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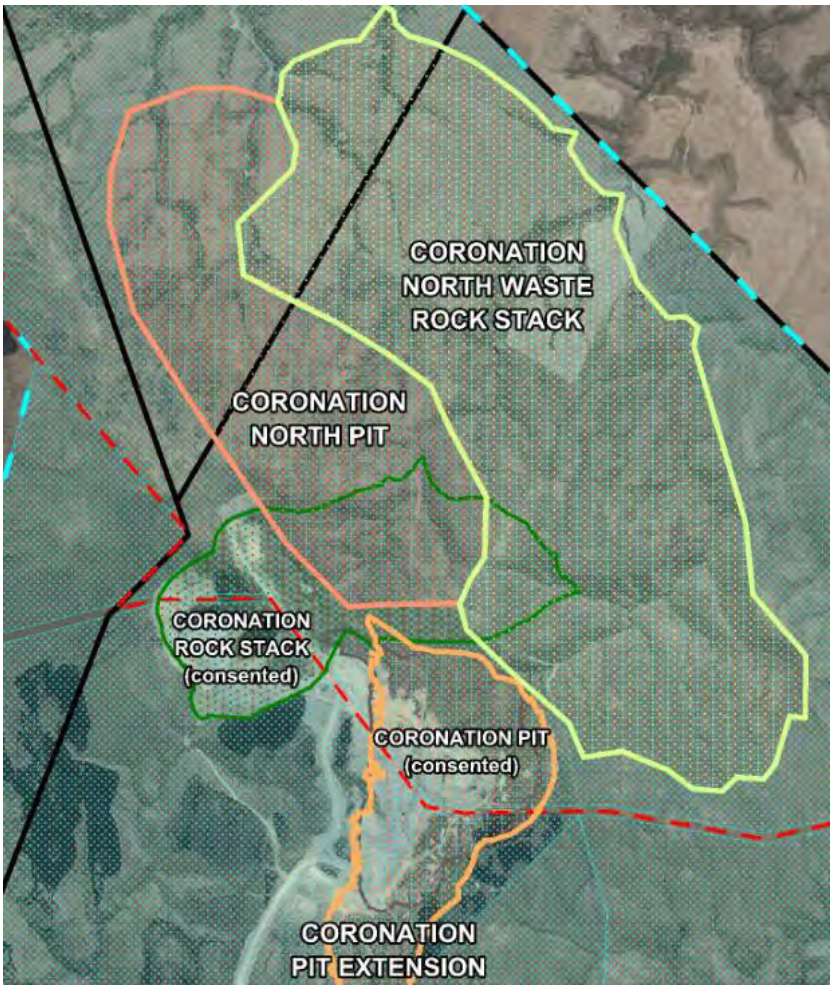
Report

Oceana Gold (New Zealand) Limited - Coronation North - Assessment of Effects of Discharges to Air

Prepared for Oceana Gold (NZ) Limited

Prepared by Beca Ltd (Beca)

14 April 2016



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1 Introduction

1.1 Proposal

Oceana Gold (New Zealand) Limited (OceanaGold) operates an open pit gold mine at Macraes Flat in North Otago. In August 2013, OceanaGold was granted resource consent RM12.378.15 to discharge contaminants to air resulting from mining at Coronation Pit.

OceanaGold wishes to expand the Coronation Project by extending the currently-consented Coronation Pit to the south and developing a new pit and WRS to be known as Coronation North Pit and Coronation North WRS. A resource has been identified within and further to the north of the area of the existing waste rock stack (WRS), which will be mined as part of the Coronation North pit. Coronation North WRS will increase the waste rock storage capacity from the currently-consented 94 mega tonnes (Mt) by 270 Mt. The existing Coronation Pit haul road will be extended approximately 2 km to the north.

Mining of Coronation North is expected to commence in July 2016 and will add an additional 3 years to the Macraes Gold Project's life. The rehabilitation phase of the project is estimated to be a further 2 years duration post-mining.

The proposed Coronation North Project area will be mined using the same equipment and processes as currently used in other areas of the Macraes mining operation. No additional equipment, such as trucks or excavators will be used. Overall, the level of activity at the Macraes Gold Project will not increase. OceanaGold currently holds four consents for discharges to air issued by the ORC for the Macraes Gold Project. These are:

- Consent 96785_V5 for discharges to air from the main mine area
- Consent RM10.351.52 for discharges to air from the Macraes Phase III Project
- Consent 2006.689 for discharges to air from underground mining at Frasers
- Consent RM12.378.15 for discharges to air from Coronation Pit.

The discharges to air from the proposed new Coronation North Project are not authorised by the existing resource consents and are not activities which are permitted in the Regional Plan: Air for Otago (Air Plan). A new resource consent is therefore required for the discharges to air that will result from the new Coronation North Project mining activities under section 15 of the Resource Management Act, 1991 (RMA).

OceanaGold has commissioned Beca Limited (Beca) to prepare an Assessment of Environmental Effects (AEE) of the discharges to air from the proposed Coronation North Project to accompany an application to the Otago Regional Council (ORC) for a new consent. The AEE has been prepared in accordance with section 88 and the Fourth Schedule of the RMA and the relevant provisions of the Air Plan.

1.2 Limitations

This report has been prepared by Beca for OceanaGold. Beca has relied upon the information provided by OceanaGold in completing this document. Unless otherwise stated, Beca has not sought to independently verify the information provided. This document is, therefore, based upon the accuracy and completeness of the information provided and Beca cannot be held responsible for any misrepresentations, incompleteness, or inaccuracies provided within that information. Should any new or additional information become available, this report will need to be reviewed accordingly.

2 Environmental Setting

2.1 Site and Locality Description

The OceanaGold Macraes Gold Project is located in a rural area that is dominated by OceanaGold's existing mining activity and low intensity pastoral farming. Macraes Village, located to the southwest of the Macraes Gold Project mining area, is a small village that includes approximately 20 houses and an historic hotel.

The existing Coronation Project is located to the north of the main Macraes Gold Project, approximately 6 km from Macraes Village and 3.5 km from Round Hill Pit. The Coronation Pit is located on the ridgeline to the north of Horse Flat Road along the Shag River and Taieri River Catchment divide, between the features known as Sister Peak and Highlay Hill.

The existing Coronation Pit will be extended primarily to the south. The Coronation North Project will be located immediately to the north of the existing Coronation Project site. A map showing the locations of the existing and proposed mine features is shown in Figure 2-1.

The land in the vicinity of the proposed Coronation North Project mining activity is rural and of a similar character to the land surrounding the existing Macraes Gold Project mine and Coronation Pit, which is dominated by steep contours.

The land is owned by OceanaGold. The boundary between the Dunedin City Council and the Waitaki District Council bisects the existing Coronation Project area. The Coronation North Project area will be located within Dunedin City.

Figure 2-1 shows the areas of land in the vicinity of the proposed Coronation North Project which are owned or leased by OceanaGold and the boundaries of the land owned by neighbours. The map also shows the locations of the existing Macraes Gold Project, Coronation Project and the location of the proposed Coronation North Project and demonstrates the distances from the mining activities to the boundaries with neighbouring properties.

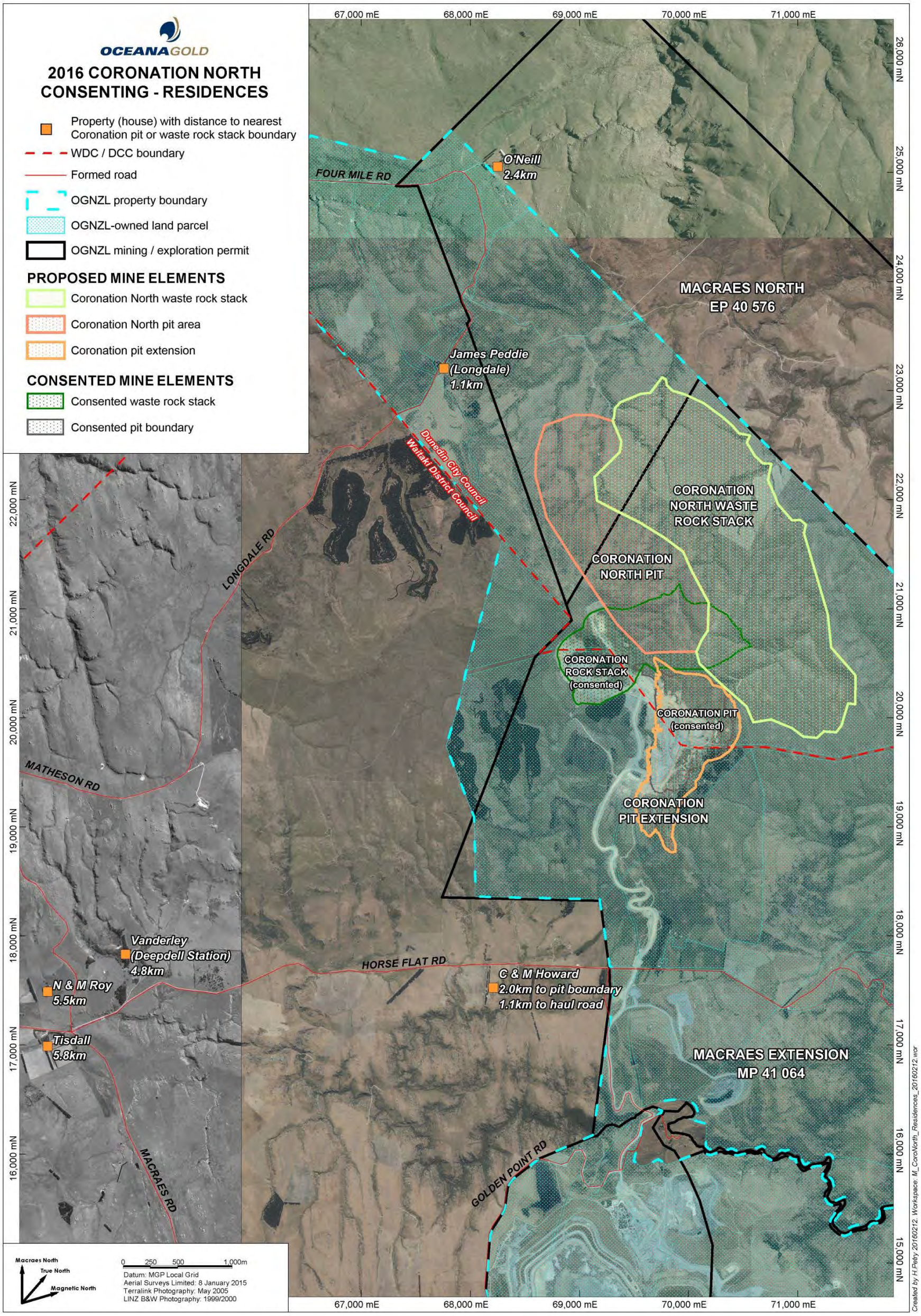

Figure 2-1 Aerial photograph showing the main mine features and land owned and leased by OceanaGold and locations of neighbouring landowners (note that the photograph is aligned with “Macraes North” and not true north).

As illustrated in Figure 2-1, there are very few houses in the area. OceanaGold owns the Longdale Station property, the residence for which is located approximately 2.5 km to the northwest of the existing Coronation Project waste rock stack. Longdale Station is leased to the Peddie family.

The closest privately-owned houses to the Coronation North Project will be the Howard residence, the Vanderley residence at Deepdell Station and the O'Neill residence located at 540 Four Mile Road, Hyde.

The Howard residence is located approximately 2.3 km to the south of the existing Coronation Project area and approximately 1.2 km to the southwest of the existing haul road. The Howard residence will be located 2.0 km from the proposed extension to Coronation Pit and 1.1 km from the extension to the haul road.

The O'Neill residence is located approximately 4 km to the northwest of the existing Coronation Project WRS and will be approximately 2.4 km from the northerly extent of the proposed Coronation North WRS and North Pit.

The Vanderley residence, at Deepdell Station, is located approximately 4.8 km from the existing Coronation Project and will also be approximately 4.8 km from the proposed extension to Coronation Pit.

The legal descriptions of the land to be mined as part of the Coronation North Project are listed in Table 2-1 and illustrated in Figure 2-2.

Table 2-1 Legal descriptions of land to be mined

Coronation North Project Element	Parcel Description	CT Number	Owner
Coronation North Pit	Part Section 2 Block V Highlay SD	OT15A/514	Oceana Gold (NZ) Ltd
Coronation North Waste Rock Stack	Part Section 2 Block V Highlay SD		Oceana Gold (NZ) Ltd
Coronation Stage 5	Part Section 2 Block V Highlay SD, Lot 1 DP 465577, Part Section 2 Block VII Highlay SD & Part Section 11 Block VII Highlay SD		Oceana Gold (NZ) Ltd

The map reference for the centre of the site is within a 3000 m radius of NZTM 2000 1395000 E 4978500 N.

The proposed mine is located in Airzone 3 as defined in the Regional Plan: Air for Otago. Airshed 3 includes all areas of Otago which are not located within Airsheds 1 and 2 and comprises the rural areas of the region. The proposed mine is not located within an airshed which is gazetted under the National Environmental Standard for Air Quality (NESAQ) and is not in an area which is defined as "polluted" by Regulation 17 of the NESAQ.

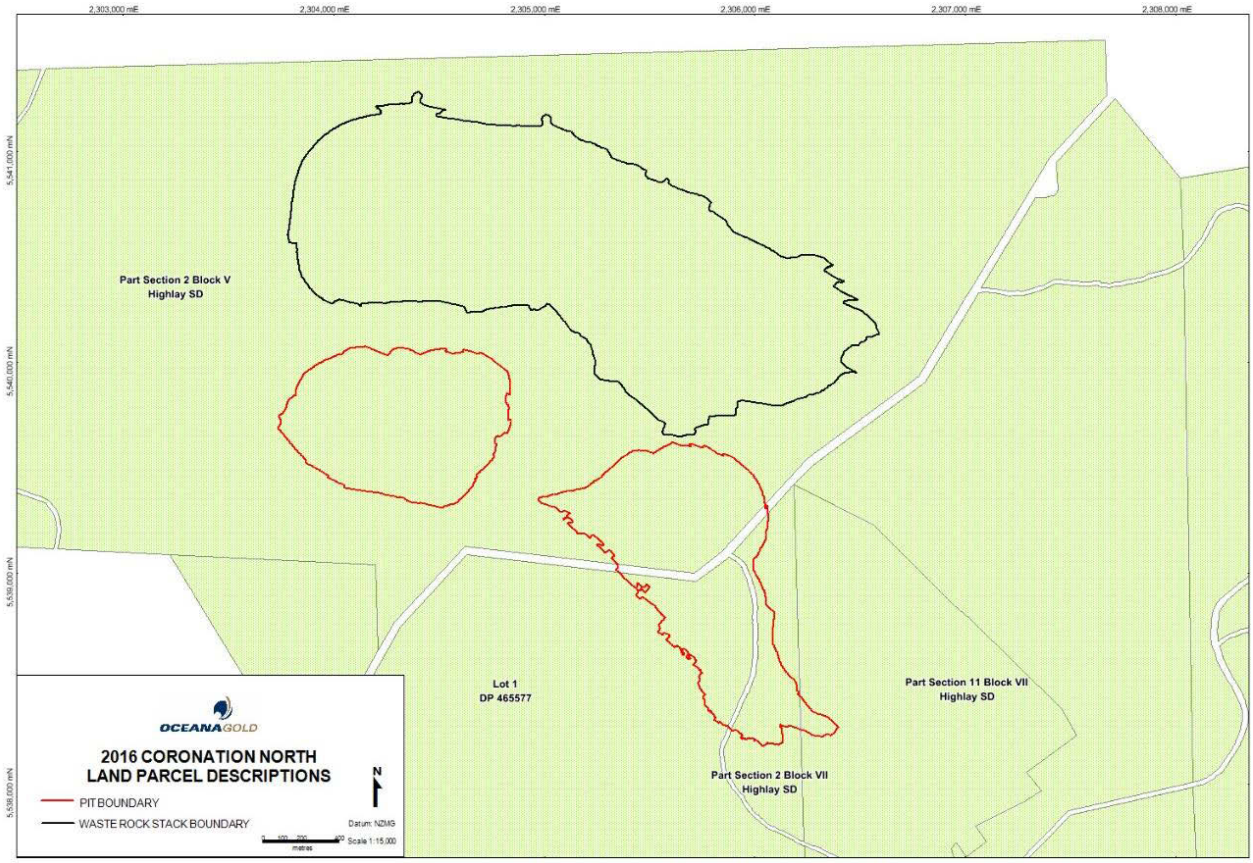

Figure 2-2 Map showing legal descriptions of properties to be mined.

2.2 Meteorology

OceanaGold measures meteorological variables at a climate station located on Golden Point Road (Site 3), approximately 5.5 km south of the existing Coronation Project. Figure 2-3 is a windrose for the years 2012-2015 inclusive, which shows that winds blow predominantly from the south-westerly and north-westerly quarters. The strongest winds also come from these quarters. Winds from the north-easterly quarter tend to be lighter and less frequent and winds from the south-easterly quarter are rare.

The average wind speed measured between 2012 and 2015 (inclusive) was 3.4 m/s and calm conditions occurred for 2.7% of the time. Winds exceeding 5 m/s, which is the critical wind speed for the pick-up of dust from unconsolidated surfaces, occurred for 21.9% of the time. Figure 2-4 shows the frequency of occurrence of various wind speed classes measured between 2012 and 2015 (inclusive). Figure 2-5 is an aerial photograph overlaid with the site windrose which also shows the location of the existing Coronation Project, the proposed Coronation North Project area and the locations of the closest residences.

The average annual rainfall measured by OceanaGold, at the Golden Point climate station between 2012 and 2015 (inclusive), was 661 mm.

The relatively high frequency of winds exceeding 5 m/s and the relatively low rainfall are climatic features that contribute to the generation and transport of dust.

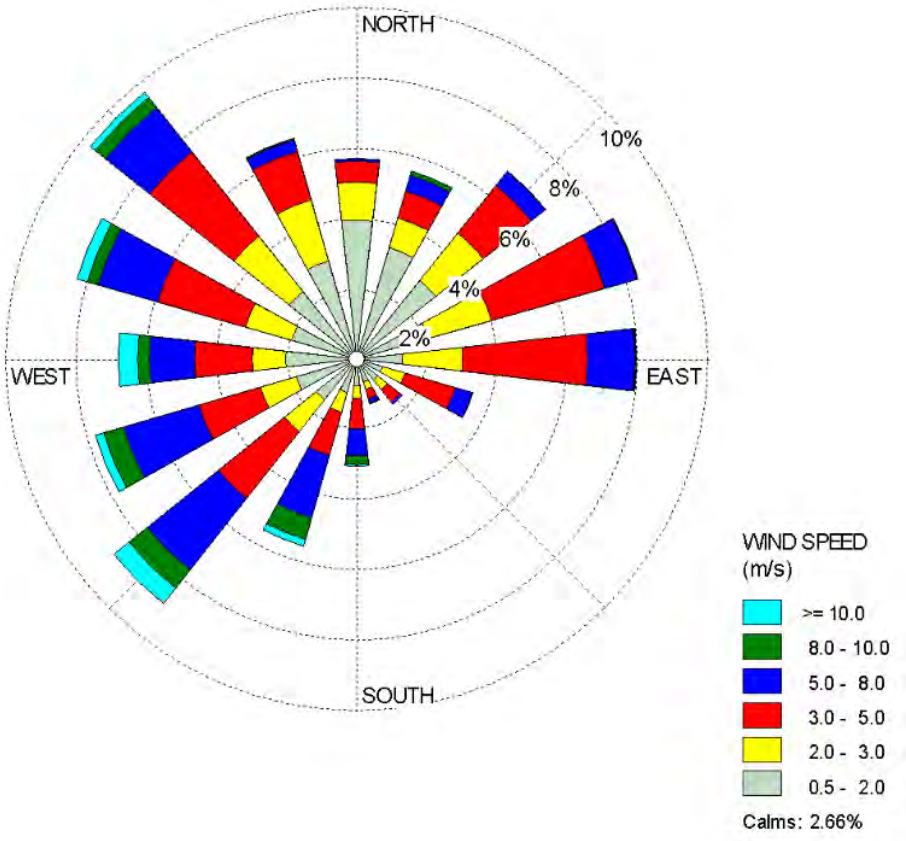

Figure 2-3 Windrose of hourly average wind speed and direction measured at Golden Point Road 2012-2015 (inclusive)[1]

[1] Data supplied by OceanaGold

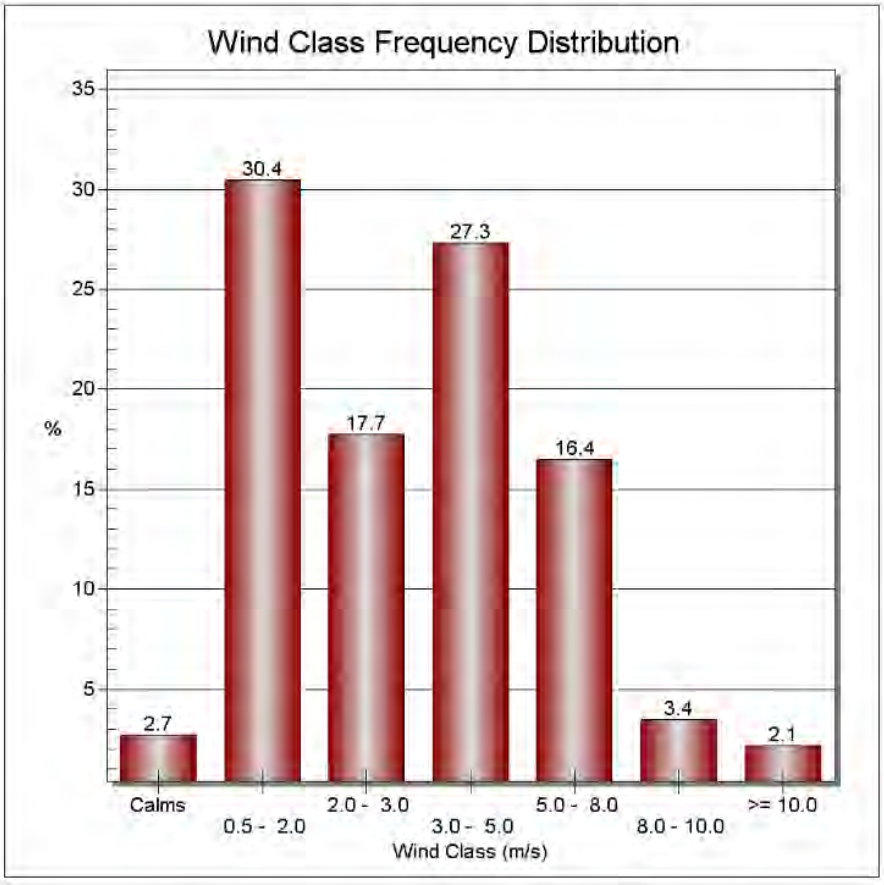

Figure 2-4 Frequency distribution of hourly average wind speeds measured at Golden Point Road 2012-2015 (inclusive)[1]

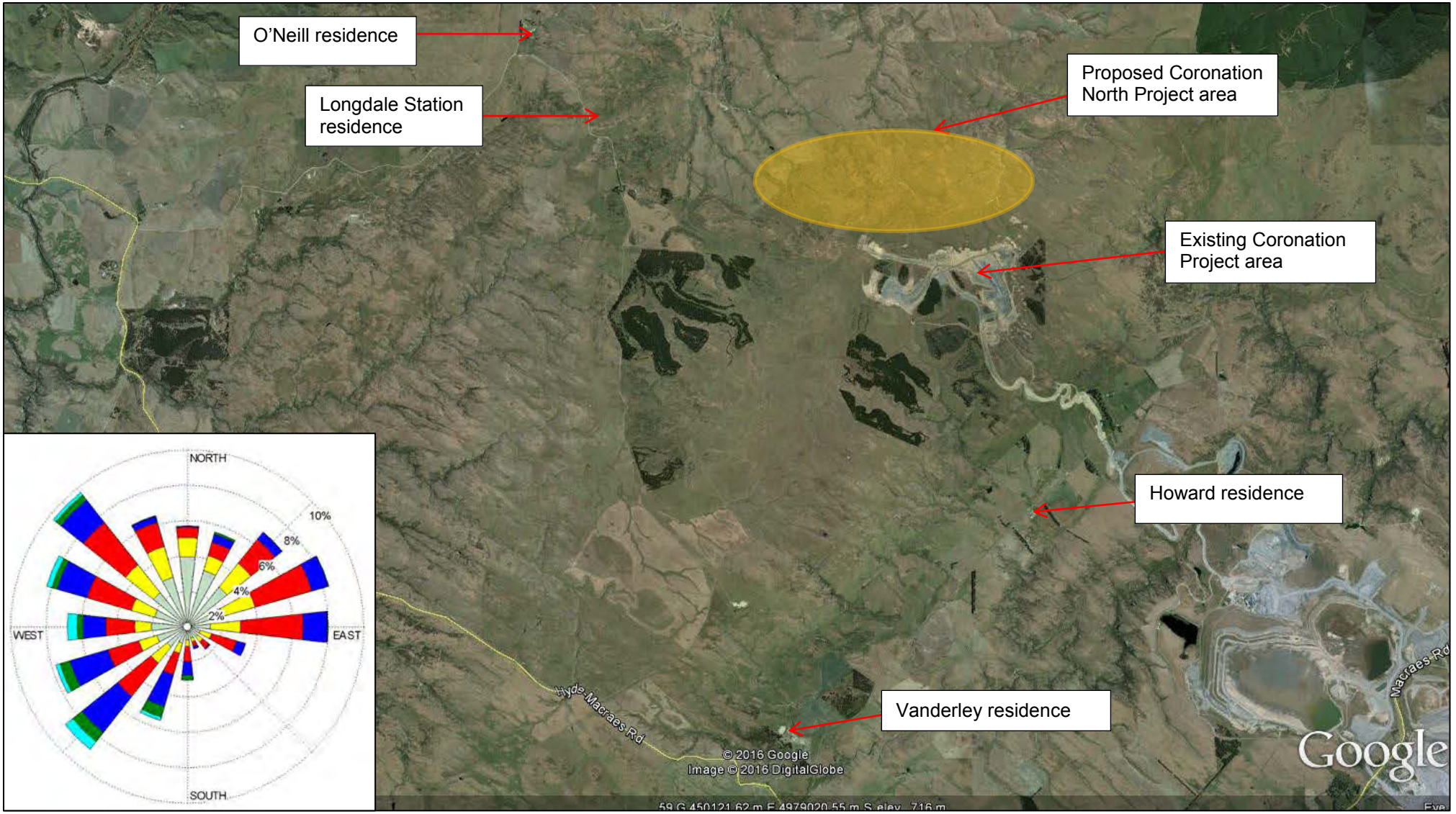

Figure 2-5 Aerial photograph of proposed project area overlain with the site windrose for 2012-2015.

2.3 Background Air Quality

OceanaGold has been monitoring deposited dust and total suspended particulate (TSP) concentrations in the vicinity of the Macraes Gold Project since 1989, prior to mining beginning in 1990. The concentrations of fine particulate (PM_{10}) and respirable quartz were also measured for a period. Deposited dust is measured at four background sites (Sites 9, 10, 17 and 24, refer Figure 6-1), which are unaffected by mining activities. The dustfall measured at these sites should be indicative of deposited dust concentrations in the rural area surrounding the mine and in the vicinity of the proposed Coronation North Project. TSP concentrations are measured at one site (refer Figure 6-1), in the vicinity of Macraes Flat (Site 15). The TSP concentrations measured at this site should also be indicative of TSP concentrations in the general area of the Coronation North Project. Table 2.2 summarises the average background deposited dust and TSP data for 2014 and 2015.

Table 2.2: Summary of background insoluble deposited dust values and TSP concentrations for 2014 and 2015

Parameter	Insoluble Background Dust (g/m^2/30 days)		TSP 24 hour average concentrations ($\mu g/m^3$)	
	2014[2]	**2015**[3]	**2014**[4]	**2015**[5]
Average	0.8	0.5	17	19.4
Maximum	1.4	0.9	341	87.1
Minimum	0.5	0.0	0.0	0.0

[2] Beca Ltd "*Macraes Mine – Summary of Ambient air Monitoring Results for 2014"* prepared for Oceana Gold (New Zealand) Limited, May 2015.

[3] Data supplied by OceanaGold

[4] Beca Ltd "*Macraes Mine – Summary of Ambient air Monitoring Results for 2014"* prepared for Oceana Gold (New Zealand) Limited, May 2015.

[5] Data supplied by OceanaGold

3 Air Quality Standards

In October 2004, the Government introduced five National Environmental Standards for Ambient Air Quality (NESAQ) with three subsequent amendments. The NESAQ regulations are designed to address the health effects caused by poor air quality. Ambient air quality standards for fine particles (PM_{10}), sulphur dioxide (SO_2), nitrogen oxides (NO_2), carbon monoxide (CO) and ozone (O_3) came into force on 1 September 2005. The standard of relevance to this application is the NES for PM_{10}. The PM_{10} standard allows a maximum of one exceedance per year of a PM_{10} concentration of 50 µg/m^3 (24 hour average).

Regulation 17 restricts the granting of resource consents for discharges of $PM_{10,}$ where that discharge would be likely to increase off-site 24 hour average PM_{10} concentrations in "polluted" airsheds by more than 2.5 µg/m^3 at any time.

The proposed Coronation North Project area is located within the airshed comprised of all areas within the Otago region that do not fall within the four gazetted airsheds. There is no meaningful PM_{10} concentration data available for this airshed and it therefore, does not meet the NESAQ definition of "polluted". As such there are no restrictions under Regulation 17 to the granting of this consent.

4 Coronation North Project Description

The Coronation North Project will extend and add to the existing Coronation Project and will have the following features:

- The construction of a new 63 ha pit to be known as Coronation North Pit
- The extension of the area of the currently-consented Coronation South Pit from 62 ha to 85 ha
- The construction of a new 270Mt capacity WRS to be known as Coronation North WRS, which will be located to the north-east of the existing Coronation Pit and WRS.
- The mining of the northern portion of the existing Coronation WRS footprint
- The extension of the existing haul road to the north by an additional 2 km
- Construction of associated diversion drains, silt and sediment control infrastructure.

The Coronation North Project is estimated to contain approximately 9 Mt of ore. The mining rate will be approximately 40 Mt per year split between the two pits and the project (including operation and rehabilitation phases) is expected to take up to 5 years to complete. Where practicable, partial backfilling of the pit voids will occur and any backfill placement will result in a proportional reduction in the size of the rock stack. Overall, the mining rate at the Macraes Gold Project will not change during the course of the mining at Coronation North.

The mining methods used will be similar to those already conducted at the Macraes Gold Project and will involve drilling and blasting. The mining will use the existing fleet of diesel-powered mining equipment.

Ore will be hauled from Coronation North Pit to the Macraes Gold Project processing plant via an extension to the existing Coronation haul road.

The Coronation North WRS will be progressively rehabilitated. At closure, a pit lake will be formed and the haul road will be rehabilitated.

Figure 4-1 shows the proposed Coronation North Project features and layout.

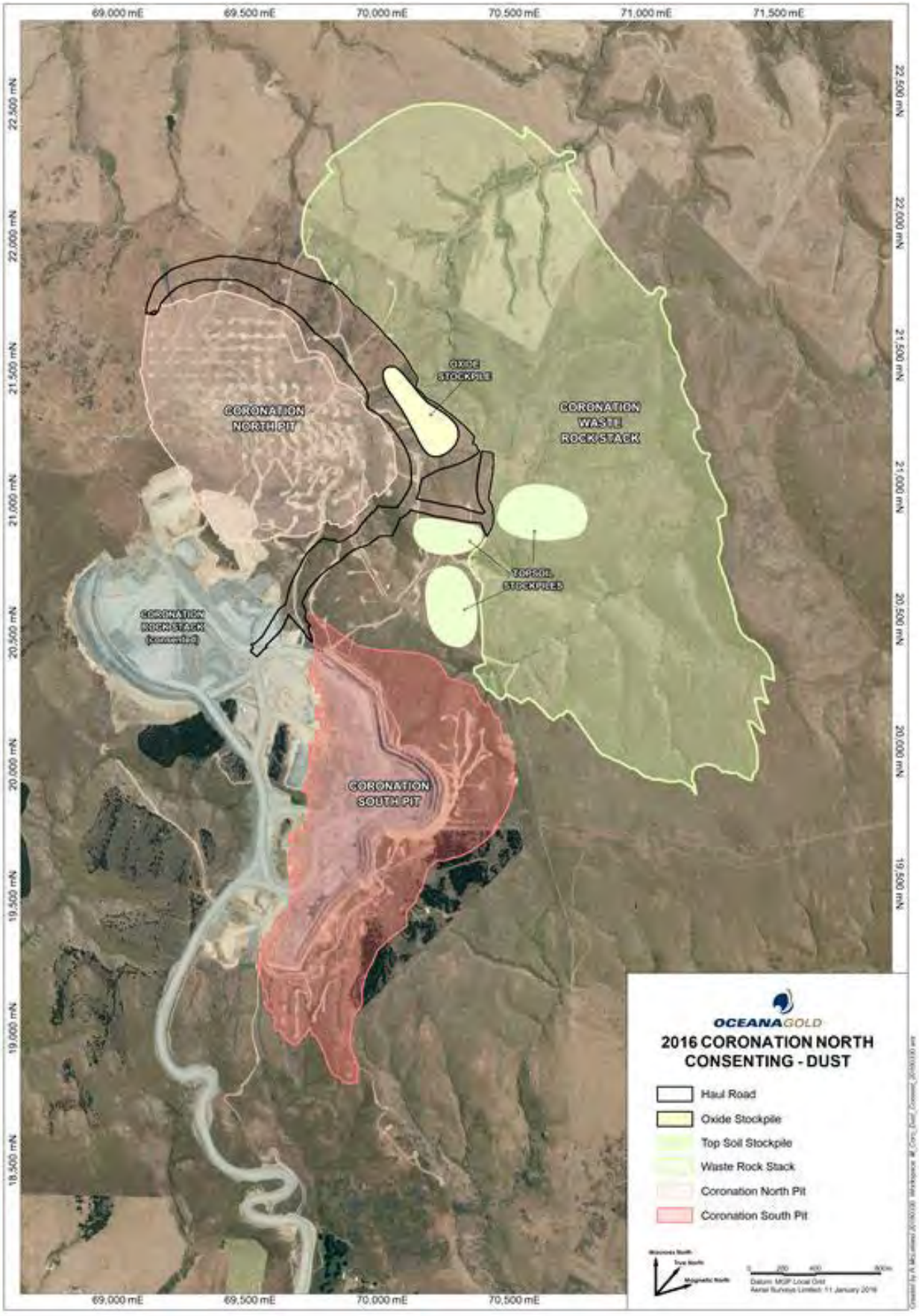

Figure 4-1 Coronation North Project features and layout

5 Discharges and Associated Mitigation Methods

5.1 Emissions from Mining

The nature of the emissions from the mining of Coronation North will be very similar to the nature of the emissions from other mining activities carried out by OceanaGold at the Macraes Gold Project.

Engine exhaust emissions will be generated from the mobile equipment used on the site. The vehicles to be used at Coronation North will be sourced from other parts of the Macraes operation and no additional vehicles will be required. The emissions from the engines are considered to be relatively minor and expected to be well-dispersed prior to reaching sensitive receptors; therefore these emissions are not assessed further in this report.

5.2 Factors which Influence Dust Generation

The predominant discharge from the proposed project works will be particulate matter. The dust that will be discharged from the project activities will be comprised of a wide variety of size fractions. The larger settleable dust material is generally greater than 50 µm in diameter. It has the potential to create a nuisance effect due to soiling of surfaces and by causing irritation to eyes and nose. Because it is relatively large in size, deposited particulate usually falls out of the air within a short distance (approximately 100 to 200 m) of the source.

The finer material is defined as suspended particulate and known as TSP. It is generally less than 20 µm and can travel large distances downwind. The portions of TSP that pose the greatest potential health effect are particulates less than 10 µm in diameter (known as PM_{10}) and particulates less than 2.5 µm (known as $PM_{2.5}$). PM_{10} is able to penetrate the upper respiratory tract and consequently, has the potential to impact on human health. $PM_{2.5}$ can penetrate even further into the lung and is suspected of being the fraction of PM_{10} that is responsible for health impacts that can lead to an increase in morbidity and mortality in particular circumstances.

The particulate generated from processes, such as those involved in the Coronation North Project, is likely to be predominantly made up of larger size fractions (greater than 10 µm). The major source of the finer particulates PM_{10} and $PM_{2.5}$ in the atmosphere is combustion processes. The assessment of effects in this report focuses primarily on the effect of the larger settleable particulates, as there are few combustion processes associated with the project and therefore only minor amounts of finer particulates are expected to be generated.

The major factors that influence dust emissions from surfaces are:

- Wind speed across the surface – the critical wind speed for pickup of dust from surfaces is 5 m/s; above 10 m/s pickup increases rapidly[6].
- The percentage of fine particles in the materials on the surface.
- Moisture content of the material on the surface.
- The area of exposed surface.
- Disturbances such as traffic, excavation, loading and unloading of materials.

Dust emissions from mining activities can be significant if not controlled. However, if standard dust control techniques are used the emissions can be reduced significantly.

[6] Air and Waste Management Association *"Air Pollution Engineering Manual"* 2nd edition edited by Wayne T Davis, 2000.

The larger the area of exposed material the more potential there will be for dust emissions. Vehicles travelling over exposed surfaces tend to pulverise any surface particles. Particles are lifted and dropped from rolling wheels and the road surface is exposed to strong air currents due to turbulence between the wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

The smaller the particle size of the material on the surface of a road or an exposed surface, the more easily the particles are able to be picked up and entrained in the wind. Moisture binds particles together preventing them from being disturbed by wind or vehicle movements. Therefore, one of the primary techniques for controlling dust is the application of water to unconsolidated surfaces.

It is possible to estimate the potential emissions of particulate matter from construction and mining activities using emission factors developed primarily for the US Environmental Protection Agency (USEPA) and published in a number of publications including the USEPA AP42 database[7]. However, for fugitive dust sources such as those at OceanaGold, these emission factors have a large degree of uncertainty. For this assessment, no attempt has been made to quantify the emissions from the mine. Instead, the assessment method is based on comparing the existing effects of the Macraes Gold and Coronation Projects with the potential effects of the new Coronation North Project development, taking into account any changes in the level of operation and the location of the development in relation to sensitive receptors.

5.3 Sources of Particulates and Proposed Mitigation Methods

The activities that are proposed at the Coronation North Project (and currently take place at the existing Macraes Gold Project mining sites), with a potential to generate discharges to air include:

- Earthworks, including stripping of overburden and topsoil, mining, construction of roads and dam structures and formation of the WRS and stockpiles
- Blasting
- Vehicle movements on unpaved surfaces
- Loading and unloading of materials
- Wind-generated dust from dry exposed surfaces such as roads and stockpiles.

These activities are addressed in the following subsections along with a summary of the proposed mitigation methods. OceanaGold has a Dust Management Plan which provides details of the mitigation methods currently used at the Macraes Gold Project and which will also be used on the Coronation North Project. A copy of the Dust Management Plan is attached as **Appendix A**. The mitigation methods prescribed in the Dust Management Plan have been effective at controlling dust generated at the Macraes Gold Project and should also be an effective management tool for controlling dust emissions at the Coronation North Project.

5.3.1 Earthworks

The stripping of overburden, soil and rock from surface areas and the spreading of overburden and topsoil on rehabilitated land has the potential to generate significant quantities of dust, if the process is not carefully controlled. Similarly, the construction of infrastructure such as roads, dams, stockpiles and WRSs has the potential to generate significant quantities of dust.

To control dust from these activities, OceanaGold proposes to continue to use the methods currently utilised at the Macraes Gold Project. These include the following methods:

- Keep exposed surface areas to a minimum and re-vegetate exposed areas as soon as practical
- Plan potentially dusty activities such as stripping and spreading of topsoil for days when weather conditions are predicted to be favourable (as defined in the Dust Management Plan)

[7] United States Environmental Protection Agency (USEPA) *AP42 Emission Factor Database,* Chapter 13

- Use water as a dust suppressant to keep un-vegetated surfaces and haul roads damp.

The National Pollution Inventory for Mining published by the Commonwealth of Australia[8] (NPI Manual), estimates that the use of water to control dust on stripping, hauling and loading and unloading activities can reduce the emissions of dust by 50%. The NPI Manual also estimates that re-vegetation of overburden stockpiles reduces their dust generation capacity by 99%.

5.3.2 Roads

Dust generated from heavy vehicle movements on haul roads and around the proposed WRS, and from general traffic around the proposed Coronation North Project works area, all have the potential to be significant sources of dust. Dust from roads is controlled primarily by limiting the amount of fine particles exposed to the wind, keeping surfaces damp and controlling vehicle speeds. To achieve this, OceanaGold proposes to use the following dust mitigation methods, which are used successfully at the Macraes Gold Project at present:

- Limit vehicle speeds
- Minimise haul distances as far as practical
- Keep roads and construction surfaces damp with water carts and/or fixed sprinklers when required
- Regularly maintain haul roads by grading and laying of fresh rock/gravel.

Speed controls on vehicles have an approximately linear relationship with dust emissions[9]. OceanaGold imposes speed limits on all haul roads and other access roads in and around the Macraes Gold Project site that are appropriate for their use.

5.3.3 Vehicles

Overall, the number of vehicles to be used on the Coronation North Project will be small in comparison to the number of vehicles used over the entire Macraes mine site. However, when ore is being hauled to the processing plant, the majority of the truck fleet will be used. Providing the management practices currently employed at the Macraes Gold Project continue to be carried out, the dust discharges generated by vehicle movements are expected to be negligible.

5.3.4 Loading and unloading

The loading of material onto trucks (and including the subsequent offloading), has the potential to generate dust. Trucks will be loaded with materials from the base of the pit and from areas where construction activities are occurring using excavators and loaders. The majority of materials will be unloaded onto the WRS or onto areas that are being rehabilitated. Dust from sources such as these is best controlled by minimising drop heights. OceanaGold currently requires machinery operators to minimise drop heights and will continue to do so.

5.3.5 Exposed surfaces

Exposed surfaces on stockpiles, the WRS, and pit walls are all potential sources of dust. The primary means of controlling dust from sources such as these is by progressive revegetation, wherever practical, and by keeping surfaces damp. Minimising the quantity of fine particles on the surfaces exposed to the wind also reduces the dust potential.

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[8] Commonwealth of Australia "*National Pollutant Inventory Emission Estimation Technique Manual for Mining Version 2.3"* 2001.

[9] Supra at 3

At present, OceanaGold revegetates all permanent stockpiles of materials, such as topsoil, as soon as practical and will continue to do so during the Coronation North Project.

OceanaGold progressively revegetates the outer walls of WRSs as each lift is constructed. This will continue to be the practice on the WRS that will be constructed as part of this project.

5.3.6 Blasting

Blasting will occur at intervals and within restricted hours. The explosive to be used is a mix of ammonium nitrate and fuel oil, referred to as ANFO. Blasting generates emissions of particulates, carbon monoxide, nitrogen oxides and small quantities of sulphur dioxide[10]. Blasting also produces dust generated from the shattering of rock. Blasting will take place within the pit and the majority of the discharges produced will be contained within the pit walls. Due to the large distances between the pit and the site boundaries, any contaminants that do disperse beyond the pit will be well diluted before they reach the boundary of the mine site.

[10] US EPA AP42 Compilation of Emission Factors. Chapter 13.3 Explosives Detonation.

6 Effects of Existing Mining Activities

6.1 Approach to Assessment of Effects

A common method of assessing the effects of a new activity is to measure or estimate the potential emissions from the site and to then calculate the likely down-wind concentrations of contaminants using dispersion modelling. The modelling predictions are then compared with air quality standards and guidelines in order to determine if an adverse effect is likely to occur. It is very difficult to estimate the emissions from fugitive dust sources such as mining and it is also very difficult to model the emissions as the locations and scale of the sources will change frequently, as will the local topography. Consequently, qualitative assessment methods must be used.

For this assessment, the effects of the existing Macraes Gold Project activity have been assessed by analysing the available environmental monitoring data, with particular emphasis on the effects of the existing Coronation Project. The potential effects of the planned Coronation North Project have been estimated based on the existing effects of the Coronation Project and the likely changes to the scale and location of the emissions and the proposed mitigation methods.

6.2 Nature of Dust and Potential to Cause Adverse Effects

Dust deposition is the settling of dust onto surfaces. The effects of dust deposition can be subjective and are dependent on the sensitivity of the receiving environment. Some people will consider dust a nuisance while others may find it objectionable or offensive. Dust fallout on a road or rural farmland may not be a nuisance even at relatively high deposition rates.

Typically, the most common areas of concern from dust deposition arise at residential properties (or similar sensitive locations such as retail premises or schools), and include the visual soiling of clean surfaces, such as cars, window ledges, and household washing, as well as dust deposits on vegetation.

The Ministry for the Environment *Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions* (GPG Dust)[11] notes that the potential for a dust discharge to cause an objectionable or offensive effect depends on the following characteristics of the dust fallout:

- The frequency of dust nuisance events
- The intensity of events, as indicated by dust quantity and the degree of nuisance
- The duration of each dust nuisance event
- The offensiveness of the discharge having regard to the nature of the dust
- The location of the dust nuisance, having regard to the sensitivity of the receiving environment.

These factors are known as the FIDOL factors, and are also used in odour assessment to consider whether a discharge to air has caused an offensive or objectionable effect. Essentially, whether a dust discharge leading to dust deposition causes an offensive or objectionable effect depends on how frequent it is, how much dust is deposited and the sensitivity of the receiving environment.

Dust deposition is typically measured over a period of about 30 days using a dust gauge. However, this does not mean that dust deposition occurs gradually and evenly over that 30 day period. Dust concentrations in the ambient air, downwind of a dust discharge, vary with the rate of dust generation and the wind conditions. Therefore, the rate of dust deposition varies as well. It is quite possible that the majority of the dust deposition measured in a 30 day period by a dust gauge actually occurs during a small number of

[11] Ministry for the Environment: "*Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions"* September 2001.

short, relatively high-rate deposition events. Short-term events of relatively high-rate dust fallout are more likely to be noticed by residents as deposits on surfaces, cars and washing.

Total Suspended Particulate (TSP) monitoring measures particles that are suspended in the air. Most monitoring equipment collects particles that vary in size between 0.1 µm and about 100 µm. The finer fractions can travel large distances downwind before they reach ground level. The larger fractions of TSP can have nuisance effects but the perception of potential for TSP to cause health effects is usually the cause of most concern for nearby residents.

6.3 Assessment Criteria for Deposited and Total Suspended Dust

6.3.1 New Zealand guidelines

In New Zealand, there are no environmental standards or guidelines for deposited dust. However, the GPG Dust recommends a 'trigger' level for deposited dust of not more than 4 g/m^2/30 days above background levels. The GPG Dust notes that deposition rates of more than 4 g/m^2/30 days above background levels, in some industrial and sparsely populated areas, may not cause nuisance, but conversely in sensitive residential areas, deposition in the order of 2 g/m^2/30 days above background levels may cause nuisance.

Similarly, there are no environmental standards or guidelines for Total Suspended Particulates (TSP). The GPG Dust suggests 'trigger' levels for TSP of 80 µg/m^3 (24-hour average) for sensitive areas with significant residential development, 100 µg/m^3 for areas with moderate sensitivity and 120 µg/m^3 for insensitive areas, such as sparsely populated rural areas similar to Macraes Flat.

6.3.2 Current consent conditions

The current consents for the Coronation Project set limits for deposited dust and TSP. These limits are shown in Table 6.1.

Table 6.1: Current consent limits for deposited dust and TSP

Contaminant	RM 12.378.15
Deposited dust	Not to exceed 3 g/m2/30 days insoluble dust above background more than twice in any calendar year at Sites 7, 20, 21, 22 and 23. Not to exceed 3 g/m2/30 days insoluble dust above background at Sites 2 and 15.
TSP	Not to exceed 120 µg/m^3 at Site 15.

6.4 OceanaGold Dust Monitoring

OceanaGold has been monitoring deposited dust and TSP concentrations, in the vicinity of the Macraes Gold Project, since 1989. The concentrations of fine particulate (PM_{10}) and respirable quartz were also measured for a period. Over the years of monitoring, some new monitoring sites have been added to measure the impacts of new areas of the mine and some sites have become redundant.

Deposited dust is made up of soluble and insoluble dust fractions. Soluble dust is only of interest downwind of sources that produce water-soluble emissions, such as milk powder from a dairy factory. For OceanaGold, the only emissions of any significance are crustal dust particles, which are insoluble in rainwater.

6.4.1 Deposited dust

Figure 6-1 shows the locations of the deposited dust monitoring stations as required by the most recent Consent RM 12.378.15, which includes the gauges for the MPIII and Coronation Projects.

The majority of the monitoring sites are located on land that is owned by OceanaGold and within the existing mine boundary. The monitoring sites that are subject to the 3 g/m^2/30 day limit, described in the conditions of consents RM12.378.15, RM10.351.52 and 96785_V5, are Sites 7, 17, 20, 21, 22 and 23. All of the sites

subject to the 3 g/m^2/30 day limit were located beyond the boundary of the mine when consent RM12.378.15 was granted. OceanaGold purchased Longdale Station in 2013 and consequently, Sites 22, 23 and 24 are now located on property owned by OceanaGold.

The consent conditions also state that OceanaGold must undertake a review of dust mitigation measures if the dust deposition rate exceeds 3 g/m^2/day above background, during any month at either Site 2 or Site 15. Site 15 is located very close to the boundary of the mine.

Sites 17, 22 and 23 are the closest sites to the existing Coronation Project and the proposed Coronation North Project. Background deposited dust concentrations are currently measured at Sites 9, 10 and 24.

Figure 6-2 and Figure 6-3 show the total dust deposition corrected for background concentrations for monitoring sites within the mine boundary and beyond the mine boundary, respectively. Where concentrations measured at the background sites exceed the values at the monitoring sites, the dust concentration above background will be negative. These values are shown as zero in Figures 6-2 and 6-3.

Figure 6-4 plots the annual average insoluble dust above background concentrations for sites subject to the consent limit for the years 2004-2015.

Appendix B includes a table which summarises the annual average and maximum values for each site plus the number of exceedances above 3 g/m^2/30 days. The consent conditions limit deposited dust to no more than 3 g/m^2/30 days, above background concentrations measured beyond the mine boundaries, more than twice in any calendar year. The sites which are beyond the site boundary and/or are subject to the consent limits are highlighted in the appended table.

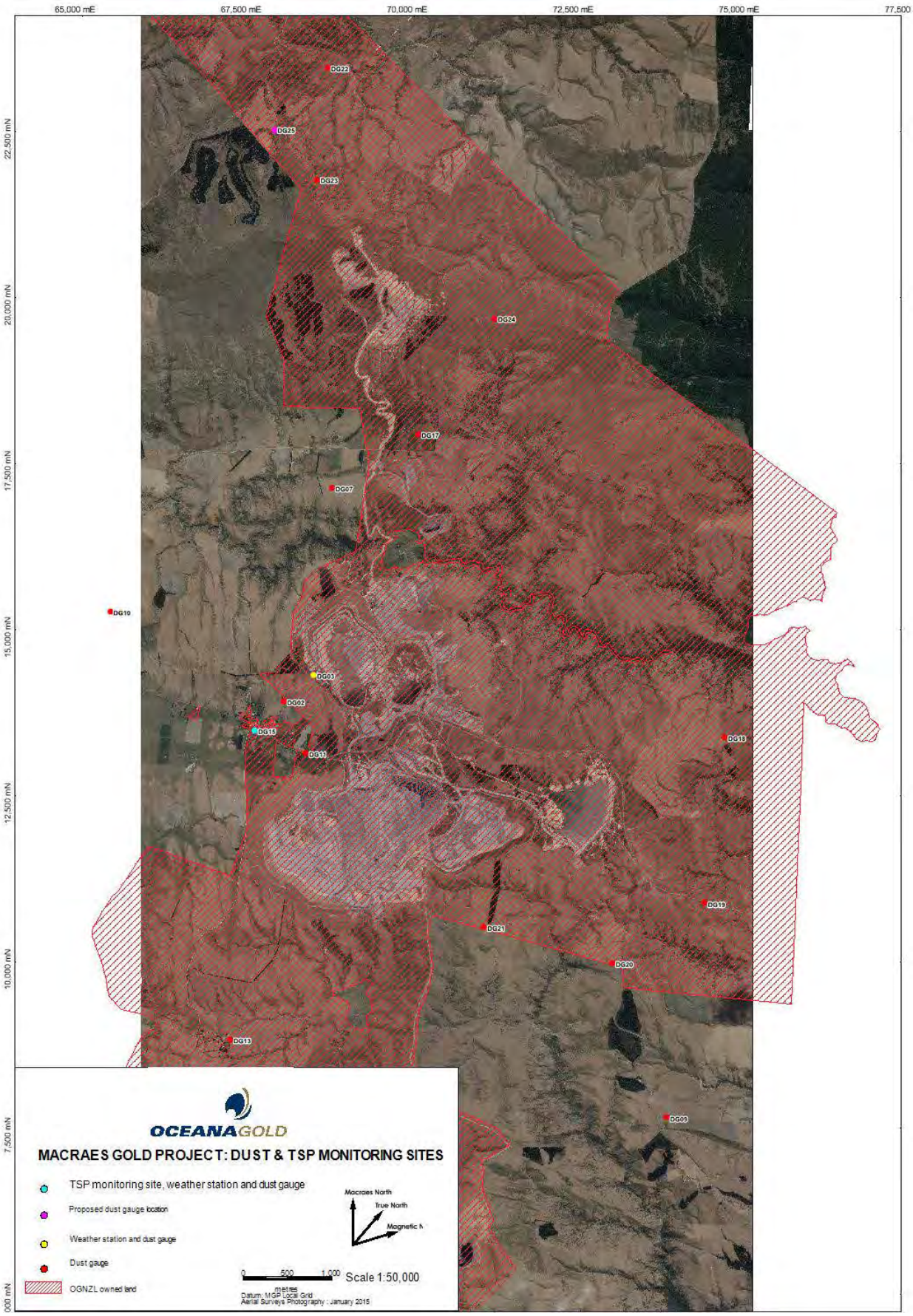


Figure 6-1 Aerial photograph showing locations of deposited dust and TSP monitoring sites

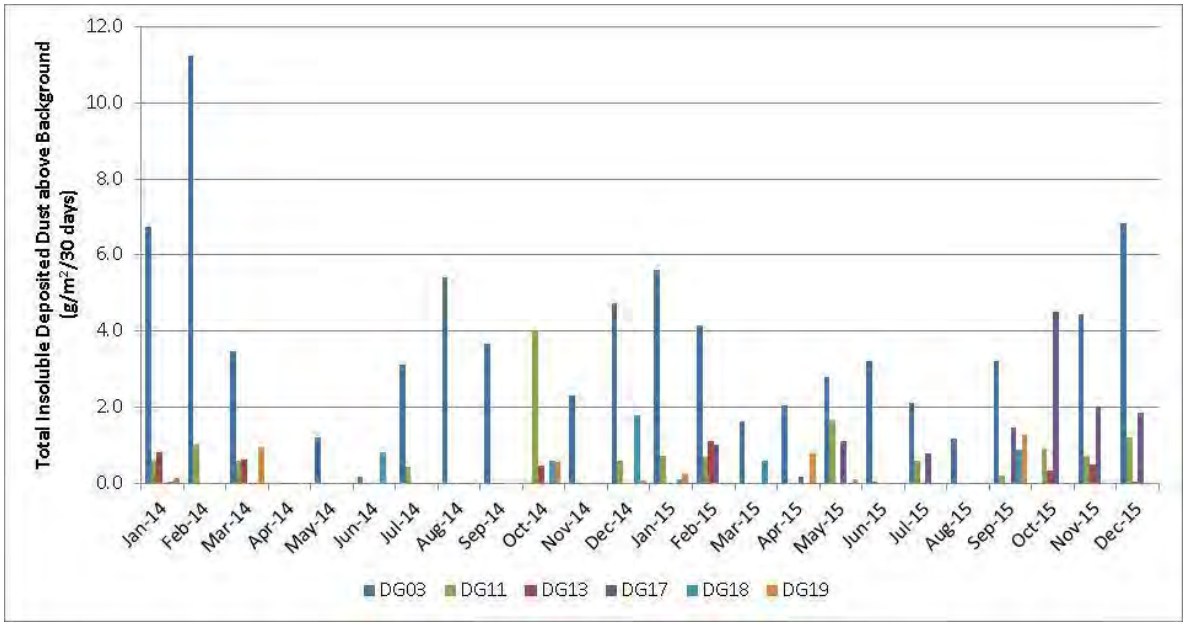


Figure 6-2 Insoluble dust deposition (g/m^2/30 days) above background concentrations for monitoring sites within the mine boundary and not subject to consent limits (2014-2015)

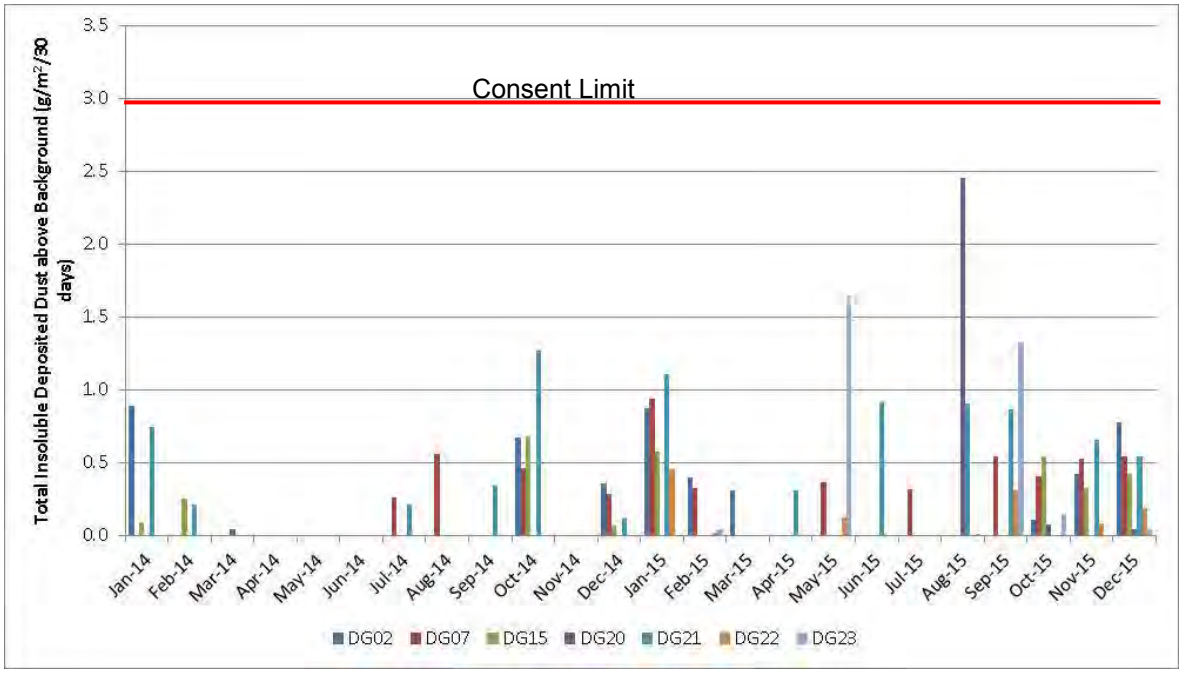


Figure 6-3 Insoluble dust deposition (g/m^2/30 days) above background concentrations for monitoring sites beyond the mine boundary and subject to consent limits (includes Site 15) (2014-2015)

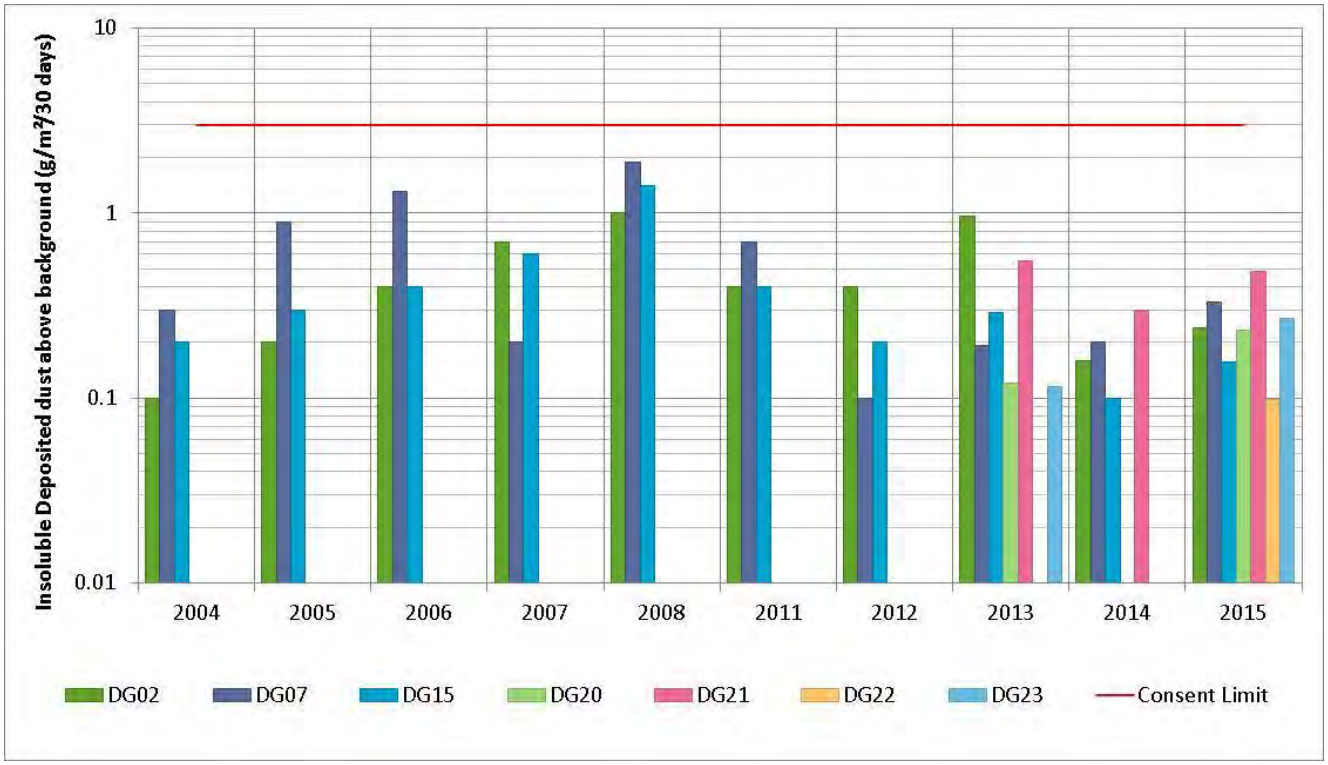


Figure 6-4 Annual average insoluble deposited dust above background (2004–2015)

6.4.2 Summary of current effects of deposited dust

During the twenty five years of mining at the Macraes Gold Project, the deposited dust levels measured beyond the mine boundary have been within the consent limits for the majority of the time. Dust levels measured within the mine boundary have also remained below 3 g/m^2/30 days for the majority of the time. There have been occasional recordings of high dust deposition levels at some sites, which have been attributed to specific reasons, such as extreme wind events and the proximity of busy, unpaved roads and agricultural activities. Where problems have been identified, such as the dust events associated with the Mixed Tailing Impoundment (MTI) during 2006 and 2007, OceanaGold has implemented additional dust control measures, which have reduced dust levels below the limit. Dust levels measured in proximity to Macraes Village have exceeded 3 g/m^2/30 days only 3 times between 2004 and 2015 (at Sites 2 and 15).

6.5 TSP

All three current consents for discharges to air from the mine require OceanaGold to monitor TSP concentrations at Site 15 using a nephelometer, or another similar continuous monitoring instrument. The consents all impose an upper limit on concentrations measured at Site 15 of no more than 120µg/m^3 (24-hour average), and require that dust mitigation methods are reviewed if concentrations exceed the threshold.

Figure 6-5 and 6-6 show the 24-hour average TSP concentrations measured at Site 15 for 2014 and 2015, respectively. During May 2015, OceanaGold installed a digital meter for recording the TSP concentrations in addition to the existing analogue meter. Data from both meters is shown in Figure 6-6.

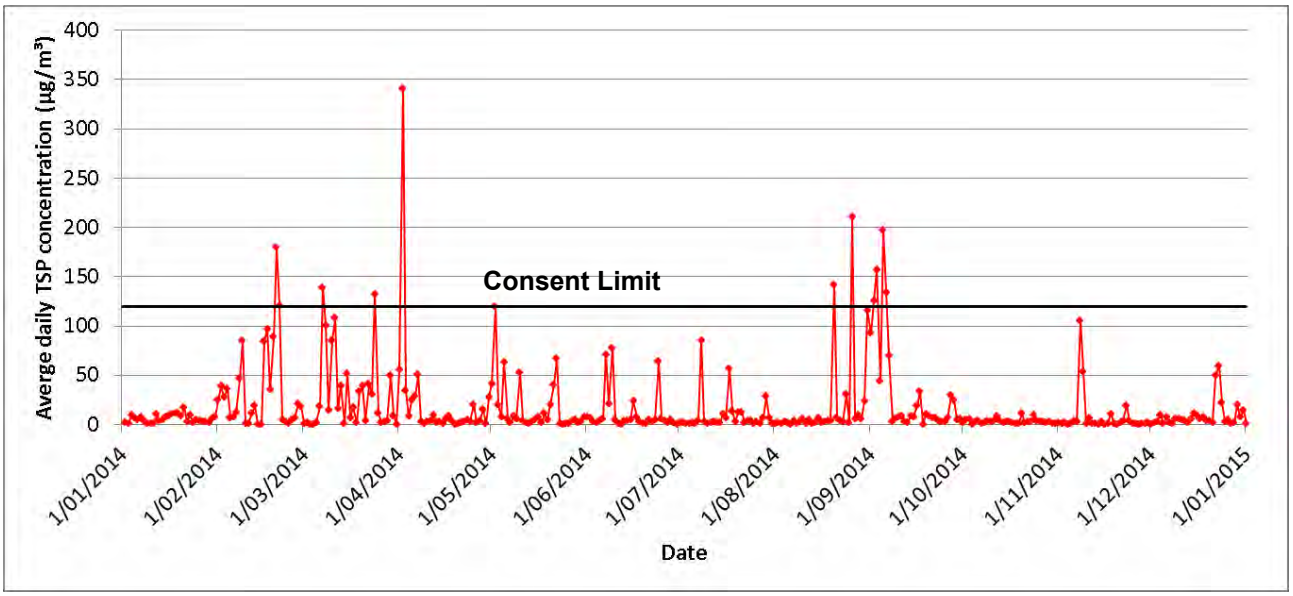


Figure 6-5 – Site 15, 24-hour average ambient TSP concentrations for 2014

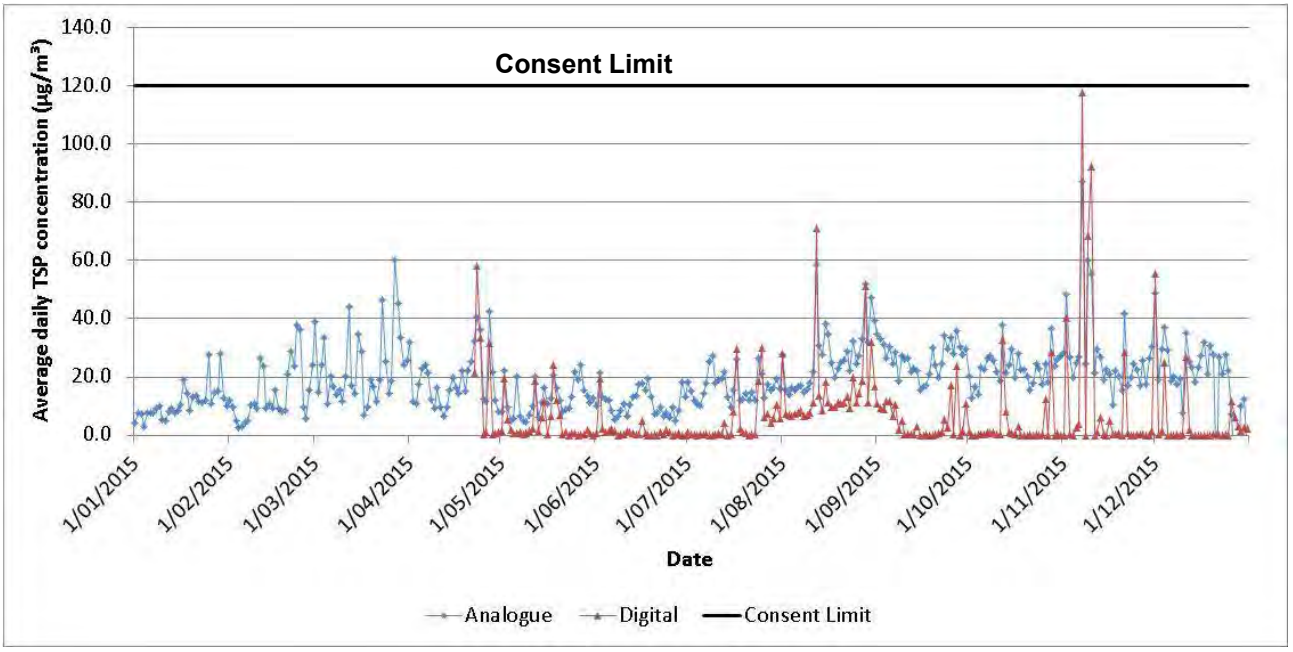


Figure 6-6- Site 15, 24-hour average ambient TSP concentrations for 2015[12]

Figure 6-5 illustrates that there were 11 exceedances of the TSP consent limit during 2014. A review of the monitoring results conducted by Beca in 2014[13] demonstrated that the high concentrations of TSP recorded by the nephelometer during 2014 were most likely due to the instrument recording moisture as particulate or

[12] Data provided by OceanaGold

[13] Beca *"Macraes Mine – Summary of Ambient Air Monitoring Results for 2014"* prepared for OceanaGold May 2015

localised sources of dust and were unlikely to be related to mining activities[14]. There were no exceedances of the consent limit during 2015.

6.5.1 $PM_{10}/PM_{2.5}$ and respirable quartz monitoring

The fine $PM_{10}/PM_{2.5}$ fractions of particulate within the dust emissions from the mine have the potential to impact on human health. Respirable quartz can cause the lung disease silicosis when people are exposed to high concentrations over extended periods of time. $PM_{10}/PM_{2.5}$ and respirable quartz concentrations were measured at Macraes Flat by OceanaGold during the summer months between 1998 and 2000. Monitoring was undertaken at the three TSP monitoring sites plus an additional site located at Golden Point to the north of the Golden Point Pit. The monitoring was undertaken using two High Volume Samplers at each site, one fitted with a PM_{10} inlet and the other fitted with a $PM_{2.5}$ inlet. The particulate collected on the $PM_{2.5}$ filters was analysed for quartz concentrations. Samples were taken once a month at each site in November through to March. $PM_{10}/PM_{2.5}$ and respirable quartz concentrations were all well below the consent limits and national and regional guideline values. The ORC subsequently authorised that this monitoring could cease.

6.6 Complaint Records

ORC and OceanaGold both record complaints received from the public regarding dust discharges from the Macraes Gold Project site. The ORC has recorded five complaints since 2009, the majority of which related to dust coming from the Mixed Tailings Facility (MTI). OceanaGold has recorded 14 complaints since 2006, the majority of which were also related to the MTI.

No complaints have been received by ORC, or OceanaGold, relating to the operation at Coronation Pit or the operation of the rest of the mine during 2014 and 2015.

The record of complaints clearly demonstrates that the MTI has been the largest source of complaints regarding dust and those complaints often occur during high winds. Complaints tend to occur most frequently in the spring, summer and autumn months, which correspond to the windiest times of the year. The dust incidents were identified by OceanaGold to occur primarily when no tailings were being deposited and the edges of the impoundment had dried out. OceanaGold has instituted a dust control procedure specifically to control dust from the edges of the tailings impoundment during these conditions.

6.7 Summary of Current Effects from Existing Mining Activities

From the information presented above, the current effects of the existing mining activities can be summarised as follows:

- The operation of the Macraes Gold Project has resulted in deposited dust levels in the area increasing in comparison to background values. However, at the majority of locations, levels have not increased more than permitted in the current resource consents. At locations close to where the majority of people live in the area, such as in Macraes Flat Village (Sites 2 and 15), deposited dust levels are consistently below the consent limit.
- TSP concentrations are generally below the consent limit, but on occasions relatively high concentrations have been recorded. However, the majority of these high concentrations have been found to be due to causes other than the mine and most likely due to the instrument measuring moisture as particulate.
- PM_{10} and respirable quartz concentrations are low.
- The number of complaints reported to the ORC is low and related mainly to dust from the MTI.

[14] : "These type of instruments commonly read fog as dust. Since the 2014 exceedances, OceanaGold has added an inlet heater which keeps the air above the dew point and improves accuracy. However, at times, moisture still gets into the meter and is read as particles, although this is usually obvious."

Taking all of these factors into account, it is considered that the discharges to air from the existing Macraes Gold and Coronation Projects result in effects on the environment that are no more than minor.

7 Potential Effects on the Environment of Proposed Development

7.1 Potential Effects of Discharges to Air from Coronation North Project

7.1.1 Potential range of dust deposition effects

In addition to consideration of dust sources and factors that may influence dust generation, an assessment of effects of dust should consider the distance that any dust may travel from the sources.

In general, although mining activities can generate dust from a wide range of particle sizes, those dust emissions are comprised mostly of larger particles. In general, the larger the size of a particle, the less distance it is likely to travel.

As a general rule of thumb, based on the results of research into dust entrainment, dust deposition is unlikely to occur to any significant degree beyond an approximate distance of 100-200m of a significant dust source in most circumstances. Dust nuisance is more likely to occur where sensitive receptors are located within such proximity of a significant dust source.

Local environmental conditions may influence the potential range of dust deposition. High average wind speeds, a high frequency of strong winds or complex local topography may increase the potential range over which dust deposition may occur.

In this case, the average wind speed in the area is relatively high, the terrain is complex and local environmental factors would therefore tend to increase the range of dust deposition due to mining activities.

Operational factors will also influence the likely range of dust deposition. Discharges from elevated sources (such as from the surfaces of elevated WRSs), will be able to travel proportionally further before reaching ground level. A larger scale of dust-generating activities and associated emissions will also increase the potential for dust deposition to occur at greater distances.

Hence, for an area such as Macraes Flat, which is subject to high wind speeds, with large scale open cast mining activities and elevated dust sources, it is expected that areas within approximately 1-2 km of mining activities may be potentially affected by dust under worst case weather conditions, if appropriate mitigation measures are not implemented.

7.1.2 Potential effects of emissions from construction of the Coronation North WRS and Coronation North Pit.

The new Coronation North WRS will be located to the northwest of the existing Coronation Pit and 1.1 km to the southeast of the Longdale Station residence and 2.4 km from the O'Neil residence. The Longdale Station and O'Neil residences will be down-wind of the new WRS and pit during south easterly winds. Winds from this direction are infrequent and do not tend to be strong. Consequently, it is considered unlikely that the Longdale Station and O'Neill residences will be adversely affected by dust arising from the construction of the Coronation North WRS and pit.

The Howard residence will be approximately 3 km downwind of the Coronation North Project during north-to –northwest winds. Winds from these directions occur for approximately 22% of time and are relatively light for the majority of time, but can be strong on occasions. Winds from the north to north-west directions, which exceed 5 m/s occur, occur for approximately 2.6% of the time. Given the distance between the Howard residence and the Coronation North Project area, the nature of the topography between the two locations

and the infrequency of strong winds from the north to north-west directions, the Howard residence is unlikely to be impacted by dust arising from the construction and operation of the Coronation North WRS and pit.

Macraes Village is located approximately 7 km to the south of the proposed Coronation North WRS and pit and is unlikely to be affected by dust generated during the construction and operation of the new area due to the large distance between the village and the proposed mining area.

The predominant westerly quarter winds will blow dust generated from the construction of the Coronation North WRS and pit towards rural farmland (Longdale Station), to the east of the project area, which is leased by the Peddies from OceanaGold. If dust is not adequately controlled, there is a potential for the farmland in close proximity to the WRS to be affected by dust. The potential effects of dust on vegetation are discussed in Section 7.1.7.

The sides of the Coronation North WRS will be progressively re-vegetated as it is constructed during the life of the mine. This should minimise the discharge of dust from the WRS.

7.1.3 Potential effects of emissions from the extension of Coronation Pit

Coronation Pit will be extended to the south of the existing pit area and closer towards the Howard residence. The Howard residence will be approximately 2 km from the southerly extent of the pit and will be downwind of the extended pit during northerly winds. Northerly winds are infrequent (occur for less than 6% of the time) and tend to be light. Consequently, given the distance between the Howard residence and the extended pit and the infrequency of winds from the north, it is not expected that this residence will be affected by the extension of Coronation Pit.

All other residences in the area are located more than 4 km from the Coronation Pit extension and are therefore, unlikely to be adversely affected by dust from this source.

7.1.4 Potential effects of emissions from topsoil and low grade ore stockpiles

Two stockpile areas of topsoil will be created on the southern side of the Coronation North pit. The majority of the stockpiled brown rock and topsoil will be created within the dump footprint to be used as rehabilitation becomes available on the WRS. A significant portion of the topsoil and brown rock will then be directly mined and spread over batters without going to stockpile as the dump develops.

A low grade ore stockpile will be formed on the north-eastern side of the pit (see Figure 4.1). Topsoil stockpiles are potential sources of dust if the surfaces are not protected from the wind. The topsoil stockpile will be progressively vegetated by OceanaGold as it is formed, which should minimise the discharges of dust from these sources. The location of the topsoil stockpile between the WRS and mine pit should result in the majority of dust deposits from the topsoil stockpile being confined to the mine area. Given the distances between the topsoil stockpile and neighbouring land (at least 200 m), it is unlikely that any dust generated from the topsoil stockpile will impact on neighbouring properties.

The low grade ore stockpile is unlikely to be a significant source of dust as the ore should have a low percentage of fine material that is susceptible to entrainment in wind.

7.1.5 Potential effects of emissions from the haul road

The existing Coronation haul road is located within approximately 1.1 km of the Howard property. The haul road will be extended to the north to service the Coronation North Project and the extension will be located further from the Howard property than the existing road. The Howard property will be down-wind of the new section of haul road during northerly and north-easterly winds. North-easterly winds are moderately frequent (approximately 15% of the time), but do not tend to be very strong.

The construction and use of the road has the potential to generate visible emissions of dust, especially during dry conditions. The use of the standard dust mitigation techniques currently used on the Coronation

haul road, such as keeping the road surface damp and limiting vehicle speeds, and the separation distance, should continue to prevent dust from the road causing nuisance effects at the Howard residence.

7.1.6 Potential effects of emissions from blasting

Immediately after blasting, there will be discharge of combustion contaminants and dust from the fractured rock. The emissions will dissipate quickly and are unlikely to have any measurable effect on air quality beyond the boundary of the site.

7.1.7 Potential effects on vegetation and farm animals

High levels of dust deposition have the potential to adversely affect vegetation by interfering with plant photosynthesis, promoting weed or disease incidence and impacting on the application of pesticides or fertilisers. In addition to potentially impacting on vegetation, dust may also affect agricultural activity through the promotion of disease or health problems in stock animals.

The new Coronation North Project mine area will be bounded to the north and east by the property leased by the Peddies from OceanaGold and to the south by land leased by the Howards. The activities associated with the Coronation North Project will be the same nature and scale as the activities carried out in the existing Coronation Project area. OceanaGold owns and farms all of the land surrounding the existing Macraes Gold Project. OceanaGold has advised that it has not experienced any adverse effects on vegetation or animal health on the land that it owns and farms. OceanaGold has also advised that it is not aware of any problems being reported by the neighbouring farmers regarding effects on vegetation.

7.1.8 Potential public health effects

Fine fractions of dust emitted from mining activities, such as PM_{10} and $PM_{2.5}$, have the potential to cause adverse respiratory health effects downwind of the mine. As described in Section 6, dust discharges from earthworks and mining activities are typically comprised of a high proportion of coarse particle sizes. Such particles generally have minimal impact on respiratory health, as particles have only limited penetration into the human respiratory tract.

The major sources of fine particulates at the mine are the vehicle exhausts. The monitoring undertaken by OceanaGold of PM_{10} and $PM_{2.5}$ concentrations demonstrated that concentrations in the vicinity of the Macraes Gold Project mining operation were low and below national standard and regional guideline values. The emissions from the vehicles will occur from locations spread over a large area and widely dispersed before they reach the boundary of the site. Beyond the boundary, the emissions will be dispersed further before the contaminants reach sensitive locations, namely residences downwind of the mine. It is expected that the concentrations of fine particulate in the vicinity of the Coronation North Project will not change significantly and no adverse effects on public health should result.

7.2 Potential Cumulative Dust Effects

There is a potential for the discharges of dust from the Coronation North Project (and Coronation Project) to combine with the discharges to air from the existing Macraes Gold Project mining activity to create cumulative effects. During north-westerly and south-easterly quarter winds, the plumes from the two mining areas may combine. However, the two mining areas are at least 2 km apart and the dust plumes are not expected to combine to any substantial degree. During the predominant westerly quarter winds, the dust from the two mining areas will not combine at all. Hence, there are not expected to be any significant cumulative effects resulting from the two separate mining activities.

OceanaGold proposes to continue to use the dust control methods that have been successfully used to date at the mine. Providing these measures are diligently carried out, any increases in the discharges from the mine should be minimised and adequately mitigated.

7.3 Summary of Potential Effects

The quantity and frequency of dust discharges from mining activities are related to a number of factors, such as the amount of material that is moved and processed, the area of open ground, the dust control measures employed and local weather conditions. The scale of the dust emissions will also have a strong bearing on the potential for dust effects. In comparison to the existing mining activity at the Macraes Gold Project, activity at the Coronation North Project will be of relatively small scale and will take place over a short period of time.

The nature of the activities that will take place during the Coronation North Project will be the same as the activities currently taking place at the Coronation and Macraes Gold Projects. The nature of the effects will also be similar.

The results of site monitoring and audits, as well as the low number of complaints, demonstrate that measured dust levels resulting from existing mining activities are within the limits set by the current resource consents and the existing effects of the mine are no more than minor. OceanaGold intends to continue to use the dust mitigation techniques that have been used successfully to date at the Coronation and Macraes Gold Projects. Given the small scale of the proposed additional mining activities associated with the Coronation North Project, relative to the scale of existing activities, any increase in the nature and scale of effects of dust emissions from the extension of the current activities is expected to be minimal.

It is considered that, provided particular care continues to be taken with the construction of the new and extended mine components, the discharge of dust from the proposed Coronation North Project will be adequately mitigated and any adverse effects downwind of the site are expected to be less than minor.

8 Monitoring

The current ambient air monitoring programme for the Coronation Project includes three sites that are also in the vicinity of the proposed Coronation North Project, one of which (Site 24) is a background site. Site 22 is located to the southeast of Coronation Pit and will be unaffected by the proposed works. Site 23 will be located very close to the westerly boundary of Coronation North Pit. OceanaGold proposes to move Site 23 to a new site to the north-west of the current location, shown as Site 25 on Figure 6-1. No additional monitoring sites are considered necessary.

9 Statutory Matters

9.1 Resource Management Act 1991

The Resource Management Act 1991 (RMA) provides the framework for all resources used in New Zealand. The overriding purpose of the RMA is *"to promote the sustainable management of natural and physical resources"* (s.5, RMA). The broader principles (s.6 to s.8) are a guide to considerations of any resource consent, development or protection.

An activity can be authorised by a rule, either in the Regional or District Plan, or through a resource consent. Part 3 of the RMA has the following section that is considered relevant to the activities sought in this application:

Section 15 – Discharges

Section 15(1)(c) of the RMA states that:

> *"No person may discharge any –*
>
> *(b) Contaminant from any industrial or trade premises into air;*
>
> *……..*
>
> > *Unless the discharge is expressly allowed by a national environmental standard or other regulations, a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or a resource consent.*

The proposed project works will involve discharges of contaminants to air (dust); therefore the discharge of contaminants into air needs to be expressly allowed by a rule in a regional plan and any relevant proposed plan or resource consent.

The relevant regional plan rules are discussed in Section 9.2.3.

9.2 Relevant Planning Instruments

9.2.1 Otago Regional Policy Statement

The Regional Policy Statement for Otago (RPS) provides an overview of resource management issues in the region and directs how the resources of Otago are to be managed. The policy statement is an umbrella document that provides the framework for the Regional Plans.

The primary objectives of the RPS, with regard to air quality, are to promote the protection of high ambient air quality, the enhancement of degraded air quality and the maintenance of good air quality by avoiding, remedying or mitigating the adverse effects of the discharge of contaminants to air.

Otago's air quality is generally very good, with poor air quality usually only experienced in towns with specific topographic and climatic constraints. Whilst the proposed activity will not result in any improvements in ambient air quality, it is expected that the discharges from the proposed activity will not have a significant adverse effect on the local air quality, or the overall air quality within Air Zone 3, in regard to NES and Air Plan requirements.

In summary, the proposed Coronation North Project is considered to be consistent with the provisions of the RPS.

9.2.2 Proposed Regional Policy Statement (PRPS)

The Proposed Regional Policy Statement (PRPS) was notified on 23 May 2015. Hearings have been held but no decisions have been released. The policies and objectives included in the PRPS need to be taken into consideration for decision making but, at this stage, should be given minimal weight compared to the operative RPS.

The objectives of the PRPS that are relevant to this application include Objective 2.1 which promotes recognising, maintaining and enhancing Otago's natural and physical resources including air quality. Policy 2.1.4 aims to maintain good ambient air quality that supports human health or enhance air quality where it has been degraded, protect Kai Tahu values and maintain other cultural, aesthetic and amenity values. Policy 2.3.5 applies an integrated management approach to activities that affect air quality by co-ordinating the management of land use and air quality in order to maintain or enhance air quality values and reduce the potential for adverse health and nuisance effects.

The effects of the existing Macraes and Coronation mining projects have been demonstrated to have no more than minor effects on ambient air quality. The proposed Coronation North Project will have no additional adverse effects on the environment, human health or amenity values and is therefore considered to be consistent with the policies and objectives of the PRPS.

9.2.3 Regional Plan: Air for Otago

Objectives and Policies

The relevant objectives and policies of the Air Plan (Operative in 2003, and including amendments 2006 & 2009), are discussed in the following section.

The proposal is considered consistent with the following objectives:

Objective 6.1.1 – To maintain ambient air quality in parts of Otago that have high air quality and enhance ambient air quality in places where it has been degraded

Objective 6.1.2 –To avoid adverse localised effects of contaminant discharges into air on:

- *Human health;*
- *Cultural, heritage and amenity values;*
- *Ecosystems and the plants and animals within them; and*
- *The life-supporting capacity of air.*

Objective 6.1.3 – To allow for sustainable use of Otago's air resource.

Section 7 of this report discusses the effects of the proposed activities on the environment. The conclusions from this assessment are that adverse effects on the local environment including health effects, amenity values and ecosystems, that are more than minor, are not expected, The proposal will not enhance ambient air quality, but neither is it expected to result in any significant degradation of air quality.

Policy 7.1.1 – To recognise and provide for the relationship Kai Tahu have with the air resource through procedures that enable Kai Tahu to participate in management of the air resources.

The Coronation North Project is not expected to result in any significant adverse effects that will impact on the air resource. The proposal should not result in adverse effects on the relationship that Kai Tahu, as Kaitiaki, has with the air resource or affect the ability of Kai Tahu to participate in the management of the air resource.

Policy 8.1.1 – To have regard to the Otago Goal Levels identified in Schedule 1 and comply with the Resource Management (National Environmental Standard Relating to Certain Air Pollutants, Dioxins and Other Toxics) regulations 2004 in managing the regions ambient air resource.

Monitoring of PM_{10} in the vicinity of the current Macraes Gold Project mining activity has found that concentrations are well below the NES and Otago Goal Levels. The Coronation North Project is not expected to result in any significant increase in local concentrations of PM_{10}.

Policy 8.2.3 – In the consideration of any application to discharge contaminants into air, Council will have;

a) *Particular regard to avoiding adverse effects including cumulative effects on:*

    i. *Values of significance to Kai Tahu*

    ii. *The health and functioning of ecosystems, plants and animals*

    iii. *Cultural, heritage and amenity values*

    iv. *Human health*

    v. *Ambient air quality of any airshed; and*

b) *Regard to any existing discharge from the site, into air, and its effects*

The effects of the current Macraes and Coronation projects, and the potential effects of the proposed Coronation North Project, have been discussed in Sections 6 and 7. The actual, potential and cumulative effects of the proposal on human health, ecosystems, amenity values and cultural and heritage values are considered to be less than minor.

Policy 8.2.8 – To avoid discharges to air being noxious, dangerous, offensive or objectionable on the surrounding local environment.

The proposed Coronation North Project mining operation will be very similar in scale and nature to the current Coronation Project's operations and will generate the same discharges. OceanaGold proposes to continue to use the dust mitigation methods that are being used successfully at present. The effects of the proposed operation are also expected to be very similar to the effects of the current Coronation Project. The current operation has not caused any effects to date that have been considered to be noxious, dangerous, offensive or objectionable. It is therefore expected that the discharges from the proposed Coronation North Project will not result in discharges that are noxious, dangerous, offensive or objectionable.

Policy 10.1.1 – The Otago Regional Council will encourage:

a) *People undertaking land use activities to adopt management practices to avoid, remedy or mitigate any adverse effects of dust beyond the boundary of the property; and*

b) *City and District councils to use land use planning mechanisms and other land management techniques to manage land use activities which have the potential to result in dust beyond the boundary of the property.*

OceanaGold plans to continue to use dust mitigation methods that it currently employs and which have been demonstrated to be effective.

Overall, the discharges to air from the proposed expansion of mining activities are considered to be consistent with the policies and objectives of the Air Plan.

Rules

Rule 16.3.5.3 – Discharges from mineral extraction and processing – permitted activity

The discharge of contaminants into air from:

1) *The extraction of minerals from the surface or from an open pit at a rate less than 20,000 cubic metres per month and 100,000 cubic metres per year; or*
2) *The crushing and screening of minerals at a rate less than 200 tonnes an hour; or*
3) *The drying or heating of minerals from single activities or a combination of activities on one site with equipment that has a heat generation capacity of less than 500 kW; or*
4) *The making of refractory, bricks or ceramic products at a rate less than 200 kg/hr of products;*

*is a **permitted activity**, providing*

a) *The mineral extraction, crushing and screening activities are located in Air Zone 3; and*
b) *In the case of equipment installed after 28 February 1998, any chimney complies with Schedule 6 ("Determination of Chimney Heights"); and*
c) *Any discharge of smoke, odour or particulate matter is not noxious, dangerous, offensive or objectionable at or beyond the boundary of the property.*

The Coronation North Project will exceed the processing rates included in Rule 16.3.5.3. Hence, Rule 16.3.5.9 applies.

Rule 16.3.5.9 – Other discharges from industrial or trade processes – discretionary activity

*Except as provided for by Rules 16.3.5.1 to 16.3.5.8 and 16.3.6.1, 16.3.6.2, 16.3.7.1, 16.3.9.2, 16.3.10.2, 16.3.11.1, 16.3.13.1 and 16.3.13.2, or prohibited by Rule 16.3.3.1, the discharge of contaminants into air from industrial or trade processes is a **discretionary activity**.*

Rule 16.3.15.5 – Discharges of PM_{10} after 31 August 2013 – discretionary activity.

Except as provided for by the permitted activity rules in this Plan or prohibited by Rules 16.3.1.1, 16.3.3.1, 16.3.12.1 and 16.3.15.1, the discharge of PM_{10} to air in an airshed after 31 August 2013,

*is a **discretionary activity**, providing:*

a) *The concentration of PM_{10} in the airshed does not breach its ambient air quality standard; or*
b) *The granting of the resource consent is not likely, at any time, to cause the concentration of PM_{10} in an airshed to breach its ambient air quality standard.*

The concentration in Airshed 3 does not breach the ambient air quality standard and the granting of consent to the Coronation North Project is not expected to result in the airshed exceeding the ambient air quality standard for PM_{10}.

Overall, the discharge to air from the proposed expansion of mining activities is a ***discretionary activity.***

10 Alternatives

Section 105 of the RMA requires that an assessment of environmental effects include a description of any alternative methods of discharge, including discharge into any other receiving environment. There are no alternative locations for the mining operation as it is dependent on the location of the gold resource. There are also no practical alternative methods of discharge as OceanaGold is proposing to use all of the relevant best practice techniques to control dust from the proposed Coronation North Project.

11 Proposed Conditions of Resource Consent

OceanaGold proposes that the conditions of consent for the Coronation North Project are essentially the same as the conditions included in Consent RM12.378.15 granted for the Coronation Project, with only minor alterations to change specific references to the location. A copy of Consent RM12.378.15 is attached in **Appendix C**. No changes to the monitoring conditions and performance standards are considered to be necessary, other than replacing monitoring Site 23 with Site 25.

12 Conclusion

OceanaGold proposes to develop a new mine pit and associated WRS to be known as the Coronation North Project in the area of the existing Macraes Gold Project mine. The location of the new Coronation North Pit and WRS will be towards the north of the current Coronation North Pit and WRS and approximately 2.0 km from the nearest privately-owned residences and 7 km from Macraes Village.

The nature of the proposed activities will be the same as the activities currently undertaken at other parts of the Macraes Gold and Coronation Projects. The scale of the proposed activities will be the same as the current Coronation Project and small in comparison to the scale of the Macraes Gold Project operation. Consequently, the effects of the operation are expected to be very similar to the effects of the Coronation Project and proportionally smaller than the effects of the Macraes Gold Project operation, providing standard dust mitigation techniques are carried out, as proposed, by OceanaGold.

Overall, it is considered that emissions to air from the Coronation North Project will result in a minimal level of effects in addition to those of the emissions from currently-consented activities at the mine. OceanaGold intends to continue to operate within and comply with the current consent limits.

It is therefore considered that, providing the proposed mitigation methods are diligently carried out, any adverse effects of discharge of dust from the proposed Coronation North Project should be adequately avoided, remedied and mitigated. The effects of the discharges of dust on the environment should be no more than minor.

Appendix A

Dust Management Plan

Macraes Operation

Dust Management Plan

August 2015

Table of Contents

Revision History

Date	Revision No.	Issued for	By
04Mar11	A	Initial Draft	Debbie Clarke
18Mar11	B	Amendments to Draft A	Jenny Autridge
01May13	C	Plan Review	Patrick Windsor
09Jul14	D	General Review and Update to include Coronation	Debbie Clarke
04Aug15	E	Plan Review	Debbie Clarke

1 BACKGROUND

1.1 Air Discharge Consents

This Dust Management Plan (DMP) covers the area of the original mining operation at Macraes (up until May 2012), the Macraes Phase III mine expansion area and the Coronation Project area. The plan has been prepared to fulfil the requirement for a DMP which is a resource consent condition in three air discharge consents held by Oceana Gold (New Zealand) Limited (OceanaGold). A fourth air discharge consent is held for the ventilation of the Frasers Underground mine. Details of the consents are summarised in Table 1.1.

Table 1.1: Air Discharge Consents held by OceanaGold

Consent Number	Details
Discharge Permit 96785_V5	To discharge contaminants from mining operations and post mining rehabilitation to air in the vicinity of Macraes Flat. (all the minesite except features associated with Macraes Phase III and Coronation).
Discharge Permit 2006.689	To discharge contaminants to air for the purpose of ventilating Frasers Underground Mine.
Discharge Permit RM10.351.52	To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations (Macraes Phase III expansion).
Discharge Permit RM12.378.15	To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations (Coronation Waste Rock Stack, Coronation Pit and associated haul roads, utility areas and stockpiles).

Discharge Permit 96785_V5, RM10.351.52 and RM12.378.15 include conditions requiring a DMP. These conditions are reproduced below.

Condition 16a (96785_V5), Condition 16 (RM10.351.52) and Condition 14 (RM12.378.15)

"Prior to the exercise of this consent, the consent holder shall submit a Dust Management Plan to the Consent Authority. The Dust Management Plan shall include, but not be limited to, the following:

(a) A description of potential dust sources and the factors influencing dust generation;

(b) Dust mitigation measures and procedures including, but not limited to:

i) Minimising the areas of disturbed ground;

ii) Watering, with water trucks and fixed sprinklers;

iii) Avoiding as far as possible, ground disturbance when wind may cause dust nuisance;

iv) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion;

v) Ensuring materials being moved are kept in a coarse state;

vi) Covering materials; and

vii) Replanting disturbed ground as soon as possible, including temporary planting if necessary.

(c) A description of dust monitoring equipment and procedures, including methods of analysis and details of the method used for the calculation of background dust concentration should values from one or all of the background sites be unavailable;

(d) Procedures for managing and addressing air quality or odour related complaints; and

(e) Key responsibilities, consultation and reporting, including details of the annual review and independent consultant used as required by Condition 18 of this consent."

Condition 16b (96785_V5), Condition 17 (RM10.351.52) and Condition 15 (RM12.378.15)

"The consent holder shall review the Dust Management Plan annually taking into account the following:

(a) The outcomes of reviews completed in accordance with Condition 10 and 18 of this consent; and

(b) Whether management practices are resulting in compliance with the conditions of this consent.

Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan for the Macraes Gold Project site. The consent holder shall provide the Consent Authority with any updates of the Dust Management Plan within one month of any update occurring."

1.2 Purpose

The purpose of this Dust Management Plan (DMP) is:

To facilitate the avoidance, remediation and mitigation of any adverse effects of dust discharges generated from mining activities and to promote proactive solutions to the control of dust discharges from the site.

The DMP includes information on the following:

- The sources of dust at Macraes Gold Project including the Coronation area;
- Dust mitigation and prevention measures;
- Monitoring methods;
- Mechanisms for remediation of adverse effects (should this be required);
- Methods for managing complaints regarding dust and keeping records related to compliance; and
- Key responsibilities, consultation and reporting.

The DMP is intended to be a working document and is to be reviewed annually. Any updates made to the DMP must be forwarded to the Otago Regional Council within one month of the update occurring.

1.3 Objectives

The objectives of this management plan are:

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

2 SITE OVERVIEW

2.1 Description of Mine Areas

The key features of the Macraes Gold Project up until August 2012 are:

- The Deepdell South, Golden Point, Round Hill, Innes Mills, Frasers and Golden Bar Open Pits;
- A backfilled Deepdell North Pit;
- The Mixed Tailings and Southern Pit 11 tailings storage facilities;
- The Deepdell, Northern Gully, Western, Back Road, Frasers West, Frasers East and Golden Bar Waste Rock Stacks;
- A processing plant;
- Various offices, workshops and ancillary buildings;
- The Lone Pine Fresh Water Reservoir; and
- Haul road, light vehicle access roads, assorted silt ponds, topsoil stockpiles, oxide stockpiles and low grade stockpiles.

The main features of the MPIII expansion include:

- A tailings storage facility (called Top Tipperary Tailings Storage Facility (TTTSF)) constructed in upper Tipperary Creek. This has been constructed and is now in use;
- Expansion of the existing Back Road Rock Stack to the east of the Round Hill/Southern Pit locations. The expansion of the Back Road Rock Stack has been deferred;
- Linking of Frasers East and Frasers West Rock Stacks with the Frasers South Rock Stack and the addition of the Frasers North Rock Stack. Frasers South Rock Stack has been constructed with Frasers North Rock Stack planned to commence in 2016;
- Realignment of the Macraes-Dunback Road. The major realignment works have been completed;
- Realignment of Golden Bar Road, scheduled for 2016;
- Expansion of existing pits to include the following; Frasers Stage VI, Round Hill – Southern Pit Extension, and Innes Mills Stage V. Some of these works will commence during 2015;
- Continued down dip (North Easterly) development of Frasers Underground mine; and
- A fresh water storage dam in Camp Creek (a tributary of Deepdell Creek) that will be filled from flood flows. The dam will result in a permanent residual flow in Deepdell Creek. This has been deferred.

More detailed information on the MPIII project is contained in the Assessment of Environmental Effects – Macraes Phase III and associated technical reports submitted with the consent application. Of particular relevance is the Assessment of Environmental Effects of Air Discharges, April 2011 prepared by Beca Infrastructure Ltd.

The main features of the Coronation Project include:

- Coronation Open Pit covering an area of approximately 62 hectares. Opportunistic backfilling of the pit may occur during operations. Upon closure Coronation Pit Lake will be formed;
- Coronation Waste Rock Stack (WRS) which will be approximately 94Mt in volume, with a maximum height to 730mRL and an area of 105 hectares. The WRS will be shaped to blend into the surrounding landscape and progressively rehabilitated; and
- Coronation Haul Road which will be used to haul ore from the Coronation pit to the MGP processing plant.

More detailed information on the Coronation Project is contained in the Assessment of Environmental Effects – Coronation and associated technical reports submitted with the consent application. Of particular relevance is the Coronation Project - Assessment of Environmental Effects of Air Discharges, April 2013 prepared by Beca Infrastructure Ltd.

2.2 Description of Site and Local Environment

2.2.1 Site Description – Macraes Gold Project – excluding Coronation

The OceanaGold mine is located in a rural area that is dominated by existing mining activities and low intensity pastoral farming. Macraes Flat Village, a small village that includes approximately 20 houses and a historic hotel is located to the west of the mining area.

The existing mining area extends to the north and south of Macraes-Dunback Road. Initially the mining operations were all to the north of Macraes-Dunback Road. Since 2000, mining has been developed to the south of the road into Frasers Pit and Golden Bar Pit. Mining has been completed at Golden Bar. The processing plant and Mixed and Southern Pit 11 tailings storage facilities are located to the north of the road.

The newly constructed Top Tipperary tailings storage facility is located to the east of the present mining activity. The Frasers South Waste Rock Stack is located to the south of Frasers Pit and links the existing Frasers West and Frasers East Waste Rock Stacks. An extension to Frasers East Waste Rock Stack will be added to the north, called Frasers North Waste Rock Stack. Figure 2.1 shows the locations of the existing and proposed mine features.

The mine site occupies an area of approximately 1500 hectares.

2.2.2 Site Description – Coronation Project

The proposed Coronation project is located on the Taieri Ridge, in the headwaters of; Camp Creek (Shag River catchment),Maori Hen Creek and Trimbells Gully Creek (tributaries of the Mare Burn in the Taieri River catchment). Figure 2.2 shows the proposed Coronation mine features.

The landscape of the Project area is steep to rolling country, rising steeply from the north-west side of Horse Flat Road to a relatively flat plateau on the Taieri Ridge, adjacent to the Sister Peak. The southern flank of the Project area drains to one main north-south oriented gully – Camp Creek – which in turn is fed by numerous other small gullies to the east and west. Camp Creek then drains to Deepdell Creek. The northern flank of the Project area drains to Maori Hen Creek and Trimbells Gully; both of which drain to the Mare Burn. Portions of the project area, along with the ridge tops of the west side of Camp Creek, are covered in pine plantation. The remaining land is generally grazed, tussock grassland.

In terms of natural character and visual amenity value, it is assessed that the Taieri Ridge forms a distinct skyline and visual backdrop to the Macraes area to the south and eastern extent of the Middlemarch-Hyde basin to the north. Its block faulted ridgeline with frequent outcrops of schist is distinctive and its various incised gullies that drain to Deepdell Creek to the south and Mare Burn to the north give the ridge a rugged

character. The visual amenity of the Taieri Ridge is further defined by its predominant vegetation cover of tussock grassland, which has been maintained by extensive pastoral farming practices and its elevation and isolation. The section of the Taieri Ridge that contains the Project is defined by the Sister Peaks promontories, the incised, upper catchment of Camp Creek to the west and south, and the more gentle slopes of the upper Mare Burn catchment to the north. On the southern side of the ridge and the Sister Peaks, the landscape character and amenity are somewhat degraded by the random patterns and arbitrary edge lines of the pine plantations.

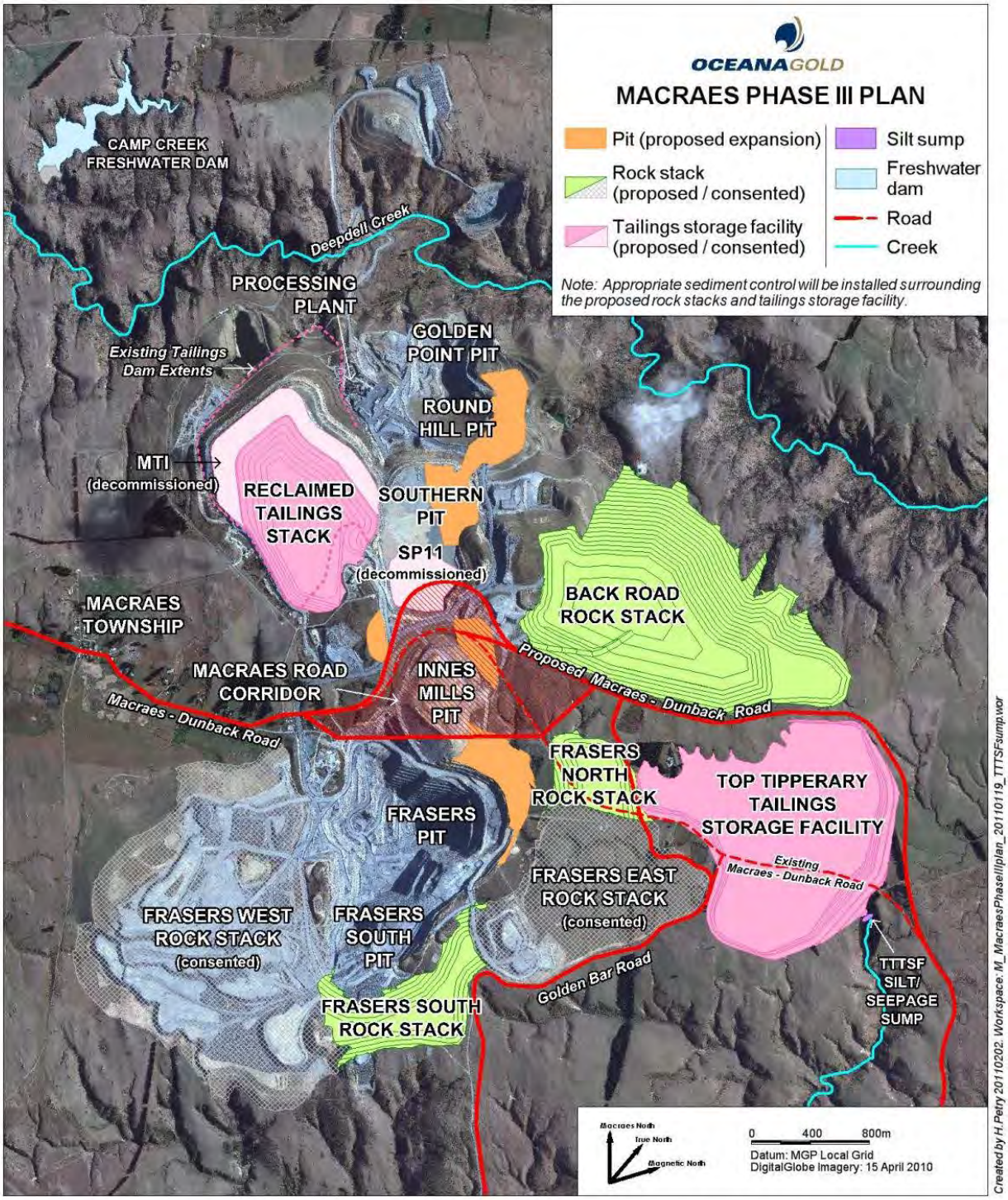


Figure 2.1: Macraes Phase III Plan

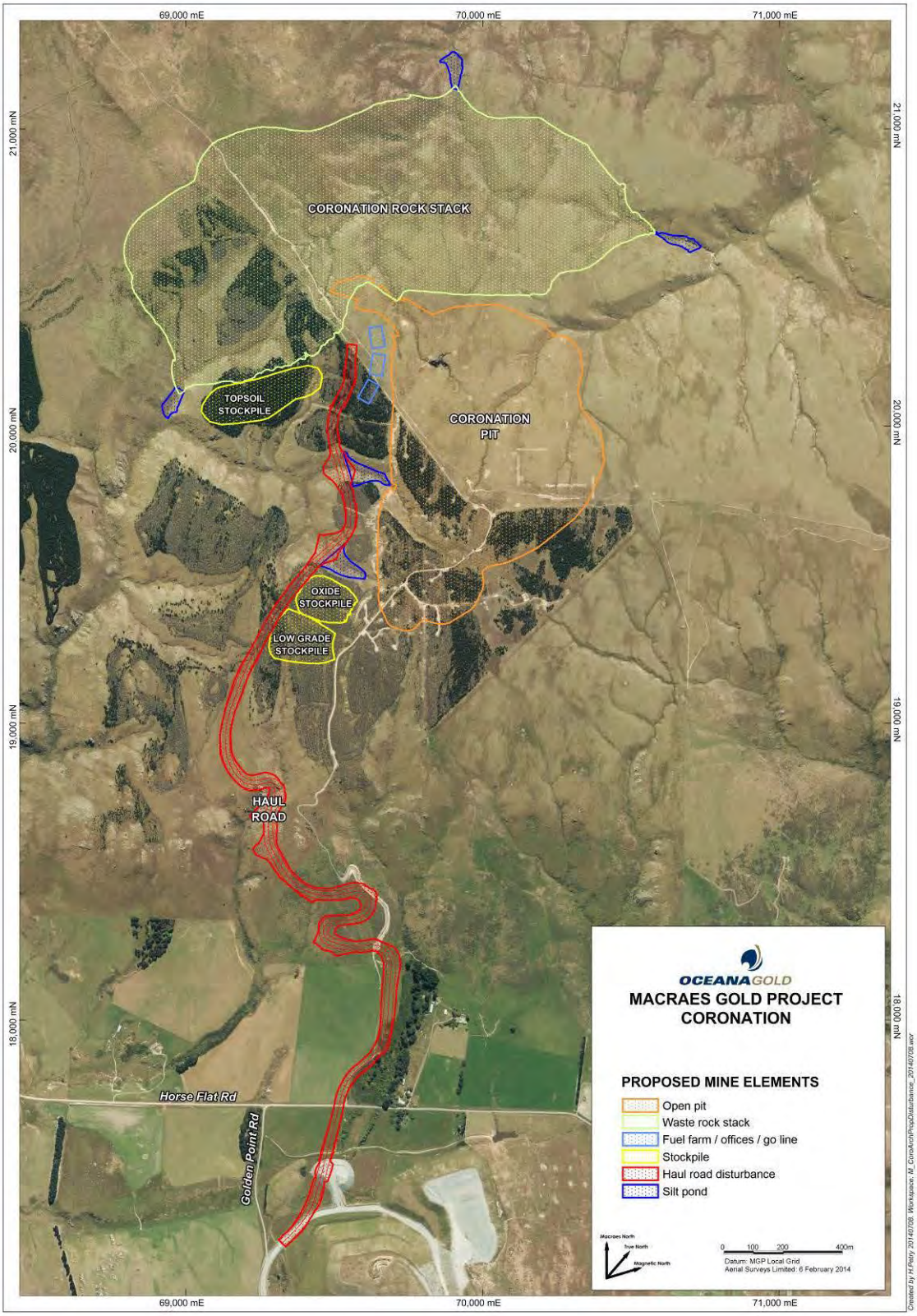


Figure 2.2: Coronation Project Features

2.2.3 Local Environment

The land in the vicinity of the Macraes Phase III and Coronation mine activities is rural and is of a similar character to the land surrounding the existing mine. The topography of the area is dominated by the large waste rock stacks and mine pits. The land to be mined is all owned by OceanaGold with the exception of the Camp Creek Reservoir site.

Figure 2.3 shows the areas of land in the vicinity of the mine which are owned by OceanaGold, including areas of land leased and the boundaries of land owned by neighbours. The map also shows the locations of the existing and proposed mine activities and demonstrates the distances from the mining activities to the boundaries with neighbouring properties.

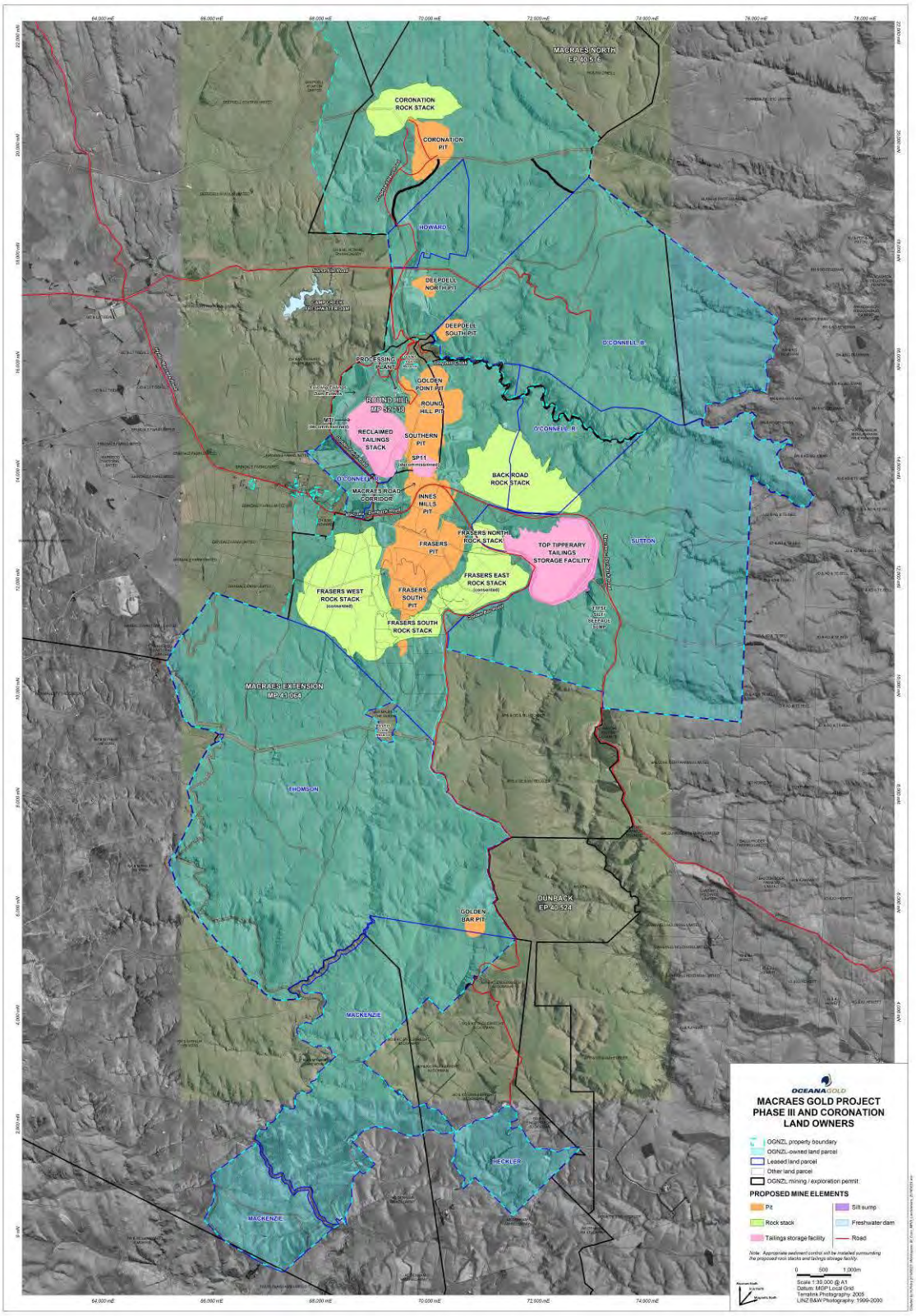


Figure 2.3: Land Owned and Leased by OceanaGold and Locations of Neighbouring Landowners

2.2.4 Site Weather Conditions

The main features of the Macraes Flat climate are the relatively low rainfall (site average annual rainfall is 628mm (Golder Associates, November 2010)) and the moderately strong average wind speed of 5.5m/s[1]. Both of these features can contribute to the generation and transport of dust. OceanaGold measures wind speed and wind direction at a climate station located on Golden Point Road and at a second site adjacent to dust monitoring site 15 near the Macraes Village. A typical windrose for the years 2000-2006 is shown in Figure 2.4. Winds tend to blow predominantly from the south and west. The strongest winds also come from these quarters. Winds from the northerly and easterly quarters tend to be lighter and less frequent.

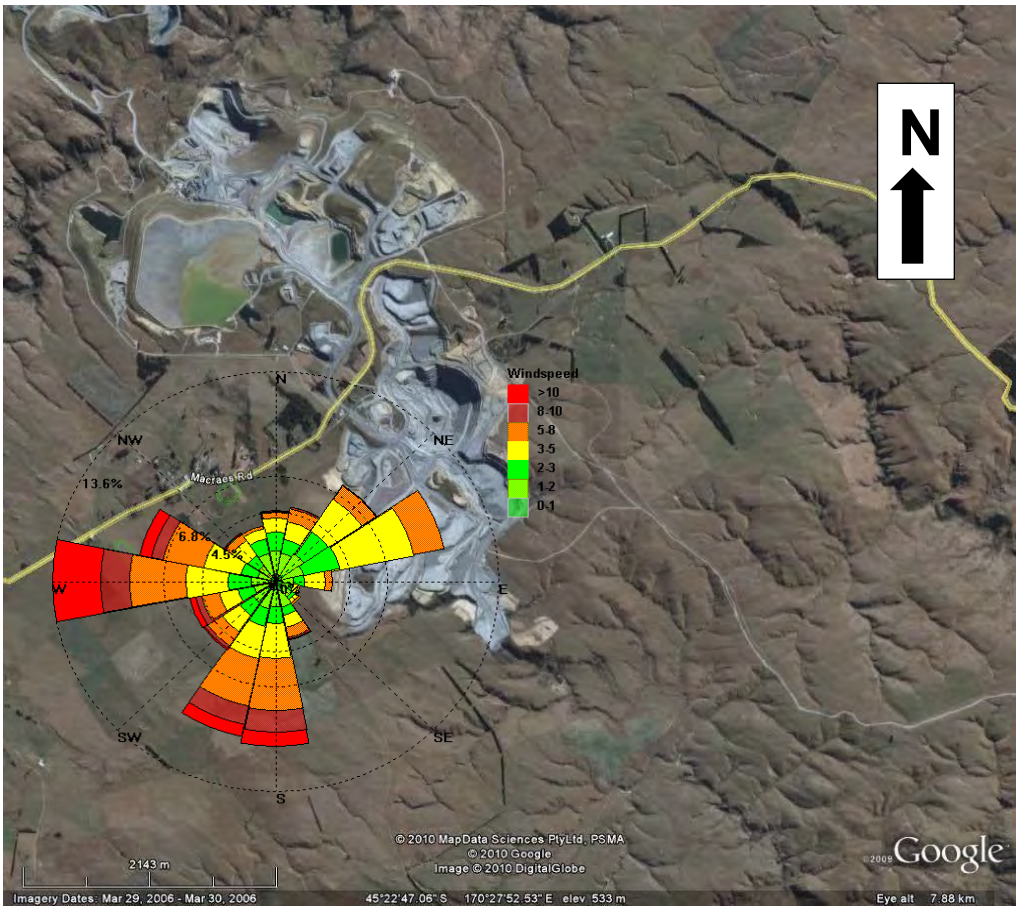


Figure 2.4: Macraes Windrose based on Data from the Golden Point Weather Station 2000 to 2006

[1] Macraes Mining Company Ltd. Macraes Gold Project Discharges to Air Assessment of Environmental Effects December 1996.

3 DUST SOURCES AND GENERATION

3.1 Potential Dust Sources

The following activities have the potential to generate dust:

- Blasting of rock;
- Excavation, including stripping of overburden and topsoil;
- Vehicle movements on unpaved surfaces (i.e. haul roads);
- Loading and unloading of materials;
- Wind generated dust from dry exposed surfaces such as stockpiles, tailings impoundment surfaces and non-rehabilitated surfaces; and
- Crushing of materials.

Dust emissions from exposed surfaces generally increase with increasing wind speed. However, dust pick up by wind is only significant at wind speeds above 5m/s. The smaller the particle size of the material on an exposed surface, the more easily the particles are able to be picked up and entrained in the wind. Moisture binds particles together preventing them from being disturbed by winds or vehicle movements. Similarly vegetated surfaces are less prone to wind erosion than bare surfaces. The larger the areas of exposed surfaces the more potential there will be for dust emissions.

Vehicles travelling over exposed surfaces (i.e. haul roads) tend to pulverise any surface particles. Particles are lifted and dropped from rolling wheels and the surface. Dust is also sucked into the turbulent wake created behind moving vehicles.

The discharge of dust from haul roads has the potential to have effects on two scales. The first is individually from a source where the effects are localised in the immediate area surrounding the activity. Secondly, cumulative effects may be observed where the dust generated from all of the nearby dust sources (such as machinery operating in the pit and adjacent haul roads) combine to affect the air quality of the area as a whole. Therefore, it is important that all dust sources be minimised as far as practical, including those well separated from sensitive locations, as all dust generated will have an effect on the overall air quality in the area.

3.2 Factors Influencing Dust Generation

There are five major factors which influence the potential for dust to be generated from the site. These are:

- Wind speed across the surface;
- The percentage of fine particles in the material on the surface;
- Moisture content of the material;
- The area of exposed surface;
- Disturbances such as traffic, excavation, loading and unloading of materials and blasting.

Systems for controlling dust emissions need to include methods that modify the condition of the materials so that it has a lesser tendency to lift with the wind or disturbances such as vehicle movements, and methods that reduce the velocity of the wind at the surface.

Watering of exposed surfaces and materials that may be disturbed is a primary method of control. As a general guide, the typical water requirements for most parts of New Zealand are up to 1 litre per square meter per hour.

The dust prevention methods detailed in Section 4 are the methods that have been found to be effective over the last 20 years of operation at the Macraes mine site. They can be used alone or in combination depending on the circumstances.

4 DUST MITIGATION MEASURES AND PROCEDURES

The following measures and procedures are implemented as necessary. Where relevant, the measures and procedures are also incorporated into contractor's responsibilities.

Unpaved Surfaces (haul roads, waste rock stacks, tailings impoundment surfaces, pits)

- Limit the area of exposed surfaces.
- Retain as much vegetation as possible.
- Keep tailings impoundment, pit and haul road maintenance up to date, such as repair of pot holes and the laying of fresh gravel or surfacing material.
- Keep haul road and exposed surfaces damp during dry conditions with water carts or fixed sprinklers.
- Cover exposed fine fill materials with coarse materials where practicable.

Vehicles (light vehicles, dump trucks, earthmoving machinery)

- Minimise traffic movements and control vehicle speeds to a maximum of 60km/h on haul roads.
- Adhere to load sizes to avoid spillages.
- Minimise travel distances through appropriate site layout and design**.**

Stockpiles (topsoil, brown rock, waste rock)

- Limit the height and slope of stockpiles to reduce wind entrainment.
- Orientate stockpiles to maximise wind sheltering.
- Minimise drop heights.
- Vegetate stockpiles of any materials that are to be left undisturbed for more than three months.
- Maximise shelter from winds as practicable.

Miscellaneous

- Revegetate exposed soil with appropriate vegetation as soon as practical.
- Install wind fences or barricades where practicable and appropriate.
- Minimise the area of surfaces covered with fine materials.
- Remove topsoil and loose material covering rock prior to blasting.
- Schedule potentially dusty operations where possible to avoid times of the day and year when conditions are likely to be particularly dry and windy.
- Schedule blasts to take into account wind conditions.

In addition to the above measures, specific dust mitigation methods exist for the tailings impoundment surfaces. These mitigation methods are detailed in the *Southern Pit 11 Tailings Impoundment, Mixed Tailings Impoundment and Top Tipperary Tailings Storage Facility Dust Control Manual presented in Appendix B*. Specifically, the measures outlined in the Tailings Dust Control Manual include:

Tailings Discharge

- Tailings deposition to be sequentially moved around the dam, restricting the likelihood of windborne dust generation created by the tailings beach drying out.

Rock Mattress Cover

- If feasible mitigate dust generation from the tailings beach via construction of a rock mattress. A rock mattress to be laid out over the outer 120m of the tailings beach for the Mixed Tailings and 90m for the Southern Pit 11 Tailings Impoundments.

- Rock mattress construction will commence as soon as practicable after cessation of tailings deposition for impoundments constructed using upstream construction methods.

Tailings Wetting System

- For impoundments constructed using upstream construction methods a tailings wetting system is to be established following rockfill mattress construction to enable distribution of either water or tails onto the inner surface of the impoundment surface not covered by the rock mattress.

- Tailings wetting systems are to have the capacity to be operational at all times when the impoundment is not active or resting.

- Limit traffic on the tailings surface when the impoundment is inactive in order to preserve the crust.

- Ensure tailings wetting system can be mobilised to other areas of the impoundment where necessary to mitigate dust generation.

5 MONITORING

OceanaGold currently holds four air discharge consents: RM10.351.52 (Macraes Phase III), 96785_V5 (covering general mining and processing operations in all areas not covered by Macraes Phase III) and RM12.378.15 covering the Coronation area, as well as Consent No 2006.689 for the purpose of ventilating the underground mine. Copies of these consents are presented in Appendix A.

Under air discharge consents 96785_V5, RM10.351.52 and RM12.378.15 the following monitoring is currently completed:

- Dust deposition rates at monthly intervals at 16 sites (13 sites for 96785_V5 and RM10.351.52 and three sites for RM12.378.15);
- Real time total suspended particulate concentrations at site DG15. The ORC gave permission for the concurrently operated High Volume Sampler to be disestablished in May 2015);
- Continuous meteorological monitoring of conditions at two representative locations on-site (Sites DG03 and DG15); and
- Daily record kept of water used for dust suppression.

In addition to the resource consent monitoring OceanaGold has a process of checking weather forecasts and advising key operational personnel if strong winds are forecast. This process is set out in the *Southern Pit 11 Tailings Impoundment, Mixed Tailings Impoundment and Top Tipperary Tailings Storage Facility Dust Control Manual*, included as Appendix B.

To ensure that controls are implemented and are effective in minimising dust emissions, OceanaGold monitors weather conditions, the condition of potential dust generating areas and undertakes depositional dust and total suspended particulate monitoring.

Table 5.1 below outlines the current dust monitoring programme.

Table 5.1: Existing Dust Monitoring Programme

Monitoring Activities	Frequency
Check weather forecasts for strong winds and send electronic alerts to key personnel.	Daily
Observe weather conditions, wind via observations (Beaufort Scale)[2].	Daily and as conditions change.
Inspect all haul road surfaces for dampness and general condition.	Daily and as conditions change
Inspect all exposed surfaces for dampness and to ensure that surface exposure is minimised.	Daily and as conditions change.
Inspect tailings impoundment surfaces for dampness.	Daily and as conditions change.
Inspect tailings impoundment dust suppression systems.	Twice daily during extended periods of no deposition
Monitor dust deposition rates in 16 gauges surrounding the mine site.	Monthly
Monitor real time Total Suspended Particulate (TSP) at Dust Site 15 using a Nephelometer.	Continuously
Monitor meteorological conditions at Dust Sites 3 and 15.	Continuously

The locations of the depositional and total suspended particulate monitoring sites are shown on Figure 5.1.

[2] A description of the Beaufort Scale can be found in Appendix C

5.1 Monitoring Equipment Specifications

Specifications of the equipment used to undertake these monitoring activities can be found in Tables 5.2 to 5.4 below.

Table 5.2: Monitoring Equipment at Site DG15

Monitor Type	Monitor Specifications
Nephelometer (real time total suspended particulate monitoring)	Met One E-Sampler-9800.
Atmospheric monitoring site	Temperature sensor: Campbell Scientific 107 Anemometer: Vector A101M Wind Vane: Vector W200P Rain Gauge: TB3-0.2/P
Dustfall Gauge	Standard Dust Deposition Gauge. Dust gauges are analysed using the Horizontal Deposit Gauge Method.

Table 5.3: Monitoring Equipment at Site DG03

Monitor Type	Monitor Specifications
Atmospheric Monitoring Site	Temperature Sensor: Campbell Scientific 107 Temperature and RH Sensor: Viasala HMP50Y Anemometer: Vector A101M Wind Vane: Vector W200P Rain Gauge: Ota Keiki Seisakusho 34-T Solar Radiation: Apogee SP110 Pyranometer
Dustfall Gauge	Standard Dust Deposition Gauge. Dust gauges are analysed using the Horizontal Deposit Gauge Method.

Table 5.4: Other Dust Monitoring Locations

Monitoring Type	Specifications
Dustfall Gauge	Standard Dust Deposition Gauge. Sixteen gauges are positioned in various locations around site (see Figure 5.1 for locations). Dust gauges are analysed using the Horizontal Deposit Gauge Method.

5.2 Data Analysis and Reporting

5.2.1 Dustfall Gauge Data

Data from dustfall gauges is collected, analysed and reported on a monthly basis by Environmental Standards Limited. Dustfall gauges are analysed using the Horizontal Deposit Gauge method. This method is detailed in the Draft International Standard ISO/DIS 4222.2 (‘*Air Quality Measurement of Atmospheric Dustfall – Horizontal Deposit Gauge Method”* 1980).

Depositional dust results are included in the Quarterly Monitoring Reports supplied to the Otago Regional Council.

5.2.2 Atmospheric and Total Suspended Particulate Data

Watercare Services Limited (WSL) undertakes data analysis and reporting for the nephelometer, and atmospheric monitoring station. A monthly summary report is produced once all the data has been collected and analysed. Details of the methods for data analysis can be found in Section 5 of their latest monthly report, which can also be found in Appendix D of this plan.

Total suspended particulate results are included in the Quarterly Monitoring Reports supplied to the Otago Regional Council.

5.3 Compliance Limits

Under resource consent RM10.352.52 (Macraes Phase III) and 96785_V5, the following compliance limits apply:

- Insoluble dust deposition rates at sites DG07, DG20 and DG21 must not exceed 3g/m^2/30days of insoluble dust above background more than twice in any calendar year;
- Insoluble dust deposition rates at sites DG02 and DG15 must not exceed 3g/m^2/30days of insoluble dust above background; and
- 24 hour average total suspended particulate at Site DG15 must not exceed 120ug/m^3.

Background concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG24. In the event that a result for one of these sites is unavailable, the background concentration will be calculated by averaging the remaining two sites.

Under resource consent RM12.378.15 (Coronation), the following compliance limits apply:

- Insoluble dust deposition rates at sites DG07, DG20, DG21, DG22 and DG23 must not exceed 3g/m^2/30days of insoluble dust above background more than twice in any calendar year;
- Insoluble dust deposition rates at sites DG02 and DG15 must not exceed 3g/m^2/30days of insoluble dust above background.
- 24 hour average total suspended particulate at Site DG15 must not exceed 120ug/m^3.

Background concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG24. In the event that a result for one of these sites is unavailable, the background concentration will be calculated by averaging the remaining two sites.

5.4 Exceedance of a Compliance Limit

If a consent limit for depositional dust or total suspended particulate is exceeded, OceanaGold will undertake an immediate review to determine the likely cause of the exceedance. Within one month a report detailing the findings will be forwarded to the Otago Regional Council. If it is found that activities of OceanaGold were the cause of the exceedance then dust mitigation measures shall be reviewed by an independent consultant and a report prepared summarising the cause of the exceedance and recommending measures to improve dust mitigation so the exceedance does not occur again. The report will be forwarded to the Otago Regional Council within two months of the exceedance being identified.

5.5 Annual Dust Review

An annual summary of the ambient air monitoring results is to be forwarded to the ORC by 30th April each year. This report reviews and assesses the results for the previous calendar year and is to be undertaken

by a suitably qualified independent reviewer. OceanaGold engage Prue Harwood from Beca Infrastructure for this report. Her qualifications and experience can be found in Appendix B of *"OceanaGold Macraes Mine – Summary of Ambient Air Monitoring Results for 2014".*

The report shall include the following:

(a) The name, qualifications and experience of the reviewer;

(b) The methods used and the investigations undertaken for the review;

(c) Interpretation of the monitoring data reviewed;

(d) An assessment of the quality of the monitoring data;

(e) An assessment of the monitoring regime;

(f) A description and evaluation of each of the dust mitigation measures used;

(g) Recommendations on whether:

i) The monitoring of dust is adequate or should be changed, and if changed the changes that are recommended;

ii) The dust mitigation measures used by the consent holder are adequate, or should be changed, and the changes that are recommended; and

iii) Any changes that should be made to the conditions of this consent.

(h) Any other matters that the reviewer considers should be drawn to the attention of OceanaGold or the Otago Regional Council.

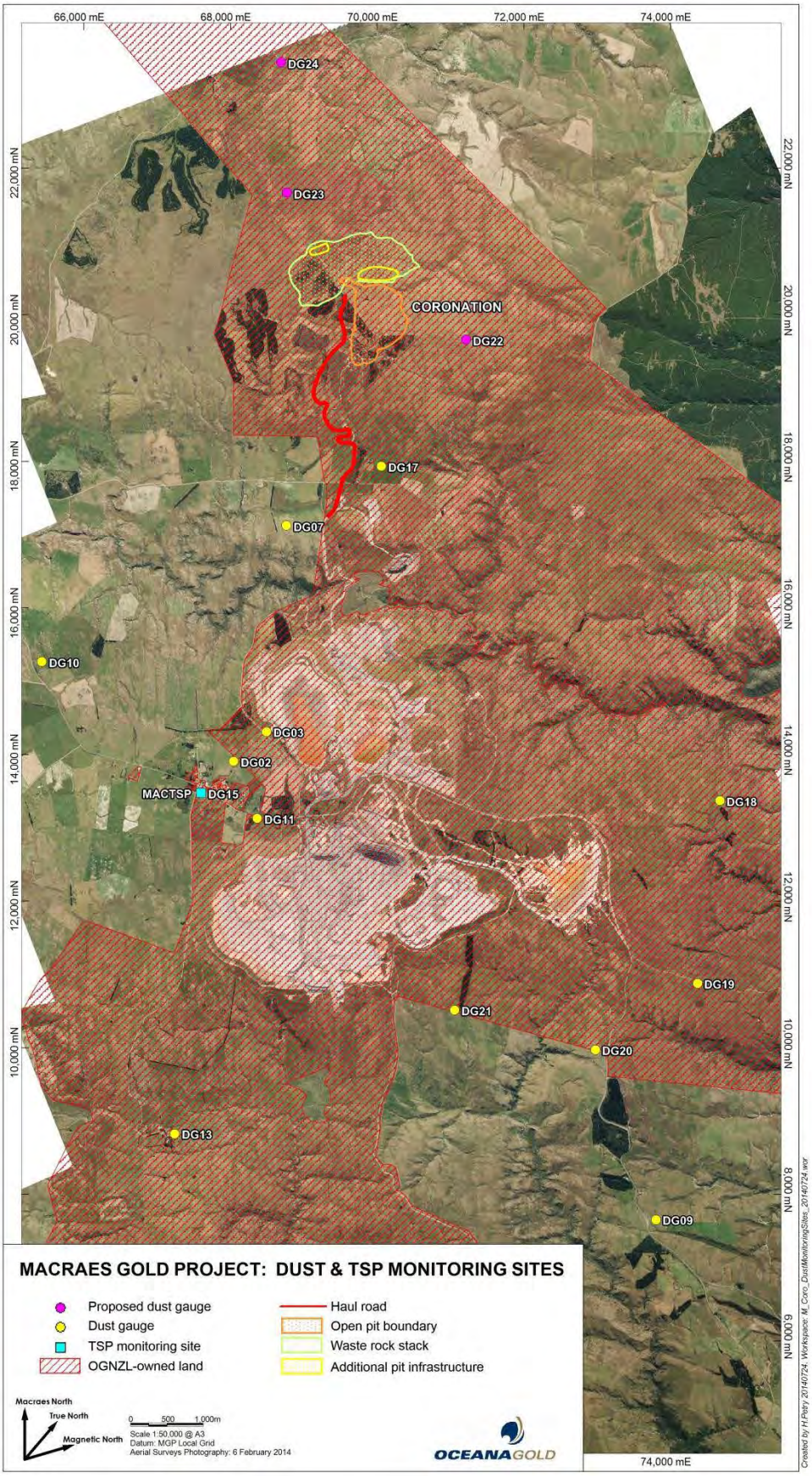


Figure 5.1: Depositional Dust and TSP Monitoring Sites

6 COMPLAINTS

Complaints may be referred by one or more of the regulatory authorities, a member of the public or an OceanaGold employee or contractor. It is the responsibility of the Senior Environmental Advisor to respond to and follow up all complaints regarding dust. The Senior Environmental Advisor is responsible for ensuring suitably qualified personnel are available to respond to complaints at all times.

Actions to be taken as soon as possible by the Senior Environmental Advisor

- Fill out an Environmental Incident Report form.
- Note the time, date, identity and contact details of complainant. Wind direction, strength and weather conditions are to be recorded. Note if complaint has been referred from a Consent Authority.
- Ask the complainant to describe the dust emission; whether it is constant or intermittent, how long it has been going on 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 dust producing activities taking place, which staff member or contractor is responsible for the site and the dust mitigation methods that are being used. Order any remedial action necessary. If the complaint was related to an event in the recent past, note any dust producing activities that were underway at that time, if possible.
- As soon as practical (preferably within two hours) visit the area from where the complaint originated to ascertain if dust is still a problem.
- If it becomes apparent that there may be a source of dust other than activities at Macraes Gold Mine causing the dust nuisance it is important to verify this. Photograph and document the source and emissions.
- 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.
- Complete complaint form and file on complaint register.

Follow Up Actions

- Advise the Otago Regional Council as soon as practical that a complaint has been received and what the findings of the investigation were and any remedial actions taken.

7 RESPONSIBILITIES

OceanaGold as the holder of consents for Macraes Gold Mine site 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 DMP.

Specifically, the following roles share operational responsibility for ensuring mining activities are carried out in accordance with the DMP:

- General Manager Macraes Operation
- Open Pit Mine Manager
- Process Manager

These roles will have the following responsibilities:

- Overall responsibility at the site for ensuring that the dust control and mitigation measures and procedures outlined in Section 4 of the DMP are implemented effectively.
- Overall responsibility to ensure that dust emissions are avoided and mitigated as far as is practicable.

The Senior Environmental Advisor will have the following associated responsibilities:

- Responsibility to ensure that the dust monitoring programme is carried out as required.
- Responsibility to ensure that complaints are received and investigated as outlined in Section 6 of the DMP.
- Responsibility to ensure the DMP is current and reviewed at least annually.

All contractors and staff working on site are to ensure that their activities comply with the requirements of the DMP.

8 CONSULTATION, REPORTING AND REVIEW

8.1 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 dust control 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 complaint.

The contact phone numbers and email addresses to be used for registering a complaint are included in **Appendix E**.

8.2 OceanaGold to Otago Regional Council

OceanaGold will maintain a regular and formal reporting regime with the Otago Regional Council (ORC) to inform them of any issues regarding dust control at the site that may be of interest to them and to obtain feedback on compliance and performance.

OceanaGold will provide the ORC with contact numbers to be used to advise OceanaGold of a dust complaint. The contact phone numbers and email addresses to be used for registering a complaint are included in **Appendix E**.

OceanaGold will inform the ORC of the following:

- Any complaints received regarding dust to as soon as practical after receipt of the complaint.
- Of any non-compliances with monitoring as outlined in Section 5. Any non-compliance will be reported to the ORC through the nominated compliance contact (currently Rachel Brennan) or via the compliance email address (compliance@orc.govt.nz).
- Provide ORC with a copy of the DMP if any significant revisions of the DMP are made during the year.

8.3 Otago Regional Council to OceanaGold

OceanaGold requests that the ORC advise them of any complaints they receive regarding dust from the Macraes Gold Mine site immediately after the complaint has been lodged.

8.4 DMP Review Procedure

The DMP shall be reviewed regularly and at least annually preferably during the winter period and prior to the next dry season. The review shall take into account the following:

- The outcome of any reviews completed as the result of any non-compliant results;
- The outcome of the annual review of all dust monitoring data; and
- Whether management practices are resulting in compliance with the conditions of the relevant air discharge consents.

A copy of any updates to the DMP will be forwarded to the Otago Regional Council within one month of any update occurring. Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan.

9 EXCESSIVE DUST ACTION PLAN

In the event that personnel are unable to control dust adequately on the mine site and additional measures are required in order for OceanaGold to comply with the provisions of the resource consents OceanaGold shall initiate an emergency action plan. OceanaGold will maintain an in-house register of persons and contractors who have suitable equipment and personnel available that can be contacted at short notice in the event of a dust emergency occurring.

The emergency procedures may include, but are not limited to, the following:

- The use of additional water carts and irrigation systems; and
- Stopping work on areas of the site that are sources of excessive dust, where practical.

The Site Personnel Contacts list is included in **Appendix E.**

Appendix A

Resource Consents Held for Air Discharges

ORIGINAL

Otago Regional Council

Our Reference: A525831

Consent No 96785_V5

DISCHARGE PERMIT

Pursuant to Section 105 of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Oceana Gold (New Zealand) Limited

Address: Level 3, Taunton Mews, 22 Maclaggan Street, Dunedin

to discharge contaminants from mining operations and post mining rehabilitation to air in the vicinity of Macraes Flat at the site shown on Appendix I.

Description of consent location: Mine Boundaries as shown on Appendix I

Map reference centre of activity: NZMS 260 I42:105-335

Commencement of Consent: This consent shall commence when:
(i) The provisions of Section 116 Resource Management Act 1991 are satisfied.
(ii) The consent authority has accepted the surrender under S138 of the Resource Management Act 1991 of discharge permit 95787.

Expiry of Consent: This consent shall expire on 31 August 2032 or on the completion of rehabilitation to the satisfaction of the consent authority, whichever occurs earlier.

Conditions

1. This consent shall not be exercised until air discharge permit number 95787 is surrendered in accordance with Section 138 of the Act.

2. This consent shall be exercised in conjunction with in conjunction with Discharge Permit 2006.689, Discharge Permit RM10.351.52 and Discharge Permit RM12.378.15.

3. This consent shall be exercised in accordance with:

   (i) the application for resource consent dated December 1996 including the Assessment of Environmental Effects and all supporting documents (which are deemed to be incorporated in, and form part of this consent);

   (ii) *the application for a change in conditions of consent 96785_V1 dated May 2001 (and supporting documents);*

   (iii) *the application for a change in conditions of consent 96785_V2 dated April 2004 (and supporting documents) that is relevant only to the construction of the decline;*

(iv) *the application for a change in conditions of consent 96785_V3 dated April 2005 (and supporting documents); and,*

(v) ***the application for a change in conditions of consent 96785_V4 dated May 2005 (and supporting documents);***

except to the extent that any condition in this consent is inconsistent with such material. If there is an inconsistency the conditions and terms of this consent shall prevail.

4. This discharge shall occur in the area shown on Appendix I attached, other than where the discharge of contaminants to air in that area is authorised by Discharge Permit 2006.689, Discharge Permit 2007.511 and Discharge Permit RM10.351.52.

5. The consent holder shall minimise any adverse effect on the environment resulting from the discharge of dust. The methods shall include the following :

a) Minimising the areas of disturbed ground.

b) Watering, with water trucks and fixed sprinklers.

c) Avoiding as far a possible, ground disturbance when wind may cause dust nuisance.

d) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion.

e) Ensuring materials being moved are kept in a coarse state.

f) Covering materials.

g) Replanting disturbed ground as soon as possible, including temporary planting if necessary.

Dust Limits

6. There shall be no emission of visible dust from the mining activities that, in the opinion of an enforcement officer, is offensive or objectionable to such an extent that it has an adverse effect on the environment.

7. Insoluble dust deposition rates at sites DG07, DG20 and DG21, as shown on Appendix II attached, must not exceed 3 grams per square metre per 30 days of insoluble dust above background more than twice in any calendar year. Compliance with this condition shall be demonstrated by the monitoring required by Condition 11 of this consent.

8. Insoluble dust deposition rates at sites DG02 and DG15, as shown on Appendix II attached, must not exceed 3 grams per square metre per 30 days of insoluble dust above background. Compliance with this condition shall be demonstrated by the monitoring required by Condition 11 of this consent.

8a. Background insoluble dust concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG24 as shown on Appendix II attached to this consent.

9. Twenty-four hour average total suspended particulate at site DG15, as shown on Appendix II attached, shall not exceed 120 micrograms per cubic metre. Compliance with this condition will be demonstrated by the monitoring required by Condition 12 of this consent.

10. In the event of any exceedance of those limits specified in Conditions 7, 8, 8a and 9 of this consent, the consent holder must undertake an immediate review of the cause of the exceedance. A report detailing the findings of this review shall be provided to the Consent Authority within 1 month of the non compliant result(s) being received. If it is shown that the activities within the Macraes Gold Project site were the cause of the exceedance, then dust mitigation measures within the Macraes Gold Project site shall be reviewed by an independent consultant engaged in consultation with the Consent Authority. The independent consultant shall provide a report summarising the cause of the exceedance and recommending measures to improve dust mitigation so that the exceedances do not occur again. This report shall be provided to the Consent Authority within two months of the non-compliant result(s) being received.

Monitoring

11. The consent holder shall monitor dust deposition rates at monthly intervals in accordance with the draft ISO Standard ISO/SIS 4222.2, ("Air Quality Measurement of Atmospheric Dustfall - Horizontal Deposit Gauge Method" 1980), or another method approved in writing by the Consent Authority. The monitoring shall be undertaken at the sites shown in Appendix II attached.

12. a) The consent holder shall monitor real time total suspended particulate concentrations at site DG15 as shown on Appendix II attached. The monitoring shall be undertaken using a nephelometer, or other instrument as agreed in writing by the Consent Authority. The instrument shall be sited in accordance with AS/NZS 3580.1.1:2007.

b) The consent holder shall monitor total suspended particulate at monitoring site DG15 as shown on Appendix II in accordance with Australian Standard AS/NZS3580.9.3:2003 (Determination of suspended particulate matter - Total Suspended Particulates [TSP] - High Volume Sampler Gravimetric Method), or another method approved by the Consent Authority. Twenty-four hour measurements must be taken every six days March to October inclusive, and every three days November to February inclusive, for a minimum period of twelve months or for however long is required to ensure that adequate data is collected to achieve the objectives of Condition 12(d).

c) Parameters to be recorded shall include, but not be limited to:

i) Hourly average TSP concentrations as measured by the instrument installed in accordance with Condition 12(a) of this consent;

ii) 24-hour average TSP concentrations as measured by the instruments installed in accordance with Conditions 12(a) and 12(b).

d) The instruments installed in accordance with Conditions 12(a) and 12(b) shall be operated concurrently for a period of no less then twelve months to ensure that twelve months of coincident data is collected. A correlation between the data shall be established by an independent consultant engaged in consultation with the Consent Authority. A report detailing this investigation shall be provided to the Consent Authority within two months of the data being collected.

13. *Deleted*

14. (a) Meteorological conditions shall be continuously monitored and recorded at site DG03 as shown on Appendix II attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall. Sufficient information shall also be measured to allow an estimate of atmospheric stability. These estimates shall be obtained from measurements of solar radiation and temperature at two heights above ground level, or other parameters as approved by the Consent Authority.
(b) Meteorological conditions shall be continuously monitored and recorded at site DG15 as shown on Appendix II attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall.

15. The consent holder shall keep a daily record of water used for dust suppression. These records shall be made available to the Consent Authority upon request.

Monitoring reports and quality assurance

16. Results of all monitoring undertake in accordance with this consent shall be reported to the Consent Authority on a quarterly basis. The format of the report shall be agreed upon in writing with the Consent Authority.

16a. The consent holder shall submit a Dust Management Plan to the Consent Authority. The Dust Management Plan shall include, but not be limited to, the following:

a) A description of potential dust sources and the factors influencing dust generation;
b) Dust mitigation measures and procedures including, but not limited to:
    i) Minimising the areas of disturbed ground;
    ii) Watering, with water trucks and fixed sprinklers;
    iii) Avoiding as far as possible, ground disturbance when wind may cause dust nuisance;
    iv) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion;
    v) Ensuring materials being moved are kept in a coarse state;
    vi) Covering materials; and
    vii) Replanting disturbed ground as soon as possible, including temporary planting if necessary.
c) A description of dust monitoring equipment and procedures, including methods of analysis and details of the method used for the calculation of background dust concentration should values from one or all of the background sites be unavailable;
d) Procedures for managing and addressing air quality or odour related complaints; and
e) Key responsibilities, consultation and reporting, including details of the annual review and independent consultant used as required by Conditions 16b and 17 of this consent.

16b. The consent holder shall review the Dust Management Plan annually taking into account the following:

a) The outcomes of reviews completed in accordance with Conditions 10 and 17 of this consent; and

b) Whether management practices are resulting in compliance with the conditions of this consent.

Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan for the Macraes Gold Project site. The consent holder shall provide the Consent Authority with any updates of the Dust Management Plan within one month of any update occurring.

17. An independent consultant, engaged by the Consent Holder in consultation with the Consent Authority, shall undertake an annual review and assessment of all dust monitoring data. The reviewers report shall include:

a) The name, qualifications, and experience of the reviewer.

b) The methods used and the investigations undertaken for the review

c) Interpretation of the monitoring data reviewed

d) An assessment of the quality of the monitoring data

e) An assessment of the monitoring regime

f) A description and evaluation of each of the dust mitigation measures used by the consent holder.

g) Recommendations on whether:

i) The monitoring of dust is adequate or should be changed, and if changed the changes that are recommended.

ii) The dust mitigation measures used by the consent holder are adequate, or should be changed, and the changes that are recommended.

iii) Any changes should be made to the conditions of this consent.

h) Any other matters which the reviewer considers should be drawn to the attention of the consent holder or the Consent Authority

18. Deleted

19. The annual report required by Condition 17 shall be provided to the Consent Authority by 30 April each year.

20. The consent holder shall maintain a record of any complaints received regarding their operation. The register shall include, but not be limited to:

(a) name and location of site where the problem is experienced;
(b) nature of the problem;
(c) date and time problem occurred, and when reported;
(d) action taken by consent holder to remedy the situation and any policies or methods put in place to avoid or mitigate the problem occurring again.

The register of complaints shall be incorporated into the Project Overview and Annual Work and Rehabilitation Plan.

21a. In the event of any non compliance with the conditions of this consent, the consent holder shall notify the Consent Authority within 24 hours of the non compliance being detected. Within five working days the consent holder shall provide written notification to the Consent Authority providing details of the non-compliance. This notification will at a minimum include an explanation of the cause of the non compliance, the steps taken to remedy the situation and steps taken to mitigate any future occurrence of the non compliance.

21b. The consent holder shall pay to the Consent Authority, the costs for monitoring, enforcing and administering this consent as agreed upon between the consent holder and the Consent Authority pursuant to Section 36 of the Resource Management Act 1991.

21c. (a) The consent holder shall provide and maintain in favour of the Consent Authority one or more bonds to secure:

i) The performance and completion of rehabilitation in accordance with the conditions of this consent; and

ii) The carrying out of the monitoring required by the conditions of this consent; and

iii) The remediation of any adverse effect on the environment that may arise from the exercise of this consent.

iv) Compliance with Conditions 21c(m) to 22 of this consent.

(b) Before the first exercise of this consent, the consent holder shall provide to the Consent Authority one or more bonds required by Condition 21c(a).

(c) Subject to the other provisions of this consent, any bond shall be in the form and on the terms and conditions approved by the Consent Authority.

(d) Any bond shall be given or guaranteed by a surety acceptable to the Consent Authority.

(e) The surety shall bind itself to pay for the carrying out and completion of the conditions of consent which are the subject of the bond on default by the consent holder or the occurrence of any adverse environment effect requiring remedy; during or after the expiry of this consent.

(f) The amount of each bond shall be fixed annually by the Consent Authority which will take into account any calculations and other matters submitted by the consent holder relevant to the determination of the amount to be bonded in the Project Overview and Annual Work and Rehabilitation Plan, or otherwise.

(g) The amount of the bond(s) shall include:

i) The estimated costs of complete rehabilitation in accordance with the conditions of consent on the completion of the mining operations proposed for the next year and described in the Project Overview and Annual Work and Rehabilitation Plan.

ii) The estimated costs of:

- Monitoring in accordance with the monitoring conditions of the consent;
- Monitoring for and of any adverse effect of the activity authorised by this consent which may become apparent during or after expiry of this consent;
- Monitoring any rehabilitation required by this consent.

iii) Any further sum which the Consent Authority considers necessary for monitoring and dealing with any adverse effect on the environment that may arise from the exercise of the consent whether during or after the expiry of this consent.

(h) The amount shall be calculated for the duration of this consent and for a period of 20 years after its expiry.
(i) If, on review, the total amount of bond to be provided by the consent holder is greater or less than the sum secured by the current bond(s), the consent holder, surety and the Consent Authority may, in writing, vary the amount of the bond(s).
(j) While the liability of the surety is limited to the amount of the bond(s), the liability of the consent holder is unlimited.
(k) Any bond may be varied, cancelled, or renewed at any time by written agreement between the consent holder, surety and Consent Authority.
(l) The costs (including the costs of the Consent Authority) of providing, maintaining, varying and reviewing any bond shall be paid by the consent holder.
(m) For a period of 20 years from the expiry or surrender of this consent the consent holder shall provide in favour of the Consent Authority one or more bonds.
(n) The amount of the bond to be provided under Condition 21c(m) shall include the amount (if any) considered by the Consent Authority necessary for:

i) Completing rehabilitation in accordance with the conditions of this consent.
ii) Monitoring for and of any adverse effect on the environment that may arise from the exercise of the consent.
iii) Monitoring any measures taken to prevent, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent.
iv) Dealing with any adverse effect on the environment which may become apparent after the surrender or expiry of this consent.
v) Contingencies.

(o) Without limitation, the amount secured by the bond given under Condition 21c(m) may include provision to deal with structural instability or failure, land and water contamination, and the failure of rehabilitation in terms of the rehabilitation objectives and conditions of this consent. Costs shall include costs of investigating, preventing, remedying or mitigating any adverse effect.
(p) The bond(s) required by Condition 21c(m) must be provided on the earlier of:

i) 12 months before the expiry of this consent.
ii) Three months before the surrender of this consent.

(q) Conditions 21c(c), (d), (e), (h), (i), (j) and (k) apply to the bond(s) required by Condition 21c(m).

22. The conditions of this consent may be reviewed by the Consent Authority giving notice in accordance with Section 129 of the Act within 3 months of:

(a) Receiving the Project Overview and Annual Work and Rehabilitation Programme.
(b) Receiving any monitoring information relating to the exercise (including the review reports required by Conditions 10, 16b and 17) of this consent.
(c) Any material change in circumstances (including, but without limitation, change in expansion, or cessation of the mining operations to which this consent relates)

for the purposes of:

(i) Dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.

(ii) Requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment.

(iii) Ensuring the conditions of this consent are appropriate.

23. *Deleted*

Issued at Dunedin this 4th day of March 1998
Reissued at Dunedin on this 10th day of January 2003 with changes to the standard conditions (Additions underlined and italicised, deletions struck out).
Reissued at Dunedin on this 16th day of June 2004, to reflect a name change, and changes to condition 3 (additions underlined and italicised, deletions struck out).
Reissued at Dunedin on this 11th day of October 2005, to reflect changes to the standard conditions (additions underlined and italicised, deletions struck out).
Reissued at Dunedin on this 27th day of October 2005, to reflect changes to condition 3 (additions underlined and italicised, deletions struck out).
Reissued at Dunedin on this 19th day of March 2015, to reflect changes to the address of the consent holder, the purpose of the consent, the consent location, the expiry date, Conditions 2, 4, 7 – 12, 14 – 17 and 19 – 21, Appendix II, the addition of conditions 8a, 16a, 16b, 21a, 21b and 21c, and the deletion of Conditions 13, 18 and 23.

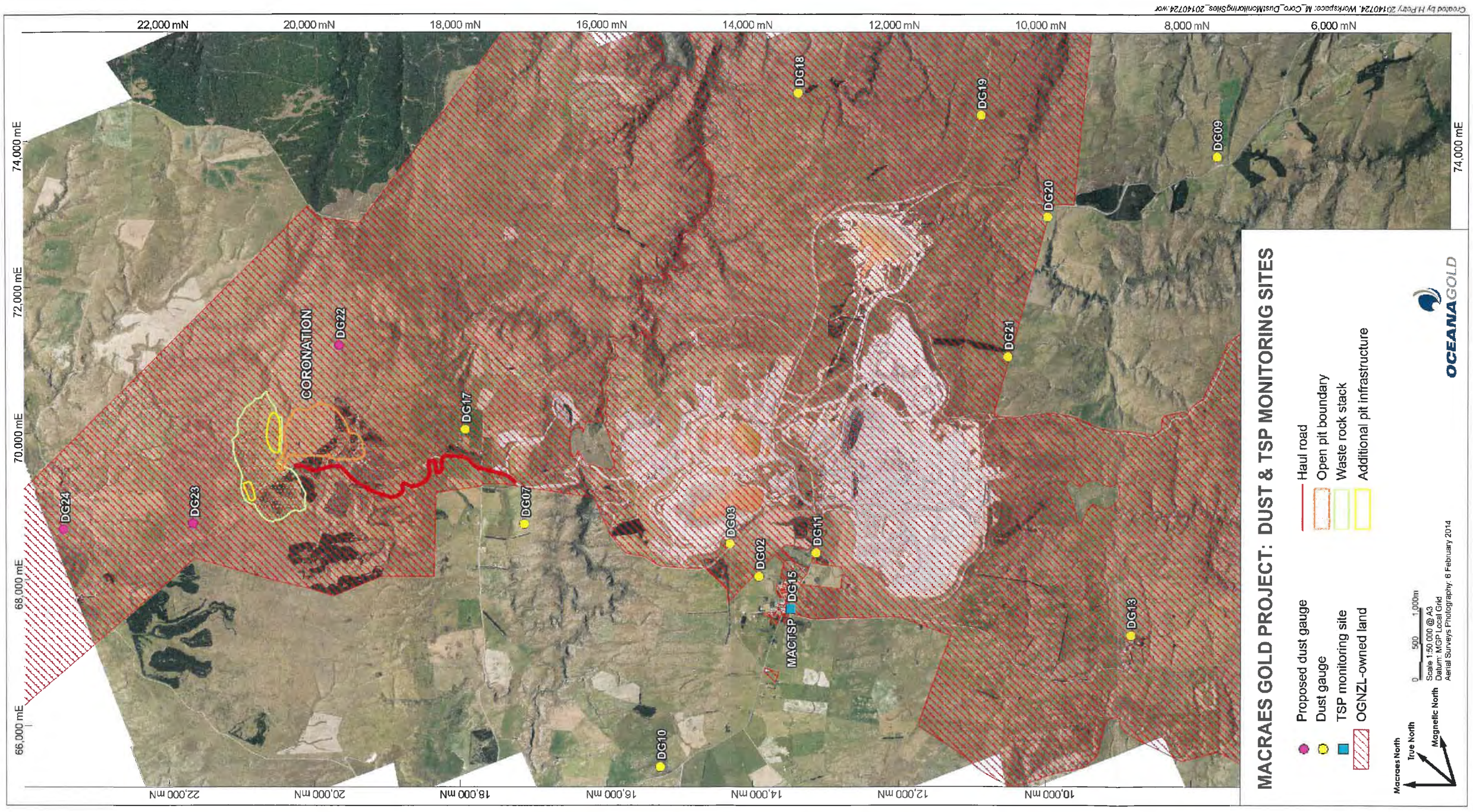
Christopher P Shaw
Manager Consents

ORIGINAL

Otago Regional Council

Appendix I

ORIGINAL



Telarc REGISTERED QUALITY ISO 9001

Appendix II

Our Reference: A384183 Consent No. RM10.351.52

DISCHARGE PERMIT

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Oceana Gold (New Zealand) Limited
Address:

To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations

For a term expiring:	31 August 2032
Location of consent activity:	Macraes Gold Project, Macraes Flat
Legal description of consent activity:	Various
Map Reference:	Within a three kilometre radius of NZTM 2000 E1400484 N4973117

Conditions

Specific

1. This consent shall be exercised in conjunction with Discharge Permit 96785 and Discharge Permit 2006.689.

2. For the purpose of this consent, the "Macraes Gold Project site" is that property owned by the Consent Holder as identified on Appendix I attached.

3. This consent will be exercised substantially in accordance with the Macraes Phase III Assessment of Environmental Effects dated 2 May 2011 and Appendix 31, Beca Infrastructure Ltd, Assessment of Environmental Effects of Air Discharges, 7 April 2011, except to the extent that any condition in this consent is inconsistent with such material. If there is an inconsistency the conditions and terms of this consent prevail.

4. This consent authorises the discharge of contaminants to air from the Macraes Gold Project site, other than where the discharge of contaminants to air in that area is authorised by Discharge Permit 96785 or Discharge Permit 2006.689.

5. There shall be no visible dust beyond the boundary of the Macraes Gold Project site that, in the opinion of an enforcement officer, is offensive or objectionable to such an extent that it has an adverse effect on the environment.

Performance Monitoring

6. Insoluble dust deposition rates at sites DG07, DG20 and DG21, as shown on Appendix I attached, must not exceed 3 grams per square metre per 30 days (g/m^2/30 days) of insoluble dust above background more than twice in any

calendar year. Compliance with this condition shall be demonstrated by the monitoring required in Condition 11 of this consent.

7. Insoluble dust deposition rates at sites DG02 and DG15, as shown on Appendix I attached, must not exceed 3 grams per square metre per 30 days ($g/m^2/30$ days) of insoluble dust above background. Compliance with this condition will be demonstrated by the monitoring required in Condition 11 of this consent.

8. Background concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG17 as shown on Appendix I attached.

9. Twenty-four hour average total suspended particulate at site DG15, as shown on Appendix I attached, must not exceed $120\mu g/m^3$. Compliance with this condition will be demonstrated by the monitoring required in Condition 12 of this consent.

10. In the event of any exceedance of those limits specified in Conditions 6, 7 and 9 of this consent, the Consent Holder must undertake an immediate review of the cause of the exceedance. A report detailing the findings of this review shall be provided to the Consent Authority within 1 month of the non-compliant result(s) being received. If it is shown that activities within the Macraes Gold Project site were the cause of the exceedance, then dust mitigation measures within the Macraes Gold Project shall be reviewed by an independent consultant engaged in consultation with the Consent Authority. The independent consultant shall provide a report summarising the cause of the exceedance and recommending measures to improve dust mitigation at the Macraes Gold Project site so that the exceedance does not occur again. This report shall be provided to the Consent Authority within 2 months of the non-compliant result(s) being received.

11. The consent holder shall monitor dust deposition rates at monthly intervals in accordance with draft ISO Standard ISO/SIS 4222.2 ("Air Quality Measurement of Atmospheric Dustfall – Horizontal Deposit Gauge Method" 1980), or another method approved in writing by the Consent Authority. The monitoring shall be undertaken at the sites shown on Appendix I attached.

12.

(a) The consent holder shall monitor real time total suspended particulate concentrations at site DG15 as shown on Appendix I attached. The monitoring shall be undertaken using a nephelometer, or other instrument as agreed in writing by the Consent Authority. The instrument shall be sited in accordance with AS/NZS 3580.1.1:2007.

(b) The consent holder shall monitor total suspended particulate at monitoring site DG15 as shown on Appendix I in accordance with Australian Standard AS/NZS3580.9.3:2003 (Determination of suspended particulate matter - Total Suspended Particulates [TSP] - High Volume Sampler Gravimetric Method), or another method approved by the Consent Authority. Twenty-four hour measurements must be taken every six days March to October inclusive, and every three days November to February inclusive, for a minimum period of twelve months

or for however long is required to ensure that adequate data is collected to achieve the objectives of Condition 12(d).

(c) Parameters to be recorded shall include, but not be limited to:

i. Hourly average TSP concentrations as measured by the instrument installed in accordance with Condition 12(a) of this consent;

ii. 24-hour average TSP concentrations as measured by the instruments installed in accordance with Conditions 12(a) and 12(b).

(d) The instruments installed in accordance with Conditions 12(a) and 12(b) shall be operated concurrently for a period of no less then twelve months to ensure that twelve months of coincident data is collected. A correlation between the data shall be established by an independent consultant engaged in consultation with the Consent Authority. A report detailing this investigation shall be provided to the Consent Authority within two months of the data being collected.

13.

(a) Meteorological conditions shall be continuously monitored and recorded at site DG03 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall. Sufficient information shall also be measured to allow an estimate of atmospheric stability. These estimates shall be obtained from measurements of solar radiation and temperature at two heights above ground level, or other parameters as approved by the Consent Authority.

(b) Meteorological conditions shall be continuously monitored and recorded at site DG15 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall.

14. The consent holder shall keep a daily record of water used for dust suppression. These records shall be made available to the Consent Authority on request.

15. Results of all monitoring undertaken in accordance with this consent shall be reported to the Consent Authority on a quarterly basis. The format of the report shall be agreed upon in consultation with the Consent Authority.

16. Prior to the exercise of this consent, the consent holder shall submit a Dust Management Plan to the Consent Authority. The Dust Management Plan shall include, but not be limited to, the following:

(a) A description of potential dust sources and the factors influencing dust generation;

(b) Dust mitigation measures and procedures including, but not limited to:

i) Minimising the areas of disturbed ground;

ii) Watering, with water trucks and fixed sprinklers;

iii) Avoiding as far as possible, ground disturbance when wind may cause dust nuisance;

iv) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion;

v) Ensuring materials being moved are kept in a coarse state;

vi) Covering materials; and

vii) Replanting disturbed ground as soon as possible, including temporary planting if necessary.

(c) A description of dust monitoring equipment and procedures, including methods of analysis and details of the method used for the calculation of background dust concentration should values from one or all of the background sites be unavailable;

(d) Procedures for managing and addressing air quality or odour related complaints; and

(e) Key responsibilities, consultation and reporting, including details of the annual review and independent consultant used as required by Condition 18 of this consent.

17. The consent holder shall review the Dust Management Plan annually taking into account the following:

(a) The outcomes of reviews completed in accordance with Condition 10 and 18 of this consent; and

(b) Whether management practices are resulting in compliance with the conditions of this consent.

Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan for the Macraes Gold Project site. The consent holder shall provide the Consent Authority with any updates of the Dust Management Plan within one month of any update occurring.

18. An independent consultant, engaged by the Consent Holder in consultation with the Consent Authority, shall undertake an annual review and assessment of all dust monitoring data. The reviewer's report shall include:

(a) The name, qualifications, and experience of the reviewer;

(b) The methods used and the investigations undertaken for the review;

(c) Interpretation of the monitoring data reviewed;

(d) An assessment of the quality of the monitoring data;

(e) An assessment of the monitoring regime;

(f) A description and evaluation of each of the dust mitigation measures used by the consent holder;

(g) Recommendations on whether:

i) The monitoring of dust is adequate or should be changed, and if changed the changes that are recommended;

ii) The dust mitigation measures used by the consent holder are adequate, or should be changed, and the changes that are recommended; and

iii) Any changes should be made to the conditions of this consent; and

(h) Any other matters that the reviewer considers should be drawn to the attention of the consent holder or the Consent Authority.

19. The annual report required by Condition 18 shall be provided to the Consent Authority by 30 April each year.

20. In the event of any non compliance with the conditions of this consent, the consent holder shall notify the Consent Authority within 24 hours of the non

compliance being detected. Within five working days the consent holder shall provide written notification to the Consent Authority providing details of the non-compliance. This notification will at a minimum include an explanation of the cause of the non compliance, the steps taken to remedy the situation and steps taken to mitigate any future occurrence of the non compliance.

21. The consent holder shall pay to the Consent Authority, the costs for monitoring, enforcing and administering this consent as agreed upon between the consent holder and the Consent Authority pursuant to Section 36 of the Resource Management Act 1991.

22. The consent holder shall maintain a record of any complaints received regarding their operation. The register shall include, but not be limited to:
(a) name and location of site where the problem is experienced;
(b) nature of the problem;
(c) date and time problem occurred, and when reported;
(d) action taken by consent holder to remedy the situation and any policies or methods put in place to avoid or mitigate the problem occurring again.

The register of complaints shall be incorporated into the Project Overview and Annual Work and Rehabilitation Plan.

General

23. The Consent Authority may, within 6 months of receipt of the Cultural Impact Assessment prepared by Kai Tahu ki Otago on behalf of Te Runanga o Moeraki and Kāti Huirapa Rūnaka ki Puketeraki, commissioned in 2011, serve notice of its intention to review the conditions of this consent for the purpose of amending or adding conditions to address mitigation of the effect(s) of the exercise of this consent on cultural values and associations. All costs associated with any such review shall be borne by the consent holder.

24. (a) The consent holder shall provide and maintain in favour of the Consent Authority one or more bonds to secure:
    i) The performance and completion of rehabilitation in accordance with the conditions of this consent; and
    ii) The carrying out of the monitoring required by the conditions of this consent; and
    iii) The remediation of any adverse effect on the environment that may arise from the exercise of this consent.
    iv) Compliance with Conditions 24(m) to 24(q) of this consent.

(b) Before the first exercise of this consent, the consent holder shall provide to the Consent Authority one or more bonds required by Condition 24(a).
(c) Subject to the other provisions of this consent, any bond shall be in the form and on the terms and conditions approved by the Consent Authority.
(d) Any bond shall be given or guaranteed by a surety acceptable to the Consent Authority.
(e) The surety shall bind itself to pay for the carrying out and completion of the conditions of consent which are the subject of the bond on default by the consent holder or the occurrence of any adverse environment effect requiring remedy; during or after the expiry of this consent.

(f) The amount of each bond shall be fixed annually by the Consent Authority which will take into account any calculations and other matters submitted by the consent holder relevant to the determination of the amount to be bonded in the Project Overview and Annual Work and Rehabilitation Plan, or otherwise.
(g) The amount of the bond(s) shall include:

i) The estimated costs of complete rehabilitation in accordance with the conditions of consent on the completion of the mining operations proposed for the next year and described in the Project Overview and Annual Work and Rehabilitation Plan.
ii) The estimated costs of:
- Monitoring in accordance with the monitoring conditions of the consent;
- Monitoring for and of any adverse effect of the activity authorised by this consent which may become apparent during or after expiry of this consent;
- Monitoring any rehabilitation required by this consent.
iii) Any further sum which the Consent Authority considers necessary for monitoring and dealing with any adverse effect on the environment that may arise from the exercise of the consent whether during or after the expiry of this consent.

(h) The amount shall be calculated for the duration of this consent and for a period of 20 years after its expiry.
(i) If, on review, the total amount of bond to be provided by the consent holder is greater or less than the sum secured by the current bond(s), the consent holder, surety and the Consent Authority may, in writing, vary the amount of the bond(s).
(j) While the liability of the surety is limited to the amount of the bond(s), the liability of the consent holder is unlimited.
(k) Any bond may be varied, cancelled, or renewed at any time by written agreement between the consent holder, surety and Consent Authority.
(l) The costs (including the costs of the Consent Authority) of providing, maintaining, varying and reviewing any bond shall be paid by the consent holder.
(m) For a period of 20 years from the expiry or surrender of this consent the consent holder shall provide in favour of the Consent Authority one or more bonds.
(n) The amount of the bond to be provided under Condition 24(m) shall include the amount (if any) considered by the Consent Authority necessary for:

i) Completing rehabilitation in accordance with the conditions of this consent.
ii) Monitoring for and of any adverse effect on the environment that may arise from the exercise of the consent.
iii) Monitoring any measures taken to prevent, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent.
iv) Dealing with any adverse effect on the environment which may become apparent after the surrender or expiry of this consent.
v) Contingencies.

(o) Without limitation, the amount secured by the bond given under Condition 24(m) may include provision to deal with structural instability or failure, land

and water contamination, and the failure of rehabilitation in terms of the rehabilitation objectives and conditions of this consent. Costs shall include costs of investigating, preventing, remedying or mitigating any adverse effect.

(p) The bond(s) required by Condition 24(m) must be provided on the earlier of:

i) 12 months before the expiry of this consent.

ii) Three months before the surrender of this consent.

(q) Conditions 24(c), (d), (e), (h), (i), (j) and (k) apply to the bond(s) required by Condition 24(m).

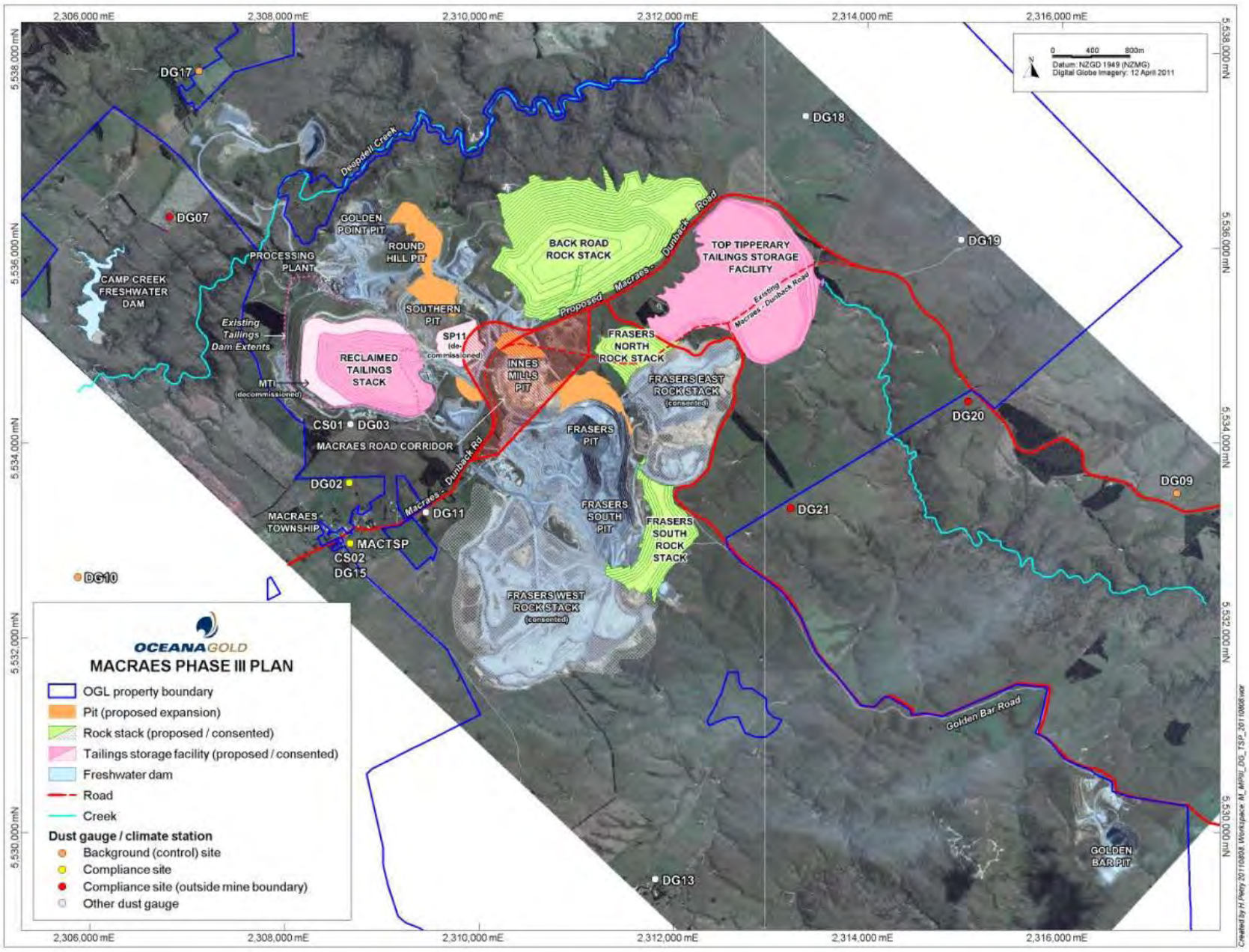
25. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, for the purpose of:

(a) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent; or

(b) ensuring the conditions of this consent are consistent with any National Environmental Standards; or

(c) requiring the consent holder to adopt the best practicable option, in order to remove or reduce any adverse effect on the environment arising as a result of the exercise of this consent.

Appendix I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Datum: NZGD 1949 (NZMG)
Digital Globe Imagery: 12 April 2011
DG17
DG18
DG19
DG20
DG21
DG09
DG07
DG10
DG11
DG02
DG03
CS01
DG15
CS02
MACTSP
DG13
Deggdell Creek
GOLDEN POINT PIT
ROUND HILL PIT
PROCESSING PLANT
CAMP CREEK FRESHWATER DAM
Existing Tailings Dam Extents
SOUTHERN PIT
SP11 (de-commissioned)
RECLAIMED TAILINGS STACK
MTI (decommissioned)
INNES MILLS PIT
BACK ROAD ROCK STACK
Proposed Macraes - Dunback Road
TOP TIPPERARY TAILINGS STORAGE FACILITY
Existing Macraes - Dunback Road
FRASERS NORTH ROCK STACK
FRASERS EAST ROCK STACK (consented)
FRASERS PIT
FRASERS SOUTH PIT
FRASERS SOUTH ROCK STACK
FRASERS WEST ROCK STACK (consented)
MACRAES ROAD CORRIDOR
Macraes - Dunback Rd
MACRAES TOWNSHIP
Golden Bar Road
GOLDEN BAR PIT
OCEANAGOLD
MACRAES PHASE III PLAN
OGL property boundary
Pit (proposed expansion)
Rock stack (proposed / consented)
Tailings storage facility (proposed / consented)
Freshwater dam
Road
Creek
Dust gauge / climate station
Background (control) site
Compliance site
Compliance site (outside mine boundary)
Other dust gauge
Created by H Petty 20110908, Workspace: M_MPIII_DG_TSP_20110908.wor

Our Reference: A571409 Consent No. RM12.378.15

DISCHARGE PERMIT

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name:	Oceana Gold (New Zealand) Limited
Address:	Level 3, Taunton Mews, 22 Maclaggan Street, Dunedin

To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations

For a term expiring:	31 August 2032
Location of consent activity:	Macraes Gold Project, approximately 6.5 kilometres to the northwest of the intersection of Macraes Road and Red Bank Road, Macraes Flat.
Legal description of consent activity:	Pt Section 2 Blk V Highlay SD, Pt Section 2 Blk VII Highlay SD, Section 2 Blk VII Highlay SD, Pt Secs 11 and 12 Blk VII Highlay SD, Road Reserve
Map Reference:	Within a 1 kilometre radius of NZTM2000 1395770 E 4977492 N

Conditions

Specific

1. This consent shall be exercised in conjunction with Discharge Permit 96785, Discharge Permit 2006.689, Discharge Permit RM10.351.52 and any subsequent variations to these permits.

2. This consent authorises the discharge of contaminants to air from the Coronation Waste Rock Stack, Coronation Pit and associated haul roads, as shown on Appendix I attached.

3. There shall be no visible dust beyond the boundary of the Macraes Gold Project site that, in the opinion of an enforcement officer, is offensive or objectionable to such an extent that it has an adverse effect on the environment, including the human environment.

Performance Monitoring

4. Insoluble dust deposition rates at sites DG07, DG20, DG21, DG22 and DG23, as shown on Appendix I and Appendix II attached, must not exceed 3 grams per square metre per 30 days (g/m^2/30 days) of insoluble dust above background more than twice in any calendar year. Compliance with this condition shall be demonstrated by the monitoring required in Condition 9 of this consent.

5. Insoluble dust deposition rates at sites DG02 and DG15, as shown on Appendix I and Appendix II attached, must not exceed 3 grams per square metre per 30 days (g/m^2/30 days) of insoluble dust above background. Compliance with this condition will be demonstrated by the monitoring required in Condition 9 of this consent.

6. Background concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG24 as shown on Appendix I and Appendix II attached.

7. Twenty-four hour average total suspended particulate at site DG15, as shown on Appendix I attached, must not exceed $120\mu g/m^3$. Compliance with this condition will be demonstrated by the monitoring required in Condition 10 of this consent.

8. In the event of any exceedance of those limits specified in Conditions 4, 5 and 7 of this consent, the Consent Holder must undertake an immediate review of the cause of the exceedance. A report detailing the findings of this review shall be provided to the Consent Authority within 1 month of the non-compliant result(s) being received. If it is shown that activities within the Macraes Gold Project site were the cause of the exceedance, then dust mitigation measures within the Macraes Gold Project shall be reviewed by an independent consultant engaged in consultation with the Consent Authority. The independent consultant shall provide a report summarising the cause of the exceedance and recommending measures to improve dust mitigation at the Macraes Gold Project site so that the exceedance does not occur again. This report shall be provided to the Consent Authority within 2 months of the non-compliant result(s) being received.

9. The consent holder shall monitor dust deposition rates at monthly intervals in accordance with draft ISO Standard ISO/DIS 4222.2 ("Air Quality Measurement of Atmospheric Dustfall – Horizontal Deposit Gauge Method" 1980), or another method approved in writing by the Consent Authority. The monitoring shall be undertaken at the sites shown on Appendix I and Appendix II attached.

10.

(a) The consent holder shall monitor real time total suspended particulate concentrations at site DG15 as shown on Appendix I attached. The monitoring shall be undertaken using a nephelometer, or other instrument as agreed in writing by the Consent Authority. The instrument shall be sited in accordance with AS/NZS 3580.1.1:2007 (Methods for Sampling and Analysis of Ambient Air – Guide to Siting Air Monitoring Equipment).

(b) The consent holder shall monitor total suspended particulate at monitoring site DG15 as shown on Appendix I in accordance with Australian Standard AS/NZS3580.9.3:2003 (Determination of suspended particulate matter - Total Suspended Particulates [TSP] - High Volume Sampler Gravimetric Method), or another method approved by the Consent Authority. Twenty-four hour measurements must be taken every six days March to October inclusive, and every three days November to February inclusive, for a minimum period of twelve months

or for however long is required to ensure that adequate data is collected to achieve the objectives of Condition 10(d).

(c) Parameters to be recorded shall include, but not be limited to:
   i) Hourly average TSP concentrations as measured by the instrument installed in accordance with Condition 10(a) of this consent;
   ii) 24-hour average TSP concentrations as measured by the instruments installed in accordance with Conditions 10(a) and 10(b).

(d) The instruments installed in accordance with Conditions 10(a) and 10(b) shall be operated concurrently for a period of no less then twelve months to ensure that twelve months of coincident data is collected. A correlation between the data shall be established by an independent consultant engaged in consultation with the Consent Authority. A report detailing this investigation shall be provided to the Consent Authority within two months of the data being collected.

11.

(a) Meteorological conditions shall be continuously monitored and recorded at site DG03 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall. Sufficient information shall also be measured to allow an estimate of atmospheric stability. These estimates shall be obtained from measurements of solar radiation and temperature at two heights above ground level, or other parameters as approved by the Consent Authority.

(b) Meteorological conditions shall be continuously monitored and recorded at site DG15 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall.

12. The consent holder shall keep a daily record of water used for dust suppression. These records shall be made available to the Consent Authority on request.

13. Results of all monitoring undertaken in accordance with this consent shall be reported to the Consent Authority on a quarterly basis. The format of the report shall be agreed upon in consultation with the Consent Authority.

14. Prior to the exercise of this consent, the consent holder shall submit a Dust Management Plan to the Consent Authority. The Dust Management Plan shall include, but not be limited to, the following:

(a) A description of potential dust sources and the factors influencing dust generation;

(b) Dust mitigation measures and procedures including, but not limited to:
   i) Minimising the areas of disturbed ground;
   ii) Watering, with water trucks and fixed sprinklers;
   iii) Avoiding as far as possible, ground disturbance when wind may cause dust nuisance;
   iv) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion;

v) Ensuring materials being moved are kept in a coarse state;
vi) Covering materials; and
vii) Replanting disturbed ground as soon as possible, including temporary planting if necessary.

(c) A description of dust monitoring equipment and procedures, including methods of analysis and details of the method used for the calculation of background dust concentration should values from one or all of the background sites be unavailable;

(d) Procedures for managing and addressing air quality or odour related complaints; and

(e) Key responsibilities, consultation and reporting, including details of the annual review and independent consultant used as required by Condition 18 of this consent.

15. The consent holder shall review the Dust Management Plan annually taking into account the following:

(a) The outcomes of reviews completed in accordance with Conditions 8 and 16 of this consent; and

(b) Whether management practices are resulting in compliance with the conditions of this consent.

Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan for the Macraes Gold Project site. The consent holder shall provide the Consent Authority with any updates of the Dust Management Plan within one month of any update occurring.

16. An independent consultant, engaged by the Consent Holder in consultation with the Consent Authority, shall undertake an annual review and assessment of all dust monitoring data. The reviewer's report shall include:

(a) The name, qualifications, and experience of the reviewer;

(b) The methods used and the investigations undertaken for the review;

(c) Interpretation of the monitoring data reviewed;

(d) An assessment of the quality of the monitoring data;

(e) An assessment of the monitoring regime;

(f) A description and evaluation of each of the dust mitigation measures used by the consent holder;

(g) Recommendations on whether:

i) The monitoring of dust is adequate or should be changed, and if changed the changes that are recommended;

ii) The dust mitigation measures used by the consent holder are adequate, or should be changed, and the changes that are recommended; and

iii) Any changes should be made to the conditions of this consent; and

(h) Any other matters that the reviewer considers should be drawn to the attention of the consent holder or the Consent Authority.

17. The annual report required by Condition 16 shall be provided to the Consent Authority by 30 April each year.

18. In the event of any non compliance with the conditions of this consent, the consent holder shall notify the Consent Authority within 24 hours of the non compliance being detected. Within five working days the consent holder shall provide written notification to the Consent Authority providing details of the non-compliance. This notification will at a minimum include an explanation of the cause of the non compliance, the steps taken to remedy the situation and steps taken to mitigate any future occurrence of the non compliance.

19. The consent holder shall maintain a record of any complaints received regarding their operation. The register shall include, but not be limited to:
(a) name and location of site where the problem is experienced;
(b) nature of the problem;
(c) date and time problem occurred, and when reported;
(d) action taken by consent holder to remedy the situation and any policies or methods put in place to avoid or mitigate the problem occurring again.

The register of complaints shall be incorporated into the Project Overview and Annual Work and Rehabilitation Plan.

General

20. The Consent Authority may, within 6 months of receipt of the Coronation Project Addendum to the MPIII Cultural Impact Assessment prepared by Kai Tahu ki Otago on behalf of Te Runanga o Moeraki, Te Runanga o Otakou and Kati Huirapa Runaka ki Puketeraki, commissioned in 2013, serve notice of its intention to review the conditions of this consent for the purpose of amending or adding conditions to address mitigation of the effect(s) of the exercise of this consent on cultural values and associations. All costs associated with such review shall be borne by the consent holder

21. (a) The consent holder shall provide and maintain in favour of the Consent Authority one or more bonds to secure:
    i) The performance and completion of rehabilitation in accordance with the conditions of this consent; and
    ii) The carrying out of the monitoring required by the conditions of this consent; and
    iii) The remediation of any adverse effect on the environment that may arise from the exercise of this consent.
    iv) Compliance with Conditions 21(m) to 21(q) of this consent.

(b) Before the first exercise of this consent, the consent holder shall provide to the Consent Authority one or more bonds required by Condition 21(a).
(c) Subject to the other provisions of this consent, any bond shall be in the form and on the terms and conditions approved by the Consent Authority.
(d) Any bond shall be given or guaranteed by a surety acceptable to the Consent Authority.
(e) The surety shall bind itself to pay for the carrying out and completion of the conditions of consent which are the subject of the bond on default by the consent holder or the occurrence of any adverse environment effect requiring remedy; during or after the expiry of this consent.
(f) The amount of each bond shall be fixed annually by the Consent Authority which will take into account any calculations and other matters submitted by the

consent holder relevant to the determination of the amount to be bonded in the Project Overview and Annual Work and Rehabilitation Plan, or otherwise.

(g) The amount of the bond(s) shall include:

i) The estimated costs of complete rehabilitation in accordance with the conditions of consent on the completion of the mining operations proposed for the next year and described in the Project Overview and Annual Work and Rehabilitation Plan.

ii) The estimated costs of:

- Monitoring in accordance with the monitoring conditions of the consent;
- Monitoring for and of any adverse effect of the activity authorised by this consent which may become apparent during or after expiry of this consent;
- Monitoring any rehabilitation required by this consent.

iii) Any further sum which the Consent Authority considers necessary for monitoring and dealing with any adverse effect on the environment that may arise from the exercise of the consent whether during or after the expiry of this consent.

(h) The amount shall be calculated for the duration of this consent and for a period of 20 years after its expiry.

(i) If, on review, the total amount of bond to be provided by the consent holder is greater or less than the sum secured by the current bond(s), the consent holder, surety and the Consent Authority may, in writing, vary the amount of the bond(s).

(j) While the liability of the surety is limited to the amount of the bond(s), the liability of the consent holder is unlimited.

(k) Any bond may be varied, cancelled, or renewed at any time by written agreement between the consent holder, surety and Consent Authority.

(l) The costs (including the costs of the Consent Authority) of providing, maintaining, varying and reviewing any bond shall be paid by the consent holder.

(m) For a period of 20 years from the expiry or surrender of this consent the consent holder shall provide in favour of the Consent Authority one or more bonds.

(n) The amount of the bond to be provided under Condition 21(m) shall include the amount (if any) considered by the Consent Authority necessary for:

i) Completing rehabilitation in accordance with the conditions of this consent.

ii) Monitoring for and of any adverse effect on the environment that may arise from the exercise of the consent.

iii) Monitoring any measures taken to prevent, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent.

iv) Dealing with any adverse effect on the environment which may become apparent after the surrender or expiry of this consent.

v) Contingencies.

(o) Without limitation, the amount secured by the bond given under Condition 21(m) may include provision to deal with structural instability or failure, land and water contamination, and the failure of rehabilitation in terms of the

rehabilitation objectives and conditions of this consent. Costs shall include costs of investigating, preventing, remedying or mitigating any adverse effect.

(p) The bond(s) required by Condition 21(m) must be provided on the earlier of:

i) 12 months before the expiry of this consent.

ii) Three months before the surrender of this consent.

(q) Conditions 21(c), (d), (e), (h), (i), (j) and (k) apply to the bond(s) required by Condition 21(m).

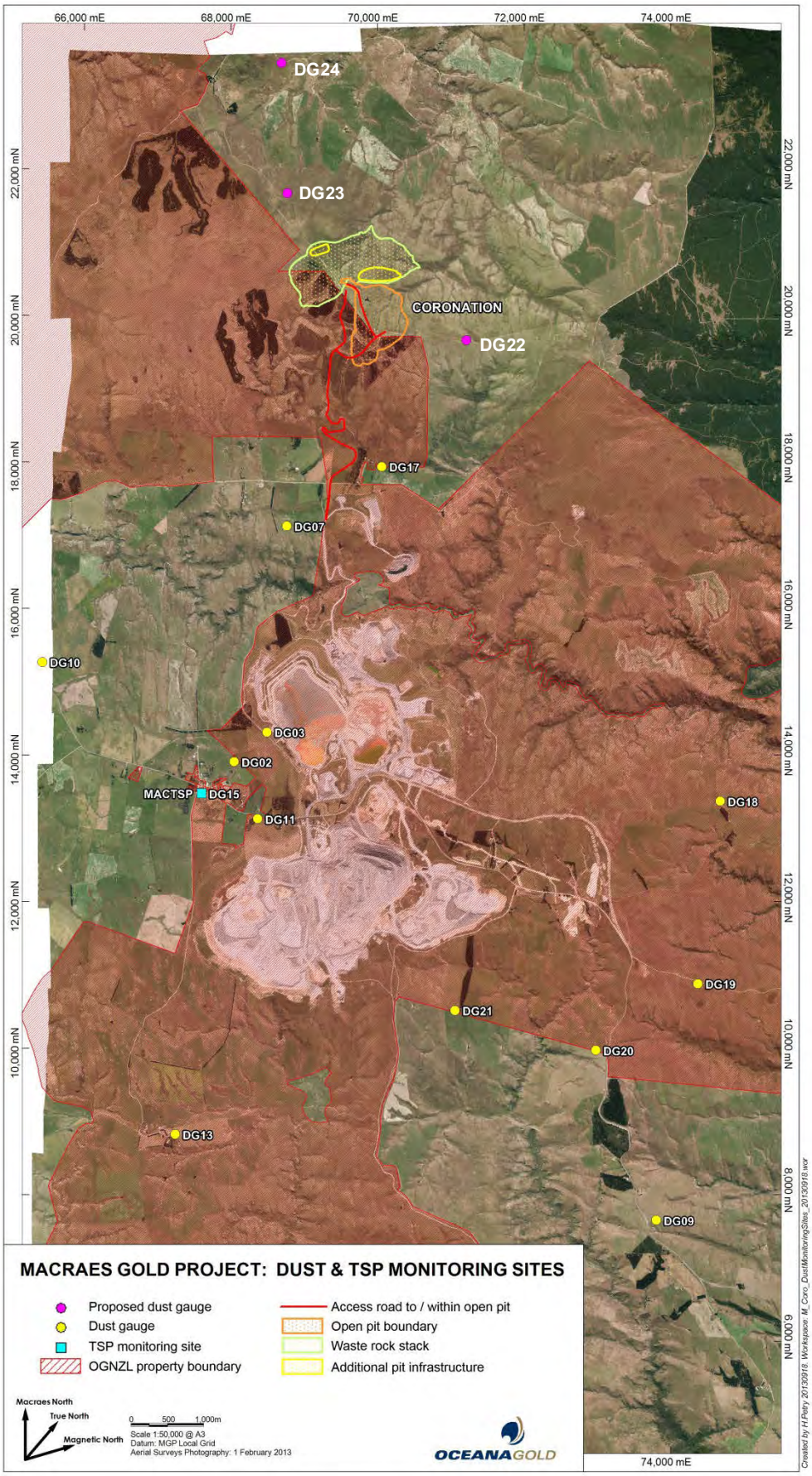
22. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, for the purpose of:

(a) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent; or

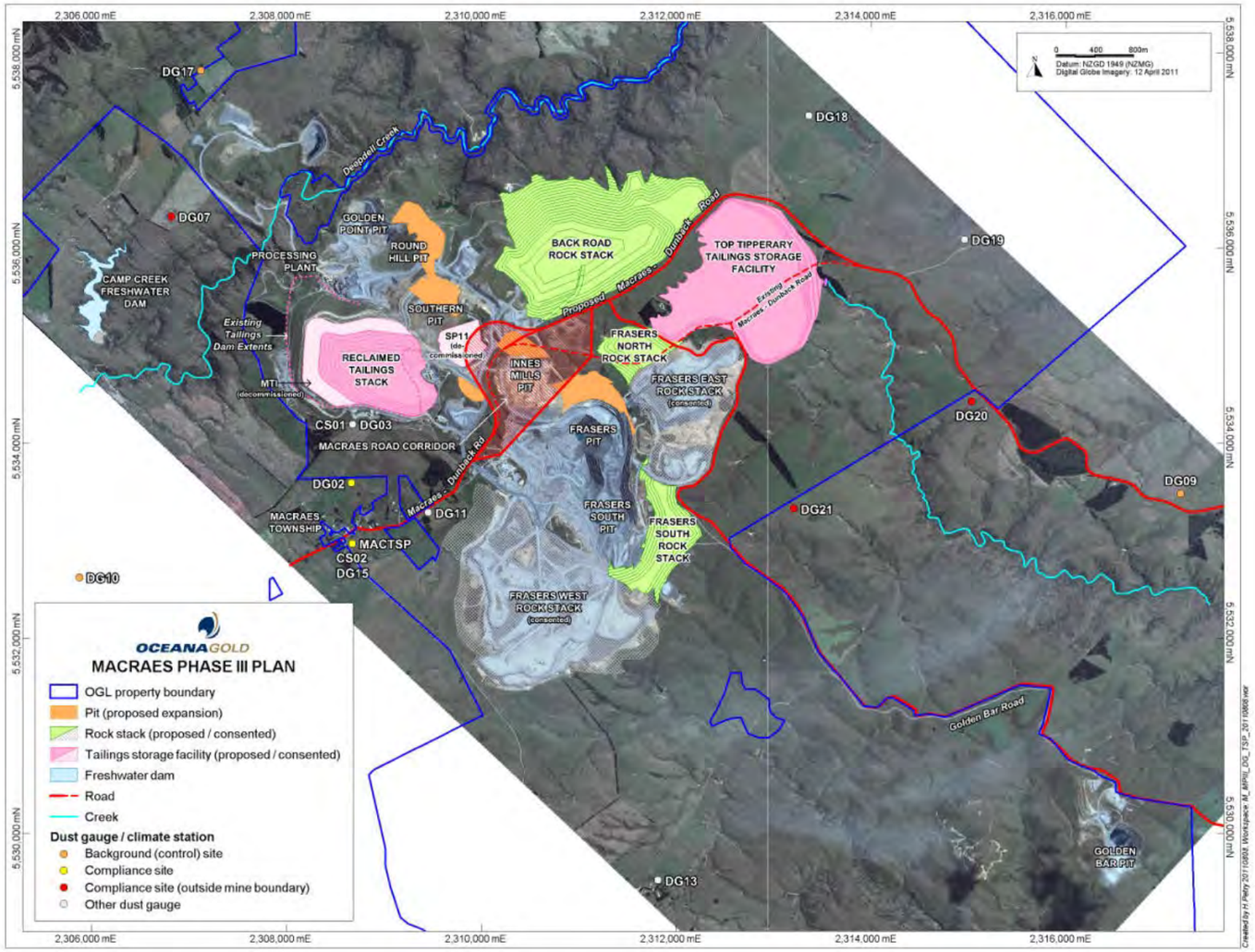
(b) ensuring the conditions of this consent are consistent with any National Environmental Standards; or

(c) requiring the consent holder to adopt the best practicable option, in order to remove or reduce any adverse effect on the environment arising as a result of the exercise of this consent.

Appendix I
RM12.378.15



Appendix II
RM12.378.15



Otago Regional Council

ORIGINAL

Consent No. 2006.689

DISCHARGE PERMIT

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: Oceana Gold (New Zealand) Limited

Address: Simpson Grierson, Barristers & Solicitors, Level 24, HSBC Tower, 195 Lambton Quay, Wellington

To discharge contaminants to air

for the purpose of ventilating Frasers Underground Mine

for a term expiring on 31 August 2032 or on completion of the rehabilitation of the underground mine, whichever occurs earlier

Location of activity: Frasers Underground Mine, immediately east of Frasers Pit, and approximately 2.6 kilometres northeast of the Macraes Flat township, Macraes Flat, East Otago.

Legal description of land: Sec 27 Blk II Highlay Survey District

Map grid reference: NZMS 260 I42:114-334

Conditions

1. This consent shall be exercised in accordance with the application for resource consent dated 2 October 2006, including the Assessment of Environmental Effects and all supporting documents.

2. There shall be no discharge of contaminants resulting from the consent holder's activities that, in the opinion of an enforcement officer of the Consent Authority, is offensive or objectionable at or beyond the boundary of the consent holder's premises.

3. The Consent Authority may, in accordance with sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent for the purpose of:
   (a) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent; or

(b) ensuring the conditions of this consent are consistent with any National Environmental Standards; or

(c) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this consent.

Issued at Dunedin this 14th day of February 2007

Christopher P Shaw
Manager Consents
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Appendix B

Southern Pit 11 Tailings Impoundment, Mixed Tailings Impoundment and Top Tipperary Tailings Storage Facility Dust Control Manual

Tailings Storage Facilities

Dust Control Manual

July 2015

Table of Contents

1 INTRODUCTION

The Macraes operation currently has three tailings storage facilities. Two of these, the Southern Pit Tailings Impoundment option 11A and the Mixed Tailings Impoundment, are currently in a resting state. There is currently no tailings discharge to these embankments however both have not yet been decommissioned and so have the potential to receive more tailings material. All tailings material is currently being deposited into the Top Tipperary Tailings Storage Facility which is located to the east of the Frasers Pit.

This manual details dust control methods that are used to control and minimise the transmission of dust particles around and away from the tailings facilities.

The design of all three tailings storage facilities has been carried out by Engineering Geology Ltd (EGL) and a description of the embankment design and operation is contained in the Design Report for each impoundment. Reference should be made to these as required.

Details of the operation, maintenance and surveillance of the tailings storage facilities can be found in the respective Operation, Maintenance and Surveillance Manuals.

2 RESPONSIBILITIES

Oceana Gold (NZ) Ltd (OceanaGold), as owners of the tailings storage impoundments are ultimately responsible for the control of dust.

Supervision and monitoring of the quality of construction is undertaken by OceanaGold as is regular monitoring, maintenance and surveillance as detailed in the respective Manuals.

The installation and maintenance of dust control systems is the responsibility of the Projects and Civil Works departments.

The operation of dust control systems and the tailings distribution system is the responsibility of the Process Supervisor. A Daily Decision Tree (attached) is available to assist with operation of dust control systems.

Whilst the above listed departments are responsible for the control of dust, it is the responsibility of all staff to ensure that the systems in place are adequate and being operated correctly and when required. The impoundments are inspected periodically throughout the day however conditions may change between inspections. Any reports of excess dust should be alerted to the Environmental, Projects or Processing departments.

3 ENVIRONMENTAL CONDITIONS

During spring, the Macraes District is frequently subjected to strong drying winds. Wind gusts in excess of 100km/hr are not uncommon and the winds can continue for several days without ceasing. The worst of the winds are often experienced between August and October although strong winds at other times are not uncommon.

Dust generation does not however only occur during periods of strong wind. Particles begin to be mobilised at wind speeds of 5m/s. This means that lower winds also have an effect on the tailings surface and can move large amounts of dust. As the wind speed increases, the mobilised particles start to dislodge other particles and this can result in large movements of particles or dust. Also the finer the particles are, the more prone to movement they are.

When conditions have been dry and windy for extended periods of time, the surface of the embankments becomes dry which leads the particles to become more easily entrained by the wind. The water on the surface of the tailings binds the surface and increases the cohesion between particles making them harder to move. Whilst wind speed cannot be controlled, the moisture of the tailings surface can and so this can determine the dust suppression technique used to control dust as seen in the below section.

To assist with predicting times of high wind and limited rain, a weather forecasting service is provided at www.metconnect.co.nz, Login: Oceana, Password: auweather.

4 METHODS OF DUST CONTROL

4.1 Tailings Discharge

During and immediately following periods of active tailings discharge the tailings beach surface remains sufficiently damp that the potential for windborne dust generation is very low.

Tailings deposition is sequentially moved around the impoundment to decrease the chance that the tailings surface could dry out and become prove to dust creation. Tailings deposition is manually redirected around the impoundment through the use of knife gate valves to direct the tailings to a general area while spigots are used to control localised tailings deposition. This method of deposition also helps to keep the tailings surface level which limits localised drying conditions.

Tailings discharge to the Top Tipperary Tailings Storage Facility commenced in October 2013. Both the Southern Pit 11 Tailings Impoundment and Mixed Tailings Impoundment are therefore currently not in use and tailings discharge will only occur into these impoundments at times of maintenance to the Top Tipperary tailings discharge system. Dust control requirements on the Top Tipperary Tailings Storage Facility will therefore be minimal as tailings will be continuously discharged to this facility and the beach is unlikely to dry sufficiently to generate dust.

4.2 Rock Mattress Cover

Experience has shown that the area of the tailings surface with the most potential for dust generation is the tailings beach adjacent to the embankment crest.

As construction of both the Southern Pit 11 and Mixed Tailings Impoundments has been completed, capping of the outer regions of the surface has commenced. This involves placing a rock mattress over the tailings surface of the impoundment. This rock mattress can consist of topsoil, grey rock or brown rock. The rock mattress will gradually extend across the entirety of the impoundment and will be covered in topsoil and vegetation. The purpose of the mattress is to prevent tailings surface exposure which removes the chance that it could be mobilised.

For details of the rock mattress and capping refer to the design documents and closure plan for each impoundment.

4.3 Dust Suppression System

A dust suppression system will be established following each stage of rockfill mattress construction to enable the distribution of water onto the inner surface not covered by the rock mattress. This system needs to be operational from August to March each year however it is prudent to continue to have this system in place at all times.

The dust suppression system generally consists of an outer ring main feeding soak hoses or sprinklers laid out over the tailings surface, however various combinations of open ended pipe discharge can be utilised as necessary to ensure good coverage and wetting.

The dust suppression system should be installed as soon as possible to prevent the risk of the tailings surface drying out. Whilst the strongest drying winds are during August to October, dust can be generated throughout the year.

Preservation of the crust on the dam surface is to be maximised by limiting traffic on the tailings surface wherever possible.

4.4 Existing covers

A layer of topsoil approximately 100mm to 200mm thick has been placed on the dry outer perimeter of the Southern Pit 11 impoundment. In total, approximately 15.5 ha has been topsoiled and vegetated.

A layer of brown rock has been placed over a portion of the outer western side of the Mixed Tailings Impoundment. This needs further contouring and sowing but in the interim provides dust generation protection of an important area of the tailings surface.

5 OPERATION

The tailings distribution system is operated by the Processing Superintendent and follows plans implemented by the Senior Mine Engineer and EGL.

A site specific model that predicts hourly wind speed, direction and rainfall (provided by the MetService) is used to assist in the prediction of wind events (note – if heavy rain or rainfall warnings are indicated for Fiordland and the West Coast this will often indicate strong winds on the East Coast). It is the responsibility of the Processing Superintendent to initiate action in accordance with the Model predictions.

The tailings or dust suppression system is to be used 12 hours prior to any anticipated high wind event (defined as an event of greater than 40km/hr winds for greater than 4 hours from a west or northwest direction).

Should wind speeds increase without warning then the system will be activated as required by process operations personnel and the Processing Superintendent will be notified.

6 TRIAL DUST SUPRESSION TECHNIQUES

6.1 Vital Bon-Matt Stonewall

Stonewall is a co-polymer that is applied to the surface of the tailings. The product is diluted in water and then applied through a spray by any method. This could be from a water cart or a knapsack sprayer. The product creates a hard surface that is similar to that which would be seen if glue was applied to the surface. The tailings surface then becomes encapsulated underneath the Stonewall surface. This limits the dust generation by removing the potential for wind to erode the surface. This system will be trialled on the Mixed Tailings Impoundment during the summer of 2015.

6.2 Vital Strike

Strike is a co-polymer based fertiliser to promote the growth of seed below its surface and increase soil stability. After seed has been broadcast, Strike is applied in much the same way as Stonewall. There is however fertiliser incorporated into the product which aids in the germination and growth of the seed. Strike will also be trialled during the summer of 2015 to assess the effects that it may have on increasing vegetation cover on the tailings surface.

6.3 Atomiser

There have been many investigations into atomisers that can generate fog or mist using the process water available inside the impoundment. The aim of these investigations was to try to keep the tailings surface wet, act as a dust curtain, and evaporate any excess water that is inside the impoundment when there is a surplus. To date no trials have been undertaken.

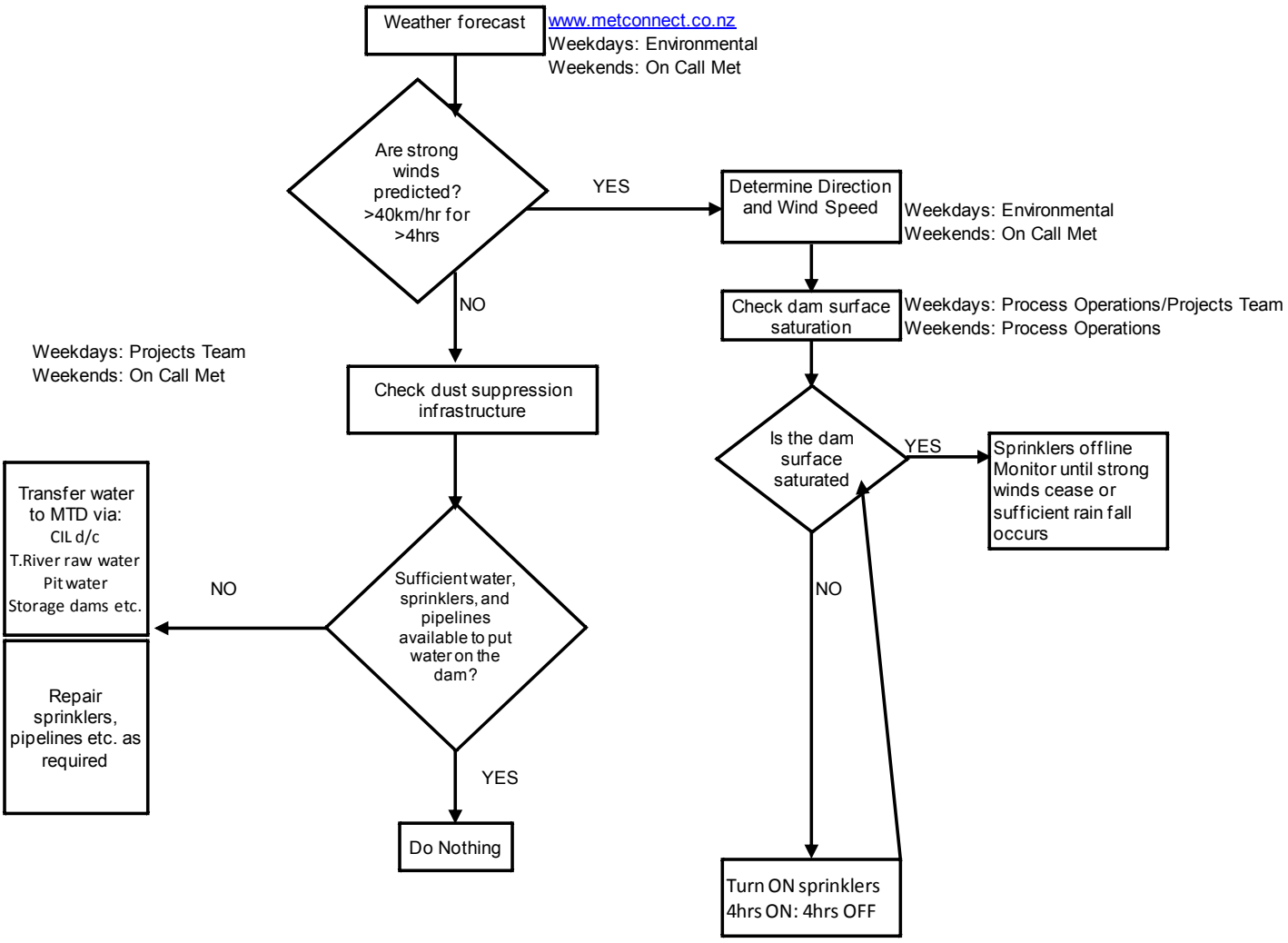
7 MAINTENANCE

The installation and commissioning of any tailings or water distribution system for dust control is the responsibility of the Project Supervisor who once commissioned, hands it over to the Processing Superintendent. Thereafter inspections, monitoring and maintenance activities are the responsibility of operational personnel.

It is also the responsibility of all staff to report breakages or leaks in the pipes to their supervisor or the environmental team. Reports also need to registered as an Environmental Incident Report through INX InControl.

8 DUST SUPPRESSION DAILY DECISION TREE

Dust Suppression on Mixed Tails Dam - Daily Decision Tree



Appendix C

Beaufort Wind Scale

The Beaufort Wind Scale
(Land)

The Beaufort scale was long in use as a system for estimating wind speeds. It was introduced in 1806 by Admiral Sir Francis Beaufort (1774-1857) of the British navy to describe wind effects on a fully rigged man-o-war sailing vessel, and it was later extended to include descriptions of effects on land features as well. Today the accepted international practice is to report wind speed in knots (1 knot equals about 1.85 km, or 1.15 mi, per hour).

The Beaufort scale is divided into a series of values, from 0 for calm winds to 12 and above for hurricanes. Each value represents a specific range and classification of wind speeds with accompanying descriptions of the effects on surface features, as follows:

Beaufort	Avg miles per hour	Avg km per hour	Knots	Surroundings
0 (calm)	0	0	0 – 1	Smoke rises vertically.
1 (light air)	1 – 3	2 – 5	1 – 3	Smoke drift indicates wind direction.
2 (light breeze)	4 – 7	6 – 12	4 – 6	Wind felt on face; leaves rustle.
3 (gentle breeze)	8 – 12	13 – 20	7 – 10	Leaves, small twigs in constant motion.
4 (moderate breeze)	13 – 18	21 – 30	11 – 16	Dust and leaves raised up, branches move.
5 (fresh breeze)	19 – 25	31 – 40	17 – 21	Small trees begin to sway.
6 (strong breeze)	26 – 31	41 – 50	22 – 27	Large branches of trees in motion/
7 (moderate gale)	32 – 38	51 – 61	28 – 33	Whole trees in motion; resistance felt walking against wind.
8 (fresh gale)	39 – 46	62 – 74	34 – 40	Twigs and small branches break from trees.
9 (strong gale)	47 – 55	75 – 89	41 – 47	Larger branches break from trees.
10 (whole gale)	56 – 64	90 – 103	48 – 55	Trees broken and uprooted.
11 (storm)	65 – 74	104 – 119	56 – 63	Widespread damage.
12 (hurricane)	75+	120+	64+	Violence and destruction.

from http://www.kites.org/jo/beaufort.html
and http://www.mountwashington.org/discovery/arcade/wind/beaufort.html

Appendix D

Watercare Services Limited
Ambient Air Quality Monitoring Methods

5. Methods

This section provides the methodology and processes used in the measurement of TSP and the meteorological parameters. The instrument maintenance history is recorded in Appendix A.

5.1. Total Suspended Particulates – E-Sampler

TSP was continuously monitored using a Met One E-Sampler-9800. The E-Sampler is a type of nephelometer that measures suspended particulates using a forward laser light scatter system with a gravimetric filter system.

The sample air is drawn into the E-Sampler at 2 litres per minute and passes through the laser light. The suspended particulates in the sample scatter a portion the laser light. This scattered light detected by the sensor is proportional to the particulate mass. The exiting sample air is deposited onto a 47mm filter. The mass on the filter is used to calculate the gravimetric K-factor to correct the E-Sampler light scattering signal. For this monitoring period the TSP concentrations were not corrected by the calculated K-factor.

5.1.1. Quality Assurance

The instrument was operated by Watercare in accordance with the manufacturer's instructions. This means that the instrument was installed, configured, calibrated and maintained in accordance with the manufacturer's operational manual.

Maintenance checks, including operational parameter examinations, are conducted, quarterly and 6-monthly. Instrument performance and data checks are carried out daily.

Every hour the E-Sampler operates an automatic self-test for 2-3 minutes. This span/zero test period was excluded from the total flow over the sample period. Particulate matter concentrations have been calculated to standard temperature (0°C) and pressure (1atm). The barometric pressure and temperature used were checked and collected manually from the E-Sampler.

5.2. Total Suspended Particulates – HiVol

TSP was measured on a 1 day in 3 cycle in March 2014 to May 2014, using a Lear Siegler HiVol TSP particulate monitor. The instrument uses a gravimetric method in which a known volume of air is passed through a pre-weighed filter over 24 hours. The filters are then used to calculate the ambient TSP concentration in the air. The result is a 24-hour average, which can be compared to consent limits and other guidelines. OceanaGold was responsible for the monitoring program and analysis of the filters. The sampling information and concentrations in this report were sent via email by OceanaGold.

5.3. Meteorological Parameters

Measurements of meteorology were made with reference to Australian Standard AS 3580.14–2011 *Meteorological monitoring for ambient air quality monitoring applications* and Watercare's quality system. The make and model of each meteorological sensor is in Appendix A.

5.3.1. Quality Assurance

To ensure compliance with the above method, all meteorological sensors must meet the method performance specifications as well as being installed, configured, calibrated and maintained in accordance with the method's requirements and the manufacturer's instructions. This includes:

- Instrument meets AS 3580.14–2011 performance specifications, including precision and accuracy, and is configured accordingly.
- Daily instrument performance and data checks.
- Six monthly calibration and maintenance including cable and system integrity checks; wind speed and direction sensor sensitivity checks; calibration of ambient temperature, relative humidity, solar radiation and pressure; and rain gauge checks.
- Annual calibration and maintenance as per every six months plus calibration of sensor signal conditioning unit and bearing friction checks of wind speed and wind direction sensors.

5.4. Data Collection

Continuous data from the instruments were logged on-site by a Campbell datalogger every ten minutes at DG15 and every hour at DG03. This data was automatically downloaded every day and checked at Watercare. The 10-minute analogue data were used to check the TSP data on a daily basis and the 1-hour TSP data manually collected were used in this report .

All data were then entered into Watercare's air quality database, Envista, which is used to validate and report all parameters. All data are stored as time ending averages and at New Zealand Standard Time (NZST).

Appendix E

Site Personnel Contact Details

Site Personnel Contact Phone Numbers

(Complaints and Emergencies)

General Manager Macraes Operation

Bernie O'Leary

Mobile: 0274 221 771

Email: bernie.oleary@oceanagold.com

Open Pit Mine Manager

Mike Dodd

Mobile: 0213 961 180

Email: mike.dodd@oceanagold.com

Process Manager

Quenton Johnston

Mobile:0212 488 195

Email: quenton.johnston@oceanagold.com

Senior Environmental Advisor

Debbie Clarke

Mobile: 021 396 210

Email: debbie.clarke@oceanagold.com

Appendix B

Summary of Annual Deposited Dust Results

Annual summary of insoluble deposited dust above background concentrations 2004-2015

Insoluble Deposited dust above background		Mine Monitoring Sites							Expansion Sites				MPII Sites				Coronation Sites	
(g/m^2/30 days)		2	3	5	6*	7*	14	15*	11	12	13	17*	18	19	20	21	22*	23*
2004	Average	0.1	7.9	1.6	0.2	0.3	1.2	0.2	0.3	46	0.1	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	0.9	20.4	3.6	0.7	1.1	3.4	0.5	0.9	77.1	0.5	0.1						
	Minimum	0	1.4	0	0	0	0.2	0	0	14.9	0	0						
	No.above 3 g/m^2/30 days	**0**	**6**	**2**	**0**	**0**	**1**	**0**	**0**	**9**	**0**	**0**						
2005	Average	0.2	5.3	0.2	0.2	0.9	0.6	0.3	0.6	46.4	0	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	0.6	9.9	1	1	2.6	2.6	0.6	1.1	105.8	0.1	0.3						
	Minimum	0	0	0	0	0	0	0	0	12.4	0	0						
	No.above 3 g/m^2/30 days	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**0**	**0**						
2006	Average	0.4	14.5	0.7	0.5	1.3	1.2	0.4	0.8	7.4	0.6	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	1.5	41.7	1.7	1.7	4.7	4.3	1.2	1.2	30.1	2.1	0						
	Minimum	0	0.6	0	0	0	0	0	0	0.1	0	0						
	No.above 3 g/m^2/30 days	**0**	**10**	**0**	**0**	**2**	**1**	**0**	**0**	**6**	**0**	**0**						
2007	Average	0.7	5.7	1	0.2	0.2	1.8	0.6	1.1	1.7	0.5	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	2.1	15.7	2.3	0.4	1.2	4	1.5	1.9	7.6	2.8	0.1						
	Minimum	0	0	0	0	0	0	0	0	0.3	0	0						
	No.above 3 g/m^2/30 days	**0**	**6**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**						
2008	Average	1	1.4	0.7	1.9	1.9	0.9	1.4	1.5	2	0.4	0.5	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	3.1	4.5	2.9	15.7	10.4	3.2	4.7	4.1	7	1.2	3.1						
	Minimum	0	0	0	0	0	0	0	0	0	0	0						
	No.above 3 g/m^2/30 days	**1**	**1**	**0**	**1**	**3**	**1**	**2**	**1**	**3**	**0**	**1**						
2011	Average	0.4	1.8	1.1	0.1	0.7	1	0.4	0.8	1	0.3	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	1.5	3.6	4.6	0.6	3.4	2.5	1.4	1.9	2.2	1.4	0.3						
	Minimum	0.1	0.7	0	0	0	0	0	0.2	0	0	0						
	No.above 3 g/m^2/30 days	**0**	**1**	**2**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**						
2012	Average	0.4	3.9	0.8	0.1	0.1	0.5	0.2	0.6	0.7	0.1	0	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed	Not yet installed
	Maximum	1.4	11.6	2.3	0.6	0.6	2.1	1.3	1.5	2.8	0.4	0.2						
	Minimum	0	0.9	0	0	0	0	0	0	0	0	0						
	No. above 3 g/m^2/30 days	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**						
2013	Average	0.39	3.62	Removed	Removed	0.2	Removed	0.1	0.29	Removed	0.07	Removed	0.18	0	0.12	0.55	Not yet installed	Not yet installed
	Maximum	2.83	8.31			0.9		0.6	1.33		0.4		1.46	0	0.67	2.12		
	Minimum	0	0			0		0	0		0		0	0	0	0		
	No. above 3 g/m^2/30 days	**0**	**4**			**0**		**0**	**0**		**0**		**0**	**0**	**0**	**0**		
2014	Average	0.2	3.5	Removed	Removed	0.1	Removed	0.1	0.6	Removed	0.2	Removed	0.3	0.1	0	0.3	0	0
	Maximum	0.9	11.2			0.6		0.7	4.0		0.8		1.8	0.9	0	1.3	0	0
	Minimum	0	0			0		0	0		8		0	0	0	0	0	0
	No. above 3 g/m2/30 days	**0**	**7**			**0**		**0**	**0**		**0**		**0**	**0**	**0**	**0**	**0**	**0**
2015	Average	0.2	3.4	Removed	Removed	0.3	Removed	0.2	0.6	Removed	0.2	1.4	0.2	0.2	0.2	0.5	0.1	0.3
	Maximum	0.9	6.8			0.9		0.6	1.7		1.1	4.5	0.9	1.3	2.5	1.1	0.5	1.6
	Minimum	0.0	1.2			0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	No. above 3 g/m^2/30 days	**0.0**	**6.0**			**0.0**		**0.0**	**0.0**		**0.0**	**1.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

*Denotes monitoring sites that are subject to consent conditions.

Note background sites were changed in May 2013

Appendix C

Consent RM12.378.15

Our Reference: A571409 Consent No. RM12.378.15

DISCHARGE PERMIT

Pursuant to Section 104B of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name:	Oceana Gold (New Zealand) Limited
Address:	Level 3, Taunton Mews, 22 Maclaggan Street, Dunedin

To discharge contaminants from mining operations and post mining rehabilitation to air for the purpose of undertaking mining operations

For a term expiring:	31 August 2032
Location of consent activity:	Macraes Gold Project, approximately 6.5 kilometres to the northwest of the intersection of Macraes Road and Red Bank Road, Macraes Flat.
Legal description of consent activity:	Pt Section 2 Blk V Highlay SD, Pt Section 2 Blk VII Highlay SD, Section 2 Blk VII Highlay SD, Pt Secs 11 and 12 Blk VII Highlay SD, Road Reserve
Map Reference:	Within a 1 kilometre radius of NZTM2000 1395770 E 4977492 N

Conditions

Specific

1. This consent shall be exercised in conjunction with Discharge Permit 96785, Discharge Permit 2006.689, Discharge Permit RM10.351.52 and any subsequent variations to these permits.

2. This consent authorises the discharge of contaminants to air from the Coronation Waste Rock Stack, Coronation Pit and associated haul roads, as shown on Appendix I attached.

3. There shall be no visible dust beyond the boundary of the Macraes Gold Project site that, in the opinion of an enforcement officer, is offensive or objectionable to such an extent that it has an adverse effect on the environment, including the human environment.

Performance Monitoring

4. Insoluble dust deposition rates at sites DG07, DG20, DG21, DG22 and DG23, as shown on Appendix I and Appendix II attached, must not exceed 3 grams per square metre per 30 days (g/m^2/30 days) of insoluble dust above background more than twice in any calendar year. Compliance with this condition shall be demonstrated by the monitoring required in Condition 9 of this consent.

5. Insoluble dust deposition rates at sites DG02 and DG15, as shown on Appendix I and Appendix II attached, must not exceed 3 grams per square metre per 30 days (g/m^2/30 days) of insoluble dust above background. Compliance with this condition will be demonstrated by the monitoring required in Condition 9 of this consent.

6. Background concentrations will be calculated by averaging the insoluble dust deposition rates at sites DG09, DG10 and DG24 as shown on Appendix I and Appendix II attached.

7. Twenty-four hour average total suspended particulate at site DG15, as shown on Appendix I attached, must not exceed $120\mu g/m^3$. Compliance with this condition will be demonstrated by the monitoring required in Condition 10 of this consent.

8. In the event of any exceedance of those limits specified in Conditions 4, 5 and 7 of this consent, the Consent Holder must undertake an immediate review of the cause of the exceedance. A report detailing the findings of this review shall be provided to the Consent Authority within 1 month of the non-compliant result(s) being received. If it is shown that activities within the Macraes Gold Project site were the cause of the exceedance, then dust mitigation measures within the Macraes Gold Project shall be reviewed by an independent consultant engaged in consultation with the Consent Authority. The independent consultant shall provide a report summarising the cause of the exceedance and recommending measures to improve dust mitigation at the Macraes Gold Project site so that the exceedance does not occur again. This report shall be provided to the Consent Authority within 2 months of the non-compliant result(s) being received.

9. The consent holder shall monitor dust deposition rates at monthly intervals in accordance with draft ISO Standard ISO/DIS 4222.2 ("Air Quality Measurement of Atmospheric Dustfall – Horizontal Deposit Gauge Method" 1980), or another method approved in writing by the Consent Authority. The monitoring shall be undertaken at the sites shown on Appendix I and Appendix II attached.

10.

(a) The consent holder shall monitor real time total suspended particulate concentrations at site DG15 as shown on Appendix I attached. The monitoring shall be undertaken using a nephelometer, or other instrument as agreed in writing by the Consent Authority. The instrument shall be sited in accordance with AS/NZS 3580.1.1:2007 (Methods for Sampling and Analysis of Ambient Air – Guide to Siting Air Monitoring Equipment).

(b) The consent holder shall monitor total suspended particulate at monitoring site DG15 as shown on Appendix I in accordance with Australian Standard AS/NZS3580.9.3:2003 (Determination of suspended particulate matter - Total Suspended Particulates [TSP] - High Volume Sampler Gravimetric Method), or another method approved by the Consent Authority. Twenty-four hour measurements must be taken every six days March to October inclusive, and every three days November to February inclusive, for a minimum period of twelve months

or for however long is required to ensure that adequate data is collected to achieve the objectives of Condition 10(d).

(c) Parameters to be recorded shall include, but not be limited to:
   i) Hourly average TSP concentrations as measured by the instrument installed in accordance with Condition 10(a) of this consent;
   ii) 24-hour average TSP concentrations as measured by the instruments installed in accordance with Conditions 10(a) and 10(b).

(d) The instruments installed in accordance with Conditions 10(a) and 10(b) shall be operated concurrently for a period of no less then twelve months to ensure that twelve months of coincident data is collected. A correlation between the data shall be established by an independent consultant engaged in consultation with the Consent Authority. A report detailing this investigation shall be provided to the Consent Authority within two months of the data being collected.

11.

(a) Meteorological conditions shall be continuously monitored and recorded at site DG03 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall. Sufficient information shall also be measured to allow an estimate of atmospheric stability. These estimates shall be obtained from measurements of solar radiation and temperature at two heights above ground level, or other parameters as approved by the Consent Authority.

(b) Meteorological conditions shall be continuously monitored and recorded at site DG15 as shown on Appendix I attached. As a minimum, the meteorological data collected shall include wind speed, wind direction, temperature and rainfall.

12. The consent holder shall keep a daily record of water used for dust suppression. These records shall be made available to the Consent Authority on request.

13. Results of all monitoring undertaken in accordance with this consent shall be reported to the Consent Authority on a quarterly basis. The format of the report shall be agreed upon in consultation with the Consent Authority.

14. Prior to the exercise of this consent, the consent holder shall submit a Dust Management Plan to the Consent Authority. The Dust Management Plan shall include, but not be limited to, the following:

(a) A description of potential dust sources and the factors influencing dust generation;

(b) Dust mitigation measures and procedures including, but not limited to:
   i) Minimising the areas of disturbed ground;
   ii) Watering, with water trucks and fixed sprinklers;
   iii) Avoiding as far as possible, ground disturbance when wind may cause dust nuisance;
   iv) Taking wind conditions into account in planning and carrying out work to minimise dust dispersion;

v) Ensuring materials being moved are kept in a coarse state;
vi) Covering materials; and
vii) Replanting disturbed ground as soon as possible, including temporary planting if necessary.

(c) A description of dust monitoring equipment and procedures, including methods of analysis and details of the method used for the calculation of background dust concentration should values from one or all of the background sites be unavailable;

(d) Procedures for managing and addressing air quality or odour related complaints; and

(e) Key responsibilities, consultation and reporting, including details of the annual review and independent consultant used as required by Condition 18 of this consent.

15. The consent holder shall review the Dust Management Plan annually taking into account the following:

(a) The outcomes of reviews completed in accordance with Conditions 8 and 16 of this consent; and

(b) Whether management practices are resulting in compliance with the conditions of this consent.

Confirmation of the review and any revisions will be included in the Project Overview and Annual Work and Rehabilitation Plan for the Macraes Gold Project site. The consent holder shall provide the Consent Authority with any updates of the Dust Management Plan within one month of any update occurring.

16. An independent consultant, engaged by the Consent Holder in consultation with the Consent Authority, shall undertake an annual review and assessment of all dust monitoring data. The reviewer's report shall include:

(a) The name, qualifications, and experience of the reviewer;

(b) The methods used and the investigations undertaken for the review;

(c) Interpretation of the monitoring data reviewed;

(d) An assessment of the quality of the monitoring data;

(e) An assessment of the monitoring regime;

(f) A description and evaluation of each of the dust mitigation measures used by the consent holder;

(g) Recommendations on whether:

i) The monitoring of dust is adequate or should be changed, and if changed the changes that are recommended;

ii) The dust mitigation measures used by the consent holder are adequate, or should be changed, and the changes that are recommended; and

iii) Any changes should be made to the conditions of this consent; and

(h) Any other matters that the reviewer considers should be drawn to the attention of the consent holder or the Consent Authority.

17. The annual report required by Condition 16 shall be provided to the Consent Authority by 30 April each year.

18. In the event of any non compliance with the conditions of this consent, the consent holder shall notify the Consent Authority within 24 hours of the non compliance being detected. Within five working days the consent holder shall provide written notification to the Consent Authority providing details of the non-compliance. This notification will at a minimum include an explanation of the cause of the non compliance, the steps taken to remedy the situation and steps taken to mitigate any future occurrence of the non compliance.

19. The consent holder shall maintain a record of any complaints received regarding their operation. The register shall include, but not be limited to:
(a) name and location of site where the problem is experienced;
(b) nature of the problem;
(c) date and time problem occurred, and when reported;
(d) action taken by consent holder to remedy the situation and any policies or methods put in place to avoid or mitigate the problem occurring again.

The register of complaints shall be incorporated into the Project Overview and Annual Work and Rehabilitation Plan.

General

20. The Consent Authority may, within 6 months of receipt of the Coronation Project Addendum to the MPIII Cultural Impact Assessment prepared by Kai Tahu ki Otago on behalf of Te Runanga o Moeraki, Te Runanga o Otakou and Kati Huirapa Runaka ki Puketeraki, commissioned in 2013, serve notice of its intention to review the conditions of this consent for the purpose of amending or adding conditions to address mitigation of the effect(s) of the exercise of this consent on cultural values and associations. All costs associated with such review shall be borne by the consent holder

21. (a) The consent holder shall provide and maintain in favour of the Consent Authority one or more bonds to secure:
    i) The performance and completion of rehabilitation in accordance with the conditions of this consent; and
    ii) The carrying out of the monitoring required by the conditions of this consent; and
    iii) The remediation of any adverse effect on the environment that may arise from the exercise of this consent.
    iv) Compliance with Conditions 21(m) to 21(q) of this consent.

(b) Before the first exercise of this consent, the consent holder shall provide to the Consent Authority one or more bonds required by Condition 21(a).
(c) Subject to the other provisions of this consent, any bond shall be in the form and on the terms and conditions approved by the Consent Authority.
(d) Any bond shall be given or guaranteed by a surety acceptable to the Consent Authority.
(e) The surety shall bind itself to pay for the carrying out and completion of the conditions of consent which are the subject of the bond on default by the consent holder or the occurrence of any adverse environment effect requiring remedy; during or after the expiry of this consent.
(f) The amount of each bond shall be fixed annually by the Consent Authority which will take into account any calculations and other matters submitted by the

consent holder relevant to the determination of the amount to be bonded in the Project Overview and Annual Work and Rehabilitation Plan, or otherwise.

(g) The amount of the bond(s) shall include:

i) The estimated costs of complete rehabilitation in accordance with the conditions of consent on the completion of the mining operations proposed for the next year and described in the Project Overview and Annual Work and Rehabilitation Plan.

ii) The estimated costs of:

- Monitoring in accordance with the monitoring conditions of the consent;
- Monitoring for and of any adverse effect of the activity authorised by this consent which may become apparent during or after expiry of this consent;
- Monitoring any rehabilitation required by this consent.

iii) Any further sum which the Consent Authority considers necessary for monitoring and dealing with any adverse effect on the environment that may arise from the exercise of the consent whether during or after the expiry of this consent.

(h) The amount shall be calculated for the duration of this consent and for a period of 20 years after its expiry.

(i) If, on review, the total amount of bond to be provided by the consent holder is greater or less than the sum secured by the current bond(s), the consent holder, surety and the Consent Authority may, in writing, vary the amount of the bond(s).

(j) While the liability of the surety is limited to the amount of the bond(s), the liability of the consent holder is unlimited.

(k) Any bond may be varied, cancelled, or renewed at any time by written agreement between the consent holder, surety and Consent Authority.

(l) The costs (including the costs of the Consent Authority) of providing, maintaining, varying and reviewing any bond shall be paid by the consent holder.

(m) For a period of 20 years from the expiry or surrender of this consent the consent holder shall provide in favour of the Consent Authority one or more bonds.

(n) The amount of the bond to be provided under Condition 21(m) shall include the amount (if any) considered by the Consent Authority necessary for:

i) Completing rehabilitation in accordance with the conditions of this consent.

ii) Monitoring for and of any adverse effect on the environment that may arise from the exercise of the consent.

iii) Monitoring any measures taken to prevent, remedy or mitigate any adverse effect on the environment that may arise from the exercise of this consent.

iv) Dealing with any adverse effect on the environment which may become apparent after the surrender or expiry of this consent.

v) Contingencies.

(o) Without limitation, the amount secured by the bond given under Condition 21(m) may include provision to deal with structural instability or failure, land and water contamination, and the failure of rehabilitation in terms of the

rehabilitation objectives and conditions of this consent. Costs shall include costs of investigating, preventing, remedying or mitigating any adverse effect.

(p) The bond(s) required by Condition 21(m) must be provided on the earlier of:

i) 12 months before the expiry of this consent.

ii) Three months before the surrender of this consent.

(q) Conditions 21(c), (d), (e), (h), (i), (j) and (k) apply to the bond(s) required by Condition 21(m).

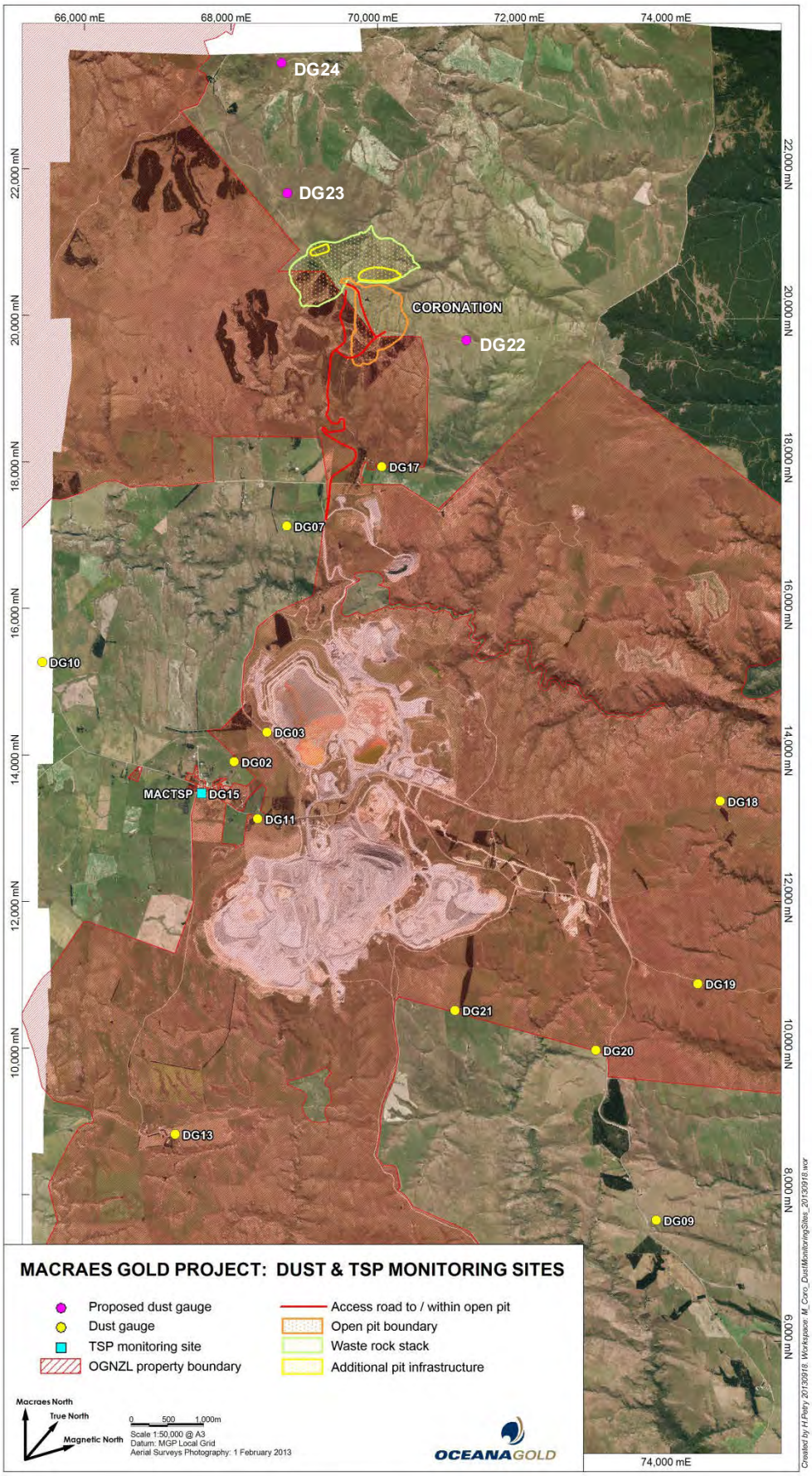
22. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent within three months of each anniversary of the commencement of this consent, for the purpose of:

(a) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent; or

(b) ensuring the conditions of this consent are consistent with any National Environmental Standards; or

(c) requiring the consent holder to adopt the best practicable option, in order to remove or reduce any adverse effect on the environment arising as a result of the exercise of this consent.

Appendix I
RM12.378.15



Appendix II
RM12.378.15