

Before the Waikato Regional
and Hauraki District Councils

Under the Resource Management Act 1991 (**RMA**)

In the matter of An application for resource consents to extend the Waihi Gold Mine via underground and open pit mining methods known as Project Martha

By **Oceana Gold (New Zealand) Limited**
Applicant

Statement of evidence of Nevil Hegley for Oceana Gold (New Zealand) Limited

28 October 2018

Counsel:
Stephen Christensen
Project Barrister
PO Box 1251, Dunedin Metro 9054
P 027 448 2325
stephen@projectbarrister.nz

Qualifications and experience

- 1 My name is Nevil Hegley.
- 2 I am the Principal of Hegley Acoustic Consultants. I have the following experience and qualifications relevant to the evidence I shall give:
 - (a) I have specialised in environmental and industrial acoustic engineering for more than 40 years’;
 - (b) I have an MSc from Southampton University where I undertook research in acoustics in 1975/76;
 - (c) I am a Member of the Institution of Professional Engineers New Zealand, the Institution of Civil Engineers London and the Acoustical Society of America;
 - (d) I have been on the majority of the Standards sub-committees dealing with sound issues since 1977 and I was the Chairman of both of the sub-committees that approved the 1984 and 1999 versions of the Construction Noise Standard NZS6803;
 - (e) In 2010, I received the Meritorious Award by Standards New Zealand for outstanding commitment to the development of New Zealand Acoustic Standards; and
 - (f) I have undertaken the acoustic assessments for the minerals industry throughout the country over the last 40 years. My experience at this site includes the acoustic analysis and the evaluation of mine related noise both in the Waihi township and at the processing plant area some 2km from the pit since 1982. My work at the mine includes the preliminary analysis of the mining noise prior to any mining commencing, construction activities, advising on the work necessary to control mine related noise, checking the noise levels to ensure they comply with the set limits and studying the various changes that have taken place since the mine opened.
 - (g) I have also been involved in the acoustic evaluation of some fifteen open cast and alluvial gold mines throughout the country and a further 20 other mining projects such as coal and ilmenite. I have also been involved with more than seventy-five quarries throughout the country. These projects have included the noise prediction, and in many cases the subsequent checking of the noise levels to ensure compliance with the planning conditions.
- 3 In preparing this evidence I have reviewed:

- (a) The reports and statements of evidence of other experts giving evidence relevant to my area of expertise, including:
 - (i) Landscape Report - Boffa Miskell (*Project Martha Landscape and Visual Effects*)
 - (ii) Traffic Report – TDG (*Transportation Assessment*)
 - (b) The parts of the section 42A report relevant to my area of expertise.
 - (c) Submissions relevant to my area of expertise.
- 4 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence has been prepared in accordance with the Code and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Scope of evidence

- 5 I have been asked by Oceana Gold (New Zealand) Limited (**OGNZL**) to prepare evidence in relation to the noise effects of Project Martha. This includes:
- (a) A description of the existing noise environment in Waihi, including the noise effects of the existing mining operations.
 - (b) The noise effects likely to arise from the new activities proposed as part of Project Martha, including the cumulative noise effects.
 - (c) Techniques that have been recommended to mitigate the adverse effects of noise including proposed conditions of consent, so as to ensure that the noise associated with Project Martha has no more effect on nearby residents than the authorised noise effects of existing mining activities.
- 6 I confirm that my evidence relates to the proposal known as Project Martha as described in Chapter 3 of the Assessment of Environmental Effects dated 25 May 2018 (**AEE**).
- 7 I confirm that I am the author of a report dated 22 May 2018 entitled Project Martha Waihi, Assessment of Noise Effects (Report No 17086/2) attached as Appendix F to the AEE. I also confirm that I am responsible for the additional information supplied in response to questions asked under section 92 of the RMA comprising a letter dated 28 June 2018 entitled Project Martha - Requests for Further Information.

- 8 My report was prepared prior to OGNZL purchasing the three dwellings located at 10 Pitt Street, 5 Cambridge Road and 77 Bulltown Road. I am advised that OGNZL has now purchased these properties so the reference to any noise controls to these properties is no longer relevant. The recommended conditions and conclusions in this evidence reflect the purchase of these properties.

Executive summary

- 9 The existing noise environment is dependent on the effects of any activity that may be occurring in the mine, the proximity to roads and general environmental noise. The existing environment in relation to mining is represented by the activities authorised by resource consent (i.e. EMMA consent) and permitted activities (i.e. the incorporation of the mining licence into a permitted activity rule).
- 10 The average day-time L_{Aeq} values range from 40 to 55dB in residential areas of Waihi which are not affected by traffic noise. The levels remain relatively steady from before 7.00am to after 6.00pm (and 9.00pm if traffic noise is not excluded). There is no significant difference at weekends.
- 11 The existing noise environment for areas around the pit is defined generally as 50dB, with some areas around the northern perimeter being 55dB, and is generally 55dB elsewhere (the conveyor, processing plant and tailings storage facilities area).
- 12 Noise from the proposed works are generated from the construction of a bund at the pit rim on the north wall, the realignment of Bulltown Road and Cambridge Road and the subsequent mining activities in the area of the north wall.
- 13 The calculations to undertake this work have been based on assumed plant, the type, size and operating location as provided by OGNZL. The assumed plant is all relatively large and representative of what has been used over the years and considered to be representative of what will be used in practice. I do note that even if there is a 30% increase in the amount of plant operating, the noise would only increase by 1dB if it is assumed the plant could be located at the same locations selected for the predictions. In practice the plant is spread out over any work area, so it is unlikely there would be a change to the noise received.
- 14 A computer prediction model has been used at the mine site since the original mining commenced. Compliance monitoring undertaken from the start of the mining has shown the model is accurate and gives reliable results meaning a high degree of confidence may be taken from the noise predictions.

- 15 To achieve the design limits, it is necessary to provide a barrier to screen the closest residential sites when operating near the pit rim. The analysis shows this is practicable and the noise generated during the construction of the proposed bund will be within the noise limits set for construction work.
- 16 Once the barrier is constructed the noise from subsequent mining will be controlled to within the proposed operational noise control boundaries. Mining noise will quickly reduce by 5dB L_{Aeq} as the plant moves into the pit minimising any noise effects for the neighbours.
- 17 The noise level from mining at the most exposed locations not owned by OGNZL will comply with a level of 50dB L_{Aeq}
- 18 The above method of mining is the same method that has been practiced over the last 29 years around the existing mine. It has been shown to be practical to implement, and results in the minimisation of any adverse noise effects for the neighbours.

Introduction

- 19 Project Martha will extend the existing Martha Mine by developing the Martha Phase 4 pit (MP4) as shown on the plans before the Commissioners where only a very minor part lies outside of the existing permit areas. The MP4 pit crest requires the realignment of Bulltown and Cambridge Roads and a bund will be constructed to assist with noise mitigation to the north of the pit. Project Martha also includes the Martha Underground Mine, which is a new project and therefore requires a new land use consent, but as underground mining generates no noise other than the associated portals and shafts within MP4, only these aspects of the underground mine are relevant to my evidence.
- 20 My report assesses the noise effects associated with the surface elements of Project Martha, including:
- i) proposed noise bund above the north wall;
 - ii) mining on the north wall of Martha Pit including blast hole drilling, excavation and hauling to the stockpiles and the crusher ROM;
 - iii) Bulltown Road realignment;
 - iv) construction and operation of a vent shaft and portals on the south wall of the pit;
 - v) crushing underground and open pit mining material at the portals within Martha Pit for use underground;

- vi) hauling waste rock from the cutback to an in-pit stockpile to be used as underground backfill;
 - vii) all activities in the Surface Facilities Area (SFA) including crushing and transfer onto the main conveyor belt;
 - viii) surface activities relating to the Martha Underground Mine being haulage of material in and out, construction and operation of the ventilation shaft and one fresh air/one return air portal;
 - ix) continued operation of the Trio and Correnso Vent Shafts; and the Martha Drill Drive Project (MDDP) portal;
 - x) mobile crusher;
 - xi) rock hammer in the base of the pit; and
 - xii) operation of the Cement Aggregate Fill (CAF) plant near the Favona portal,
- 21 The proposed mining will rely partly on the use of existing consented facilities and infrastructure including:
- i) Processing Plant, including the Water Treatment Plant;
 - ii) Access drives and shafts associated with the existing underground mines;
 - iii) Crusher and conveyor from the Martha pit to the rock and tailings storage area;
 - iv) Existing stockpiles within the Processing Plant and polishing pond stockpiles,
 - v) Existing rock and tailings storage facilities.
- 22 This evidence considers both the construction and the operational noise effects of the proposed mining-related activities. Each of the proposed activities has been evaluated and the method to be adopted to control noise to within a reasonable level has been assessed. As part of this process, appropriate noise limits have been recommended for both construction and operational activities.

Design Criteria

- 23 As shown on Figure 1 the Martha Mine is located in the Martha Mineral Zone in the Hauraki District Plan. All but a small area of the proposed open pit mining activities associated with Project Martha will be located within that zone, as are

the proposed ventilation and access shafts and portals associated with the Martha Underground Mine. Those aspects of the pit mining activities located outside of the Martha Mineral Zone will be located in the Residential and Low Density Residential Zones.

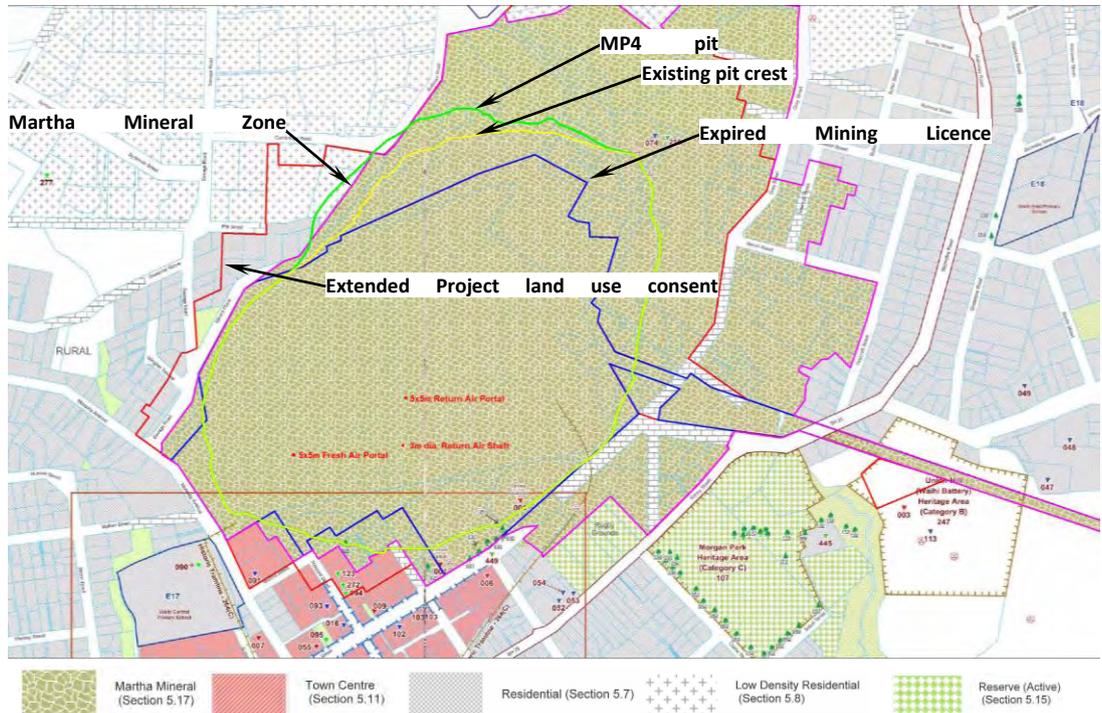


Figure 1. Site Zoning

24 Historically there has been a 50dB and 55dB noise control boundary used to control noise from mining in the Martha Pit. This is set out in the Hauraki District Council Land Use Consent and Conditions for the Extended Martha Mine Project No 87/98-105 (the EMMA consent), which established these noise control boundaries around the mine. In relation to operational noise, condition 3.8(b)(i) of the Land Use Consent includes the following:

i) Activities Within Area B

The noise level (L_{Aeq}) at any point outside the 55dB and 50dB control boundaries shown in Plan 2 [Figure 2 in this evidence] arising from mining and related activities when measured within or close to the boundary of any residentially zoned site or the notional boundary of any occupied dwelling in the Rural Zone not owned by the Company or not subject to an agreement with the Company or related Company shall not exceed the limits specified below:

		55dB Control Boundary	50dB Control Boundary
Monday – Friday	0700-2100	55dB	50dB
Saturday	0700-1200	55dB	50dB
All other times		40dB	40dB

In the event that a property is sold and ceases to be subject to an agreement between the consent holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the consent holder (or related Company) and the landowner, the location for the measurement of noise shall revert to being within or close to the boundary of that residentially zoned site or the notional boundary of the occupied rural site.



Figure 2. Noise Control Boundaries

25 There is no noise Standard for the Martha Mineral Zone in section 8.3.1.3 of the Hauraki District Plan. However, Rule 5.17.4.1 of the Martha Mineral Zone states that any activity that complies with the requirements of Mining Licence 32 2388 is a permitted activity subject to conditions in the Hauraki District Plan. The Conditions of Mining Licence 32-2388 (incorporating Favona, Trio Variations – and 2017 Variation) set the following noise requirements.

26 Condition 21 states:

- (a) All activities provided for by the Mining Licence taking place on any site within the Mining Licence area shall not exceed the following limits when measured at or within the boundary of any residentially zoned site or the notional boundary of any occupied dwelling in the Rural Zone and measured over the periods specified below:

<i>Monday-Friday</i>	<i>0700 - 2100</i>	<i>55dB L_{Aeq}</i>
<i>Saturday</i>	<i>0700 - 1200</i>	<i>55dB L_{Aeq}</i>
<i>All other times</i>		<i>40dB L_{Aeq}</i>
<i>2100 - 0700 (the following day)</i>		<i>70dB L_{AFmax}</i>

All noise shall be measured within or close to the boundary of any residentially zoned site or the notional boundary of any occupied rural dwelling site not owned by the licence holder or related Company or not subject to an agreement with the licence holder or related Company.

In the event that a property is sold and ceases to be subject to an agreement between the licence holder (or related Company) and the purchaser, or in the event that there is no longer an agreement between the licence holder (or related Company) and the landowner, the location for the measurement of noise shall revert to being on or close to the boundary of that residentially zoned site or the notional boundary of the occupied rural site.

- (b) Deleted
- (c) Deleted
- (d) Noise shall be measured in accordance with the provisions of New Zealand Standard NZS 6801:2008 Acoustics - Measurement of Environmental Sound and assessed in accordance with the provisions of NZS 6802:2008 Acoustics - Environmental Noise.
- (e) Noise Management Plan

The licence holder shall prepare a Noise Management Plan. This Management Plan shall be submitted to and approved by Hauraki District Council. The objective of this plan is to detail the methods to be used to comply with conditions 21 and 30.

- 27 Condition 9 Construction noise during construction period in the above document is set at:

With the exception of Waihi Central School where the construction noise limit shall be 55dB L_{Aeq} at any point within the boundary of the school, all construction

activities provided for by the Mining Licence taking place within the Mining Licence area shall not exceed the following limits:

<i>Monday - Friday</i>	<i>Saturdays</i>	<i>L_{Aeq}</i>	<i>L_{AFmax}</i>
<i>0630-0730</i>		<i>60</i>	<i>70</i>
<i>0730-1800</i>	<i>0730-1800</i>	<i>75</i>	<i>90</i>
<i>1800-2000</i>		<i>70</i>	<i>85</i>

At all other times, including Sundays and Public Holidays, the noise level shall not exceed 40dB L_{Aeq}.

- 28 In summary, the current consents and the Hauraki District Plan set:
- an operational noise limit of 55dB L_{Aeq} between 0700 and 2100 Monday to Friday plus 0700 to 1200 on Saturdays for all existing mining activities taking place within the (now expired) Mining Licence area;
 - an operational noise limit of 50dB L_{Aeq} between 0700 and 2100 Monday to Friday plus 0700 to 1200 on Saturdays for all existing mining activities within Area B, which is a partial annulus around the Mining Licence Area covering the pit (refer Figure 1 above), with the EMMA consent imposing a 55dB L_{Aeq} limit at a noise control boundary for a sector around the eastern half of the Martha pit;
 - for all other times (including night time) a noise limit of 40dB L_{Aeq} and
 - construction noise limits for a strictly defined set of construction activities.
- 29 The Project Martha proposal was to update the location of the current Noise Control Boundaries shown on Figure 2, to reflect the minimum practicable noise from the operation of the mine around the Martha Pit. However, as Mr Lloyd's review as part of the section 42A report points out, with the purchase of the three properties where maximum noise is predicted to exceed 50dB it is possible to make the noise conditions for Project Martha considerably more simple than I had initially proposed, and there is no need to refer to the current Noise Control Boundaries.
- 30 The shafts and portals associated with the Martha Underground Mine are located within the Martha Mineral Zone. While their use is not a permitted activity any noise from the shafts and portals will be controlled to within the requirements of the permitted activity Rule 5.17.4.1P1 of the Hauraki District Plan.
- 31 Much of the construction of these shafts and portals will be undertaken from inside the underground mine, so other than the breakthrough there will not be any noticeable construction noise. Breakthrough may be completed using a rock hammer, which, when considering the depth of the work in the pit, will

comply with the operational noise limits for any mining activity with a good factor of safety.

- 32 For the operational phase, vent fans would be designed to achieve 40dB L_{Aeq} with a factor of safety by either the selection of a quiet fan or if this is impractical, including a silencer on the fan. Any associated mining activity (e.g. light vehicle access, stockpiling near the portal) would also comply with the 40dB L_{Aeq} limit if undertaken outside of the open pit work hours. The hours of work for open pit mining, conveying and operations within the waste and tailings area (other than maintenance work) are 0700-2100 Monday to Friday and 0700-1200 Saturday, although work is permitted between 1900 and 2100 hours Monday to Friday if the operations are of an urgent nature and necessary for the effective carrying out of mining operations.
- 33 It is noted that some limited exploration drilling, maintenance work and the use of water carts for dust control may be undertaken (and has in the past) at lower levels within the pit at night time. These various activities have been, and will continue to be, managed to ensure that noise effects comply with a limit of 40dB L_{Aeq}, which also reflects the night time noise limits in the EMMA consent and Rule 5.17.4.1 P1 of the Hauraki District Plan.

Predicted Noise Levels

- 34 Noise from the various stages of bund construction and mining has been predicted using the Brüel & Kjær Predictor program version 11.10. This is a powerful environmental noise calculation software package that uses a digital terrain model with a 2m ground resolution, plus any purpose-built noise bunds, and each of the noise sources modelled at their various locations on the ground. Calculations are undertaken in accordance with the requirements of ISO 9613-1/2 Acoustics – Attenuation of Sound during Propagation Outdoors. Slightly enhanced propagation conditions have been adopted in accordance with the requirements of clause 7.1.2 of NZS6801:2008 Acoustics - Measurement of Environmental Sound with a ground attenuation factor of 0.7 for farmland and a grid size to calculate the noise contours varying between 15 – 40m. No screening effects of buildings have been included in the calculations.
- 35 For both construction and operational phases each relevant assessment has been based on the noisiest phase of the work. That is, the noise bund constructed with equipment operating at a position closest to the dwellings and mining based on the ‘top down’ approach, which is all equipment at the top of the work area. For the majority of the time the noise levels will be lower than predicted. The predicted operational noise levels are the levels from the mining activities. The levels do not include any cumulative effects from the existing

noise environment in accordance with the requirements of NZS6802:2008 *Acoustics – Environmental Noise*.

Construction – Noise Bund

- 36 The highest noise levels would be experienced during the construction of the noise control bund when there is no screening to the neighbours. The assessment has considered three of the locations most exposed to dwellings during the bund construction.
- 37 As the details are set out in the noise assessment report I have only included a summary of the predicted noise levels in this evidence and have not included the contouring.
- 38 The dwellings adopted in the calculations are shown on Figure 3 and the results given in Table 1 of my report. From the Table 1 results the property predicted to receive one of the highest levels of construction noise is dwelling 7 (77 Bulltown Rd), which OGNZL has now purchased.

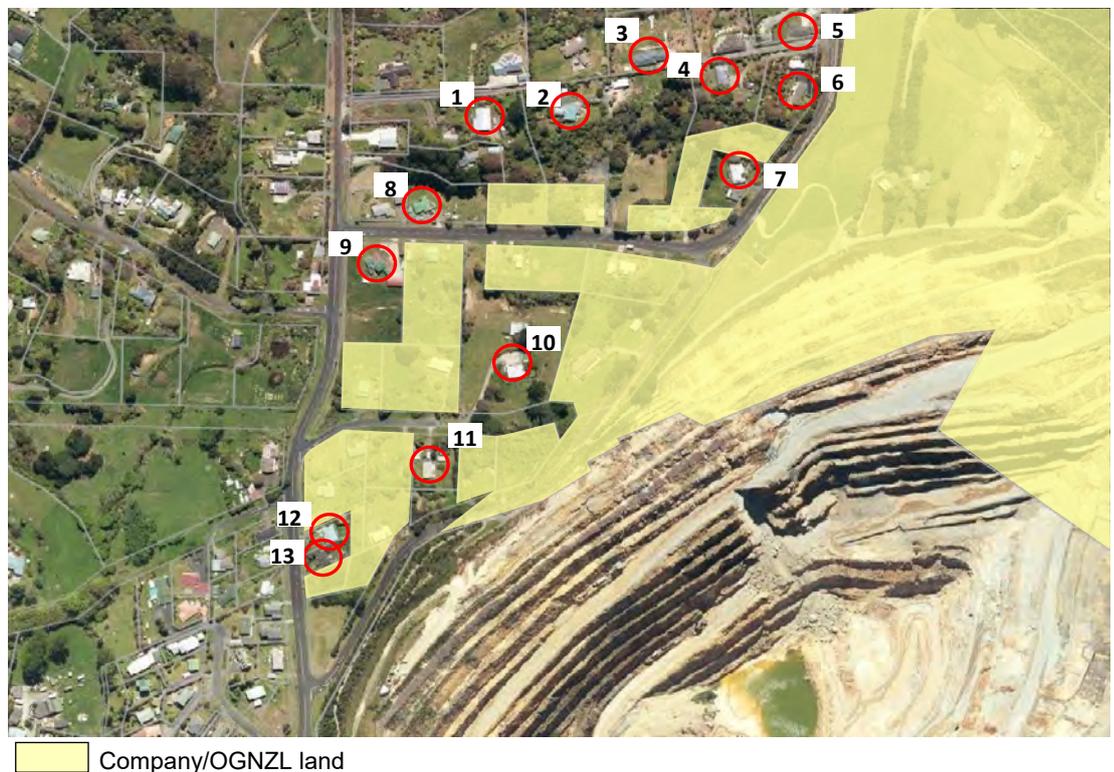


Figure 3. Noise Prediction Points for Martha Phase 4

Site*	Eastern End of Bund	Centre of Bund	Western End of Bund
1	51	55	51
2	53	56	51
3	56	54	51
4	59	53	49
5	60	49	50
6	67	51	52
7+	66	56	55
8	50	55	55
9	49	55	55
10+	50	52	70
11+	45	45	58
12	43	44	52
13	43	44	52

* See Figure 3 for the location of the dwellings

+ Recently purchased by OGNZL

Table 1. Predicted Construction Noise, dB L_{Aeq}

39 As shown in Table 1 construction noise will comply with the design limit of 75dB L_{Aeq} at all residential locations with a good factor of safety. It is noted that the predicted levels are for the worst-case construction scenarios. For the majority of the time the noise levels will be noticeably lower than given in Table 1. Construction noise will only be at the higher levels for 2 – 3 weeks (weather dependent) and will be restricted to the core construction hours of 0730 - 1800 Monday to Saturday.

Construction - Bulltown Road Realignment

40 As part of the MP4 work it will be necessary to realign Bulltown Road as shown on the plans before the Commissioner

41 The noise effects of the road realignment will be from the construction of the new section of the road and the traffic noise once the road has been realigned. It has been assumed the typical construction equipment to realign the road will include a Komatsu D53P bulldozer (L_{WA} 105dB), Cat 320D excavator (L_{WA} 106dB), Volvo L120 loader (L_{WA} 102dB), Cat 16M grader (L_{WA} 102dB), Bomag BW121D compactor (L_{WA} 100dB) and trucks (L_{WA} 102dB). Not all of this equipment will operate at the same time.

42 Based on this equipment operating, the unmitigated noise measured at 1m from the most exposed dwelling façade not owned by OGNZL (Site 6, Figure 3) is well clear of the proposed realignment so the received noise will be 66dB L_{Aeq} assuming no purpose-built screening is in place. This is well within the limit for construction noise.

43 Once the road realignment has been completed the traffic volumes and vehicle types are expected to be the same as that currently experienced. A perceptible noise change of 3dB would only occur if the distance between the existing and proposed road alignment halved. This is not the case and therefore as the realignment does not materially alter the distance to the remaining houses, traffic noise effects associated with the realignment will be less than minor.

Operational - Mining

44 Once any barrier is in place the highest noise levels will be experienced at the start of the mining activities close to the bund where the plant is at its closest position to the neighbours and at the maximum height. As a result, this location is where the maximum noise level will be experienced by any neighbour. The assessment has considered four locations to determine the mining noise effects.

45 When predicting noise from the mining it has been assumed in the assessment there will be four drilling rigs to prepare the holes to place the charges for blasting (the number of drilling rigs will vary between two and four, with two expected to be used initially. To provide the worst case four rigs have been included in the noise assessment). In addition, it is conservatively assumed there will be an underground mine truck exiting the portal to stockpile mined material before returning underground, a portable crusher to crush the stockpiled material, a loader feeding the main crusher and a conveyor and a bulldozer working on top of the stockpile to the north of the crusher at mRL 1125 to 1130. It is unlikely all of this plant would operate at the same time although it has been assumed to do so to provide a factor of safety with the noise assessment.

46 As for the construction noise only, a summary of the predicted noise levels are given in my evidence. The work areas assessed are:

- eastern end of the bund on the north wall cutback and at the top of the existing ground surface
- mining nominally half way along the proposed bund on the north wall cutback and at the closest and highest position to the dwellings
- mining the north wall cutback toward the western end of the bund and at the closest and highest position to the dwellings
- mining the north wall cutback at the western end of the bund and at the closest and highest position to the dwellings

47 Unlike construction noise, which is assessed within 1m of the building façade in accordance with the Construction Noise Standard, mining noise levels have been predicted at the residential boundaries of the houses located close to the

mining activities. Table 2 shows the predicted noise levels at the most exposed residential boundaries of the dwellings for the most exposed mining activity. The same locations used in the construction noise assessment have been used for the operational assessment.

Site*	East end	Centre	Near west end	Far west end
1	45	44	43	43
2	47	46	43	42
3	44	45	44	42
4	46	43	46	43
5	46	47	46	44
6	48	48	46	45
7 ⁺	53	53	51	47
8	46	46	45	44
9	45	45	45	45
10 ⁺	46	47	47	51
11 ⁺	44	45	46	52
12	44	44	44	50
13	44	44	44	50

* See Figure 3 for the location of the dwellings

⁺ Recently purchased by OGNZL

Table 2. Predicted Mining Noise, dB L_{Aeq}

48 As shown in Table 2 mining behind the bund will ensure compliance with the proposed 50dB L_{Aeq} limit for operational noise. It is noted that the above level is for the worst-case mining scenario. For the majority of the time the noise levels will be noticeably lower than shown in Table 2, and mining noise is expected to be a minimum of 5dB L_{Aeq} lower than predicted within six months.

49 In addition to the mining-related activities in the pit, there is also potential noise from the return air (exhaust) portal and shaft located at 925mRL (mine datum) and the fresh air (intake) portal located at 1003mRL to be constructed in the south wall of the Martha pit. Noise from these portals will be controlled by a combination of fan selection and the addition of a silencer to ensure the level is below 40dB L_{Aeq} and hence there will not be any cumulative noise effects on the predicted mining activities. Noise from the underground trucks dumping mined material just outside the portals will be 11dB L_{Aeq} at the boundary of the most exposed house and noise from crushing the material with a portable crusher will be up to 26dB L_{Aeq}.

Submissions

50 I have reviewed the submissions that raise noise as a concern and have the following response.

- 51 Heidi Holland (submission 189) has submitted noise is going to be an absolute nuisance and disruption to her peace and the removal of houses and vegetation will increase road noise at her home in the long term.
- 52 The noise will be controlled to within 50dB L_{Aeq} during the daytime and 40dB L_{AFmax} at night time from all mining noise. This is within the District Plan noise controls for any activity in the area and at a level that will not cause a noise nuisance. The levels she will receive will not noticeably increase to the level previously experienced for mining activities.
- 53 The removal of trees will not result in any increase to the noise received. As a guide, it takes approximately 30m of dense planting before there is any reduction due to trees. Similarly, when taking into account the topography and the size of the houses, the removal of any houses will not adversely affect the noise received.
- 54 Deane Holland (submission 188) at 81 Bulltown Road is concerned about noise affecting recording sessions in his studio and would like OGNZL to protect his property.
- 55 As set out above, the proposed noise conditions will provide a good level of acoustic protection regardless of how close the mining comes to the property.
- 56 Erika Naumann (submission 24) who lives at 79 Bulltown Road has submitted the effects noise will have on her quality of life and would prefer the extension did not go ahead.
- 57 As set out above, mine noise will be controlled to within a level generally considered to be well within a reasonable limit. In addition, by setting a design limit this does not mean the mine will be operating at this limit at all times. In practice, it is only while the mining is operating at the closet location the 50dB L_{Aeq} level may be reached. For all other times the noise will be lower, the exact level being dependent on where the mining is undertaken.
- 58 Michael and Catherine Mitchell (submission 74) at 100A Bulltown Road consider there is a need for independent monitoring, because in the past local Waihi Gold employees would monitor pit noise during morning smoko break when machines weren't operating.
- 59 It is my understanding compliance monitoring only occurs when the mine is operating. Occasional monitoring needs to be undertaken without the mine operating so as to understand the background or ambient noise environment. This is important because OGNZL can only be responsible for the noise it generates, and it is important for compliance and management purposes to be able to differentiate between mine noise and other noise. It may be that this is

what the submitter is referring to. Regardless, the Council does undertake noise monitoring so there is independent monitoring occurring. This should satisfy the submitter.

60 Juan Fisher (submission 209) at 2 Ashman Street is requesting the noise level should be reduced and wind restriction regarding the measuring of noise should be removed.

61 The noise levels proposed (50dB L_{Aeq} daytime and 40dB L_{Aeq} night time) are the lowest normally adopted for any noise controls in residential areas so offer a good level of protection for neighbours. I do note the closest dwelling to the mine will control the noise received and Juan Fisher's house dwelling is over 250m from the closest house to the mine where the noise levels must be complied. Thus, the controls will provide a very good level of protection for this dwelling.

62 The use of the 2008 noise standards allow the noise to be measured in light winds compared to the 1991 versions requiring neutral conditions so this should satisfy this submitter. I note that if too windy, noise measurements cannot be undertaken and in such conditions wind noise in trees will generally control the noise environment.

63 Ruth Ordish (submission 208.19) lives at 63 Gladstone Road and has submitted wind restriction for monitoring noise should be removed, decibel level should be reduced and working hours for pit activity should be reduced.

64 I have addressed the concerns with respect to wind effects above. The noise that will be experienced from the proposed mining related to this application at her property will be typically 10dB L_{Aeq} below the design limit. At a typical 40dB L_{Aeq} any mining noise should not cause this submitter any concerns.

65 The working hours are within the time period adopted throughout the country for daytime hours. Should the hours be reduced this would extend the time to complete the mining and this is unlikely to satisfy the submitter or other members of the community.

66 Erich Schmidt (submission 206) lives at 182 Kenny Street and has submitted an independent monitoring company 24/7 Noise level 20.00 - 7.00 50dB max [70dB L_{AFmax} max APP F]. It is assumed this submission is asking for the night time maximum limit (L_{AFmax}) to be reduced to 50dB rather than the proposed 70dB plus continuously monitoring to be undertaken.

67 The company has little activity that makes noise at night time and never approaches the current 70dB L_{AFmax} limit which controls single event sounds, such as a bang. However, to set a limit at 50dB L_{AFmax} would be contrary to any

limits recommended worldwide and is unnecessary to provide a good level of environmental protection for the community. A level of 70dB L_{AFmax} provides a good level of acoustic protection for the neighbours against single event sounds so should satisfy the submitter.

- 68 Mining noise is already monitored on a regular basis and as mining activities progress at a relatively slow rate additional monitoring 24/7 would not achieve any better understanding of the noise. Further, it is unclear from the submission where such monitoring would be undertaken to provide the information sought.
- 69 Gold FM Ltd (submission 198) is at 17 Hazard Street. They have submitted that consent conditions may not adequately mitigate adverse effects and appropriate mitigation measures should be included.
- 70 The proposed noise controls are adopted to ensure any adverse effects of noise are mitigated and I believe will satisfy this submission.
- 71 Sonja Ireland (Submission 207) at 13 Kent Crescent has submitted noise from Correnso blasting wakes her and the proposal takes little account of prevailing wind direction in Waihi in terms of noise mitigation. Further, there is little mention of noise monitoring in this application or the way it should be done.
- 72 This proposal does not include any night time noise that would cause sleep disturbance at 13 Kent Crescent.
- 73 All monitoring is to be undertaken strictly in accordance with the requirements of the relevant Standards (NZS6801 and NZS6802). That is, with a slightly positive meteorological effect, which reflects some of the higher noise levels than may be experienced at the receiver position. This should satisfy the submission.
- 74 Colin Purcell (submission 215) is at 1 Cambridge Road and has submitted the noise bund coming closer to his property will have impacts with regard to noise.
- 75 The purpose of the bund is to reduce noise to his site. There will be a short period during the bund construction that will be noisier but after that the level will be significantly lower than he would otherwise experience.

Recommended Conditions

- 76 I have reviewed the noise conditions as set out in the Hauraki District Council conditions and subject to one minor change believe they are reasonable.
- 77 The one change is to delete proposed condition 22 as it adopts the Outer Control Boundary, which is now redundant. This change has been included in the conditions in Mr Turner's evidence.

Conclusions

- 78 The construction and operational noise effects of the proposed development and the operation of Martha Phase 4 mine have been assessed.
- 79 The analysis has been conservatively based on the maximum equipment operating at the most exposed locations to residents. By demonstrating it is practical to achieve the design criteria for each of these locations it is reasonable to assume that all other work will comply with the noise limits with an increased factor of safety.
- 80 To achieve the design limits, it will be necessary to provide a barrier to acoustically screen the closest residential sites when operating near the pit rim. The analysis shows this is practicable and the noise generated during the construction of the proposed bund will be within the noise limits set for construction work. Once the barrier is constructed the noise from subsequent mining will be controlled to within the proposed operational noise control boundaries. As mining proceeds the noise-generating equipment will be further away from the receiver positions, which will reduce the noise for the neighbours. In addition, as the mining proceeds the equipment will move deeper into the pit so there will be greater screening to the neighbours and hence a further reduction in the noise received by the neighbours. Thus, the noise levels as predicted will quickly drop by at least 5dB and minimise any noise effects for the neighbours.
- 81 The noise level from mining at the most exposed locations on the north wall will comply with a level of 50dB L_{Aeq} at all residential sites not owned by OGNZL.
- 82 The above method of mining is the same method that has been practiced over the last 29 years around the existing mine. It has been shown to be practical to implement and results in the minimisation of any adverse noise effects for the neighbours.

Nevil Hegley

28 October 2018