

23rd December 2016

Team Leader – Air Quality
 Auckland Council
 Private Bag 92 300
 Auckland 1142

Dear Team Leader – Air Quality

Re: Investigation of Total Suspended Particulate Trigger at Three Kings Quarry

With regard to condition 21 of the Three Kings Quarry Air Discharge Consent (Permit Number 40041), this is to confirm that a result greater than 60µg/m³ as a 24 hour average was recorded by the Office BAM unit on the 16th December 2016.

The trigger is as follows:

- 16 December 2016 – 75.5 µg/m³ at the BAM monitor located at the site office.

As required by condition 21 of the Air Discharge Permit, an investigation has been undertaken. This letter details the results and conclusions of the investigation.

Air quality monitoring at Three Kings Quarry consists of:

- Two Beta Attenuation Monitors (BAM) units. These units are located at the Office and the Southern Boundary.
- A meteorological monitoring station located at the site offices that records wind speed, wind direction and rainfall on a continuous basis.
- Video cameras that monitor the site from the north and south.
- Visual inspections of air quality carried out by site staff.
- Recording of dust suppression equipment use and malfunctions.

All relevant air quality monitoring results collected on the day of the trigger have been summarised in Table 1.

Table 1: Air Quality Monitoring Results

Date	16/12/2016
BAM - Office (µg/m³)	75.5
BAM – Southern Boundary (µg/m³)	34.2
Daily Rainfall (mm)	0.0
Daily Average Wind Speed (m/s)	4.440
Daily Average Wind Direction (degrees)	231.528
Sprinklers Operational? (yes/no)	Yes
Video Monitors Operational (yes/no)	Yes
BAM Text Alarm Received (yes/no)	Yes

Investigation of the Trigger:

- There was no rainfall recorded on the day of the trigger.
- The daily average wind speed on the day of the trigger was 4.440 m/s which was the third highest average daily wind speed for the month of December 2016 thus far.
- The daily average wind direction was 231.518° (South-West).
- The BAM monitor at the site office was the only unit to record a value over 60µg/m³ as a 24 hour average. The BAM monitor located at the Southern Boundary recorded 34.2µg/m³ as a 24 hour average for the same day.
- The sprinkler system and water cart were fully operational on the day of the exceedance.
- The BAM monitors are currently set to send out text messages to the Site Manager, Supervisor and Environmental Fill Specialist at levels which provide an early warning of potential dust issues if action is not taken. A number of text messages were received on the day of the exceedance which prompted visual inspection of the site throughout the day. Points to note include:
 - A very strong South-West wind
 - No visible dust sources from fill operations within Three Kings Quarry
 - There was an entry made in the onsite dust log at 11am on the day of the exceedance which stated there was dust visible from trucks entering our site to the weighbridge. The action to mitigate this dust source was to utilise the watercart more frequently from 11am onwards, so that the entranceway was kept in a constant damp state for the remainder of the day
 - Drain laying earthworks were taking place in the adjacent SHA site at two locations along the Three Kings Quarry entranceway (refer to Appendix 1 for photos)
 - Two SHA stockpiles of aggregate were being utilised and replenished throughout the day at two locations along the Three kings Quarry entranceway (refer to Appendix 1 for photos)
 - Concrete cutting took place in the SHA site from approx. 3:30pm onwards on the day of the exceedance (refer to Appendix 1 for photo)
- Video monitors of the site have been reviewed and confirmed that there were no specific areas or activities observed within Three Kings Quarry that were significant generators of dust on the day of the trigger.

Cause of Trigger and Corrective Actions:

The investigation conducted into the result of 75.5 µg/m³ as a 24 hour average recorded at the Office BAM monitor on the 16th December 2016 concluded the following potential sources:

- A very strong South-West wind
- Drain laying earthworks taking place in the adjacent SHA site at two locations along the Three Kings Quarry entranceway
- Two SHA stockpiles of aggregate being utilised and replenished throughout the day at two locations along the Three kings Quarry entranceway
- Concrete cutting took place in the SHA site from approx. 3:30pm onwards on the day of the exceedance

We consider that the additional measures of keeping the entranceway of the quarry in a constant damp state, though did not prevent a trigger, certainly managed the degree of exceedance and effect as best as practicable.

Closing:

No complaints to date have been received as a result of this exceedance.

Three Kings Quarry staff will continue to record visible sources of dust in the Daily Dust Log Field sheet and mitigate these sources as soon as practicable.

With the ongoing daily practices being implemented, we are confident that we can continue to manage the site to minimise the occurrence of such triggers.

If there are any further queries or comments on this investigation please do not hesitate to contact me on 027 504 3624 or at angela.klein@gbcwinstone.co.nz

Yours faithfully



Angela Klein

Environmental Fill Specialist

Appendix 1: Photos

