WINSTONE AGGREGATES

Boffa Miskell

Part B

# Appendix B12.4.1

## Air Quality Assessment

# Hunua Quarry Air Quality Assessment

Prepared for

Winstone Aggregates

March 2026

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# Quality Control Sheet

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**Limitations:**

This report has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Winstone Aggregates, a division of 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 for Winstone Aggregates a division of Fletcher Concrete and Infrastructure Limited in respect of its application for all approvals under the Fast-track Approvals Act 2024 for the Hunua Quarry. The Panel appointed to consider the application for the Hunua Quarry Project may rely on this report for the purpose of making its decision under the Fast-track Approvals Act 2024. 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.

This report has been prepared in accordance with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court's Practice Note 2023. The authors of this report agree to comply with the Code of Conduct, and confirm that unless otherwise stated, the issues addressed in this report are within the area of expertise of the authors. No material facts have been omitted that might alter or detracted from the opinions expressed in this report.

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## Executive Summary

Winstone Aggregates (Winstone)[1] is applying for a new global consent under the Fast-track Approvals Act 2024 (FTAA) for the Hunua Quarry, which will cover the existing site operations and the proposed development of the Symonds Hill Pit (SHP) (the Project).

Winstone has engaged Pattle Delamore Partners Limited (PDP) to assess the potential air quality effects arising from the site including those potentially associated with the SHP development. The SHP development will occur over eight stages, which includes the development of a new western haul road and the realignment of a Mangapū (Symonds) Stream tributary. The Project will allow for a peak annual quarry production of approximately 5.4 million tonnes of aggregate and enable the continued extraction of aggregate for a further 80 years.

The current maximum extraction rate of 2,000 tonnes per hour (t/h), material processing crushing rate of 1,000 t/h, and the material screening rate of 1,000 t/h enabled by existing consents will remain appropriate for this new global consent.

This report presents the air quality effects assessment and concludes that with adequate mitigation measures employed, the discharges of dust from the quarrying activities can be effectively controlled so that the adverse effects associated with those discharges are acceptable.

Based on the multiple threads of evidence and assessment methodologies undertaken as recommended by good practice, PDP's nuisance dust effects assessment concludes that there is little potential for 'offensive or objectionable' dust amenity or nuisance effects to occur at any location outside of the quarry.

Furthermore, PDP has assessed the potential for effects from Respirable Crystalline Silica (RCS) by using monitoring data to compare against all relevant guidelines including those from the United States (US) Environmental Protection Agency (EPA), California OEHHA, and the Victoria (Australia) EPA. Additionally, PDP has reviewed specific RCS monitoring near quarries in Christchurch and reviewed information prepared by the Texas Commission on Environmental Quality (TCEQ). PDP's RCS assessment shows compliance with all relevant guidelines, concluding that there is an extremely low potential for any off-site health effects from RCS.

PDP's $PM_{10}$ assessment compared the findings of an on-site $PM_{10}$ monitoring study to the National Environmental Standards for Air Quality (NES AQ) Ambient Air Quality standards (AAAQ) and other relevant guidelines including those used as good practice. PDP also reviewed specific $PM_{10}$ sampling near quarries in Christchurch. The on-site monitoring data demonstrated that the average 24-hour concentration was approximately 25% of the NES AQ AAAQ, with the

[1] A division of Fletcher Concrete and Infrastructure Limited.

maximum being approximate 50% of the AAAQ. PDP's $PM_{10}$ assessment concludes that if the dust mitigation measures continue to be used throughout the project, they will continue to control $PM_{10}$ concentrations such that it is extremely unlikely that there would be any off-site $PM_{10}$ effects to a level where health effects are would be experienced from $PM_{10}$.

A range of mitigation measures are recommended to control and monitor dust, which are to be incorporated into the recommended amended conditions of consent and a revised Air Quality Management Plan (AQMP). These measures include the use of water as a dust suppressant and continued instrumental dust and meteorological monitoring with recommended trigger alerts to enable any abnormal dust discharges to be controlled before notable off-site effects or impacts arise.

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## 1.0 Introduction

Winstone Aggregates[2] (Winstone) operates the Hunua Quarry (the site) located in South Auckland, approximately 5 kilometres (km) southeast of Papakura and 35 km southeast of the Auckland Central Business District (CBD). The Hunua Quarry has been operating since the 1920's and produces greywacke rock. The Hunua Quarry supplies a significant portion of the Auckland region's aggregate requirements, primarily for use in civil infrastructure such as roading and concrete. The Quarry is recognised as one of Auckland's three most strategically important sources of aggregate. The location of the site is illustrated in Figure 1.


**Figure 1: Site Location**

Currently, material is extracted from the Symonds Hill Pit (SHP) and processed on-site, with material with no value (often referred to as overburden) disposed of on-site in the Overburden Disposal Area (OBDA) (the previous Hunua Pit).

To extend the operational life of the site, Winstone proposes to further develop and deepen the existing SHP (the Project) to secure additional high-quality greywacke resource. Initial investigations have identified that there is considerable resource available at the site which, based on current rates of demand and known constraints at the site and surrounding areas, may amount to up to 80 years' supply.

[2] A division of Fletcher Concrete and Infrastructure Limited.

The project is being advanced under the Fast-track Approvals Act 2024 (FTAA) as a Listed Project, reflecting its regional and national significance.

Pattle Delamore Partners Limited (PDP) has been engaged by Winstone to undertake an Air Quality Assessment (AQA) to support applications to expand the SHP and obtain a new global consent for all activities at the site.

For simplicity, the SHP expansion, on-site processing, and all other works associated with the pit expansion and site operations is hereafter referred to as 'the project'.

This report presents PDP's AQA which is utilises a semi-qualitative approach in which a number of FIDOL (Frequency, Intensity, Duration, Offensiveness, Location) assessments have been undertaken together with analysis of the site's continuous Total Suspended Particulate (TSP) (also referred to as dust) and meteorological monitoring, as well as a short term $PM_{10}$ (particulate matter with a diameter of less than 10 microns) monitoring campaign.

## 2.0 Background Information

### 2.1 Topography

The topography of the surrounding area significantly affects the wind speed and directions experienced at the site, meaning it is relevant to the assessment of potential air quality effects.

The site is located in an area known for rolling hills and valleys, typical of the Hunua Ranges. The surrounding area is therefore undulating out to a distance of approximately 1.8 km west of the site where the terrain flattens out. Figure 2 presents a three-dimensional indicative view looking north over the site which shows the extent of the undulating terrain.

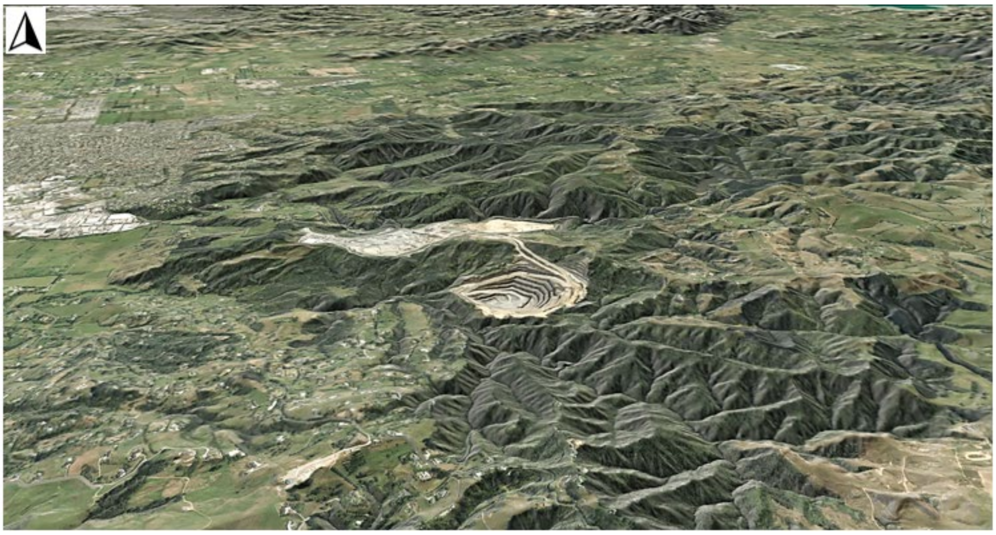

**Figure 2: Three-Dimensional Indicative View of the Site. Source: Toitū Te Whenua, Land Information New Zealand (LINZ)**

## 2.2 Compliance History

There have been five complaints relating to air quality since 2018, with four of these relating to blasting activities, and one relating to a truck that left site with an uncovered load. All complaints were investigated with data and weather conditions being analysed from the nearest dust monitor and weather monitor. No enforcement action was taken on any of these occasions.

Discussions regarding air quality have been held with stakeholders, but predominantly on an interest basis.

Auckland Council records also show that the site has not had any compliance issues with its air discharge, with the most recent Auckland Council Resource Consent Review taking place in September 2024.

## 2.3 Environmental Performance Standards

Under Rule E14.4.1 (A91) of the Auckland Unitary Plan (Operative in Part) (AUP) *"Mineral extraction activities at a rate exceeding 200 tonnes/ hour from any one quarrying process"* is a controlled activity in the SPQZ provided it meets the controlled activity standard in E14.6.2.2 which is *"The crushing of minerals and aggregates associated with a mineral extraction activity must be located at least 200m from any dwelling located outside the site zoned Special Purpose – Quarry Zone that is not under the control of the quarry operator."*

The proposal can meet this standard. However, part of the SHP development will be located outside of the SPQZ and on land zoned Rural – Mixed Rural Zone (RMRZ). Therefore, the project will require a discretionary activity consent under rule E14.4.1 (A91) for discharges to air from a medium air quality – dust and odour rural area (Rural). Figure 3 illustrates the locations of the AUP zones.

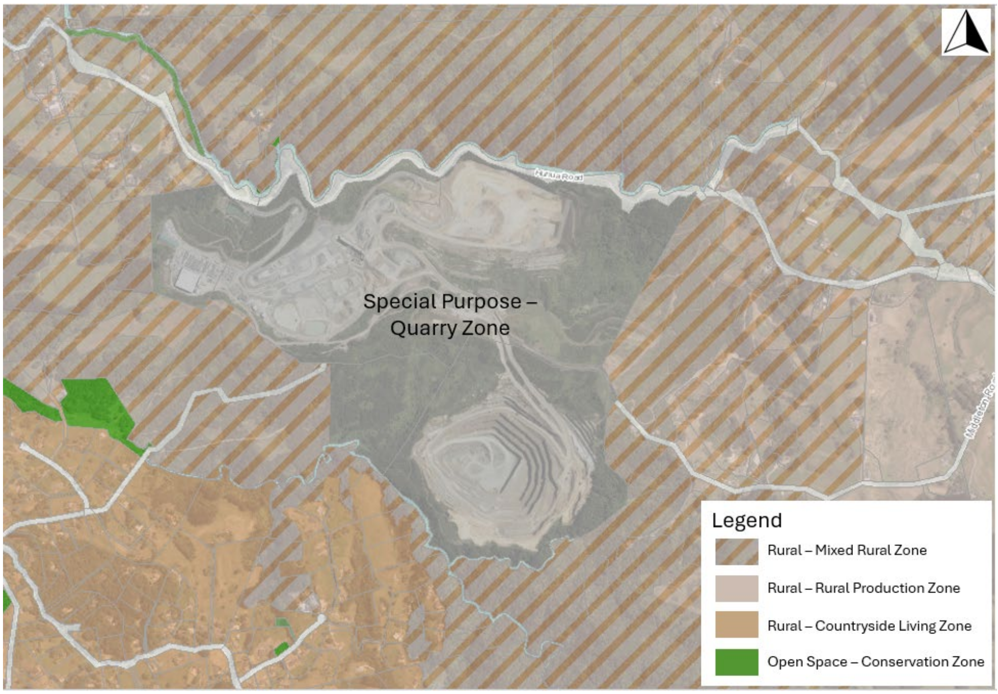


**Figure 3: AUP Zones. Source: Auckland Council GeoMaps**

As a full discretionary activity, the permitted activity general standards set out in E14.6.1.1 do not apply. However, clause C.1.8(2) of the AUP sets out that the Auckland Council will have regard to the standards for permitted activities on the same site as part of the context of the assessment of effects on the environment.

The assessment in Table 1 demonstrates that the project meets the permitted activity standards.

**Table 1: AUP Permitted Activity Rule E14.6.1.1**

| General Standard | Rule | PDP's Comment |
|---|---|---|
| (1) | The discharge must not cause, or be likely to cause, adverse effects on human health, property or ecosystems beyond the boundary of the premises where the activity takes place. | These are assessed in this section 9.0 of this report and demonstrate compliance. |
| (2) | The discharge must not cause noxious, dangerous, offensive or objectionable odour, dust, particulate, smoke or ash beyond the boundary of the premises where the activity takes place. | There will be no discharges beyond the boundary of smoke, ash, or odour unless in an emergency event.<br>The discharges of dust and particulate are assessed in Section 9.0 and are shown to meet this standard. |
| (3) | There must be no dangerous, offensive or objectionable visible emissions. | There will be no dangerous, offensive or objectionable visible emissions associated with this activity. |
| (4) | There must be no spray drift or overspray beyond the boundary of the premises where the activity takes place. | Not relevant to this application. |

## 2.4 Sensitivity of the Receiving Environment

A site investigation and desktop study was undertaken to identify discrete receptors deemed sensitive to changes in air quality near to potential dust sources on the site. The locations of these assessed receptors are presented in Figure 4 with the details of each summarised in Table 2. PDP notes that receptors R7 and R11 are dwellings located on Fletcher Concrete and Infrastructure Limited owned land and are within the site boundary. These two receptors have therefore not been further assessed in the AQA presented in this report.

While not every receptor has been identified in Figure 4, the receptors that have been assessed are considered to be representative of the surrounding community that could be affected by nuisance dust from the project. Appendix A sets out all of the receptors within 1,000 m of the Site.

In the context of this assessment, the term 'sensitive receptors' is defined as a location where people or surroundings may be particularly sensitive to the effects of air pollution. This type of receptor includes:

- residential dwellings;
- hospitals;
- schools;
- marae;
- libraries; and,
- public outdoor locations (e.g. parks, reserves, beaches, sports fields).

The sensitivity of various land use types to effects from dust is provided in the Ministry for the Environment (MfE) Good Practice Guide for Assessing and Managing Dust[3] (GPG Dust). PDP has summarised the land use types and their sensitivity below:

- Residential: High sensitivity.
- Rural residential/countryside living: Moderate to High sensitivity.
- Public Roads: Low sensitivity.
- Rural: Low to High sensitivity.

Based on the above, PDP considers that the receiving environment is generally of a low to moderate sensitivity with the identified receptors being of a moderate to high sensitivity given their rural residential nature.

[3] Ministry for the Environment, 2016. *Good Practice Guide for Assessing and Managing Dust*

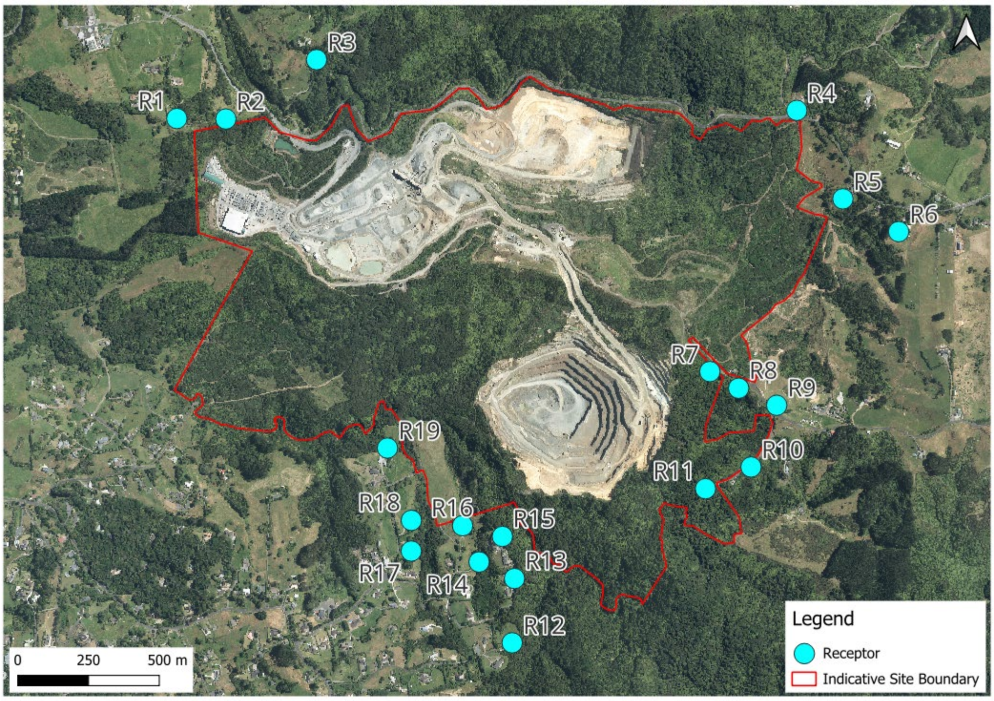


**Figure 4: Nearby Sensitive Receptors**

**Table 2: Summary of Assessed Nearby Sensitive Receptors**

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

**Table 2: Summary of Assessed 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[4] |
| R14 | 181 Judge Richardson Drive | | 200[4] |
| R15 | 119 Judge Richardson Drive | | 80[4] |
| R16 | 191 Judge Richardson Drive | Southwest | 200[4] |
| R17 | 154 Judge Richardson Drive | | 400[4] |
| R18 | 144 Judge Richardson Drive | | 355[4] |
| R19 | 80 Judge Richardson Drive | West | 305[4] |

*Notes:*

1. *Receptor located on Fletcher Concrete and Infrastructure Limited owned land. R7 also represents 180 Middleton Road, which is also located on Fletcher Concrete and Infrastructure Limited owned land, and has therefore not been further assessed.*
2. *Distance from general processing and stockpiling area.*
3. *Distance from OBDA/managed fill area.*
4. *Distance from Stage 4 extent the SHP expansion.*

PDP understands that the residents of the following properties have provided written approval for the project, and therefore the effects at these properties do not need to be considered. However, for completeness, PDP has included these in the assessment of effects. For the purposes of this assessment, some of these properties are also used as a representative receptor where there are multiple receptors within close proximity. These representative receptors can therefore not be fully discounted from this assessment as, in some cases, they represent the potential effects on residents at other nearby dwellings who have not provided written approval.

- 161 Middleton Road (R10);
- 167 Middleton Road (R8);
- 105 Judge Richardson Drive;
- 115 Judge Richardson Drive (R13); and,
- 119 Judge Richardson Drive (R15).

# 3.0 Assessment Methodology

## 3.1 Nuisance Dust

The assessment presented in this report has been undertaken in accordance with the MfE GPG Dust.

It is common practice in New Zealand to undertake a qualitative assessment of the potential nuisance dust effects associated with quarrying including the overburden removal and material processing. This assessment has involved a review of the activities that are being undertaken and then determining the likely potential for these activities to cause nuisance dust which could affect the surrounding environment. In determining whether there is the potential for nuisance to occur, the following matters have been considered:

- The nature of the activity being undertaken;
- How long the activities are likely to occur;
- The nature of the material being quarried;
- Whether mitigation measures can be implemented to control the potential for effects (e.g. use of water carts);
- How close receptors are to the activities;
- The nature of the receptors and their sensitivity to dust; and,
- The prevailing meteorological conditions.

## 3.2 $PM_{10}$ and RCS

### 3.2.1 $PM_{10}$

PDP has undertaken a two-month $PM_{10}$ monitoring campaign near to the dwellings located on Judge Richardson Drive at the location depicted in Figure 5.

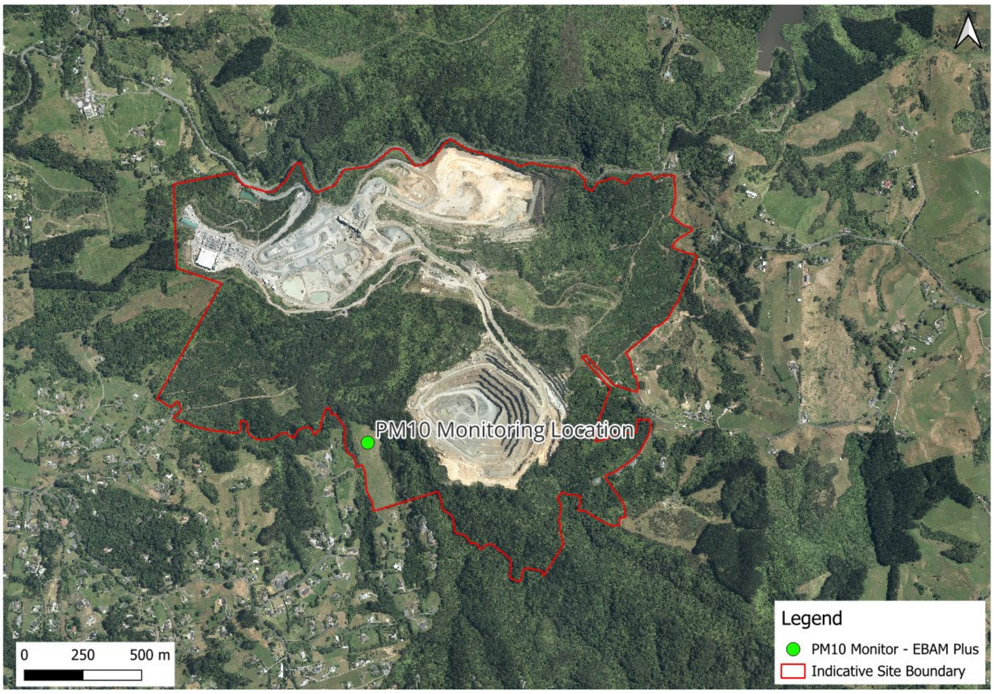


**Figure 5: Short-term $PM_{10}$ Monitoring Location**

The monitor installed was an EBAM Plus, which is a US EPA FEM approved method for the monitoring of $PM_{10}$, and complies with the $PM_{10}$ beta attenuation monitoring method of Schedule 2 of the National Environmental Standard for Air Quality (NES-AQ).

In addition to this, PDP has undertaken a qualitative assessment of $PM_{10}$ which is presented later in this report which includes a review of an ambient $PM_{10}$ monitoring programme undertaken around another New Zealand (NZ) quarry.

### 3.2.2 Respirable Crystalline Silica (RCS)

To assess the potential for off-site effects of RCS, PDP has undertaken a risk assessment using a methodology developed by the United States (US) Environmental Protection Agency (EPA)[4]. The US EPA has carried out an extensive review of all the available monitoring and epidemiology in the United States and overseas, and as a result has been able to produce a methodology to assess the potential risk to the community of exposure to RCS. This review included monitoring undertaken in communities around quarries. While this data is primarily from the United States, PDP considers that the methodology that has been used can be applied to the site to assess the risk to people in the nearby community.

[4] United States Environmental Protection Agency, Ambient Levels and Noncancer Health Effects of Inhaled Crystalline and Amorphous Silica: Health Issue Assessment, November 1996, EPA/600/R-95/115.

Figure 6 below presents the results of the US EPA research in terms of potential risk exposure.

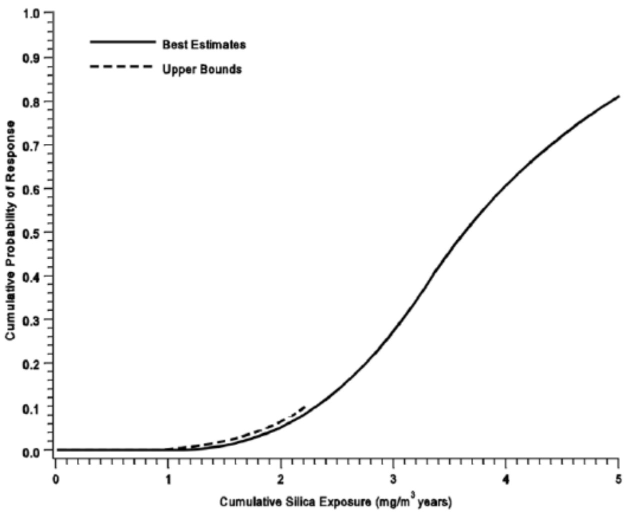


**Figure 6: Cumulative Silicosis Risk from Ambient Levels and Noncancer Health Effects or Inhaled Crystalline and Amorphous Silica: Health Issue Assessment, US EPA**

In addition, PDP has undertaken screening calculations using the silica content of resource, the on-site $PM_{2.5}$ (particulate matter with a diameter of less than 2.5 µm) and TSP monitoring. PDP has then also reviewed an ambient RCS monitoring programme undertaken near to another quarry in the South Island of New Zealand (NZ).

PDP has then compared the analysis of the site $PM_{2.5}$ crystalline silica analysis against the Victoria Environmental Protection Agency (Vic EPA) annual average assessment criteria annual average RCS as $PM_{2.5}$.

The TSP crystalline silica concentration analysis has then been compared against California Office of Environmental Health Hazard Assessment (OEHHA) chronic Reference Exposure Level (REL). The details of this REL, and the Vic EPA annual average criterion are discussed in Section 4.2.2.

Finally, PDP has compared the result to recent published studies from America, which is discussed in Section 9.7.2.4.

## 3.3 Qualitative Assessment Methodology

PDP has undertaken a qualitative assessment to assess the dust effects from the project using the FIDOL assessment tool.

The FIDOL factors are explained in greater detail below:

- Frequency relates to how often an individual is exposed to dust. Factors determining this include the frequency that the source releases dust (including its source type, characteristics and the rate of emission of the compound or compounds), prevailing meteorological conditions and topography.
- Intensity is the concentration of dust at the receptor location.
- Duration is the amount of time that a receptor is exposed to dust. Combined with frequency, this indicates the exposure to dust. The duration of dust emissions, like its frequency, is related to the source type and discharge characteristics, meteorology, and location. The longer the dust detection persists in an individual location, the greater the level of complaints that may be expected.
- Offensiveness is a subjective rating of the unpleasantness of the effects of nuisance dust.
- Location is the type of land use and the nature of human activities in the vicinity of a dust source, as well as the distance to dust source. The same process in a different location may produce more or less dust depending on local topography and meteorological conditions. It is also important to note that in some locations certain higher dust concentrations may be more acceptable than in others.

Due to the size of the site, PDP has separated the site into three primary areas with these being:

- Processing Plant Area;
- Overburden Disposal Area (OBDA) and Managed Fill (MF) Area; and,
- Symonds Hill Pit Area.

Figure 7 illustrates the indicative boundaries of each of these areas.

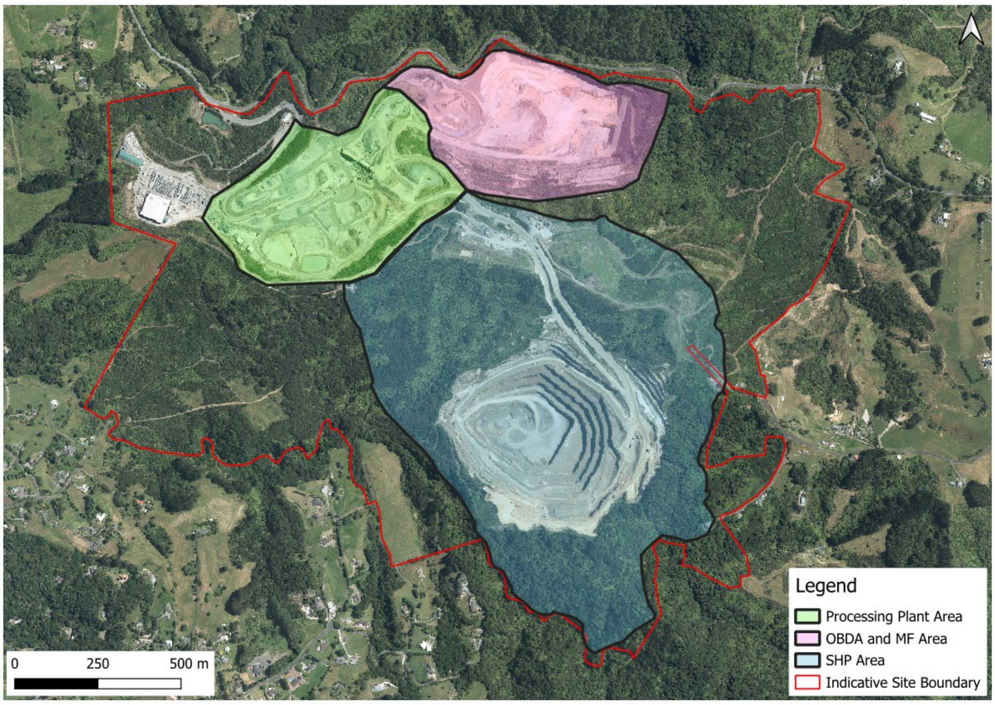


**Figure 7: Site Areas**

PDP has then undertaken a FIDOL assessment for each of the three areas, with the Project area being assessed twice as follows. One assessment is for the proposed extent of the pit up to Stage 4 (which is expected to be within the sought 35 year consent), and the other for the extent of the pit post-Stage 4 and up to Stage 8 (which is expected to be undertaken beyond the 35 year period for which consents can be granted under the FTAA for air discharges). PDP notes that the 35-year time period may occur between Stages 4 and 5, however for the purposes of PDP's assessment, the greatest potential for effect between the two stages is during Stage 4 due to the work involved in the overburden removal area. The assessment is, therefore, conservative.

Following these four FIDOL assessments, PDP has undertaken a cumulative effects assessment of the site as a whole.

# 4.0 Assessment Criteria

## 4.1 Nuisance Dust

As recommended by the MfE GPG Dust the relevant effects assessment criterion is:

> *"There shall be no noxious, dangerous, objectionable or offensive dust to the extent that it causes an adverse effect at or beyond the boundary of the site."*

The GPG Dust criterion aligns with the approach under the AUP general permitted activity standards set out in Section 2.3.

PDP has therefore adopted this criterion to assess the findings of the FIDOL nuisance dust effects assessment against.

## 4.2 $PM_{10}$ and RCS

### 4.2.1 $PM_{10}$

PDP has assessed the $PM_{10}$ concentrations recorded during the two-month study against two separate criteria set out in Table 3. The 24-hour average criterion has been taken from Schedule 1 of the NES-AQ, with the purpose of this being to ensure protection from adverse health effects from $PM_{10}$. PDP notes that the NES-AQ Ambient Air Quality Standards (AAQS) (of which the 24-hour $PM_{10}$ value is a part of) only applies at locations where people are likely to be exposed for the entirety of the averaging period. Therefore, the 24-hour average $PM_{10}$ AAQS applies at the sensitive receptor locations illustrated in Figure 4, but does not strictly apply at the location of the monitor (as it sits within the site, on land which is proposed to be planted as part of the mitigation package for the proposal).

In lieu of a 1-hour average value in the NES-AQ, PDP has compared the recorded $PM_{10}$ concentrations against the suggested 1-hour average trigger level for highly sensitive receiving environments as set out in the MfE GPG Dust. PDP notes that this value has no regulatory status but is simply a trigger level for site management as a surrogate for nuisance dust.

**Table 3: $PM_{10}$ Assessment Criteria**

| Averaging Period | Concentration (µg/m³) | Source | Concentration Type and Purpose |
|---|---|---|---|
| 1-hour | 150[1] | MfE GPG Dust | Suggested trigger level – nuisance effects |
| 24-hour | 50[2] | NES-AQ | Statutory standard – health effects |

*Notes:*
1. *Value for highly sensitive areas only. No values are defined for areas of other sensitivities.*
2. *One exceedance is permitted per 12-month period.*

#### 4.2.2 RCS

There are no New Zealand standards or guidelines for ambient concentrations of RCS; therefore, PDP has considered how RCS has been assessed in other jurisdictions.  PDP has undertaken a risk review assessment (the methodology of which is detailed in Section 3.2) and compared the findings to the US EPA threshold exposure of approximately 1 milligram per cubic metre ($mg/m^3$) years, below which there is no stated increase in the risk of developing silicosis.

PDP has also considered the California OEHHA chronic REL concentration limit of 3 $\mu g/m^3$ for RCS[5].  This REL is used for assessment against long-term exposure of RCS, which the OEHHA defines as being anywhere between 1 year and a lifetime. PDP has therefore used this as an annual assessment criterion.

The Vic EPA has also adopted 3 $\mu g/m^3$ as an annual average assessment criterion for RCS as $PM_{2.5}$[6].

# 5.0 Current and Proposed Activities

## 5.1 Current Activities

This section describes the general activities and locations of each currently undertaken on-site and for which a global air-quality discharge consent is held. A more detailed process description which is relevant to both the current and proposed activities is set out in Section 5.3.

#### 5.1.1 Overburden Removal and Disposal, Managed Fill, and Concrete Recycling

To access underlying resource, overburden is removed and then disposed of in the OBDA illustrated in Figure 8.  This figure also shows the managed fill (MF) tip head where loads of material from off-site that have been checked against the acceptance criteria, are placed, and the fines[7] disposal area.

The general OBDA is the area where Winstone currently undertake concrete recycling processes.  Here, steel reinforcing is stripped from concrete before the concrete is crushed and stockpiled for transportation off-site.  A photograph of this area is presented in Figure 9.

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[5] California Office of Environmental Health Hazard Assessment, 11 October 2023.  *OEHHA Acute, 8-hour and Chronic Reference Exposure Level (REL) Summary.* https://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary

[6] Victoria EPA, December 2007.  *Protocol For Environmental Management: Mining and Extractive Industries*

[7] Fines are generally described as particles that generally smaller than 4.75 mm and larger than 0.075 mm (75 µm), that have no use.

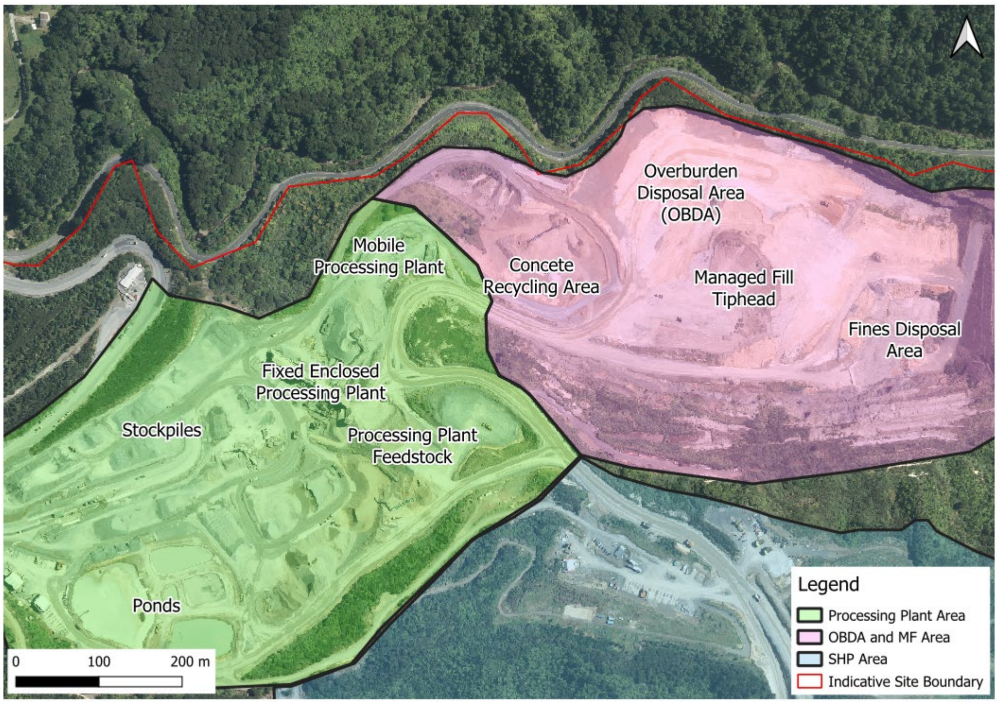


**Figure 8: General Site Layout – Processing and Overburden Disposal Area**

**Figure 9: Concrete Recycling Area**

### 5.1.2 Resource Extraction

Figure 10 presents the locations of the SHP and the primary haul road. Resource is currently extracted from the SHP using both blasting and excavation methods and transported using trucks to the processing area.

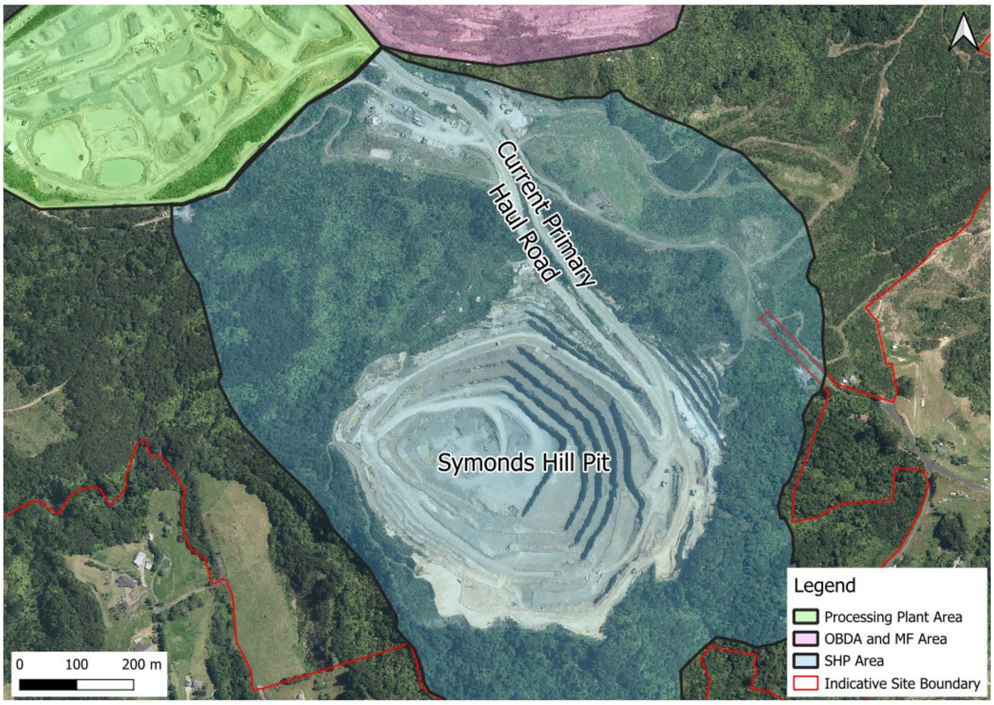


**Figure 10: General Site Layout – SHP and Haul Road**

### 5.1.3 Resource Processing

Winstone operate both fixed and mobile processing plant, the current locations of both depicted in Figure 8. Figure 11 presents a photograph of the enclosed fixed processing plant and Figure 12 then presents a photograph of the mobile processing plant. Both of these photographs (and all other others presented previously) were taken during PDP's site visit undertaken on 16 January 2026.

**Figure 11: Fixed Processing Plant**

**Figure 12: Mobile Processing Plant**

## 5.2 Proposed Development Overview

Sections 5.2.1 to 5.2.9 include details of the proposed staging of the project. It is noted that to enable operational flexibility and the need to respond to market conditions, the staging will likely be followed sequentially, however post-Stage 5 there may be variations to the staging order due to operational requirements.

The overall site operational process description which is relevant to both the current and proposed activities is set out in Section 5.3.

### 5.2.1 Stage 0

The geographical extent of the works proposed for the initial stage, Stage 0, are contained in Figure 25 in Appendix B. It is proposed that the current haul road located to the north of the SHP will be altered slightly to allow for an expansion of the SHP into the space currently occupied by the haul road. There will be an area (approximately 3.3 ha) of overburden that will be removed and disposed of in the overburden disposal area (OBDA), which is the former Hunua Pit.

PDP notes that these works have already been consented.

### 5.2.2 Stage 1

Stage 1 involves enabling works to extend the SHP further to the northwest of the existing haul road. Approximately 3.5 ha of overburden will be removed to access the underlying resource. PDP notes that these stripping and extraction works are covered under the site's existing consents and the air discharges consented under the global air discharge consent that will be replaced, and Winstone expects the extraction and resource processing from this area to take between one and three years.

Additionally, to prepare for the planned future development of the SHP, an approximately 500 m length of a tributary to the Symonds Stream will be realigned to enable the safe expansion of the SHP while achieving ecological and hydrological improvements. This work is not covered by the existing consents however will occur concurrently with the expansion to the north discussed earlier in this subsection.

The extent of the earthworks required for this is approximately 5.8 ha and can be seen to the south of the SHP in Figure 26 contained in Appendix B. Winstone expects the enabling works for the tributary alignment to take approximately four years to complete.

### 5.2.3 Stage 2

During Stage 2, the tributary realignment is proposed to be completed, and the northwestern corner of the SHP is proposed to be cut to 105 m reduced level (RL). However, the most significant expansion activity proposed for Stage 2 is the formation of the western haul road. As seen in Figure 27 contained in Appendix B, the haul road is planned to provide a more direct and efficient route to connect the SHP with the processing plant thus reducing transportation time and costs, as well as dust and vehicle emissions. Approximately 1.8 ha of overburden, including dense vegetation, will be removed to construct the western haul road. Winstone expects Stage 2 to take approximately one year to complete and may be done simultaneously with Stage 1.

### 5.2.4 Stage 3

Stage 3 involves the incremental stripping campaigns south from the current SHP crest towards the tributary realignment at the southern end of the site. The SHP will expand by approximately 4.9 ha with the majority of this area requiring vegetation and overburden removal. Figure 27 contained in Appendix B sets out the extent of Stage 3 expansion.

### 5.2.5 Stage 4

Stage 4 will again involve incremental stripping and extraction out to southwest of the tributary diversion and 10 m adjacent to the southern site boundary.

PDP notes that the duration of regional consents sought, including the air discharge permits is 35 years which Winstone estimates will conclude during Stage 4 or Stage 5.

Figure 29 contained in Appendix B illustrates the extent of the expansion during Stage 4.

### 5.2.6 Stage 5

Similarly to Stage 4, incremental stripping and extraction campaigns will occur south towards the southern site boundary. The extent of the expansion occurring during Stage 5 is pictured in Figure 30 contained in Appendix B.

As noted above Stage 5 might occur within the 35 years sought for the regional consents.

### 5.2.7 Stage 6

Stage 6 will consist of more incremental stripping and extraction campaigns in an anticlockwise direction, extending the SHP to the south and northwest while deepening the pit. The pit extent is not proposed to be expanded during this stage; however, the Stage 6 pit design is illustrated in Figure 31 contained in Appendix B.

### 5.2.8 Stage 7

During Stage 7 to allow the expansion of the SHP to the northwest, it is proposed to realign the western haul road so that it runs, for a short distance, along the southwestern extent of the SHP. This will involve some enabling works and vegetation/overburden removal.

Incremental stripping and extraction will occur during Stage 7 in an anticlockwise direction, extending the pit to the southwest and northwest while deepening the pit. Figure 32 contained in Appendix B presents the layout of the proposed pit during Stage 7.

It is noted that PDP's Land Contamination Assessment[8] has identified areas near the machinery graveyards (to the north of the SHP) where hydrocarbons are present in the ground. Stage 7 proposed to develop into this area; however, hydrocarbon contaminated areas are generally dense and damp and are therefore unlikely to give rise to significant dust emissions. Any areas found to

[8] Pattle Delamore Partners Limited, 13 March 2026. *Hunua Quarry Pit Development – Combined Preliminary & Detailed Site Investigation.*

be contaminated will be appropriately remediated prior to earthworks occurring. Additionally, this general area is located well within the site boundary and is at least 550 m from the nearest off-site receptor.

It is also likely that during Stage 7, the current OBDA will reach capacity, and overburden will be disposed of within the SHP. This is unlikely to have any noticeable effect on off-site air quality effects due to the elevation difference between the placement of the overburden and the any nearby receptors, with the pit walls providing screening.

#### 5.2.9 Stage 8

Stage 8 involves the extension of the SHP further to the north. As with other stages, stripping and extraction will occur in an anticlockwise direction. Figure 33 contained in Appendix B shows the extent of the SHP following Stage 8. Winstone estimates that Stages 4 to 8 inclusive will take approximately 41 years to complete (subject to market demand). PDP notes that this therefore extends beyond the life of the sought-after 35 year consent for the site.

Similarly to Stage 7, overburden is likely to be disposed of within the SHP. As mentioned previously, this is unlikely to have any noticeable effect on off-site air quality effects due to the elevation difference between the in-pit placement and any nearby receptors.

### 5.3 Process Description

This section describes the process description of the on-site operations which is relevant to both the current operations, and those proposed to be undertaken in the project.

#### 5.3.1 Overburden Removal

As new areas are required to be opened up to access the underlying resource, any existing vegetation and overburden is first removed. Over the life of the site (anticipated to be 80 years) approximately 24 million m³ of overburden is expected to be removed, supporting a peak production rate of 5.4 million per annum (t/a). Overburden typically includes topsoil, clay, and brown-rock which is predominantly removed using excavators. The overburden will be loaded into dump trucks for disposal in the old Hunua Pit, located at the northern end of the site (labelled as OBDA in Figure 8). It is estimated that there is sufficient capacity within the Hunua Pit for all overburden removed within a 35-year timeframe, after which in pit disposal of the SHP or off-site disposal may be adopted.

### 5.3.2 Resource Extraction

To extract resource from the SHP, drilling and blasting practices are used, typical of operations of similar scale in New Zealand. The typical current practice at the site uses drilled 20 m deep blasting holes with electronic detonation systems for control. Once blasted, the rock will be removed using excavators and front-end loaders and transported to the processing plant by 70 tonne (t) rigid dump trucks via the existing dual-way haul road, and eventually by the western haul road. Quarry deepening will occur through staged bench development, followed by progressive stabilisation of inactive areas in the later stages.

It is proposed to extract and process up to a peak of 5.4 million t/a. The global air discharge consent 34130, under which the site operates, enables a maximum extraction rate of 2,000 tonnes per hour (t/h) and Winstone considers that this extraction rate remains appropriate for the project. PDP has relied on that extraction rate to inform its assessment below.

### 5.3.3 Resource Processing

Rock is processed into aggregate products by crushing, screening, washing, blending, and conveying machinery. The products are moved by trucks, loaders, or conveyor to storage bins or stockpiles. The location of the fixed processing plant is shown in Figure 8. The site has a number of mobile crushing plants on site that either supplement or substitute for the fixed plant. The mobile processing occurs at the northern end of the site in the location depicted in Figure 8 and all mobile plant will be subject to the same set of dust control measures as the fixed plant (with the exception of the processing being enclosed) which are discussed later in this report.

The current plant is a modern aggregate processing plant capable of producing a full range of aggregate products. The plant is largely enclosed and has water control systems for dust suppression. The plant also incorporates a blending system which will allow for aggregates that would otherwise be considered low grade material to be modified by using either clean rock by-products or small amounts of concrete manufacturing by-products. The by-products are only added when manufacturing two products, namely ATAP40 and ATAP65.

The current consent limits the crushing of material to a rate of 1,000 t/h, and the screening of material also to 1,000 t/h. These both remain appropriate for the replacement global consent incorporating this project.

## 5.4 Emissions to Air

The potential for air quality effects associated with the operation of the project relates almost exclusively to the potential for dust emissions. Notwithstanding the fact the emissions from mobile sources are a permitted activity in the Auckland Region,[9] the combustion emissions from the small number of vehicles operating on the site are considered to be insignificant and are unlikely to result in any noticeable off-site changes in air quality.

Particulate matter in the environment generally falls into two categories: suspended and deposited particulate.

Suspended particulate matter is dust or aerosol which stays suspended in the atmosphere for significant periods of time. Its exact definition is dependent on the monitoring procedure adopted. The term Total Suspended Particulate (TSP) is commonly used to describe the total amount of suspended particulate in the atmosphere at any one time.

Deposited particulate matter is dust or aerosol which because of its aerodynamic diameter and density, falls from the air. In general terms deposited particulate has a diameter of greater than about 20 µm. It is generally associated with nuisance effects such as soiling.

Suspended and deposited particulate arise from many natural and man-made sources. The most significant sources globally are volcanoes and wind-blown dust, whilst on a local level, farms and fields, stationary and mobile combustion sources, road dust, wind-blown soil, pollen, and emissions from industrial processes are contributors.

Site operations have the potential to generate dust from a number of the potential activities. These include:

- Initial enabling works, including construction of the western haul roads, vegetation removal, removal of overburden, construction of erosion and sediment controls, and construction of bunds.
- Material excavation and processing.
- Operation of vehicles on the haul roads.
- Conveyor belts.
- Wind erosion of working/exposed areas.
- Disposal of overburden and cleanfilling activities.
- Rehabilitation of the completed areas.

[9] AUP Chapter E14 Rule A111.

As discussed in Section 6.0 there are mitigation measures which PDP recommends Winstone implements that will have a direct impact on the potential for the above activities to result in any form of dust nuisance effects.

A subfraction of the dust generated by quarry activities will fall into the category of $PM_{10}$ which is regulated by the NES-AQ. PDP's experience at other sites is that $PM_{10}$ from quarry activities is generally not measurable above background levels within a few hundred metres of the processing plant. However, to quantify the site-specific off-site concentrations, PDP has undertaken a short-term $PM_{10}$ monitoring campaign during summer months of 2025/2026. PDP's analysis of the results of this monitoring is presented in Section 7.3.

RCS can also be present in the dust generated by quarry operations. RCS is respirable particles (less than 4 µm particle size). To assess the potential off-site effects from RCS, PDP has undertaken a qualitative assessment and assessed against international guideline concentrations. This assessment is presented in Section 9.7.2.

## 6.0 Existing Mitigation and Monitoring Measures

This section presents the mitigation and monitoring measures that are currently successfully being used on site and which are proposed to be used to control the effects of discharges to air during the project. These mitigation measures, together with other relevant measures related to dust control and management are detailed in the Air Quality Management Plan (AQMP) for the site.

An AQMP is a requirement of the existing global air discharge consent (Permit 34130). PDP has reviewed all other conditions of this existing air discharge consent and consider it would be appropriate for these to also apply to a new consent for the site. An updated Draft AQMP (encompassing both the existing consented activities and new proposed activities) is provided at Appendix C.

### 6.1 Overburden Removal 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.

As the potential exists for dust generated by overburden removal activities associated with the expansion of the SHP to be visible from neighbouring properties, site management will, as a minimum, ensure the following measures are taken into consideration when removing overburden:

- Consider wind speeds (ideally less than 5 metres per second (m/s) as a 1-hour average) and wind direction (blowing away from nearby receptors);
- 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 is necessary to do so use appropriate management and mitigation techniques such as watercarts to wet the ground.

## 6.2 Managed Fill

Winstone will be able to control the potential for dust emissions caused by the MF operations by using a number of dust mitigation measures that are similar to those used in other areas of the site. These measures include:

- Watering of dry, exposure surfaces;
- Managing the height and location of stockpiles;
- Ensuring drop heights of material are kept to a practicable minimum;
- Use earth bunds along the northern edge of the area if required; and,
- Ensuring all vehicles comply with the on-site speed limits (discussed later in this report).

If site staff observe significant dust discharges, Winstone will increase the use of these mitigation measures in accordance with the terms of the Draft AQMP.

## 6.3 Aggregate Extraction

All drilling at the site will be carried out by rigs that are fitted with dust collection equipment. This will ensure any dust generated by this process is controlled.

Blasting is also an activity that can be inherently dusty. The site uses drilling and blasting practices typical of New Zealand operations of a similar scale. During certain stages of the development of the Symonds Hill Pit, particularly when works are occurring on the upper benches on the northeastern face of the pit, dust emissions from blasting may be visible to some residents to the southwest of the site out to a distance of approximately 1.4 km, due to the elevation of the dwellings and their clear line of sight into the pit. Visible dust emissions however do not necessarily correlate with nuisance effects. Specifically, any dust that might be generated will have settled, and is unlikely to have travelled beyond the site boundary.

All blasts are designed and managed by trained and qualified personnel taking into account a variety of factors including AUP requirements. Typically, the site blasting holes are drilled with a 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.

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.

## 6.4 Aggregate Processing

The aggregate processing components of the application are already covered by the existing global consent, by way of summary. Winstone has a modern fixed aggregate processing plant that is capable of producing a full range of aggregates. The fixed 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.

These 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 at potentially dust generating material transfer points; and,
- Mist sprays beneath all crushers.

The fixed 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 by the aggregate products themselves.

The fixed 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 Hunua Quarry is maintained at minimal levels, the current Air Quality Management Plan has been written to ensure that the processing plants complies with the requirements of the current global air discharge consent. The draft Air Quality Management Plan (AQMP) (provided in Appendix C) has also been written to achieve this and will be modified as required when Approval is granted, to ensure that dust from crushing operations is minimised and does not result in off-site effects.

Mobile aggregate processing plants and a concrete recycling plant are also used at the site in addition to the fixed plant operation. The mobile processing plants are subject to similar dust control measures with the exception that they are not an enclosed activity. The mobile plant features water sprayers which mitigate the potential for dust to be emitted.

The concrete recycling plant is located a significant distance from any of the nearby receptors; however, it is still operated with suitable dust control measures in the same manner as the mobile aggregate processing plants.

### 6.5 Stockpiles, Truck Loading, and Transportation

Stockpiles

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 (including overburden or topsoil) will be positioned in a way that minimises 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 near sensitive boundaries. The current location of stockpiles containing fines is presented in Figure 8, which PDP considers is an appropriate location to control potential off-site dust effects due to the separation distances between this area and any nearby receptors.

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, in accordance with the terms of any approved AQMP.

Truck Loading

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.

Transportation

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

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

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 all trucks exiting the site must pass through it, 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.

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

## 6.6 Additional Dust Control Measures

General Use of Water Cart

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 m/s but vehicle re-entrainment can occur under any conditions.

Spraying the surface of the ground with water is a 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 is 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 source for dust suppression is from either the Process Water Pond in the stockyard via the Coal Mine Road Bore, or from the Symonds Hill Sump. The availability of water is high for water cart usage, with the proposed water cart volume during Stage 8 being 750 $m^3$ per day.

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.

Vehicle Exhausts

All vehicles will be regularly maintained 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.

Speed Limits

Dust emissions due to moving vehicles will be controlled by enforcing on-site speed limits. The general site speed limit is 30 kilometres per hour (km/h), 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 km/h, to ensure this does not cause additional dust emissions.

Following Distances

To minimise the potential for cumulative dust emissions arising from closely traveling vehicles, site management will ensure that drivers maintain appropriate following distances between vehicles when using site haul roads.

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.

Limits on Disturbed Area

Removal of overburden will be progressively undertaken as the development of SHP continues. Only enough vegetation and topsoil will be removed to allow each stage of the development to control the area of exposed surfaces at any given time.

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 the site will be maintained at a practical minimum. 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, crimped straw mulching, or surfacing areas with non-dust producing aggregate.

## 6.7 Dust Monitoring

This section details the proposed dust monitoring for the project, which is similar to the monitoring currently undertaken on the site under the existing global consent.

### 6.7.1 General Visual Monitoring

There are a range of simple monitoring activities that can be regularly used to ensure that dust is being appropriately controlled at the site. These monitoring measures (set out in Table 4) are regularly used at most quarry sites and are proposed to be included in the updated site AQMP.

**Table 4: Visual Dust Monitoring Programme**

| Monitoring Activity | Frequency |
|---|---|
| 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 conditions are triggered (see Table 5). |
| 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. |

**Table 4: Visual Dust Monitoring Programme**

| Monitoring Activity | Frequency |
|---|---|
| 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. |

### 6.7.2 Instrumental Dust Monitoring

Winstone currently operate three continuous TSP monitors in the locations presented in Figure 13. Each of these monitors are connected to telemetry systems which send out alerts to site staff when concentrations exceed the trigger levels set out in Conditions 23 to 27 of the site's current air discharge permit. Condition 24 states that 24-hour average TSP concentrations measured at Symonds Hill and Ponga Road dust monitors shall not exceed 80 µg/m$^3$, and 100 µg/m$^3$ at the main gate dust monitor. PDP considers that these trigger levels remain appropriate for the proposed activities, because they have been demonstrated on this site to be appropriate to date. However, to align with current best practice for TSP control PDP recommends these are updated to be a 24-hour rolling average to align with Table 4 of the GPG Dust.

The details of each monitor are set out below:

- Main Gate: MetOne EBAM Plus (EBAM Plus) operated with a TSP inlet in an air-conditioned hut.
- Symonds Hill: Thermo Fisher Scientific 5014i (5014i) operated with a TSP inlet in an air-conditioned hut; and,
- Ponga Road: MetOne EBAM operated with a TSP inlet in an air-conditioned hut.

All three of these monitors are United States (US) Environmental Protection Agency (EPA) Federal Equivalent Method (FEM)[10] approved, or near FEM approved monitors for $PM_{10}$ and record high quality real-time TSP concentrations.

[10] FEM monitors are only approved for one or both $PM_{10}$ and $PM_{2.5}$. There is currently no real-time FEM monitor to measure TSP, therefore the use of a $PM_{10}$ FEM monitor with a TSP inlet is considered to be the best available.

In addition to the previously discussed consent limits, PDP recommends 1-hour average TSP trigger levels are set up on each of these monitors to notify site management at 220 µg/m³ as an alert level warning and at 250 µg/m³ as a trigger level exceedance. This 250 µg/m³ is in line with the suggested trigger level for moderately sensitive receptors set out in the GPG Dust and will aid site staff in identifying and mitigating any short-term dust discharges should they arise.

Table 5 summarises the proposed trigger levels for the three TSP monitors.

**Table 5: Proposed TSP Alert Levels**

| Averaging Period | Concentration (µg/m³) | | |
|---|---|---|---|
| | 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 |

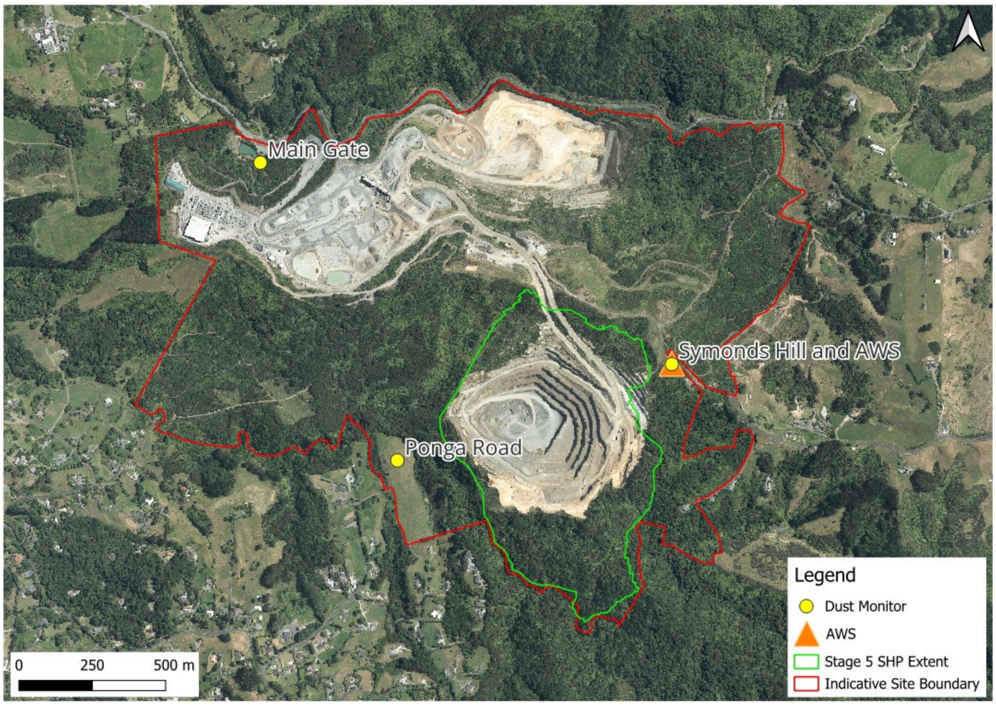


**Figure 13: Current Dust Monitor and AWS Locations**

During Stage 7 of the SHP expansion, the SHP expands into the location where the Symonds Hill dust monitor and Automatic Weather Station (AWS) are currently situated. It is proposed that the monitors are re-located to the general location identified in Figure 14 and continue to be utilised as a management tool to detect the potential for nuisance dust effects to be experienced off-site. Here, all monitors will be separated from on-site operations and continue to monitor the potential for nuisance effects. 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 (noting that this is outside the 35-year period to which the permit relates).

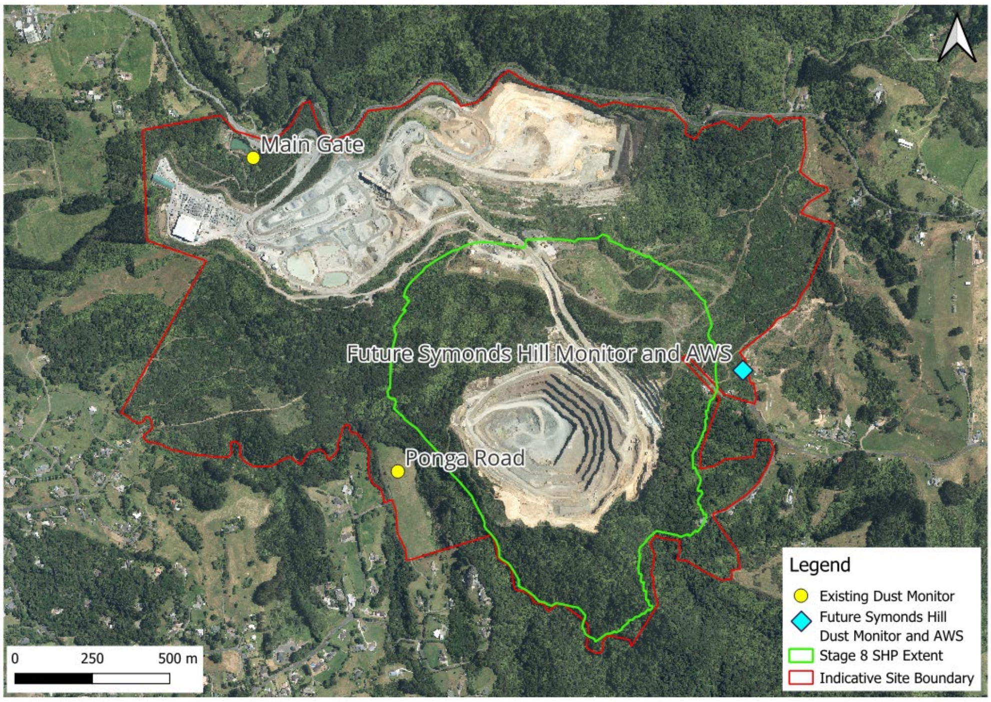


**Figure 14: Proposed Indicative Dust Monitor and AWS Locations**

### 6.7.3 Wind Monitoring

The site operates its own AWS at Symonds Hill which was installed in August 2014. The wind sensor is mounted at a height of approximately 5 m above ground level at the same location as the Symonds Hill TSP monitor, the location of which is depicted in Figure 13. As the SHP expands, PDP recommends this AWS is kept with the TSP monitor and relocated to the indicative location presented in Figure 14.

# 7.0 Data Analysis

This section presents PDP's analysis of historically collected data by the site's dust and meteorological monitors.

## 7.1 Meteorology

### 7.1.1 Wind Speed and Direction

Wind can have a significant effect on dust generation and transportation.

As previously mentioned, Winstone operate an AWS at Symonds Hill. PDP has reviewed the location of the AWS and the data collected and considers it is suitable for use to assess potential air quality effects.

A windrose developed using data from the AWS for 2023 to 2025 inclusive is presented in Figure 15, with the wind distribution frequencies presented in Table 6.

The windrose shows that the predominant wind is from the west southwest which occur approximately 20% of the time which is consistent with the typical wind conditions of Auckland. Frequent winds also occur from the west and southwest, and approximately 28% of all winds blow from the eastern hemisphere.

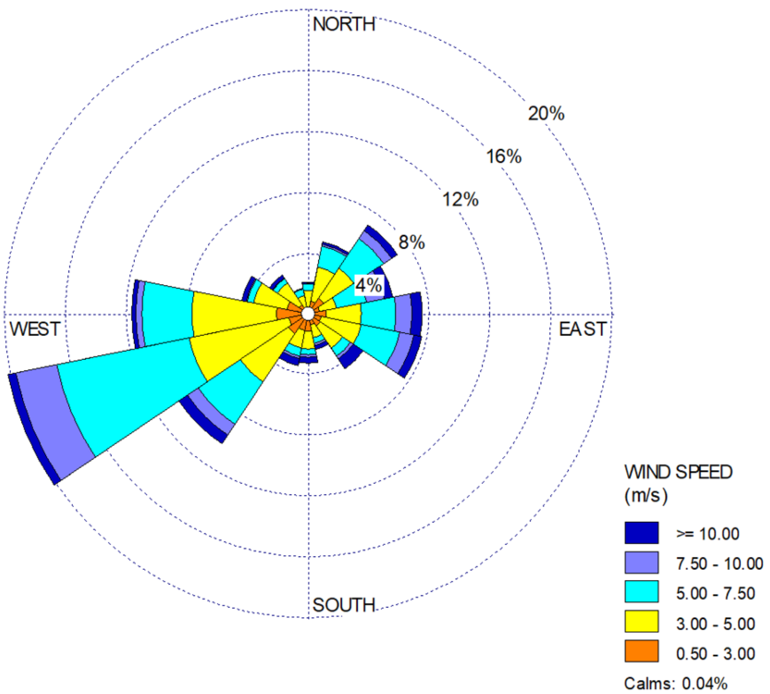


**Figure 15: Windrose from Site AWS from 2023 to 2025**

**Table 6: Wind Speed Frequency Distribution from On-site AWS**

| Direction | Frequency (%) | | | | | Total (%) |
|---|---|---|---|---|---|---|
| | 0.5 – < 3 m/s | 3 – < 5 m/s | 5 – < 7.5 m/s | 7.5 – < 10 m/s | >= 10 m/s | |
| North | 0.3 | 1.3 | 0.4 | 0 | 0.1 | 2.1 |
| North Northeast | 0.9 | 2.3 | 1.4 | 0.1 | 0.2 | 4.9 |
| Northeast | 1.3 | 2.4 | 2.3 | 0.6 | 0.4 | 7 |
| East Northeast | 0.8 | 1.1 | 2 | 1.2 | 0.6 | 5.7 |
| East | 1.2 | 2.3 | 2.3 | 1.1 | 0.7 | 7.6 |
| East Southeast | 0.9 | 2.7 | 2.6 | 0.9 | 0.5 | 7.6 |
| Southeast | 1 | 1.7 | 0.6 | 0.2 | 0.8 | 4.3 |
| South Southeast | 0.8 | 0.9 | 0.4 | 0.1 | 0.3 | 2.5 |
| South | 1.2 | 1.2 | 0.4 | 0.2 | 0.4 | 3.4 |
| South Southwest | 1.2 | 1.2 | 0.5 | 0.2 | 0.5 | 3.6 |
| Southwest | 1.6 | 3.8 | 3.3 | 0.8 | 0.7 | 10.2 |
| West Southwest | 1.4 | 6.7 | 8.8 | 2.7 | 0.5 | 20.1 |
| West | 2.1 | 5.5 | 3.3 | 0.4 | 0.3 | 11.6 |
| West Northwest | 1.5 | 2.2 | 0.4 | 0.1 | 0.3 | 4.5 |
| Northwest | 0.8 | 1.7 | 0.3 | 0 | 0.3 | 3.1 |
| North Northwest | 0.2 | 1.1 | 0.4 | 0 | 0.1 | 1.8 |
| Calms (< 0.5 m/s) | | | | | | < 0.1 |
| Missing or Incomplete | | | | | | < 0.1 |

### 7.1.2 Rainfall

Rainfall acts as a natural dust suppressant and therefore reduces the potential for dust generation. The average daily precipitation for the years 2024 to 2025 inclusive recorded by the on-site AWS are shown in Figure 16. The year of 2023 has been excluded from the rainfall analysis due to the extreme rainfall experienced through the year, including Cyclone Gabrielle which landed in Auckland during February 2023. The average daily rainfall numbers presented in Figure 16 are considered to be typical of those experienced at the site.

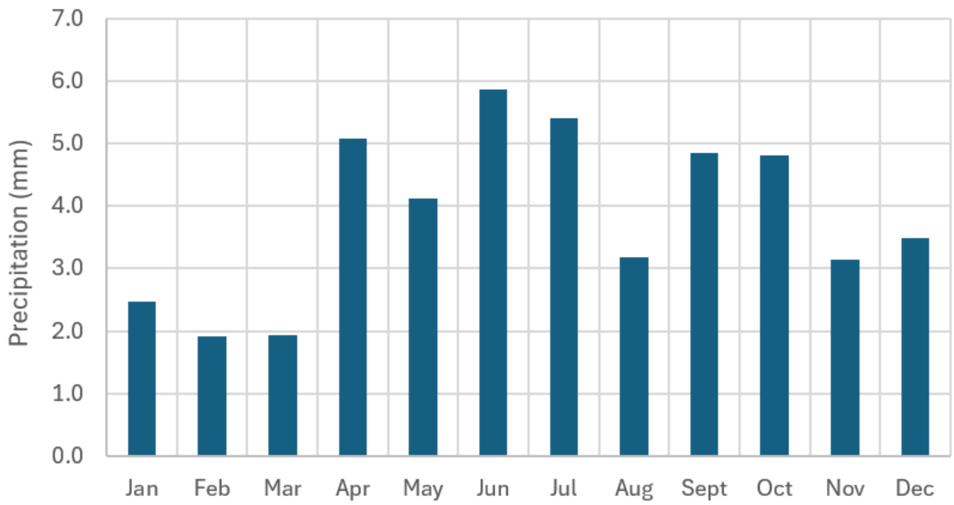


**Figure 16: Average Daily Precipitation per Month from On-site AWS, 2024 to 2025**

Figure 16 shows that the driest months of the year are January, February, and March, meaning that greater consideration and management should therefore be given to dust during these months. Over the two-year period, there were 351 days with <0.2 mm of rain in a 24-hour period (or ‘dry days’), which corresponds to almost half of the time (48%). During the drier months (Jan, Feb, and Mar) the percentage of dry days increases to 67% of the days.

## 7.2 Existing Dust Monitoring

PDP has undertaken analysis of the TSP data collected by the site’s three dust monitors and presented the findings of this analysis in the following subsections.

### 7.2.1 1-hour Average

Figure 17 presents the 1-hour average TSP data as a time series from each of the three dust monitors, with Table 7 summarising the data.

For comparative purposes, PDP has compared the concentrations against the suggested 1-hour average TSP trigger level for moderately sensitive receptors (250 µg/m³) as set out in the GPG Dust. The Main Gate and Symonds Hill monitors have each recorded one instance where this suggested trigger level was exceeded with these occurring on 23 February 2024 at 9:00 am, and 12 May 2021 at 4:00 pm respectively.

At the time of the exceedance at the Main Gate in 2024, the wind (as a 1-hour average) was blowing from the north northwest at a speed of 3.3 m/s. The site entry was therefore upwind of this monitor. During the hour following the wind increased to 4.7 m/s (still from the north northwest direction) however the TSP concentration decreased to 61 µg/m³ and further to 43 µg/m³ the hour after.

At the of the exceedance at the Symonds Hill in 2021, the wind was blowing from the west southwest at a speed of 5.8 m/s as a 1-hour average, which PDP considers to be strong winds. The SHP was upwind of this monitor during this wind direction. Only one hour was recorded as being greater than 250 µg/m³, with the TSP concentration dropping to 191 µg/m³ in the hour following, and further to 66.5 µg/m³ after that. During these two hours following the initial 250 µg/m³ exceedance, the winds were greater than 4 m/s. This was also the only day in recent times when the site's consent limit was exceeded as discussed in Section 7.2.2.

**Table 7: Summary of 1-hour Average TSP Concentrations**

| Location | Average | 75%ile | Maximum | No. of 250 µg/m³ Exceedances |
|---|---|---|---|---|
| | µg/m³ | | | |
| Main Gate | 16.4 | 21.0 | 293 | 1 |
| Ponga Road | 10.6 | 14.8 | 118 | 0 |
| Symonds Hill | 15.8 | 20.8 | 255 | 1 |

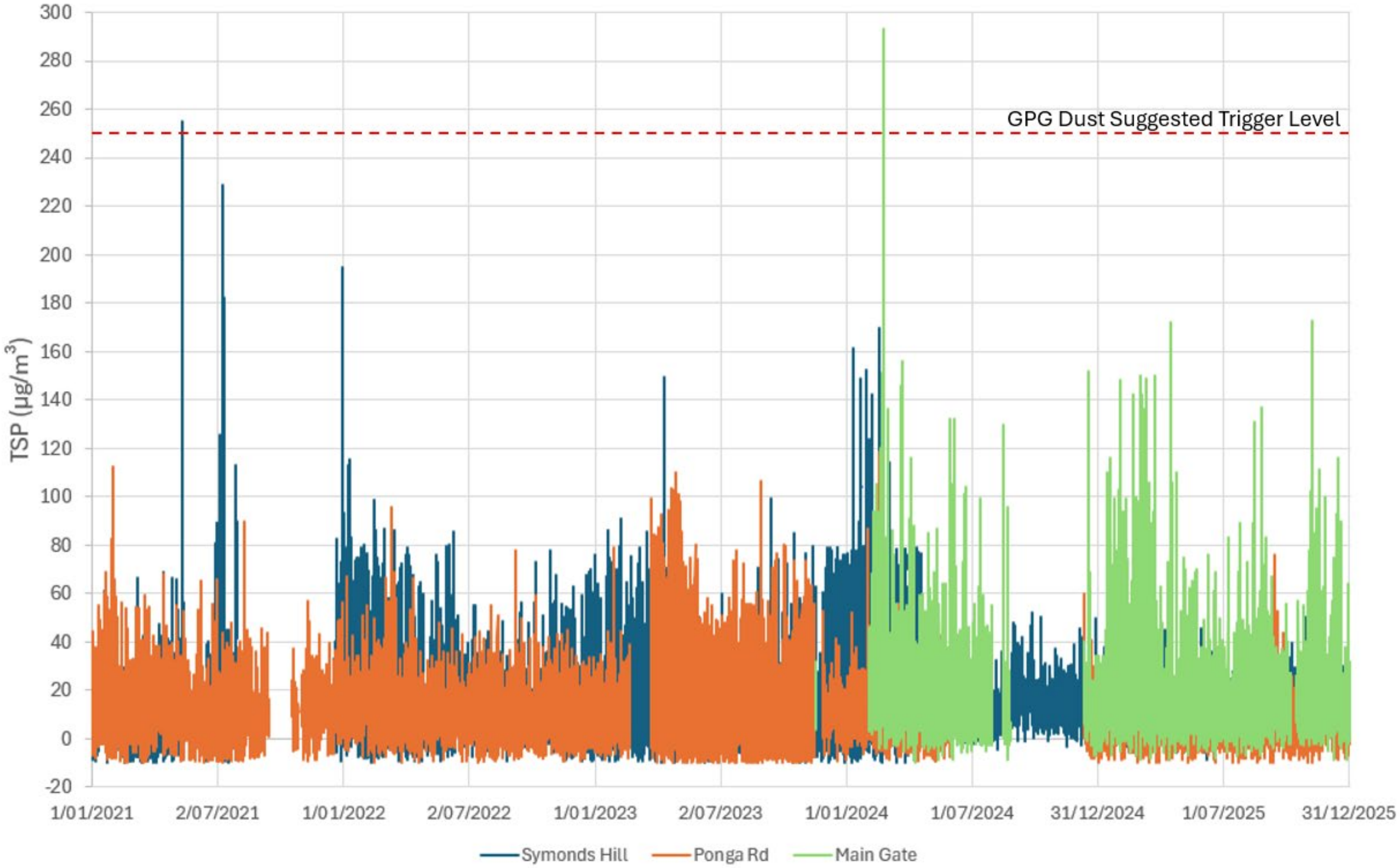


**Figure 17: TSP 1-hour Average – 2021 to 2025**

A more detailed data analysis of the 1 hour average concentrations is presented in Appendix D, which includes time, day, and month variation data as well as polar plots assessing the TSP concentrations together with the wind speed and directions. This analysis shows, as expected, a reduction in TSP concentrations during the wetter months, and a slight increase in concentrations during the general day time hours.

#### 7.2.1.1 Overburden Stripping Campaigns

Winstone has provided historical data for the months when overburden stripping has been undertaken on the site[11]. Figure 18 presents the 1hr average TSP data with the periods where overburden stripping has not been undertaken shaded by a grey overlay. The data which is not greyed out has therefore been collected while Winstones has undertaken overburden stripping.

[11] Noted these are complete months only and are not at start/stop day resolution.
The quantity/scale of overburden stripped during each month has also not been included in the following analysis.

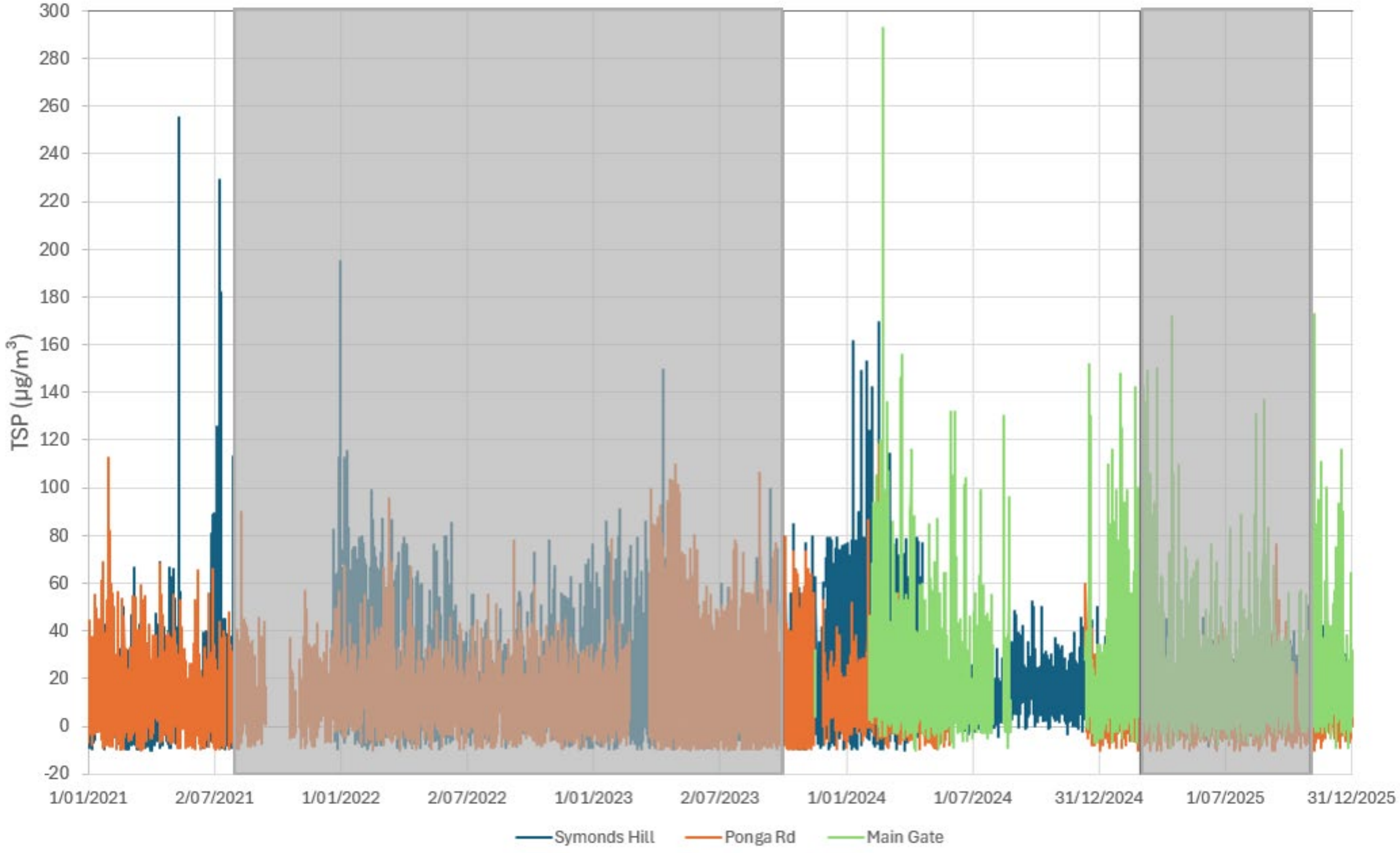


**Figure 18: TSP 1-hour Average, Overburden Stripping Occurring and Not Occurring – 2021 to 2025**

Table 8 presents a summary of all of the 1 hour average TSP data for the months when overburden stripping has and has not been undertaken. This analysis shows that at a high level, historically, overburden stripping has only had a relatively minor effect on the average and 99th %ile, if any. There is some difference at the maximum value which is not unexpected. It is noted that the main gate monitor is located on the other side of the site to the SHP and therefore the differences seen in Table 8 are not driven by SHP operations.

**Table 8: Analysis of 1hr Average TSP Data – Overburden Stripping vs Not Stripping**

| Receptor | Average (µg/m³) | | 99th %ile (µg/m³) | | Max (µg/m³) | |
|---|---|---|---|---|---|---|
| | Stripping Occurring | Stripping Not Occurring | Stripping Occurring | Stripping Not Occurring | Stripping Occurring | Stripping Not Occurring |
| Symonds Hill | 16.5 | 15.3 | 69.2 | 61.3 | 255 | 195 |
| Ponga Road | 10.6 | 10.7 | 49.2 | 54.2 | 118 | 110 |
| Main Gate | 16.9 | 15.6 | 88 | 76.3 | 293 | 172 |

Table 9 then presents the data collected by the Symonds Hill and Ponga Road TSP monitors for the periods when overburden stripping was occurring only. This data has then been summarised by wind direction and speeds.

Given the distance between the SHP and the main gate TSP monitor PDP has excluded it from the analysis in Table 9. What the data in Table 9 indicates that even when the monitors are downwind of the SHP during strong winds when overburden stripping has occurred, the concentrations are still low with no notable increase from downwind during all wind speeds (noting overlaps). There is also an insignificant difference between downwind and non-downwind concentrations while stripping is occurring.

**Table 9: Analysis of 1hr Average TSP Data during Overburden Stripping Only**

| Receptor | Average (µg/m³) | | 99th %ile (µg/m³) | | Max (µg/m³) | |
|---|---|---|---|---|---|---|
| | Symonds Hill | Ponga Road | Symonds Hill | Ponga Road | Symonds Hill | Ponga Road |
| Downwind of SHP (All Wind Speeds) | 10.5 | 9.4 | 67 | 40.9 | 255 | 81.9 |
| Downwind of SHP (WS 5 m/s and greater) | 19.1 | 9.5 | 67 | 35 | 255 | 81.9 |
| Not Downwind of SHP (Any WS) | 15.1 | 11.0 | 70.2 | 50.7 | 247 | 118 |

Overall, PDP considers that the historical TSP monitoring undertaken on site demonstrates that the proactive management of dust on site is successful with generally low TSP concentrations being recorded.

### 7.2.2 24-hour Average

Figure 19 presents the 24-hour average data recorded by each of the three monitors since 2022 as a time series, with Table 10 summarising the data presented and comparing it to the corresponding consent limit. PDP has only averaged data where there is at least 75% valid data[12] recorded during the averaging period. This data shows that there have been no exceedances of the site's 24-hour average TSP consent limits at the Main Gate and Ponga Road monitoring sites, and only one exceedance at the Symonds Hill site, which occurred in the May 2021 event referenced above. It is noted that there were not at least 75% valid data recorded by the Symonds Hill monitor on the day prior to or following this exceedance, so the exceedance period does not display in Figure 19.

[12] Valid data is defined in the GPG Data as data that has passed quality assurance checks. Generally, these include checking the operating status and calibration of the monitor, comparison of data to other data collected by the same monitoring network, and comparison of data to national, international, and other accepted standards.

| Table 10: Summary of 24-hour Average TSP Concentrations | | | | | |
|---|---|---|---|---|---|
| Location | Average | 75th %ile | Max | Consent Limit | No. of Consent Limit Exceedances |
| | µg/m³ | | | | |
| Main Gate | 16.4 | 21.3 | 66.5 | 100 | 0 |
| Ponga Road | 10.3 | 12.6 | 38.8 | 80 | 0 |
| Symonds Hill | 15.5 | 19.6 | 101 | 80 | 1 |

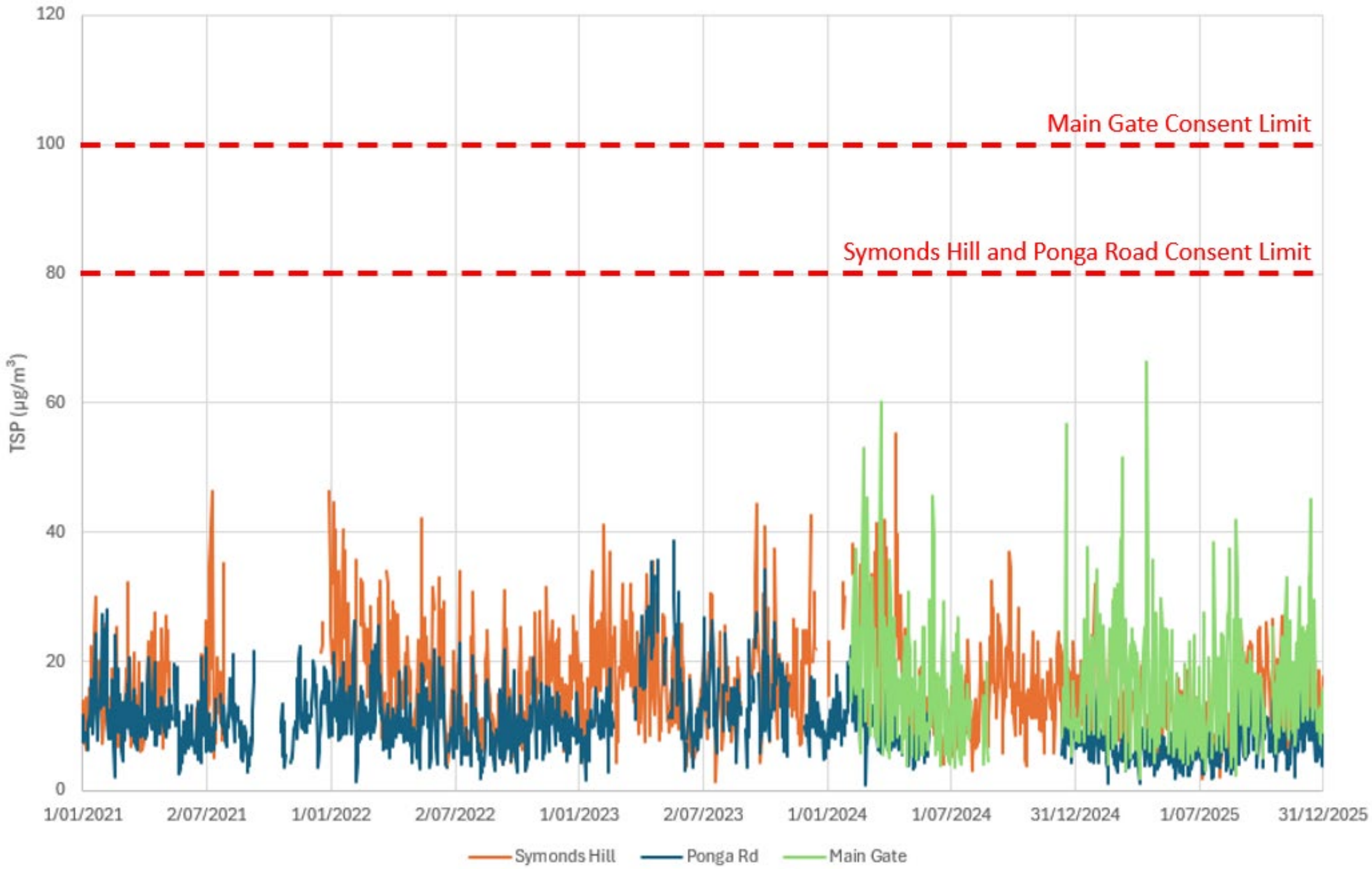


**Figure 19: TSP 24-hour Average – 2021 to 2025**

## 7.3 Short-term $PM_{10}$ Monitoring

On 27 November 2025, PDP commenced a two-month $PM_{10}$ monitoring campaign near to the dwellings located on Judge Richardson Drive at the location depicted in Figure 5. The purpose of this monitoring was to record ambient concentrations of $PM_{10}$ during dry, summer conditions, and compare the findings to the 24 hour average NES-AQ limit of 50 $\mu g/m^3$.

The monitor installed was an EBAM Plus, which is a US EPA FEM approved method for the monitoring of $PM_{10}$, and complies with Schedule 2 of the NES-AQ.

A 1 hour average time series is presented in Figure 20, with a 24-hour average time series plot presented in Figure 21. Each of these figures compares the results to the relevant assessment criterion, described in Section 4.2. A summary of the data is presented in Table 11. In line with the MfE Good practice guide for air quality monitoring and data management[13] (GPG Data), PDP has only averaged data where there is at least 75% valid data[14] recorded during the averaging period.

**Table 11: Summary of Short-term $PM_{10}$ Monitoring Results**

| Averaging Period | Average | 75%ile | Maximum | No. of Relevant Criterion Exceedances |
|---|---|---|---|---|
| | $\mu g/m^3$ | | | |
| 1-hour | 12 | 17 | 150 | 1 |
| 24-hour | 12 | 14 | 23 | 0 |

[13] Ministry for the Environment, 2009. *Good practice guide for air quality monitoring and data management*

[14] Valid data is defined in the GPG Data as data that has passed quality assurance checks. Generally, these include checking the operating status and calibration of the monitor, comparison of data to other data collected by the same monitoring network, and comparison of data to national, international, and other accepted standards.

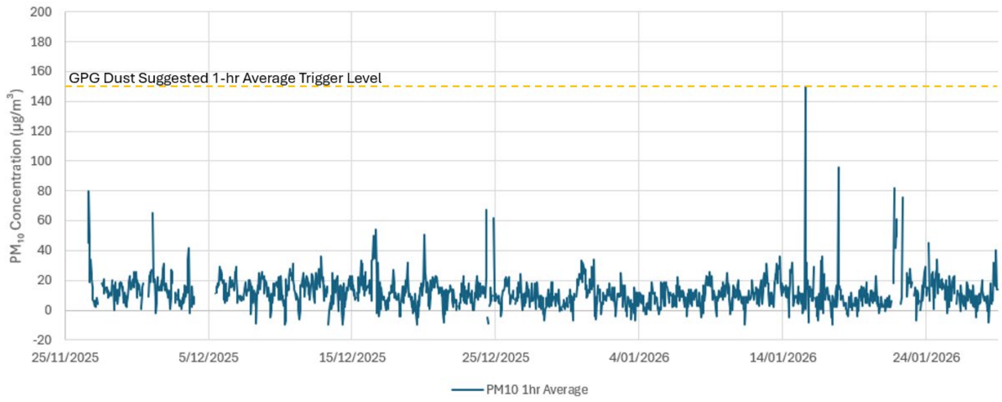


**Figure 20: Time Series – 1-hour Average PM$_{10}$**

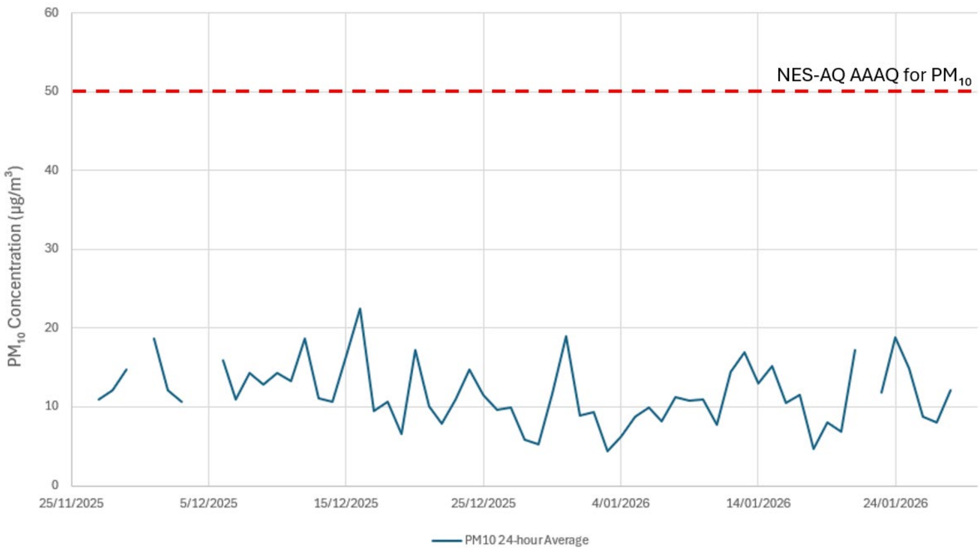


**Figure 21: Time Series – 24-hour Average PM$_{10}$**

# 8.0 Site Specific Dust Emissions and Settling Distances

The most significant potential effect from the quarrying activities is nuisance associated with dust deposition. The activities that could cause this are discussed in Section 5.4.

There are five main factors that are important to understand when determining whether any nuisance is caused by dust emissions from quarrying activities.

These are:

- Particle size;
- Particle density;
- Wind speed;
- Wind direction; and,
- Distance between the source of the dust and sensitive receivers.

These factors are all interrelated, and it is how they combine that determines the potential for an effect to occur.

In general, however, it is possible to make the following statements:

- Heavier and larger particles require more wind (speed) to become airborne;
- Large particles will deposit faster than small particles (of a similar density);
- More dense particles will deposit more rapidly than less dense particles (of a similar size); and
- Particles will travel further before depositing with a strong wind blowing than with a light wind blowing.

Considering this range of variables, there are a number of recognised guidance documents that state that dust nuisance effects are generally only experienced within 300 and 500 m of unmitigated dust sources. However, as discussed in Section 6.0, Winstone will employ various forms of mitigation measures to control dust discharges and therefore it is considered that there will not be unmitigated discharges resulting in nuisance dust beyond the boundary.

PDP considers that the most common type of materials that have the potential to generate dust emissions from the project are topsoil and clay from the overburden. Dust from the quarried material is typically denser and consequently does not travel as far.

Figure 22 depicts the distance potentially travelled by dry material from the quarry for a range of wind speeds based on a particle diameter of 50 to 100 µm. This is a reasonable assumption based on PDP's experience with dust nuisance. The release height of three metres in Figure 22 is also typical of the height that dust is released from for a range of quarrying activities i.e. material being loaded into a truck. However, it is noted that these distances are based on flat terrain and do not account for changes in terrain elevation.

For the most part, the surrounding receptors are screened from the site by mature vegetation which should reduce dust effects.

It is also noted that the quarried material will generally be damp, and essentially at or below ground level in the pit, meaning that Figure 22 will overestimate the potential for effect from this source.

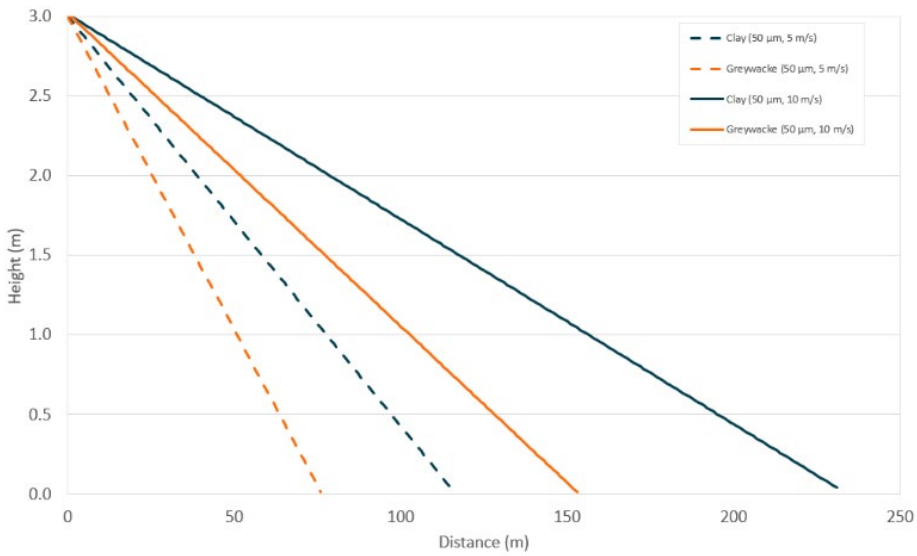


**Figure 22: Difference in Particle Travel with Wind Speed**

# 9.0 Assessment of Effects

As mentioned in Section 3.3, given the size of the site and the distances between different potential dust sources, PDP has undertaken an assessment of effects for three main areas of the site. PDP considers these are the:

- Processing plant area;
- The Project; and
- OBDA and MF area.

These areas are illustrated in Figure 7, and the following subsections set out each of the assessments which follow the previously described FIDOL methodology.

After each of the three assessments, PDP has undertaken a cumulative effects assessment whereby all parts of the site are considered together due to the global nature of the replacement consent sought.

## 9.1 Processing Plant Area

This section presents PDP's FIDOL assessment of the processing plant area. For clarity, the 'processing plant area' includes the following:

- Fixed enclosed processing plant;
- Current location of mobile processing plant;
- Stockpile area; and
- Processing plant feedstock area.

The locations of each of these are presented in Figure 8.

### 9.1.1 Frequency

Frequency relates to how often dust discharges have an effect on sensitive receptors. This is influenced by the frequency with which dust discharges occur and coincide with meteorological conditions that have the potential to transport dust significant distances. To determine the frequency, three parameters need to be established, these being:

- the direction of sensitive receptors relative to the potential dust source;
- the frequency at which winds blow in this direction with sufficient strength to transport dust; and,
- the frequency of the dust discharges.

PDP considers that winds with a speed at least 5 m/s (hereafter referred to as 'strong winds') have the greatest potential to transport dust and potentially cause nuisance dust effects off-site, if dust mitigation measures are not implemented.

Based on the meteorological analysis presented in Section 7.1, strong winds are most frequent from the west southwest direction (occurring 12% of the time) and are also present from the southwest and eastern directions, albeit less frequently at 4.8% and 4.1% respectively.

Receptors R1 to R3 (the locations of which are presented in Figure 4) are the closest to the processing plant area and PDP considers these are the primary receptors which have the potential to experience any nuisance dust effects from the processing plant area.

Table 13 sets out the frequency with which strong winds t blow towards these receptors, as well as the frequency classifications set out in Table A3-2 of the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Mineral Dust Impacts for Planning[15], which have been reproduced in Table 12. PDP has conservatively assumed that all days are 'dry days' when determining the frequency category, which is worst case.

**Table 12: IAQM Frequency Categories**

| Frequency Category | Criteria |
|---|---|
| Infrequent | Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%. |
| Moderately frequent | The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%. |
| Frequent | The frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%. |
| Very frequent | The frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%. |

**Table 13: Receptor Downwind Frequency during Strong Winds – Processing Plant**

| Receptor | Wind Direction(s) when Downwind of Processing Plant Area | Frequency of Strong Winds (%) | IAQM Classification |
|---|---|---|---|
| R1 | East to South Southeast | 10.5 | Moderately Frequent |
| R2 | | | |
| R3 | South Southeast to South Southwest | 3 | Infrequent |

[15] Institute of Air Quality Management, May 2016. *Guidance on the Assessment of Mineral Dust Impacts for Planning (v1.1)*

In relation to the frequency of dust discharges, PDP considers that if the processing plant area discharges dust, it will be very infrequent due to the majority of the processing being undertaken within the enclosed, fixed processing plant. This enclosure captures emitted dust and prevents it from becoming airborne and potentially being transported.

There is the potential for the other activities undertaken in the general processing plant area (including the mobile processing, stockpile, and fixed plant feedstock) to generate dust. However, PDP considers that with the proposed mitigation measures detailed in Section 6.0 implemented, dust discharges from these will also be very infrequent.

When considering the frequency at which the plant may discharge dust together with the frequency that the nearby receptors will be downwind during strong winds, PDP considers that if elevated dust concentrations are experienced off-site from the processing plant operations, it will be very infrequent.

PDP notes that it is not proposed to modify the operations undertaken within the processing plant area as part of the project (which Winstone already holds consent for) and therefore PDP considers that due to the dust mitigation and control measures adopted, there should be no change to the very infrequent dust discharges that currently occur from this activity.

### 9.1.2 Intensity

Intensity relates to the concentration of dust that is likely to be experienced at any potential receptor. While aggregate processing is generally a dust generating activity, PDP considers the processing plant is unlikely to discharge significant concentrations of dust due to the process being predominantly enclosed.

The TSP monitor at the main gate is situated between the processing plant and Receptors R1 to R3 and as presented in Section 7.2, the 24-hour average concentrations for this monitor have not exceeded the site's consent limit of 100 $\mu g/m^3$ over the last two years.

Additionally, there has only been one exceedance of the MfE GPG Dust recommended TSP trigger level of 250 $\mu g/m^3$ for moderately sensitive receptors which was recorded in February 2024 (when the processing plant area was not upwind).

Given that the receptors are all located further away than the monitor as well, the intensity of any dust experienced at them will be lower than any recorded by the monitor.

### 9.1.3 Duration

Duration relates to the amount of time that a receptor is exposed to dust. In this case, the duration relates to the time taken to mitigate dust discharges, should they arise. PDP considers that the monitoring programme currently undertaken (and proposed to continue to operate) is rigorous and will enable site staff to be alerted to any elevated dust emissions, especially with the introduction of 1-hour average trigger level.

If this trigger level was to be exceeded, site staff would be alerted and able to react promptly and limit the discharge to a period of no more than 1 to 2 hours at any one time. This is based on the time it takes to recognise that dust emissions are occurring, identify the source, and implement any additional mitigation measures that may be required. PDP therefore considers that any dust emissions caused by the processing plant are likely to be for a short period.

### 9.1.4 Offensiveness

The offensiveness of dust is correlated with the type of material that makes up the dust with different materials having different levels of offensiveness. For example, coal dust could result in black deposits which could be noticeable on surfaces and be more offensive than lighter coloured soil.

Dust from on-site activities is most likely to be from the greywacke rock being excavated and processed or from overburden removal and placement. Greywacke is generally light to mid-grey colour and is highly unlikely to result in dark deposits. Likewise, dust from soil/overburden will be characteristic of dust that generally occurs in a rural environment. Consequently, PDP considers any dust discharged from the site to be of a low offensiveness.

### 9.1.5 Location

Location refers to the area of the dust source and its physical surroundings (i.e. rural, industrial, or urban).

Receptors R1 to R3 are all considered to be rural residential properties which are generally more tolerant to dust given the nature of other rural activities which may also generate dust. PDP also considers that there are significant separation distances from the processing plant to Receptors R1 to R3 with the minimum being approximately 390 metres. Consequently, PDP considers the processing plant area is well located.

### 9.1.6 FIDOL Conclusion

Having assessed the operations undertaken within the processing plant area against the FIDOL factors, PDP considers that there is a low likelihood of offensive or objectionable dust effects being experienced off-site. This is predominantly due to the largely enclosed fixed processing plant controlling dust from being emitted and transported, and the receptors all being located at significant distances from the nearest potential dust source.

Additionally, the TSP monitoring undertaken as per the site's current consent and AQMP shows that generally low concentrations of dust have been recorded near to the site entrance which is located closer to the processing plant than any of the receptors.

## 9.2 The Project – Up to Stage 4

In this section PDP has assessed the potential effects from the Project out to the 35 year mark, this being the duration of air quality permits sought.

For clarity, the potential dust generating activities undertaken within the Project area include:

- Overburden removal and transportation to OBDA and MF area; and,
- Resource extraction and transportation to processing plant area.

PDP notes that the duration of the Project will extend beyond 35 years, out to potentially 80 years.

The works proposed for the Project beyond the 35 year mark are separately assessed in Section 9.3 of this report

The FIDOL assessment presented in the following subsections assesses the potential effects up to the completion of Stage 4.

### 9.2.1 Frequency

As previously discussed, to determine the frequency of potential adverse dust effects, three parameters need to be established, these being:

- the direction of sensitive receptors relative to the potential dust source;
- the frequency at which strong winds blow in this direction; and,
- the frequency of the dust discharges.

In relation to the first two parameters, Figure 4 identifies eight receptors located near to the Project area (R7 to R14). A summary of the downwind direction in relation to the Stage 4 of the Project and the frequency at which strong winds blow in those directions is presented in Table 14.

The IAQM frequency classifications (defined in Table 12) are also contained in the summary table, however it is important to note that these refer to the frequency of strong winds, rather than the frequency of potential adverse dust effects and do not take into account 'wet days'.

**Table 14: Receptor Downwind Frequency during Strong Winds – Stage 4**

| Receptor | Wind Direction(s) when Downwind of the Project (Stage 4) | Frequency of Strong Winds | IAQM Classification |
|---|---|---|---|
| R8<br>R9 | South southwest to northwest | 23.4 | Very frequent |
| R10 | Southwest to north northwest | 22.7 | Very frequent |
| R12 | North to east northeast | 9.3 | Moderately Frequent |
| R13 | North northwest to east | 13.9 | Frequent |
| R14 | North to east southeast | 17.4 | Frequent |
| R15 | North northwest to east southeast | 17.9 | Frequent |
| R16 | North to east southeast | 17.4 | Frequent |
| R17<br>R18 | North northeast to east southeast | 17.9 | Frequent |
| R19 | Northeast to southeast | 16.8 | Frequent |

Table 14 shows that all of the nearby receptors are downwind of the Stage 4 either frequently or very frequently, with the exception of R12 which is downwind during strong winds moderately frequently. As with the other FIDOL assessments presented in this report, PDP has taken the worst case conservative approach and assumed that all days are 'dry days' when determining the frequency category.

With regard to the third important parameter to consider when assessing frequency, the frequency of dust discharges, PDP considers that the activity which has the greatest potential to discharge dust during the SHP expansion works is the removal of overburden.

During Stage 1, there is some overburden that is required to be removed to the north of the existing SHP in an area that is located more than 400 m from the nearest receptor. The majority of the overburden removal however will occur during the formation of the Mangapū Tributary realignment. Works in both of these areas however will be undertaken using the dust mitigation measures detailed in Section 6.0. With these measures in place, PDP considers it is unlikely that frequent dust discharges will occur. PDP also notes that these works are currently consented under the existing global consent.

Stage 2 consists of the formation of the western haul road. Dust may be generated from the construction of this as overburden is removed and the road surface is formed, both of which are inherently dust creating activities.

Stage 3 consists of expanding the SHP to the south, closure to Receptor R11, and connecting in with the Mangapū Tributary realignment batters. A significant amount of overburden will need to be removed during this stage which has the potential to discharge dust which can be managed through dust management practices as set out Section 6.0 and as per the AQMP.

Stage 4 involves the SHP expanding to the south and requires a relatively large area of overburden to be removed. This will necessitate the implementation of robust dust mitigation measures that will be regularly checked to minimise the risk of dust discharges. If large scale areas are left exposed for long periods of time, these will be either covered or stabilised to minimise the potential for frequent wind-blown dust.

Blasting to dislodge resource can generate dust, however this is generally a short and controlled activity. PDP therefore considers that it is unlikely that frequent dust discharges will occur as a result of blasting activities.

While there is the potential (in the absence of mitigation) for frequent dust nuisance effects on nearby receptors, these can be readily managed through the implementation of dust mitigation measures, as discussed in this report. These measures will reduce the risk of dust emissions to a level where nuisance effects are infrequent.

### 9.2.2 Intensity

Intensity relates to the concentration of dust that is likely to be experienced at any potential receptor. There is the potential for relatively high intensities of dust to be discharged during the overburden stripping campaigns if these are unmitigated.

The TSP monitoring undertaken to date provides a very good indication of the intensity of dust experienced at the nearby receptors during the current site activities. The Symonds Hill monitor is located approximately 200 m northwest of receptor R8 and is located less than 100 m from the extent of the current SHP.

The analysis of the data collected from this monitor as presented in Section 7.2 shows generally low historical concentrations. Between 2021 and 2025, only once exceedance of the MfE suggested trigger level (250 µg/m³ as a 1-hour average) was recorded. This shows that the site has been effectively using the dust mitigation measures set out in the AQMP to control off-site concentrations.

Similarly, the Ponga Road monitor is located approximately 230 m from the current extent of the SHP. It is also south southwest of the centre of the pit and given the typical meteorology of the site (discussed in Section 7.1), is frequently downwind of the pit. The TSP data analysis presented in Section 7.2 shows that between 2021 and 2025, there were no exceedances of the MfE 250 µg/m³ suggested trigger level, with the maximum TSP concentration being recorded as 118 µg/m³.

This data demonstrates that TSP concentrations have remained consistently low, and, given that the monitor is positioned at a comparable distance from the pit as the nearby receptors, it indicates that these receptors have generally not experienced significant dust nuisance due to the mitigation used.

It is acknowledged that there is a significant amount of overburden to be removed up to Stage 4 which has the potential to generate elevated concentrations of dust. PDP's analysis of TSP concentrations during historical overburden stripping periods (presented in Section 7.2.1.1) shows that there has historically been an insignificant difference in 1-hour average TSP concentrations between months during which overburden has and hasn't been stripped, suggesting that Winstone has been appropriately controlling dust from these activities.

With these mitigation measures continued and scaled accordingly for the proposed overburden removal, PDP considers that the dust emissions will be controlled so that off-site intensities are expected to be low.

### 9.2.3 Duration

As previously discussed, duration relates to the amount of time that a receptor is exposed to dust. A factor associated with this however is the duration of any dust discharges themselves. Overburden stripping campaigns typically last between 3 and 9 months, however, in this case and as with any dust discharges from the processing plant, the duration relates to the time taken to mitigate dust discharges, should they arise.

PDP considers that the Symonds Hill and Ponga Road dust monitors are well located to alert site staff if dust concentrations approach a level which indicates that there is potential that dust effects may be experienced at a nearby receptor. If this were to occur, site staff would be able to react promptly and limit the discharge to a period of no more than 1 to 2 hours at any one time. This is based on the time it takes to recognise that dust emissions are occurring, identify the source, and implement any additional mitigation that may be required, details of which are discussed in Section 6.0.

PDP therefore considers that any dust emissions caused by the Project and any related off-site nuisance effects are likely to be short.

### 9.2.4 Offensiveness

The offensiveness of dust is correlated with the type of material that makes up the dust with different materials having different levels of offensiveness.

Dust from the Project is most likely to be from the overburden material being removed with some potential for dust to be discharged from the extraction of the greywacke rock. Greywacke is generally light to mid-grey colour and is highly unlikely to result in dark deposits. Likewise, dust from soil/overburden will be characteristic of dust that generally occurs in a rural environment. Consequently, PDP considers that any dust discharged from the Project is likely to be of a low offensiveness.

### 9.2.5 Location

As previously mentioned, location refers to the area of the dust source and its physical surroundings (i.e. rural, industrial, or urban).

Receptors R7 to R19 are the closest to the SHP and all located within 400 m of the proposed Stage 4 extent of the Project. The IAQM categorises the distance a receptor is from a dust source. PDP has presented these categories in Table 15, and Table 16 then compares the receptor distances (excluding Fletcher owned receptors) to these categories.

**Table 15: IAQM Distance Categories**

| Distance Category | Criteria |
|---|---|
| Distant | Receptor is between 200 m and 400 m from the dust source. |
| Intermediate | Receptor is between 100 m and 200 m from the dust source. |
| Close | Receptor is less than 100 m from the dust source. |

**Table 16: Receptor Distances from Potential Dust Source – Stage 4 SHP**

| Receptor | Distance from Extent of Stage 4 Pit | IAQM Classification | Receptor Type |
|---|---|---|---|
| R8 | 245 | Distant | Rural Residential |
| R9 | 340 | Distant | |
| R10 | 250 | Distant | |
| R12 | 320 | Distant | |
| R13 | 135 | Intermediate | |
| R14 | 200 | Intermediate | |
| R15 | 80 | Close | |
| R16 | 200 | Intermediate | |
| R17 | 400 | Distant | |
| R18 | 355 | Distant | |
| R19 | 305 | Distant | |

All receptors within close proximity of the Project are considered to be rural residential properties and only one receptor (R15) is defined as being close, with three receptors being of an intermediate distance (R13, R14, and R16). All other identified receptors are classified as being distant.

Between receptors R13 to R16 and the SHP there is a buffer of approximately 215 m of mature vegetation, which PDP considers will provide some dust mitigation. While it is noted that during Stage 4 some of this vegetation will be removed to enable access to the underlying resource, there will still be a vegetated buffer of approximately 80 m once this has been completed. The dwelling at R15 is located slightly higher than the nearest portion of the SHP with a valley separating the two. Figure 23 presents a three-dimensional aerial image showing the extent of the current dense, mature vegetation surround R15 and the valley running between the receptor and the existing SHP.


**Figure 23: Three-dimensional Aerial Image of R15 and Current SHP – Google Maps**

Receptors R13, R14, and R16 are all located within 200 m of the Stage 4 of the Project are located in the same general vicinity of receptor R15. The same vegetation as illustrated in Figure 23 provides a buffer and mitigation to R13, R14, and R16 and based on the most recent Google Maps three-dimensional imagery, at ground level at these receptors, there is no direct line of sight to the southwestern extent of the SHP.

Receptors R8 to R12 and R17 to R19 are all considered distant from a potential dust source, with the separation distances providing a buffer for emitted dust particles to settle before reaching the receptor, which consequently reduces the potential for nuisance dust effects to be experienced.

PDP therefore considers that these eight receptors (R8 to R12 and R17 to R19) are well located, however, when solely considering the location, there is an elevated risk of nuisance dust at receptors R13 to R16 if activities undertaken within Stage 4 of the Project are undertaken without mitigation.

#### 9.2.6 FIDOL Conclusion

While it is acknowledged that the nearby receptors are relatively frequently downwind of the Project during strong winds, this does not necessarily correlate with these receptors frequently experiencing nuisance dust. Historic TSP monitoring has recorded low TSP concentrations and PDP considers that any dust discharges will be of a low offensiveness. PDP also considers that any discharges will be of short durations due to the robust TSP monitoring undertaken and the mitigation measures available.

The distance between the Project and the nearby receptors does however increase the potential for nuisance dust effects to be experienced at some of the receptors, in particular receptors R13 to R16. These four receptors are all considered to be an intermediate distance to a dust source, and in the case of receptor R15, close to a dust source (less than 100 m) as defined by the IAQM. All other identified nearby receptors are located at distances classified as distant or further.

However, when assessing the operations undertaken within the Project to Stage 4 against all of the FIDOL factors, and considering the dust mitigation measures available, PDP considers that there is a low likelihood of offensive or objectionable dust effects being experienced off-site.

## 9.3 The Project – Stage 5 to 8

This section presents PDP's assessment of the Project beyond Stage 4. This is considered to be beyond 35 years and the activities of which will not be covered by the consent being applied for as part of the project.

As with PDP's FIDOL assessment of the Project up to Stage 4, the potential dust generating activities undertaken within the Project include:

- Overburden removal and transportation to OBDA; and,
- Resource extraction and transportation to processing plant area.

#### 9.3.1 Frequency

As previously discussed, to determine the frequency of potential adverse dust effects, three parameters need to be established, these being:

- the direction of sensitive receptors relative to the potential dust source;
- the frequency at which strong winds blow in this direction; and,
- the frequency of the dust discharges.

In relation to the first two parameters, Figure 4 identifies eight receptors located near to the Project with these being R7 to R14. A summary of the downwind direction in relation to the Stage 8 extent of the Project and the frequency at which strong winds blow in those directions is presented in Table 17.

The IAQM frequency classifications (defined in Table 12) are also contained in the summary table.

**Table 17: Receptor Downwind Frequency during Strong Winds – SHP Stage 4**

| Receptor | Wind Direction(s) when Downwind of the Project (Stage 8) | Frequency of Strong Winds | IAQM Classification |
|---|---|---|---|
| R8<br>R9 | South southwest to north northwest | 23.9 | Very Frequent |
| R10 | Southwest to north northwest | 22.7 | Very Frequent |
| R12 | North northwest to east northeast | 9.8 | Moderately Frequent |
| R13<br>R14 | North northwest to east | 13.9 | Frequent |
| R15<br>R16 | North northwest to east southeast | 17.9 | Frequent |
| R17<br>R18 | North to east southeast | 17.4 | Frequent |
| R19 | North to southeast | 19 | Frequent |

Table 17 shows that two receptors (R8 and R9) are downwind during strong winds very frequently, four receptors (R13 to R19) are frequently downwind and R12 is downwind moderately frequently. Again, it is important to note that these frequencies do not correspond with the frequency of either dust discharges or nuisance dust effects.

With regard to the third important parameter to consider when assessing frequency, the frequency of dust discharges, PDP considers that the activity which has the greatest potential to discharge dust during the Project expansion works is the removal of overburden. Stage 7 and Stage 8 each require significant quantities of overburden to be removed to access the underlying resource.

Stage 7 expands the Project in the northwest to eastern directions and approaches closer to Receptors R8 to R10, and slightly closer to the receptors at the southwest of the site.

Stage 8 continues the expansion primarily to the north of the site.

Stage 6 may require some overburden removal, however Stage 7 and 8 have the greatest potential to frequently discharge dust if unmitigated due to the extent of the expansion.

If the expansion works, in particular the overburden removal, are undertaken unmitigated, there is the potential for very frequent nuisance dust effects to be experienced off-site. This is primarily due to the scale of overburden removal during these stages, and the frequency of strong winds blowing towards the nearby receptors.

However, Winstone will be adopting the proactive dust mitigation measures as set out in Section 6.0. With these measures implemented, PDP considers that nuisance dust effects being experienced off-site can be controlled so that if they are experienced, they will be infrequent.

### 9.3.2 Intensity

The intensity of historic off-site concentrations is discussed in the previous FIDOL assessment (Section 9.2.2). In summary, the TSP monitoring undertaken to date provides a very good indication of the intensity of dust experienced at the nearby receptors during the current site activities. This data shows generally low historic concentrations with only one exceedance of the proposed 1-hour average trigger level (250 µg/m³) recorded at the Symonds Hill monitor between 2021 and 2025. There were no exceedances of this concentration recorded by the Ponga Road monitor during the same period.

As with the works required up to Stage 4 of the Project expansion, there is a significant amount of overburden to be removed up to Stage 8 which has the potential to generate elevated concentrations of dust. However, PDP considers that the mitigation measures proposed will control the intensity of dust emissions such that the intensity of dust experienced off-site will be low.

### 9.3.3 Duration

A factor associated with the duration of adverse dust effects is the duration of any dust discharges themselves. As discussed, overburden stripping campaigns typically last between 3 and 9 months, however, this is not to say that dust will be discharged the entire time.

PDP considers that in this case, the duration of nuisance effects relates to the time taken to mitigate dust discharges, should they arise.

PDP considers that the Symonds Hill and Ponga Road dust monitors are well located, including the proposed new location of the Symonds Hill monitor prior to Stage 7. These monitors with the proposed trigger and alert levels enable site staff to react promptly and limit any significant dust discharges to a period of no more than 1 to 2 hours at any one time. This is based on the time it takes to recognise that dust emissions are occurring, identify the source, and implement any additional mitigation that may be required and any remedial action taken to rectify the situation

PDP therefore considers that in the event that they do occur, warning systems are in place, well established and proven to work and any dust emissions caused by the overburden removal, and any related off-site nuisance effects are likely to be of a short duration.

### 9.3.4 Offensiveness

As with Stages 1 to 4, dust from the Project is most likely to be from the overburden material being removed with some potential for dust to be discharged from the extraction of the greywacke rock. For the reasons previously discussed in Section 9.2.4, PDP considers that any dust discharged from Project activities is likely to be of a low offensiveness.

### 9.3.5 Location

The locations of the receptors near to the Project are described in Section 9.2.5 of PDP's previous FIDOL assessment. However, as the extent of the Project increases, the distances between some of these receptors and potential dust sources decrease. Table 18 sets out the separation distances between the nearby receptors and the Stage 8 extent of the Project together with the corresponding IAQM distance classification. As previously mentioned, all of these receptors are defined as rural residential properties.

**Table 18: Receptor Distances from Potential Dust Source – Stage 8 SHP**

| Receptor | Distance from Extent of Stage 8 Pit | IAQM Classification |
|---|---|---|
| R8 | 80 | Close |
| R9 | 225 | Distant |
| R10 | 150 | Intermediate |
| R12 | 320 | Distant |
| R13 | 135 | Intermediate |
| R14 | 200 | Intermediate |
| R15 | 80 | Close |
| R16 | 190 | Intermediate |
| R17 | 390 | Distant |
| R18 | 350 | Distant |
| R19 | 240 | Distant |

#### 9.3.6 FIDOL Conclusion

As with the FIDOL Assessment set out in section 8.3, it is acknowledged that the nearby receptors are relatively frequently downwind of the Project during strong winds. However, this does necessarily correlate with these receptors frequently experiencing nuisance dust.

Historic TSP monitoring has recorded low TSP concentrations and PDP considers that any dust discharges will be of a low offensiveness. PDP also considers that any discharges will be of short durations due to the robust TSP monitoring undertaken and the mitigation measures available.

Consequently, having assessed the operations undertaken within the Project up to Stage 8 against the FIDOL factors, PDP considers that there is a low likelihood of offensive or objectionable dust effects being experienced off-site.

### 9.4 Overburden Disposal and Managed Fill Area

This section presents PDP's FIDOL assessment of the general OBDA and MF area. For clarity, this area includes the following:

- Overburden disposal area in the former Hunua Pit (OBDA);
- Managed fill (MF);
- Fines disposal area; and,
- Concrete recycling plant.

#### 9.4.1 Frequency

As seen in Figure 4, the nearest receptors to the OBDA and MF area are receptors R3 to R6 with R3 being located to the west northwest of the area and R4 to R6 being located to the east. To assess the frequency with which these four receptors may experience nuisance dust effects, PDP has first assessed the frequency with which they are downwind of this area during strong winds. Table 19 presents these frequencies and compares them to the frequency categories as set out by the IAQM.

**Table 19: Receptor Downwind Frequency during Strong Winds – OBDA and MF Area**

| Receptor | Wind Direction(s) when Downwind of OBDA and MF Area | Frequency of Strong Winds | IAQM Classification |
|---|---|---|---|
| R3 | East southeast | 4 | Infrequent |
| R4 | West southwest to west | 16 | Frequent |
| R5 | West to west northwest | 4.8 | Infrequent |
| R6 | West northwest | 0.8 | Infrequent |

Table 19 shows that receptors R3, R5, and R6 are all downwind during strong winds infrequently (less than 5% of the time), with R4 being frequently downwind during strong winds (16% of the time).

In terms of the frequency of dust discharges from this area, there is the potential for this to be relatively frequent when overburden disposal is occurring if unmitigated. This is primarily due to the relatively large, exposed surface area from which strong winds have enough strength to dislodge particles from and transport significant distances.

However, the mitigation measures currently adopted and proposed to continue to be adopted in this area (including wetting of surfaces) results in the frequency of dust discharges being significantly reduced.

When assessing this resultant, mitigated dust discharge frequency with the frequency of strong winds blowing in the direction(s) of the nearest receptors, PDP considers that nuisance effects will be infrequently experienced off-site.

#### 9.4.2 Intensity

Intensity relates to the concentration of dust that is likely to be experienced at any potential receptor. When large, exposed surfaces are left unmitigated, significant intensities of dust can be discharged when disturbed either mechanically or naturally by way of wind erosion. However, given that Winstone will adopt an appropriate level of dust mitigation in this OBDA and MF area (the details of which are discussed in Section 6.0), PDP considers that any off-site dust discharges will be of low intensity.

The intensity of any dust experienced at any of the nearby receptor will also be lower than that generated due to the significant separation distances which will allow particle settling to occur. These separation distances are further discussed in the 'Location' section of this FIDOL assessment.

Consequently, PDP considers that if dust is experienced off-site at a receptor, the intensity of the dust will be low.

#### 9.4.3 Duration

The OBDA and MF area is in constant use as part of the normal daily activities, however in this case, the duration of any nuisance dust effects does not correlate with the duration of the activity. The mitigation measures that are currently, and will continue to be, implemented in the OBDA and MF area mean that the potential for dust discharges to occur will be proactively managed. Site staff will also be visually monitoring this area for any elevated dust discharges, with additional mitigation measures including the increased application of water to control emissions. Consequently, PDP considers that if any nuisance dust effects are experienced off-site, they will be short.

### 9.4.4 Offensiveness

As previously discussed, the offensiveness of dust is correlated with the type of material that makes up the dust with different materials having different levels of offensiveness. The material generally processed in the OBDA and MF area is overburden, concrete (from the concrete recycling area), and fines.

Dust from soil/overburden will be characteristic of dust that generally occurs in a rural environment. Likewise, dust from managed fill material (generally inert natural materials including clays and soils), and fines will be essentially the same colour to the overburden and not uncommon in rural environments. Concrete dust is likely to be lighter in colour and may have greater potential to be considered offensive if detected off-site.

Consequently, PDP considers that any dust discharged from the OBDA and MF area is likely to be of a low offensiveness if appropriately mitigated.

### 9.4.5 Location

The OBDA and managed fill are located at the northern end of the site. Hunua Road runs adjacent to this area with the nearest receptors being R3 to R6. Receptor R3 is located 390 m from the edge of the OBDA and MF area, which the IAQM defines as distant from a dust source. The next three nearest receptors (R4 to R6) are all located at least 490 m from these areas. The IAQM does not have a classification for receptors located further than 400 m from a dust source, and PDP considers this is a significant separation distance. Based on these separation distances, PDP considers the OBDA and managed fill area are well located to control potential dust effects at off-site receptors.

PDP does however note the proximity of Hunua Road. While the MfE GPG Dust defines public roads as being of low sensitivity to dust, PDP considers that unmitigated dust emissions could cause adverse effects, predominantly from soiling of vehicles. However, PDP considers that the mitigation measures both currently undertaken in this area and proposed will control dust to a level where the effects on the public road are negligible.

### 9.4.6 FIDOL Conclusion

Having assessed the operations undertaken within the OBDA and MF area against the FIDOL factors, PDP considers that there is a low likelihood of offensive or objectionable dust effects being experienced off-site. This is primarily due to the mitigation measures proposed to control dust and the significant separation distances between the area and the nearby receptors, with the shortest distance being 390 m. Over this distance, dust will tend to settle before it reaches the receptors.

## 9.5 Cumulative Effects

Due to the size of the site, there is the potential for nearby receptors being downwind of multiple potential dust sources at the same time. The receptors where this could occur, the potential dust source areas of the site, and the distance to the second closest area are set out in Table 20 below.

**Table 20: Receptors Downwind of Multiple Potential Dust Sources**

| Receptor | Potential Upwind Dust Source Area | Minimum Distance to Second Closest Dust Source Area (m) |
|---|---|---|
| R1 to R3 | The Project (all stages) and Processing Plant Area | 835 |
| R4 to R6 | Processing Plant Area and OBDA/MF Area | 1,090 |
| R8 to R10 | The Project (all stages) and Processing Plant Area | 1,050 |
| | SHP (Stage 8 only) and OBDA/MF Area | 740 |
| R12 to R19 | All areas | 600 |

Table 20 shows that when considering the location section alone of the FIDOL tool, all of the nearby receptors are located at least 600 m from the second nearest area of the three identified by PDP, each of which are illustrated in Figure 7.

PDP considers that 600 m is a very effective separation distance and unless extreme weather conditions are present with wind speeds greater than 20 m/s (which occur very infrequently), there is a very low potential for nuisance dust to be experienced at an off-site receptor which has originated from multiple sources. Consequently, PDP considers that there is a very low potential for cumulative effects to occur.

## 9.6 Potential Post Stage 8 Effects

PDP notes that there is the potential in the future that the site continues to develop beyond the extent proposed for Stage 8 extent. While no details are available at the time of writing, generally there are two ways in which a quarry pit can be developed.

One is that the quarry pit progresses deeper to access more resource. If this is the case, PDP considers there will be a negligible increase in any nuisance dust experienced at nearby receptors during Stage 8 (which have been assessed in Section 8.3 of this report). This is primarily due to the increased elevation difference between the pit floor and any nearby receptors, and that pit extent will not increase.

The second potential way a quarry pit can develop is by expanding the upper extent, thus likely requiring overburden stripping and disposal. PDP considers that if this occurs, any effects experienced will be consistent with those assessed in Section 8.2, which covers Stage 4 of the project where a relatively large amount of overburden is proposed to be removed and disposed of. PDP's assessment in Section 8.2 concludes that there is a low likelihood of offensive or objectionable dust effects being experienced off-site assuming the recommended dust mitigation and monitoring measures are implemented.

PDP notes that there is the potential for the quarry pit to both deepen and expand. If this occurs, the effects will be consistent with those from Stage 4.

## 9.7 Health Effects

### 9.7.1 $PM_{10}$

#### 9.7.1.1 Site Specific Monitoring

The potential human health effects from quarrying activities are driven primarily by the smaller size fraction of particulate ($PM_{10}$ and smaller). To measure $PM_{10}$ near to the site, PDP undertook a short-term monitoring study using the methodology set out in Section 3.2. The results of this monitoring are set out in Section 7.3 and in summary show no exceedances of the NES-AQ AAAQ of 50 µg/m³ as a 24-hour average.

These results are in line with PDP's experience with other quarries around New Zealand and are indicative of general rural background concentrations. The average recorded 24-hour average value at Hunua was 14 µg/m³, with the maximum being 23 µg/m³ (as presented in Table 11).

To put this in context these readings are approximately 25% and 50% of the NES-AQ AAAQ recommended 24-hour average limits for $PM_{10}$ respectively.

While these measurements are only for 3 months, they cover the period when dust effects are generally greatest due to the warmer temperatures. They are also comparable with estimated concentrations developed for Waka Kotahi[16].

Given this, PDP is comfortable that this monitoring is representative of the annual $PM_{10}$ in this location.

The monitoring results also indicate that the site made very little, if any, contribution to ambient $PM_{10}$ concentrations, and no concentrations were recorded that would suggest the potential for human health to be affected.

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[16] New Zealand Transport Agency Waka Kotahi, May 2022. *Background Air Quality. Background PM concentrations by CAU May22.* The estimated background value for Hunua was 24 µg/m³.

PDP notes that all of the dust mitigation measures currently and proposed to be adopted on the site to control nuisance dust, also effectively control the potential $PM_{10}$ discharges. PDP considers that if these mitigation measures continue to be used throughout the project, they will continue to control the potential for elevated off-site $PM_{10}$ concentrations.

#### 9.7.1.2 Review of $PM_{10}$ Study near other NZ Quarry

There is very little publicly available $PM_{10}$ monitoring from quarries in New Zealand, with the most comprehensive study being the work carried out for Environment Canterbury downwind of the Yaldhurst quarry area monitoring[17] between 22 December 2017 and 21 April 2018. In this study, monitoring for $PM_{10}$ was undertaken at 10 locations at a variety of different distances around the Yaldhurst quarries. The Yaldhurst study measured $PM_{10}$ and RCS concentrations to assess the dust nuisance and the potential risk to public health. Yaldhurst represents a large area (230 ha) similar to that of the Hunua Quarry containing multiple quarries and a range of processing activities.

A summary of the results from the Yaldhurst study applicable to this assessment is as follows:

- There were no exceedances of the NES-AQ for $PM_{10}$ as measured by the reference instruments (50 µg/m³ as a 24-hour average).
- The average 24-hour average $PM_{10}$ concentrations for all of the sites were between 21 and 27 µg/m³.
- There were 17 exceedances of the MfE GPG Dust $PM_{10}$ suggested nuisance dust trigger level (150 µg/m³ as a 1-hour average). However, the majority of these exceedances occurred within 100 m of the quarries.

#### 9.7.1.3 $PM_{10}$ Conclusion

After undertaking site specific $PM_{10}$ monitoring and reviewing monitoring undertaken at a similar scale site in New Zealand, PDP considers that $PM_{10}$ concentrations as a result of the quarry operations will be at a level that will not result in adverse health effects at nearby sensitive locations.

### 9.7.2 Respirable Crystalline Silica

RCS can pose significant health risks when inhaled, as prolonged or repeated exposure may lead to serious respiratory diseases such as silicosis, lung cancer, and chronic obstructive pulmonary disease. Crystalline silica in all forms is classified as a human carcinogen by WorkSafe New Zealand. PDP has therefore undertaken a three-stage approach to assess the potential off-site effects from RCS. Each of the sections of the assessment are set in this subsection.

[17] Mote Ltd, 19 June 2018. *Yaldhurst Air Quality Monitoring – Summary Report: 22 December – 21 April 2018.*

#### 9.7.2.1 Recommended RCS Monitoring

Winstone currently undertakes periodic worker exposure monitoring at various locations at the site. PDP understands that this data does not follow a standard methodology, and consequently, has reservations about its use in a comprehensive air quality assessment. Regardless of this PDP has presented this data in Section 9.7.2.2 and in addition has set out below a recommended monitoring programme to measure ambient concentrations of RCS to compare against relevant guidelines. This recommended monitoring is included in the proposed air discharge consent conditions.

- Baseline Pre-Project Monitoring

PDP recommends that at least three months of baseline monitoring is undertaken using a recognised methodology to measure RCS, noting that this should be measuring concentrations in the respirable range ($PM_4$). PDP recommends this baseline monitoring is undertaken in the locations presented in Figure 24.

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

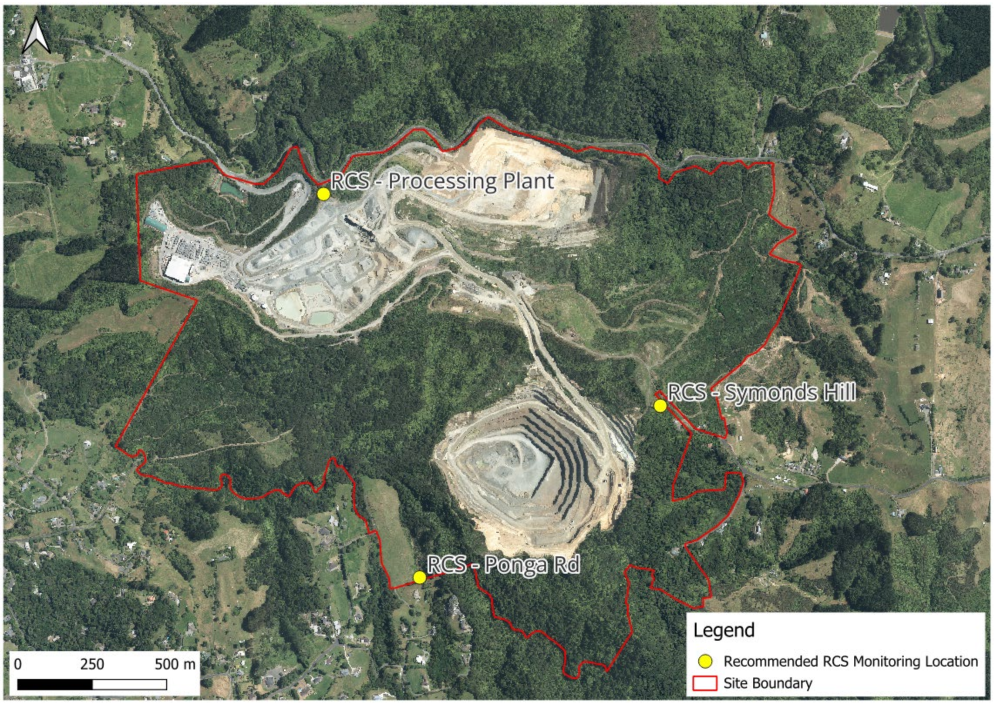


**Figure 24: Recommended RCS Monitoring Locations**

- Operational Monitoring

Once the Project has commenced, PDP recommends that monitoring using the same methodology as the baseline monitoring, is undertaken for 12 months in the same locations as those depicted in Figure 24. The results of this monitoring can 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 OEHHA annual average limit of 3 µg/m³.

If the annual average limit of 3 µg/m³ 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.

#### 9.7.2.2 On-site Workplace Exposure Monitoring

Winstone currently undertakes periodic worker exposure monitoring at various locations at Hunua. PDP has considered the results of the three most relevant locations as follows:

- Inside the weighbridge building with windows being opened and closed frequently – Starting 13 June 2025 1:00 pm for approximately 35 hours;
- Inside the enclosed fixed plant (near to screen 3) – Starting 24 June 2025 for approximately 24 hours; and,
- Inside the fixed plant control room – Starting 29 April 2025 10:30 am for approximately 25 hours.

The monitoring undertaken recorded concentrations of $PM_{2.5}$, with a factor of 9% silica content applied to provide an indicative RCS concentration. PDP notes that this approach will likely under-report concentrations of RCS, as the 2.5 µm or less diameter particles ($PM_{2.5}$) only make up a portion of $PM_4$ particles.

Table 21 presents a summary of the data analysis undertaken by PDP.

**Table 21: On-Site Crystalline Silica Monitoring Summary**

| Location | Maximum 8-hour Rolling Average (µg/m³) | Maximum 24-hour Rolling Average (µg/m³) |
|---|---|---|
| Weighbridge | 0.9 | 0.5 |
| Fixed Plant Control Room | 18 | 7.7 |
| Inside Fixed Plant | 172 | 84 |

This analysis shows as expected, that concentrations at the weight bridge (approximately 355 m from the processing plant) are significantly lower than those inside the plant or plant control room

Conservatively assuming that the 24-hour average concentrations of $PM_{2.5}$ crystalline silica are the same as the annual averages, then the concentrations recorded at the weighbridge are significantly lower than the Vic EPA annual average assessment criterion of 3 µg/m³ for RCS as $PM_{2.5}$. Even if the Weighbridge values were doubled or trebled to account for the difference between $PM_{2.5}$ and $PM_4$, the concentrations would still be less than the Vic EPA criteria.

As the closest off-site receptors are even further from the fixed plant than the weighbridge, concentrations at these locations will be significantly less.

Therefore, on the basis of on-site data there is no risk of off-site effects from RCS in the area surrounding Hunua Quarry.

#### 9.7.2.3 Review of Ambient RCS Monitoring near another NZ Quarry

The Yaldhurst quarry area monitoring commissioned by ECan between 22 December 2017 and 21 April 2018 also comprised of monitoring for RCS with 20 samples collected. Of these 20 samples, only two samples detected RCS concentrations above the limit of detection. Both samples were collected within 50 m of the quarry, and the concentrations were well below the recommended guidelines.

The data measured at the weighbridge is consistent with the data from the Yaldhurst study again demonstrates that there is unlikely to be any off-site RCS effects from activities associated with the Hunua Quarry.

#### 9.7.2.4 Review of Overseas Information

In 2020 the Texas Commission on Environmental Quality (TCEQ) published[18] a comprehensive analysis of RCS monitoring around what they call Aggregate Production Operations (APO). TCEQ reported ambient 24-hour average $PM_{2.5}$ concentrations of RCS that ranged between 0 and 1.9 µg/m³. These values are directly comparable to the values in Table 19, and this again shows that that the Weighbridge values are representative of ambient concentrations.

TCEQ also concluded in its review that:

*These data indicate that the contribution of crystalline silica from these facilities to ambient levels of particulate matter and respirable crystalline silica is negligible or minimal and that the levels generally are below the health-based AMCVs for crystalline silica developed by the TCEQ.*

[18] Texas Commission on Environmental Quality, Crystalline Silica Ambient Air Quality Monitoring and Evaluation of Community Health impacts near Aggregate Production Operations, December 2020

Given this it is again PDP's opinion, that there is no potential for RCS emissions from Hunua Quarry to result in effects on the local environment.

#### 9.7.2.5 US EPA Silicosis Risk Assessment

Finally, PDP has also undertaken a risk assessment following the US EPA Methodology discussed in Section 3.2, and has calculated the silica risk score for Hunua Quarry to be 0.4 mg/m³ years. This is less than half of the 1 mg/m³ years which is the level at which the US EPA considers below which there is no stated increase in the risk of developing silicosis. PDP's calculation is based on the maximum 24-hour average $PM_{10}$ concentration recorded off-site during the short-term summer study (23 µg/m³) and the factor of 9% silica content. Using the maximum $PM_{10}$ concentration adds conservatism to the assessment however even when doing so the assessment shows that there is no increase in the risk of people off-site developing silicosis.

Again, this reinforces PDPs' opinion that there is little risk that RCS from the Hunua Quarry will result in any form of the off-site health effects.

#### 9.7.2.6 RCS Conclusion

Having undertaken analysis of Winstone's on-site workplace silica monitoring, undertaken a conservative assessment of the TSP monitoring, reviewed specific RCS sampling near quarries in Christchurch, reviewed information prepared by TCEQ, and undertaken a risk assessment using a methodology developed by the US EPA, PDP concludes that there is an extremely low potential for any off-site health effects from RCS.

## 10.0 Conclusion

PDP has undertaken an assessment of the potential for site activities to result in either nuisance dust or health effects.

The qualitative nuisance dust assessment concludes that there is the potential (in the absence of the proposed mitigation) for dust discharges to cause nuisance off-site at the nearest receptors to the southwest of the pit, in particular during the relatively large-scale overburden stripping required during Stage 4 of the Project. However, PDP considers that with the dust mitigation and monitoring measures set out in this report implemented, effects can be controlled to a point where there a low likelihood of off-site nuisance occurring.

Additionally, PDP's assessment for $PM_{10}$ and RCS has concluded that there is a very low likelihood of either $PM_{10}$ or RCS being present at concentrations that could cause any form of off-site health effects.

These conclusions are based on the following key points:

- Winstone is currently and will continue to operate a robust TSP monitoring network which will detect any increases in dust and allow site staff to implement additional mitigation measures.
- The fixed processing plant is predominantly enclosed.  This effectively controls dust generated by the fixed processing activities, meaning there is a very low potential for off-site effects
- Due to the distance between potential dust sources, there is a very low likelihood of cumulative effects being experienced at any of the nearby receptors.
- Based on PDP's $PM_{10}$ monitoring, and the RCS assessment, there is a very low potential for off-site receptors to experience any air quality related health effects as a result of quarry activities.

# Appendix A: Individual Receptors

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| R1 | 369 Hunua Road | NW | Residential | 200-500 |
| R2 | 411 Hunua Road | NW | Residential | 200-500 |
| R3 | 486 Hunua Road | NW | Residential | 200-500 |
| R4 | 910 Hunua Road | E | Residential | 200-500 |
| R5 | 969 Hunua Road | E | Residential | 500+ |
| R6 | 1001 Hunua Road | E | Residential | 500+ |
| R7 | 193 Middleton Road | E | Residential | <200 |
| R8 | 167 Middleton Road | E | Residential | <200 |
| R9 | 170 Middleton Road | E | Residential | 200-500 |
| R10 | 161 Middleton Road | SE | Residential | <200 |
| R11 | 165 Middleton Road | SE | Residential | <200 |
| R12 | 610 Ponga Road | S to SW | Residential | 200-500 |
| R13 | 115 Judge Richardson Drive | S to SW | Residential | <200 |
| R14 | 181 Judge Richardson Drive | S to SW | Residential | <200 |
| R15 | 119 Judge Richardson Drive | S to SW | Residential | <200 |
| R16 | 191 Judge Richardson Drive | SW | Residential | <200 |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| R17 | 154 Judge Richardson Drive | SW | Residential | 200-500 |
| R18 | 144 Judge Richardson Drive | SW | Residential | 200-500 |
| R19 | 80 Judge Richardson Drive | SW | Residential | 200-500 |
| 20 | 367 Hunua Road | NW | Residential | 500+ |
| 21 | 241 Hunua Road | NW | Residential | 500+ |
| 22 | 341 Hunua Road | NW | Residential | 500+ |
| 23 | 315 Hunua Road | NW | Residential | 500+ |
| 24 | 352 Hunua Road | NW | Residential | 500+ |
| 25 | 430 Hunua Road | NW | Residential | 500+ |
| 26 | 350 Hunua Road | NW | Residential | 500+ |
| 27 | 482 Hunua Road | NW | Residential | 200-500 |
| 28 | 894 Ardmore Quarry Road | N | Residential | 500+ |
| 29 | 900 Ardmore Quarry Road | N | Residential | 500+ |
| 30 | 892 Hunua Road | N | Commercial | 500+ |
| 31 | 902 Ardmore Quarry Road | N | Commercial | 500+ |
| 32 | 904 Ardmore Quarry Road | N | Unknown | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 33 | 906 Ardmore Quarry Road | N | Residential | 500+ |
| 34 | 920 Hunua Road | E | Residential | 500+ |
| 35 | 1040 Hunua Road | E | Residential | 500+ |
| 36 | 977 Hunua Road | E | Residential | 500+ |
| 37 | 1000 Hunua Road | E | Residential | 500+ |
| 38 | 1041 Hunua Road | E | Residential | 500+ |
| 39 | 1712 Hunua Road | E | Residential | 500+ |
| 40 | 100 Middleton Road | E | Residential | 500+ |
| 41 | 138 Middleton Road | E | Residential | 200-500 |
| 42 | 136 Middleton Road | E | Residential | 200-500 |
| 43 | 134 Middleton Road | E | Residential | 500+ |
| 44 | 145 Middleton Road | E | Residential | 200-500 |
| 45 | 159 Middleton Road | E | Commercial | 200-500 |
| 46 | 101 Middleton Road | E | Residential | 500+ |
| 47 | 98 Middleton Road | E | Residential | 500+ |
| 48 | 802 Ponga Road | S | Residential | 200-500 |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 49 | 850 Ponga Road | S | Residential | 500+ |
| 50 | 872 Ponga Road | S | Commercial | 500+ |
| 51 | 894 Ponga Road | S | Residential | 500+ |
| 52 | 916 Ponga Road | S | Residential | 500+ |
| 53 | 879 Ponga Road | S | Residential | 500+ |
| 54 | 822 Ponga Road | S | Residential | 500+ |
| 55 | 855 Ponga Road | S | Residential | 500+ |
| 56 | 831 Ponga Road | S | Residential | 500+ |
| 57 | 806 Ponga Road | S | Residential | 500+ |
| 58 | 781 Ponga Road | S | Residential | 500+ |
| 59 | 777 Ponga Road | S | Residential | 500+ |
| 60 | 794 Ponga Road | S | Residential | 500+ |
| 61 | 769 Ponga Road | S | Residential | 500+ |
| 62 | 744 Ponga Road | SW | Residential | 500+ |
| 63 | 745 Ponga Road | SW | Residential | 500+ |
| 64 | 728 Ponga Road | SW | Residential | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 65 | 721 Ponga Road | SW | Residential | 500+ |
| 66 | 720 Ponga Road | SW | Residential | 500+ |
| 67 | 736 Ponga Road | SW | Residential | 500+ |
| 68 | 714 Ponga Road | SW | Residential | 500+ |
| 69 | ? Ponga Road | SW | Residential | 500+ |
| 70 | 705 Ponga Road | SW | Residential | 500+ |
| 71 | 700 Ponga Road | SW | Residential | 500+ |
| 72 | 706 Ponga Road | SW | Residential | 500+ |
| 73 | 696 Ponga Road | SW | Residential | 500+ |
| 74 | 690 Ponga Road | SW | Residential | 500+ |
| 75 | 684 Ponga Road | SW | Residential | 500+ |
| 76 | 676 Ponga Road | SW | Residential | 500+ |
| 77 | 612 Ponga Road | SW | Residential | 200-500 |
| 78 | 608 Ponga Road | SW | Residential | 200-500 |
| 79 | 616 Ponga Road | SW | Residential | 500+ |
| 80 | 650 Ponga Road | SW | Residential | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 81 | 640 Ponga Road | SW | Residential | 500+ |
| 82 | 693 Ponga Road | SW | Residential | 500+ |
| 83 | 660 Ponga Road | SW | Residential | 500+ |
| 84 | 634 Ponga Road | SW | Residential | 500+ |
| 85 | 620 Ponga Road | SW | Residential | 500+ |
| 86 | 624 Ponga Road | SW | Residential | 500+ |
| 87 | 630 Ponga Road | SW | Residential | 500+ |
| 88 | 647 Ponga Road | SW | Residential | 500+ |
| 89 | 606 Ponga Road | SW | Residential | 500+ |
| 90 | 105 Judge Richardson Drive | SW | Residential | <200 |
| 91 | 163 Judge Richardson Drive | SW | Residential | 200-500 |
| 92 | 73 Judge Richardson Drive | SW | Residential | 200-500 |
| 93 | 604 Ponga Road | SW | Residential | 500+ |
| 94 | 600 Ponga Road | SW | Residential | 500+ |
| 95 | 625 Ponga Road | SW | Residential | 500+ |
| 96 | 601 Ponga Road | SW | Residential | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 97 | 215 Judge Richardson Drive | SW | Residential | 200-500 |
| 98 | 175 Judge Richardson Drive | SW | Residential | 200-500 |
| 99 | 19 Judge Richardson Drive | SW | Residential | 500+ |
| 100 | 17 Judge Richardson Drive | SW | Residential | 500+ |
| 101 | 3 Judge Richardson Drive | SW | Residential | 500+ |
| 102 | 9 Judge Richardson Drive | SW | Residential | 500+ |
| 103 | 15 Judge Richardson Drive | SW | Residential | 500+ |
| 104 | 21 Judge Richardson Drive | SW | Residential | 500+ |
| 105 | 25 Judge Richardson Drive | SW | Residential | 500+ |
| 106 | 27 Judge Richardson Drive | SW | Residential | 500+ |
| 107 | 33 Judge Richardson Drive | SW | Residential | 500+ |
| 108 | 12 Judge Richardson Drive | SW | Residential | 500+ |
| 109 | 4 Judge Richardson Drive | SW | Residential | 500+ |
| 110 | 581 Ponga Road | SW | Residential | 500+ |
| 111 | 555 Ponga Road | SW | Residential | 500+ |
| 112 | ? Judge Richardson Drive | SW | Residential | 200-500 |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 113 | 158 Judge Richardson Drive | SW | Residential | 200-500 |
| 114 | 52 Judge Richardson Drive | SW | Commercial | 200-500 |
| 115 | 40 Judge Richardson Drive | SW | Commercial | 500+ |
| 116 | 546 Ponga Road | SW | Residential | 500+ |
| 117 | 548 Ponga Road | SW | Residential | 500+ |
| 118 | 544 Ponga Road | SW | Residential | 500+ |
| 119 | 528 Ponga Road | SW | Residential | 500+ |
| 120 | ? Ponga Road | SW | Residential | 500+ |
| 121 | 494 Ponga Road | SW | Residential | 500+ |
| 122 | 498 Ponga Road | SW | Residential | 500+ |
| 123 | 506 Ponga Road | SW | Residential | 500+ |
| 124 | 68 Judge Richardson Drive | W | Residential | 200-500 |
| 125 | 74 Judge Richardson Drive | W | Residential | 200-500 |
| 126 | 78 Judge Richardson Drive | W | Residential | 200-500 |
| 127 | 534 Ponga Road | W | Residential | 500+ |
| 128 | ? Ponga Road | W | Residential | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 129 | 484 Ponga Road | W | Residential | 500+ |
| 130 | 400 Ponga Road | W | Residential | 500+ |
| 131 | 63 Coal Mine Road | W | Residential | 500+ |
| 132 | 65 Coal Mine Road | W | Residential | 500+ |
| 133 | ? Coal Mine Road | W | Residential | 500+ |
| 134 | ? Coal Mine Road | W | Residential | 500+ |
| 135 | 89 Coal Mine Road | W | Residential | 500+ |
| 136 | 85 Coal Mine Road | W | Residential | 500+ |
| 137 | 55 Coal Mine Road | W | Residential | 500+ |
| 138 | 57 Coal Mine Road | W | Residential | 500+ |
| 139 | 32 Kauri View Road | W | Residential | 500+ |
| 140 | 35 Kauri View Road | W | Residential | 500+ |
| 141 | 530 Coal Mine Road | W | Residential | 500+ |
| 142 | 538 Coal Mine Road | W | Residential | 500+ |
| 143 | 97 Kauri View Road | W | Residential | 500+ |
| 144 | 140 Kauri View Road | W | Residential | 500+ |

**Table 22: Receptors within 1,000 m of Site Areas**

| Receptor/ID | Address | Direction Relative to Nearest Quarry Area | Receptor Type | Distance from Nearest Quarry Area (m) |
|---|---|---|---|---|
| 145 | 179 Kauri View Road | W | Residential | 500+ |
| 146 | 248 Kauri View Road | W | Residential | 500+ |
| 147 | 235 Kauri View Road | W | Residential | 500+ |
| 148 | 534 Coal Mine Road | W | Residential | 500+ |
| 149 | 297 Kauri View Road | W | Residential | 500+ |
| 150 | 320 Kauri View Road | W | Residential | 500+ |
| 151 | 357 Kauri View Road | W | Residential | 500+ |
| 152 | 373 Kauri View Road | W | Residential | 500+ |
| 153 | 239 Kauri View Road | W | Unknown | 500+ |
| 154 | 241 Kauri View Road | W | Unknown | 500+ |
| 155 | 95 Hunua Road | W | Residential | 500+ |
| 156 | 99 Hunua Road | W | Residential | 500+ |

# Appendix B: State Figures

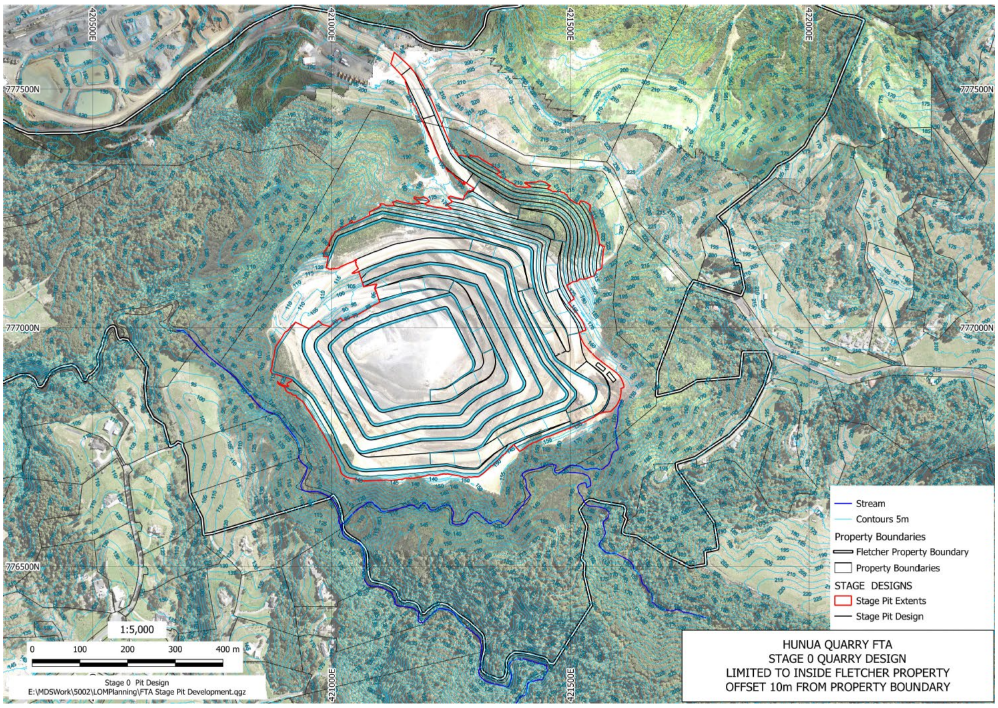


**Figure 25: Extent of Proposed Expansion – Stage 0**

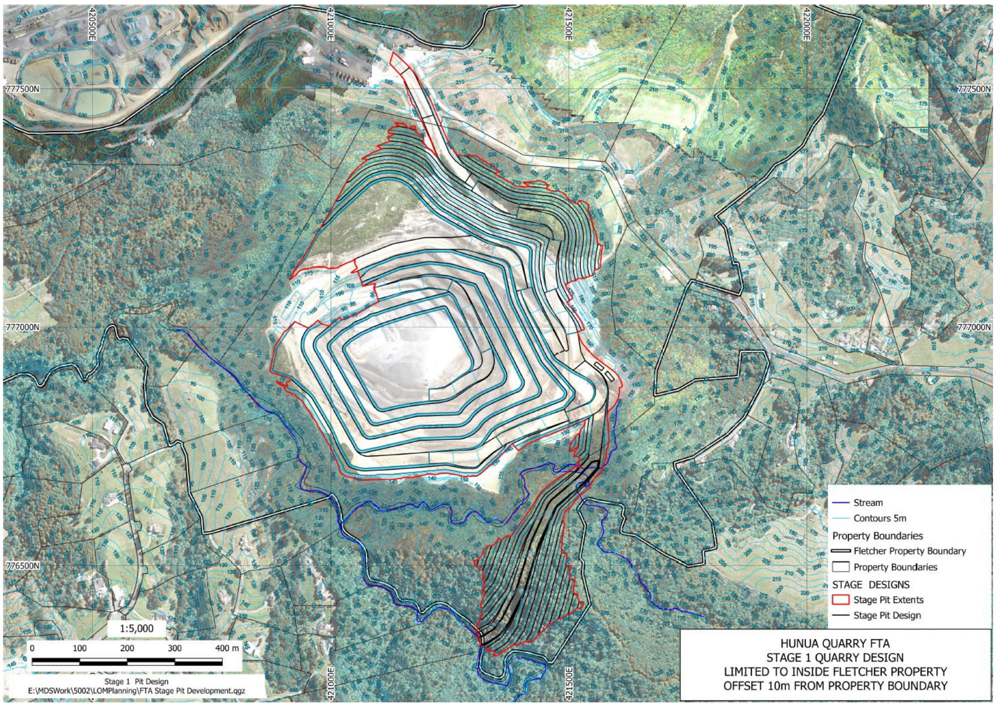


**Figure 26: Extent of Proposed Expansion – Stage 1**

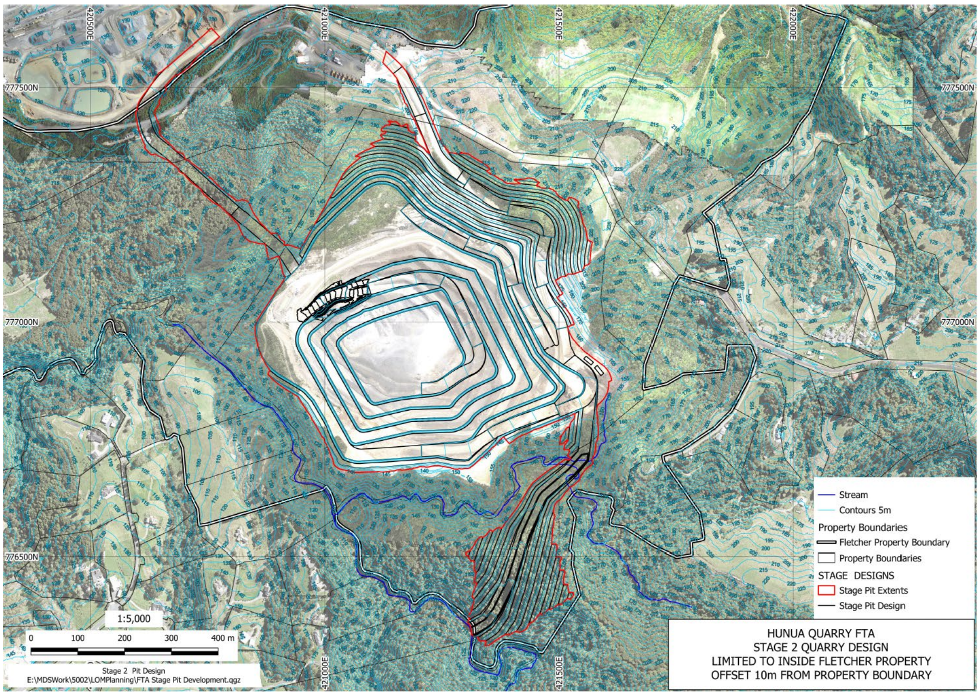


**Figure 27: Extent of Proposed Expansion – Stage 2**

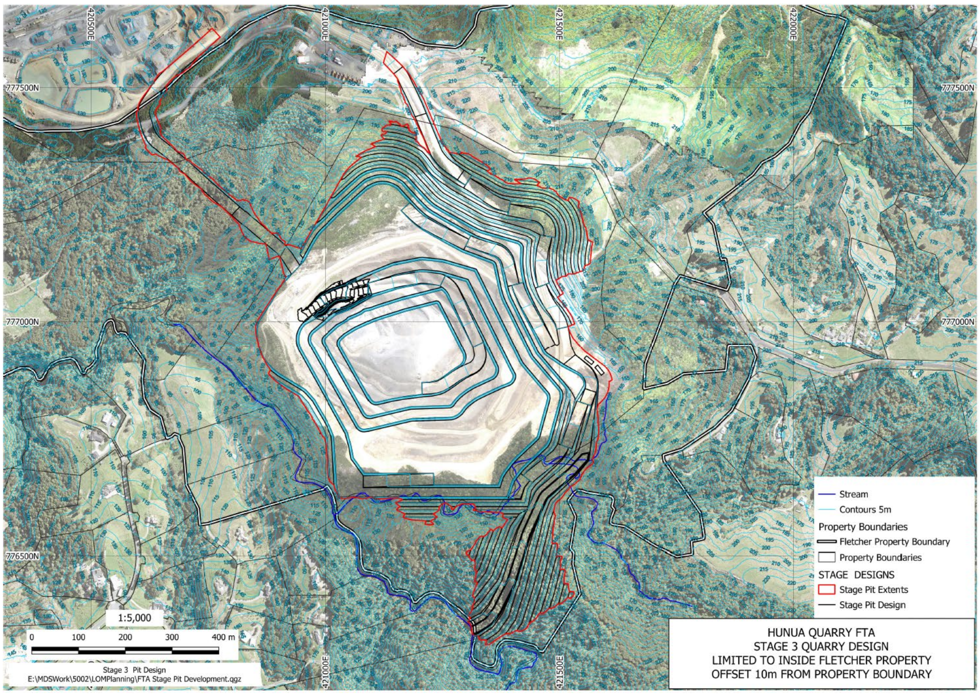


**Figure 28: Extent of Proposed Expansion – Stage 3**

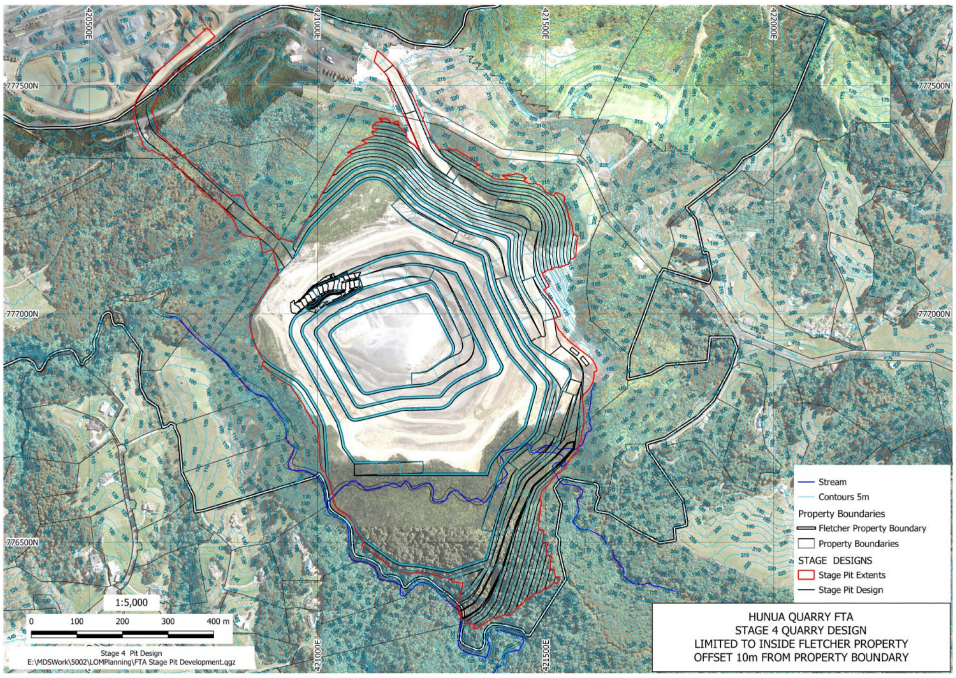


**Figure 29: Extent of Proposed Expansion – Stage 4**

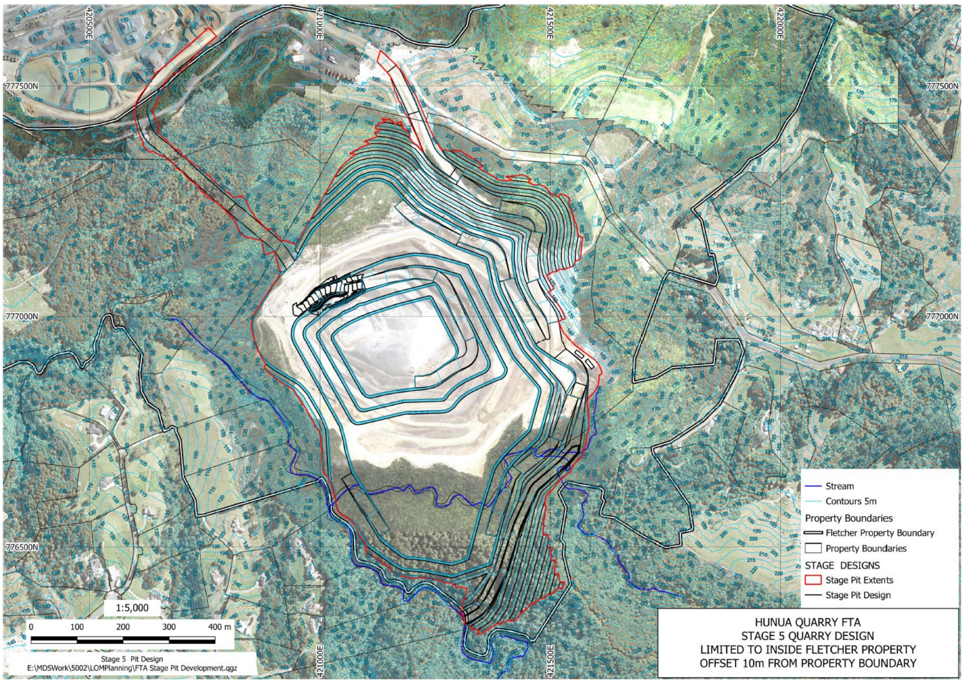


**Figure 30: Extent of Proposed Expansion – Stage 5**

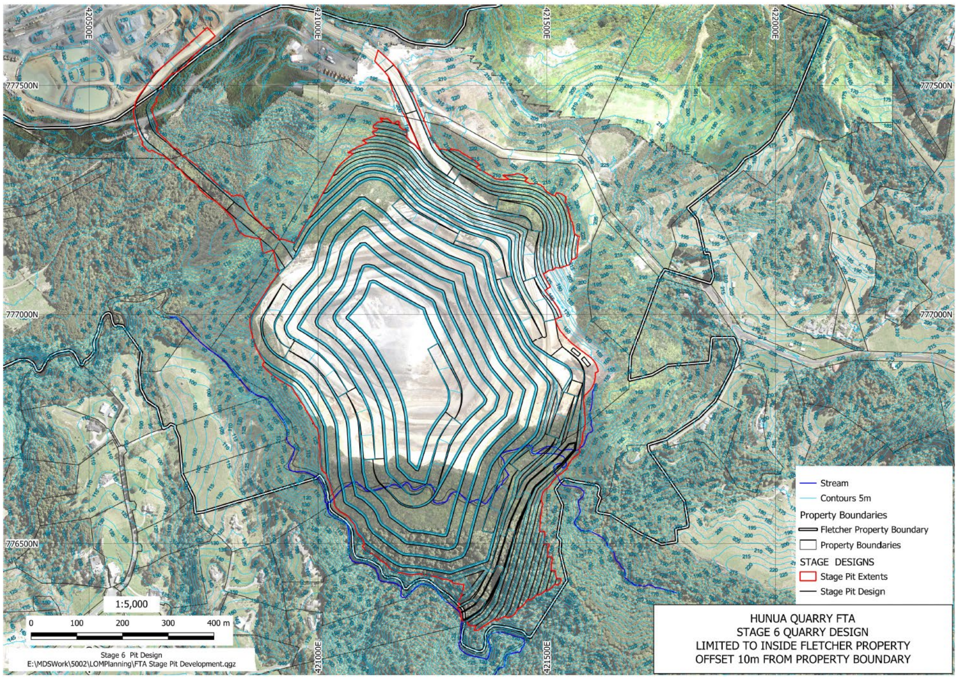


**Figure 31: Extent of Proposed Expansion – Stage 6**

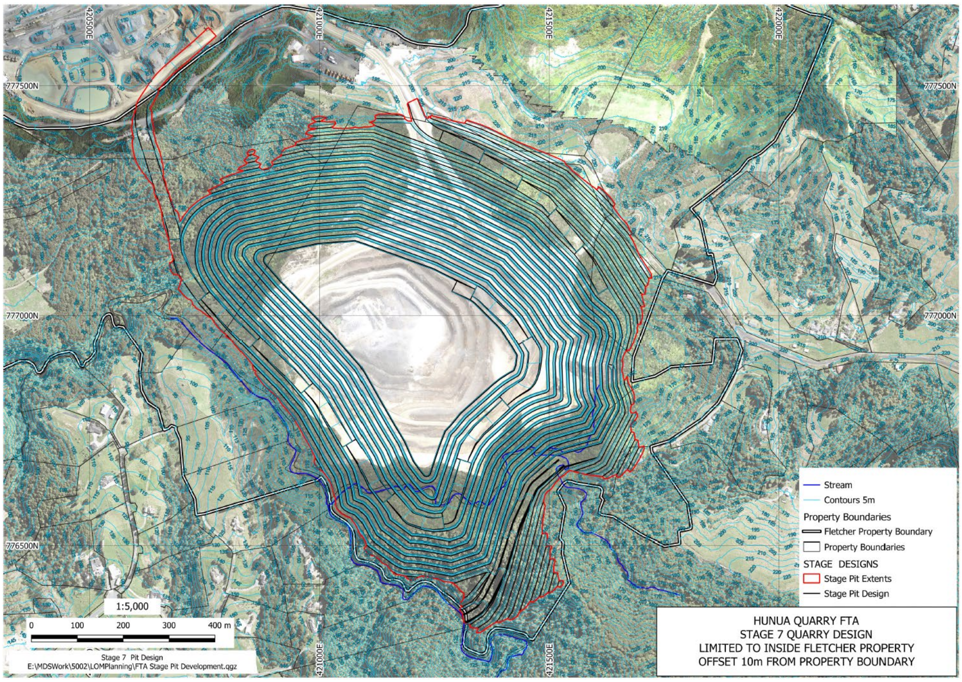


**Figure 32: Extent of Proposed Expansion – Stage 7**

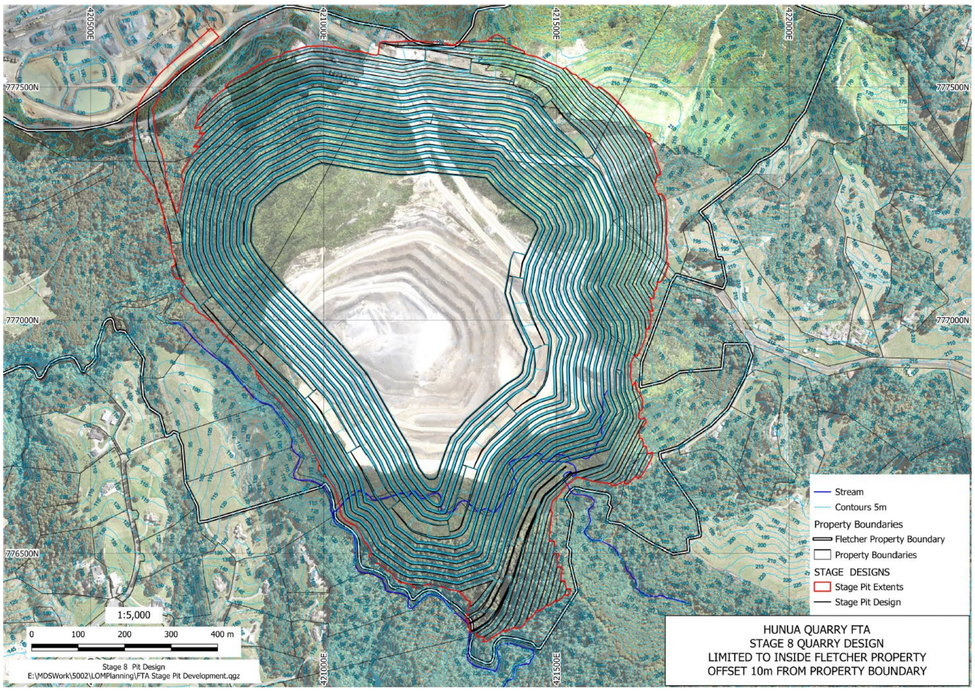


**Figure 33: Extent of Proposed Expansion – Stage 8**

# Appendix C: Draft AQMP

# Hunua Quarry – Air Quality Management Plan

Prepared for

Winstone Aggregates

March 2026

D R A F T

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# Quality Control Sheet

| | |
|---|---|
| TITLE | Hunua Quarry – Air Quality Management Plan |
| CLIENT | Winstone Aggregates |
| ISSUE DATE | 27 March 2026 |
| JOB REFERENCE | A035680013 |

D R A F T

**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 |

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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.

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D R A F T

# 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[1] 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** with 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;

[1] 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.

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## 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 |

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## 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.

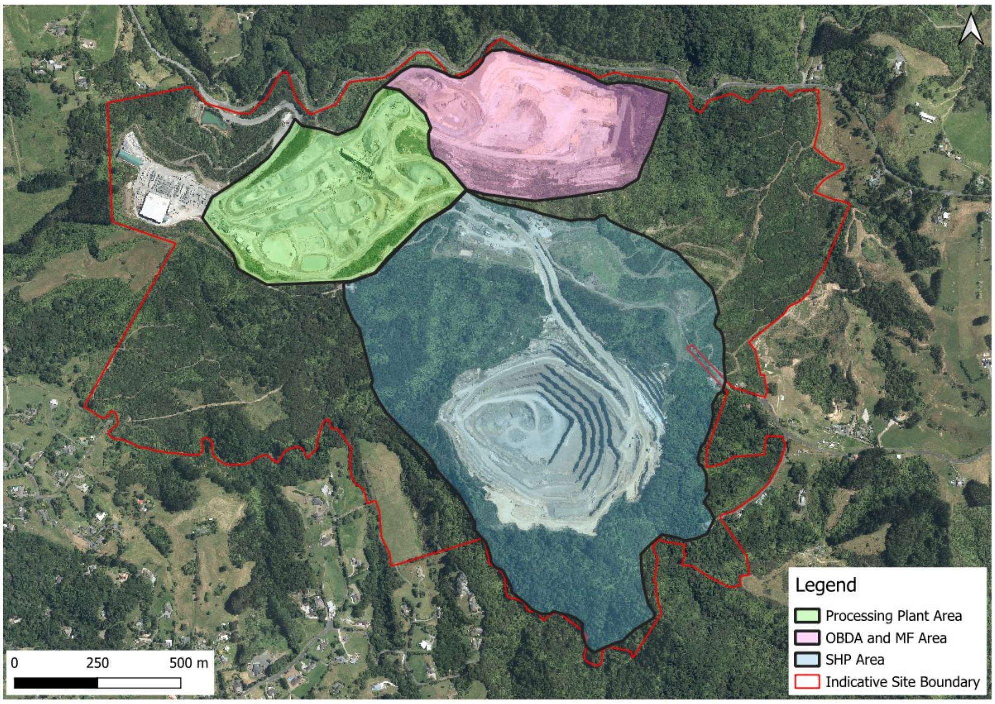


**Figure 1: Site Areas**

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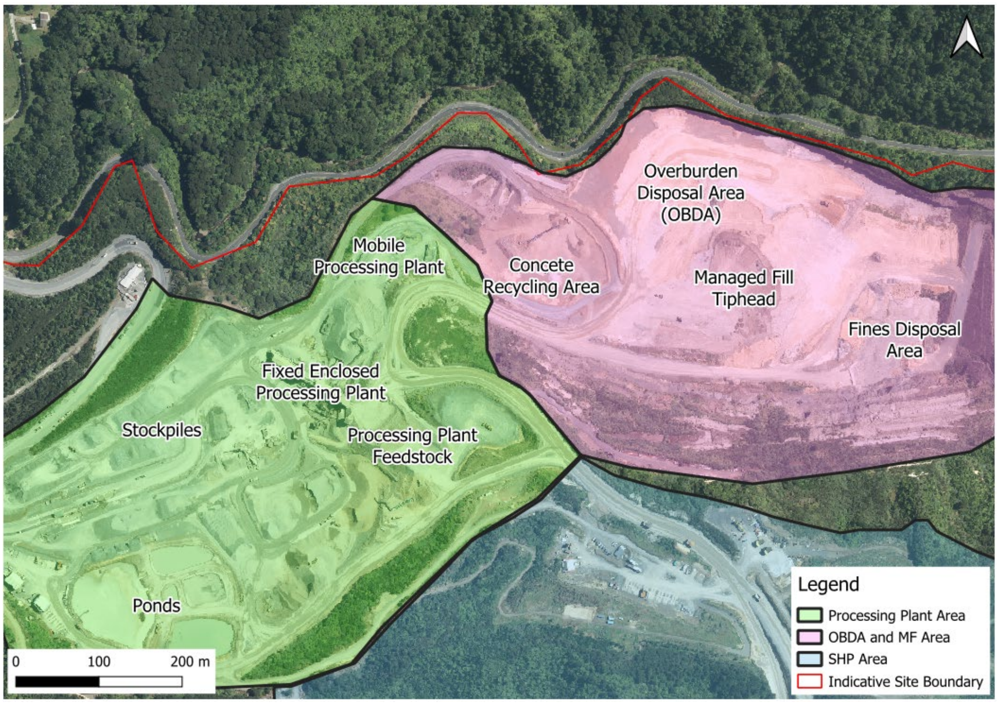


**Figure 2: General Site Layout – Processing and Overburden Disposal Area**

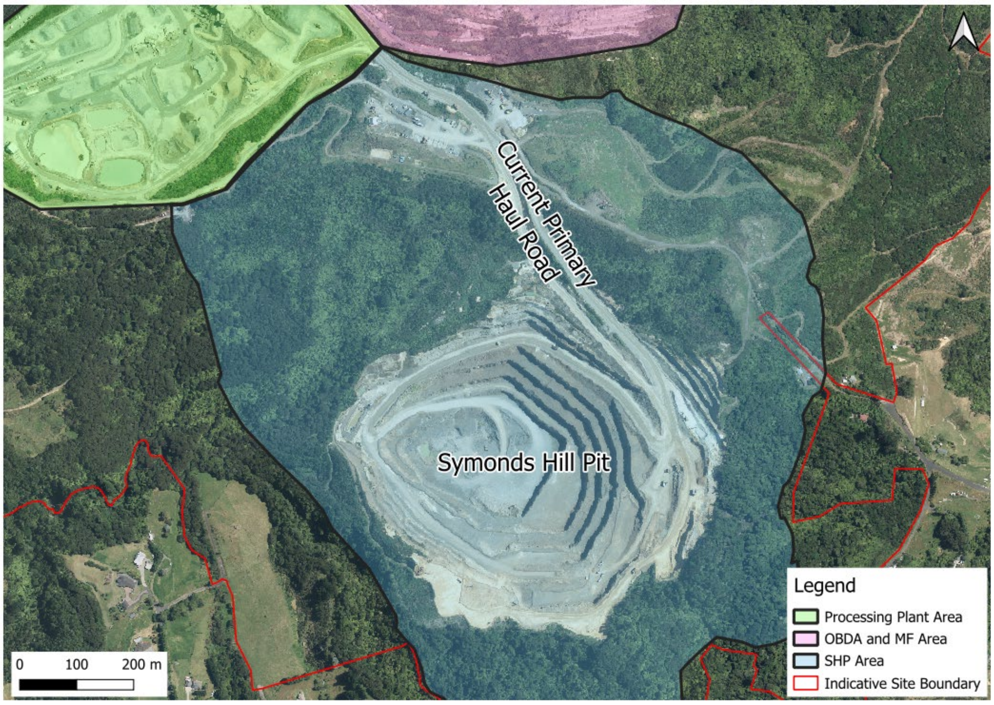


**Figure 3: General Site Layout – Symonds Hill Pit and Haul Road**

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## 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.

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### 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.

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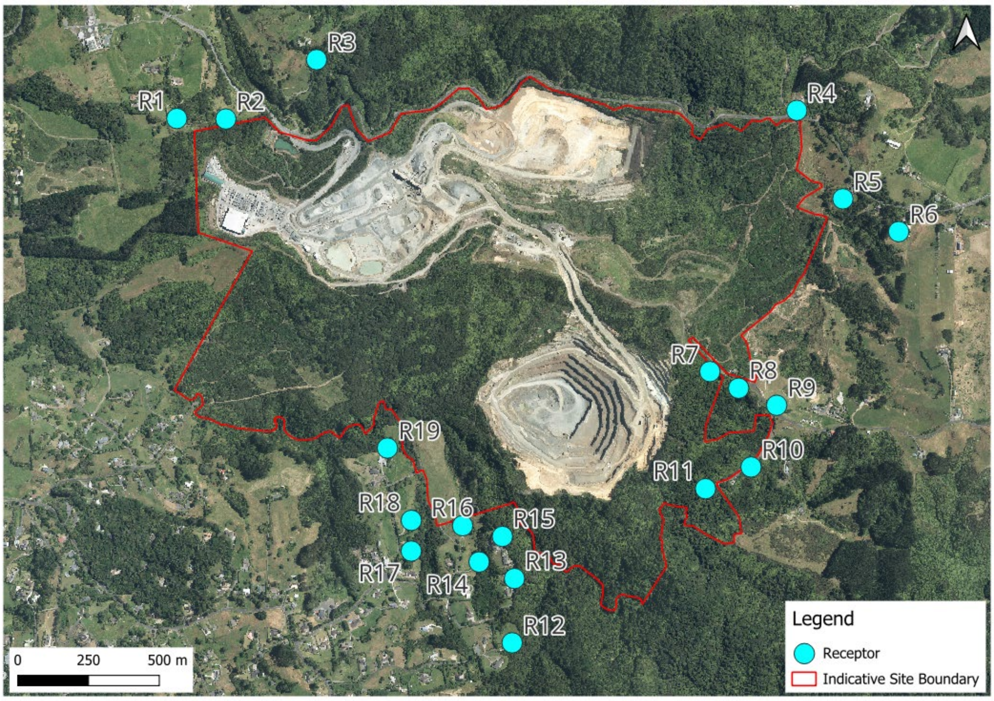


**Figure 4: Nearby Sensitive Receptors**

**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[2] |
| R2 | 411 Hunua Road | | 390[2] |
| R3 | 486 Hunua Road | | 390[2] |
| R4 | 910 Hunua Road | East | 490[3] |
| R5 | 969 Hunua Road | | 690[3] |
| R6 | 1001 Hunua Road | | 890[4] |
| R7[1] | 193 Middleton Road | | 130[4] |
| R8 | 167 Middleton Road | | 245[4] |
| R9 | 170 Middleton Road | | 340[4] |
| R10 | 161 Middleton Road | Southeast | 250[4] |
| R11[1] | 165 Middleton Road | | 100[4] |
| R12 | 610 Ponga Road | | 320[4] |

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**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[4] |
| R14 | 181 Judge Richardson Drive | | 200[4] |
| R15 | 119 Judge Richardson Drive | | 80[4] |
| R16 | 191 Judge Richardson Drive | Southwest | 200[4] |
| R17 | 154 Judge Richardson Drive | | 400[4] |
| R18 | 144 Judge Richardson Drive | | 355[4] |
| R19 | 80 Judge Richardson Drive | West | 305[4] |

*Notes:*

1. *Receptor located on Flecther 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.*

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## 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.

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## 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.

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### 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.

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### 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 nor 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.

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## 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.

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## 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.

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# 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.

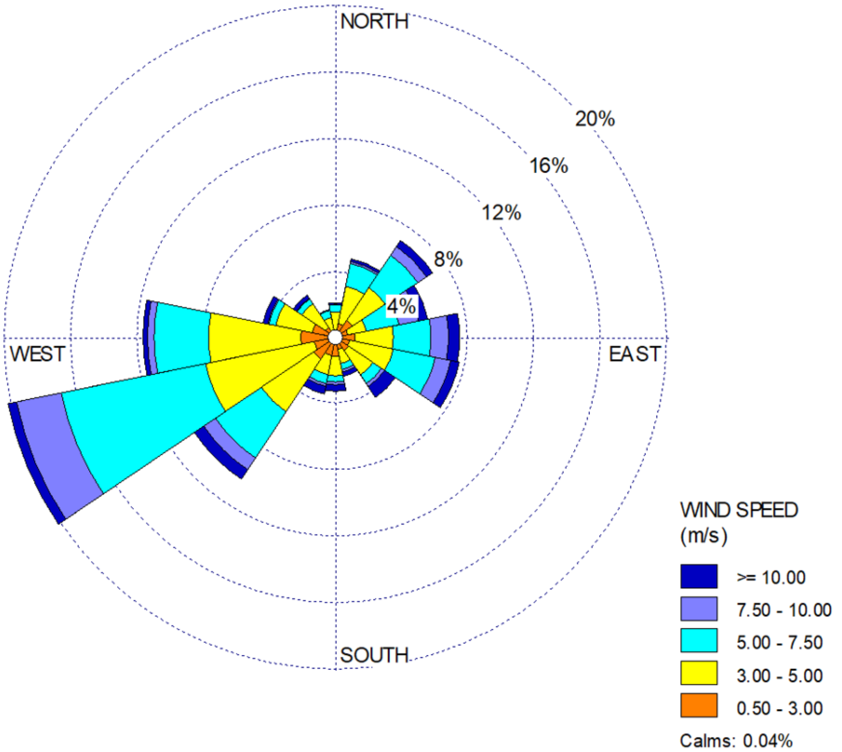


**Figure 5: Windrose from the on-site Symonds Hill AWS from 2023 to 2025**

## 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 (100µg/m$^3$ as a 24 hour average at the Main Gate monitoring site and 80µg/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

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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.

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## 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**

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**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[2] 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.

[2] https://www.vaisala.com/sites/default/files/documents/M210906EN-C.pdf

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# 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.

**Table 4: Visual Dust Monitoring Programme**

| Monitoring Activity | Frequency |
|---|---|
| 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. |

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**Table 4: Visual Dust Monitoring Programme**

| Monitoring Activity | Frequency |
|---|---|
| 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. |

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## 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.

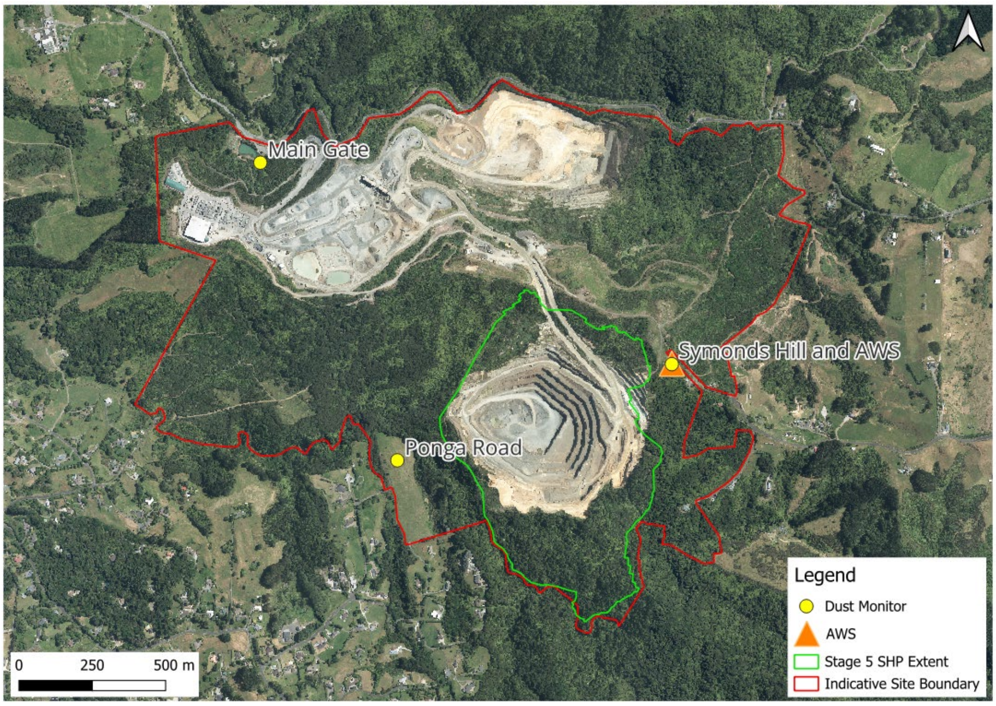


**Figure 8: Dust Monitor and Weather Station Locations**

### 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.

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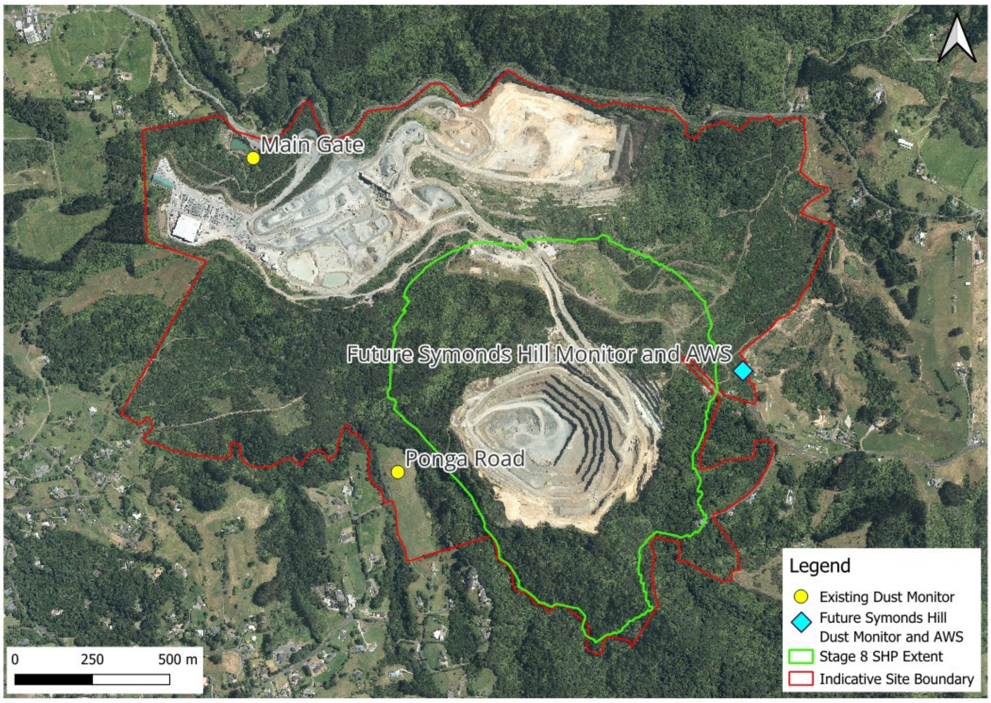


**Figure 9: Proposed Indicative Dust Monitor and AWS Locations**

## 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 ($PM_4$). 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.

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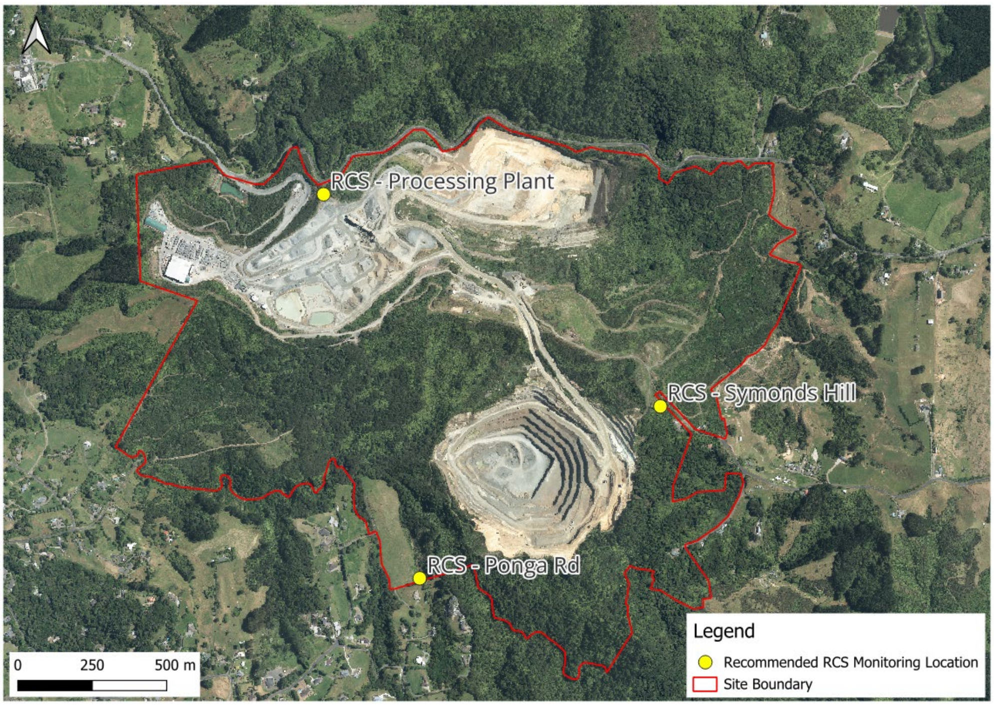


**Figure 10: RCS Monitoring Locations**

- 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 µg/m³.

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.

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## 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 (µg/m³) measured as a 24-hour rolling average at the Symonds Hill and Ponga Road monitors, and 100 µg/m³ 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.

**Table 5: TSP Instrumental Monitoring Alert Levels**

| Averaging Period | Concentration (µg/m³) | | |
|---|---|---|---|
| | 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 |

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# 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 28th February, 31st May, 31st August and 30th 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.

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**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.

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## 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.

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# Appendix A: Air Discharge Consent XXX

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# 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?<br>[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 | |

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| 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? | | |

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# Appendix D: 1-hour Average TSP Data Analysis

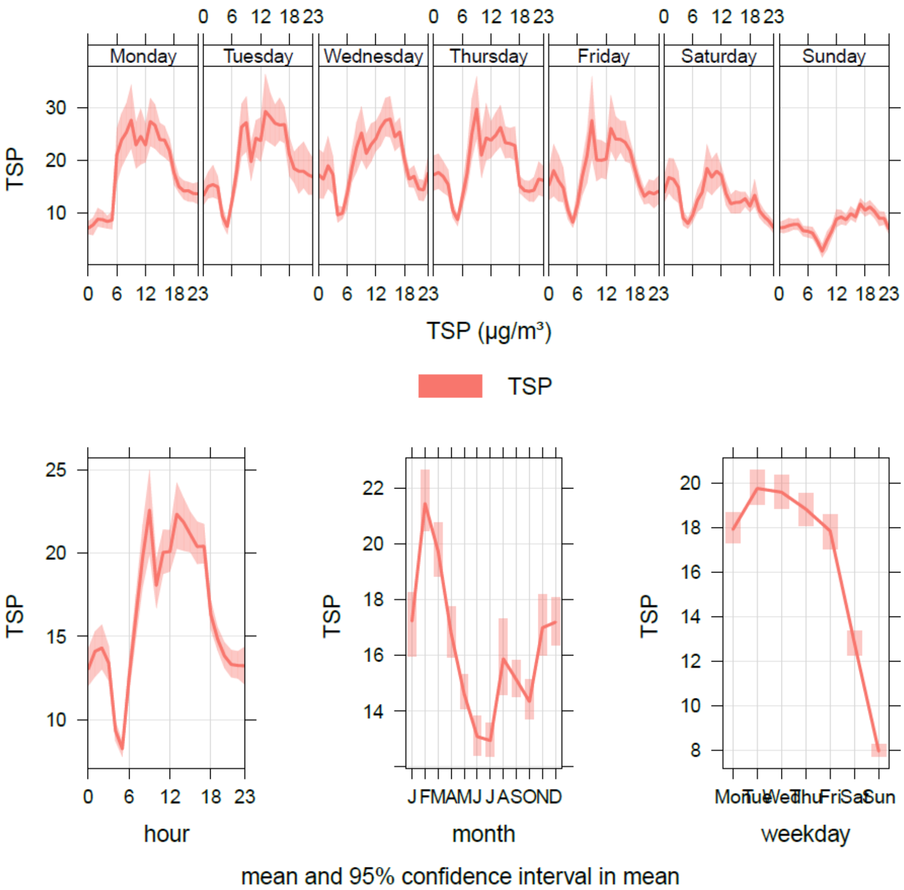


**Figure 34: Main Gate TSP 1-hour Average Variations (µg/m³) – 2024 to 2025**

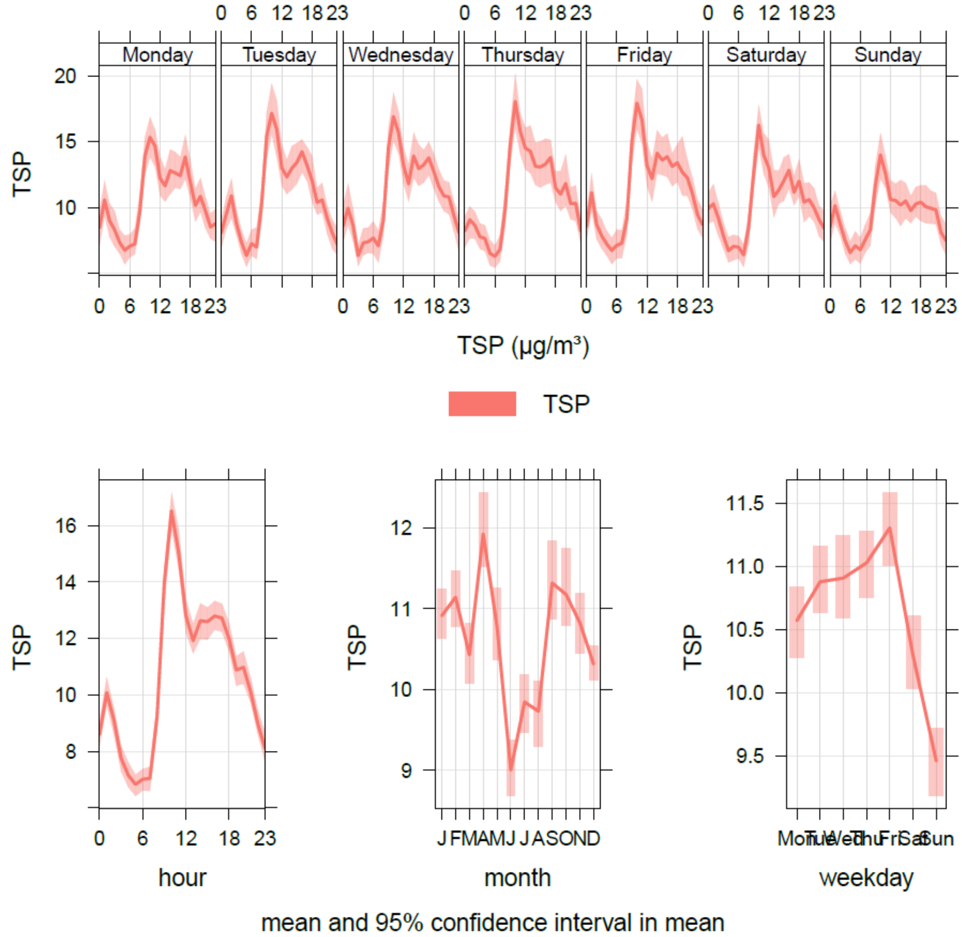


**Figure 35: Ponga Road TSP 1-hour Average Variations (µg/m³) – 2021 to 2025**

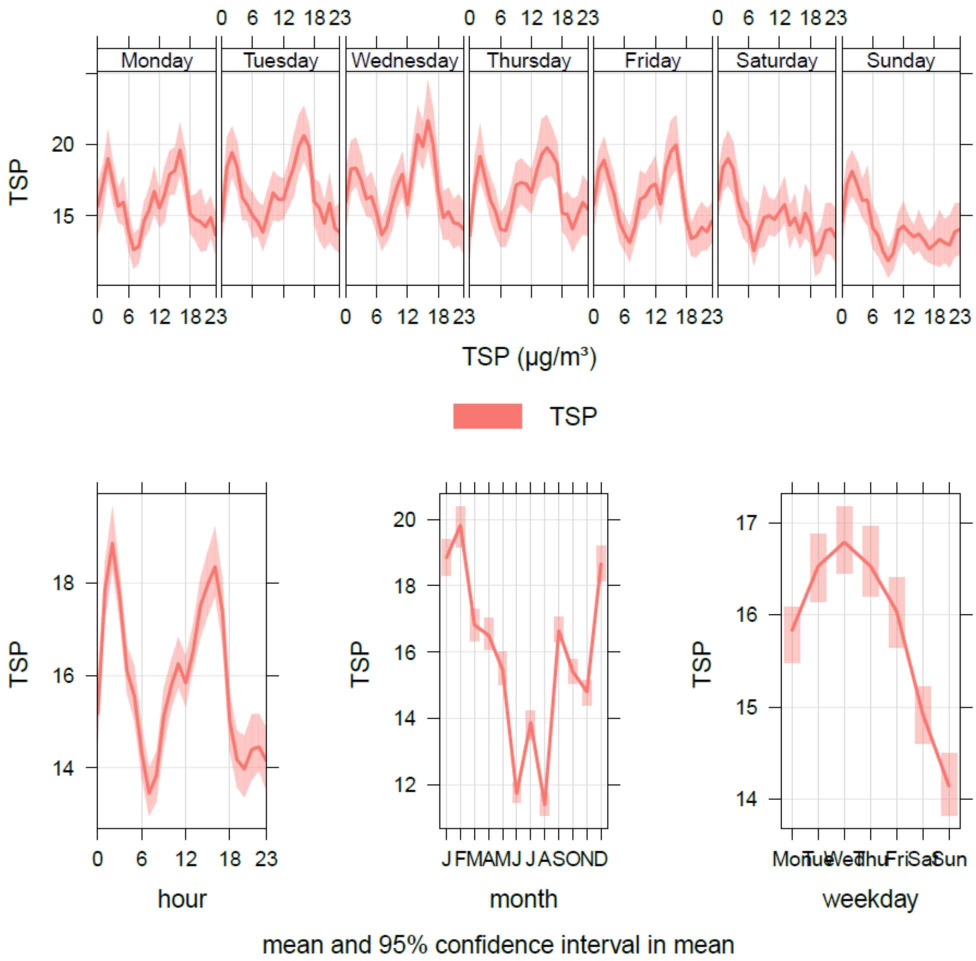


**Figure 36: Symonds Hill TSP 1-hour Average Variations (µg/m³) – 2021 to 2025**

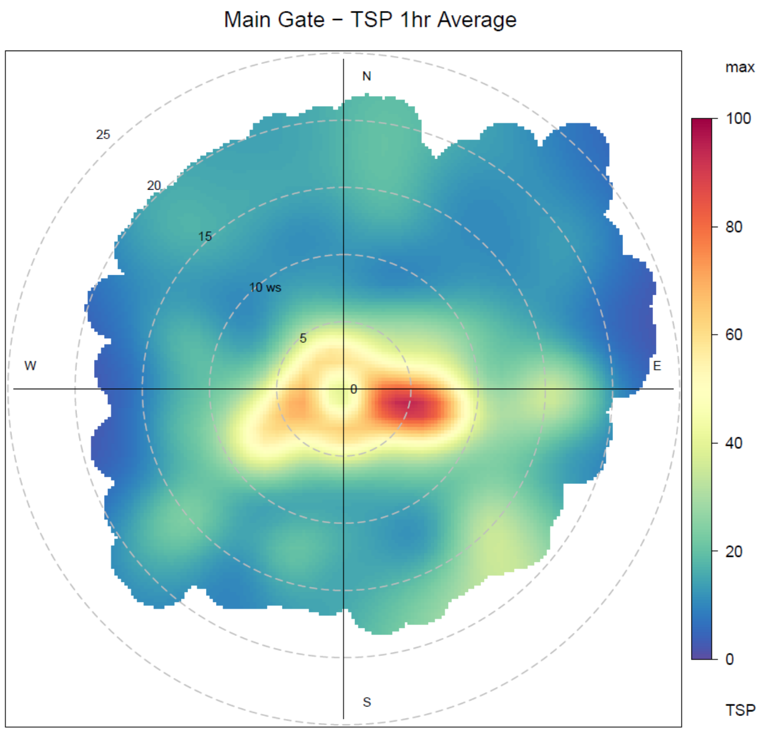


**Figure 37: Main Gate Maximum 1-hour Average Polar Plot (2024 to 2025)**

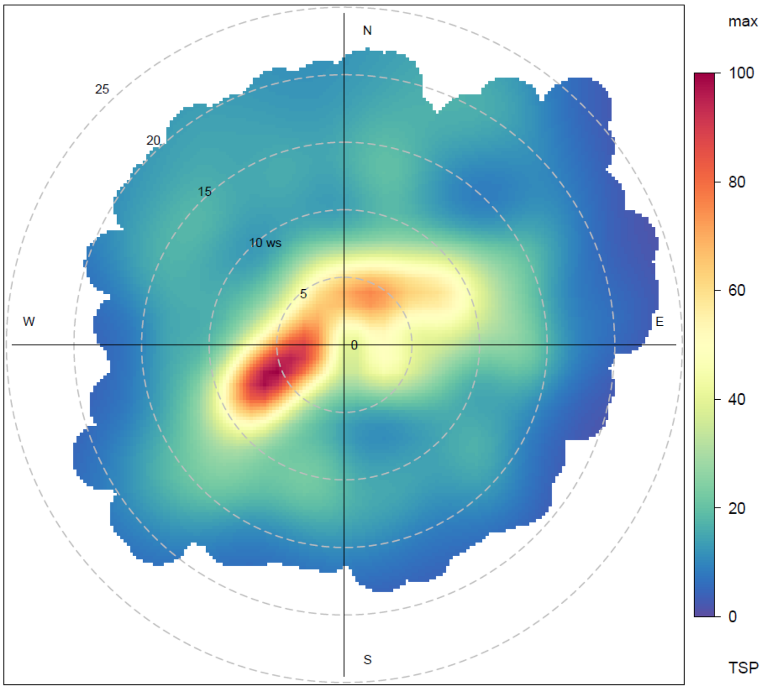


**Figure 38: Symonds Hill Maximum 1-hour Average Polar Plot (2021 to 2025)**

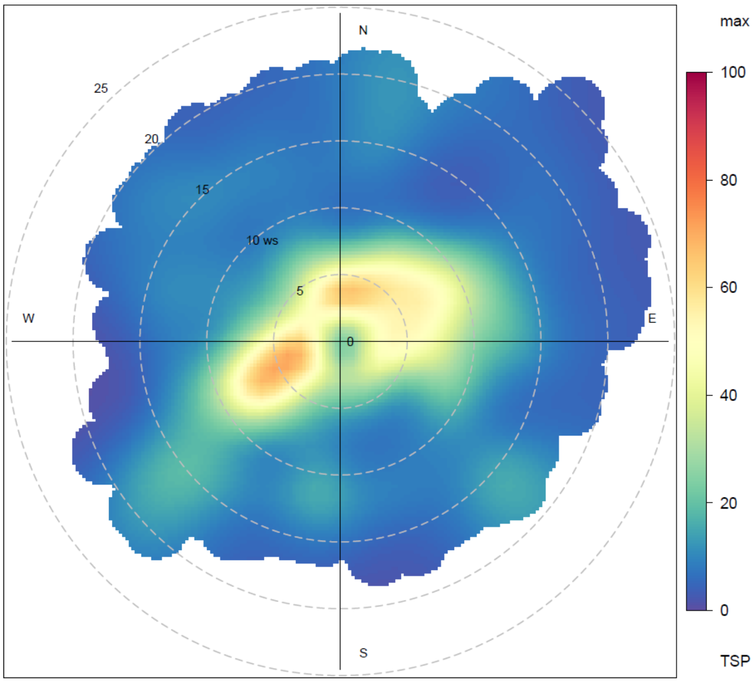


**Figure 39: Ponga Road Maximum 1hr Average Polar Plot (2021 to 2025)**

# Appendix E: Draft Air Discharge Consent Conditions

**General Conditions**

1. That the Consent Holder shall allow access to the servants or agents of Auckland Council (AC) to relevant parts of the property at all reasonable times for the purpose of carrying out inspections, surveys, investigations, tests, measurements or taking samples.

2. That the Consent Holder shall operate the plant and associated processes in accordance with the documentation submitted to AC as part of application number xxxxx, including but not limited to the Hunua Quarry Air Quality Assessment, dated March 2026, prepared by Pattle Delamore Partners Limited, where not mended by the conditions of this consent. No alterations shall be made to the plant or processes that do not, or are not likely to, comply with the provisions of this consent, a regional rule, or regulations under the Resource Management Act 1991.

3. That the Consent Holder shall be responsible for all discharges into air from the site and shall make any person on site aware of any relevant conditions of this consent.

**Limit Conditions**

4. That the Consent Holder shall at all times, operate, maintain, supervise, monitor and control all processes on site so that emissions authorised by this consent are maintained at the minimum practicable level.

5. That the Consent Holder shall ensure that beyond the boundary of the site there is no odour, dust or fume caused by discharges from the site which, in the opinion of an enforcement officer, is noxious, offensive or objectionable.

6. That the Consent Holder shall ensure that no discharge from any activity on site gives rise to visible emissions to an extent which, in the opinion of an enforcement officer, are noxious, offensive or objectionable.

7. That the Consent Holder shall ensure that beyond the boundary of the site there is no hazardous air pollutant, caused by discharges from the site, which is present at a concentration that is likely to be detrimental to human health or the environment.

8. That the Consent Holder shall operate the site in accordance with the Air Quality Management Plan which shall be submitted to the Manager for review within three months of the commencement of this consent. All subsequent changes shall be submitted to the Manager for review prior to becoming operational. The Plan may form part of an overall management plan for the site.

**Process Conditions**

9. The Consent Holder shall ensure adequate water suppression shall be available at all times to ensure that dust emissions are minimised from any area where vegetation, overburden and/or topsoil has been, or is being, removed.

10. That the Consent Holder shall stabilise bare earth surfaces:

    (a) along the realigned Mangapū Stream Tributary in accordance with condition X;

    (b) associated with quarry faces, slopes and OBDA areas in accordance with condition X;

    (c) all other areas of the Site where that are not being worked, as soon as reasonably practicable with polymer, hydroseed, or other permanent vegetation.

11. That the Consent Holder shall ensure techniques are used for overburden removal, excavating rock, blasting and drilling which minimise dust emissions. Dust emissions from all transfer operations shall be kept to a practicable minimum.

12. That, in the event complaints are received by either the Consent Holder or AC that relate to dust from blasting, the Consent Holder shall within seventy-two hours of the complaint, or receipt of details of the complaint from AC, provide all available information about the blasts to which the complaints relate to AC. The information provided shall include, but not be limited to the location of the blast, weather conditions, air quality monitoring data and blast logs.

13. That, in the event that, in the opinion of AC, the information provided in accordance with Condition 12 indicates that complaints received may have been a consequence of blasting activities on the Site, at the request of ~~the~~ AC, the Consent Holder shall inform AC seventy-two hours prior to the next such blasting event, and such subsequent blasting events as are considered necessary by the Manager, to allow the blast(s) to be observed and blast discharges evaluated against the requirements of Conditions 5,6 and 23.

14. That, in the event dust from blasting results in non-compliance with conditions 5 and/or 6 on two or more occasions within a twelve month period, the Consent Holder shall engage a suitably qualified individual to investigate further dust suppression measures including any proposed timeframe for their implementation (where appropriate). The results of the investigation shall be submitted in the form of a report to AC within six months of the second non-compliance.

1. Note: This consent condition shall not be initiated without prior consultation with the Consent Holder and notification in writing by AC.

15. The Consent Holder shall ensure:

    (a) all dust suppression equipment associated with the processing plant is maintained in good working condition; and

    (b) no part of the processing plant is operated without dust suppression equipment being fully operational and functioning correctly; and

    (c) the processing plant buildings are maintained in order to ensure that potential fugitive emissions are minimised.

16. That the Consent Holder shall ensure all air displaced from silos associated with the blending plant shall be vented to atmosphere via filter system(s) prior to discharge to atmosphere. The filter systems shall comply with the relevant design, operating and monitoring criteria/requirements of that version of TP152 that is current three months prior to installation of that system, or better.

17. That the Consent Holder shall construct and position all stockpiles to minimise the potential for dust emissions. Methods to suppress stockpile emissions shall be set out in the Air Quality Management Plan required by condition 29 of this consent.

18. That the Consent Holder shall maintain all internal quarry roads in a manner which minimises the potential for dust emissions. Methods to suppress emissions from quarry roads shall be set out in the Air Quality Management Plan required by condition 29 of this consent and shall include, but not be limited to, procedures relating to road maintenance, water suppression and vehicle speeds.

19. That the Consent Holder shall provide a wheel washing facility at the exit of the premises to be used by all vehicles that have dirt on the tyres which is, or is likely to be, transferred off the tyres on to the roadways to ensure no tracking onto public roads.

20. That the Consent Holder shall clean any sealed roads within the site on a regular basis to ensure that dust is kept to a practicable minimum.

21. That the Consent Holder shall, without contravening the requirements of any other consent, maintain ponds or other water supplies at such capacity that application of water as a dust control measure is not limited.

22. That the Consent Holder shall ensure that no material shall be disposed of by open burning on site.

**Monitoring Conditions**

23. That the Consent Holder shall carry out Total Suspended Particulate (TSP) monitoring at the following locations:

    (a) At the site of the existing monitor near the quarry access.

    (b) In the general vicinity of Middleton Road.

    (c) On the south westerly boundary.

    The monitoring equipment must be of US EPA Federal Equivalent Method (FEM) or considered near FEM for $PM_{10}$ however operated with a TSP inlet and have a sample flow rate of at least 5 litres per minute.

    The monitoring equipment must be connected to a telemetry system capable of recording and presenting data in 1 hour average intervals in real time and be capable of sending alerts to site staff via text and/or email.

24. That, without prejudice to the generality of conditions 4 and 5, if the monitoring shows that the TSP in ambient air at or beyond the boundary of the site, as measured in accordance with condition 23, exceeds 80 µg/m³ as a 24 hour average at the sites listed in condition 23(b) and/or (c) and 100 µg/m³ as a 24 hour average at the 23(a) monitoring site, the Consent Holder shall initiate an investigation as to the probable cause(s) of the exceedance.

25. That, if an investigation initiated by condition 24 establishes the probable cause of the elevated levels of TSP is an activity undertaken on the Consent Holder's site, the Consent Holder shall take action to reduce those discharges to the satisfaction of AC.

26. That the Consent Holder shall report any results of TSP in ambient air tests showing exceedances of the prompts given in condition 24 by facsimile to the Manager as soon as practicable. A summary of all monitoring results for the previous 12 months, including references to wind and rainfall data, and any remedial action taken shall be submitted to AC by no later than 20 working days after 28 February each year.

27. The Consent Holder shall engage a suitable qualified air quality professional to undertake an ambient Respirable Crystalline Silica (RCS) Monitoring programme in the locations identified in the Hunua Quarry Air Quality Assessment prepared by Pattle Delamore Partners in March 2026. As a minimum, the monitoring programme must:

    (a) Monitor baseline RCS concentrations for at least three (3) months prior to Stage 1 of the project commencing;

    (b) Monitor for 12 continuous months following Stage 1 of the project commencing;

(c) Be designed to assess compliance of 3 µg/m³ annual average RCS concentration at any nearby dwelling.

The findings of the monitoring shall be included in a report and submitted to AC within 20 working days of the completion of the monitoring.

28. In the event that the annual average limit of 3 µg/m³ 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.

29. That the Consent Holder shall maintain and operate a weather station that is located to AC's satisfaction. The Consent Holder shall continuously record and be able to make available wind speed, wind direction and rainfall data.

30. That the Consent Holder shall ensure that all records, monitoring and test results that are required by the conditions of this consent are made available on request, during operating hours, to an enforcement officer and shall be kept for a minimum period of twenty-four months from the date of each entry.

31. The objective of the Air Quality Management Plan (AQMP) is to set out measures to minimise the risk of noxious, offensive, or objectionable dust emissions occurring beyond the boundary of the Site and ensure compliance with the requirements in conditions XX to XX.

As a minimum, the AQMP must include:

(a) identification of all fugitive and point sources for discharges of contaminants into air, including a map showing the location of each source;

(b) details of the type and location of the meteorological monitoring site to be operated and maintained in the vicinity of the Site required by condition X;

(c) details of the number, type and locations of dust monitoring sites to be operated and maintained in the vicinity of the Site required by condition X;

(d) details to minimise discharges of contaminants into air, including details of the inspection, maintenance, monitoring and contingency procedures in place for all emissions control equipment at the Site;

(e) procedures for the operation, maintenance, and calibration of the meteorological site required by condition X;

(f) procedures for the operation, maintenance, and calibration of the ambient dust monitors as required by condition X;

(g) details of management and monitoring measures in place to minimise discharges of dust; including but not limited to:

  (i) the use of water carts and irrigation systems to dampen dusty surfaces and all other dust mitigation measures required by condition X;

  (ii) stopping all work on areas of the site that are sources of excessive dust, other than dust control activities;

  (iii) implementation of two alert levels of dust generation that trigger firstly additional dust mitigation measures and secondly cessation of certain dust generating activities on site until dust concentrations no longer constitute a significant adverse effect beyond the boundary of the Site. Determination of a significant adverse dust effect beyond the boundary of the Consent Holder's property is to be carried out using the guidance included in the Ministry for the Environment's *Good Practice Guide for Assessing and Managing Dust* and in consultation between the Consent Holder and the Council;

  (iv) Contingency measures to investigate the causes of any exceedances of the dust alert levels and to minimise dust discharges in the event that the investigation identifies on-site dust as the cause of an exceedance.

32. That the Consent Holder shall, by xxxxx following commencement of this consent and annually thereafter, provide a suitable report, including scale plans, to AC detailing:

(a) Areas to be quarried over the next 12 months.

(b) Plans for earthworks, including overburden stripping, over the next 12 months.

(c) Details of product stockpiling activities.

(d) Details of rehabilitation carried out in accordance with condition 10 of this consent in the previous 12 months.

(e) Pond storage volume taking into account silting up.

The report may form part of the Annual Erosion and Sediment Control Management Plan required by condition xx of consent number xxxxx.

33. That the Consent Holder shall record the following in a daily log:

    (a) Any dust control equipment malfunction and any remedial action taken.

    (b) Any visible emission of dust and the source.

    (c) The weather conditions for the day, including wind strength and direction and rainfall.

    (d) Any use of a watercart, the frequency of use and the volume of water used.

    (e) The volume of water used for dust suppression other than watercart usage.

    (f) The date and signature of the person entering the information.

    A summary of the information recorded in (a) to (f) shall be submitted to the Manager no later than 20 working days after 28 February, 31 May, 31 August and 30 November each year.

34. That the Consent Holder shall log all air quality complaints received. The complaint details shall include:

    (a) The date, time, location and nature of the complaint.

    (b) The name, phone number and address of the complainant unless the complainant refuses to supply these details.

    (c) Wind strength and direction at time of complaint.

    (d) Any remedial actions taken.

    Details of any complaints received shall be provided to the Manager within one working day of receipt of the complaint(s).

**Community Liaison Group**

35. That the Consent Holder shall consult with the local community as soon as practicable to facilitate continuation of the established Community Liaison Group (CLG). Parties to be consulted will include owners and occupiers of all premises within 500 metres of the site boundary, relevant community organisations such as the Hunua Environmental Protection Society Incorporated (HEPSI), and AC.

36. That the Consent Holder shall ensure:

    (a) That invitations to participate in the CLG shall be distributed to potential members including all those identified in condition 33, with the objective that the CLG comprise up to five representatives of the local community, as well as representatives of the Consent Holder, and AC. The membership of the CLG shall be reviewed triennially, or more frequently if appropriate, and invitations to participate distributed to potential members.

(b) That its representative attends each formal meeting of the CLG, which shall be held within six months of the date of commencement of this consent and at least once every six months thereafter, unless otherwise agreed at a greater or lesser frequency by majority decision of the CLG membership.

(c) That the purpose of the CLG shall be as agreed by the CLG to discuss matters relevant to the effects of quarry operations beyond the site boundary, including, but not limited to, results of monitoring, future development proposals or proposals to vary or apply for consents, concerns and complaints of residents, particularly where the concern or complaint pertains to a matter of general as opposed to individual interest, and aspects of any non-compliance and means of alleviating them.

(d) That an agenda listing matters for discussion and relevant written information regarding the matters on the agenda is provided to the CLG at least one week prior to each meeting,

(e) That the minutes of the CLG and details of action points to be followed up shall be forwarded to the members and attendees of the CLG and the parties listed in condition 33 upon request within one month of each meeting being held.

(f) That at least two weeks' notice in writing of the date, time and location of the next CLG is given to the members of the CLG.