



Noise Summary Report
Fourth Quarter 2023



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1. Summary

Compliance against the consented noise limit(s) and New Zealand Standards was achieved during the fourth quarter of 2023. Four mean corrected noise level (MCNL) assessments were made during the period; all of which were compliant. Two of the MCNLs achieved all three readings in suitable meteorological conditions.

15 single corrected measurement levels (SCML) were made during the quarter; eight were taken in suitable met conditions. Suitable wind conditions (<3 m/s), as recorded at the Kenny St meteorological station, occurred on 9 of the 15 monitoring occasions. Day-time measurements returned levels ranging from 39.0 to 49.3 dB L_{Aeq} ; the dominating noises were birds and the excavator working on the Favona stockpile. MCNLs from these readings returned 45.7 and 46.4 dB. Night-time measurements recorded levels between 31.4 and 45.9 dB; the dominant noises were wind, crickets, and trucks. These readings returned MCNLs of 33.2 and 37.4 dB.

Six of the SCML's were taken to monitor in-pit waste rock dumping at night-time. These readings ranged from 32.9 to 45.9 dB (MCNL 37.4 dB). The dominant noise was the wind and background noises included traffic, a dog barking, and a truck dumping waste rock. However, the truck was inaudible in four of the six SCML readings.

There were three noise complaints raised during the reporting period; one related to a helicopter flight to Wharekirauponga, another was found to be unrelated to mining activities, and a third was of an unknown noise source. In early November, the helicopter contractor was operating in the vicinity of a resident's property at the time of their complaint. A summary of the flight path was received, which went near but not over the property, at a height of over 1000ft. They have been reminded to avoid flying near the area. Later in November, there was another complaint made about a helicopter flying low over a resident's property. It was found that the helicopter was not related to OceanaGold and was likely PowerCo checking the powerlines. A third noise complaint received at the beginning of December was not able to be investigated as the complainant did not use the appropriate channel for noise complaints (0800 number) or provide any details around the noise they could hear.

2. Introduction

This report provides a summary of noise measurements and assessments undertaken by OceanaGold (NZ) Ltd Waihi Operations (OceanaGold) for the fourth quarter of 2023. The report is prepared to comply with the requirements of four consents:

- Hauraki District Council (HDC) Land Use Consent (LUC) for Project Martha (LUC 202.2018.857.1, condition 26A). OceanaGold is required to submit quarterly summary reports to Council on representative noise levels.
- Under the Noise Conditions of the LUC for the Favona Underground Mine (No. 85.050.326.E, condition 9) a summary report is required at the end of each 3-month period from commencement to completion of work.
- Under the Noise Conditions of the LUC for the Trio Underground Mine (RC-15774, condition 6d) a summary report is required at the end of each 3-month period from commencement to completion of work.
- Under the Noise Conditions of the LUC for the Correnso Underground Mine (RC-202.2012, condition 11d) a summary report is required at the end of each 3-month period from commencement to completion of work.

Although a report is required, there was no active mining in the areas of the later three consents during the period.

For exploration drilling operations, the conditions set out in section 8.3.1 of the Hauraki District Plan apply. Any monitoring of these activities is also included in this report.

3. Methodology

Sound measurements and assessments by OceanaGold comply with the consent conditions and the New Zealand Standards *NZS 6801:2008 Acoustics - Measurement of Environmental Sound* and *6802:2008 Acoustics - Environmental Noise*.

Compliance noise is measured for a minimum of 15 minutes as required under the consent conditions. Compliance readings cannot always be made on every site visit or check due to excessive wind conditions (i.e. greater than 5 m/s).

Monitoring checks are made in response to complaints whenever necessary; initially to verify the noise level and subsequently (if necessary) to determine the effectiveness of any mitigating actions and/or the effect of changing wind conditions (changing wind strength or direction influences noise transmission between the mine and the receiver).

OceanaGold uses noise monitoring procedures to ensure conformance to the above standards and consent conditions, and to support noise mitigation protocols documented in the site Noise Management Plan. The noise mitigation protocols require review of wind conditions that could potentially result in noise levels generating complaints. Monitoring has shown that wind speeds over 3 m/s (as measured at the OceanaGold meteorological station at Kenny St) are likely to increase mine noise downwind of an activity to levels that generate complaints. When such wind conditions occur, OceanaGold implements mitigating actions to reduce noise levels where practicable. During periods when high frequency sounds such as birds, cicadas and crickets become the controlling noise, a filter may be applied to noise measurements to exclude four and eight kHz (kilo-hertz) and enable analysis of the lower frequency noise levels (i.e. those usually associated with mine operations).

Wind has a significant influence on sound propagation. Sound measurement and assessment must take the effect of wind into account. Sound measurements are taken in conditions ranging from nil wind up to 5 m/s at the receiver (*NZS 6801:2008 Acoustics - Measurement of Environmental Sound*). Wind greater than 5 m/s is generally unacceptable for monitoring due to wind noise effects in the nearby environment (e.g. trees) and on the microphone.

Downwind, wind speeds of 3 - 5 m/s are considered marginal due to propagation of sound by wind from source to receiver. Conditions like those for which the compliance limits are set generally occur when wind speeds are less than 3 m/s (*Hegley, 2003: Evidence of Nevil Hegley – Favona Underground Project 2003 Final – 11/11/03*).

Wind speeds are recorded at the OceanaGold met station. These wind readings are assumed to represent the general wind conditions across Waihi and at the noise source (e.g. the mine).

Other meteorological factors influencing the overall sound environment include solar radiation, cloud cover, sunrise and sunset times, wind direction and the direction from source to receiver. These factors were also measured to derive a meteorological stability rating at the time of monitoring. Meteorological stability categories of 4 (neutral) or 5 (slightly positive) are considered suitable meteorological influences on sound propagation and are used to determine noise compliance (*NZS 6801:2008 Acoustics - Measurement of Environmental Sound* (HDC LUC 97/98-105, Condition 3.8 (e))).

4. Results

4.1. General

Monitoring activity for the period is shown in Table 1.

Table 1. Noise monitoring activity.

	Number of days checked	Number of days measured	Number of checks (compliance & other)	Number of complaint days	Number of complaint checks
October	3	3	6	0	0
November	1	1	6	0	0
December	2	2	3	0	0
QR Total	6	6	15	0	0

4.2. Wind

Adverse wind conditions (≥ 3 m/s, as measured at the met station) occurred on six (6/15) of the compliance monitoring occasions (see Table 2). While it is the general prevailing wind condition as measured at the met station that primarily affects noise propagation, measurements may be made under adverse conditions if the wind at the receiver or at street level is generally more favourable for monitoring. Even then, representative noise measurements of mining activities are not always possible due to wind noise. Periods of high wind strengths above 5 m/s were experienced twice this period, during noise checks of the night-time waste rock dumping in the pit.

Table 2. Percentage of monitoring occasions average wind speeds ≥ 3 m/s.

	Receiver	Met Station
October	0%	100%
November	0%	0%
December	0%	0%
QR Total	0%	40%

60% (9/15) of the compliance measurements made in the reporting period were in suitable wind conditions (< 3 m/s at the met station). Adverse wind conditions can influence suitable met assessments, as well as other factors including wind direction, solar radiation, and cloud cover. Monitoring in suitable wind conditions occurred less often during this reporting period compared to the previous (75%).

4.3. Compliance

No mine dominated SCML exceeded compliance levels in suitable met conditions during the reporting period (see Table 3).

Table 3. Summary of Single Corrected Measured Levels (SCML).

	Total SCML readings	Mine dominated SCML over (limit + 5 dB)	SCML in suitable met	Mine dominated SCML over in suitable met
October	6	0	0	0
November	6	0	5	0
December	3	0	3	0
QR Total	15	0	8	0

Four MCNL assessments were made during the quarter. Two of these had all contributing measurements in suitable met conditions (see Table 4) and all were within consent limits.

Table 4. Summary of Mean Corrected Noise Levels (MCNL).

	Total MCNL calculations	Marginal MCNL	MCNL 5 dB over limit	MCNL in suitable met	MCNL over limit in suitable met
October	1	0	0	0	0
November	2	0	0	1	0
December	1	0	0	1	0
QR Total	4	0	0	2	0

4.4. Complaints

There were three noise complaints raised during the reporting period (Figure 1); one related to a helicopter flight to Wharekirauponga, another was found to be unrelated to mining activities, and a third was of an unknown noise source.

In early November, the helicopter contractor was operating in the vicinity of a resident’s property at the time of their complaint. A summary of the flight path was received, which went near but not over the property, at a height of over 1000ft. They have been reminded to avoid flying near the area.

Later in November, there was another complaint made about a helicopter flying low over a resident’s property. It was found that the helicopter was not related to OceanaGold and was likely PowerCo checking powerlines.

A noise complaint received at the beginning of December was not able to be investigated as the complainant did not use the appropriate channel for noise complaints (0800 number) or provide any details around the noise they could hear.

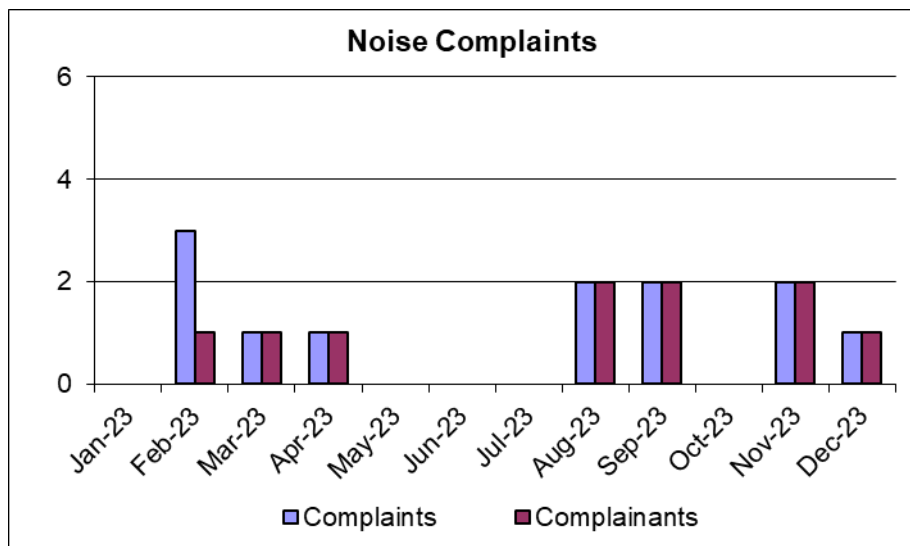


Figure 1. Noise complaint history.

4.5. Operations Assessment

4.5.1. Mill/Processing

Processing operations continued as usual during the quarter. Day-time activities at the mill were compliant with noise limits and the three measured levels ranged between 39.0 and 49.3 dB (MCNL 45.7 dB). The excavator working on the stockpile and birds were the dominant noises. Night-time activities at the mill were also compliant with noise limits and the three measured levels ranged between 31.4 and 35.5 dB (MCNL 33.2 dB), with crickets and trucks being the dominant noises.

4.5.2. Underground Operations

In mid-July, works at the base of the pit were carried out to prepare the site for in-pit waste rock dumping from underground. A listen-only check was completed, and the excavator was inaudible from the pit rim. Day-time in-pit waste rock dumping from underground commenced on 9 August 2023, and five noise checks were completed. Trucks were audible at close-proximity locations but not at compliance locations, with levels ranging from 43.4 to 48.0 dB (MCNL 44.5 dB).

Night-time in-pit waste rock dumping from underground started during the quarter, on 4 October 2023. Six noise checks were completed from a compliance location, with levels ranging from 32.9 to 45.9 dB (MCNL 37.4 dB). Being the dominant noise, winds were strong on these monitoring occasions (3 – 6 m/s) but positive for monitoring as the microphone was downwind. Background noises included traffic, a dog barking, and a truck dumping waste rock. On four of the six readings, no trucks were audible (including the highest reading of 45.9 dB). On the other two readings, the truck noise reached a maximum of 42.4 dB for less than 10 seconds during the period and the total duration readings were 35.0 and 37.9 dB. It is expected that these levels would be even lower during light wind conditions.

Including the usual quarterly monitoring requirements, three compliance measurements were made of surface-related activities (e.g. ventilation) supporting underground operations during the period. Day-time activities were compliant with noise limits and levels ranged from 45.3 to 47.2 dB (MCNL 46.4 dB), with birds being the dominant noise.

4.5.3. Exploration & Other Drilling

Exploration drilling during the quarter continued underground; no local surface exploration drilling occurred.

4.5.4. Martha Pit (non-underground related)

No significant surface-related works were conducted in the Martha Pit during the quarter, with only essential maintenance (drainage, weed control, and security) and low-impact geotechnical monitoring being undertaken.

5. Mitigation

5.1. Mine & Exploration

Commitment to the management and mitigation of mine noise was sustained during the reporting period. In accordance with the Noise Management Plan (noise mitigation), no yellow or red assessments were determined during the quarter.