, Schedule 3	Satisfactory (Yes/No/Partial)	Document reference and comment	Action Required
15A. For the life of the development, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Yes	Section 7.4.	N/A
Management Plan Requirements Condition 2, Schedule 5	Satisfactory (Yes/No/Partial)	Document reference and comment	Action Required
2. The Applicant must ensure that the Management Plan required under this consent are prepared in accordance with any relevant guidelines, and include			

(a) Detailed baseline data;	No	Baseline data not provided	Amend to address condition Response GL: added to Appendix 2
(b) A description of: <ul style="list-style-type: none"> 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; 	Yes	Section 3 and 6, Table 9	N/A
(c) A description of the measures that would be implemented to comply with the relevant statutory requirements, limits of performance measures/criteria.	Yes	Section 8	N/A
(d) A program to monitor and report on the: <ul style="list-style-type: none"> Impacted and environmental performance of the development; and Effectiveness of any management measures (see (c) above); 	Yes	Section 8	N/A
(e) A contingency plan to manage any unpredicted impacts and their consequences	Yes	Section 9	N/A
(f) A program to investigate and implement ways to improve the environmental performance of the development over time;	Yes	Section 10	N/A
(g) A protocol for managing and reporting any: <ul style="list-style-type: none"> Incidents; Complaints; Non-compliances with statutory requirement; and Exceedance of the impact assessment criteria and/or performance criteria 	Yes	Section 8	N/A
(h) A protocol for periodic review of the plan <i>Note the secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Yes	Section 10	N/A
General Comments: <ul style="list-style-type: none"> Table 1 contains a typo. The first condition listed - Schedule 3 Condition 1.2 should say Condition 12. Response GL: amended Update sections in Table 1 to line up with correct sections in which the conditions are addressed. Response GL: updated Change all references of DPIE to DPE. Response GL: updated. Section 8 mentions Section 9.1 and 9.2 which do not exist. Response GL: amended 			

b. Appendix 2 – Baseline Air Quality Data

i. Baseline Air Quality Data

Air quality data collected at the location prior to commencement of operations and construction is provided in the sections below. Air quality data since operations began is continually published on the Holcim website and summarised in Annual Reports.

1. Dust deposition

Table 13 summarises the dust deposition average pre-construction at each nominated location.

Table 13 - Dust deposition measured prior to construction representing baseline conditions prior to 31 December 2012

Dust Deposition Gauge	Average dust deposition pre-construction (g/m ² /month)
DDG1	3.4
DDG2	2.2
DDG3	7.1
DDG4	3.2
DDG5	1.8
DDG6	14.4
DDG7	1.5
DDG8	1.1

2. Particulate of less than 10 microns in aerodynamic diameter (PM₁₀)

Annual average PM₁₀ results collected prior to construction at the site are provided in **Table 14**.

Table 14 - PM₁₀ concentrations measured prior to construction representing baseline conditions prior to 31 December 2012

PM ₁₀ Monitor	Average concentration (µg/m ³)	Maximum concentration (µg/m ³)
PM ₁₀ - 1	8.6	38.1
PM ₁₀ - 2	3.6	11.8