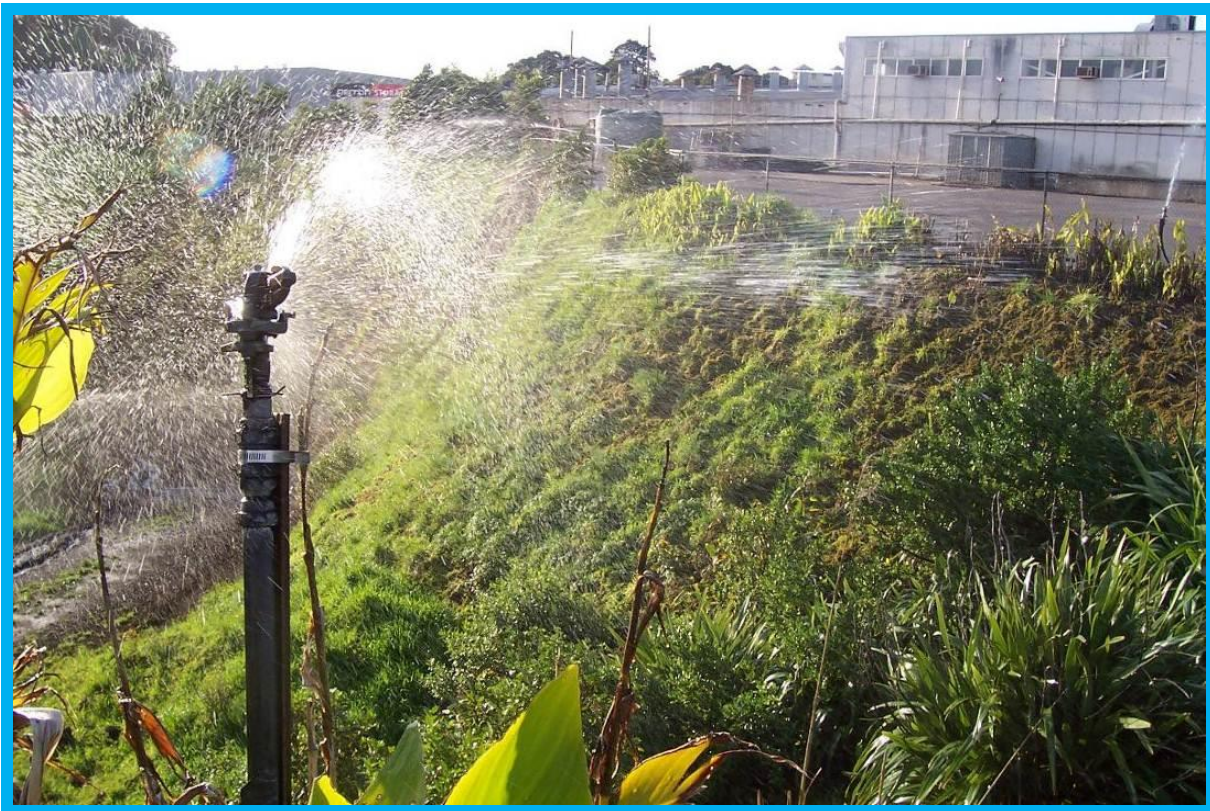


September 2015

Three Kings Air Quality Management Plan

An Air Quality Management Plan for the Three Kings Quarry is required by condition 26 of the Air Discharge Permit for Three Kings Quarry (Permit No 40041)



Note: This plan is subject to change. The Site Manager or Consent Authority should be contacted to ensure the latest version is being viewed.

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APPENDICES

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Abbreviations:

AQMP: Air Quality Management Plan

AC: Auckland Council

BAM Beta Attenuation Monitor

Hi-vol: High Volume TSP Sampler

TSP: Total Suspended Particulate

SLG: Site Liaison Group

1. Introduction

An Air Quality Management Plan for the Three Kings Quarry is required by condition 26 of the Air Discharge Permit for Three Kings Quarry (Permit No 40041) granted February 2015 (Appendix 1). Permit No 40041 was granted following the application made by Winstone Aggregates to renew the site's Air Discharge Permit No 21875 which expired on 1 August 2012.

Air Discharge Permit 40041 authorises dust emissions to air from quarry operations at the Three Kings Quarry provided that beyond the boundary of the site there shall be no odour, fume or dust which is noxious, offensive or objectionable. Discharge to air from the fill activity is classified as a permitted activity under Rule 4.5.1 of the Auckland Council Regional Plan: Air, Land and Water (2013) and therefore does not require separate resource consent.

This Air Quality Management Plan records all management, monitoring and operational procedures necessary to comply with the conditions of the Three Kings Quarry Air Discharge Permit.

The Key Monitoring Features Layout Plan (Appendix 1) shows the general layout of Three Kings Quarry including the operational areas and monitoring points.

2. Purpose and Objective of the Plan

The purpose of this plan is to document all management, monitoring and operational procedures required to achieve compliance with Air Discharge Permit 40041 and the permitted activity standards of Rule 4.5.1 of the Auckland Council Regional Plan: Air, Land and Water (2013) and the Proposed Auckland Unitary Plan (PAUP) .

The objective being to avoid, remedy or mitigate any adverse effects of particulate due to quarry/fill activities beyond the boundary of the site.

A copy of this management plan shall be kept on site at all times and will be available for use by site personnel at all times.

3. Resource Consent Requirements

3.1 Requirement to Prepare an Air Quality Management Plan

Condition 26 of the Air Discharge Permit requires the following:

An Air Quality Management Plan (AQMP) which accurately records all management, monitoring and operation procedures necessary to comply with the conditions of this consent shall be maintained. The AQMP shall include, but not be limited to, details regarding the following:

- (a) dust suppression methods for stockpiles, crushing, screening and transfer operations including details relating to water sprays on any permanent stockpiling equipment;*
- (b) operation of the reticulated dust suppression system;*
- (c) any other relevant dust suppression techniques to be used on site; and*
- (d) all relevant monitoring procedures required by conditions 19 to 24 including procedures for dealing with elevated dust levels as required by conditions 21 and 22.*

The AQMP shall be submitted to the Team Leader – Air Quality for review on the written request of the Team Leader – Air Quality. Any subsequent changes shall also be submitted for review. The Team Leader – Air Quality will advise the Consent Holder, in writing, if any aspects of the Management Plan are considered to be inconsistent with achieving the provisions of this consent.

3.2 Limit Conditions

The Air Discharge Permit states limit conditions which operations at Three Kings Quarry are required to meet. These conditions are 6, 7, 8 and 9. Further requirements are detailed within condition 59 of the AC amalgamated consent conditions which authorise filling.

Air Discharge Permit

Condition 6:

At all times, quarrying processes on site shall be operated, maintained, supervised, monitored and controlled so that emissions authorised by this consent are maintained at the minimum practicable level.

Condition 7:

Beyond the boundary of the site there shall be no odour, fume or dust caused by discharges from the site which, in the opinion of an enforcement officer, are noxious, offensive or objectionable.

Condition 8:

Quarrying activities, including blasting, crushing, screening, transporting of rock on site with the potential to generate dust shall be undertaken to ensure visible discharges to air are kept below levels which, in the opinion of an enforcement officer, are noxious, offensive or objectionable.

Condition 9:

The operation of the Three Kings Quarry shall not exceed:

- (a) an extraction rate of 100 tonnes per hour;*
- (b) a crushing rate of 200 tonnes per hour; and*
- (c) a screening rate of 200 tonnes per hour.*

Fill Permits

Condition 59:

All necessary actions shall be taken to ensure compliance with the regional discharge air permit 21875 to prevent dust nuisance from the filling to neighbouring properties and public roads, reserves and areas outside of the subject site. These include, but shall not be limited to:

- (a) Staging of areas of works*
- (b) Retention of existing vegetation and bunds around the perimeter of the site*
- (c) The installation and maintenance of wind fences and where practicable vegetated strips as the fill level rises*
- (d) Watering down of internal haul roads which are not metalled or adequately sealed*

- (e) *Watering down fill materials which are dry and/or contain dust substances*
- (f) *Suspension of fill operations if necessitated by the prevailing weather conditions*
- (g) *Providing dust suppression monitoring records to the Manager on a 3 monthly basis after commencement of the fill activities to ensure ongoing compliance with this condition.*

3.3 Process Conditions

The Air Discharge Permit defines process conditions which operations at Three Kings Quarry are required to meet (conditions 10 to 18) as follows:

- *techniques used for excavating rock, blasting and drilling which minimise dust emissions*
- *crushing, screening and transfer operations which minimise dust emissions*
- *procedures to ensure that dust from the yard, quarry floor and all internal roads is kept to a practicable minimum at all times (including during non-working hours)*
- *to limit vehicle speeds within the site to a maximum of 20 km/hr unless the road or route is visibly damp and vehicles do not raise visible dust*
- *the location, construction and management of stockpiles to minimise dust emissions*
- *the installation and maintenance of a suitably designed wheel wash*
- *the operation of a automatic reticulated dust suppression system around the perimeter of the quarry working area*
- *the maintenance of water supplies for dust control measures*
- *the rehabilitation of quarry batters*
- *to limit extraction, processing and stockpiling to the existing quarry operational area*
-

3.4 Expiry of the Air Discharge Permit

The permit to discharge contaminants to air (Air Discharge Permit 40041) will expire on 1 March 2020. At this point the Three Kings Air Quality Management Plan will be updated to reflect the nature of onsite operations and the regulatory framework.

3.5 Permitted Activity Standards

Rule 4.5.1 of the Auckland Regional Council: Proposed Air Land and Water Plan states:

- (a) *That beyond the boundary of the premises where the activity is being undertaken there shall be no noxious, dangerous, offensive or objectionable odour, dust, particulate, smoke or ash; and*
- (b) *That there shall be no noxious, dangerous, offensive or objectionable visible emissions; and*
- (c) *That beyond the boundary of the premises where the activity is being undertaken there shall be no discharges into air of hazardous pollutants that does, or is likely to, cause adverse effects on human health, ecosystems or property; and*
- (d) *That beyond the boundary of the premises where the discharges into air of agrichemical or paint or powder coatings is being undertaken there shall be no drift or overspray from the application.*

4 Relevant Documents

Reference should be made to the Three Kings Quarry Management Plan and the current TSP Monitoring Plan dated April 2007) and associated correspondence (Appendix 3) and documents submitted to the Auckland Council associated with the application for a resource consent to discharge contaminants to air (application dated 31 January 2012). Reference should also be made to the “Assessment of Air Quality Effects from the Proposed Cleanfill at the Winstone Aggregates Three Kings Quarry – Final Report, URS New Zealand Ltd, 30 July 2008.

The TSP Monitoring Plan has been undated as of April 2007 to include the addition of a continuous TSP (total suspended particulate) monitor, the BAM (Beta Attenuation Monitor), to the monitoring programme. Approval of the April 2007 TSP Monitoring Plan is contained within correspondence from AC received 3 July 2007 (Appendix 3).

4.1 Location of Documents

A copy of the following documents will be maintained in the office at Three Kings Quarry and will be made available for use by all staff and site visitors as is reasonably required.

- Air Quality Management Plan.
- Dust monitoring records and associated reports.

In addition, the following plan will generally be available at the quarry office.

- Three Kings Quarry Management Plan.

Records are periodically archived in secure storage.

5 Roles and Responsibilities

5.1 Winstone Aggregates

The Three Kings Site Manager is responsible for, and manages all site operations. Winstone Aggregates, as the consent holder, has a general responsibility to implement all consent conditions, to abide by this Management Plan, as well as all other Management Plans relevant to the operation.

5.2 Auckland Council

The Team Leader - Air Quality, Auckland Council is responsible for the suitability of this AQMP as well as regulating compliance to permit 40041. Condition 26 of permit 40041 states that the Manager will advise Winstone Aggregates, as the consent holder, in writing, if any aspects of the AQMP are considered to be inconsistent with achieving the provisions of this consent.

The Auckland Council also has enforcement officer duties and assesses the operation in terms of compliance with the air discharge permit.

5.3 Technical Experts

Technical experts are, at times, required to provide advice and technical expertise on the operation. An understanding of consent conditions and this management plan is required.

6 Specific Plan Components

6.1 Overall Requirements

The overall requirement of this management plan is to comply with the conditions of Air Discharge Permit 40041 and the permitted activity standards of Rule 4.5.1 of the Auckland Council Regional Plan: Air, Land and Water (2013). It provides a platform to efficiently monitor dust (particulate) emissions associated with the quarrying, processing, stockpiling and transport of aggregates. In addition, it provides a platform to efficiently monitor dust (particulate) emissions associated with the placement of fill.

It contains operational procedures, monitoring plans, reporting and contingency plans relating to control of dust emissions.

6.2 Consultation

Winstone regularly consults with interested parties, in particular the Three Kings Quarry Site Liaison Group. The members of the Three Kings Quarry Site Liaison Group, at the Site Liaison Group meeting, will be informed of monitoring results obtained since the previous Site Liaison Group Meeting.

6.3 Training

The success of this AQMP depends on appropriate actions by site personnel in day to day operations of Three Kings Quarry. Training will be provided to staff during site inductions and regular site operation meetings. A Health, Safety and Environmental meeting is held monthly where staff attendance is mandatory. These meetings assess the site activities and any incidents or complaints of the previous month and commit to any required actions for the next. On site practices relating to minimising dust emissions together with procedures for reporting and dealing with dust emissions are reviewed as required.

Job descriptions and annual training reviews will identify individual staff training requirements in aspects of the control. The Site Manager or representative will oversee training, and ensure that it is appropriate. Staff training records will be maintained and available for inspection by AC for the duration of the relevant consents and two years thereafter.

Procedures active at Three Kings Quarry ensure that mitigations described within this AQMP are maintained and obligations are fulfilled. Specialist training will be provided as required to personnel involved in the following areas:

- Collection of TSP data
- Recording and Processing of Data
- Download of Meteorological Data
- Data Storage
- Reporting

7 General Description of Site Operations

Winstone has operated a scoria quarry at Three Kings since the 1920s. Quarrying has occurred in the general location for over 150 years. The site area is 15.184 ha, with adjacent land to the immediate north, south and southwest having previously been quarried. Some of that previously quarried land has also been rehabilitated by filling, and some of it has subsequently been developed.

Until 2011 the predominant operations at Three Kings have been quarrying, involving extraction of rock resource, processing, stockpiling and load out.

In 2012, rehabilitation of the site commenced through backfilling of the void created by scoria extraction using imported fill material. Filling is now the predominant operation at Three Kings but rock extraction may continue as described in the next section.

Fill material is typically the surplus soil resulting from development site excavations, (e.g. from sub-divisions, roads, commercial and residential structures etc.) from other parts of the Auckland region.

Stockpiling and load out activities continue utilising aggregates imported from other quarries. The size and scale of the stockyard will change depending on the space available (due to filling activities).

Quarrying

As filling progresses it may enable access to additional rock resource which may be extracted, processed and stockpiled for use onsite or sale depending on the feasibility assessed at that time. In addition rock resource may need to be removed from within the quarry floor (the mounds). The following describes typical quarry activities undertaken at Three Kings for rehabilitation purposes.

7.1 Extraction

Scoria is generally extracted using an excavator or bulldozer as required. However, layers and irregular masses of harder basalt rock are often present amongst the predominant scoria material. This harder basalt may require drilling and blasting or the use of a rock hammer to extract. The extraction of rock is undertaken in order to enable the rehabilitation works to progress and provide for onsite use if required

7.2 Crushing and Screening

If the extracted rock requires further processing it is crushed and screened using a mobile crushing and screening plant, located on the quarry floor. The processing plant is generally enclosed with the processed material being transported to the stockpile area using a wheeled loader as the product is processed. Wherever possible the use of mobile crushing equipment will be minimised.

7.3 Stockpiling

Product is removed from the processing plant at various points and transported by wheeled loader to the stockyard prior to sale.

Unprocessed rock and scoria or imported materials are also stockpiled within the stockpile area.

7.4 Loadout and Transport

Road trucks are loaded with aggregate within the stockpile area using a wheeled loader and are dispatched from the site via a weighbridge. Prior to exiting the site, all trucks which enter the quarry or stockpile area must pass over a wheel wash.

Fill Placement

In 2012, rehabilitation of the site commenced through backfilling of the void created by scoria extraction using imported fill material. Fill is transported by trucks, or trucks and trailers, and placed progressively by earth moving machinery in layers across the site. The procedures to address fill material quality and acceptance are discussed in the Fill Management Plan (FMP).

The following describes typical fill activities which will occur at Three Kings.

7.5 Incoming Fill

All vehicles transporting fill shall report to a designated reception area at the site entrance off Mt Eden Road. A suitable trained person shall inspect all incoming loads and these inspections shall be documented and subject to internal quality procedures and audit which shall be reported to the Manager (AC) on an annual basis. Once all the requirements of the Fill Management Plan have been met the truck driver will be directed to the tip head

7.6 Fill Placement

During summer months, trucks will back up over previously deposited fill and tip off at a safe distance from the tip face as directed by a spotter or machine operator. Tipped loads are pushed clear, spread in layers and will be compacted according to material type and according to the spatial location in the body of the fill.

In winter, if required, a tip head or tip dock which trucks reverse up to may be constructed. This would be at the edge of the tip face with a hardened access and turning area for the trucks to traverse. Fill loads are then deposited over the tip dock, and an excavator used to lift the fill material from the trench and deposit for a bulldozer to push out.

7.7 Fill Placement/Rejection and Air Quality

A key aspect of fill placement is that the materials will generally be damp and consequently unlikely to generate any significant levels of dust during placement.

Furthermore, it is important to state that material placed on the site must meet the definitions within the Three Kings Fill Management Plan. This means it will not contain contaminants that have the potential to be harmful to human health or the environment.

However, as a contingency measure Section 4.6 of the Fill Management Plan addresses the procedures in place when fill material is rejected from the site (due to any of the reasons detailed in the Fill Management Plan). As part of the fill rejection procedures air quality will be taken into

account in that the material will be appropriately stored / handled to minimize any discharges to air.

8 Dust Suppression Methods

Winstone personnel will be made aware of all potential adverse effects of dust emissions and shall be active in identifying actual and potential dust sources.

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

The control of dust emissions at Three Kings 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 site activities being undertaken, wind strength, speed and direction, and shall be determined in practice by the Site Manager or representative.

8.1 Reticulated Dust Suppression System

An automated fixed water sprinkler system is located around the perimeter of the quarry working area in order to keep upper quarry benches and main access roads in a damp condition. The water sprinklers are spaced at 10 to 15 metre intervals in order to maximise the effectiveness of the sprinkler system as a dust suppression measure. The sprinklers use an automated timing system where individual zones operate on a continuous rotation around the perimeter of the site. These sprinklers will generally be able to be used 24 hours a day, 7 days a week, 365 days a year provided the water supply is maintained.

Contingency measures will be put in place (such as using mains water or an alternative water supply) should the existing municipal supply bore not be able to provide sufficient water to the sprinklers for any period of time (section 9.7).

Automated timing of the sprinklers is controlled from the weighbridge and is usually activated at all times. The timing and duration of the rotation of the sprinklers is able to be carried such that one part of the quarry could receive more water as required should the need arise.

The sprinkler system also maintains vegetation cover on the upper faces and benches, further reducing the potential for dust emissions arising from these areas.

8.2 Excavation and Blasting

Scoria is generally of a damp condition and dust emissions during extraction are minimal. A water cart is used to dampen haul roads throughout the site and to dampen any stockpiled material, should dust emissions occur.

Dust suppression during blasting will consist of measures such as the wetting of rock prior to blasting. Blast hole drilling rigs will be fitted with dust suppression and dust collection equipment.

8.3 Crushing and Screening

A mobile crushing and screening plant is typically used to process the excavated basalt and scoria. Water sprays are not fitted on the processing plant, as the material being processed is generally damp and does not emit significant amounts of dust during processing.

Processed material is generally removed from around the processing plant as it is produced and stockpiled within the stockpile area. Haul routes from the processing plant are watered as required to reduce emissions of dust arising from vehicle movements.

8.4 Stockpiling

Stockpiles are currently located in a stockyard in the south-west section of the site. Stockpiles may be relocated as the fill operations progress. The location of the stockpile/stockyard, volume of stock and stock types will be detailed in the biennial report due by 1 November every two years starting in 2015.

Dust emissions from the stockpile area are suppressed by water from a water cart. The water cart also has a fogging facility to dampen stockpiled material as required. At present Winstone has one full time water cart onsite at Three Kings. If required an additional water cart can be sourced from another Winstone site or from one of our mobile plant hire providers.

8.5 Loading, Transport and Transfer Operations

The quarry haul roads are regularly dampened by the water cart especially when visual checks have identified dust to be rising with vehicle movements. The fixed sprinkler systems installed around the perimeter of the quarry also dampens main haul roads to and from the weighbridge and stockpile areas.

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

All Winstone employed drivers are required to cover loads when delivering or taking aggregate. All other drivers (including owner drivers/contractors) will be requested to cover loads which have a potential to create a dust nuisance. A sign will be displayed near the quarry exit requesting all drivers to cover loads with a potential to create a dust nuisance.

8.6 Fill Placement

For the fill component of the Three Kings operation the most important dust control technique is the management of the material that is brought onto the site. Winstone Aggregates will implement strict controls to determine materials meet the acceptance criteria in the Fill Management Plan. This means that potentially dusty materials will not be tipped, unless they have been dampened or otherwise stabilised. Drivers or companies that falsely declare loads that are dusty will be dealt with through the Incidents and Complaints Procedure which is detailed in the Fill Management Plan.

The other mitigation measures that can be used to minimize dust emission from the placement of fill include:

Considering Meteorological Conditions

By reviewing meteorological conditions before undertaking tasks it is possible to avoid effects. For example, using alternative tipping locations within the site that are more than 100 meters from the site boundary if there is a strong wind (greater than 10 m/s) blowing towards the boundary.

Minimise Exposed Areas

Because of the relatively confined space within the quarry footprint and the need to move the tipping faces around the site it is not considered practical to further minimise the exposed area. However, Winstone Aggregates will develop dedicated haul routes within the site that will be used by trucks and thereby minimise surface disturbance. These haul routes are watered as required to reduce emissions of dust arising from vehicle movements.

Dampening with Water

The periodic watering of the disturbed areas of the site will be used to control dust emission of required. The amount of water and frequency of application to maintain a desired level of dust control will be a function of the season and the moisture content of the material. Because of the need to control moisture content of the fill to ensure consistent compaction it is unlikely that there will be a need to water the tip areas

Load Covering

Winstone Aggregates will insert a condition in any contract between the consent holder and any major contributor of fill requiring contractors to comply with the Driver's Code of Conduct (including to cover loads where necessary). For further details on the Driver's Code of Conduct refer to the Fill Management Plan.

9 Additional Dust Control Measures

9.1 Vehicle Speed Limit

A speed restriction of 20 km/h is generally in place within the quarry site. All vehicle speeds on unsealed roads will be limited to a maximum of 20 km/h unless the road is visibly damp, and vehicles do not raise dust. All visitors to the site are requested, via a sign at the entrance, to reduce speed.

9.2 Water Cart Management Procedure

A water cart is operated whenever required to dampen areas throughout the site, including stockpile areas. The water cart has a fogging facility to dampen stockpiled material prior to loadout. The need for its use shall be determined in response to weather conditions and observed dust emissions on site. The water cart will be operated outside normal working hours, including weekends and public holidays as required. The water cart use, including amount of water used, is recorded in the daily water cart sheet.

9.3 Wheel Wash

To prevent the deposition of materials on public roads by vehicles leaving the site, two wheel washes have been installed. When exiting the site all vehicles that have traversed over unsealed parts of the site are required to pass through at least one of the wheel washes. At least one of the wheel washes will remain in operation at all times and for as long as the fill consents are exercised. All necessary measures, including maintenance of access roads and wheel washes, shall

be used to prevent the deposition of sediment and any other materials on public roads by vehicles leaving the site. Should material be deposited on the road to an extent considered significant by the Manager (AC) it shall be removed immediately by Winstone.

9.4 Truck Spillage

Dust emissions may be caused by the spillage of material from a truck either on site or once the truck has exited. 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 spilled material noted or reported to the quarry within the sealed area of the site or in the general vicinity of the quarry, once the truck has left the site, will be promptly cleaned up.

9.5 Vehicle Exhausts

Winstone ensures that all its vehicles do not have downward facing exhausts as these may act to raise dust in dry conditions.

All Winstone vehicles are regularly maintained to ensure minimum emissions.

9.6 Vegetation

Vegetation is used to reduce the generation of dust emissions from upper quarry faces and benches. The vegetation planting is described in the document prepared by Boffa Miskell Limited, titled "Three Kings Quarry, Boundary Planting Proposal", dated 1996. A copy of this document is attached with to Quarry Management Plan.

This plan details boundary and screen planting in four areas during quarry and fill operations:

- Mt Eden road frontage;
- the internal access road;
- the western quarry face (adjacent to the Big King Reserve);
- all other quarry faces.

The vegetation is planted and maintained at all times and in such a manner as to create and preserve a visual screen for adjacent sites. Re-vegetation of quarry batters and faces is undertaken on an on-going basis where the resource is depleted or no longer plays an active part in the operation of the quarry. All areas to be re-vegetated will be planted, grassed or hydroseeded as soon as practical.

All re-vegetated areas will be monitored with appropriate maintenance and watering to maintain the planting or vegetation cover.

9.7 Water Supply

Water used for dust suppression within the site is sourced from the municipal supply bore located adjacent to the southern boundary of the site. This bore has sufficient capacity to supply all the water requirements for the site.

Contingency measures will be put in place, such as using mains water or an alternative site supply should the existing municipal supply bore not be able to supply sufficient water for any period of

time. In the event of a water shortage for dust suppression, water can be immediately brought onto site using a tanker truck. An alternative temporary supply to the municipal supply bore can be generally established at the quarry within 5 working days.

9.8 Limitation on Extraction, Processing and Stockpiling

No extraction or processing will be undertaken within the north eastern corner of the site without a variation to existing conditions of consent. Refer to Appendix 1 for a plan which details this boundary.

9.9 Procedure for Replacing the Processing Plant

The existing mobile crushing and screening plant may be replaced or additional processing plant may be installed. Notice will be given to the Manager (AC) at least one month prior to the mobile crushing and screening plant and associated equipment being replaced or additional plant being installed.

Details will be supplied to the Manager (AC) of the proposed replacement or additional processing plant, the location of the plant and associated equipment and any mitigation measures proposed for both moving and operating the new or additional plant.

10 Monitoring

The following monitoring will be undertaken:

- Total suspended particulate (TSP)
- Video recording all blasting and associated dust emissions
- Video monitoring of site operations
- Wind speed, wind direction and rainfall

10.1 Total Suspended Particulate Monitoring

In accordance with Condition 19 of the Air Discharge Permit and the recommendations of the report 'A Review of the TSP Monitoring Plan for Three Kings Quarry', dated April 2007 and the subsequent information submitted as part of the application for the current Air Discharge Permit total suspended particulate (TSP) monitoring will be undertaken by two Real Time Beta Attenuation Monitor (BAM)

A single BAM is located at the existing site offices, and samples the ambient air 24hrs a day, seven days a week.

A second BAM is located in the south western corner of the site. This monitor was installed in early 2012 prior to the placement of fill as required by the consents which authorise filling.

Both BAMs are programmed to send out text messages to the Site Manager and representatives at levels which provide an early warning of the potential dust issues if action is not taken. When such alarms are received appropriate investigation and/or action by the Site Manager or representative will be undertaken to address the alarm. The alarms levels will continue to be reviewed as data is received and analysed and the levels adjusted as required.

The data from the BAMs are recorded with an automatic data logger. The data is downloaded monthly for analysis, reporting and archiving.

10.2 Video Recording of Blasting and Associated Dust Emissions

A video recording will be made of all blasts.

10.3 Video Monitoring of General Site Operations

Motion activated video monitoring is undertaken at Three Kings Quarry. The locations of the cameras are detailed in Appendix 1. These cameras, depending on the location, provide video footage which can be used in dust monitoring and incident and complaint investigations as well as for processing trucks, security measures and a record of the general daily operations.

Approximately three months of data is held in archive of all video recordings. This data is available to be viewed onsite during operating hours by prior arrangement with the Site Manager or representative.

In addition, for any period requested in writing by the Manager (AC) the recordings of specific cameras will be kept for an extended period of six months from the date of each entry.

All recordings are date and time stamped.

10.4 Weather Station

A weather station will be maintained onsite to continuously record wind speed, wind direction and rainfall. This weather data is recorded with an automatic data logger. The data is downloaded monthly for analysis, reporting and archiving.

10.5 Daily Air Permit Log

A daily air permit log will be kept recording the following information:

- Any dust control equipment malfunctions and any remedial action taken;
- Any visible emissions of dust and the source;
- All relevant details relating to the total suspended particulate monitoring required by the TSP Monitoring Plan to enable compliance with conditions 19 to 24 of the Air Discharge Permit;
- Water cart use, the frequency of use and the volume of water used;
- The date and time of the entry and the signature of the person entering the information.

10.6 Complaints

If an air quality complaint is received it will be recorded as per the Incidents and Complaints Procedure (as detailed in the Fill Management Plan) with the following information noted:

- The date, time, position and nature of the complaint;
- The name, phone number and address of the complaint, unless the complaint refuses to supply these details; and
- Any remedial actions taken.

A copy of all complaint records will be available on request for inspection at the quarry office during operating hours. These records will be kept for the duration of Air Discharge Permit.

A summary of all complaints received and any remedial actions will be submitted to the Manager (AC) at the end of each quarter.

10.7 Summary of Monitoring Requirements

A summary of all monitoring related to Air Discharge Permit 40041 is provided in Table 1

Table 1: Air Discharge Permit Monitoring Requirements

Parameter	Location	Frequency of sampling	Sampling Period
Real Time BAM	On the office roof within the quarry site	24hrs a day, 7 days a year.	Continuous
Real Time BAM	South West Corner	24hrs a day, 7 days a year.	Continuous
Wind speed, Wind Direction and Rainfall	On the top of the main office at the site	Continuous	Continuous
Motion activated video monitoring	Quarry working area	Continuous	As requested by the Manager (AC)
Video monitoring of blasting	Quarry working area	Whenever a blast is undertaken	Whenever a blast is undertaken
Visual emission of dust and water cart usage	Within the boundary of the quarry	Daily during working hours	Whenever the quarry is operating
Air Permit Daily Log	Within the Quarry Site	Daily	Whenever the quarry is operating
Water Use	Within the Quarry Site	Daily	Daily and Weekly
Complaints	Reported to the Quarry	When a complaint is received	When a complaint is received

11 Recording and Reporting

11.1 Quarterly Reporting

A quarterly report will be submitted to the Auckland Council and will include a summary of BAM, wind and rainfall data, the daily air permit log and any complaints received for the preceding 3 months.

Quarterly reports will be submitted to the Auckland Council 10 working days following the end of February, May, August and November.

11.2 Biennial Reporting

A biennial air permit report will be provided to the Auckland Council by 1 November 2015 and every second year thereafter which includes:

- (a) The volume and type of the rock and areas where extraction has occurred over the previous two years;
- (b) Areas where rehabilitation has occurred over the previous two years, including the areas fully quarried out and replanted and those areas with temporary planting, and the periods when and areas where hydro seeding or grassing was undertaken;
- (c) Location of stockpiles, including volumes and aggregate types;
- (d) A summary of the weekly water usage, including water cart usage;
- (e) Projections for the upcoming two years for items (a) to (d); and
- (f) Any dust trials or additional dust control measures undertaken for the past two years or proposed for the next two years.

11.3 Blast Notification

At least 24 hours prior to any blasting being undertaken on site written notification shall be provided to the Manager (AC). This notification shall provide the following details:

- (a) The proposed date and time of the blast(s);
- (b) The proposed location and size of the blast(s) including what rock type is to be excavated;
- (c) The proposed dust suppression methods to be undertaken;
- (d) Any other relevant details; and

If any of the information changes following notification the Manager (AC) shall be advised as soon as practicable.

Furthermore, signs or notices that describe what the siren blasts mean and the timing of the subsequent blast will be placed in prominent places around the Three Kings Community. Refer to the Quarry Management Plan for further details.

11.4 Additional Reporting

In accordance with condition 27 of the Air Discharge Permit should TSP monitoring results from either BAM exceeds 60 micrograms per cubic metre as a 24 hour average the Manager (AC) will be advised as soon as practicable. An investigation shall be undertaken immediately by the Site Manager or representative as to the probably causes of the exceedance. If the cause of the elevated levels of TSP is identified as being an activity related to site activities, then as far as practicable, action shall be taken by the Site Manager or representative to reduce those discharges to the satisfaction of the Manager (AC).

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The Three Kings Quarry Site Liaison Group, at the site liaison group meetings, will be informed of the monitoring results for the previous quarter.

11.5 Records

The following records will be kept on site available for review with prior arrangement:

- Copies of all monitoring results (up-dated monthly).
- Copies of all Quarterly and Bi-annual Reports.
- Copies of all relevant correspondence with the Auckland Council.
- Copies of all consents, permits, SLG meeting notes and management plans associated with the quarry operation and rehabilitation.
- Daily air permit logs.
- Copies of exceedance investigation reports.
- Training and environmental audits and reviews.

An electronic file of all monitoring results will also be maintained.

12 Contingency Plan for Air Quality Exceedances

Monitoring of ambient air conditions at Three Kings Quarry Site is outlined in section 10. A programme of emergency response will be undertaken if the total suspended particulate concentration exceeds 60 micrograms per cubic meter as a 24-hour average as recorded in either BAM.

The emergency response programme is:

Step 1:

When the total suspended particulate concentration level in ambient air monitoring exceeds 60 micrograms per cubic meter as a 24 hour average, the Manager (AC) will be informed as soon as practicable.

Step 2:

An investigation will be undertaken by Winstone personnel to ascertain of the probable causes of exceedence. The results of this investigation are to be reported to the Auckland Council.

This may involve the following:

- Analysis of wind speed and wind direction
- Analysis of video records of the site
- Analysis of BAM samples for inorganic composition
- Source analysis of the BAM samples

Step 3:

If the cause of the elevated levels of total suspended particulate is identified as being from an activity undertaken within the Three Kings Quarry then appropriate action will be undertaken to reduce those discharges to the satisfaction of the Manager (AC).

13 Audit and Review of Air Quality Management Plan

Winstone carries out periodic internal and external environmental reviews and audits. These are undertaken by senior Winstone personnel or external consultants.

A Health, Safety and Environmental meeting is held monthly where site staff attendance is mandatory. These meetings assess the activities and any incidents of the previous month and commit to any required actions for the next.

Because of the physics of dust movements the greatest potential for effects will occur when the filling activities are within 100 metres of the site boundary, as that is when the greatest potential exist for dust, if it is generated, to be carried off site. As a result Winstone Aggregates commits to reviewing this Air Quality Management Plan on an annual basis. This review will typically take place prior to the summer months and allow for any amendments to be made onsite prior to the drier weather.

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

Condition 32 of the Air Discharge Permit provides for a review of the conditions of consent by the Auckland Council in March 2016 and March 2018 in order to:

- (a) deal with any significant adverse effect on the environment arising from the exercise of this consent which was not foreseen at the time the application was considered and is appropriate to deal with at the time of the review;*
- (b) consider the adequacy of the conditions which prevent nuisance beyond the boundary of the site, particularly if regular or frequent complaints have been received and validated by an enforcement officer;*
- (c) consider developments in control technology and management practices that would enable practicable reductions in the discharge of contaminants;*
- (d) alter the monitoring requirements, including requiring further monitoring, or increasing or reducing the frequency of monitoring, or altering the trigger level as given in Condition 21, if it is considered that the monitoring requirements are not appropriate to assess any nuisance beyond the boundary of the site; or*
- (e) consider the adequacy of the conditions which relate to preventing nuisance and controlling discharges to air from blasting operations on si*

