



OCEANAGOLD

PROJECT MARTHA

Response to Request for Further
Information pursuant to s92 of the
Resource Management Act 1991

17 July 2018

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1. HYDROLOGY

- 1.1 *When the river flow is at 2 x MALF what rate do you propose to initiate taking the water at? Is the Company proposing a variable pump rate up to the maximum rate sought such that the river level is always maintained at 2 x MALF when the water take is being exercised? Please confirm this or otherwise.*
- 1.2 *The Company has not provided the location or methodology of the high trigger flow for the proposed water take. Please provide information with respect to this matter. Alternatively there may be a number of options to address this matter but at this stage the WRC suggestion is that Ohinemuri @ Queens Head is the location of the high trigger flow. If this site is used then WRC and the Company will need to establish a correlation between the final point of take and the recorder site - one way of doing may be to provide for low flow gaugings when low flows occur in the Mangatoetoe Stream which can potentially be provided via consent conditions. Please advise whether this approach is acceptable by the Company or whether another approach is preferred and if so what that approach should be. FYI - WRC has calculated the 2 x MALF in the Ohinemuri River as 1.240 m³/s at Queens Head.*

A response to these questions is provided by GHD in **Appendix 1** to this further information response.

2. AIR QUALITY

- 2.1 *With regards to the new area to be mined in the open pit at the northern end, it would be useful to have some assessment of the crystalline silica content compared with previous areas mined to help evaluate risk of air borne silica concentrations based on past monitoring. Does crystalline silica content vary much across the pit or is it relatively homogenous?*
- 2.2 *Ambient air concentrations of NO₂, CO and PM₁₀ arising from blast emissions: I note that the assessment of this indicates that concentrations within the underground mine vent shaft during blasting were all below ambient air quality guidelines and standards and therefore air dispersion modelling is not necessary to demonstrate offsite ambient air concentrations at sensitive receptors. However, evidence for this was from Watercare's analysis in 2007 where it was also unclear what the averaging period was for this testing and how representative the size of the blasts were compared with the current proposal. I therefore think that there needs to be some more justification around this. Are there more test results available (e.g. page 27 refers to regular monitoring of underground air quality for Worksafe purposes)? Are there test results taken at another site with similar blasting conditions that could be used as further evidence?*
- 2.3 *With regards to products of combustion from surface vehicles, the assessment predicts a similar level of combustion related contaminants on the basis that the frequency and concentration of vehicle movements within the mine will be similar to recent levels. However, does this similarity in vehicles mean that there is a similar proportion of vehicles i.e. similar proportion of excavators to trucks to light vehicles etc?*
- 2.4 *Proposed monitoring: it appears that dust deposition and TSP monitoring will continue as currently. However, the current dust deposition and TSP monitoring is limited to one month and 7 day averaging periods respectively which is too long to identify short term elevated dust events. I therefore recommend that continuous dust monitoring using an optical technique is undertaken at station 6.63 (Met station site) at Barry Road. The purpose of such monitoring would be to provide an early warning system to help identify when problems are occurring and to ensure that mitigative actions are taken promptly.*
- 2.5 *Proposed mitigation: although there has been some detail provided around additional mitigation for dust control in the form of wind speed trigger levels and corresponding actions to take, I consider that other additional mitigations discussed are lacking in detail and should be more clearly defined):*
- i) *Earthworks (page 24) - can a limit be placed on the square area of exposed soil at any one time during earthworks rather than just saying keeping this to a minimum and re-vegetating as soon as practical?*

- ii) *Vehicles and roads (page 24) - what is the limit for vehicle speeds? Minimise haul distances? Will there be documentation available to provide evidence of this?*
- iii) *(page 24) What is the decision making process for using dust suppressants rather than other forms of mitigation?*
- iv) *Loading, conveying and unloading (page 25) - How are drop heights minimised? Can this be quantified/ height restrictions imposed?*

A response to these questions is provided by Beca in **Appendix 2** to this further information response.

APPENDIX 1

GHD

LETTER DATED 13 JULY 2018



13 July 2018

Kathy Mason
Oceana Gold NZ Limited
43 Moresby Ave
Waihi

Our ref: 51/37083/

Dear Kathy

Project Martha – Waikato Regional Council Further Information Requests

Please find following our responses to the Further Information Requests (issued by Waikato Regional Council on 3 July 2018) that are relevant to the GHD Water Management studies for Project Martha.

- 1. When the river flow is at 2xMALF what rate do you propose to initiate taking the water at? Is the Company proposing a variable pump rate up to the maximum rate sought such that the river level is always maintained at 2xMALF when the water take is being exercised? Please confirm this or otherwise.*

Our analysis currently assumes that if river flow is at or above 2xMALF at the point of abstraction, then abstraction can occur. We have estimated the 2xMALF value at the point of abstraction to be 0.85 m³/s.

On the occasions when river flow is exactly at 2xMALF at the abstraction point; river flows will fall below 2xMALF in the reach immediately downstream until contribution from other tributaries join the Ohinemuri River. The proposal is to take 20% of flow so the change in flow would be 20% of 2xMALF.

For the ecological analysis we have used the “FRE3” metric, which is an ecologically meaningful indicator of the hydrological regime. The FRE3 statistic is derived by calculating three times the median flow, counting the number of occasions that this was exceeded in the flow record and dividing this number by the number of years of record. Our analysis shows that the change in FRE3 is negligible with the proposed abstraction (14.2 current versus 13.6 with the abstraction) and hence does not impact on this hydrological characteristic. Whether the flow below the abstraction is maintained at 2xMALF or flow falls 20% below 2xMALF in the reach below the abstraction does not change this hydrological characteristic and is unlikely to result in any change in ecological condition or characteristics.

- 2. The Company has not provided the location or methodology of the high trigger flow for the proposed water take .Please provide information with respect to this matter. ...*

The proposed abstraction location is shown on Figure 20 of the GHD water management report and this is reproduced following for reference.



Figure 1 Proposed abstraction location

As suggested the abstraction will be undertaken using a variable rate pump with the control linked to river flow. The existing flow gauges at Frenedrups and Ruddocks (Ruahorehore Stream) cover the majority of the catchment associated with the abstraction point. As shown in Table 1 below only a very small percentage of flow is not monitored by these gauges.

We thus propose that the pumps are operated based on the combined flows from these two gauges with a small factor applied to account for the remaining 3 % of catchment.

OGNZL currently operate both of these gauges and they operate continuously.

Table 1 Flow gauges proposed to manage abstraction from the Ohinemuri River

Flow Gauge Site	Catchment area (Km ²)	Percent of catchment (%)
Frenedrups	50	70
Ruahorehore Stream	19	27
Balance to abstraction point	2	3
Total	71	100

I trust this covers the information requests.

Please advise if you need anything further

Sincerely
GHD Limited

A handwritten signature in blue ink, appearing to read 'Sioban Hartwell', written in a cursive style.

Sioban Hartwell

GHD Principal
029 3551427

APPENDIX 2

BECA

LETTER DATED 5 JULY 2018

Ms Kathy Mason
Senior Environmental Advisor
Oceana Gold (NZ) Limited
43 Moresby Avenue
Waihi 3610

5 July 2018

Attention: Kathy Mason

Dear Kathy

Project Martha - Response to Request for Further Information Application No. APP139551

Oceana Gold (NZ) Limited (OGNZL) has asked Beca to provide a response to the questions relating to air quality matters that were included in the Waikato Regional Council (WRC) letter to OGNZL, dated 3 July 2018. This further information request under section 92 of the RMA relates to Application No. APP139551.

The responses to each question are as follows.

Question 3

As is the case over all areas of the pit, the crystalline silica content of the material to be mined in the MP4 Pit will vary depending on the whether or not the material being extracted is quartz rock or overburden material. The overall crystalline silica content of the mined material will be the same as the overall crystalline silica content in areas of the pit that have been mined previously. Consequently, the discharge of crystalline silica from mining the new areas of the pit is expected to be very similar to historical discharge levels of crystalline silica.

The monitoring of ambient respirable crystalline silica (RCS) concentrations carried out by OGNZL over many years, including when the mine was at peak production, found that ambient concentrations of RCS were consistently below guideline levels and because of this, the monitoring was suspended in 2015 with the agreement of Waikato Regional Council (WRC). It is therefore our opinion that the mining of the MP4 Pit will not pose any adverse health risks associated with the discharge of RCS.

Question 4

Watercare Services carried out emission testing for the Favona Vent Shaft on 15th and 16th August 2007. A copy of the test report prepared by Watercare Services is attached to this letter for your reference.

As noted in Section 5.5.1 of the Assessment of Environmental Effects report prepared in support of the application for discharges to air from Project Martha (Beca AEE)¹ the testing for particulate matter was reported by Watercare to have been carried out for periods of between 30 to 90 minutes for a series of 5 blasts. The testing coincided with the ignition of each blast, and for the period following the blast, when emissions are at their peak and gradually decreasing back to pre-blast levels. The concentrations of carbon

¹ Beca Limited "Project Martha – Assessment of Environmental Effects of Discharges to Air" 13 March 2018

monoxide, nitrogen oxide and nitrogen dioxide were measured at the same time as the particulate matter tests using a continuous combustion gas analyser. Although the report did not state the length of time the combustion gas analysis was carried out for, it is reasonable to assume that it was carried out for the same period of time as the particulate matter test and for the duration of the emissions from the blast.

The results of the combustion gas testing showed that the peak instantaneous concentrations of NO₂ measured in the discharge were above the ambient air quality 1-hour average standard concentration of 0.1ppm, but that the average concentration measured in the discharge were below the standard. If the average NO₂ concentrations measured over the time period for each blast are adjusted to 1 hour average concentrations, they range from 0ppm to 0.08ppm, which are slightly less than the values reported in Table 5-2 of the Beca AEE and less than the ambient air quality standard of 0.1 ppm.²

The maximum and average CO concentrations measured in the vent were all below the relevant ambient air quality guideline value of 8 ppm.

The contaminants that are discharged from blasting, whether as a diffuse source when blasts occur on the surface or as a point source from an underground vent shaft, will be dispersed and diluted in the plume as it travels downwind and consequently, the concentrations of CO and NO₂ in areas where people are likely to be exposed will be significantly less (several orders of magnitude) than the concentration measured in the vent.

The quantity of explosive used in each test blast varied between 345 kg to 557 kg of emulsion explosive. OGNZL has advised that the quantities of explosive used during the tests are typical of blasts carried out at the mine including that which will be used for Project Martha.

Question 5

The monitoring of ambient concentrations of contaminants due to vehicle emissions, discussed in Section 5.3 of the Beca AEE, showed that vehicle emissions at the mine have minimal effects on air quality. The monitoring was carried out at two locations in 1993, one within the Martha Mine and close to the eastern end of the pit and the other about 600m from the mine in Waihi Township. The only result which exceeded the ambient air quality guideline values was recorded when a stockpile was being worked within 10 m of the monitoring site and within the mine. This produced elevated levels of nitrogen dioxide and sulphur dioxide.

Although the monitoring was carried out 25 years ago, the results are considered to provide a conservative estimate of the current effects of vehicle emissions as, since that time, the combustion efficiency of vehicles and the quality of diesel fuel has improved, resulting in significantly reduced emissions of contaminants. We are therefore confident that the emissions from vehicles associated with Project Martha will have a negligible effect on ambient air quality in the vicinity of the mine.

Question 6

OGNZL is currently trialling various optical instruments to test their suitability and intend to determine the best location for installing an instrument in consultation with WRC.

² The averages were adjusted using the equation $c(t_1) = C(t_2) \times (t_2/t_1)^{0.2}$ which is the equation recommended by the Ministry for Environment for adjusting averaging times of air quality measurements.

Question 7.

The dust mitigation measures described in the Beca AEE will be included in the AQMP that will be revised to include any specific measures that will be required for Project Martha, including the use of wind speed trigger levels. The AQMP will include details of each method and these will be updated as the project progresses and as necessary to meet the conditions of the resource consent. For many methods, it is not possible to provide specific limits as these may be impractical and may need to be varied depending on the location or scale of an activity. It is therefore envisaged that the majority of the mitigation methods in the AQMP will not be included in specific resource consent conditions and therefore do not need to be quantified.

This approach is consistent with the guidance provided in the Ministry for the Environment “*Good Practice Guide for Assessing and Managing Dust*” (GPG Dust)³. Our response to the specific issues raised is as follows:

- i. It is not practical to impose a limit on the area of soil that will be exposed at the mine at any time. There are numerous areas of the mine where soil is exposed including all the overburden stockpiles and tailings storage facilities, pit walls, areas where overburden is being removed as well as the construction activities that will be involved with the initial stages of Project Martha. It would be extremely difficult to estimate the size of the exposed areas and to determine what would be an acceptable limit. In our experience many AQMPs include a method which requires minimisation and revegetation, as soon as practicable, and this approach is included in the dust mitigation measures recommended in the GPG Dust.
- ii. The Waihi mine includes a large network of internal roads and accessways that are used by a variety of different types of vehicles ranging from heavy haulage trucks, and large earthmoving machinery to cars. OGNZL imposes speed limits within the mine that are appropriate to the nature of the traffic using the road and the design of the road. The speed limits are imposed for safety and to minimise the generation of dust from vehicles. The speed limits on routes can change as the mine layout changes over time. While it is therefore not practical to impose a blanket speed limit for roads within the mine, we consider that it is appropriate that any specific speed limits are included in the AQMP. This is also consistent with the dust mitigation measures recommended in the GPG Dust.

Similarly, it is impractical to set any quantifiable limit on minimising haul distances. It is in the interests of OGNZL to keep haul distances as short as possible for time and fuel efficiency. The GPG Dust includes a recommended method to minimise travel distances and in our experience, many AQMPs include such a method.

- iii. OGNZL will assess the use of dust suppressants based on their appropriateness and cost effectiveness, compared to alternative dust control methods, such as the use of water and other surface coatings such as aggregates and sealing.
- iv. It is impractical to set maximum drop heights for equipment as they vary according to the type of equipment and materials being handled. For fixed equipment, such as conveyors, the drop heights are set by the design of the equipment. For equipment such as excavators and trucks, the equipment

³ Ministry for the Environment “*Good Practice Guide for Assessing and Managing Dust*” 2016

is matched according to size so that drop heights can be reduced as far as practicable. OGNZL makes their equipment operators aware of the impact excessive drop heights can make to dust and noise emissions as part of their training.

Yours sincerely

A handwritten signature in blue ink that reads "Prue Harwood". The signature is written in a cursive style.

Prue Harwood
Senior Associate - Environmental Engineering

on behalf of

Beca Limited

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