



**WINSTONE**  
AGGREGATES

Boffa Miskell



Part  
B

# Appendix B12.8.1

Air Quality Management Plan

# Hunua Quarry – Air Quality Management Plan

✦ Prepared for

Winstone Aggregates

✦ March 2026

D  
R  
A  
F  
T



PATTLE DELAMORE PARTNERS LTD  
Level 2, 109 Fanshawe Street,  
Auckland Central 1010  
PO Box 9528, Auckland 1149, New Zealand

Tel +64 9 523 6900  
Web [www.pdp.co.nz](http://www.pdp.co.nz)



**solutions** for your environment

## Quality Control Sheet

TITLE Hunua Quarry – Air Quality Management Plan

CLIENT Winstone Aggregates

ISSUE DATE 27 March 2026

JOB REFERENCE A035680013

Revision History					
REV	Date	Status/Purpose	Prepared By	Reviewed by	Approved
1	20/02/2026	DRAFT	Trevor Everett	Cameron Brown	Andrew Curtis
2	27/03/2026	Updated DRAFT	Trevor Everett	Cameron Brown	Andrew Curtis

D  
R  
A  
F  
T

### DOCUMENT CONTRIBUTORS

Prepared by

SIGNATURE

---

Trevor Everett

Reviewed by

Approved by

SIGNATURE

---

Cameron Brown

Andrew Curtis

### Limitations:

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Fletcher Concrete and Infrastructure Limited. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of Fletcher Concrete and Infrastructure Limited for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

© 2026 Pattle Delamore Partners Limited

## Table of Contents

SECTION	PAGE
<b>1.0 Introduction</b>	<b>1</b>
<b>2.0 Requirement to Prepare an AQMP</b>	<b>1</b>
<b>3.0 General Responsibilities</b>	<b>1</b>
3.1 Winstone Aggregates	1
3.2 Site Manager	1
3.3 Winstone Staff	2
3.4 Contractors	2
3.5 Auckland Council	2
3.6 Technical Experts	2
<b>4.0 Contact Details</b>	<b>3</b>
<b>5.0 Staff Training</b>	<b>3</b>
<b>6.0 General Description of Quarry Operations and Potential Air Discharge Sources</b>	<b>4</b>
6.1 Vegetation Removal and Site Preparation	6
6.2 Soil Stripping and Stockpiling	6
6.3 Overburden Stripping and Disposal, Concrete Recycling, and Managed Fill	6
6.4 Rock Removal	6
6.5 Processing Rock	7
6.6 Storage and Distribution	7
6.7 Concrete Crushing	7
<b>7.0 Nearby Sensitive Receptors</b>	<b>7</b>
<b>8.0 Dust Suppression Methods</b>	<b>9</b>
8.1 Overburden Stripping and Disposal	10
8.2 Drilling	10
8.3 Blasting	10
8.4 Rock Removal	10
8.5 Crushing and Screening	11
8.6 Concrete Crushing	12
8.7 Stockpiling	12
8.8 Loadout, Transport and Transfer Operations	13
<b>9.0 Additional Dust Control Measures</b>	<b>13</b>
9.1 Watercarts	13
9.2 Truck Spillage	14
9.3 Vehicle Exhausts	14
9.4 Speed Limit	14
9.5 Following Distances	14

 D  
R  
A  
F  
T

9.6	Haul Road Maintenance	14
9.7	Site Layout and Design	14
9.8	Limits on Disturbed Area	15
9.9	Temporary Cover	15
9.10	Wheel Wash	15
<b>10.0</b>	<b>Dust Mitigation Criteria</b>	<b>16</b>
10.1	Amount and Location of Disturbed Areas	16
10.2	Prevailing Weather Conditions	16
10.3	Occurrence of Visible Dust within Earthworks Sites	17
10.4	Measurement of Dust above Consent Limits	17
10.5	Valid Complaints from Adjacent Residents	18
<b>11.0</b>	<b>Key Dust Mitigation Responsibilities</b>	<b>18</b>
<b>12.0</b>	<b>Meteorological Monitoring</b>	<b>19</b>
<b>13.0</b>	<b>Dust Monitoring</b>	<b>21</b>
13.1	Visual Monitoring	21
13.2	Instrumental Monitoring	22
13.3	RCS Monitoring	24
13.4	Consent Limits and Trigger Levels	26
<b>14.0</b>	<b>Instrumental Monitoring Maintenance, Servicing, and Calibration</b>	<b>27</b>
<b>15.0</b>	<b>Maintenance and Contingency Measures</b>	<b>27</b>
<b>16.0</b>	<b>Reporting</b>	<b>27</b>
<b>17.0</b>	<b>Public Complaints</b>	<b>28</b>
<b>18.0</b>	<b>Audit and Review of Air Quality Management Plan</b>	<b>29</b>

## Table of Figures

Figure 1: Site Areas	4
Figure 2: General Site Layout – Processing and Overburden Disposal Area	5
Figure 3: General Site Layout – Symonds Hill Pit and Haul Road	5
Figure 4: Nearby Sensitive Receptors	8
Figure 5: Windrose from the on-site Symonds Hill AWS from 2023 to 2025	17
Figure 6: Photograph of Symonds Hill AWS	19
Figure 7: Location of Symonds Hill AWS	20

Figure 8: Dust Monitor and Weather Station Locations	23
Figure 9: Proposed Indicative Dust Monitor and AWS Locations	24
Figure 10: RCS Monitoring Locations	25

## Table of Tables

Table 1: Internal Contact Details	3
Table 2: External Contact Details	3
Table 3: Summary of Nearby Sensitive Receptors	8
Table 4: Visual Dust Monitoring Programme	21
Table 5: TSP Instrumental Monitoring Alert Levels	26

## Appendices

Appendix A: Air Discharge Consent XXX
Appendix B: Daily Dust Log Form

## 1.0 Introduction

This Air Quality Management Plan (AQMP) for the Hunua Quarry ('the Site' or 'the quarry') has been prepared by Pattle Delamore Partners Limited (PDP) on behalf of Winstone Aggregates (Winstone).

This plan records all management, monitoring, and operational procedures necessary to comply with the conditions of the Hunua Quarry Air Discharge consent XXX.

A copy of this management plan shall be kept<sup>1</sup> on Site and will be available for use by Site personnel at all times.

## 2.0 Requirement to Prepare an AQMP

To fill in with Discharge to Air Consent XXX wording and include reference to relevant consent conditions along with standard place holder resubmitted for approval and certification by Council.

This Draft AQMP has been prepared by a PDP staff who is a suitably qualified air quality professional (SQEP).

## 3.0 General Responsibilities

### 3.1 Winstone Aggregates

Winstone Aggregates (**Winstone**), a division of Fletcher Concrete and Infrastructure Limited (**FCIL**), is required to submit this AQMP for review by the Manager of Air Quality, AC within XXXX months of the commencement of Consent XXX.

Winstone, as the consent holder, has a general responsibility to implement all consent conditions, and to manage the Site in accordance with this AQMP.

### 3.2 Site Manager

The **Site Manager** will have the day-to-day responsibility for the implantation of the AQMP for all Site operations at the Site. This responsibility includes ensuring that all contractors operating on Site are familiar with the requirements of these documents and are undertaking their activities in accordance with those requirements. The **Site Manager** will have the following responsibilities in respect of the management of air emissions. They shall ensure:

- ∴ That the conditions of all relevant resource consents are complied with at all times;
- ∴ That the dust control and mitigation measures and procedures outlined in the AQMP are implemented effectively;

---

<sup>1</sup> A hard copy is to be kept in the main administration block.

- ∴ That there are adequate personnel and equipment on Site at all times to enable the prescribed dust control;
- ∴ That the meteorological and dust monitoring programmes are carried out as required, including recording of daily observations;
- ∴ That any complaints received are investigated and resolved as far as practicable; and
- ∴ That all records are kept and are available to the relevant regulatory authorities.

### 3.3 Winstone Staff

Winstone employees have a duty to avoid, remedy or mitigate adverse air quality effects arising from an activity carried out by them or on their behalf. To achieve this, every Winstone employee has a duty to adopt the best practicable option in terms of the management of air quality at the Site, to ensure that dust emissions remain within consented levels.

### 3.4 Contractors

While working at the Site, Hunua Quarry contractors also have a duty to avoid, remedy or mitigate any adverse air quality effects arising from an activity carried out by them or on their behalf. Every contractor also has a duty to adopt the best practicable option to manage dust emissions while working at Hunua Quarry, to ensure that dust emissions remain within consented levels.

### 3.5 Auckland Council

Auckland Council (AC) is required to review this Air Quality Management Plan to ensure it meets the requirements of Condition XX of Air Discharge Consent XXX. AC also has enforcement officer duties, which in part, are to assess the operation in terms of compliance with Air Discharge Consent XXX.

AC will advise Winstone in writing if Air Discharge Consent XXX is to be reviewed in accordance with section 128 of the Resource Management Act 1991.

### 3.6 Technical Experts

Technical experts will from time to time provide advice and technical expertise on the operations at the Site. To effectively achieve this, an understanding of consent conditions and this AQMP, as well as all other Management Plans relevant to the operation of the Site, will be required.

## 4.0 Contact Details

Internal and external contacts for the Site in the event of an emergency or complaint are provided in Table 1 and Table 2 below.

Table 1: Internal Contact Details			
Role	Name	Phone	Email
Site Manager	Mitchell O’Kane	xxxx	mitchell.okane@winstoneaggregates.co.nz
Environmental Coordinator	Imogen McKernan	xxxx	imogen.mckernan@winstoneaggregates.co.nz
xxx	xxx	xxx	xxx

Table 2: External Contact Details			
Role	Name / Organisation	Phone	Email
Consents Compliance Team	Xxxxx, Auckland Council	xxxx	xxxx
Dust and Weather Monitor Service and Maintenance	Cameron Brown, PDP	021 226 7415	aqmonitors@pdp.co.nz

D  
R  
A  
F  
T

## 5.0 Staff Training

The success of this AQMP depends on appropriate actions by Site personnel in day-to-day operations at the Site. Training will be provided to all staff and contractors both during Site inductions and at regular site meetings by Site Manager or someone who understands the Site’s obligations to control emissions to air. This will provide a forum to discuss:

- ∴ On Site practices relating to the minimisation of dust emissions; and
- ∴ Procedures for reporting and dealing with dust emissions as they arise.

The overall objective of environmental training relating to dust at the Site is to ensure Winstone personnel, and all contractors, operating on Site will be made aware of all potential adverse effects of dust emissions and shall be proactive in identifying actual and potential dust sources.

Job descriptions and annual training reviews will identify individual staff training requirements in aspects of dust management and control. This is particularly relevant for operators involved with operating watercarts and other dust management measures. The **Quarry Manager** and **Environmental Coordinator** (based at Hunua Quarry) will oversee training and ensure that it is appropriate. A record of staff training and dates completed will be maintained on Site.

The **Quarry Management Team** will ensure that any training provided by earthmoving contractors to its staff also meets the requirements with respect to dust control and management.

### 6.0 General Description of Quarry Operations and Potential Air Discharge Sources

The following activities broadly summarise the current and proposed quarry operational activities that occur on the Site, each of which are a potential discharge to air source. However, it is expected that specific machinery and methods of extraction will vary in the future as technology develops and machinery and quarrying techniques are replaced.

Figure 1 presents the general areas of the Site, and Figure 2 and Figure 3 then show each activity generally undertaken within the areas. These will be updated as the site develops.

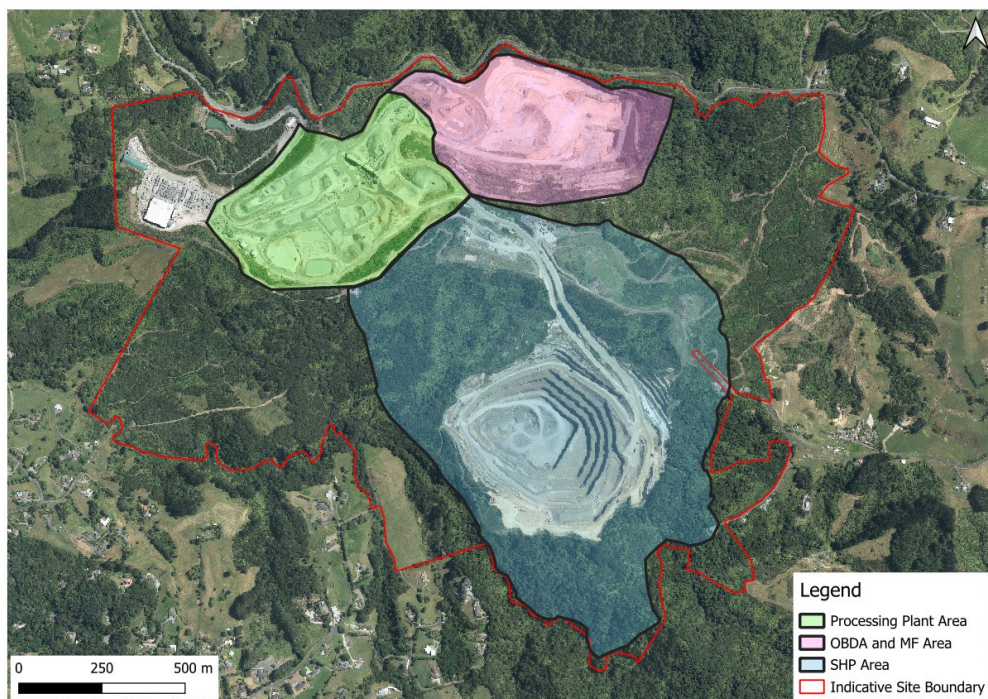


Figure 1: Site Areas

D  
R  
A  
F  
T

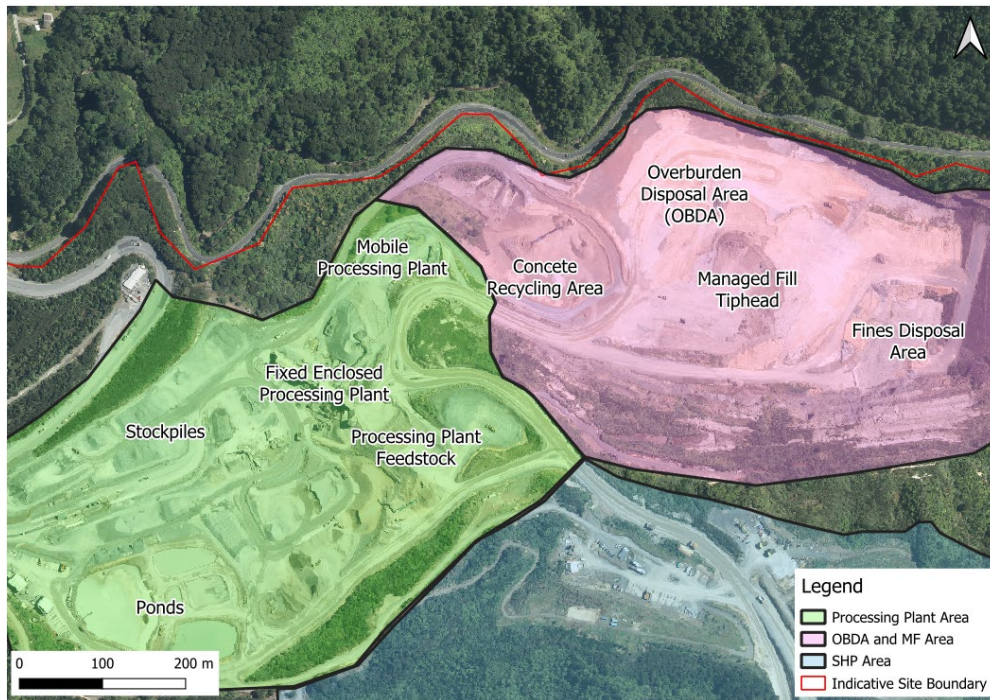


Figure 2: General Site Layout – Processing and Overburden Disposal Area

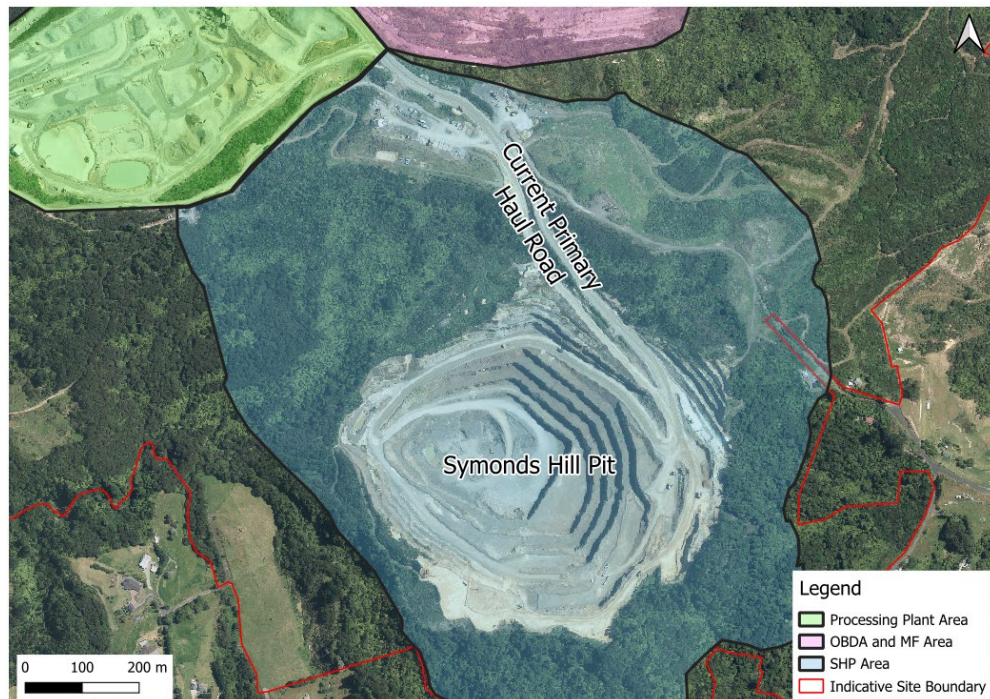


Figure 3: General Site Layout – Symonds Hill Pit and Haul Road

D  
R  
A  
F  
T

### 6.1 Vegetation Removal and Site Preparation

This involves removal of vegetation and any structure from the area that overburden is to be removed from. This may be included as part of the soil stripping process, may be done separately by heavy machinery or manually with chainsaws.

### 6.2 Soil Stripping and Stockpiling

As the quarry pit develops, soils and subsoils are stripped, transported and stockpiled using motor scrapers, bulldozers, and/or excavators and trucks. These materials may be used in the construction of bunds for landscape enhancement and noise control or stored for future rehabilitation work.

### 6.3 Overburden Stripping and Disposal, Concrete Recycling, and Managed Fill

As the quarry pit develops, overburden materials are stripped, transported, and deposited. Such materials have insignificant commercial value but are required to be removed to facilitate extraction of the aggregate resources, employing a similar range of machinery as used for soil/subsoil excavation. Overburden material is placed in the old Hunua Pit at the northern end of the Site and is generally referred to as the overburden disposal area (OBDA).

Managed fill material is also brought in from off-Site and is checked against the acceptance criteria before being placed in the general area of the OBDA at the northern end of the Site. Fines are also disposed of in this area.

Recycling of concrete is undertaken in this general OBDA where steel reinforcing is stripped from concrete before the concrete is crushed and stockpiled for transportation off-site.

### 6.4 Rock Removal

The quarrying of softer aggregate resource types uses excavators and/or bulldozers and loaders to excavate and load materials onto trucks for transport to the processing plant, stockpiles or offsite. The quarrying of harder rock requires drilling and blasting with explosives, followed by loading onto trucks using excavators or loaders for transport to the processing plant, stockpiles or offsite.

The Site uses drilling and blasting practices typical of New Zealand operations of a similar scale. All blasts are designed and managed by trained and qualified personnel taking into account a variety of factors including District Plan requirements for noise and vibration. Typically, at the site blasting holes are drilled with 102 mm diameter. These holes are loaded with either bulk or bagged ANFO (Ammonium Nitrate and Fuel Oil) and are initiated with electronic detonators to reduce the potential for vibration and air blast.

## 6.5 Processing Rock

Rock is processed into aggregate products, using crushing, screening, washing, blending and conveying machinery. The products are moved by trucks, loaders or conveyor to storage bins or stockpiles. The site utilises both fixed and mobile plant to process rock. The fixed plant is largely enclosed which minimises dust emissions.

## 6.6 Storage and Distribution

Aggregate products are transported around the site with the use of a range of mobile plant and equipment. Wheel loaders are used to load customer's trucks for distribution off site.

## 6.7 Concrete Crushing

Concrete crushing involves breaking, removing and crushing existing concrete into a material with a specified size and quality. Hardened waste concrete is bought into site for the purpose of producing recycled concrete aggregate product that performs to a high standard and would otherwise be disposed of at a landfill or cleanfill. Once on site, the concrete is stockpiled and stored for future use. It is processed through the mobile jaw crusher and crushed to a 40mm product. It is sold as a recycled base course product or blended with other base course products.

## 7.0 Nearby Sensitive Receptors

Figure 4 illustrates the locations of the nearby receptors that may be sensitive to dust. While not every receptor has been identified, the identified receptors are considered to be representative of the surrounding community that could be affected by nuisance dust from the Site. Details of the receptors are set out in Table 3.

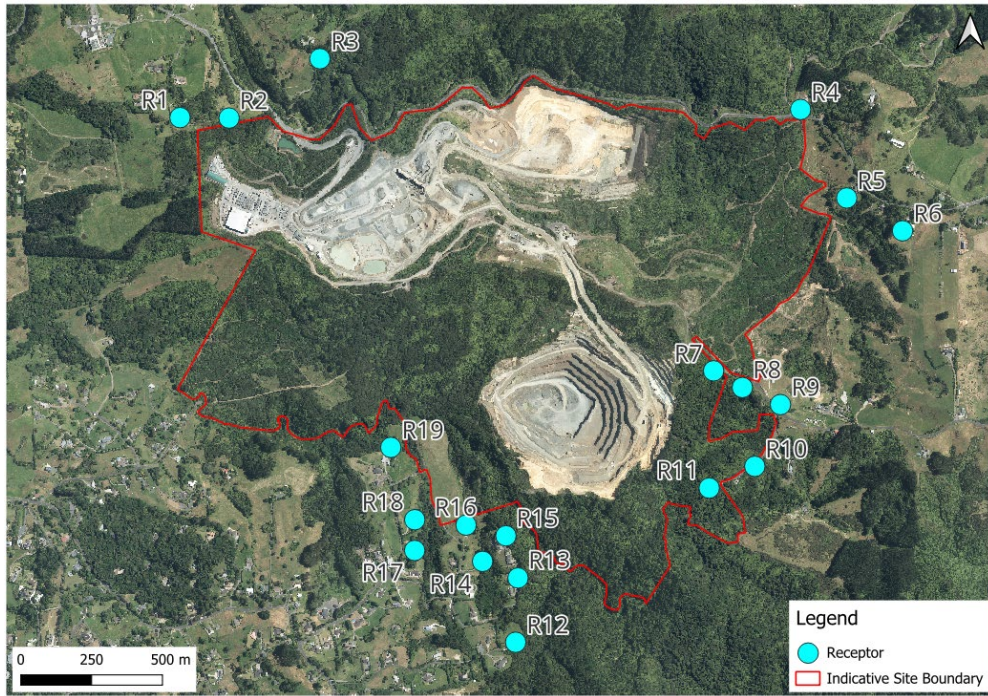


Figure 4: Nearby Sensitive Receptors

D  
R  
A  
F  
T

Table 3: Summary of Nearby Sensitive Receptors			
Receptor	Address	General Direction Relative to Dust Source	Approximate Distance from Dust Source (m)
R1	369 Hunua Road	Northwest	530 <sup>2</sup>
R2	411 Hunua Road		390 <sup>2</sup>
R3	486 Hunua Road		390 <sup>2</sup>
R4	910 Hunua Road	East	490 <sup>3</sup>
R5	969 Hunua Road		690 <sup>3</sup>
R6	1001 Hunua Road		890 <sup>4</sup>
R7 <sup>1</sup>	193 Middleton Road		130 <sup>4</sup>
R8	167 Middleton Road		245 <sup>4</sup>
R9	170 Middleton Road		340 <sup>4</sup>
R10	161 Middleton Road	Southeast	250 <sup>4</sup>
R11 <sup>1</sup>	165 Middleton Road		100 <sup>4</sup>
R12	610 Ponga Road		320 <sup>4</sup>

**Table 3: Summary of Nearby Sensitive Receptors**

Receptor	Address	General Direction Relative to Dust Source	Approximate Distance from Dust Source (m)
R13	115 Judge Richardson Drive	South to southwest	135 <sup>4</sup>
R14	181 Judge Richardson Drive		200 <sup>4</sup>
R15	119 Judge Richardson Drive		80 <sup>4</sup>
R16	191 Judge Richardson Drive	Southwest	200 <sup>4</sup>
R17	154 Judge Richardson Drive		400 <sup>4</sup>
R18	144 Judge Richardson Drive		355 <sup>4</sup>
R19	80 Judge Richardson Drive	West	305 <sup>4</sup>

*Notes:*

1. Receptor located on Flechter Infrastructure and Construction Limited owned land.
2. Distance from general processing and stockpiling area.
3. Distance from OBDA/managed fill area.
4. Distance from Stage 4 extent the SHP expansion.

D  
R  
A  
F  
T

## 8.0 Dust Suppression Methods

Winstone personnel and contractors will be made aware of the potential adverse effects of dust emissions during induction training (set out in Section 5.0) and shall be active in identifying actual and potential dust sources.

Results of visual monitoring shall be recorded in the daily air discharge log, dated and signed by the person entering the information. Although Winstone personnel are instructed to keep an eye out for dust emissions, the **Quarry Manager** is to ensure that dust emissions from the site are within the consented limits.

The control of dust emissions at Hunua Quarry is undertaken by a number of measures outlined below. Actual measure(s) used to control dust emissions in any given situation is dependent on factors such as location of source, current quarry activities being undertaken, wind strength, speed and direction, and shall be determined in practice by the **Quarry Manager** or **Environmental Coordinator**.

Emissions from the Hunua and the Symonds Hill pit fall into two categories: particulate or dust; and combustion emissions. Most of the specific measures described in the following sections relate to particulate dust. Combustion emissions will be managed through consideration of vehicle selection at the time of purchasing / leasing, and through standard vehicle maintenance procedures.

## 8.1 Overburden Stripping and Disposal

The removal of overburden material, particularly during dry windy conditions has the potential to generate dust. This can occur both as the material is being removed and also as it is being placed in the disposal area. Due to the placement of the overburden being towards the north of the site in the old Hunua Pit dust nuisance associated with the disposal activities is likely to be minimal. This is primarily due to the distance between these locations and any potentially affected parties, as well as the dust control techniques that are employed on site.

As the potential exists for dust generated by overburden removal activities associated with the development of the Symonds Hill Pit to be visible from neighbouring properties, **Hunua Quarry Management** will, as a minimum, ensure the following measures are taken into consideration when removing overburden:

- ∴ Wind speeds and wind direction;
- ∴ Re-vegetating or stabilising exposed areas as soon as practicable; and,
- ∴ Ensuring that overburden removal is either not carried out during particularly dry periods, or if it was necessary to do so use appropriate management and mitigation techniques such as watercarts to wet the ground.

## 8.2 Drilling

All drilling at the Site will be carried out by rigs that are fitted with dust collection equipment. This will ensure that minimal amounts of airborne dust will be generated by drilling activities at the site.

## 8.3 Blasting

Blasting is also an activity that can be inherently dusty. Blasting will also generate some combustion emissions. During certain stages of the development of the Symonds Hill Pit, the emissions from blasting may be visible to some residents to the south-west of the site. It is not expected that blasting will cause an increase in dust effects for these residents, mainly due to the distance between their properties and the Pit.

## 8.4 Rock Removal

Rock removal activities generally cause minimal dust emissions at the site. However, from time to time, it may be necessary to wet rock material as it is being loaded in order to reduce dust emissions. Watercarts will also be used to wet haul roads, preventing excessive dust emissions rising from active haul roads.

## 8.5 Crushing and Screening

Winstone has a modern aggregate processing plant that is capable of producing a full range of aggregates. The plant has been specifically designed to maximise the Hunua rock resource while at the same time minimising the potential for adverse environmental effects such as noise and dust.

Special environmental controls include:

- ∴ Housing the main processing plant to contain the potential effects of noise and dust;
- ∴ Covering all potentially dust generating conveyors;
- ∴ Spray bars potentially dust generating material transfer points; and,
- ∴ Mist sprays beneath all crushers.

The plant has been designed with the capability of washing semi-processed and finished aggregate products and a water control and treatment system has been incorporated into the plant to manage aggregate washings. This system is generally a closed-circuit system with only makeup water added to compensate for water lost through evaporation or soaked up the aggregate products themselves.

The plant has a dust suppression system involving water and/or chemical dust suppressant sprays at conveyor drop points, on the screens, and at the inlets to the crushers. This system, coupled with the enclosure of the crushing plant within a long run coloursteel enclosure, means that there are minimal dust emissions from this part of the operation. To ensure that dust from crushing operations at the Site is maintained at minimal levels, no part of the processing plant shall be operated without the particular dust suppressing equipment being fully operational.

From time to time depending on market conditions, mobile aggregate processing plants are used at the site to supplement the fixed plant operation. These plants are subject to the same environmental controls as all other operations on site and are typically located in areas where adverse effects can best be avoided.

There is also the potential for dust emissions from the filling of the cement silo associated with the stabilised basecourse manufacturing plant. However, the risk of this is controlled through the use of filter socks, which provide an extremely effective means of control for possible dust emissions from the stabilised basecourse plant.

## 8.6 Concrete Crushing

Methods from concrete crushing include:

- a) The removal of extraneous material will be undertaken prior to crushing. Visual inspections will occur to remove extraneous material. In the instance where extraneous material is embedded in the concrete, as is commonly the case with reinforcing steel, the concrete will go through a primary jaw crusher which will remove the embedded material. The jaw crusher will be fitted with magnets and remove any steel/extraneous material which was embedded in the concrete. All extraneous material will be put aside and recycled where possible.
- b) Where wind conditions are such that there is the potential for discharges to be generated, crushing will likely cease. Regard will be given to wind direction and particulate matter.
- c) Water sprays will be mounted to the crushing unit and used when operating in dry conditions.
- d) Regular clean-up of spilled material will occur around the mobile plant.
- e) Stockpiles will be kept damp to reduce discharges during dry conditions.
- f) Stockpiles will not exceed the natural slump angle of the dry product; this will be overseen by the **Quarry Manager**.
- g) The drop height of the product from the crushing unit to the stockpiles will be reduced where practicable to reduce the discharge to air.

## 8.7 Stockpiling

There is generally minimal dust generated from product stockpiles as they are generally either washed aggregates or contain only small quantities of fine particulate. However, stockpiles that are comprised of fine material will be positioned in a way that minimizes their potential for nuisance dust emissions. In doing this, consideration will be given to not placing such stockpiles in locations that are particularly windy or are near sensitive boundaries.

Appropriate mitigation measures will be used to control dust in and around the stockpile areas such as wetting/dampening stockpiles and roads with the watercart if dust is being generated.

## 8.8 Loadout, Transport and Transfer Operations

The site haul roads are regularly dampened by the water cart especially when visual checks have identified dust to be rising with vehicle movements.

The site entrance is sealed from the quarry entrance to the weighbridge. Regular maintenance such as sweeping and hole repair are undertaken to minimise any dust nuisance created by vehicles entering or exiting the site.

Although not practicable for all products, Winstone employed and contracted drivers are generally required to cover loads which leave the site as a requirement of Winstone's standard operating procedures. This reduces the potential for dust generation from trucks as they leave the site.

## 9.0 Additional Dust Control Measures

### 9.1 Watercarts

Dust from disturbed or unpaved surfaces such as haul roads and the overburden disposal area can be thrown into the air by wind or vehicle movements. Dust pick-up by wind is usually only significant at wind speeds above 5 metres per second (18kph), but vehicle re-entrainment can occur under any conditions.

Spraying the surface of the ground with water is readily available and highly effective method of suppressing dust. Water carts on site will provide onsite control of fugitive dust on haul roads and disturbed surfaces on an as-required basis. The frequency of watering depends on several factors; including weather, soil type, and traffic. Water should be applied at a rate so that the soil surface is wet, but not saturated or muddy.

Where practicable during dry weather, the water cart will start prior to quarry operations to ensure that the water gets a chance to soak into the road. The water cart will then continue to operate periodically throughout the day, on an as required basis. The water supply for the water carts will be from the Hunua Quarry Pit(s), process water pond(s) or sediment retention pond(s).

Water carts and fill up stations will be maintained in a good working condition. In the event of failure/breakdown of a water cart, an alternative water cart will be brought in. If this is delayed, and dust levels exceed consented limits, then work may cease until dust emissions can be adequately controlled.

## 9.2 Truck Spillage

Dust emissions may be caused by the spillage of material from truck traveling in and around the quarry. Spilled material could further act as a source of dust emission if it is crushed by traffic movements.

Spillage from trucks will be minimised by not overloading or otherwise incorrectly loading trucks. Any spill material will be promptly cleaned up, to reduce the ability of the material to create airborne emissions if driven over by machinery.

## 9.3 Vehicle Exhausts

All vehicles will be regularly maintained and serviced to ensure minimum emissions. Heavy machinery will not have downward facing exhausts that are close to the ground, as these may act to raise dust in dry conditions.

## 9.4 Speed Limit

Vehicles traveling over paved or unpaved surfaces tend to pulverize any surface particles and other debris. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents due to turbulent shear between the wheels and the surface. Dust particles are also sucked into the turbulent wake created behind moving vehicles.

Dust emissions due to moving vehicles will be minimised by restricting speed so that dust does not rise to levels that exceed consented limits. The general site speed limit is 30 kph, except for production load and cart fleet which may operate at faster speeds. Closer attention will be focused on areas where the load and cart fleet operates faster than 30 kph, to ensure this does not cause additional dust emissions.

## 9.5 Following Distances

Site management will ensure that drivers maintain good following distances between vehicles using Quarry haul roads, to minimise the potential for cumulative dust emissions arising from closely traveling vehicles.

## 9.6 Haul Road Maintenance

Haul roads will be regularly graded to maintain an even surface with potholes and bumps smoothed over as soon as is reasonably practical. This will prevent haul road surface deterioration that may result in increased dust generation. Site personnel will be encouraged to immediately report any deterioration of the haul road surface to supervisors, so that it can be rectified.

## 9.7 Site Layout and Design

Haul routes will be generally restricted to the shortest possible travel distance along defined travel routes, which minimises the potential for dust generation.

## 9.8 Limits on Disturbed Area

Removal of topsoil and vegetation will be progressively undertaken as the development of Hunua Quarry continues. Only enough vegetation and topsoil will be removed to allow each stage of the development to be undertaken, or to meet consent requirements, such as those relating to gecko relocation. In addition, only enough vegetation and topsoil will be removed to allow development of haul roads and other work areas.

Bare earth surfaces that are not being actively worked, will be progressively stabilised against erosion as soon as practicable during earthworks operations. Stabilisation may occur through one of several processes, including placement of non-dust generating mediums such as large aggregate or geotextiles, placement of straw mulch and grass seed, hydroseeding, or establishment of grass from seed sowing or spreading.

The area disturbed by earthworks on Hunua Quarry will be maintained at a practical minimum. This will be achieved by progressively limiting the removal of vegetation and overburden.

## 9.9 Temporary Cover

Temporary cover may be needed from time to time for exposed surfaces during the overburden stripping operations. This will be assessed on a case-by-case basis and may involve such methods as chemical dust suppressants, hydroseeding, crimped straw mulching or surfacing areas with non-dust producing aggregate.

## 9.10 Wheel Wash

The potential exists for vehicles to track dirt off-site, particularly during wet conditions. This dirt can generate dust when it dries out. To minimise the dust emissions from this activity, a wheel wash will be maintained on the quarry exit road. This is activated automatically as the truck drives onto the wheel wash and means that all trucks exiting the site have to pass through the wheel wash, which greatly reduces the potential for dirt to be tracked out onto Hunua Road.

The only area of sealed road on the site runs between the weighbridge and Hunua Road. This section of road will have dust tracked on to it from vehicles entering and exiting the site and will accumulate some dust from site operations. This access road will be swept, washed or vacuum brushed, as appropriate, to ensure that there is no tracking onto Hunua Road.

## 10.0 Dust Mitigation Criteria

Criteria to be used to determine when the dust mitigation measures are required to control the potential for dust to be generated are as follows;

- ∴ The amount and location of disturbed earthworks;
- ∴ The prevailing weather conditions including wind direction and wind speed, and time since last rainfall;
- ∴ The occurrence of visible dust within the site;
- ∴ The measurement of dust above pre-determined trigger levels; and/or
- ∴ Valid complaints from adjacent residents.

### 10.1 Amount and Location of Disturbed Areas

As quarry operations progress, consideration will be made of the limits on exposed area and the dust suppression methods that are available. Limiting the exposed overburden area reduces the potential for fugitive emissions from the quarry site.

### 10.2 Prevailing Weather Conditions

A water cart or other approved dust suppressant method (i.e. sprinklers) will be used during periods of little or no rainfall, or during dry and windy conditions.

The prevailing wind direction has been considered during design of the dust monitoring station network. The monitoring system will be capable of provide text alerts to the Quarry Management when key climatic parameters are exceeded, such as excessive wind speeds.

A wind rose for the main Hunua quarry monitoring site is presented in Figure 2. In the Hunua pit area, winds tend to be very strongly constrained by the topography of the Hunua Gorge, with the prevailing wind coming from the West-Southwest.

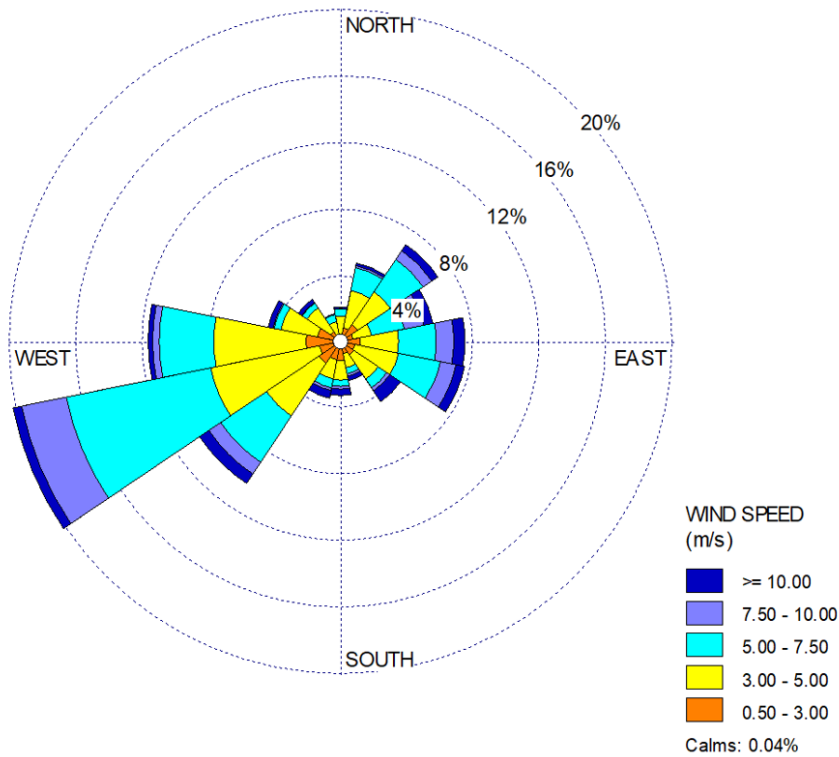


Figure 5: Windrose from the on-site Symonds Hill AWS from 2023 to 2025

### 10.3 Occurrence of Visible Dust within Earthworks Sites

Hunua Quarry management will ensure that overburden removal is either not carried out during particularly dry periods, or if it is necessary to do so, use appropriate management and mitigation techniques such as wetting the materials to be handled.

Occurrence of visible dust within the Quarry site will trigger increased dust suppression activities. In real terms, this means that a water cart, or other approved dust suppressant methods will be used when there is visible dust rising from road surfaces.

Ongoing occurrence of visible dust within the Quarry site may require additional dust suppression (greater operation of watercarts), temporary cover and/or stabilization of exposed surfaces.

### 10.4 Measurement of Dust above Consent Limits

Site Management will be alerted to exceedances to consent limits ( $100\mu\text{g}/\text{m}^3$  as a 24 hour average at the Main Gate monitoring site and  $80\mu\text{g}/\text{m}^3$  as a 24 hour average at the Symonds Hill and Ponga Road monitoring sites (see Figure 8) through text and/or email alerts from the automated monitoring system. In such an event, an investigation will be carried out to determine the cause of the

D  
R  
A  
F  
T

exceedance, and will involve visual assessments, examination of operational activities, watercart use and examination of the current metrological conditions. If required, appropriate mitigation measures will be put in place with the objective of ensuring dust emissions from the Site remain within consented levels.

### 10.5 Valid Complaints from Adjacent Residents

Valid complaints from neighbouring residents (see Section 14.0 below) will also trigger visual assessments, examination of operational activities, watercart use and examination of the current metrological conditions. If required, appropriate mitigation measures will be put in place with the objectives of both ensuring dust emissions from the Site remain within consented levels, and also that air quality in and around the site remains as high as is practicably possible.

### 11.0 Key Dust Mitigation Responsibilities

Key responsibilities for Dust Mitigation are as follows:

- ✧ Inspection of works for visible dust emissions;
- ✧ Maintenance of haul roads;
- ✧ Use of water cart(s);
- ✧ Limits on exposed areas;
- ✧ Limits on vegetation clearance;
- ✧ Cessation of work;
- ✧ Temporary cover requirements;
- ✧ Dust suppression on fixed processing plant;
- ✧ Wheel wash; and
- ✧ Appropriate induction and training of operations and contractors.

The **Quarry Manager** will be responsible for implementing these key dust mitigation responsibilities and making day-to-day decisions. The **Quarry Manager** may delegate some or all of these responsibilities to other people. Any such delegation will be documented and recorded. Records will be available at the Site office.

## 12.0 Meteorological Monitoring

To measure the weather conditions at the Site, set out below are details of the Site's Automatic Weather Station (AWS). A photograph is presented in Figure 6, with the location identified in Figure 7.



Figure 6: Photograph of Symonds Hill AWS

D  
R  
A  
F  
T



**Figure 7: Location of Symonds Hill AWS**

The AWS measures the following parameters:

- ✧ Wind speed (WS);
- ✧ Wind direction (WD);
- ✧ Air temperature (AT);
- ✧ Relative humidity (RH);
- ✧ Barometric Pressure (BP); and,
- ✧ Rainfall.

A Vaisala WXT520<sup>2</sup> mounted at approximately 5 m above ground level and is used to measure WS, WD, AT, RH, and BP with a Davis 0.2mm tipping bucket rain gauge is used to measure rainfall. It is noted a lightning rod is also installed to protect the weather and dust monitoring equipment from strikes.

<sup>2</sup> <https://www.vaisala.com/sites/default/files/documents/M210906EN-C.pdf>

### 13.0 Dust Monitoring

#### 13.1 Visual Monitoring

To ensure that dust mitigation measures are implemented and are effective at minimising dust emissions, presented in Table 4 is a visual monitoring plan for this. The frequency of the monitoring is defined but it must be noted that in the instance of strong winds, dust emissions off-site, or a complaint, the monitoring programme should be undertaken more regularly.

<b>Table 4: Visual Dust Monitoring Programme</b>	
<b>Monitoring Activity</b>	<b>Frequency</b>
Check weather forecasts for strong winds and rainfall to plan appropriate work schedule and dust management response.	Daily.
Inspect land adjacent to the site, site exits and adjoining roads for the presence of dust deposition.	At least daily and more frequently if the wind is blowing from a potential dust operation towards the boundary or sensitive receptor and the TSP or meteorological monitoring conditions are triggered (see ).
Observe weather conditions including wind and rain via observations and data outputs from weather stations.	Daily and as conditions change.
Inspect all exposed surfaces for dampness and to ensure that the exposed un-stabilised area is minimised.	Daily and as conditions change.
Ensure instrumental monitors are operating correctly.	Daily.
Observe weather conditions including wind and rain via observations and data outputs from weather stations.	Daily and as conditions change.
Inspect any stockpiles to ensure that they are not subject to wind erosion. Minimise as far as practical the height of stockpiles containing unprocessed or unwashed material.	Daily and as conditions change.

D  
R  
A  
F  
T

<b>Table 4: Visual Dust Monitoring Programme</b>	
<b>Monitoring Activity</b>	<b>Frequency</b>
Inspect all exposed surfaces for dampness and to ensure that the exposed un-stabilised area is minimised.	Daily and as conditions change.
Inspect dust generating activities to ensure dust emissions are effectively controlled.	Daily and as new activities are commenced.
Inspect watering systems (sprays and water carts) to ensure equipment is maintained and functioning to effectively dampen exposed areas.	Weekly.

### 13.2 Instrumental Monitoring

This section sets out the instrumental dust and weather monitoring programme which consists of:

#### Symonds Hill TSP Monitor

A continuous dust monitor capable of recording Total Suspended Particulate (TSP) continued to be operated on the crest of the ridge near the northwestern corner of the Symonds Hill Pit (approximate NZTM grid ref 1778439, 5893792).

#### Ponga Road TSP Monitor

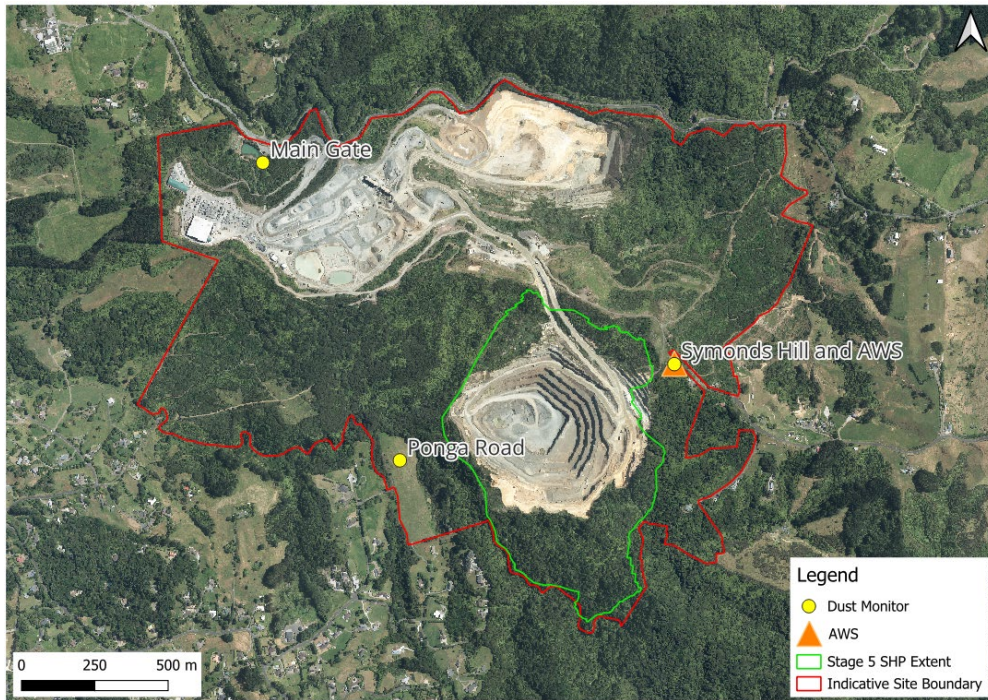
A continuous dust monitor capable of recording TSP continued to be operated adjacent to the southern boundary of the Symonds Hill Pit on or about the Ponga Valley Farm Subdivision (approximate NZTM grid ref 1777494, 5893486).

#### Main Gate TSP Monitor

A continuous dust monitor capable of recording TSP continued to be operated near to the quarry sediment ponds by the site entrance (approximate NZTM grid ref 1777050, 5894506).

The locations of each of these monitors are shown in Figure 8.

D  
R  
A  
F  
T



**Figure 8: Dust Monitor and Weather Station Locations**

13.2.1 Future Monitor Locations

As the SHP develops there may be the need to modify the location of the Symonds Hill dust monitor and AWS. It is proposed that the monitors are re-located to the general location identified in Figure 9, to provide separation from site operations so it can continue to be utilised as a management tool to detect the potential for nuisance dust effects to be experienced off-site. It is noted however that this location is indicative and that the actual position may need to be adjusted slightly for power availability and/or practicality reasons.

D  
R  
A  
F  
T

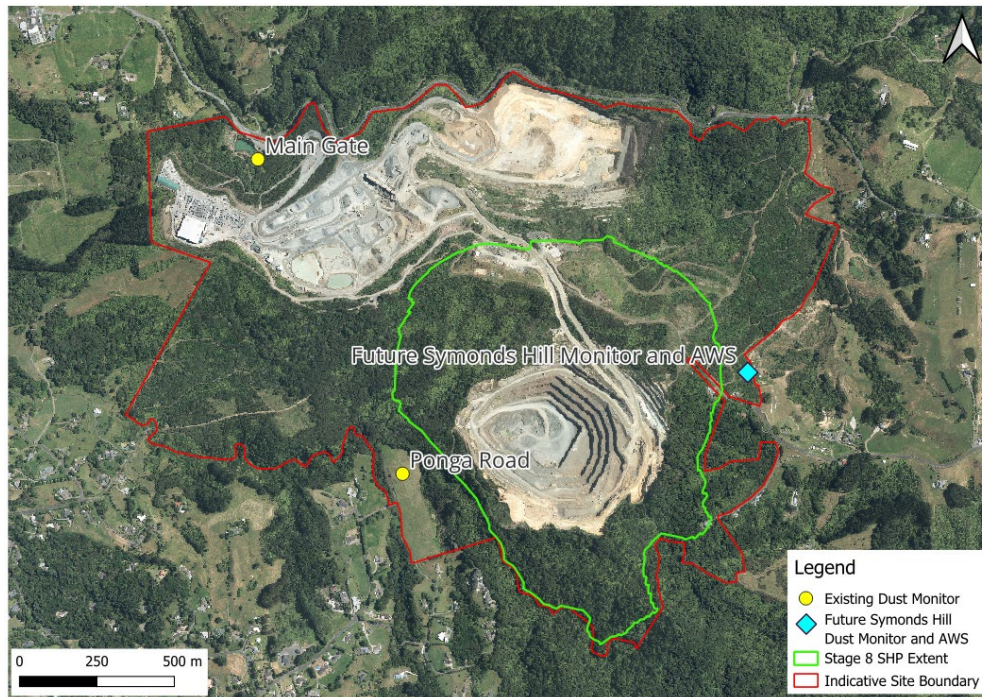


Figure 9: Proposed Indicative Dust Monitor and AWS Locations

### 13.3 RCS Monitoring

Ambient respirable crystalline silica (RCS) monitoring will be undertaken to ensure that the Site is not discharging concentrations of RCS that may pose a risk to human health. This monitoring will consist of baseline (pre-development) monitoring and during project monitoring, each of which are detailed below.

∴ Baseline Pre-Project Monitoring

At least three months of baseline monitoring will be undertaken using a recognised methodology to measure RCS, noting that this should be measuring concentrations in the respirable range (PM<sub>4</sub>). The monitoring will be undertaken in the indicative locations presented in Figure 10.

The purpose of this monitoring is to establish the existing RCS concentrations from which it can be assessed if the Site development is having an effect on the concentrations.

D  
R  
A  
F  
T



**Figure 10: RCS Monitoring Locations**

∴ Operational Monitoring

Once the Project has commenced, monitoring using the same methodology as the baseline monitoring, will be undertaken for 12 months in the same locations as those depicted in Figure 10.

The results of this monitoring will then be compared to the baseline concentrations to assess the effect (if any) that the project is having on RCS concentrations around the site, and against an annual average limit of  $3 \mu\text{g}/\text{m}^3$ .

If the annual average limit is met at a monitoring location, then ambient RCS monitoring in that location will cease.

If the annual average limit is exceeded at a monitoring location, then monthly monitoring will continue at that location until such time that the annual average limit is met.

### 13.4 Consent Limits and Trigger Levels

The dust monitoring programme will monitor site performance to ensure that TSP concentrations do not exceed 80 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) measured as a 24-hour rolling average at the Symonds Hill and Ponga Road monitors, and 100  $\mu\text{g}/\text{m}^3$  measured as a 24-hour average at the Main Gate monitor.

If these levels are exceeded, **Hunua Quarry Management** will immediately undertake an investigation as to the probable causes of the exceedance, and to identify if the probable cause lies within site boundary. This will involve visual assessments, examination of operational activities, watercart use, and examination of the current metrological conditions. If the probable cause is identified as being with site boundary, appropriate mitigation measures will be put in place with the objective of ensuring dust emissions from the Site are reduced to, and remain within, consented levels.

The monitoring system will provide text and/or email alerts to the **Site Management** when dust concentrations exceed consented limits.

In the event of an exceedance of consented dust levels, **Site Management** will notify Auckland Council of the exceedance as soon as practicable.

Trigger levels will also be set on the monitors to help identify when elevated dust events are occurring and to ensure remedial measures are taken immediately to prevent future exceedances. The alert levels, which include the 24-hour rolling consent levels are shown in Table 5.

DRAFT

Table 5: TSP Instrumental Monitoring Alert Levels			
Averaging Period	Concentration ( $\mu\text{g}/\text{m}^3$ )		
	Main Gate	Symonds Hill	Ponga Road
1-hour – Alert Level	220	220	220
1-hour – Trigger Level	250	250	250
24-hour (rolling)	100	80	80

## 14.0 Instrumental Monitoring Maintenance, Servicing, and Calibration

In the event of an issue with any of the instrumental monitors or AWS arises, the **Environmental Coordinator** will contact the **Dust and Weather Monitor Maintenance and Service Provider** (PDP) to arrange repair/remediation of the monitor(s) to minimise data loss.

Calibrations on all instrumental TSP monitors and the AWS is undertaken by the **Dust and Weather Monitor Maintenance and Service Provider** every 6 months in accordance with the manufacturer's instructions.

## 15.0 Maintenance and Contingency Measures

All mechanical dust control measures (such as water carts) will be appropriately serviced and maintained to reduce the likelihood of malfunction. However, in the event that any of the dust mitigation measures (such as water cart) are not operating as required, the Quarry Manager will arrange for a suitable replacement to ensure appropriate mitigation measure are available.

## 16.0 Reporting

Winstone will ensure that all monitoring records and test results relating to the conditions of Discharge to Air Consent XXX will be kept for a minimum of 24 months from the date of each entry. Site Management will make these results and entries available on request, during operating hours, to all enforcement officers of the Auckland Council.

A quarterly report, containing a summary of the information recorded on a daily basis (recorded via daily logs – example found in Appendix XX) at the Site will be submitted to the Group Manager, Consents and Compliance, or AC staff acting on the Managers behalf no later than 20 working days after 28<sup>th</sup> February, 31<sup>st</sup> May, 31<sup>st</sup> August and 30<sup>th</sup> November each year.

- (a) Any dust control equipment malfunction and any remedial action taken;
- (b) Any visible emission of dust;
- (c) Weather conditions including wind strength and direction and rainfall;
- (d) Any use of a watercart, including frequency of use and volume of water used;
- (e) Volume of water used for dust suppression other than watercart usage; and
- (f) The date and signature of the person entering the information.

**Hunua Quarry Management** will report any exceedance in consented limits for TSP at the site, to the Group Manager, Consents and Compliance, or AC staff acting on the Managers behalf, as soon as is practicable after the event.

A report containing a summary of all TSP monitoring results for the previous 12 months including references to wind and rainfall data, and any remedial action taken as a result of an exceedance of consented limits will be submitted to the AC no later than 20 working days after 28th February each year.

**Hunua Quarry Management** will provide an annual report to the Group Manager, Consents and Compliance, or AC staff acting on the Managers behalf that outlines:

- (a) Areas to be quarried over the next 12 months;
- (b) Plans for earthworks and overburden stripping over the next 12 months;
- (c) Details of product stockpiling activities;
- (d) Details of bare earth surfaces that have been rehabilitated or stabilised within the previous 12 months; and,
- (e) Pond storage volume taking into account silting up.

## 17.0 Public Complaints

A permanent record of any complaints received alleging adverse effects from or related to the exercise of this consent will be maintained by Winstone.

This record will include the following, where practicable:

- (a) Date, time, location and nature of the alleged event;
- (b) The name, phone number and address of the complainant, if supplied;
- (c) Wind strength and wind direction at the time of the alleged event; and
- (d) Any remedial actions taken.

Once a complaint is received it will be promptly investigated and dealt with by a trained personal in accordance with the site complaints procedure. If found to be valid, appropriate measures will be put in place with the objective of avoiding a reoccurrence of the instances leading to the complaint.

The AC will be notified of any complaints relating to air quality within one working day of being received.

The complaints record will be made available to the officers of the AC on request, during normal working hours.

## **18.0 Audit and Review of Air Quality Management Plan**

This air quality management plan will be reviewed when there are any substantial changes in activities at the Site, or when there is a need to incorporate new and/or different dust management practices.

Any revision of the Dust Management Plan will be submitted to the Auckland Council for review of consistency with consent conditions prior to a change being implemented.

D  
R  
A  
F  
T

## Appendix A: Air Discharge Consent XXX

XXX

D  
R  
A  
F  
T

## Appendix B: Daily Dust Log Form

### Daily Dust Inspection Log

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Inspection by (name and signature):  
\_\_\_\_\_

Current weather conditions (e.g. sunny, cloudy, rainy):  
\_\_\_\_\_

Wind speed and direction (e.g. light, moderate, strong or weather station data):  
\_\_\_\_\_

Weather forecast for next 24 hours (e.g. rainy, windy):  
\_\_\_\_\_

Area(s) inspected:  
\_\_\_\_\_

Daily Dust Log Form		
Scope of Inspection	Circle Relevant Item	Comments
Is there visible dust from site work activities, stockpiles, earthworks areas, or material disturbance areas?	Y N N/A	
Are unsealed surfaces generating visible dust that could pose a safety risk or nuisance and need spraying with water?	Y N N/A	
Are any exposed earthworks or material disturbance areas generating visible dust that could pose a safety risk or nuisance and need water spray/stabilising?	Y N N/A	
Are there any signs of dust going off site as a result of site activities? [View land adjacent to the site exits and adjoining roads for the presence of dust deposits.]	Y N N/A	
If wind speeds are strong or forecast to be strong (over 5 m/s) are additional inspection and mitigation measures necessary? Has the Quarry Manager been advised? (e.g. increase water application, restrictions on dusty activities)	Y N N/A	
Are watering systems (e.g. water carts and wheel wash) operating effectively to minimise dust?	Y N N/A	

D  
R  
A  
F  
T

Daily Dust Log Form		
Scope of Inspection	Circle Relevant Item	Comments
How much water (volume) was used for dust control today?		
Note and dust control equipment malfunctions (and remedial actions taken as appropriate)		
Any unusual on-site activities today?		

D  
R  
A  
F  
T