

Air Quality and Greenhouse Gas Management Plan

For the Brandy Hill Quarry Expansion







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1. Introduction

1.1 Scope

This Air Quality and Greenhouse Gas Management Plan (the Plan) has been prepared by R W Corkery & Co Pty Limited (RWC) on behalf of Hanson Pty Ltd (Hanson) for the Brandy Hill Quarry (the Quarry). The Quarry Site is located approximately 3.5km to the east of Seaham, 15km northeast of Maitland and 30km north of Newcastle in the Port Stephens Shire Council (Council) Local Government Area (LGA). The Quarry is an open cut hard rock extraction operation with associated crushing and screening, product stockpiling, associated infrastructure and other ancillary activities required for product preparation and despatch. Access to the Quarry is via the public road network at a dedicated intersection with Clarence Town Road and Brandy Hill Drive.

This document has been prepared in satisfaction of Condition 25 of Development Consent SSD 5899 (SSD 5899) and describes the following.

- Air quality management objectives, roles and responsibilities.
- Competence training and awareness.
- The consultation undertaken during preparation of this document.
- The air quality management context including the existing conditions for the operation.
- The legal and other requirements associated with management of air quality-related issues.
- Air quality management measures that would be implemented during the life of the Quarry.
- Incident reporting and compliance management.
- Document review.

The Quarry, is fully described in the following documents and no further background information is provided as part of the Plan:

- Environmental Impact Statement Report Brandy Hill Expansion Project, prepared by Hanson Construction Materials Pty Ltd, dated February 2017 (Hanson, 2017);
- Amended Response to Submissions, prepared by R.W Corkery and Co Pty Limited, dated September 2019 (RWC, 2019).
- Air Quality Impact Assessment Brandy Hill Quarry Expansion, prepared by Todoroski Air Sciences, dated September 2019 (TAS, 2019); and

In addition, a range of management plans have been prepared to guide operations within the Quarry. These include the following.

- Environmental Management Strategy
- Biodiversity and Rehabilitation Management Plan
- Blast Management Plan
- Noise Management Plan
- Traffic Management Plan
- Water Management Plan

A copy of this Plan and each of the above documents are available from the Hanson website.

This Plan has been prepared to be a practical tool for the management of air quality-related risks for the ongoing operation of the Quarry. Hanson will not commence Stage 1 of operations until this plan is approved. This plan will be implemented as approved by the Planning Secretary.



1.2 Objectives and Outcomes

Table 1 presents the objectives and key performance outcomes for this Plan and the Quarry operation.

			Tab	le 1				
Air Q	uality	Objectives	and k	Key I	Performanc	e O)utcom	es

OBJECTIVES			KEY PERFORMANCE OUTCOMES			
Air	Quality					
(a)	To ensure compliance with all relevant approvals, licences and lease and reasonable community expectations.	(i)	Compliance is achieved with all relevant criteria nominated in SSD 5899 and Environment Protection Licence (EPL) 1879, and reasonable community expectations.			
(b)	To implement appropriate air quality management and mitigation measures during all stages of Quarry development.	(ii)	All identified air quality management and mitigation measures are implemented to the extent required.			
(c)	To implement an appropriate monitoring program to establish compliance or otherwise with relevant criteria during all stages of the Quarry.	(iii)	All identified monitoring is undertaken in accordance with the relevant procedures and at the relevant intervals.			
(d)	To implement an appropriate complaints handling and response protocol.	(iv)	Complaints (if any) are handled and responded to in an appropriate and timely manner.			
(e)	To implement continual improvement for investigating, implementing and reporting on reasonable and feasible measures to reduce air quality emissions.	(v)	An appropriate continual improvement program has been implemented.			
(f)	To implement an appropriate incident reporting program, if required.	(vi)	Incidents (if any) are reported in an appropriate and timely manner.			

1.3 Roles and Responsibilities

Table 2 presents the roles and responsibilities for the implementation of this Plan.

ROLES	RESPONSIBILITIES			
Operations Manager	Must ensure adequate resources are available to enable implementation of the Program.			
Environment, Planning and Compliance Coordinator	Accountable for the overall environmental performance of the Brandy Hill Quarry Expansion operations, including the following outcomes of this Plan.			
	 Evaluation of compliance as outlined in Section 4.2 and related follow-up actions. 			
	 Incident reporting as outlined in Section 4.1. 			
	 Publication of monitoring data and reports as outlined in Section 3.7. 			
	 Review of this Plan as outlined in Section 4.4. 			
Quarry Manager	Manage the implementation of the following components of this Plan.			
	 Implementation of the competence training and awareness as outlined in Section 1.4. 			
	 Implementation of the air quality management system outlined in Section 3. 			
	 Air quality monitoring as outlined in Sections 3 			
	 Complaints handling and response as outlined in Section 3.4.2. 			
All personnel	Ensure training and awareness induction has been undertaken. Compliance with this Plan.			
Source: Hanson Construction Ma	terials Pty Ltd.			

Table 2Roles and Responsibilities



1.4 Competence Training and Awareness

All Hanson personnel and contractors and their employees will undergo Hanson and site specific inductions, incorporating air quality management awareness training as part of the site induction program. The following areas will be covered in the induction:

- awareness of prevailing wind directions and their potential to increase air emissions downwind;
- awareness of air quality control measures;
- awareness of operating hours;
- awareness of community complaints protocols;
- awareness of the potential for air quality impacts to neighbours and the locations of the nearest privately owned residences; and
- awareness of the requirements for notifying incidents.

The Quarry Manager will be responsible for ensuring the appropriate air quality management training is included in the induction.

In addition, monthly toolbox meetings are held to discuss whole-of-site production, management, safety and environmental issues. Matters relating to air quality are raised during these meetings, when necessary.

1.5 Consultation

The following consultation was undertaken during preparation of the Plan:

A draft copy of the Plan was provided to the Environment Protection Authority (the EPA) and the Department of Planning Industry and Environment (the DPIE) on 3 March 2021. Feedback was received on 29 March 2021 from the EPA and on 16 June 2021 from DPIE. A virtual conference meeting was held with an officer of DPIE on 25 August 2021 to discuss Hanson's approach to compliance with conditions relating to dust (PM_{2.5}) generation.

All feedback received as part of the consultation process has been incorporated, where required, into the final Plan. A copy of all comments received during consultation are provided as **Appendix 1**.



2. Air Quality Management Context

2.1 Introduction

Under SSD 5899, Hanson is approved to extract, process and transport from the Quarry up to 1,500,000t per year of quarry products and 15,000m³ per year of pre-mixed concrete (concrete batching once constructed) for use principally in the Hunter, Central Coast and Sydney regions. The Quarry may also receive up to 20,000t per year of concrete washout material per annum (principally from concrete batching plants) for recycling. Further information regarding approved activities is available in the EIS (Hanson, 2017) and the Amended Response to Submissions (RWC, 2019).

The progressive development of the Quarry will occur over five operational stages resulting in a total disturbance area of 97.7ha. In summary, the development stages of the Quarry will be as follows:

- Stage 1 deepening of the existing Extraction Area and lateral extension to the west and south. Extraction would progress to an elevation of approximately 22m AHD. Topsoil and overburden salvaged during this stage would be used to develop an amenity bund at the southern end of the final disturbance area.
- Stage 2 progression towards the south west corner of the Extraction Area as its footprint is expanded and deepened to approximately -8m AHD. Topsoil salvaged during site preparation would be temporarily stockpiled or applied directly to rehabilitate the terminal benches above approximately 20m AHD.
- Stage 3 progression of the Extraction Area towards the existing Processing and Stockpiling Area and to a depth of -38m AHD. Topsoil and overburden salvaged during this stage would be directly applied to terminal benches for progressive rehabilitation.
- Stage 4 relocation of the Processing and Stockpiling Area to the south of its existing location. The extraction area footprint is expanded towards the eastern boundary and deepened to approximately -58m AHD. Topsoil and overburden salvaged during this stage would continue to be directly applied to terminal benches for progressive rehabilitation.
- Stage 5 completion of the Extraction Area to the south east resulting in a final floor elevation of -72m AHD.
- Closure closure and predicted recovery of groundwater levels in Extraction Area void.

The following subsections provide an overview of the air-quality management context for the Quarry, including the following.

- The existing setting and background dust levels.
- Potential air quality-related impacts.
- The legal and other requirements of the operation.

2.2 Surrounding Residences and Buffer Land

Quarrying activities at Brandy Hill have been occurring since 1983 with the extraction, processing and associated transportation activities co-existing with the progressive development of rural residential living in the local area. Brandy Hill Drive was built to service the Quarry and land along this road was progressively subdivided and developed in the presence of an operating Quarry.

It is important that personnel recognise the proximity of the operation to residences and the potential for quarrying activities to adversely impact neighbours. **Figure 1** presents the locations of residences to the west, east and south of the Quarry. The closest residences to the operation are located on the following roads.

- Giles Road to the west.
- Mooghin Road to the east.
- Clarence Town Road and Brandy Hill Drive to the south.







Operational air quality criteria apply at all residences.

In order to mitigate for any potential amenity impacts from the operations, land owned by Hanson that is not to be cleared must remain as buffer lands for the life of the development

2.3 Background Dust Levels

2.3.1 Deposited Dust

Deposited dust levels have been monitored since 2011 using standard dust deposition gauges, which are located at three points around the Quarry. Over that time, samples have been taken roughly every 30 days and the results compared to the standard deposited dust 12-month rolling average limit of 4g/m²/month.

A summary of historic deposited dust monitoring is provided in **Table 3**. It is noted that on occasion high samples have been recorded. However, field records at these times generally record insects or other material that has landed in the gauge and contaminated the sample. The results indicate that dust levels have been consistently compliant at all monitoring points excluding those results influenced by external events such as dust storms and bushfire.

	Insoluble Solids (g/m²/month)							
Location ¹	Giles Road	Front Gate	Cattle yards					
Period (July – Ju	Period (July – June)							
2011-2012	0.4	3.1	1.1					
2012-2013	0.6	3.1	1.9					
2013-2014	0.5	2.3	1.4					
2014-2015	0.5	1.4	0.6					
2015-2016	0.6	0.8	1.2					
2016-2017	0.7	1.5	2.9					
2017-2018	1.6	3.0	2.3					
2019-2020	1.4	9.6 ²	2.2					
Total Average	3.1	1.7						
Note 1: See Figure	Note 1: See Figure 2 for gauge locations							
Note 2: High average results were caused by regional dust storms and bushfires and are not representative of Quarry impacts.								
Source: Hanson								

Table 3Historic Deposited Dust Monitoring Results 2010 – 2020

2.3.2 Particulate Matter (PM₁₀)

Hanson has historically been monitoring particulate matter at the Quarry utilising a TSI Dusttrak II Desktop. There is no formal monitoring system or program in place. Therefore the data is not considered a reliable indication of background conditions and is not presented here. It has provided a record of particulate matter sized 10 microns or less and has also been a component of air quality management by providing Hanson with reactive triggers for management in the form of notifications.

The air quality monitoring program that will be implemented as part of the Development Consent is described in Section 3.5.

2.4 Ambient Air Quality

At the time the assessment was undertaken for the EIS, the annual average dust deposited levels were between 0.7g/m²/month and 2.2g/m²/month.



For environmental management purposes, particles are usually described by their size:

- Deposited Dust Similar to Total Suspended Particulate Matter except this is a measure of all dust deposited on a given surface. It is measures in g/m²/month.
- TSP Total Suspended Particulate Matter (TSP) refers to the total of all particles suspended in the air. Even the largest of these particles is barely half the width of a human hair.
- PM₁₀ Also a subset of TSP, and includes all particles smaller than 10µm in diameter (smaller than 1/7th of a hair width).
 Particles in the size range 2.5µm to 10µm in diameter are referred to as coarse particles (PM 2.5-10).
- PM_{2.5} A subset of both PM₁₀ and TSP categories and refers to all particles less than 2.5µm in diameter. PM_{2.5} is referred to as fine particles and is most commonly produced from combustion processes such as vehicle exhaust but is also produced from crushing and screening activities.

Particles levels in air are measured by the weight (micrograms) of particles per cubic metre of air (μ g/m³). One (μ g/m³) equals one millionth of a gram in a cubic metre of air. TSP can also be measured as the weight of dust falling on a given area over time ("dust deposition").

A comprehensive review of the air quality conditions is included in Section 4 of TAS (2019). **Table 4** presents the background conditions assumed for the assessment of potential air quality impacts for the Project. As there are exceedances in the background data for daily PM_{10} and $PM_{2.5}$ records at the Beresfield monitoring station, data from across the 2015 calendar year was used as representative year for the assessment of daily PM_{10} and $PM_{2.5}$ dust predictions. Therefore, a single value for 24 hour PM_{10} and $PM_{2.5}$ is not available.

Parameter	Period	Applied Background	Comments		
TSP	Annual	67.7 μg/m³	Double annual average PM ₁₀		
PM10	Annual	18.8 µg/m³	Annual Average Beresfield Data 2013		
PM _{2.5}	Annual	7.3 μg/m ³	Annual Average Beresfield Data		
Dust Deposition	Monthly	2.2 g/m ² /month	Average of available Quarry data		
Source: TAS (2019) – Section 4.3.5.4					

Table 4 Adopted Background Air Quality Concentrations

2.5 Site Wind Environment

Prevailing wind influences the likely direction of dust dispersion and can indicate where the greatest risk and level of impact may occur. Todoroski Air Sciences reviewed the existing site wind environment during preparation of the Air Quality Impact Assessment (TAS, 2019) for the expansion project. Within the Quarry Site, winds predominantly occur from the west-northwest and northwest and tend to flow on a northwest to southeast axis. In summer, winds tend to occur from the southeast quadrant. The autumn and winter wind distributions are similar to the annual distribution with winds predominantly occurring from the west-northwest and northwest. In winter there are fewer winds originating from the southeast quadrant. In spring, there is greater variability in wind directions which are more evenly distributed compared to the other seasons.

2.6 Potential Air Quality Impacts

The following activities have been identified as potentially resulting in emissions of dust and particulate matter during dry conditions.

- Clearing of vegetation.
- Loading, hauling and stockpiling of topsoil.
- Loading and hauling material for processing.
- Crushing and screening.



- Unloading crushed and processed material to stockpile.
- Concrete handling.
- Hauling material off-site.
- Wind erosion from material stockpiles, soil stockpiles and unsealed roads.
- Grading roads.

Dust generated by the operation may have the following impacts at nearby residences.

- Nuisance dust on surfaces, roofs and washing.
- Fine dust entering windows
- Health impacts associated with frequent inhalation of high levels of particulates.
- Dust entering water tanks.

Emissions of carbon monoxide (CO), nitrogen dioxide (NO2) and sulphur dioxide (SO2) would also occur from diesel-powered plant and equipment used on-site and vehicle movements to and from the Quarry Site.

2.7 Predicted Air Quality Impacts

The results of dispersion modelling undertaken by TAS (2019) as part of the *Environmental Impact Statement* indicated the following.

- Average annual TSP Including the assumed annual average background concentration of 67.7µg/m³, the cumulative annual average TSP is predicted to be less than 75.4µg/m³ at all residences, which is below the criterion of 90µg/m³. The highest incremental change due to the Project is 7.8µg/m³.
- The highest incremental 24-hour PM₁₀ concentration predicted by modelling was 18.2µg/m³ at Residence 13 during Stage 4 of operations.
- Average annual PM₁₀ Including the assumed annual average background concentration of 18.8µg/m³, the cumulative annual average PM₁₀ is predicted to be less than 22.0µg/m³ at all residences, which is below the criterion of 25µg/m³. The highest incremental change due to the Project is 3.2µg/m³.
- The highest incremental 24-hour PM_{2.5} concentration predicted by modelling was 3.0µg/m³ at Residence 13 during Stage 4 of operations.
- Annual average PM_{2.5} Including the assumed annual average background concentration of 7.3µg/m³, the cumulative annual average PM_{2.5} is predicted to be less than 7.9µg/m³ at all residences, which is below the criterion of 8.0µg/m³. The highest incremental change due to the Project is 0.6µg/m³.
- Respirable Crystalline Silica (RCS) TAS (2019) considered the predicted annual average PM_{2.5} level to provide an indication of the RCS likely to be in particulate matter in the vicinity of the Quarry. As the maximum incremental annual average PM_{2.5} level is predicted to be 0.6µg/m³, and this is likely to contain only a small fraction of RCS, TAS (2019) concluded that the RCS concentration would be well within the adopted assessment criteria of 3µg/m³.
- Deposited Dust Including the assumed annual average background concentration of 2.2g/m²/month, TAS (2019) predicted that the maximum monthly average level of deposited dust is 2.4g/m²/month which complies with the total deposited dust criterion of 4g/m²/month. The maximum incremental increase in dust deposition would be 0.2g/m²/month which is within the criterion of 2g/m²/month for incremental increases to total dust deposition.

Table 5 presents the maximum predicted annual average particulate matter concentrations for each operational stage that was modelled.



Sum	mary of Ai	r Quality Mode	lling Predictions
			Maximum Predicted C

Table 5

			Assumed	Maximum Predicted Concentrations at Any Receptor			ons at
Pollutant	Averaging Period	ing Period Criteria Backgrou		Existing	Stage 1	Stage 2	Stage 4
TSP (µg/m³)	Annual	90	67.7	71.4	72.6	72.1	75.4
PM ₁₀ (µg/m ³)	Annual	25	18.8	20.8	21.1	20.7	22.0
PM _{2.5} (µg/m ³)	Annual	8	7.3	7.8	7.8	7.8	7.9
Dust Deposition	Monthly Total	4	0.0	2.3	2.3	2.3	2.4
(g/m ² /month)	Monthly Increase	2	2.2	0.1	0.1	0.1	0.2
* Monthly average over a rolling 12-month period.							

The results of the Level 2 contemporaneous assessment undertaken by TAS (2019) indicate that there would be no additional exceedances of the 24-hr PM_{10} and 24-hr $PM_{2.5}$ criteria due to the Project. TAS (2019) conclude that in most cases the 24-hr PM_{10} and 24-hr $PM_{2.5}$ levels generated from the Project would be difficult to discern from the background dust concentrations.

2.8 Legal and other Requirements

2.8.1 Development Consent SSD 5899

Hanson has been the owner and operator of the Quarry since 2001, initially under Development Application No 1920 (DA1920) which was originally granted in 1983 to the Hunter Valley Mining Corporation Pty Ltd by Port Stephens Shire Council. In July 2020 the NSW Independent Planning Commission granted Development Consent SSD 5899 which allows for an expansion and subsequent continuation of operations at the Quarry.

SSD 5899 was granted on 16 July 2020 and presents a number of conditional requirements. *Condition B25* requires that an *Air Quality and Greenhouse Gas Management Plan* be prepared to guide the management of air quality and greenhouse gases within and Quarry Site and surrounding public roads. **Table 6** identifies the conditional requirements related to air quality and identifies the section of this Plan where each is addressed.

Table 6	
Development Consent Conditions (SSD 5899) - Air Qua	lity

		Page 1 of 6
Condition No.	Condition	Section
Evidence of	f Consultation	
A22	 Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document; and (b) provide details of the consultation undertaken including: i. the outcome of that consultation, matters resolved and unresolved; and ii. details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved. 	1.5
Buffer Land	S	
A34	The Applicant must not use or permit the use of the Buffer Lands for any purpose associated with the development that would generate significant noise or compromise the visual screening or biodiversity value provided by the vegetation on the Buffer Lands, except to manage bushfire risk and for weed and pest control.	2.2



Table 6 (Cont'd)
Development Consent Conditions (SSD 5899) – Air Quality

		Page 2 of 6				
Condition No.	Condition					
Odour						
B21	The Applicant must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.					
	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land. Table 4: Air quality criteria					
	Pollutant Averaging period Criterion					
	Annual *. c 25 µg/m ³					
	24 hour ^b 50 µg/m ³					
B22	Particulate matter < 2.5 µm (PM _{2.5}) Annual *.º 8 µg/m ³	3.1				
	24 hour ^b 25 µg/m ³					
	Total suspended particulate (TSP) matter Annual a. c 90 µg/m ³					
	Note: A Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources). b Incremental impact (i.e. incremental increase in concentrations due to the development on its own). c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.					
B23	The air quality criteria in Table 4 do not apply to a residence if the Applicant has an agreement with the owner/s of that residence or infrastructure to exceed the air quality criteria, and the Applicant has advised the Department in writing of the terms of this agreement.					
Air Quality	Operating Conditions					
	The Applicant must:					
	(a) take all reasonable steps to:					
B24	 24 i. minimise odour, fume, greenhouse gas and dust (including PM₁₀ and PM_{2.5}) emissions of the development; ii. minimise any visible off-site air pollution generated by the development; and 					
	 iii. minimise the extent of potential dust generating surfaces exposed on the site at any given point in time; 					
	 (b) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see Note c to Table 4 above); 					
	 (c) carry out real time and routine air quality monitoring to determine whether the development is complying with the relevant conditions in this consent; and 					
	 (d) 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. 					
Air Quality	and Greenhouse Gas Management Plan					
	The Applicant must prepare an Air Quality and Greenhouse Gas Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:					
	(a) be prepared by a suitably qualified and experienced person/s;	Noted				
	(b) be prepared in consultation with the EPA;	1.5				
	(c) describe the measures to be implemented to ensure:					
B25	i. compliance with the air quality criteria and operating conditions in this consent;	3				
	ii. minimise the development's Scope 1 and 2 greenhouse gas emissions;	3.6				
	iii. improve the development's energy efficiency;	3.6				
	iv. best practice management is being employed; and	3				
	 v. air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events; 	3.3.2				



Table 6 (Cont'd)
Development Consent Conditions (SSD 5899) – Air Quality

0		Page 3 of 6			
Condition No.	Condition				
Air Quality	ty and Greenhouse Gas Management Plan (Cont'd)				
	(d) include an air quality monitoring program that:	3.4			
B25	 is capable of evaluating the performance of the development against the air quality criteria; 				
(Cont'd)	includes a protocol for identifying any air quality-related exceedance, incident or non- compliance and for notifying the Department and relevant stakeholders of these events.				
	iii. includes a protocol for identifying any air quality-related exceedance, incident or non- compliance and for notifying the Department and relevant stakeholders of these events.				
B26	The Applicant must not commence construction until the Air Quality and Greenhouse Gas Management Plan is approved by the Planning Secretary.	Noted			
B27	The Applicant must implement the Air Quality and Greenhouse Gas Management Plan as approved by the Planning Secretary.	Noted			
B50	The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated. Note: It is accepted that some parts of the site that are progressively rehabilitated may be	3.2			
	subject to further disturbance at some later stage of the development.				
C1	As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any noise, blasting or air quality criterion in PART B of this consent, the Applicant must: (a) provide to any affected landowners and tenants; and	3.3.2.4			
	(b) publish on its website				
C2	For any exceedance of any air quality criterion in PART B of this consent, the Applicant must also provide to any affected land owners and tenants a copy of the fact sheet entitled "Mine Dust and You" (NSW Minerals Council, 2011).	3.3.2.4			
C3	If a landowner considers the development to be exceeding any noise, blasting or air quality criterion in PART B of this consent, they may ask the Planning Secretary in writing for an independent review of the impacts of the development on their land.				
C4	If the Planning Secretary is not satisfied that an independent review is warranted, the Planning Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.				
C5	 If the Planning Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Planning Secretary and the landowner, of the Planning Secretary's decision, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Planning Secretary, to: i. consult with the landowner to determine their concerns; ii. conduct monitoring to determine whether the development is complying with the 	3.3.2.4			
	relevant criteria in PART B of this consent; and iii. if the development is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria; give the Planning Secretary and landowner a copy of the independent review; and comply with any written requests made by the Planning Secretary to implement any findings of the review				



Table 6 (Cont'd)
Development Consent Conditions (SSD 5899) – Air Quality

		Page 4 of 6				
Condition No.	Condition	Section				
Air Quality and Greenhouse Gas Management Plan (Cont'd)						
	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:					
	(a) a summary of relevant background or baseline data;	2.4 and 2.7				
	(b) details of:					
	 the relevant statutory requirements (including any relevant approval, licence or lease conditions); 	2.8				
	(ii) any relevant limits or performance measures and criteria; and	3.1				
	 (iii) 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; 	3				
	 (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria; 	3				
	(d) a program to monitor and report on the:					
D4	(i) impacts and environmental performance of the development; and	3.4				
D4	(ii) effectiveness of the management measures set out pursuant to condition D4;	3.4				
	 (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; 	3.3				
	 (f) a program to investigate and implement ways to improve the environmental performance of the development over time; 	4.3				
	(g) a protocol for managing and reporting any:					
	 (i) incident, non-compliance or exceedance of the impact assessment criteria or performance criteria; 	4.1				
	(ii) complaint; or	3.4				
	(iii) failure to comply with statutory requirements; and	3.3.2.3				
	(h) a protocol for periodic review of the plan.	4.6				
	Note: The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.					
	Within three months of:					
	(a) the submission of an incident report under condition D7;					
	(b) the submission of an Annual Review under condition D9;					
	(c) the submission of an Independent Environmental Audit under condition D11;					
D5	(d) the approval of any modification of the conditions of this consent;	4.6				
	(e) notification of a change in development stage under condition A15; or					
	(f) the issue of a direction of the Planning Secretary under condition A2(b) which requires a review,					
	the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.					



 Table 6 (Cont'd)

 Development Consent Conditions (SSD 5899) – Air Quality

		Page 5 of 6		
Condition No.	Condition	Section		
Air Quality and Greenhouse Gas Management Plan (Cont'd)				
D6	If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review. Note: This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.	4.6		
D7	The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing through the Department's Major Projects website and identify the development (including the development application number and name) and set out the location and nature of the incident.	4.1		
D8	Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing to through the Department's Major Projects website and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. <i>Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.</i>	4.1		
Annual Rev	iew			
D9	By the end of March in each year after the commencement of development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary.	4.4		
D10	Copies of the Annual Review must be submitted to Council and made available to the CCC and any interested person upon request.	4.4		
Independen	t Environmental Audit			
D11	Within one year of the commencement any development under this consent, and every three years after, unless the Planning Secretary directs otherwise, the Applicant must commission and pay the full cost of an Independent Environmental Audit of the development.	4.5		
D12	Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, the Applicant must submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The recommendations must be implemented to the satisfaction of the Planning Secretary.	4.5		
D13	Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit. For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the consent or on the environmental impact of the development, and an "environmental audit" is a periodic or particular documented evaluation of the development to provide information on compliance with the consent or the environmental management or impact of the development.	3.4		



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 Table 6 (Cont'd)

 Development Consent Conditions (SSD 5899) – Air Quality

		Fage 0 01 0			
Condition No.	Condition				
Independen	t Environmental Audit (Cont'd)				
D14	Noise, blast and/or air quality monitoring under this consent may be undertaken at suitable representative monitoring locations instead of at privately-owned residences or other locations listed in Part B, providing that these representative monitoring locations are set out in the respective management plan/s.				
D15	 Before the commencement of construction until the completion of all rehabilitation required under this consent, the Applicant must: (a) make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of this consent) publicly available on its website (i) all approved strategies, plans and programs required under the conditions of this consent; (ii) 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; 				

2.8.2 Environment Protection Licence 1879

Environment Protection Licence (EPL) 1879 contains a number of conditional requirements relating to the management of air quality. **Table 7** identifies each of these conditional requirements and identifies the section of this Plan where each is addressed.

No	Condition				
P1	Location of Monitoring/Discharge Points and Areas			Section	
P1.1	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. <i>Air</i>			3.4	
	EPA identi- fication no. 1	Type of Monitoring Point Dust monitoring	Type of Discharge Point	Location Description Dust deposition gauge, shown as "Giles Road" on Figure titled "Hanson Construction Materials - Brandy Hill Quarry - Dust Monitoring Locations - September 2010" (on EPA file LIC10/854).	
	2	Dust monitoring		Dust deposition gauge, shown as "Front Gate" on Figure titled "Hanson Construction Materials - Brandy Hill Quarry - Dust Monitoring Locations - September 2010" (on EPA file LIC10/854).	
	3	Dust monitoring		Dust deposition gauge, shown as "Cattleyards" on Figure titled "Hanson Construction Materials - Brandy Hill Quarry - Dust Monitoring Locations - September 2010" (on EPA file LIC10/854).	
O 3	Dust				
03.1	The premises must be maintained in a condition which prevents or minimises the emission of air impurities, including dust, from the premises.			3.2	
03.2	All operations and activities occurring at the premises must be carried out in a manner that prevents or minimises the emission of air impurities, including dust, from the premises.			3.2	

 Table 7

 Conditional Requirements for Prevention of Pollution (Air Quality) of EPL 1879



2.8.3 Statement of Commitments

The Statement of Commitments for the Quarry operation are presented in the Amended RTS (RWC, 2019) and include the following commitments relevant to air quality and greenhouse gas management.

Air Quality

- Implement routine watering or similarly effective dust suppression treatment of internal roads and unsealed surfaces (including stockpiles and stockpile transfer points) during operations and at an increased frequency during adverse climate conditions.
- Modify operations during unfavourable weather conditions and in areas with high potential for dust dispersion, where
 necessary, to reduce dust generation.
- Stabilise the earthen amenity barrier (once constructed) to the south of the Quarry Site with groundcover vegetation as soon as practical following completion.
- Stabilise disturbed areas within the Quarry Site that are no longer required for operations with groundcover vegetation as soon as practical following completion.
- Maintain the internal road network through surfacing with well graded materials to reduce dust generation.
- Limit vehicle speed on internal roads to 30km/hr to reduce potential dust lift off.
- Minimise dump heights from trucks, front-end loaders and conveyors, where practical.
- Where feasible and practical, and in accordance with safe use of explosive practices, schedule blasts (or re-schedule) to avoid windy conditions.
- Install a continuous particulate matter monitor at a location identified in the Air Quality Management Plan incorporating a trigger mechanism to notify Quarry personnel when 24-hour particulate matter levels approaches the guideline. Notifications to be provided by SMS and/or email to key Quarry personnel.
- Prepare and implement a site Air Quality Management Plan for the life of the Project. Regularly review and update the plan in accordance with the requirements of the Project Approval.

Greenhouse Gas and Energy

- Document and evaluate energy use of the Project in the Annual Review.
- Ensure the use of appropriately sized, high efficiency motors on all pumps, crushers & equipment.
- Variable speed drives will be provided on electric motors in order to ensure energy savings and to deal with the results of varying loads on equipment.
- Apply timer switches, where possible, to relevant electrical appliances and sensor lights installed where possible to reduce energy use.
- Consider fuel economy and energy use when sourcing company vehicles.
- Incorporate the use of alternative fuels when feasible and available.



3. Air Quality Management System

3.1 Air Quality Criteria

In accordance with Condition B22 of SSD 5899, the particulate matter and deposited dust air quality criteria at any residence on privately-owned land for all activities undertaken during development are presented in **Table 8**.

All quality officing				
Pollutant	Averaging Period	eriod Criterion		
Particulate matter < 10 µm (PM ₁₀)	Annual	^{a,d} 25µg/m ³		
Particulate matter < 10 µm (PM ₁₀)	24 hour	^b 50µg/m³		
Particulate matter < 2.5 µm (PM _{2.5})	Annual	^{a,d} 8µg/m³		
Particulate matter < 2.5 µm (PM _{2.5})	24 hour	^b 25µg/m³		
Total suspended particulates (TSP)	Annual	^{a,d} 90µg/m ³		
^c Deposited dust	Annual	^b 2 g/m ² /month ^{a,d} 4 g/m ² /month		

Table 8 Air Quality Criteria

Notes:

a Cumulative impact (i.e. increase in concentrations due to the development plus background concentrations due to all other sources)

b Incremental impact (i.e. 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

3.2 **Pre-Emptive Management Measures**

3.2.1 Operating Hours

The operating hours for the Quarry are provided below in Table 9.

3.2.2 Design Controls

A range of standard and site-specific controls would be implemented to control dust generation and dispersion as part of planning and design of the Quarry. These measures include the following.

- The internal road network would continue to be surfaced with well graded materials to reduce dust generation.
- An earthen amenity barrier located to the south of the Quarry Site would be constructed during Stage 1 of operations and would be between 18m and 20m high.
- The earthen amenity barrier would be stabilised with groundcover vegetation as soon as practical following construction.
- Earthen amenity barriers of various lengths and heights would be temporarily constructed for each stage of operations and strategically located within the Processing and Stockpiling Area to mitigate dust dispersion.



Activity	Permissible Hours	
Construction work	7 am to 6 pm Monday to Friday	
	7 am to 5pm Saturday	
	At no time on Sundays or public holidays	
Product loading and dispatch	6 am to 6 pm Monday to Friday	
	6 pm to 10 pm Monday to Friday on 20 days per calendar year	
	6 am to 6 pm Saturday	
	At no time on Sundays or public holidays	
Quarrying operations (excluding	6 am to 6 pm Monday to Saturday	
secondary and tertiary processing)	At no time on Sundays or public holidays	
Secondary and tertiary processing	6 am to 8 pm Monday to Friday	
	6 am to 6 pm Saturday	
	At no time on Sundays or public holidays	
Blasting	9 am to 5 pm Monday to Friday (except public holidays)	
Maintenance, security, office work, cleaning, etc	May be conducted at any time, provided that these activities are not audible at any residence on privately-owned land	

Table 9 Operating Hours

3.2.3 Enclosure of Processing Equipment

The principal design control for potential air quality impacts is the enclosure of fixed crushing and screening equipment. In addition to the enclosure of fixed equipment, the conveyor transfer points would be partially enclosed after Stage 4 of operations once the new processing plant is constructed.

Hanson has also committed to partially enclosing the mobile crushing equipment used for concrete recycling activities. As the equipment is mobile it is not possible to completely enclose it. However, Hanson has committed to the use of stacked shipping containers and a temporary roof structure to mitigate dust generated through this process. These structures would be in place whenever this mobile equipment is in use.

3.2.4 Operational Mitigation

Hanson would continue to implement a number of operational controls consistent with best practice management to mitigate dust generation during operations. These measures include the following.

- Planning activities with consideration of predicted climate conditions and amending activities to suit prevailing conditions.
- Visual monitoring of dust generation and an adaptive management approach to prevailing conditions.
- Disturbed areas within the Quarry Site that are no longer required for operations would be subject to progressive rehabilitation and be stabilised with groundcover vegetation as soon as practical following completion. Areas that are only temporarily removed from active use would also be stabilised on a temporary basis using groundcover vegetation to limit dust generation.
- Vehicle speed on internal roads would be limited to 30km/hr and restricted to designated roads to reduce potential dust lift off.
- All loads are to be covered upon exiting the Quarry and hardstand areas are to be swept/cleaned as needed.
- Dump heights from trucks, front-end loaders and conveyors would be minimised, where practical. Quarry personnel would be trained to limit the height from which material is loaded to trucks to reduce the momentum of material falling into the trailer and therefore dust generation.



- Operations at exposed locations would be modified under unfavourable weather conditions, where necessary, to reduce
 potential dust generation.
- Blasts would be scheduled to avoid windy conditions, where feasible and in accordance with safe use of explosive practices.
- Vehicles are to be maintained and serviced according to manufacturer's specifications and all engines of on-site vehicles and plan are to be switched off when not in use.
- Vehicles and plant are to be fitted with appropriate pollution reduction devices where practicable.
- Any activities that may cause offensive odours are to be managed to reduce the potential for odours to be experienced outside the Quarry Site as defined under Section 129 of the *Protection of the Environment Operations Act 1997* (POEO Act). For quarry operations these principally include management of blasting fumes or diesel exhaust and the handling of chemicals that may be vaporised when exposed to the air (such as diesel).

3.2.5 Water Truck Operation

A water truck would continue to be used to water any exposed areas within the Quarry Site. These includes the following, in no particular order.

- Internal unsealed roads.
- Internal sealed roads.
- Unsealed surfaces within the processing and stockpiling area
- Product stockpiles of material that is not likely to be despatched within 24 hours
- Soil stockpiles that are not yet stabilised with groundcover including the amenity barrier once constructed.

In all cases the water cart driver is to use their discretion and experience to determine the schedule and focus of watering activities. Watering of roads and exposed stockpiles would be increased during dry and windy conditions

The air quality assessment for the Project (TAS, 2019) estimated that an 80% control efficiency for dust control via watering may be achieved through the following measures.

- A typical water application intensity of 0.32L/m².
- Allowing from an average of an hour between applications

This application intensity and application rate can be achieved using the existing 45,000L water truck. Application intensity and passing frequency will not be monitored actively, with compliance and successful implementation to be indicated by dust monitoring activities.

Table 10 presents the predicted annual water use requirements for road watering activities. Only worst-case scenarios were estimated with water use requirements during Stage 3 and Stage 5 anticipated to be below that estimated in **Table 10**. For the purpose of water use requirements, the peak of 31.3ML per annum has been used.

Annual Water Requirements for Road Watering					
Scenario	Control efficiency (%)	Average hourly traffic rate (/hr)	Time between applications	Annual water requirement (ML)	
Stage 1	80	20	1	27.4	
Stage 2	80	20	1	27.7	
Stage 4	80	20	1	31.3	

Table 10 Annual Water Requirements for Road Watering



3.3 Reactive Management Measures

3.3.1 Triggers

Reactive management will be applied. The following triggers are in place to provide for:

- 1. **Exceedance of Air Quality Criteria** Any record of air quality exceeding the criteria nominated in Section 3.1 will trigger the response and corrective action measures described in Section 3.4.2.1.
- Air Quality Complaint Any complaint received, either directly or indirectly via Council, EPA or other regulatory agency, will trigger the implementation of the response and corrective action measures described in Section 3.4.2.2. Complaints may also trigger a request for independent review of the impacts of the development as described in Section 3.3.2.3.
- 3. Air Quality Internal Investigation Trigger Value The continuous particulate matter monitoring equipment will be equipped with an internal alarm when dust levels are approaching or likely to approach the criteria levels. The alarm will not represent an exceedance of air quality criteria, but will be used to as a trigger for Quarry personnel to review and potentially modify operations with regards dust generation.
- 4. **Predicted Adverse Weather Conditions** such as high winds and excessively dry periods would be considered as triggers for reactive management.
- 5. **Extraordinary Events or Conditions** such as bushfires, prescribed burning, dust storms, fire incidents or any other activity.

3.3.2 Response and Corrective Actions

3.3.2.1 Air Quality Criteria Exceedance

If emissions monitoring indicates that the approved criteria has been exceeded, the following response and action plan will be implemented.

- 1. The Quarry Manager will be notified of the potential non-compliance.
- 2. Hanson will immediately investigate the source of the emissions, review the activities undertaken at the time and if necessary amend operations to reduce emissions.
- 3. DPIE and the EPA would be notified immediately of the non-compliance.
- 4. An investigation into the potential non-compliance would be instigated, with the objective of identifying the following, where appropriate:
 - the date and time of the non-compliance;
 - the duration of the non-compliance;
 - whether the non-compliance was directly related to operations within the Quarry or if any other factors contributed to the non-compliance;
 - the primary cause of the non-compliance;
 - any contributing factors which led to the non-compliance;
 - whether appropriate controls were implemented to prevent the non-compliance; and
 - corrective and preventative measures that may be implemented to prevent a recurrence of the non-compliance.
- 5. Within 7 days of the date of identifying the non-compliance Hanson will provide a detailed report to DPIE and the EPA. The report shall (at a minimum):
 - a. be made in writing through the Major Projects Portal;
 - b. identify the development (including the development application number and name);
 - c. set out the condition of consent that the development is non-compliant with;
 - d. why it does not comply and the reasons for the non-compliance (if known); and
 - e. what actions have been, or will be, undertaken to address the non-compliance.



6. Within 7 days of obtaining any data showing an exceedance of air quality criteria, Hanson will notify in writing any affected residents in accordance with Condition C1 of SSD 5899. All affected residences would be provided with a copy of the Mine Dust and You (NSW Health, 2017) that is included as **Appendix 2**.

Following completion of the investigation, Hanson will:

- 1. Provide a copy of the completed investigation report to DPIE, the EPA and affected residents.
- 2. Implement the corrective and preventative actions identified in the investigation report.
- 3. Publish the investigation report on its website and present the findings to the CCC.

Any exceedance of the approved air quality criteria will be reported to EPA in the Annual Return and to DPIE in the Annual Review.

3.3.2.2 Air Quality Complaints

The *Environmental Management Strategy* includes a detailed complaints management procedure. This sub-section records the procedures that would be implemented following receipt of an air quality-related complaint which may be received through one of the following methods.

- Directly via Hanson's 24-hour, 7 day per week general Emergency Line (1800 882 478). This number will be advertised on signage at the Quarry entrance and on Hanson's website.
- Directly via the customer feedback / complaint / incident portal on the Hanson website.
- Indirectly via a government agency.

In addition, consultation will be held with the community as part of Hanson's standard consultation procedures, namely informal meetings with surrounding landholders as required and meetings of the Community Consultative Committee. These meetings will provide a further forum at which complaints maybe received.

Following receipt of any air quality-related complaint, the following procedure will be implemented.

- 1. The complaint will be reviewed by the Quarry Manager or their delegate to determine the nature, date and time of the complaint. This will include contacting and meeting with the complainant as required.
- 2. Relevant monitoring data will be reviewed.
- 3. Should the monitoring results indicate that no exceedance of the assessment criteria identified in Section 3.1, the Quarry Manager will continue to consult with the complainant in relation to managing impacts associated with the Quarry.
- 4. Should the monitoring indicate an exceedance of the relevant criteria, the Quarry Manager will notify the DPIE and EPA and will implement the procedures identified in Section 3.3.2.1. In addition, the Quarry Manager will continue to consult with the complainant, as required, in relation to the complaint, until the issue is resolved.
- 5. In the event that multiple complaints are received from the same individual(s) and the Quarry can demonstrate:
 - at least three complaints from the complainant, with demonstrated compliance with the relevant criteria in each case; and
 - there is documented evidence of a genuine attempt by the Quarry to discuss the issue and seek a resolution with the complainant without success.

The Quarry may, in consultation with the relevant government agencies, limit responses to further complaints to Steps 1 and 2 above.

All complaints would be recorded using a proforma complaints record sheet, with a description of the nature and the outcome of the complaint and subsequent investigation provided in summary form to the Community Consultative Committee and in the Annual Review/Annual Return. The complaints register will be published on the Hanson website on a quarterly basis.

3.3.2.3 Air Quality Complaints and Independent Review of Operations

Condition C3 permits landowners who believe that air quality exceedances are or have occurred from the Quarry to request from Government (DPIE) an independent review of the impacts of the operation on their land. Should DPIE consider that a review is not warranted it will notify the landowner of this decision and the reasons for it within 21 days of the request.



However, if DPIE determine that the review is warranted and notifies Hanson of the decision, within 3 months of notification Hanson must:

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

The outcomes of any independent review will be published in the Annual Review and on the Hanson website.

3.3.2.4 Air Quality Internal Investigation Trigger

If the nominated internal investigation trigger alarm is activated an investigation will be commenced in accordance with the following response and action plan.

- 1. Hanson will review meteorological conditions to assess whether these were a factor in the result.
- 2. Hanson will investigate the source of the elevated emissions, review the activities being undertaken and if necessary amend operations to reduce emissions.

24-hour average trigger levels will indicate both operational and environmental exceedances. This may include bush fires, regional road works or dust conditions as well as site conditions.

3.3.2.5 Predicted Adverse Weather Conditions

It is noted that air quality criteria still apply during adverse weather conditions such as high winds or extremely hot and dry periods. Should local weather predictions include the potential for adverse weather conditions, Hanson will limit or modify operational activities, based on weather predictions to minimise the potential of air quality impacts and ensure compliance during these periods.

3.3.2.6 Extraordinary Events or Conditions

Extraordinary events include any of the following, relevant to operations at the Quarry. It is noted that air quality criteria do not apply under these conditions.

- Bushfires.
- Prescribed burning
- Dust storms.
- Fire incidents.
- Any other activity agreed by the Secretary of the DPIE, or their delegate.

During times when these conditions are forecast or observed it would be at Hanson's discretion to limit or modify operational activities to ensure that air quality impacts are limited as much as practically possible.

3.4 Air Quality Monitoring

Air quality monitoring will be undertaken at the Quarry Site in order to provide evidence of compliance with the conditions of SSD 5899 and to monitor any environmental impacts of the development.



The existing program of deposited dust monitoring will be continued at three locations including Giles Road, the Front Gate of the Quarry and the Cattle Yards to the southeast of the Quarry. Dust data will be collected monthly from the existing dust gauges. Hanson will also implement continuous monitoring of particulate matter that is sized 10 microns or less (PM₁₀) at a location between the Quarry and Clarence Town Road. An initial period of continuous monitoring of particulate matter that is sized 2.5 microns or less (PM_{2.5}) would occur for 12 months to establish the relationship between PM₁₀ and PM_{2.5} in the local area including that generated at the Quarry. Following the initial 12-month period of monitoring, PM₁₀ data would be used as a surrogate for both PM_{2.5} and TSP, with additional monitoring to be undertaken if persistently high concentrations of PM₁₀ are recorded. The location of monitoring points are presented in **Figure 2**. These locations are considered to be representative monitoring locations for any potential impacts at privately-owned residences (in accordance with Condition D14 of SSD 5899).

The highest predictions of particulate matter dispersion occur at residences along Clarence Town Road. Therefore, the proposed location for the particulate matter monitor to the south of the Quarry between the operational areas and Clarence Town Road is considered the most appropriate. It is noted that in accordance with Condition D14 of SSD 5899, a representative location for monitoring is appropriate for measuring compliance at privately-owned locations.

Monitoring will be undertaken in accordance with the following documents.

- AS 29221987 Ambient Air Guide for the Siting of Sampling Units (NSW DECCW Method AM-1).
- NSW EPA Approved methods for the sampling and analysis of air pollutants in NSW (EPA, 2017).

Hanson is aware of the penalties described in Section 9.4 of the EP&A Act relating to the provision of false or misleading information when reporting monitoring data relating to air quality, withholding information required to be reported or for failing to maintain records for at least five years.

3.4.1 Deposited Dust

Three dust deposition gauges have been installed within or surrounding the Quarry (**Table 11** and **Figure 2**). Dust deposition gauges will be installed and operated in accordance with the following.

- AS 2922:1987 Ambient Air Guide for the Siting of Sampling Units (NSW DECCW Method AM-1) (superseded by AS/NZS 3580.1.1:2016), and the NSW EPA Approved methods for the sampling and analysis of air pollutants in NSW (DEC, 2007).
- AS/NZS 3580.10.1:2016 Methods for sampling and analysis of ambient air Determination of particulate matter Deposited matter - Gravimetric method.

Dust deposition will be measured and reported on a monthly basis. Exposed gauges will be replaced on a monthly basis, with analysis conducted at a NATA accredited laboratory for insoluble solids, combustible matter and ash content.

montoning zoodiono			
Monitoring Location	Monitoring Type	Northing	Easting
Access Road	Deposited Dust	376855	6384396
Giles Road	Deposited Dust	375579	6385533
South-East	Deposited Dust	378514	6384801
South	PM ₁₀	376972	6384741

Table 11 Monitoring Locations

3.4.2 Continuous Particulate Matter Monitoring

Continuous monitoring of particulates that are 10 microns or less in size (PM₁₀) has been occurring at the Quarry historically and would continue under SSD 5899 (see **Figure 2**). The monitoring equipment will be set to continuous operation and PM₁₀ sample results will be collected digitally via a direct download from the equipment. Data will also be collected manually on a monthly basis.







The physical crushing activities that will occur at the Quarry are more likely to generate particulate matter of larger fractions (typically PM₁₀) due to the crushing and shearing forces applied compared to the smaller dust fractions that are typically generated through grinding and sanding activities. Notwithstanding this, SSD 5899 prescribes criteria relating to PM_{2.5} in order that the compliance criteria that are applied to the operation cover particulate matter fractions of all sizes. In order to ensure that compliance with the particulate matter criteria for PM_{2.5} specified in Section 3.1 are satisfied, Hanson will implement a program of continuous PM_{2.5} monitoring for a period of 12 months following commencement of operations under SSD 5899. This monitoring will permit Hanson to establish the relationship between PM₁₀ and PM_{2.5} in the local area and also to measure any seasonal changes to this relationship. For examples, it is common that ambient PM_{2.5} levels increase during winter when households are using wood-burning heaters with the smoke exhaust containing fine particles of ash.

Hanson proposes to continue using TSI Dusttrak II Desktop equipment for monitoring particulate matter. The equipment is a solar-powered laser nephelometer that records particulates with data available via a web-based portal. The use of a solar power supply would allow the equipment to be deployed at any location surrounding the site to, for example, respond to community complaints, monitor potential impacts from blasting at nearby residences, or provide ongoing information on any changes to the environment resulting from Quarry operations.

The equipment will be set to provide SMS or email advice once particulate matter reaches trigger levels for a given period. Trigger levels will be established for 24-hour or other incremental averaging period for particulate matter levels so that quarry management can respond accordingly. Protocols for response to these triggers is provided in Section 3.3.1.

As the highest incremental PM₁₀ levels generated by the Quarry were predicted to be 18.2µg/m³ at Residence 13 during Stage 4 of operations¹ (compared to a criteria level of 50), monitoring activity will not be measuring direct impacts of the Quarry but seeking to identify periods when the Quarry operation is adding to ambient conditions to produce a level of cumulative particulate matter that exceeds the criteria level. In most cases the background level assumed for assessment was much higher than the dust generated by the Quarry. The use of trigger notifications will ensure that these (cumulative) levels are not exceeded, except in situations where ambient conditions are exceedingly high (such as during bushfires or dust storms).

As a result, the use of TSI Dusttrak II Desktop equipment in the location currently applied is considered the most appropriate to both demonstrate compliance with the conditional requirements of SSD 5899 and to monitor the environmental impacts of the Quarry.

The real time particulate matter monitors will be subject to operational checks by quarry personnel on a monthly basis with calibration conducted on the unit at intervals in accordance with the manufacturer's instructions. The manufacturer also recommends that the equipment is returned to the factory for service and recalibration every two years.

PM₁₀ data (and the first 12 months of PM_{2.5} data) will be analysed on a monthly basis and yield information on:

- average daily (24-hour) concentrations (µg/m³); and
- average annual concentrations (μg/m³), once sufficient data is available.

Once the initial 12-month period of PM_{2.5} monitoring is completed, ongoing compliance with criteria for TSP and PM_{2.5} will be inferred through measurement of PM₁₀ and compliance with PM₁₀ criteria. For the purpose of demonstrating ongoing compliance with the air quality criteria for TSP and PM_{2.5}, monitored records of PM₁₀ and compliance with annual average criteria for PM₁₀ will be used to infer compliance with the TSP and PM_{2.5} criteria. It is recognised that PM₁₀ generally constitutes approximately 40% of TSP and therefore may be used as a surrogate. Demonstrating compliance with TSP criteria in this manner is a common and accepted practice (i.e. recorded PM₁₀ divided by 0.4 will be used to assess compliance with TSP criteria).

Should monitoring records indicate persistently high concentrations of PM_{10} , additional monitoring for $PM_{2.5}$ (following the initial 12-month monitoring program) and/or TSP would be undertaken in consultation with the EPA. This approach is considered appropriate given that the highest annual average TSP levels due to the Project (incremental change) is 7.8μ g/m³ and the highest annual average PM_{2.5} levels (incremental change) due to the Project is 0.6μ g/m³.

¹ See Appendix E of TAS (2019)



3.5 Meteorological Monitoring

An Automated Weather Station (AWS) is located adjacent to the Quarry Access Road (see **Figure 2**) to provide meteorological information for use as part of the environmental monitoring program, including air quality, and for management of operations at the Quarry. The AWS records the following data at the Site:

- rainfall;
- temperature at 10m;
- temperature at 2m;
- relative humidity;
- net solar radiation;
- sigma theta;
- wind direction; and
- wind speed.

The AWS installed at the Quarry:

- complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007); and
- is capable of measuring meteorological conditions in accordance with the NSW Industrial Noise Policy (EPA, 2000),

3.6 Greenhouse Gases

Hanson will maintain a greenhouse gas reporting system to track energy consumption and greenhouse gas emissions, establish targets for reduction and facilitate assessment and reporting against targets for reduction. The results from the greenhouse gas reporting system will be regularly reviewed to ensure the data being collected is meaningful.

Hanson generally considers measures to reduce greenhouse gas emissions through consideration of fuel economy and energy use in selecting Company vehicles, pumps, crushers and other equipment. Alternative fuels are also considered where feasible.

Site-based operational controls to limit the emission of greenhouse gases during operations would include the following.

- Optimising Quarry design to minimise travel distances for equipment and the need for rehandling of overburden and aggregate materials.
- Reduce truck queuing, unnecessary idling of trucks and unnecessary trips through logistical planning, where possible
- All equipment on site is maintained as per the manufacturer's specification to maximise efficiency and minimise emission generation.
- Variable speed drives will be provided on electric motors in order to ensure energy savings and to deal with the results of varying loads on equipment.
- Timer switches will be used on electrical appliances and sensor lights installed where possible to reduce energy use.

Hanson will document and report annual energy use and any efficiency measures that have been implemented in the Annual Review

3.7 Publication of Information

Hanson will publish air quality-related information on Hanson's website. Specific publication requirements include the following:

- A copy of this Plan and any assessment document relating to air quality.
- A summary of air quality monitoring results will be published every month.
- The Annual Review for the period 1 January to 31 December of each year, will be published within fourteen (14) days of acceptance by DPIE.



- All air quality exceedance investigation reports will be made publicly available on the Quarry website within fourteen days of being finalised and accepted by DPIE.
- Incident and exceedance investigation reports will be made publicly available within fourteen (14) days of being provided to the relevant regulator.

Finally, Hanson will also provide the Community Consultative Committee with a copy of the above documentation.

The Environment, Planning and Compliance Coordinator will be responsible for publication of all relevant monitoring information. All information published to the website will be kept up to date.



4. Management of Compliance

4.1 Incident Management

4.1.1 Incident Identification

Condition D7 of SSD 5899 requires Hanson to notify DPIE and any other relevant agencies immediately after becoming aware of an incident. The notification must be in writing through the Department's Major Projects website and identify the development (including the development application number and name) and set out the location and nature of the incident. In this case an incident is defined as an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance.

Similarly, Condition R2 of EPL 1879 requires that the Quarry must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident.

For the purpose of air quality management at the Quarry, material harm is harm that:

- · involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial; or
- results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment).

An incident which causes or threatens to cause material harm to the environment (and may or may not result in an exceedance of discharge quality criteria) is referred to as a **Pollution Incident**.

An incident which is only as a result of an exceedance of discharge quality criterion, is referred to as a **Non-compliance Incident**.

Substantiated complaints received by the Quarry will not be considered incidents but will trigger an investigation and subsequent feedback to the complainant.

4.1.2 Non-compliance Incident

On identification of a non-compliance against the air quality-related conditions of SSD 5899, which may follow receipt of a complaint, the Quarry Manager will be notified. and an investigation into the source of the non-compliance or complaint will be commenced in accordance with the response and corrective actions described in Section 3.3.2.

4.1.3 Pollution Incident

In the event of an incident which is deemed a Pollution Incident, the Quarry Manager and Environment, Planning and Compliance Coordinator will be notified, who will immediately notify DPIE and the EPA (using the Environmental Line 131 555). Following notification, the Quarry Manager will initiate an investigation (as described in Section 3.3.2) into the cause and once identified the Quarry Manager or delegate will implement corrective measures (to be identified as part of the investigation).

Corrective and/or preventative actions will be assigned to relevant Hanson personnel. Actions will be communicated internally through planning meetings and toolbox talks and outstanding actions will be monitored for their effectiveness upon completion.

4.1.4 Incident Notification and Reporting

In the event that an initial investigation concludes that an exceedance of an environmental criterion was directly attributed to activities associated with the Quarry, as described in Section 3.3.2, the event will be reported to the DPIE and the EPA immediately upon confirmation of the exceedance. The affected landowner will also be notified and a copy of the NSW Health fact sheet entitled "Mine Dust and You" will also be provided.



Within 7 days of identifying the exceedance, Hanson will submit a written report with regular updates on the status of the additional mitigation actions to DPIE, the EPA and the affected resident or complainant, in accordance with the procedures identified in Section 3.3.2. In addition, a copy of all reports will be provided to the Community Consultative Committee, made publicly available on the Quarry website and will be included in the *Annual Review*.

The Environment, Planning and Compliance Coordinator will be responsible for incident reporting.

4.2 Evaluation of Compliance

An evaluation of compliance with the conditions of approval will be undertaken as follows:

- A summary of any complaints would be published quarterly and measures undertaken to investigate and resolve those complaints.
- A summary of air quality monitoring results will be published every month. The summary will include a review of compliance with all air quality criteria.
- A review of all air quality monitoring results captured over the preceding year and any trends identified in the data as well as comparison with the predicted dust levels will be presented in the Annual Review.

4.3 Continual Improvement

Opportunities for improvement of air quality-related impacts will be discussed internally at toolbox meetings, in conjunction with all Quarry personnel. These opportunities would be presented to the Quarry Manager for consideration and any changes to operations as a result reported on as part of the *Annual Review* or, where relevant, reflected in an updated Plan.

In addition, general compliance, air quality monitoring outcomes and the number of complaints would be used as an indication of the effectiveness of management. This includes issues identified through the Annual Review preparation (Section 4.4) and the outcomes of any Independent Environmental Audit of the operation (Section 4.5). Incidents (as defined in Section 4.1) would be triggers for review of the air quality management system and update to management, where necessary.

4.4 Annual Review

In accordance with Condition D9 and D10 of SSD 5899, by the end of March in each year after the commencement of development, or other timeframe agreed with the Planning Secretary, an Annual Review will be submitted to DPIE reviewing the environmental performance of the development.

The approach to preparing and the contents of the Annual Review are described in Section 5.9 of the Environmental Management Strategy and are not repeated here.

Air quality-related matters that will be reported in the Annual Review include the following as relevant for the calendar year of reporting.

- A summary of the outcomes of air quality management for the period and that proposed for the following year.
- Any changes to air quality management that occurred as part of operations during the year or that are proposed for the following year.
- The outcomes of all monitoring described in Section 3.4.
- A review of any incidents or complaints that relate to air quality management.
- A statement regarding compliance with air quality-related conditions of consent for the period.

Copies of all Annual Reviews will be available from the Hanson website. Each year a copy of the Annual Review will be submitted via the Major Projects Portal and electronically submitted to Council. Copies will be made available to the CCC and any interested person upon request.



4.5 Independent Environmental Audit

Within one year of the commencement of Stage 1 of operations, and every three years thereafter, unless the Planning Secretary directs otherwise, Hanson will commission an Independent Environmental Audit of the development.

The audit process is described in detail in Section 5.10 of the Environmental Management Strategy and is not repeated here, However, the audit will provide an independent evaluation of the performance of measures implemented under the Plan and provide recommendations for improvement or update.

Within three months of commencing an Independent Environmental Audit, or within another timeframe agreed by the Planning Secretary, Hanson will submit a copy of the audit report to the Planning Secretary, and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations.

Any recommendations agreed through the audit process will be implemented by Hanson consistent with the timetable approved by the Planning Secretary.

4.6 Review

In accordance with *Condition D5*, this Plan will be reviewed within three months of:

- the submission of an incident report under Condition D7 of SSD 5899;
- the submission of an annual review under Condition D9 of SSD 5899;
- the submission of an independent environmental audit report under Condition D11 of SSD 5899;
- the approval of any modification to the conditions of SSD 5899;
- notification of a change in development stage under Condition A15 of SSD 5899; and
- the issue of a direction of the Planning Secretary under condition A2(b) which requires a review.

The reviewed plan will be submitted to the Planning Secretary for approval within six weeks of finalisation of the review.

In addition, this Plan will be reviewed and updated, should it be required, at the commencement of a new operational stage of development.

The Environment, Planning and Compliance Coordinator will be responsible for the review of this Plan.



5. References

- Department of Environment and Conservation (DEC) (2007). Approved methods for the sampling and analysis of air pollutants in NSW
- Environment Protection Authority (EPA) (2000).NSW Industrial Noise Policy
- Hanson Construction Materials Pty Ltd (2017). Environmental Impact Statement Report Brandy Hill Expansion Project, dated February 2017
- **NSW Health (2017)**. *Mine Dust and You*, Fact Sheet https://www.health.nsw.gov.au/environment/factsheets/Pages/minedust.aspx
- R.W. Corkery & Co. Pty Limited (RWC) (2019). Amended Response to Submissions, prepared for Hanson Construction Materials Pty Ltd, dated September 2019
- Todoroski Air Sciences (TAS) (2019). Air Quality Impact Assessment Brandy Hill Quarry Expansion, prepared for Hanson Construction Materials Pty Ltd, dated September 2019



Appendices

(Total No. of pages including blank pages = 10)

- Appendix 1 Government Agency Consultation Correspondence
- Appendix 2 Mine Dust and You Fact Sheet (4 pages)



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Appendix 1

Government Agency Consultation Correspondence

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DOC21/160386-2

Department of Planning, Industry and Environment

Returned via the Major Projects Portal

Attention: Genevieve Lucas

29 March 2021

Planning Referral - Brandy Hill Quarry Expansion Project (SSD-5899-PA-3) - Air Quality and Greenhouse Gas Management Plan

Dear Ms Lucas

I refer to the email from the Department of Planning, Industry and Environment (DPIE) of 5 March 2021, requesting the Environment Protection Authority (EPA) review and comment on the Brandy Hill Quarry Expansion Air Quality and Greenhouse Management Plan, document (SSD-5899-PA-3) dated 3 March 2021.

The EPA encourages the development and use of such plans to ensure that proponents have met their statutory obligations and designed environmental objectives.

Being a regulatory authority, the EPA's role is to set environmental management objectives rather than being directly involved in the development of strategies to achieve those objectives. Accordingly, the EPA has not reviewed this report and accordingly offers no comments in relation to it.

If you require any further information regarding this matter, please contact Genevieve Lorang on (02) 4908 6869.

Yours sincerely

MITCHELL BENNETT Acting Manager - Regulatory Operations

 Phone
 131 555
 TTY
 133 677

 Phone
 +61 2 9995 5555
 ABN 43 692 285 758

 (from outside NSW)

Locked Bag 5022 Parramatta NSW 2124 Australia 4 Parramatta Square 12 Darcy St, Parramatta NSW 2150 Australia info@epa.nsw.gov.au www.epa.nsw.gov.au





Ms Belinda Pignone Graduate Environmental Planning Coordinator Hanson Construction Materials Pty Ltd Level 18 2-12 Macquarie Street Parramatta, NSW, 2150

16/06/2021

Dear Ms Pignone,

Brandy Hill Quarry Expansion Project (SSD 5899) Air Quality and Greenhouse Gas Management Plan - request for additional information

We require additional information relating to the Air Quality and Greenhouse Gas Management Plan submitted under the conditions of consent for the Brandy Hill Quarry Expansion Project (SSD 5889).

Please submit a revised document that addresses the requirements under Attachment A.

Please provide the information or notify us that you will not provide the information by Friday 25 June 2021. If this timeframe is not achievable, please provide and commit to an alternative timeframe for providing this information.

If you have any questions, please contact Callum Firth at Callum.Firth@dpie.nsw.gov.au.

Yours sincerely

Matthew Sprott Director Resource Assessments (Coal & Quarries)



Appendix 2

Mine Dust and You Fact Sheet

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Mine Dust and You – Fact Sheet

WHAT IS THIS FACT SHEET?

People living near mine sites often ask about the effects of dust emissions in the air as a result of mining activities. This fact sheet has been prepared to explain the type of dust that is generated from mine sites and the potential risks from mine dust to health.

WHAT IS PARTICULATE MATTER?

Commonly called "dust," scientists and regulators refer to the term particulate matter (or PM) to describe the range of particles that exists in the air we breathe.

PM exists naturally in the atmosphere, e.g. sea-salt spray and pollens. PM can be increased due to human activities such as vehicle exhaust, industrial processes, power stations, mining, farming and wood heaters, or smoke from bushfires.

Exposure to PM can be associated with health and amenity impacts. The likely risk of these impacts depends on a range of factors including the size, structure and composition of the PM and the general health of the person.

SIZE OF PARTICULATE MATTER

Just as the size of balls we can see ranges from marbles to basketballs, PM can be thought of as microscopic balls of varying sizes. Instead of measuring PM in centimetres as we do with balls, scientists use micrometres (sometimes called "microns") to measure the diameter of particles. A micrometre is one-millionth of a metre and its symbol is µm.

Particle size	Description
TSP	Total Suspended Particulate Matter (TSP) refers to the total of all particles suspended in the air. Even the largest of these particles is barely half the width of a human hair.
"larger than" PM10	A subset of TSP, and refers to all particles of size 10 μm in diameter and greater.
PM10	Also a subset of TSP, and includes all particles smaller than 10 μ m in diameter (smaller than 1/7th of a hair width). Particles in the size range 2.5 μ m to 10 μ m in diameter are referred to as coarse particles (PM 2.5-10).
PM2.5	A subset of both PM10 and TSP categories and refers to all particles less than 2.5µm in diameter. PM _{2.5} is referred to as fine particles and is mainly produced from combustion processes such as vehicle exhaust.

For environmental health purposes, particles are usually described by their size:

Particles levels in air are measured by the weight (micrograms) of particles per cubic metre of air (μ g/m3). One (μ g/m3) equals one millionth of a gram in a cubic metre of air. TSP can also be measured as the weight of dust falling on a given area over time ("dust deposition").

PARTICULATE MATTER FROM MINING

The vast majority of dust from mining activities consists of coarse particles (around 40 per cent) and particles larger than PM_{10} , generated from natural activities such mechanical disturbance of rock and soil materials by dragline or shovel, bulldozing, blasting, and vehicles on dirt roads. Particles are also generated when wind blows over bare ground and different types of stockpiles. These larger particles can have amenity impacts as well as health impacts.



Fine particles from vehicle exhausts and mobile equipment are also produced at mine sites, though they only account for about 5 per cent of the particles emitted during the mining process. Fine particles produced at mine sites are manly from vehicle and mobile equipment exhausts.

POTENTIAL HEALTH IMPACTS FROM PM

The human body's respiratory system has a number of defence mechanisms to protect against the harmful effects of PM. PM is often trapped in sticky mucus on the walls of the airways and can be removed by cilia, small hair-like objects which line the surface of the airways. This mucus can then be swallowed or coughed up.

PM exposure can lead to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits and even to death from heart or lung diseases. Both long (over years) and short term (hours or days) particle exposure have been linked to health problems.

Generally, it is thought that fine particles below 2.5μ m in diameter may be of a greater health concern than larger particles as they can reach the air sacs deep in the lungs. However, coarse particles (PM 2.5-10) could also be associated with adverse health effects.

People who may be more susceptible to the health effects of fine and coarse particles are:

- infants, children and adolescents;
- elderly;
- people with respiratory conditions such as asthma, bronchitis and emphysema;
- people with heart disease; and
- people with diabetes.

If health effects arise from exposure to coarse particles, such as from mining activities, the symptoms are likely to be:

- cough;
- wheeze, or worsening of asthma;
- increased need for medications (e.g. puffers, antibiotics); and
- increased breathlessness.

Some recent research suggests that heart problems, such as angina and heart attacks may also be associated with coarse particle pollution.

High levels of TSP may also cause coughing, sneezing or sore eyes.

POTENTIAL AMENITY IMPACTS

Amenity impacts from dust are usually associated with coarse particles and particles larger than PM₁₀. The impact of dust from a nearby mine on local amenity depends on the distance from the mine site and climatic conditions such as wind.

Concerns about amenity from mine site dust often relate to "visibility" of dust plumes and dust sources. Visible dust is usually due to short-term episodes of high emissions, such as from blasting.

Other amenity impacts include dust depositing on fabrics (such as washing) or on house roofs, and the transport of dust from roofs to water tanks, during rain. NSW Health's Rainwater Tanks brochure provides advice on how to maintain water tanks for safe drinking. Strategies to reduce dust in water tanks include first flush devices and desludging.



GOVERNMENT REGULATIONS

In New South Wales, outdoor air quality is governed by both State and Commonwealth regulations. The National Environmental Protection Measure (Air NEPM) provides air quality standards that are applied in cities and large towns across Australia. NEPM standards apply to average concentrations across a region.

The NSW Environment Protection Authority (NSW EPA) also has regulatory criteria for assessing ambient air quality. Although consistent with the Air NEPM, these criteria are more comprehensive. NSW EPA Impact Assessment Criteria are used to assess PM in localised areas, close to the mine itself.

The standards imposed by the regulatory authorities take into account what we know about health effects on people with asthma, lung conditions, and heart disease. PM standards and criteria are set to control short (daily) and long term (average) levels. The table below summarises the relevant air quality standards and criteria for mines.

Pollutant and Averaging Period	Concentration Standard (µg/m ³)	Agency
TSP – 1 year	90	NSW EPA Criterion
PM ₁₀ – 1 day	50	NSW EPA Criterion and NEPM Standard
PM ₁₀ – 1 year	25	NSW EPA Criterion and NEPM Standard
PM _{2.5} – 1 day	25	NSW EPA Criterion and NEPM Standard
PM _{2.5} – 1 year	8	NSW EPA Criterion and NEPM Standard
Dust deposition – 1 year	4 grams/m²/month (maximum total)	NSW EPA Criterion
Dust deposition – 1 year	2 grams/m²/month (maximum increase)	NSW EPA Criterion

 Table 1

 Air Quality Standards and Criteria for Particulate Matter

HOW CAN YOU AVOID MINE DUST?

Provided that mines are operated with proper dust controls it is unlikely that healthy adult residents would suffer any serious health effects from the expected exposure to particulate matter.

If you notice that dust levels are high, try to keep your windows and doors closed. People who have asthma or lung conditions should avoid outdoor activities at these times. An air-conditioner can reduce PM levels inside, but it is important to regularly clean the intake filter.

Residents experiencing the health symptoms outlined in this fact sheet should see their local doctor.



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