



# Noise, Airblast and Vibration Management Plan

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|               |                                    |
|---------------|------------------------------------|
| Department    | Environment and Social Performance |
| Location/Site | Macraes                            |

## Approval Table

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# 1 Purpose

## 1.1 Background

This Noise, Airblast and Vibration Management Plan (NAVMAP) has been prepared pursuant to, and to give effect to conditions of the OceanaGold (New Zealand) Limited (OceanaGold) land use consents listed in Table 1-1.

**Table 1-1: Relevant OceanaGold Resource Consents**

| Project                                        | Consent Reference                                                      |
|------------------------------------------------|------------------------------------------------------------------------|
| Macraes Phase III Expansion Project)           | LRC 201.2011.35                                                        |
| Coronation Project                             | Joint LRC 201.2013.360 and LUC 2013-225                                |
| Coronation North Project                       | Joint LRC 201.2016.779, 201.2013.360.1, LUC-2016-234 and LUC-2013-225A |
| Coronation North Extension                     | Joint LRC 201.2019.1241/2, LUC-2019-42A                                |
| Deep Dell North Stage III                      | LUC 201.2019.1454                                                      |
| Golden Point Underground Mine Extension (2023) | LRC 201.2023.2107                                                      |
| Golden Point Underground Mine Extension (2020) | LUC 201.2020.1514                                                      |
| Consents Continuity Stage 1 (CCP1)             | 201.2023.2302                                                          |
| Consents Continuity Stage 2 (CCP2 )            | 201.2023.2302/3                                                        |
| Macraes Phase 4                                | [TBC]                                                                  |

In particular, the NAVMAP gives effect to the MP4 consent conditions in the following sections: [To be completed]

The purpose of the NAVMAP is to facilitate the avoidance, remediation, and mitigation of any adverse effects of noise, airblast or vibration generated from mining activities and to promote proactive solutions to the control of noise, airblast and vibration from the site.

All of the consents listed in Table 1-1 stipulate compliance limits for noise, airblast and vibration generated by mining activities at the Macraes Operation. Until the consents expire or are formally surrendered, they technically authorise activities that generate noise and set out compliance limits that must be achieved. While the consents are generally consistent in how they set compliance limits, where there is an inconsistency, the more restrictive limit must be complied with.

The purpose of the NAVMAP is to facilitate the avoidance, remediation, and mitigation of any adverse effects of noise, airblast or vibration generated from mining activities and to promote proactive solutions to the control of noise, airblast and vibration from the site.

The NAVMAP includes information on the following:

- The sources of noise, airblast and vibration at the Macraes Operation;
- Noise, airblast or vibration monitoring methods;
- Noise, airblast and vibration mitigation and prevention measures;
- Mechanisms for remediation of adverse effects (should this be required);
- Methods for managing complaints regarding noise, airblast and vibration and keeping records related to compliance; and
- Key personnel responsible for implementing the NAVMAP.

The NAVMAP is intended to be a working document and as such information included is expected to be reviewed and revised as mining activities progress.

## 1.2 Objectives

The objectives of the NAVMAP are:

- To describe current and proposed noise, airblast and vibration management methods and procedures;
- To enable OceanaGold to operate in full compliance with resource consent requirements; and
- To describe the noise, airblast and vibration monitoring regime and reporting of results.

# 2 Background

## 2.1 Description of Activity

Key mining activities authorised by OceanaGold land use consents relevant to the NAVMAP include:

- The extraction of minerals and overburden by mechanical means including blasting within the open pits and the stockpiling and/or stacking of these materials;
- The construction of waste rock stacks;
- The transport, treatment, and processing of extracted minerals and waste rock;
- The stacking, deposit and storage of substances considered to contain any mineral from mine workings;
- The construction, maintenance, and use of all haul roads and access tracks around the mine site;
- The construction, de-commissioning, rehabilitation, de-construction or dismantling of the mine landforms and any structures and works resulting from mining activities;
- The construction, operation and maintenance of silt ponds and silt control facilities necessary for controlling runoff from mining operations;
- The construction of water storage dams;
- The processing of minerals at the onsite processing facility;
- The removal of tailings from existing storage facilities by way of hydraulic methods; and
- The transportation and discharge of tailings within storage facilities and the construction of these facilities.

- Maintenance of mobile and fixed plant.

Blasting is the dominant source of airblast and vibration, with hauling of ore/waste rock also a potential source of vibration.

Vehicle movements and heavy mining machinery, operation of stationary equipment, horns and sirens/alarms are the main sources of noise.

This management plan is informed by various technical reports prepared to support resource consent applications submitted to authorise the above activities. All the relevant technical reports are available upon request.

## 2.2 Description of Site and Local Environment

### 2.2.1 Site Description

The Macraes Operation is located on the Macraes Flat, approximately 30 km northwest of Palmerston in the Otago Region. Macraes Flat is situated on an elevated plateau at approximately 500 m above sea level. The plateau is flanked by the Taieri Ridge to the northwest, Shag Valley and Horse Range to the east, and the coastal hills and extinct volcanic cones of Palmerston and Waikouaiti to the southeast. Macraes Road provides access to Macraes Flat and the Macraes Operation, connecting to State Highway 85 to the east and State Highway 87 (SH87, the Middlesmarch–Hyde Road) to the west.

The environment within and surrounding the Macraes Operation has been shaped by historic and current mining activities undertaken in accordance with existing resource consents. Figure 2-1 shows the arrangement of the major mine features at the Macraes Operation. In summary, the current components of the Macraes Operation include:

- Numerous open pits (both operational and non-operational);
- Two underground mines (Fraser's, now closed, and Golden Point, which is actively mined);
- Waste rock stacks at various stages of operation and rehabilitation;
- A network of haul roads and general mine service tracks;
- A Processing Plant;
- Five tailings storage facilities (three inactive, one active but nearing capacity, and one under construction and currently receiving tailings);
- An extensive network of water management infrastructure, including diversion drains, silt ponds, sumps, pit lakes, and freshwater storage reservoirs;
- Two consented but not yet constructed water storage reservoirs (Camp Creek Dam and Coal Creek Dam); and
- Associated infrastructure supporting ongoing operations, including district roads, powerlines, workshops, offices, and associated water and amenity facilities.

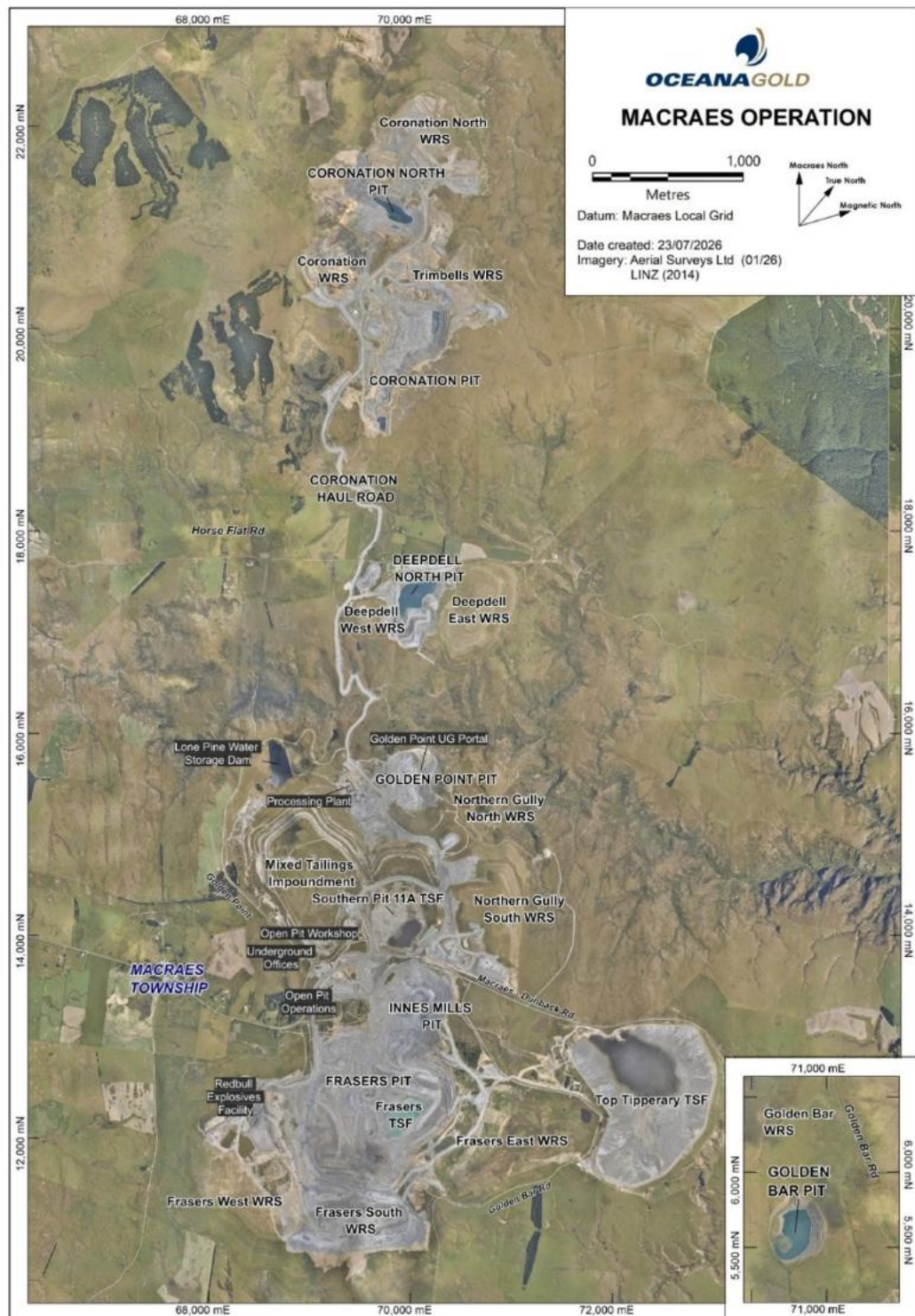


Figure 2-1: Macraes Operation Overview Maps

### 2.2.2 Local Environment

Macraes village is located approximately 1.2 km west of the Macraes Operation, there are land uses within the village that are sensitive to the effects of noise, vibration and blast effects, including dwellings, a school and community facilities. In addition to sensitive land uses within Macraes village, there are also sensitive land uses in the form of rural residential dwellings and historic sites in the wider area surrounding the Macraes Operation. Sensitive receivers in the environment surrounding the Macraes Operations are identified in Figure 2-2, Figure 2-3 and Figure 2-4. Included in Table 2-1 is a list of sensitive receiver sites.

**Table 2-1: Sensitive Receivers**

| Address             | Type            | Owner                                         |
|---------------------|-----------------|-----------------------------------------------|
| 1 Hill Street       | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 11 Hyde Street      | Dwelling        | Teachers Residence New Zealand Gazette 1962   |
| 15 Hyde Street      | Dwelling        | [REDACTED]                                    |
| 1700 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1702 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1704 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1720 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1726 Macraes Road   | Non-residential | [REDACTED]                                    |
| 1738 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1755 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1756 Macraes Road   | Community Hall  | Oceana Gold (New Zealand) Limited             |
| 1757 Macraes Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 1760 Macraes Road   | Stanleys Hotel  | Oceana Gold (New Zealand) Limited             |
| 1801 Macraes Road   | Dwelling        | [REDACTED]                                    |
| 2 Hill Street       | Non-residential | [REDACTED]                                    |
| 3 Hill Street       | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 406 Horse Flat Road | Dwelling        | [REDACTED]                                    |
| 47 Hyde Street      | Dwelling        | [REDACTED]                                    |
| 482 Longdale Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 497 Red Bank Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 540 Four Mile Road  | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 546 Red Bank Road   | Dwelling        | Oceana Gold (New Zealand) Limited             |
| 6 Hyde Street       | School          | Set Apart for School New Zealand Gazette 1960 |
| 800 Stoneburn Road  | Dwelling        | [REDACTED]                                    |
| Callery's Battery   | Dwelling        | Administered by Department of Conservation    |

|                             |               |                                            |
|-----------------------------|---------------|--------------------------------------------|
| Gay Tan's Cottage           | Historic Site | Oceana Gold (New Zealand) Limited          |
| Golden Point Reserve Site 1 | Historic Site | Administered by Department of Conservation |
| Golden Point Reserve Site 2 | Historic Site | Administered by Department of Conservation |
| Golden Point Reserve Site 3 | Historic Site | Administered by Department of Conservation |
| Golden Point Reserve Site 4 | Historic Site | Administered by Department of Conservation |
| Murphys Flat                | Historic Site | Administered by Department of Conservation |

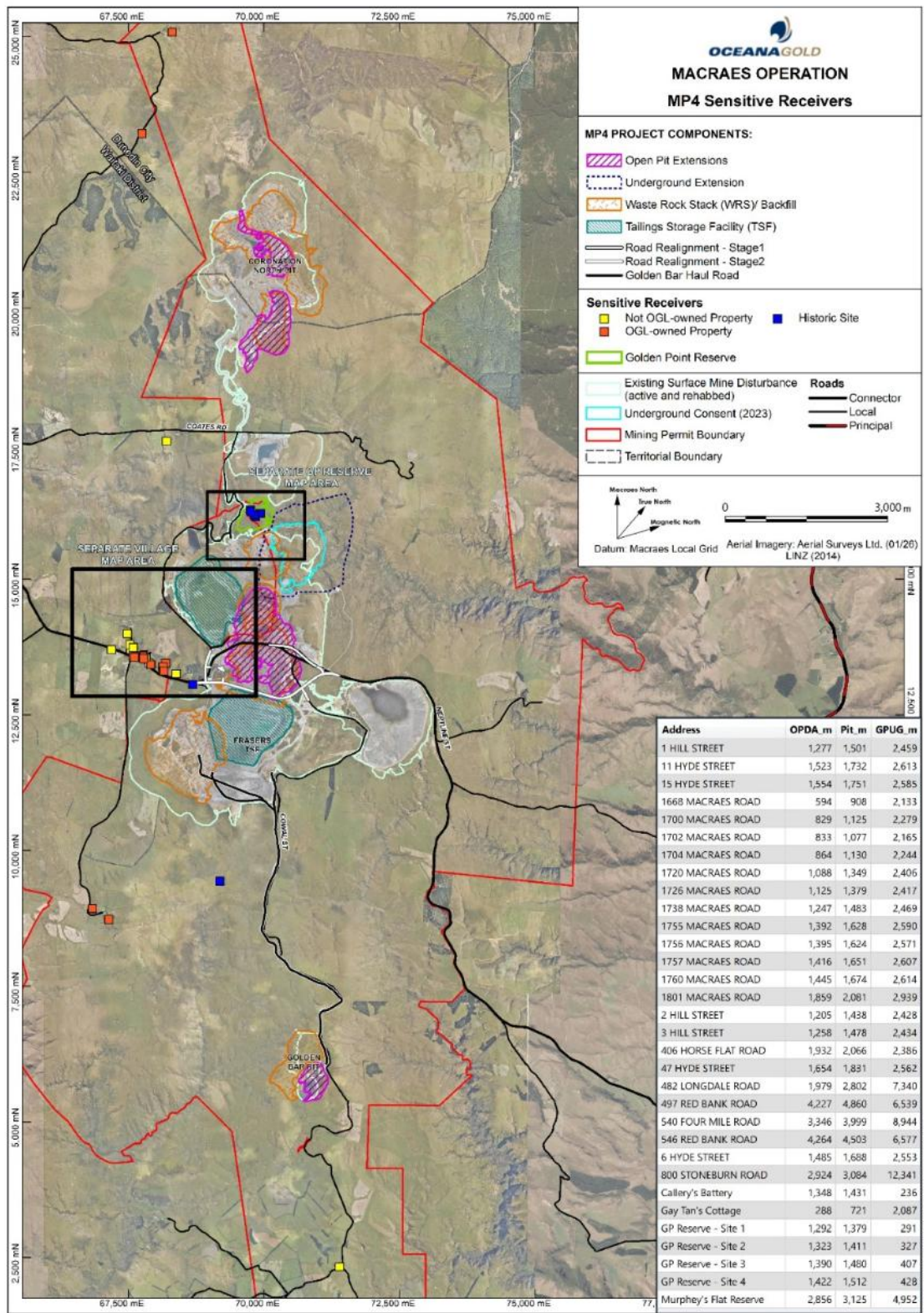
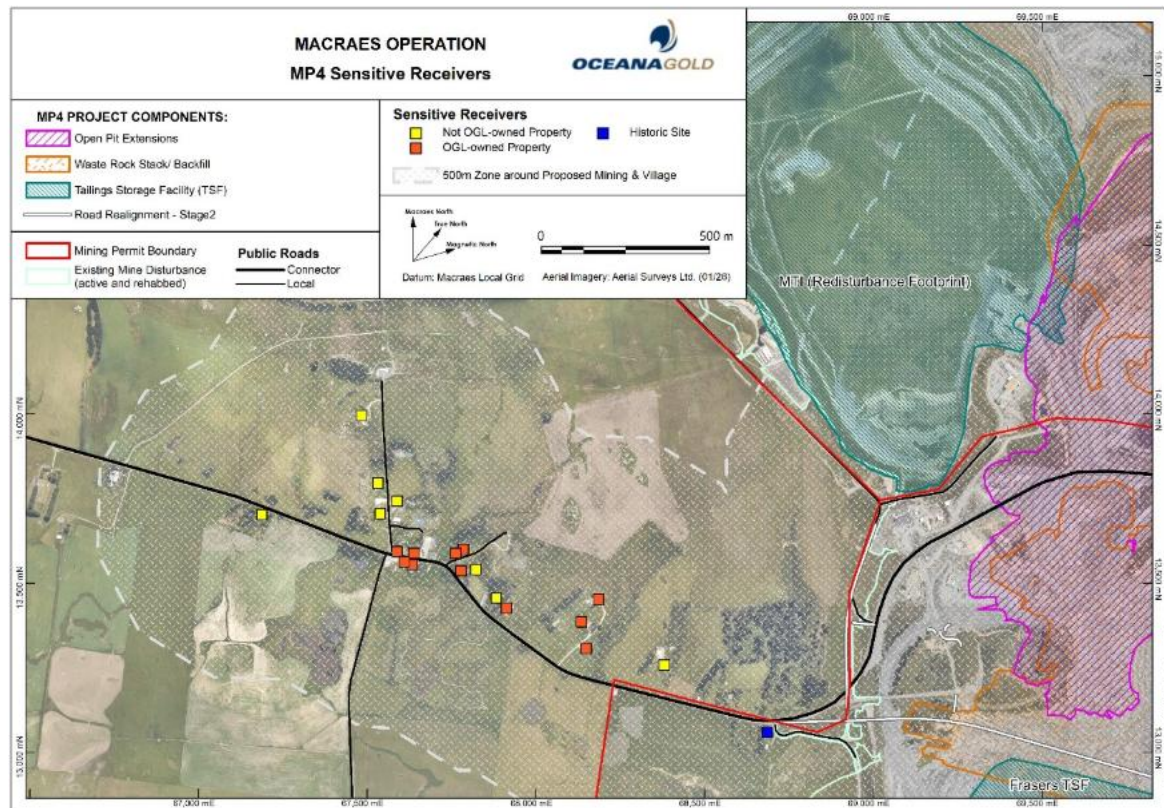
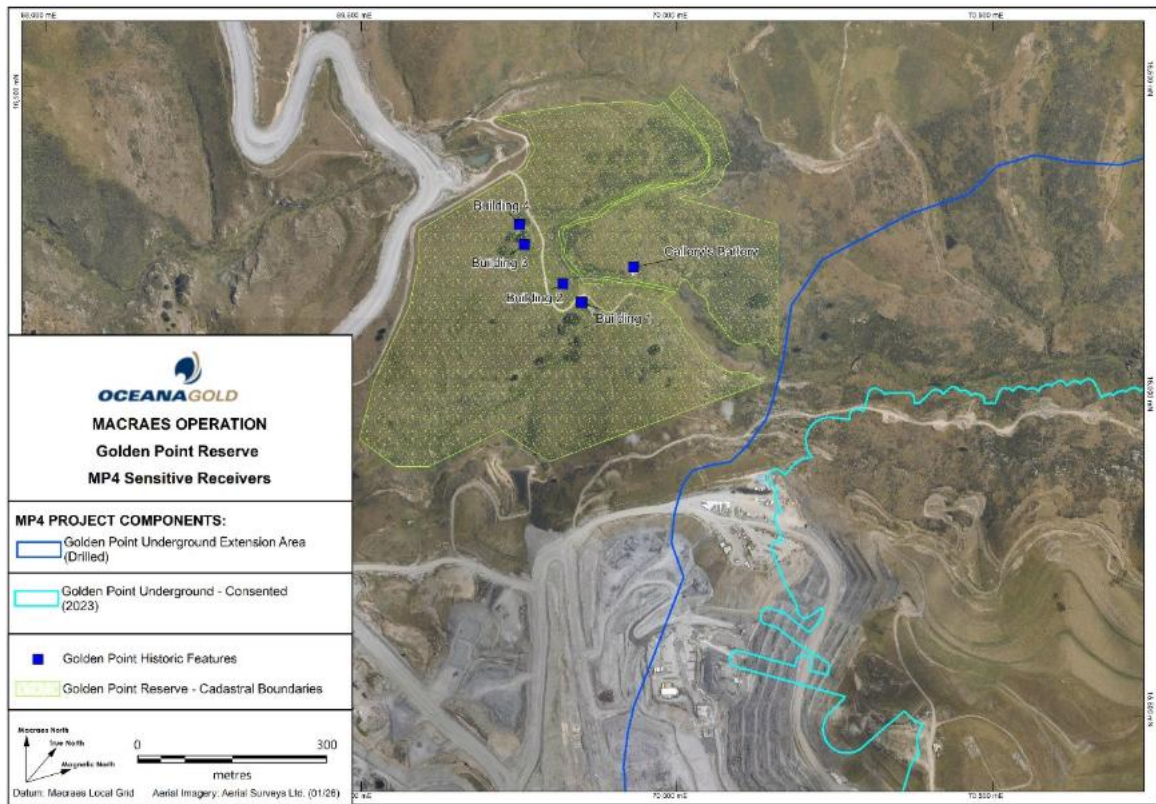


Figure 2-2: Overview of Sensitive Receivers



**Figure 2-3: Macraes Village Sensitive Receivers**



**Figure 2-4: Golden Point Historic Reserve Sensitive Sites**

## 3 Management of Adverse Effects

### 3.1 Noise Effects Management

#### 3.1.1 Noise Compliance Limits at Dwellings

Land use consents listed in Table 1-1 impose the following noise limits at the notional boundary of any dwelling not owned by OceanaGold:

- On any day between 7 am to 9 pm (daytime): 50 dBA Leq; and
- On any day between 9.00 pm to 7.00am the following day (night-time): 40 dBA Leq; and/or 70 dBA Lmax.

There are number of consents where bespoke limits or management approaches have been adopted, these are described below.

#### Deepdell North Stage III

Under consent 201.2019.1454 that authorises Deepdell North Stage III mining activities, a limit of 55 dBA Leq applies during on any day between 7 am to 9 pm.

## Consents Continuity Stages 1 and 2

Under resource consents 201.2023.2302 and 201.2023.2302/3 that authorise CCP1 and CCP2 land use activities, compliance limits do not apply at following locations:

- Any property or site that is owned by the OceanaGold;
- The property located at 1668 Macraes Road;
- The property located at 406 Horse Flat Road;
- The property located at 1726 Macraes Road;
- The property located at 2 Hill Street; or
- Any property or site where a dwelling did not exist at the time this consent was granted.

## Macraes Phase 4

*[To be completed]*

### 3.1.2 Mitigation Strategies

In line with sound environmental management practice and as set out in the relevant technical assessments, the development of mitigation strategies generally follows the hierarchy below:

- Control the impact at the source;
- Intercept at the pathway;
- Monitor at the receptor;
- Mitigate unacceptable adverse effects at the receptor; and
- Remedy unacceptable adverse effects at the receptor.

Thus, depending on the outcomes of modelling, mitigation strategies to avoid or minimise disturbance from noise, airblast and vibration include, but are not limited to:

- Staging of mining operations to avoid certain areas at night or in unfavourable weather conditions;
- Modification of blasting methods or blasting times;
- Modification to equipment or use of alternative equipment;
- Use of Trigger Action Response Plans (TARPs) for controlling problematic nighttime activities;
- Construction of noise bunds or barriers;
- Noise suppression systems on machinery;
- Maintenance of machinery;
- Double glazing of windows, insulation of walls or other forms of noise abatement at the receptor;
- Prior notification to affected parties where noise, airblast or vibration will be at levels of potential nuisance; and
- Monitoring and repair of any damage at historic sites vulnerable to the effects of vibration and airblast.

Mitigation strategies that are required by resource consent conditions or relied upon in effects modelling are set out below in Sections 3.2.2 - 3.2.5. Monitoring of adverse noise, vibration and airblast effects relies heavily on monitoring to inform blast designs, Section 4 describes noise, vibration and airblast monitoring at the Macraes Operation.

### Noise Bunds

Noise bunds have been constructed south of the Frasers West Pit, west of Frasers Pit and east of the Coronation Haul Road to mitigate potential noise effects. Noise bunds must be retained through to closure of the mine.

To mitigate noise effects at 1688 Macraes Road associated with activities authorised by [insert MP4 consent ref] within three months of authorised activities commencing, a noise bund must be constructed on adjoining land to the east as shown in red on Figure 3-1 .



**Figure 3-1: MP4 Noise Bund to Mitigate Effects on 1668 Macraes Road**

### Coronation Haul Road Restrictions

Condition 8.2 of resource consents that authorise mining at Coronation North states that no Heavy Vehicles other than a service truck shall use the haul road between the Coronation or Coronation North mine site and the gold processing plant as shown on Map 1 between the hours of 9.00 pm to 7.00 am each day. Condition 8.2 ceases to have effect if the OceanaGold obtains

an agreement with the owners of 406 Horse Flat Road that the condition is no longer necessary. The effect of Condition 8.2 not applying is that the noise limit at 406 Horse Flat Road during night-time hours shall be 51dBA LAeq.

Noise attenuation works were undertaken on the dwelling at 406 Horse Flat Road and approval from the owners of 406 Horse Flat Road was obtained and provided to ORC. Condition 8.2 of xx no longer applies.

Subject to future mine extensions being designed to not expose the dwelling at 406 Horse Flat Road to noise effects worse than those measured to inform the design of noise attenuation works undertaken on the dwelling, the agreement relating to the use of the Coronation Haul Road continues to apply i.e. OGL must continue to manage noise effects to comply with a limit of 51 dBA at Horse Flat Road. For clarity, a noise limit 51dB LAeq applies at the notional boundary of 406 Horse Flat Road for MP4 activities.

#### **Night-time Activity Restrictions – Innes Mills Back Fill and Frasers West Waste Rock Stack**

Mining activities authorised by MP4 are subject to additional controls to ensure noise levels remain below night-time noise compliance limits at the below locations:

- At the notional boundary of the dwelling at 1668 Macraes Road; and

Operations in the specific areas of Frasers West Waste Rock Stack and Innes Mills Back Fill Stage 1, identified in Figure 3-2, must occur during the day-time period only to ensure compliance with the night-time noise compliance limits.

The above restrictions are limited to spreading waste within these areas using a dozer and grader. Haulage to these locations is not restricted.



**Figure 3-2: Restrictions on Night-Time Operations**

### **Maintenance of Machinery**

All machinery is regularly maintained to ensure it generates noise levels no higher than what was modelled to assess potential effects.

## **3.2 Blast Effects Management**

### **3.2.1 Open Pit Vibration and Airblast Compliance Limits at Dwellings**

Note: underground blasting is not subject to consent conditions that require compliance with limits at the notional boundary of dwellings.

The following blast and vibration limits apply when measured at the notional boundary of any dwelling not owned by OceanaGold:

- Vibration shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time; and
- Airblast overpressure shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 120 dB (Linear peak) at any time.

### 3.2.2 Open Pit Blasting Times and Notifications

Note: underground blasting is not restricted to certain periods.

Blasting must be undertaken within the following periods:

- Monday-Friday 9.00 am to 5.30 pm; and
- Saturday, Sunday 10.00 am to 4.30 pm.

In addition to the above restrictions, blasting within the Deepdell Stage 3 pit is restricted to 10 am to 4:30 pm on public holidays.

The location and time of open pit blasting must be posted daily at all the main mine entrances and advised to employees by daily email.

### 3.2.3 Blast Design Parameters and Considerations

The size of any blast and hence the management of blasting effects starts with appropriate mine planning and design.

Management of blast vibration therefore needs to be a critical consideration in all areas of mine design and planning. The selection of the spacing, length and diameter of blast holes is interrelated and determines the optimum explosives charge weight that should be effectively applied when production blasting. All aspects of mine planning and design will be appropriately applied to achieve a balance between productivity, cost-effectiveness and vibration minimisation.

The blast design parameters are typically determined based upon the required powder factor that adequately fragments the rock to be excavated. The powder factor is the amount of explosives weight (or charge) used in kg per m<sup>3</sup> of rock to be broken.

Ground vibration and airblast must also be considered to ensure compliance with the limits imposed by consent conditions. The magnitude of ground vibration and airblast are dependent upon the distance from the blast and the maximum instantaneous charge (MIC) of explosives being fired.

Other blast parameters that need to be determined for each blast are:

- The blasthole diameter;
- Burden and spacing of the blast pattern;
- The explosive density;
- The uncharged length of blasthole;
- The type of stemming material used and the stemming length. Insufficient stemming or inferior stemming material will reduce the confinement of the explosives charge when detonated, potentially resulting in some 'rifling' of the explosives charge and increased airblast;
- Sequencing of the blast hole initiation and the timing of the delays between each blast hole being initiated

- Whether decking of the explosives column in each blast hole is required to reduce the MIC. For example, detonation of some of the explosive's column can be delayed through the use of millisecond delay initiation units.

These parameters need to be selected to ensure blasting results in sufficient fragmentation of the blasted rock while achieving consent compliance and minimising detrimental vibration effects.

### 3.2.4 General Blast Design Procedure

In practice, the application of statistics and the design of a blast via a given vibration relationship (equation) does not need to and will not occur for every blast. The practice used throughout is to:

- Adopt an existing relevant vibration relationship as the starting point for the open pit and underground blast designs, adopting conservatism in selecting a Maximum Instantaneous Charge (MIC) until there are enough data to confirm or refine this relationship;
- Ensure the blast design has an MIC that is below the limiting MIC that has been calculated to achieve compliance with the consent conditions for ground vibration and airblast; and
- Review vibration and airblast monitoring data and adjust blast design parameters where necessary, monitoring data must be reviewed daily and adjusted accordingly when blasting is occurring within 2 km of a sensitive receiver.

All blasts are designed by open pit and underground mining engineers and are reviewed and approved by a Senior Technical Services staff member. This review must consider the maximum instantaneous charge, timing and sequencing and the results of previous firings in the same area.

#### Open Pit Blast Design

##### *Characteristics*

The most recent assessment of vibration and airblast effects from blasting at the Macraes operation by TechNick Consulting was undertaken in May 2026. The assessment concluded that 'production' blasting in the open pit will have to be moderated when the distance between blasting and a residence is less than 2km as the calculated peak particle velocity (PPV) at this distance would be 4.8 mm/s which is close to the resource consent limit of 5 mm/s.

Included in Table 3-1 are the open pit blast design parameters for 'Normal' blasting which may be applied when at greater distances than 2 km from the nearest residence. 'Normal' blasting is what is used in most instances for overburden stripping. More conservative blast designs are used in circumstances where more cautious blasting is appropriate to maintain control and minimise any environmental disturbances, such as blasting near pit limits. These more conservative blast designs are termed 'Reduced' blasting and 'Mini' blasting, they include additional measures of control as indicated in Table 3-1.

Typical blasthole designs and configurations may have up to three holes per delay MIC for Ore blasts and two holes per delay MIC for Waste blasts.

**Table 3-1: Open Pit Blast Design Parameters**

| Design Parameters | Mini-blasting | Reduced | Normal |
|-------------------|---------------|---------|--------|
| Diameter (mm)     | 102mm         | 102mm   | 200mm  |
| Explosives MIC    | 30kg          | 60kg    | 400kg  |

*Practices*

In order to minimise ground vibration and airblast, within a single pit, initiation of blasting on different benches will be offset (not simultaneous) to ensure no cumulative effects.

Between different pits, initiation of blasting will also be offset (not simultaneous).

Mine operations management shall also make an assessment of the weather conditions on the day of a proposed open pit blast and to make changes to the time of a blast if conditions are deemed unfavourable (eg weather inversions).

Where a blast is within 2km of the nearest residence, appropriate adjustments will need to be made to the blast design parameters (particularly MIC based on the actual distance to a residence) to ensure the vibration limits are complied with.

*Calculations*

The AS2187.2 default formula used for predicting vibration levels is:

$$V = K \times \left( \frac{\sqrt{W}}{D} \right)^{1.6}$$

where:

V = peak particle velocity (PPV) or (RPPV)

W = explosives charge per delay (kg) or MIC

D = distance to damageable “target” (m)

K = is a constant related to rock properties & blast design

RPPV refers to the ‘Resultant’ peak particle velocity which is the value taken from the accumulation of the vertical radial, and transverse individual planes. This is the most common reference applied to vibration limits and upon which the Australian Standard 2187.2 is based.

AS2187.2 recognizes a range of potential ‘K’ values because of the wide range of geological formations world-wide. The ‘K’ value depends on geological conditions and the nature of the type of blast design.

Calculations using AS2187.2 formula can assume a ‘K’ value of 1200 which is at the higher end of “back-calculated” values from the historical OGNZL blasting records.

For blasts within 2km of a residence, an acceptable MIC will be back calculated using the above formula. Back calculation allows the determination of the site specific 'K' value for the geological formations between the blast area and the receptor.

For calculating airblast, the relevant formula has been derived from AS 2187.2 2006: section J7.2 'Airblast overpressure'.

$$P = K_a \times \left( \frac{R}{Q^{1/3}} \right)^\alpha$$

Where:

P = pressure (kPa)

Q = explosives charge mass (kg)

R = distance from charge (m)

K<sub>a</sub> = site constant

α = site exponent

The resultant kPa pressure is then converted to dBL. Using the historical blast data, the relationship below has been used to calculate airblast generated for the Macraes open pit blasts:

$$P = 40 \times \left( \frac{R}{Q^{1/3}} \right)^{-1.45}$$

|               |     |
|---------------|-----|
| Production kg | 400 |
| Distance m    | 910 |
| dBL           | 107 |

Calculations show that the closest house (1668 Macraes Road) is predicted to experience acceptable airblast levels (less than 115 dBL) for the closest, typical production blast designs. Potential environmental effects associated with airblast are generally considered to be negligible.

### 3.2.5 Underground Blast Design

Residential sensitive receivers are sufficiently setback from blasting within the Golden Point Underground mine to ensure vibration levels do not exceed compliance limits without any modification to the standard underground blast designs.

Within the Golden Point Historic Reserve there are number of historic buildings which could potentially be impacted by underground blasting. The approach to managing potential effects on historic buildings within the Golden Point Historic Reserve is set out in Section 3.3.7.

### 3.2.6 Blasting Records

For each blast, details of the blasting method and parameters, strength of the blast (drill and blast design details, explosives used) and time of the blast shall be entered into a record kept for that purpose and shall be available to the Council on request.

### 3.2.7 Managing Effects of Blasting on Historic Buildings

Based on vibration modelling it is possible that historic buildings within the Golden Point Historic Reserve will be subject to vibration levels exceeding recommended limits identified in AS 2187.2:2006 to protect against damage to buildings from blasting.

Table 3-2 shows the modelled vibrations for historic sites located within the Golden Point Historic Reserve and the closest residence at 406 Horse Flat Road. Calculations are based on the maximum MIC being utilised at closest possible distance to sensitive receivers.

**Table 3-2: Golden Point Underground Vibration Predictions**

| Underground Blasting     | Historic Building                | Set back Distance (m) | Modelled Peak Particle Velocity or PPV (mm/s) | As 2187.2:2006 Recommended Limit (mm/s) |
|--------------------------|----------------------------------|-----------------------|-----------------------------------------------|-----------------------------------------|
| 'K' = 1200<br>MIC =400kg | Gaytan's Cottage                 | 721                   | 16.3                                          | 12.7                                    |
| 'K' = 1200<br>MIC =100kg | Callery's Battery                | 239                   | 25.0                                          | 19                                      |
|                          | Building 1 (Manger's House)      | 261                   | 22.5                                          | 19                                      |
|                          | Building 2 (Hughie Fraser's Hut) | 326                   | 17.2                                          | 19                                      |
|                          | Building 3 Sod Hut A             | 411                   | 13.0                                          | 12.7                                    |
|                          | Building 4 Sod Hut B             | 432                   | 12.3                                          | 12.7                                    |

To address potential effects on historic buildings, prior to commencing blasting authorised by [insert MP4 consent ref], the following protocol must be adhered to:

If vibration monitoring undertaken in accordance with this NAVMAP indicates that vibration trigger limits have been exceeded at Building 2 or Gay Tan's Cottage, the Consent Holder must:

- Immediately revise blast design to avoid further trigger limit exceedences.
- Engage a SEQP - Heritage Structures, to:
  - undertake a follow-up condition survey of each heritage building where the relevant vibration limit has been exceeded. Where the relevant vibration limit is exceeded at Building 2, all buildings in the Golden Point Historic Reserve must be inspected; and
  - prepare a report which sets out:
    - the results of any follow-up condition surveys;
    - confirmation as to whether any new damage is likely to be attributable to the blasting;
    - recommendations to change the blasting methodology as a means to avoid any further damage; and
    - any recommendations to change the frequency of monitoring as necessary.
- The report must be provided to the Consent Authority, the Department of Conservation and Heritage New Zealand Pouhere Taonga.
- If the SQEP – Heritage Structures, confirms that new damage to a heritage building is attributable to blasting authorised by this consent, the Consent Holder must notify the

Department of Conservation and Heritage New Zealand Pouhere Taonga and offer to repair the damage at its own cost.

[Heritage NZ contact details]

[DoC contact details].

## 4 Monitoring

### 4.1 Monitoring Plan Requirement

The NAVMAP shall include but not be limited to:

- Details of the monitoring locations, the frequency of monitoring and the method of measurement and assessment in accordance with the relevant conditions of each consent that pertain to noise and vibration management;
- Procedures for recording blast method, strength of the blast and time of the blast; and
- Procedures for addressing non-compliant results and notification to the Council.

### 4.2 Blasting and Vibration Monitoring

#### 4.2.1 Monitoring Locations and Frequency

Compliance limits apply at the notional boundary of any dwelling not owned by OceanaGold. Under consent LRC 201.2011.35 that authorises MP3 mining activities, compliance limits included in Section 3.3.1 also apply at a school or church that exists outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010.

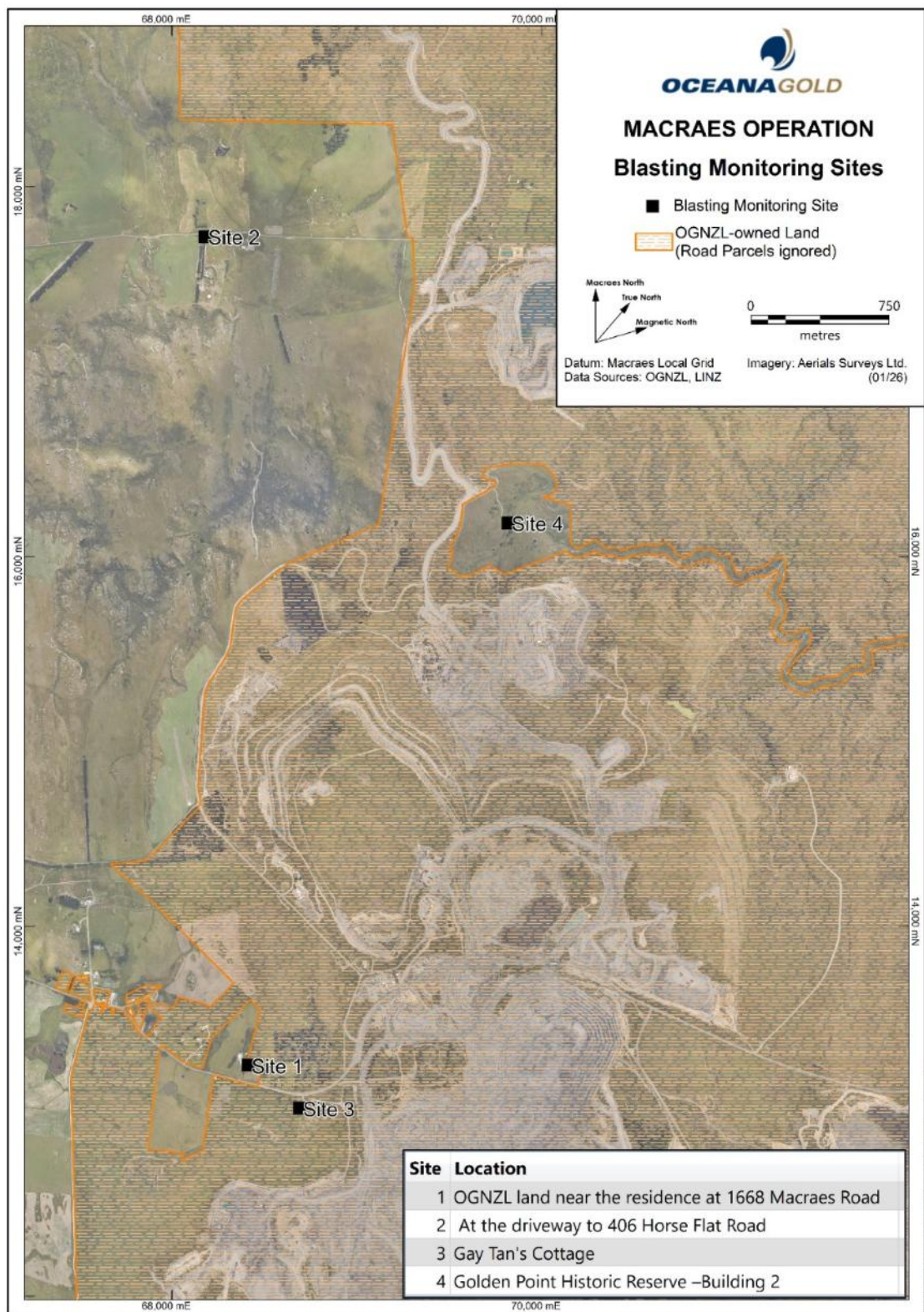
The notional boundary is defined as a line 20m from the exterior wall of any rural dwelling or the legal boundary where this is closer to the dwelling.

To manage blasting effects and to confirm compliance with limits in Section 3.3.1, blasting shall be monitored on OGNZL land near the residence at 1668 Macraes Road and at the driveway to 406 Horse Flat Road. To manage blasting effects on historic buildings in accordance with the protocol identified in Section 3.3.7, blasting shall be monitored at Gaytans Cottage and Building 2 in the Golden Point Historic Reserve (refer Figure 2-4). The proposed location, timing and frequency of blast monitoring is set out in Table 4-1. Monitoring locations for blasting are identified in Figure 4-1.

**Table 4-1: Blast Monitoring – Location, Timing and Frequency**

| Site Ref | Monitoring Locations                               | Timing                                    | Frequency                              |
|----------|----------------------------------------------------|-------------------------------------------|----------------------------------------|
| Site 1   | OGNZL land near the residence at 1668 Macraes Road | Blasting in Innes Mills Pit               | Continually*                           |
| Site 2   | At the driveway to 406 Horse Flat Road             | Blasting in Coronation Pit                | Monthly - two randomly selected blasts |
| Site 3   | Gay Tan's Cottage                                  | Blasting in Innes Mills Pit               | Continually*                           |
| Site 4   | Golden Point Historic Reserve –Building 2          | Blasting in Golden Point Underground Mine | Continually*                           |

The frequency of monitoring can reduce to 'two randomly selected blasts each month' where blasting occurring at distances exceeding 2 km from the closest sensitive receiver has not exceeded compliance limits specified in Section 3.3.1 for three months in a row.



**Figure 4-1: Blasting Monitoring Locations**

#### 4.2.2 Monitoring Equipment

Blast and sound overpressure monitoring will be undertaken using OceanaGold's Texcel GTM blast monitors or similar equivalent. The Blast monitors shall be calibrated externally before the expiry date of the previous external calibration.

#### 4.2.3 Monitoring Results, Investigation and Reporting

Recorded airblast and vibration monitoring data must be stored in a central location and assessed against relevant compliance limits described in Section 3.3.1. Where monitoring results indicate an exceedance of airblast and vibration limits at a dwelling sensitive site, an investigation must be undertaken.

The investigation will include collection of relevant weather data, identifying operational activities at the time of the incident, collecting camera footage and interviewing operational staff. Investigations should endeavour to identify root cause and contributing factors.

Where the breach relates to a historic site, a condition survey must be undertaken in accordance with the protocol identified in Section 3.3.7.

In the event of a valid non-compliant airblast or vibration reading the event should be reported through to the relevant territorial authority (i.e. Waitaki District Council or Dunedin City Council depending on which Council boundary the incident occurred within), within 24 hours of the incident occurring.

A record of the event must be recorded in the InControl reporting system and any relevant actions assigned.

Monitoring results will be summarised and reported in the Project Overview and Annual Work and Rehabilitation Programme that is supplied to the WDC and DCC by 31 March each year

### 4.3 Noise Monitoring

A minimum of four readings must be taken each month at any of the dwellings identified as sensitive receiver(s) in Table 2 (not every dwelling is required to be monitored each month). Monitoring is to include both day-time (Monday to Friday 7 am – 9 pm) and night-time (Monday to Friday 9 pm to 7 am) measurements.

When the Coronation Haul Road is being used to transport ore to the processing plant, monthly monitoring must occur at 406 Horse Flat Road. When mining activities are occurring in the Central Mining Area<sup>1</sup>, monthly monitoring must occur at 1668 Macraes Road.

In addition, noise monitoring may occur on OceanaGold property from time to time as part of OceanaGold's internal review system.

#### 4.3.1 Monitoring Equipment

Noise monitoring for compliance will be undertaken with a Casella CEL-621A or Casella CEL-632A sound Level Meter. The sound level meter shall be calibrated before each use and externally before the expiry date of the previous external calibration.

All noise measurements referred to shall be measured in accordance with the provisions of NZS 6801:2008 Acoustics: Measurement of Environmental Sound and shall be assessed in accordance with the provisions of NZS 6803:2008 Acoustics: Environmental Noise.

#### 4.3.2 Monitoring Results, Investigation and Reporting

Recorded noise monitoring data must be stored in a central location and assessed against relevant compliance limits described in Section 3.1. Where monitoring results indicate an exceedance of the noise limits at a sensitive site, an investigation must be undertaken.

The investigation will include collection of relevant weather data, identifying operational activities at the time of the incident, collecting camera footage and interviewing operational staff. Investigations should endeavour to identify root cause and contributing factors.

In the event of a valid non-compliant noise reading the event should be reported through to the relevant territorial authority (i.e. Waitaki District Council or Dunedin City Council depending on which Council boundary the incident occurred within), within 24 hours of the incident occurring.

A record of the event must be recorded in the InControl reporting system and any relevant actions assigned.

Monitoring results will be summarised and reported in the Project Overview and Annual Work and Rehabilitation Programme that is supplied to the WDC and DCC by 31 March each year.

#### 4.3.3 Additional Monitoring

Additional monitoring may be required as a consent condition to confirm noise modelling results, in order to improve knowledge of specific conditions which may arise and lead to excessive noise levels, or as a result of management of operational noise through Trigger Action Response Plans (TARPs).

The use of unattended noise monitoring equipment is a useful tool for addressing knowledge gaps however it is important to consider using such equipment in conjunction with the collection of real-time weather data to ensure that measurements that are taken are within the meteorological window as defined by NZS 6801:2008 and NZS 6802:2008.

Spot noise measurements, as part of TARPs, will only be made by trained individuals (could include OGL personnel with the necessary skills to operate monitoring equipment effectively). Such spot measurements must record all necessary information (including time of reading, background noise, weather conditions). This information will be passed on to an OGL Environmental Advisor for filing and future reference.

## 5 Complaints

Complaints may be referred by one or more of the regulatory authorities, a member of the public or direct via an OceanaGold employee or contractor. It is the responsibility of the Manager Environment and Social Performance to respond to and follow up all complaints regarding noise, airblast or vibration. The Manager Environment and Social Performance may delegate that authority, and is responsible for ensuring suitably qualified personnel are available to respond to complaints.

Actions to be taken as soon as possible by the Manager Environment and Social Performance or delegated personnel:

- All complaints are logged in InForm Stakeholder data base.
- Note the time, date, identity and contact details of complainant. Note if complaint has been referred from a Consent Authority.
- Ask the complainant to describe the noise, airblast or vibration; how long it has been noticeable for, is it worse at any time of day, does it come from an identifiable source.
- As soon as possible after receipt of a complaint undertake a site inspection. Note all noise, airblast or vibration-producing activities taking place, which staff member or contractor is responsible for the site and the noise, airblast and vibration mitigation methods that are being used. Instigate any remedial action necessary.
- As soon as practical (preferably within two hours of remedial action being implemented) visit the area from where the complaint originated to ascertain if noise, airblast or vibration is still a problem.
- If it becomes apparent that there may be a source of noise, airblast or vibration other than activities at the Macraes Operation causing the nuisance it is important to verify this. Document the source.
- If complaint is received more than 12 hours after the event, conduct investigation including collecting relevant weather data, identifying operational activities at the time of the incident, collecting camera footage and interviewing operational staff. Investigations should endeavour to identify root cause and contributing factors.
- As soon as possible after the initial investigations have been completed contact the complainant to explain what has been found and remedial actions taken.
- If necessary, update any relevant procedures to prevent any recurrence of problems.

Follow up actions: Advise the Waitaki District Council (WDC) (all areas excluding Coronation North) and the Dunedin City Council (Coronation North and the DCC side of the Coronation Project) as soon as practical that a complaint has been received, what the findings of the investigation were and any remedial actions taken. A single consolidated reporting database that records whether complaints arise within the jurisdiction of WDC or DCC should be maintained.

The Macraes Operation has a concerns, complaints and grievance mechanism to use if the community has any issues. The relevant contact phone number or email address for the community to contact, and the process to follow, are laid out in the Macraes Operation Concerns, Complaints and Grievance Mechanism Standard Operating Procedure.

## 6 Responsibilities

OceanaGold as the holder of the consents for the Macraes Operation has the ultimate responsibility to ensure that all statutory requirements and conditions of consent are complied with and mining activities are carried out in accordance with the NAVMAP.

**Table 6-1: Roles and Responsibilities**

| Role                                                               | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Macraes Asset President                                            | Provide appropriate management and financial support for the effective implementation of the NAVMAP.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Open Pit Mining Manager                                            | Implementation of the NAVMP and periodic reviews of the NAVMAP.<br>Investigating breaches of noise, vibration or airblast consent compliance limits.<br>Designing blasts to comply with vibration standards.<br>Monitoring blasts to inform blast designs.<br>Scheduling and managing mining activities to comply noise and vibration limits.<br>Provision of information in a timely manner to inform investigations into breaches of compliance limits.<br>Notifying staff of blast location and time <sup>1</sup> . |
| Underground Mining Manager                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Processing Manager                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Maintenance Superintendent<br>(limited to noise from the workshop) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Environment and Social Performance Manager                         | Review and approve the NAVMAP and ensure such reviews are undertaken at least annually..<br>Ensuring staff environmental awareness and training.                                                                                                                                                                                                                                                                                                                                                                       |
| Environment Superintendent                                         | Review the NAVMAP<br>Monitoring and reporting of noise and vibration monitoring data to councils as required by consent conditions.<br>Investigating breaches on noise and vibration standards.<br>Commissioning historic building condition surveys where trigger limits are exceeded.<br>Maintaining and operating the vibration monitoring network and calibration of blast monitors.                                                                                                                               |
| External Affairs and Social Performance Superintendent             | Responding to and managing complaints.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Environment Advisor                                                | Undertaking measurements and maintenance at the direction of the Environment Superintendent.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| All personnel and contractors                                      | Be aware of, and comply with, the procedures contained within or referred to in the NAVMAP                                                                                                                                                                                                                                                                                                                                                                                                                             |

All contractors and staff working on site are to ensure that their activities comply with relevant consent conditions, inclusive of requirements set out in the NAVMAP.

## 7 Consultation

### 7.1 Neighbours

OceanaGold will consult with the Macraes Community Incorporated (MCI) regularly, as part of the bi-monthly meeting process, to inform them of any issues regarding noise, airblast or vibration at the Macraes Gold Mine site that may be of interest to the community and to obtain feedback from the community.

OceanaGold will advise the Macraes Community, through MCI, of the contact phone numbers to be used to advise OceanaGold of a noise, airblast or vibration complaint.

OceanaGold will also consult with parties who are potentially affected by noise, airblast and vibration, as determined by modelling or as identified through previously consented projects. Discussions will include an explanation of modelling results and mitigation strategies to be used to avoid or minimise noise effects.

Complaints should be directed to:

[Insert external affairs email address]

### 7.2 District and City Councils

OceanaGold will inform WDC and DCC of any issues regarding noise, airblast or vibration control at the Macraes Operation that may be of interest to them and to obtain feedback on compliance and performance where relevant. OceanaGold will provide WDC and DCC with contact numbers to be used to advise OceanaGold of a noise, airblast or vibration complaint.

## 8 Reporting

### 8.1 OceanaGold to Regulatory Authorities

OceanaGold will inform WDC and DCC of the following:

- Any complaints received regarding noise, airblast or vibration as soon as practical after receipt of the complaint; and
- Of any non-compliance with consent limits in Sections 3.2.1 and 3.3.1.

Only complaints related to activities north of Matherson Road (jurisdiction of DCC) will be forwarded on to DCC.

### 8.2 Waitaki District Council/Dunedin City Council to OceanaGold

OceanaGold requests that WDC and DCC advise of any complaints they receive regarding noise, airblast or vibration from the Macraes Operation immediately after a complaint has been lodged.

## 9 NAVMAP Review Procedure

The NAVMAP shall be reviewed as required taking into account:

- The outcome of any reviews completed as the result of any non-compliant results;
- The outcome of the blasting and noise monitoring data; and
- Whether management practices are resulting in compliance with the conditions of the relevant consents.

OGNZL may lodge an amended monitoring plan, management plan or other document for recertification at any time. Minor/administrative changes may be implemented without recertification where written notice is provided to ORC no less than 5 working days prior to publication of the amended document.

Minor/administrative changes are limited to corrections of errors, updates to contact details, updates to reflect changes in organisational structure, formatting improvements, or other changes that:

- Do not alter the objectives, performance standards, mitigation methods, monitoring methodology, or reporting requirements of the certified document; and
- Do not materially affect the scale, location, or nature of activities authorised by these consents.

## APPENDIX A

### Resource Consent Conditions for Noise, Airblast and Vibration

| MP3                                                                                                                                                                                                                                                                                               | Coronation                                                                                                                                                                                                                                                                                        | Coronation North                                                                                                                                                                                                                                                                                  | Coronation North Extension                                                                                                                                                                                                                                                                        | Deepdell North                                                                                                                                                                                                                            | CCP1                                                                                                                                                                                                                                                                                              | CCP2                                                                                                                                                                                                                                                                                             | GPUG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | MP4              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Blasting and Vibration</b>                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |
| 8.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Fly-rock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 7.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Fly-rock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 7.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Fly-rock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 7.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Fly-rock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 7.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Flyrock shall be minimised, and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. | 8.1 The consent holder shall ensure that blasting practices minimise air and ground borne vibration. Fly-rock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 7.1 The Consent Holder shall ensure that blasting practices minimise air and ground borne vibration. Flyrock shall be minimised and all blasting procedures shall be carried out so as to ensure the safety of employees and the public. No blasting shall occur when the weather is unsuitable. | 39. The consent holder shall ensure that any blasting authorised by this consent avoids any damage to historic buildings or structures located in the Golden Point Historic Reserve. To achieve this condition the following shall be complied with:<br>a) Prior to the commencement of blasting, a suitably qualified and experienced structural engineer shall examine these buildings and prepare a report that summarises the baseline condition of the buildings and in particular any cracks that already occur;<br>b) The report completed under condition 39 (a) shall be provided in writing to the Consent Authority;<br>c) The expert shall monitor the structures at a sufficient frequency to ensure, as far as practicable, that there is no damage to the buildings that could be attributable to the blasting;<br>d) In the event that any new visible cracks appear on the features, or any other damage that has been attributed to the blasting by the monitoring in condition 39 (c), then the Consent Holder shall immediately cease all blasting and the Consent Authority and the Department of Conservation shall be immediately informed;<br>e) The Consent Holder shall engage suitably qualified structural engineering and blasting experts that together prepare a report which sets out the reasons why the damage is likely to be attributable to the blasting and recommendations to change the blasting methodology as a means to avoid any further damage and any recommendations to change the frequency of monitoring as necessary. This report shall be provided in writing to the Consent Authority and Department of Conservation;<br>f) Blasting may recommence in accordance with the recommendations contained in the report prepared under | To be completed. |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           |  |
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| 8.2 The location and time of blasting shall be posted daily at all the main mine entrances and advised to employees by daily email.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 8.2 The location and time of blasting shall be posted daily at all the main mine entrances and advised to employees by daily email.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7.2 The location and time of blasting shall be posted daily at all the main mine entrances and advised to employees by daily email.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |  |
| 8.3 Blasting shall be restricted to within the following hours: Monday-Friday 9 am to 5.30pm, Saturday and Sunday 10am to 4.30 pm                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 7.2 Blasting shall be restricted to within the following hours: Monday-Friday 9 am to 5.30 pm, Saturday and Sunday 10 am to 4.30 pm.                                                                                                                                                                                                                                                                                                                         | 7.2 Blasting shall be restricted to within the following hours: Monday-Friday 9 am to 5.30 pm, Saturday and Sunday 10 am to 4.30 pm.                                                                                                                                                                                                                                                                                                                         | 7.2 Blasting shall be restricted to within the following hours: Monday-Friday 9 am to 5.30 pm, Saturday and Sunday 10 am to 4.30 pm.                                                                                                                                                                                                                                                                                                                         | 7.2 Blasting authorised by this consent shall be restricted to within the following hours: a. Monday-Friday 9.00 am to 5.30 pm, b. Saturday, Sunday and public holidays 10.00 am to 4.30 pm.                                                                                                                                                                                                                                                                 | 8.3 Blasting shall be restricted to within the following hours: Monday-Friday 9am to 5.30pm, Saturday and Sunday 10am to 4.30pm                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 7.3 Blasting shall be restricted to within the following hours: Monday to Friday 9.00am to 5.30pm, Saturday and Sunday 10.00am to 4.30pm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                           |  |
| 8.4 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Council on request. This information shall also be included in the monitoring report, required under Condition 10.                                                                                                                                                                                                                                                                                                                             | 7.3 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Council on request. This information shall also be included in the monitoring report, required under Condition 9.                                                                                                                                                                                 | 7.3 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Council on request. This information shall also be included in the monitoring report, required under Condition 9.                                                                                                                                                                                 | 7.3 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Council on request. This information shall also be included in the monitoring report, required under Condition 9.                                                                                                                                                                                 | 7.3 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Consent Authority on request. This information shall also be included in the monitoring report, required under Condition 9.                                                                                                                                                                       | 8.4 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Council on request. This information shall also be included in the monitoring report, required under Condition 10.                                                                                                                                                                                                                                                                                                                             | 7.4 Details of blasting method, strength of the blast and time of blast shall be entered into a record kept for that purpose and shall be available to the Consent Authority on request. This information shall also be included in the monitoring report, required under Condition 9.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                           |  |
| 8.5 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 7.4 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 7.4 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 7.4 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 7.4 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 8.5 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time. | 7.5 Vibration due to blasting or any other activity associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the Consent Holder, or subject to an agreement with the Consent Holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.<br><b>Advice Note:</b> The notional boundary is defined as a line 20 metres from the exterior wall of any rural dwelling or the legal boundary where this is closer to the dwelling. |                                                                                                                           |  |
| 8.6 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.               | 7.5 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.                | 7.5 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.                | 7.5 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.                | 7.5 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.                | 8.6 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the consent holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.               | 7.6 Airblast overpressure from blasting associated with the mining operation, when measured at any point within the notional boundary of any dwelling not owned by the Consent Holder, or subject to an agreement with the Consent Holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan, deemed operative on 23 August 2010 shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 10 mm/sec at any time.                                                                                                                                                                                                    |                                                                                                                           |  |

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| or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. | shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. | shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. | shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. | shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. Note: The notional boundary is defined as a line 20 metres from the exterior wall of any rural dwelling or the legal boundary where this is closer to the dwelling. | or flat) level of 115 decibels (dB), shall not exceed a peak non-frequency-weighted (Linear or flat) level of 115 decibels (dB), provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level shall not exceed 120 dB (Linear peak) at any time. For the purpose of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting. Note: The notional boundary is defined as a line 20 metres from the exterior wall of any rural dwelling or the legal boundary where this is closer to the dwelling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |
|                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                                   |                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       | 8.7 The consent holder shall not conduct blasting within the vicinity of the Macraes-Dunback Road or Golden Bar Road in a manner that constitutes a danger to life or property. If the Waitaki District Council considers it necessary to temporarily close the Macraes-Dunback Road or the Macraes Road or Golden Bar Road to allow blasting to take place, it may permit the consent holder to temporarily close the road, provided that the consent holder: <ul style="list-style-type: none"> <li>(a) Keeps the time of closure as short as possible; and</li> <li>(b) Does not allow the time of closure to exceed a maximum of 15 minutes in any continuous period of 60 minutes, except where an emergency situation arises in respect of the safety of the public or project personnel.</li> </ul> In the event of such temporary closure the Consent Holder shall: <ul style="list-style-type: none"> <li>(a) Ensure appropriate barriers are erected and ensure such number of persons as may be necessary are stationed at Macraes Road or Golden Bar Road to prevent access by the public to that part of the road that shall be closed; and</li> <li>(b) Hold current public liability insurance to indemnify any member of the public affected.</li> <li>(c) Postpone any blasting in order to reopen the Macraes Road or Golden Bar Road to allow the passage of vehicles for emergency purposes.</li> </ul> |  |  |
|                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                   |                                                                                                                                                                                   |                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                       | 8.8 In the event of such temporary closure the consent holder shall: <ul style="list-style-type: none"> <li>(a) Ensure appropriate barriers are erected and ensure such number of persons as may be</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |

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## Appendix C: Proposed conditions of consent

### Blasting and Vibration

1. Conditions 10 – 13 (inclusive) do not apply to blasting undertaken in the Golden Point Underground Mine.
2. The Consent Holder must ensure that blasting practices minimise air and ground borne vibration. Fly-rock must be minimised and all blasting procedures must be carried out to ensure the safety of employees and the public. Blasting must not occur when the weather is unsuitable.
3. The Consent Holder must ensure that the location and time of blasting is posted daily at all the main mine entrances and advised to employees by daily email.
4. The Consent Holder must ensure that blasting is restricted to within the following hours:
  - a) Monday to Friday 9.00am to 5.30pm; and
  - b) Saturday and Sunday 10.00am to 4.30pm.
5. The Consent Holder must ensure that details of blasting method, strength of the blast and time of blast are entered into a record kept for that purpose. This record must be provided to the District Councils following any written request.
6. Vibration due to blasting or any other activity associated with the mining operations, when measured at any point within the notional boundary of any dwelling not owned by the Consent Holder or subject to an agreement with the Consent Holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan deemed operative on 23 August 2010, must not exceed a peak particle velocity measured in the frequency range 3-12 Hz of 5 mm/sec provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level must not exceed 10 mm/sec at any time.

*Advice Note: The notional boundary is defined as a line 20 metres from the exterior wall of any rural dwelling or the legal boundary where this is closer to the dwelling.*
7. Airblast overpressure from blasting associated with the mining operations, when measured at any point within the notional boundary of any dwelling not owned by the Consent Holder or subject to an agreement with the Consent Holder, school or church outside the Macraes Mining Project Mineral Zone as defined by the Waitaki District Plan deemed operative on 23 August 2010 must not exceed a peak non-frequency-weighted (Linear or flat) level of 115 dB, provided this level may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level must not exceed 120 dB (Linear peak) at any time. For the purposes of this consent, C-frequency-weighting may be considered equivalent to the Linear or Flat-frequency-weighting.
8. The Consent Holder must not conduct blasting within the vicinity of the Macraes Road or Golden Bar Road in a manner that constitutes a danger to life or property. Where the Waitaki District Council permits the Consent Holder to temporarily close the Macraes Road or Golden Bar Road to

allow blasting to take place, and subject to the conditions of the road closure approvals, the Consent Holder must:

- a) Keep the time of closure as short as possible;
- b) Not allow the duration of a closure to exceed a maximum of 15 minutes in any continuous period of 60 minutes, except where an emergency situation arises in respect of the safety of the public or project personnel;
- c) Ensure appropriate barriers are erected and ensure such number of persons as may be necessary are stationed at Macraes Road or Golden Bar Road to prevent access by the public to that part of the road that must be closed;
- d) Hold current public liability insurance to indemnify any member of the public affected; and
- e) Postpone any blasting in order to reopen the Macraes Road or Golden Bar Road to allow the passage of vehicles for emergency purposes.

*Advice Note: Temporary road closures are subject to separate application processes under Schedule 10 of the Local Government Act 1974.*

### **Monitoring of Noise, Airblast and Vibration**

9. The Consent Holder must submit a Noise, Airblast and Vibration Management Plan (NAVMAP) for certification in accordance with Conditions 9 - 20 of Schedule 1 (Common Conditions).

10. The Objectives of the NAVMAP are to:

- a) To describe current and proposed noise, airblast and vibration management methods and procedures.
- b) To enable OceanaGold to operate in full compliance with resource consent requirements.
- c) To describe the noise, airblast and vibration monitoring regime and reporting of results

11. The NAVMAP must include but not be limited to:

- a) Sources of noise, airblast and vibration at the Macraes Operation;
- b) Details of the monitoring locations, the frequency of monitoring and the method of measurement and assessment in accordance with Conditions 13 - 16;
- c) Procedures for recording blasting method, strength of the blast and time of blast;
- d) Procedures for addressing non-compliant results and notification of the District Councils;
- e) Procedures for identifying heritage structures potentially affected by blasting, undertaking baseline condition surveys, monitoring those structures, and responding to any damage in accordance with Conditions 20 - 24; and
- f) Key personnel responsible for implementing the NAVMAP.

12. Prior to the commencement of blasting authorised by this consent within the Central Mining Area, and in accordance with the certified NAVMAP, the Consent Holder must undertake baseline condition surveys of the following heritage buildings shown on Figure X in Schedule 4:

- a) Gaytan's Cottage;

- b) Callery's Battery;
- c) Building 1 (Manager's House);
- d) Building 2 (Hughie Fraser's Hut);
- e) Building 3 Sod Hut A; and
- f) Building 4 Sod Hut B.

13. The baseline condition surveys required by Condition 20 must be completed by a SEQP - Heritage Structures. The results of the inspection must be documented in a report, a copy of which must be provided to the Consent Authority, the Department of Conservation and Heritage New Zealand Pouhere Taonga within 40 working days of commencing blasting activities.

14. Prior to the commencement of blasting authorised by this consent within the Central Mining Area, and in accordance with the certified NAVMAP, the Consent Holder must install vibration monitors at Building 2 and Gay Tan's Cottage, or at such alternative monitoring locations specified in the certified NAVMAP. Vibration monitoring must be undertaken in accordance with the certified NAVMAP.

15. Where blasting is proposed within 2 kilometres of a heritage building identified in Condition 20, the Consent Holder must use its best endeavours to design blasts to achieve the following vibration limits:

| Heritage Building                                                                                   | Vibration trigger limit |
|-----------------------------------------------------------------------------------------------------|-------------------------|
| Gay Tan's Cottage<br>Building 2 (Hughie Fraser's Hut)<br>Building 3 Sod Hut<br>Building 4 Sod Hut B | 12.7 mm/s               |
| Callery's Battery<br>Building 1 (Manager's House)                                                   | 19 m/s                  |

16. If vibration monitoring undertaken in accordance with the certified NAVMAP indicates that vibration trigger limits have been exceeded at Building 2 or Gay Tan's Cottage, the Consent Holder must:

- a) Immediately revise blast design to avoid further trigger limit exceedences,
- b) Engage a SEQP - Heritage Structures to:
  - i. Undertake a follow-up condition survey of each heritage building where the relevant vibration limit has been exceeded. Where the relevant vibration limit is exceeded at Building 2, all buildings in the Golden Point Historic Reserve must be inspected; and
  - ii. Prepare a report which sets out:
    - the results of any follow-up condition surveys;
    - confirmation as to whether any new damage is likely to be attributable to the blasting;
    - recommendations to change the blasting methodology as a means to avoid any further damage; and
    - any recommendations to change the frequency of monitoring as necessary.

17. The report must be provided to the Consent Authority, the Department of Conservation and Heritage New Zealand Pouhere Taonga.

18. If the SQEP – Heritage Structures, person confirms that new damage to a heritage building is attributable to blasting authorised by this consent, the Consent Holder must notify the Department of Conservation and Heritage New Zealand Pouhere Taonga and offer to repair the damage at its own cost.

19. The NAVMAP for this consent may be combined with any other NAVMAP required by any other consent held by the Consent Holder for mining operations at Macraes Flat.

20. The Consent Holder must produce a report summarising exceedances of vibration limits P for the last 12 months. The report must be included in the annual Project Overview and Annual Work and Rehabilitation Plan (Conditions 23 of Schedule 1 (Common Conditions)).

21. All measurements from the NAVMAP must be recorded and must be provided to the District Councils following any written request.