



# Coronation North Extension

## Assessment of Environmental Effects

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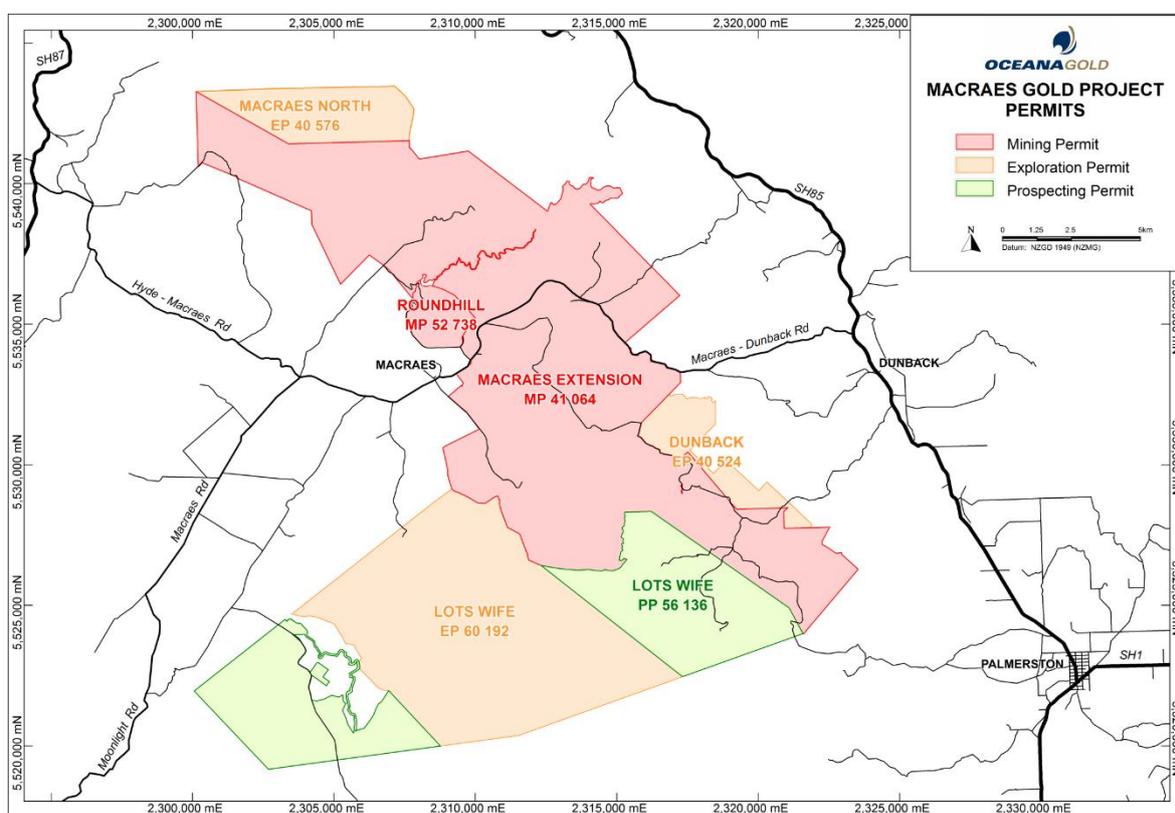
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# 1 INTRODUCTION

## 1.1 Background and Site Description

Oceana Gold (New Zealand) Limited ("OceanaGold") is a significant multinational gold producer and New Zealand's largest producer of gold. OceanaGold's current operating assets in New Zealand consist of two large open pit mines (at Macraes in the South Island and at Waihi in the North Island), and four underground mines (Frasers at Macraes, Favona, Trio and Correnso at Waihi). OceanaGold also has a large open pit mine at Reefton in the South Island which is currently in the closure phase and the company operates and owns a mine at Didipio in the Northern Philippines, and at Haile in South Carolina, United States of America.

The Macraes Gold Project (MGP) is located approximately 30 kilometres (km) to the northwest of Palmerston in the Otago Region of the South Island, New Zealand. The Macraes mining and exploration tenements cover a contiguous area of 15,705 hectares as shown in Figure 1-1. The mining operation is centred 1 to 2 km to the east of the Macraes township and is predominantly surrounded by farmland.



**Figure 1-1 OceanaGold Macraes Minerals Permits**

Presently, the company directly employs around 550 people at the Macraes site. The mine also provides significant additional job opportunities for contractors, with several contractors permanently based at the site and a large contractor workforce utilised during regular processing plant maintenance shutdown events.

The Macraes operation is the largest goldmine in New Zealand and since the commencement of operations over 4 million oz. of gold has been produced.

The Macraes operation was commissioned in 1990 following the construction of a gold processing plant to treat ore mined by open pit mining methods and has been operating continuously since that time, for over 27 years now. The processing plant had an original capacity of 1.5 million tonnes ("MT") per annum and

this has increased since 1990 through continual upgrades to approximately 5-6 MT of ore per annum. The Macraes operation processing plant recovers gold by concentrating the metal into a relatively small fraction of flotation concentrate, oxidising the reground concentrate in a pressure oxidation (POX) autoclave, washing the oxidised residue and then utilising a carbon-in-leach process to recover gold from the residue. Ore supply has been from a series of open pits combined with the Frasers underground mine that has been operating since 2006.

Ore supply is currently from the Frasers underground (commonly referred to as FRUG) and Coronation North Pit. The mining at Coronation North was consented in 2017 and extended the mining at the Coronation Pit and allowed for the creation of a new Coronation North pit and waste rock stack. A proposed extension to the Coronation North Pit now has the potential to be mined over the next year. The new consent seeks to gain regulatory approvals to extend this pit for the purpose of ongoing continuity of ore supply to the processing plant and allows for geotechnical mitigation on the existing Coronation North Pit. In addition to the proposed extension of the Coronation North Pit, a consent variation is being sort for the design of the Coronation North Waste Rock Stack which will limit the environmental footprint and avoid specific ecological values.

By way of background, the Coronation Project, within its original footprint, commenced at the beginning of 2015, so that its projected effects would have been expected to continue through to the end of 2017 at the latest.

The Coronation North and Coronation Pit Extension Project (Coronation North) project represented 12.5 MT of additional ore supply. The May 2016 AEE for Coronation North indicated that that project, in combination with underground ore and other ore sources, was expected to add about 3 further years of mining, on top of the existing Coronation mining operations. At the time of the Coronation North AEE submission Coronation was expected to finish by the end of 2016.

Ore delivery to the processing plant from the Coronation North began in earnest in October 2017, so based on the above estimated durations could be expected to continue until October 2020.

With the inclusion of the current Coronation North Extension project, the entire Coronation complex is estimated to have 9.8 MT of ore remaining. Mining at Coronation is forecast to take about 24.5 months from the end of October 2018 (just over 2 years of mining and hauling of ore), substantially consistent with the previously forecast completion date of October 2020. Notwithstanding the addition of Coronation North Extension mining and hauling of ore will add an additional four months to the approximate 3 year production window that was envisaged for the Coronation North Project and the overall 4-6 year production window that was approximated for the Coronation and Coronation North projects combined.

Relative to previously modelled ore extraction of 17.5 MT (Coronation and Coronation North combined) the Coronation North Extension project will take total actual ore extracted and hauled to 18.6M tonnes.

## 1.2 Existing Consents

OceanaGold was granted a suite of consents by the Otago Regional Council (“ORC”), the Dunedin City Council (“DCC”) and the Waitaki District Council (“WDC”) for the Coronation North Project in 2017. These consents were to expand the existing mining operations at the Coronation Project and to follow the line of strike further north to newly discovered mineral deposits.

The Coronation North Project consents authorised a new 63 hectare Coronation North Pit with an estimated 9 MT of ore, a 23 hectare extension to the Coronation Pit with an expansion of ore recovery from 5 MT to approximately 8.5 MT, a reduction of the consented Coronation Waste Rock Stack by about 64 hectares, a new Coronation North Waste Rock Stack of about 197 hectares, extension to the existing haul road and mining infrastructure at Coronation, and water takes for dust suppression and clean water diversion around the Coronation North mining operation. Consents were also issued for potential construction of a freshwater dam known as the Coal Creek Dam, with a footprint of about 9.3 hectares, to supplement natural low flow periods and dilute sulphate in discharged mine water.

The estimated duration of the operation and rehabilitation phases of the Coronation North Project was about 3 + 2 years, with about 3 years added to the overall Macraes mine life. This was in addition to the Coronation Project which had been expected to take about 3 years for operation and rehabilitation and add

1 year to the overall life of the operation. Accordingly, the combined schedule of operations for both projects was about 5-6 years plus rehabilitation.

The approved closure plan for Coronation and Coronation North Projects remains consistent with the consented approach that has been adopted throughout the operation. It provides for progressive rehabilitation of the waste rock stacks, opportunistic backfilling of the pits during operations, formation of pit lakes within both pits, removal of temporary structures and infrastructure, and decommissioning of silt ponds into stock water ponds.

### 1.3 Project Description

The Coronation North Extension Project is driven by several aspects, as follows:

- Successful exploration activity - OceanaGold has located an additional resource not previously identified at the time of consenting the previous project;
- Geotechnical constraints with pit wall stability in the Coronation North Pit; and
- Optimisation in design of waste rock movement from the Coronation North Pit and the Coronation Pit extension (consented as part of the Coronation North development) and subsequently waste rock stack design.

The overall effect of these aspects is to increase the volume of ore being excavated from the mining operation to:

- Extend the life of mining by approximately four months;
- Increase in unconsented area of 57.39ha, balanced by the set aside of 52.9ha of consented area resulting in a net increase/decrease of 4.49ha;
- Reduce effects (in almost all cases) to significant biodiversity values, when compared with the existing consented baseline;
- A reduction of visual effects when compared with the existing consented baseline; and
- Improve the safety of current operations and long-term stability of the pit walls.

The specific Project Elements of the Coronation North Extension are:

- Pit Cutback – Following more detailed exploration drilling and pit optimisation, approximately 2.8 MT of gold bearing ore have been identified close to the existing Coronation North Pit. It is proposed to extend the Coronation North Pit to the south east in order to access the underlying gold resources in an area partially consented for haul road and topsoil access. The cutback will result in approximately 28.8 MT (or 12.2 million m<sup>3</sup>). The additional area required for this cutback is 25.76ha;
- Pit Wall Stability Layback – As the Coronation North Pit has developed, greater knowledge and understanding of the underlying geology and pit wall behaviour has been gathered. In order to ensure the safe removal of ore from the Coronation North Pit, the pit wall is required to be laid back. This will result in approximately 14.12ha of additional unconsented area;
- Pit Backfill – the Pit Cutback will allow for approximately 19.3 MT (9.2 million m<sup>3</sup>) of waste rock to be placed at the north western end of the Coronation North Pit. The pit backfill will rise approximately 30m above the natural ground level on the north western side of the pit to an elevation of RL 640m;
- Trimbells Waste Rock Stack (Trimbells WRS) – detailed scheduling of waste movement has led to the design of Trimbells WRS, which is located high in the catchment of Trimbells Gully and partially covers Area B and Area C of the consented Coronation North WRS. Trimbells WRS requires an additional 17.51 ha of unconsented area and has a final elevation of RL 675m. The design of the Trimbells WRS as a replacement for the Area B and C of the consented Coronation North WRS has allowed for a significant area of consented land to be relinquished. The area equates to 52.9ha which has several benefits as outlined in the Section 6;

These Project Elements are shown in Figure 1-2, whilst the existing consented and proposed consented areas associated with these Project Elements are shown in Figure 1-3.

Mining of the Coronation North Pit and Pit Cutback will be conducted in conjunction with the Coronation Pit extension (consented as part of the Coronation North Project). Waste rock will be placed in the consented Coronation North WRS (Area A), Coronation North Pit Backfill, Coronation WRS and Trimbells WRS. A detailed materials balance of waste rock movement is summarised in the table Table 1 Waste Rock Materials Balance<sup>1</sup>. The overall balance suggests net surplus of available volume of 3.6 million m<sup>3</sup> (8.9 MT) in the designed waste rock storage. For the purposes of design and subsequently consenting it is preferable to take a more conservative approach to ensure suitable capacity of storage.

**Table 1 Waste Rock Materials Balance**

Source	Volume	Tonnes	Destination	Volume	Tonnes
Coronation North Pit	7.7	15.6	Coronation North WRS	12.2	25.6
Coronation North Pit Extension	12.6	26.2	Coronation WRS	2.1	4.4
Coronation Pit Extension	16.9	35.0	Trimbells WRS	17.6	36.3
			Coronation North Pit Backfill	9.2	19.3
<b>Total</b>	<b>37.2</b>	<b>76.8</b>		<b>41.1</b>	<b>85.6</b>

In addition to the Project Elements the following measures will be taken as part of the good practice for environmental management at Macraes:

- Surface runoff will continue to be diverted around the open pit and WRS workings and managed with diversion drains and silt control dams located in gullies of disturbed areas, as is currently implemented. Any additional sediment control required will be installed prior to any additional disturbance within each catchment area;
- Surface and ground water collected within the pit will continue to be used for dust suppression activities onsite. This water will be utilised in the watercarts for keeping dust on the haul roads, WRS, and pit floors to a minimum;
- Discharges to air will continue to be managed by the operative Dust Management Plan. The plan includes methods which may be used to minimise dust generation. Dust and Total Suspended Particulate (“TSP”) will continue to be monitored at existing monitoring sites;
- In preparation for excavation of the Coronation North Pit extension, Coronation Pit extension and Trimbells Gully WRS, topsoil and the under-lying brown rock (i.e. weathered schist) will be stripped for the purposes of rehabilitation. It is not envisaged that additional footprint will be needed for temporary stockpiles as this material will be used directly on existing WRS final surfaces;
- The closure plan will continue to be comprised of progressive rehabilitation of Trimbells WRS, Coronation North WRS, Coronation WRS and the Pit Backfill. The open pit will form a pit lake within the remaining pit shell. All other rehabilitation programmes will remain as previously planned and consented;
- Access to Trimbells WRS will utilise existing consented alignments. The main access from the Coronation to the Coronation North Pits will be diverted approximately 300m to the mine’s south east but will be contained within the proposed disturbance envelope;
- Temporary pedestrian access will largely remain unchanged from that established for the Coronation North Project. There will be a slight realignment in the mine west corner where the access will be pushed westward.
- The Coronation North Extension will be carried out, managed and monitored on substantially the same basis as the consented Coronation and Coronation North projects during operations in terms of mining methods, operating 24 hours a day seven days a week, drilling and blasting, use of the existing fleet of diesel powered mining equipment, transport movements, dust management, surface and groundwater management, sediment control, progressive rehabilitation of waste rock stacks;

<sup>1</sup> All volumes and weights in the table are expressed in millions.

- The existing haul road access to the Coronation North project area will largely remain unchanged. Mining access will continue to be from the haul road leading up from Horse Flat Road;
- Hauling of ore will be undertaken under a 'no night time hauling' policy until such time that agreement can be obtained with an affected party to alter that policy (see Section 6 for more information);
- Ore will continue to be processed at the existing processing plant and the existing processing rate at the plant of approximately 5-6MT per annum will also remain the same.

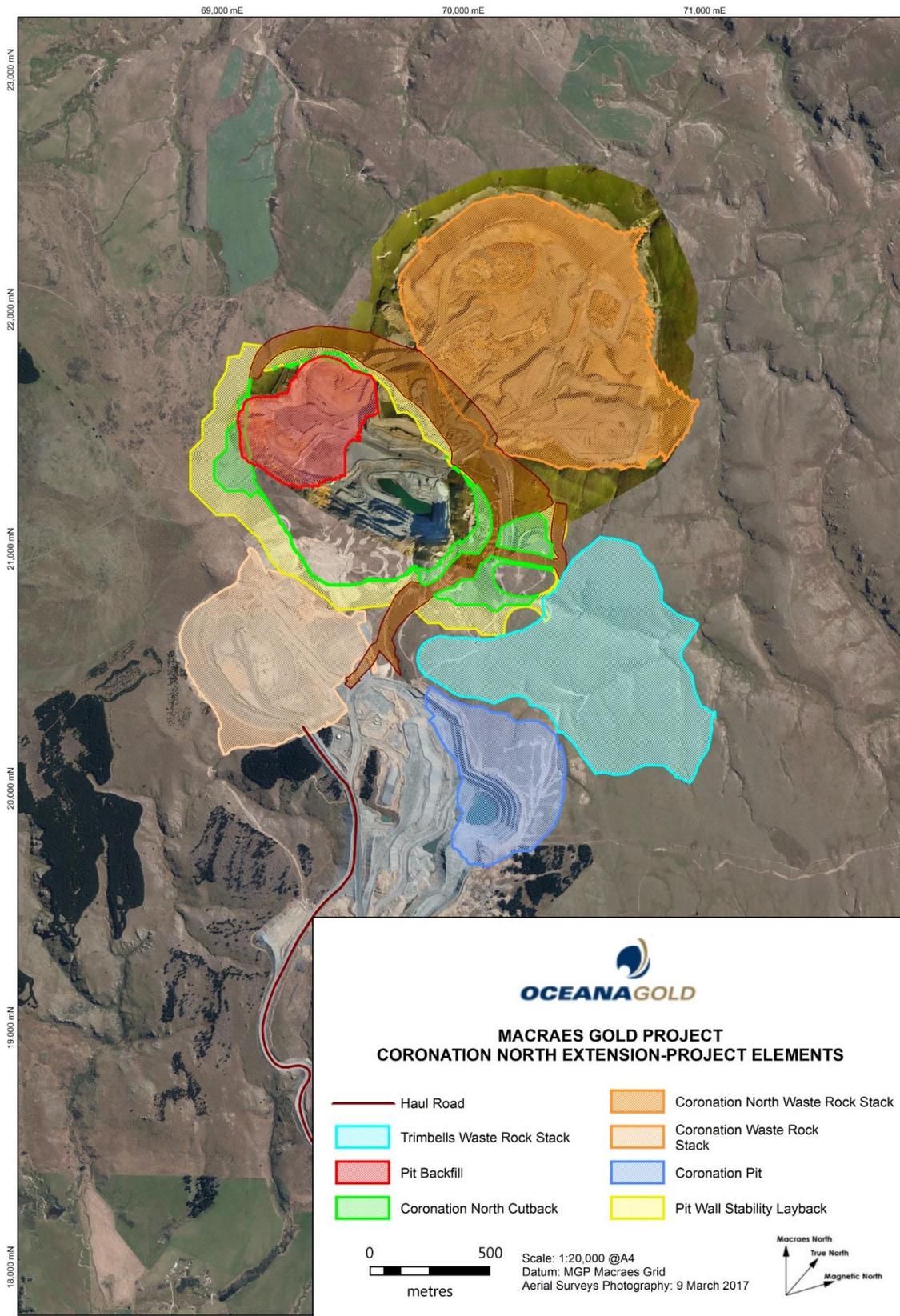


Figure 1-2 Coronation North Extension Project Elements

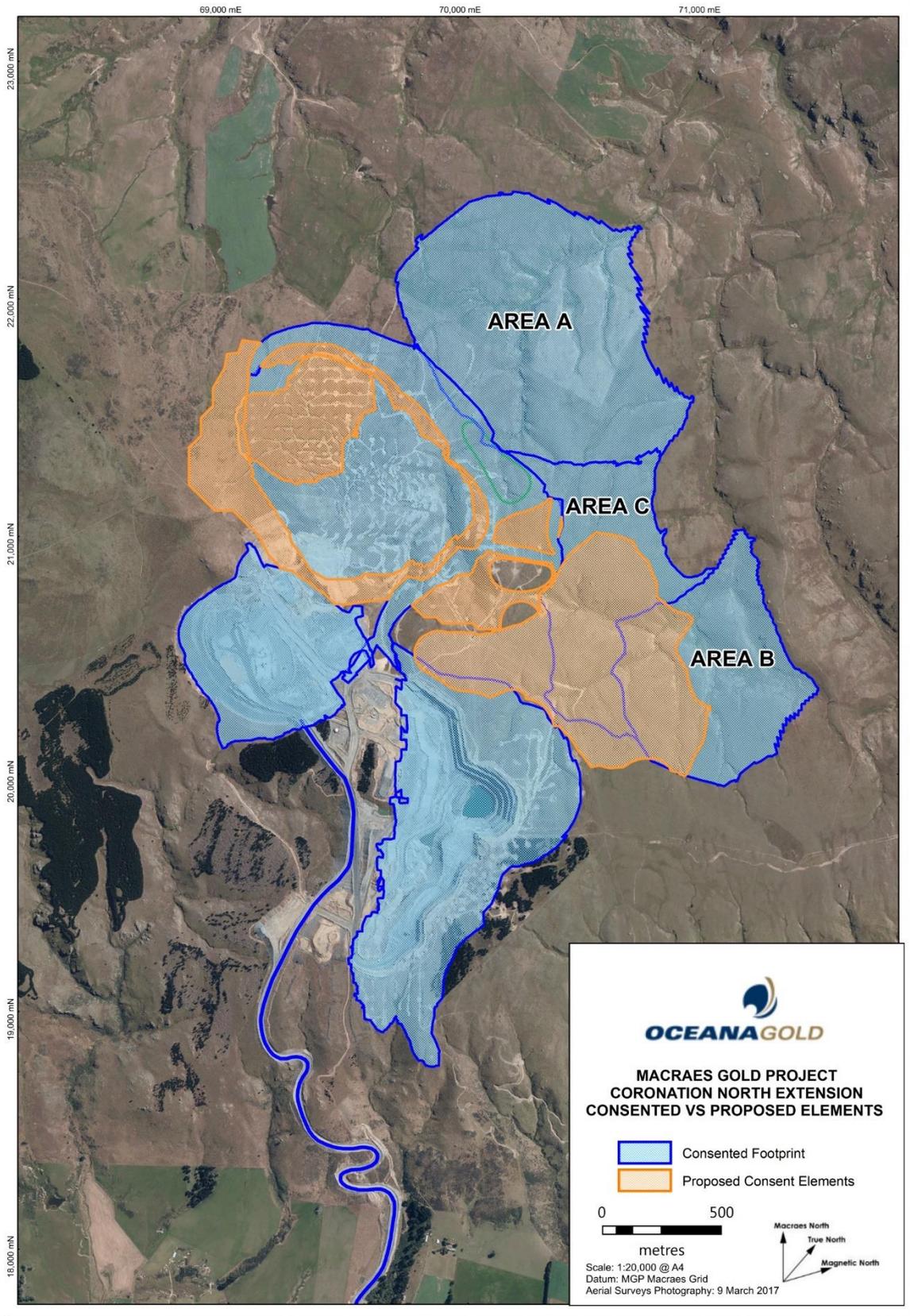


Figure 1-3 Consented and Proposed Consented Areas

## 2 LEGAL DESCRIPTION

The land upon which the Coronation North Extension Project falls is all under the one parcel, the legal description being: Part Section 2 Block V, Highlay Survey District with the CT number OT15A/514. The RAPID number is 560. This land is entirely owned and occupied by OceanaGold.

## 3 ACTIVITY STATUS AND CONSENTS REQUIRING VARIATION

Local and regional consents were issued for the Coronation Project (2012) and the Coronation North Project (2016) by the Otago Regional Council, Dunedin City Council, and the Waitaki District Council. The mining activity in the area was assessed as a discretionary activity and consents were issued to OceanaGold with a number of conditions attached.

As a result of discussions with DCC, new consents (as opposed to variations) are now being sought to undertake an extension to the currently consented Coronation North Pit. The new consents are not considered to cause any effects that are greater than minor as the impacts from the extension do not materially add to the impact attributed to the current consents. The various consents from each council are detailed below.

### 3.1 Otago Regional Council Consents

The Coronation North Project included permitting for; an extension to the Coronation Pit, the Coronation North Pit, Coronation North Waste Rock Stack, extending the roading infrastructure from the existing Coronation Project, and the creation of the Coal Creek Freshwater Dam. Variations are now being sought to the list of consents shown in Table 2 for the Coronation North Extension Project. There is no material change to the consent conditions being sought, but rather that maps annexed to the consent documents are updated. This is because the maps currently reference the Coronation North Project and changes are requested to reflect the modification of the Coronation North Pit boundary to provide for an extended pit footprint, and for relocation of the pit cut-off drain to a slightly more upstream point (but still within the area covered by the existing consent).

**TABLE 2: OTAGO REGIONAL COUNCIL CONSENTS REQUIRING VARIATION**

ORC Consent Number	Description
RM16.138.01	To disturb, deposit and reclaim the bed of unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of constructing the Coronation North Waste Rock Stack
RM16.138.04	To discharge contaminants and water from silt ponds to unnamed tributaries of Maori hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of operating silt ponds for Coronation North Pit and the Coronation North Waste Rock Stack.
RM16.138.06	To discharge water containing contaminants from Coronation North Pit Lake to unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of pit lake overflow
RM16.138.10	To discharge waste rock to land within the Coronation North Pit for the purpose of disposing of rock.
RM16.138.11	To take surface water for the purpose of dewatering Coronation North Pit and use for the purpose of dust suppression.
RM16.138.12	To take surface water for the purpose of creating the Coronation North Pt Lake.
RM16.138.13	To take groundwater for the purpose of dewatering Coronation North Pit and use for the purpose of dust suppression.
RM16.138.14	To take groundwater for the purpose of creating the Coronation North Pit Lake.
RM16.138.15	To divert water around the open pit known as Coronation North Pit and into unnamed tributaries of Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of preventing surface water ingress and managing surface water runoff.
RM16.138.17	To dam water in the Coronation North Pit for the purpose of creating the Coronation North Pit Lake.
RM16.138.19	To discharge contaminants from mining operations and post mining rehabilitation

	to air for the purpose of undertaking mining operations.
RM16.138.20	To permanently divert water around the Coronation North Waste Rock Stack and into Maori Hen Creek, Trimbells Gully, Mare Burn and Coal Creek for the purpose of preventing surface water ingress and managing stormwater runoff.

### 3.2 Dunedin City Council

The Dunedin City Council issued Land Use Consents LUC-2016-234 for the Coronation North Project and amended LUC-2013-225A for the Coronation Project. This project introduces an extension to the footprint area of the Coronation North pit and amendment to the waste rock stack location. Variations are sought to the existing consents to change the naming conventions associated with the Coronation North Project and replace approved maps/plans with updated maps/plans that include reference to Coronation North Extension. A new land use consent is sought for the additional areas of land disturbance. Proposed conditions are discussed in Section 10 below.

**TABLE 3: ACTIVITY STATUS AND CONSENTS REQUIRED – DUNEDIN CITY COUNCIL OPERATIVE PLAN**

Type	Purpose	Plan Rule	Activity Status
Land Use	a) Extraction of minerals and overburden by mechanical means from Coronation North Pit (centred at grid reference NZTM 1394460E 4978050N);	6.5.6(v) 17.7.5	Discretionary Restricted Discretionary
	b) Deposition of waste rock produced by the operation to Coronation North Waste Rock Stack(centred at grid reference NZTM 1395310E 4978930N) and the deposit of waste rock as backfill into the Coronation North open pit;	6.5.6(v)	Discretionary
	c) Construction, operation and maintenance of various silt ponds and silt control facilities for controlling runoff from mining operations;	6.5.6(v) 17.7.5	Discretionary Restricted Discretionary
	d) Construction and use of haul roads;	6.5.6(v) 17.7.5	Discretionary Restricted Discretionary
	e) Construction and use of temporary buildings;	6.5.6(v)	Discretionary
	f) Earthworks in wetlands;	16.6.2(ii)	Discretionary
	g) Clearance or modification of indigenous vegetation;	16.6.2(i)	Discretionary
	h) Decommissioning and rehabilitation of the structures and works listed above;	6.5.6(v)	Discretionary
	i) The excavation, construction and operations of Coal Creek Dam and tracks associated with mining.	6.5.6(v)	Discretionary

**TABLE 4: ACTIVITY STATUS AND CONSENTS REQUIRED – DUNEDIN CITY COUNCIL 2GP**

Type	Purpose	Plan Rule	Activity Status
Land use	Mining (not in a General Residential 1 Transition Overlay Zone)	16.3.3 15	Discretionary
	Buildings and structure activities	16.3.4 3	Permitted
	Earthworks – large scale	8A.3.2.3	Restricted discretionary

### 3.3 Waitaki District Council

The Waitaki District Council issued Land Use Consents 201.2016.779 for the Coronation North Project and amended 201.2013.360.1 for the Coronation Project. As with the existing Otago Regional Council consents, other than recording an extension to the footprint area of the Coronation North pit and amendment to the waste rock stack location no material change is sought in the existing WDC consent conditions for the Coronation North Extension Project. The variation sought will change the naming conventions associated with the Coronation North Project and replace approved maps/plans with updated maps/plans that include reference to Coronation North Extension.

**TABLE 5: ACTIVITY STATUS AND CONSENTS/CONSENT VARIATIONS REQUIRED – WAITAKI DISTRICT COUNCIL OPERATIVE PLAN**

Type	Purpose	Plan Rule	Activity Status
Land Use	a) Deposition of waste rock (centred at grid reference NZTM 1395770E 4977492N) as backfill into the Coronation open pit;	6.3.2(1) (within MMP Mineral Zone)  4.3.3(4) (within Rural Scenic Zone)	Restricted Discretionary  Discretionary
	b) Operation and maintenance of various silt ponds and silt control facilities for controlling runoff from mining operations;	6.3.2(1) within MMP Mineral Zone)  4.3.3(4) (within Rural Scenic Zone)	Restricted Discretionary  Discretionary
	c) Use of haul road;	6.3.2(1) (within MMP Mineral Zone)  4.3.3(4) (within Rural Scenic Zone)	Restricted Discretionary  Discretionary
	d) Use of 2 haul road crossings;	6.3.2(1) (within MMP Mineral Zone)  4.3.3(4) (within Rural Scenic Zone)  12.1.1	Restricted Discretionary  Discretionary  Discretionary
	e) Variation to timing of re-opening of Golden Point Road;	6.3.2 (within MMP Mineral Zone)  4.3.3(4) or 4.4.3(14) (within Rural Scenic Zone)	Discretionary  Discretionary
	f) Use of temporary buildings;	10.1.1.2	Discretionary
	g) Use and storage of hazardous substances (explosives and diesel);	16.1.2(1)	Discretionary
	h) Decommissioning and rehabilitation of the structures and works listed above.	4.3.3(4)	Discretionary

## 4 STATUTORY CONSIDERATIONS

OceanaGold originally applied to vary its existing consents, however after discussions with the DCC OceanaGold is now applying for new consents to authorise the Coronation North Extension.

The DCC land use consent being sought represents a small increase in the size of the pit footprint to allow additional ore to be accessed and to lay back the pit wall to improve stability. No changes to the transportation and processing of ore are contemplated. No increase to the footprint and volume of waste rock storage is proposed, rather the design of the waste rock stack has been optimised resulting in modification of the location and a reduced footprint area. This is because the pit extension allows OceanaGold to backfill into the enlarged pit, and therefore reduces the amount of material to be deposited in the waste rock stack. The Coronation North Extension will Result in an extension of four months beyond the three mining period however no new adverse effects that are more than minor are to occur

No new activities requiring new regional council consents are being undertaken. The existing regional consents relevant to the Coronation North pit will continue to apply to the varied mining activity and the only changes contemplated are a relocation of the pit cut-off drain to a slightly more upstream point (but still within the area covered by the existing consent) and an increase in the area of the pit that is expected to fill as a lake over time, once mining has ceased. No substantive changes to any regional council consent conditions are proposed, only replacement of approved plans.

### 4.1 Part II of the RMA

In August 2018 the Court of Appeal released its decision on *RJ Davidson Family Trust v Marlborough District Council* [2018] NZCA 316. The Court held that in the context of resource consent applications, a consent authority is not prohibited from considering Part 2 of the Resource Management Act 1991 (RMA). Instead Part 2 provides "strong directions, to be borne in mind at every stage of the planning process", however this should not be to the extent that Part 2 is used to subvert an otherwise clear direction in a planning instrument. It is therefore seen as relevant and appropriate to consider Part 2 of the RMA.

The purpose of the RMA through section 5 is to promote the sustainable management of natural and physical resources. Section 5 defines "sustainable management" as:

"Managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –

- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
- (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment."

The Coronation North Extension Project achieves the purpose of the RMA. It will allow additional ore to be accessed and processed utilising the existing infrastructure and mining methods. The ability to structure operations so that waste can be progressively backfilled into the pit without generating additional truck movements or needing a larger waste rock stack is also economical. It is therefore an efficient use of resources and will contribute to the ongoing social and economic needs of the community by further enhancing the ongoing sustainability of the operation.

The sustainable nature of mining activities undertaken by OceanaGold for 28 years has been recognised through the numerous resource consents issued for mining at Macraes. Of particular relevance, the consent authorities recognised through the granting of consents for the Coronation North Project that the mining of the Coronation North resource in the manner proposed promotes sustainable management. The Coronation North Extension Project proposes these same methods being extended to a slightly enlarged pit area, and OceanaGold's view is that the same analysis as to the appropriateness of mining at Coronation North that was applied by the consent authorities when consents were granted applies to the extension.

Section 6 of the RMA states that in achieving the purpose of the RMA all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the various matters of national importance. None of the listed matters of national importance are invoked by the Coronation North Extension Project. In particular, in relation to the protection of areas of significant indigenous vegetation and significant habitats of indigenous

fauna as required by section 6(c) it is noted that the ecological assessment states that no new significant areas or species have been encountered in the area of the proposed pit extension and therefore the existing conditions regarding ecological mitigation and compensation remain appropriate.

Section 6(a) provides for the preservation of wetlands and the protection of them from inappropriate use and development. The ecological assessment concludes that the avoidance of already consented area provides for net gain in biodiversity as a result of the Coronation North Extension Project, but also suggests restoration of wetlands currently contained within an existing protected area

Section 6(b) provides for the protection of outstanding natural features and landscapes from inappropriate use and development. The operative DCC Plan lists part of the project area as an outstanding landscape. However, the DCC's second generation district plan ("2GP") was notified in 2015 and it no longer classified the area as outstanding landscape. There were no public submissions that requested the area be re-classified as outstanding landscape. Decisions on the 2GP were notified on 7 November 2018. 83 appeals on the 2GP have been lodged in the Environment Court and there are no appeals relating to the landscape classification in the project area. Now that decisions have been released the provisions of the 2GP that are not under appeal replace the provisions in the operative Plan. Therefore, although the operative plan identifies part of the project area as an outstanding landscape this is no longer relevant. . Regardless, the visual impacts of the proposed pit extension and re-designed waste rock stack have been assessed as no more than minor.

In relation to the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as required by section 6(c) it is noted that the ecological assessment concludes that no new significant areas or species have been encountered within the Project's footprint and the avoidance of already consented land will result in a net gain in biodiversity. Therefore the existing conditions regarding ecological mitigation and compensation remain appropriate.

The matters of national importance in 6(d) and (f) are not considered relevant here – this is private land and there is no public access, and there is no historic heritage identified within the project area. In any event OceanaGold operates an accidental discovery protocol that would apply should any heritage items be discovered during development.

Matters 6(e) and 6(g) - the relationship of Maori to the site and protection of customary rights – have to the best of OceanaGold's knowledge already been addressed by the cultural impact assessments (CIA) that were completed for the Coronation and Coronation North projects. However, OceanaGold is consulting Nga Runanga on this application and should any new, previously unidentified, matters arise is open to considering and appropriately responding to them.

In respect of management of significant risks from natural hazards under 6(h) OceanaGold considers the mine development will continue to be designed and constructed utilising expert advice that will ensure that hazards are appropriately assessed and managed.

Section 7 of the RMA states that in achieving the purpose of the RMA, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to a range of matters, namely:

- "(a) Kaitiakitanga;*
- (aa) The ethic of stewardship;*
- (b) The efficient use and development of natural and physical resources;*
- (ba) The efficiency of the end use of energy;*
- (c) The maintenance and enhancement of amenity values;*
- (d) Intrinsic values of ecosystems;*
- (e) Repealed;*
- (f) Maintenance and enhancement of the quality of the environment;*
- (g) Any finite characteristics of natural and physical resources;*
- (h) The protection of that habitat of trout and salmon;*
- (i) The effects of climate change;*
- (j) The benefits to be derived from the use and development of renewable energy."*

Section 7 (ba), (h), (i) and (j) are not relevant to this application.

In respect of section 7(a) and (aa), as mentioned above a CIA that was completed for the Coronation Project was updated for Coronation North and raised no matters of particular cultural concern. Given the

minor changes proposed as part of the Coronation North Extension Project OceanaGold does not consider that section 7(a) and (aa) require particular regard. Nevertheless, further consultation with iwi will be undertaken as a means to address their concerns (if any).

The Coronation North Extension Project represents an efficient use of resources under section 7(b) because it utilises existing physical resources from the operation and further develops a natural resource that is recognised as being of value to the district and regional community.

In terms of section 7(c) the definition of amenity values means "*those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes*". The amenity values of the area include most notably the modified landscape and associated industrial scale activities associated with mining at Coronation North and Coronation. The changes in amenity value of the area as a consequence of the Coronation North Extension Project are less than minor. In this connection it is important to note that the pit and waste rock stack areas are on private land are not accessible to the public.

In respect of section 7(d), (f) and (g) the intrinsic values of the ecosystems, including the flora and fauna that form part of them, at the Coronation North Project Area and downstream will continue to be appropriately protected, remedied or mitigated in accordance with the existing conditions of consent. In particular, the consented rehabilitation approach will ensure the longer term quality of the natural and physical resources within the area.

It is considered that the application is consistent with the requirements of Sections 6 and 7 of the RMA.

Section 8 of the RMA requires all persons acting under the RMA to take into account the principles of the Treaty of Waitangi. This will be addressed by having ongoing regard to the existing CIA, and through ongoing consultation with iwi.

#### **4.1.1 Section 105 of the RMA**

When considering an application for a discharge permit, section 105(1) of the RMA requires regard to be had to:

- "(a) The nature of the discharge, the sensitivity of the receiving environment, and the applicant's reasons for the proposed choice;*
- (b) Any possible alternative methods of discharge including discharge into any other receiving environment."*

OceanaGold has chosen to locate the Coronation North Extension Project as proposed because that is where additional gold resources have been discovered and it is economically sensible to extend the existing pit to access this material. As with the existing consented discharges from Coronation North pit the discharges from the Extended Coronation North Pit are unavoidable and OceanaGold will manage them into the ultimate receiving environments in the same manner as the existing discharges so that they will not give rise to anything other than minor effects.

The discharge of waste rock to land is located largely within the existing consented footprint of the Coronation North WRS and more efficiently manages waste rock disposal, thus reducing the footprint area of the WRS and having overall lesser effects on the receiving environment.

#### **4.1.2 Section 107 of the RMA**

Section 107(1) of the RMA states that a discharge permit shall not be granted if, after reasonable mixing, the contaminant or water discharged is likely to give rise to all or any of the following effects in receiving waters:

- (c) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended material; or
- (d) Any conspicuous change in the colour or visual clarity; or
- (e) Any emission of objectionable odour; or
- (f) The rendering of freshwater unsuitable for consumption by farm animals; or
- (g) Any significant adverse effects on aquatic life.

The changes contemplated as part of the Coronation North Extension Project do not alter the conclusion of the Coronation North assessments which indicated that provided proposed mitigation measures are implemented, the discharges should not give rise to any of the effects listed above.

## 4.2 National Environmental Standards (NES)

The following current NES were relevant to the Coronation North Project and continue to be relevant to the Extension project:

- Air Quality Standards;
- Assessing and managing contaminants in soil to protect human health.

### Air Quality Standards

As the Beca 'Assessment of Environmental Effects of Discharges to Air' report states (refer Appendix 3 of the Coronation North application) there were no restrictions under the National Environmental Standards for Ambient Air Quality (NESAQ) to the granting of consent for the Coronation North Project, and that continues to be the case for the Extension Project.

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<sub>10</sub>), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>2</sub>), carbon monoxide (CO) and ozone (O<sub>3</sub>) came into force on 1 September 2005. The standard of relevance to this application is the NES for PM<sub>10</sub>. The PM<sub>10</sub> standard allows a maximum of one exceedance per year of a PM<sub>10</sub> concentration of 50 µg/m<sup>3</sup> (24 hour average).

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

The proposed Coronation North Extension 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<sub>10</sub> 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 continuation of the air discharge consent for the Extension Project.

### Contaminated Land

Under the regulations that govern assessing and managing contaminants in soil to protect human health, land is considered to be actually or potentially contaminated if an activity or industry on the Hazardous Activities or Industries List (HAIL) has been, is, or is more likely than not to have been, undertaken on that land. The additional land upon which the Coronation North Extension Project is to be located has not been used for any of the activities listed on the HAIL because it has been used for farming, predominantly grazing. There are therefore no restrictions to the granting of consent for the Coronation North Extension Project with regard to managing contaminants in soil to protect human health.

## 4.3 National Policy Statement for Freshwater Management

The NPS for freshwater management took effect on 1 July 2011 and was updated in 2014 to provide greater direction for Councils in setting freshwater objectives and limits in their regional plans by prescribing a National Objectives Framework (NOF) and the NPS was further amended in 2017. It provides overarching objectives and policies for managing the quality and quantity of freshwater resources within the country. The NPS was considered prior to the granting of consents for Coronation North. As the Extension Project has less than minor changes to freshwater resources from the consented effects of Coronation North it is considered that the proposal is not in conflict with the NPS.

## 4.4 Regional Policy Statement for Otago (RPS)

The Otago Regional Policy Statement (RPS) was made operative on 1 October 1998. The RPS gives an overview of the resource management issues facing Otago and establishes policies and methods to manage Otago's natural and physical resources.

The Proposed RPS was publicly notified on 23 May 2015. OceanaGold made extensive submissions on the Proposed RPS and opposed the Proposed RPS's failure to adequately acknowledge that mining is

location specific and the mining resources may be situated where other values (for example ecological values or heritage values) are present. The decision on the Proposed RPS released by the Otago Regional Council failed to address these matters in OceanaGold's view. There were numerous appeals filed in the Environment Court including an appeal by OceanaGold which sought to better reflect the regional importance of providing for mining in Otago, and the need to manage mining activities with care where they intersect with other important values such as significant landscape and biodiversity values. Court assisted mediation resulted in significant negotiated changes to the provisions of the Proposed RPS. However, two appeals, one being OceanaGold's appeal, were not resolved through negotiations and became the subject of Environment Court hearings. The issues from OceanaGold's appeal that were heard in court related to mining and indigenous biodiversity offsetting. The decision on OceanaGold's appeal has not yet been released. The Environment Court released a decision on the other appeal on 28 September 2018 and it has been appealed to the High Court, with a hearing set down in June 2019. The other appeals with resolved matters were placed before the Environment Court for consent orders to be made and consent orders have been granted.

The proposed RPS has been made partially operative from 14 January 2019. The Partially Operative Otago Regional Policy Statement 2019 (changes as a result of appeals) ("POORPS") brings into force the provisions of the proposed RPS that are no longer subject to appeal. The POORPS aims to ensure Otago's natural and built resources are managed well – now and for the future.

District and regional councils need to give effect to the RPS when making decisions about resource consents. Where there is an operative RPS and a proposed RPS both documents must be considered and the Proposed RPS is given weight depending on how far through the planning process it has progressed. It is considered that the majority of the POORPS can be given full weight. However, the mining and biodiversity offsetting provisions in the RPS remain operative and provisions in the POORPS on those issues can be given little weight as they remain under appeal and do not have full legal force.

The assessment of environmental effects that accompanied the application for consents for Coronation North included an analysis of the relevant provisions of the Operative and Proposed RPSs. The analysis concluded that the Coronation North proposal was consistent with the purpose and principles of the relevant provisions of the Operative RPS and generally consistent with the Proposed RPS. An assessment of relevant Operative RPS provisions that remain in force and the POORPS follows.

### **Operative RPS**

Under Issue 5.3.2 it is identified that the primary productive capacity of Otago's land resource may be compromised by activities which result in loss of vegetation cover, or the spread of plant and animal pests or degradation of the soil resource, or flooding or inadequate drainage. And Issue 5.3.5 identifies that land use activities can adversely affect ecological, amenity and intrinsic values associated with Otago's significant indigenous vegetation and significant habitats of indigenous fauna.

Objective 5.4.1 seeks:

*To promote the sustainable management of Otago's land resources in order:*

- (a) To maintain and enhance the primary productive capacity and life-supporting capacity of land resources; and*
- (b) To meet the present and reasonably foreseeable needs of Otago's people and communities.*

And Objective 5.4.2 seeks to "avoid remedy or mitigate degradation of Otago's natural resources resulting from activities utilising the land resource."

Associated policies are: 5.5.3 – maintain and enhance land resource through avoiding, remedying or mitigating adverse effects of activities; 5.5.4 – promote diversification and use of land resource to achieve sustainable land use and management systems for future generations; and 5.5.5 – minimise adverse effects of land use activities on the quality and quantity of water resource through promoting and encouraging the... (b) maintaining and where practicable enhancing, vegetation cover, upland bogs and wetlands to safeguard land and water values.

This project is consistent with the purpose of sustainable management. Ongoing mining helps support the economic and social wellbeing of the Macraes community and wider region by the provision of jobs, expenditure in the region and involvement of the workforce in community groups and clubs. During the extension project OceanaGold will continue to operate in a manner that adequately manages pest and weed control and drainage. As previously stated, there have been no significant terrestrial ecology values identified in the extended pit project area and the values that exist in the amended WRS footprint are overall of lesser significance than the values that will be avoided in the currently consented WRS footprint

Additional mitigation is also proposed to account for loss specific habitat loss. Rehabilitation that will return the land to its primary production use following completion of mining and the productive capacity of the land will be maintained.

Issue 5.3.4 identifies that Otago's outstanding natural features and landscapes are threatened by inappropriate subdivision, use and development. Objective 5.4.3 is *"to protect Otago's outstanding natural features and landscapes from inappropriate subdivision, use and development."* And Policy 5.5.6 seeks *"to recognise and provide for the protection of Otago's outstanding natural features and landscapes"*. The project is not located in an area of ONF or ONL and has previously been granted consent which demonstrates that it is not considered to be inappropriate use or development in this location.

Issue 5.3.7 identifies that access to mineral resources may be compromised through the inappropriate location of other development activities above or in close proximity to the mineral resource. Policy 5.5.8 is *"To recognise known mineral deposits and to consider the potential for access to those mineral resources to be compromised or removed by other alternative land development."* Although this issue is not relevant to this project it demonstrates that the Operative RPS recognises that minerals are an important resource for the people and communities of Otago in providing for their present and future wellbeing and acknowledges that mineral resources are fixed and can only be utilised in the location where they are found.

Objective 5.4.5 is *"To promote the sustainable management of Otago's mineral resources in order to meet the present and reasonably foreseeable needs of Otago's communities"*. Since the location of minerals is fixed there is no alternative location for the Coronation North Extension Project. The project proposal supports the continuation of mining under new or varied consents in a manner that provides for sustainable management of the resource. The project will support ongoing social and economic benefits to the community.

Chapter 6 relates to Water and identifies as an Issue that *"Ecological, amenity and intrinsic values associated with Otago's wetlands are compromised by ...(c) adverse effects of activities in and round wetlands"* (Issue 6.3.7).

Objective 6.4.3 seeks to safeguard the life-supporting capacity of water resources through protecting their quantity and quality. Objective 6.4.4 seeks to maintain and enhance the ecological, intrinsic, amenity and cultural values of water resources. Objective 6.4.5 is to avoid, remedy or mitigate degradation of water resources resulting from the use or development of the beds of water bodies and of adjacent land areas.

Policy 6.5.6 aims to protect Otago's significant wetlands from the effects of activities **except where** the activity can be shown to have no significant adverse effects on factors including *"(a)(iii) the natural hydrological characteristics of the wetland", "(a)(v) habitats of indigenous fauna", "(a)(vi) amenity values", "(a)(vii) intrinsic values of ecosystems" or except where "(b) alternative habitats of a similar or improved nature are provided in compensation for any loss of habitat."* Policy 6.5.9 is *"to allow for the community's use, development...of the beds...of Otago's water bodies provided (a) Any adverse effects on (ii) the natural character of the water body; or (iii) habitats of indigenous fauna; or (iv) amenity values; or (v) intrinsic values of ecosystems are avoided, remedied or mitigated, and that the life supporting capacity of the water body is maintained and, where practicable, enhanced..."*. Mitigation measures outlined in section 6.1.4 are believed to fulfil the aims of Policy 6.5.6.

### **POORPS (Changes as a result of appeals)**

Objective 1.1 is that *'Otago's resources are used sustainably to promote economic, social and cultural wellbeing for its people and communities'*. Policy 1.1.1 seeks to *"provide for the economic wellbeing of Otago's people and communities by enabling the resilient and sustainable use and development of natural and physical resources"*. The project will enable continued operation at Coronation North which promotes local and regional economic and social benefits.

Chapter 2 of the POORPS relates to recognition of Kai Tahu values and interests. As discussed, there are no known wahi tapuna sites affected by the project and the previous Cultural Impact Assessments and OceanaGold's accidental discovery protocols ensure there are appropriate procedures in place in the event any important sites are discovered. Policy 2.2.1 seeks to support Kai Tahu wellbeing by safeguarding the life-supporting capacity of natural resources. It is considered that this project is not incompatible with that intent.

Chapter 3 of the POORPS – Otago has high quality natural resources and ecosystems – contains objectives and policies regarding biodiversity. They remain under appeal therefore they are not discussed further in this assessment.

Chapter 4 of the POORPS – Communities in Otago are resilient, safe and healthy – contains objectives and policies regarding natural hazards, climate change, energy resources, nationally and regionally significant infrastructure, urban growth and hazardous substances which are not considered directly relevant to this project. Policies of relevance include:

Policies 4.1.4 and 4.1.5 – assess and manage activities for natural hazard risk to people, property and communities, It is considered that improving the stability of Coronation North pit to enhance its performance in a natural hazard seismic event is consistent with this policy approach. The WRS will continue to be designed and constructed in accordance with best industry practice regarding long-term stability and safety.

Policy 4.6.2 managing the use, storage and disposal of hazardous substances; and Policy 4.6.8 managing waste storage and disposal. All of OceanaGold’s operations at the MGP, including this extension project, meet the requirements set out in these policies.

Policy 4.6.9 seeks to avoid the creation of new contaminated land, and where this is not practicable, to minimise adverse effects on the environment. There are additional areas of land required for the extension project including a small area of farmland that will become waste rock stack. OceanaGold will take appropriate measures to minimise any adverse environmental impacts.

Chapter 5 of the POORPS – ‘People are able to use and enjoy Otago’s natural and built environment’ – contains objectives and policies which this project is consistent with. Relevantly:

Objective 5.2 and policies 5.2.1, 5.2.2, and 5.2.3 seek to recognise and identify historic heritage and manage adverse effects upon it. There are no known heritage sites impacted by this project and the area is previously modified land so it is not anticipated that any will be found, however OceanaGold operates an accidental discovery protocol and if any heritage features are discovered appropriate steps will be followed to investigate and record them.

Objective 5.3 – ‘Sufficient land is managed and protected for economic production’ – is supported by Policy 5.3.1(b) which aims to manage activities in rural areas to support the region’s economy and communities, by providing for mineral exploration, extraction and processing. The extension project will assist to provide for the MGP to continue operating and supporting the economy and local communities.

Chapter 5 also contains the mining and biodiversity offsetting provisions that remain under appeal, and which are not considered here.

Overall OceanaGold considers that the Coronation North Extension Project will be consistent with both the Operative RPS and the POORPS.

#### **4.5 Regional Plan: Water for Otago (RPW)**

The following policies from Chapter 5 (Natural and Human Use Values), Chapter 6 (Water Quantity), Chapter 7 (Water Quality), Chapter 8 (The Beds and Margins of Lakes and Rivers) and Chapter 9 (Ground Water) of the RPW were assessed as relevant to the Coronation North Project applications, and are therefore relevant to the Extension project to the extent that it concerns the same water bodies in and around the Coronation North pit.

In terms of Chapter 5:

- Policy 5.4.3
- Policy 5.4.8
- Policy 5.4.9
- Policy 5.4.10

Overall the Coronation North Extension Project applications are considered to be consistent with Chapter 5 of the RPW. The existing activities will have an effect on surface and ground water values but proposed conditions of consent will ensure that these effects are avoided and mitigated as far as practically possible. That will continue to be the case with the Extension Project. Existing lawful uses or priorities for the use of water will still be avoided (Policy 5.4.3). Because the takes are from the open pit area, as opposed to

directly from a watercourse, there are no features or values of watercourses that need to be had regard to (Policies 5.4.8, 5.4.9 and 5.4.10).

The following policies in Chapter 6 were assessed as relevant to the Coronation North Project and are therefore relevant to the Extension Project to the extent that it involves ongoing impacts in the area of the Coronation North pit:

- Policy 6.4.0
- Policy 6.4.0A
- Policy 6.4.0C
- Policy 6.4.1A
- Policy 6.4.10A3(d)
- Policy 6.4.16
- Policy 6.4.19
- Policy 6.5.6

Water takes are necessary to manage groundwater that collects in the open pit as opposed to being a water take that is directly from a water course. Accordingly there are no instream values that will be affected by the taking of groundwater. Pit dewatering for hard rock mining activities is provided for in Policy 6.4.10A3(d) when the aquifer is not mapped in the C-series of the RPW, and this aquifer is not mapped. It is considered that the Coronation North Extension Project application is consistent with the purpose and principles of Chapter 6.

The following policies from Chapter 7 of the RPW concern discharges:

- Policy 7.B.2
- Policy 7.B.6
- Policy 7.B.8
- Policy 7.C.2
- Policy 7.C.3

These policies were considered as part of the Coronation North Project and overall the application was considered to be consistent with the purpose and principles in Chapter 7 of the RPW. No changes to volumes and types of discharges are proposed as part of the Coronation North Extension Project, and OceanaGold considers this conclusion remains valid.

The following policies from Chapter 8 of the RPW were considered relevant to the Coronation North Project:

- Policy 8.4.2
- Policy 8.5.3
- Policy 8.6.1
- Policy 8.6.2
- Policy 8.8.1
- Policy 8.8.2

OceanaGold will continue to operate erosion and sediment control plans as part of the Coronation North Extension Project to ensure the effects of activities adjacent to water courses continue to be controlled and to minimise any reduction in water clarity caused by bed disturbance. There are no practical alternatives to the proposed reclamation of water courses if the Coronation North Extended Pit is to be constructed. Waste rock, rather than clean fill, will be used in the reclamation of water courses but, other than in that respect, the applications are considered overall to be consistent with Chapter 8 of the RPW.

## 4.6 Regional Plan: Air for Otago (RPA)y

The RPA became operative in 2003 and was amended in 2006 and 2009.

Objectives 6.1.1, 6.1.2 and 6.1.3 provide:

*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.*

The proposal is considered consistent with these objectives.

*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 extension proposal should not result in adverse effects on the relationship that Kai Tahu, as Kaitiaki, have 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<sub>10</sub> in the vicinity of the current Macraes Gold Project mining activity has found that concentrations are well below the NES and Otago Goal Levels.

*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 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 effects of the proposed Coronation North Extension Project will be the same as those assessed for the Coronation North Project. The current operation has not caused any effects to date that have been considered to be noxious, dangerous, offensive or objectionable and similarly it is expected that the discharges from the extended pit area will not be 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 currently employs dust mitigation methods which have been demonstrated to be effective, and these will continue to be used.

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

## **4.7 Dunedin District Plan**

### **4.7.1 Landscape**

Chapter 14 of the Dunedin City District Plan (“DDP”) records objectives and policies to identify and protect the important characteristics of Dunedin’s outstanding landscapes. This includes the High Country Outstanding Landscape Area (“HCOLA”) outlined in 14.5.1(b) (page 14:13), where the Coronation North Pit is located. The features to be protected in the HCOLA include: “the highly coherent natural landform under an apparently largely unmodified grassland vegetative cover; the very limited visual impact of any human imposed element; the rock outcrops which give rise to a dramatic skyline and create particular visual interest generally; the large scale, open, expansive, remote wilderness character; the vegetation patterns which reinforce and reflect landform character; the fragile ecosystems.” The principal threats to visual quality, which are controlled by rules in the DDP, are considered to be: “roads and tracks; and excavations – inappropriate siting and scale of ... excavations such that they become visually dominant focal points.” Other threats to visual quality, which are covered by design guidelines that operate in conjunction with the DDP, include: “structures - inappropriate siting, design, scale and finish of structures such that they become visually dominant from public viewpoints; areas of indigenous vegetation – removal or diminution of significant natural features such as areas of indigenous vegetation.”

Assessment matters in section 6.7 of the DDP include: sustainability; manawhenua; amenity values; cumulative effect; intensity of activities; noise; glare and lighting; visual impact; clearance of vegetation; archaeological sites; indigenous vegetation and habitats; hazards; landscape; conflict and reverse sensitivity.

As previously mentioned, it is considered that the HCOLA is no longer relevant to the extension project as the 2GP is now in force.

#### **4.7.2 Hazards**

Chapter 17 of the DDP addresses the issue of seismic risk. Seismic risk is addressed through existing conditions of consent, and no changes to the consent conditions are necessary or sought for this topic, therefore it is considered that the Coronation North Extension Project is consistent with the objectives and policies in this part of the DDP.

Hazardous substances are also covered in Chapter 17. As with existing operations, OceanaGold considers that activities within the extended Coronation North Pit will be consistent with the objectives and policies of this part of the DDP.

Earthworks are controlled in Dunedin according to their location and scale: policy 17.3.9. This means resource consent is only required where the scale and/or location of earthworks are such that adverse effects are likely. If resource consent is required the range of effects assessed is tailored to the scale and location of the earthworks.

#### **4.7.3 Indigenous Vegetation and Fauna**

Chapter 16 of the DDP contains objectives and policies to promote retention of remaining areas of indigenous vegetation and habitats of indigenous fauna. The Coronation North Extension Project is not located in an area of ‘significant conservation value listed in Schedule 25.4’. Vegetation clearance and earthworks (including deposit of fill in wetlands) requires discretionary activity consent under rule 16.6.2.

#### **4.7.4 Manawhenua**

The objectives and policies contained in Chapter 5 have been observed by OceanaGold’s consultation with manawhenua and commissioning of a CIA in connection with the Coronation and Coronation North projects. The company will continue to consult with iwi in relation to all aspects of the Macraes operation, including the proposed extension to Coronation North pit and waste rock stack reconfiguration.

#### **4.7.5 Sustainability**

Objectives and policies in Chapter 4 of the DDP seek to achieve the sustainable management of the city’s resources, in accordance with the purpose of the RMA. Overall, taking into account that it is proposed that the same or very similar conditions of consent continue to apply, it is considered that the Coronation North Extension Project satisfies this purpose.

#### **4.7.6 Farming Activity**

Relevant to the permitted baseline, it is noteworthy that stock grazing is a permitted activity in the Rural Zone. Vegetation clearance associated with farming activity is also permitted, although clearance of a wetland where the vegetation is not totally separated from other indigenous vegetation, is more than 5 hectares in area and includes a threatened species listed in Appendix 16A of the Plan (for instance *Olearia bullata* or *Chionochloa rubra subsp. Cuprea*) would be a discretionary activity that required resource consent.

#### 4.8 DCC Proposed 2GP

The Dunedin City Council's proposed 2GP was notified on 26 September 2015. Hearings on the 2GP have concluded and the decisions were released on 7 November 2018. This means that the rules in the 2GP that are not under appeal now have "legal effect". The objectives and policies of the proposed 2GP need to be considered alongside the objectives and policies of the operative DCC Plan and given appropriate weight depending on how far through the Schedule 1 RMA process the 2GP has progressed.

The introduction to the rural zone section recognises that "The rural environment contributes significantly to Dunedin's economy through rural primary production activities such as farming, and forestry, **and mining...**" (emphasis added).

The Coronation North Pit (including the proposed extension) sits within the DCC High Country Rural Zone, and as a result of the decisions the site is also within the Taieri Ridge and Mare Burn mapped area (this is discussed further below). Potential adverse effects of mining on the amenity of residential activities on surrounding properties are to be avoided or, if avoidance is not practicable, adequately mitigated (Policy 16.2.2.5). Adverse effects on residential amenity will be avoided. The nearest non-OceanaGold owned residences to the Coronation North Pit are 2.0 km (Howards), 4.8 km (Vanderley) and 2.4 km (O'Neil). The Assessment of Effects of Discharges to Air that accompanied the Coronation North applications concluded that with appropriate mitigation any adverse effects downwind of the site are expected to be less than minor. Experience with operating Coronation North has confirmed that this assessment was accurate. No change is expected with the pit extension because the extension allows for backfilling of the pit and therefore there are no additional haul road movements. Similarly, the separation distance and topography between the pit area and the nearest potentially sensitive receptors is such that other amenity effects (such as visual impact, lighting, noise, vibration and fly rock) from activities in the area of the extended pit will be less than minor.

Under Policy 16.2.3.4 mining is only to be allowed where there is reasonable certainty that land will be restored or rehabilitated to an acceptable standard in terms of landform and productive, recreational or conservation use as soon as possible. The extension area of the pit site will be progressively rehabilitated as appropriate and incorporated into the consented Coronation North pit lake which will be formed on closure.

Mining is only to be allowed where adverse effects from large scale development on rural character and visual amenity will be avoided or minimised as far as practicable (Policy 16.2.3.5).

Policy 16.2.3.9 requires activities to be designed and operated to ensure that adverse effects from light spill on rural character and amenity, and the ability of people to view the night sky, will be no more than minor.

Objective 8A.2.1 aims for permitted or approved earthworks to avoid or adequately mitigate any adverse effects on visual amenity and character; the stability of land, buildings, and structures; and surrounding properties.

Section 10 of the 2GP deals with the natural environment and as one of its objectives seeks to maintain and enhance areas of indigenous vegetation and the habitats of indigenous fauna. Specific policies concern mining activity and require restoration of indigenous vegetation where it was cleared for mining, and if this is not practicable to otherwise ensure that biodiversity values are maintained or enhanced (Policy 10.2.1.7). Policy 10.2.2.2 and 10.2.2.3 require buildings, structures, storage and use of hazardous substances, and earthworks - large scale and vegetation clearance to be set back from water bodies an adequate distance to enable the biodiversity and natural character values of coastal and riparian margins to be maintained or enhanced and to minimise erosion.

In considering a discretionary activity application for mining, circumstances that support an application include:

- The activity will be set back a sufficient distance from its own [property](#) boundaries to avoid or adequately mitigate any adverse effects from noise, odour, dust, contaminants or visual effects on surrounding properties (Rule 16.11.2.4(h)). The project achieves this.
- Management plans or other mitigation measures will be used to adequately manage any adverse effects from dust, vehicle movements and operating noise on surrounding properties (Rule 16.11.2.4(h)). OceanaGold already operates under such management plans and will continue to do so.
- There will be no adverse effects in terms of land instability (Rule 16.11.2.4(k)). The extension project is aimed at improving the stability of Coronation North pit so achieves this desirable outcome.

In considering a discretionary activity application for mining, the Council will consider:

- Effects on amenity, including the effects of vehicle movements on the [site](#) as well as any significant changes to the number or nature of vehicle movements on the adjoining [road](#) (Rule 16.11.2.4(l)). Vehicle movements on site and on public roads will not change during the extension project.
- the locational constraints of the resource and logistical and technical access requirements (Rule 16.11.2.4 (m)) and that is a relevant consideration here.
- Effects on rural character values and amenity, including rehabilitation measures that ensure that final landforms will be minimised by blending final contours with surrounding landforms to achieve as natural appearance as possible and by providing for the establishment of vegetation cover appropriate to the local character (Rule 16.11.2.4(n)). OceanaGold's existing rehabilitation plan for waste rock stacks will achieve this outcome.

In relation to earthworks in the rural zone, section 8A of the 2GP now requires the Council to consider the effects on the values specified in Objective 16.2.3 and the effects on the rural character values identified in Appendix A7.

Relevant to the permitted baseline, when compared to the operative DDP the 2GP has been changed but it does not appear to make farming activities significantly more restrictive in the High Country Rural Zone and the Rural Zone (section 16). Both stock grazing and farming are promoted by policies and objectives and are permitted activities. Vegetation clearance is a permitted activity but must be in accordance with the Vegetation Clearance Standards (for example, 10.3.2.3: clearance must not occur within 20m of any wetland identified in Appendix A1.2). Indigenous vegetation clearance is permitted and must also be in accordance with the Vegetation Clearance Standards (for example, rule 10.3.2.A maximum area of clearance for High Country Rural Zone (within the Taieri Ridge and Mare Burn mapped area, which this site appears to be within) is 1,00m<sup>2</sup> for non-tussock species, and 1,000m<sup>2</sup> for tussock species).

## 4.9 Waitaki District Plan

### 4.9.1 Takata Whenua Values

The WDP seeks to protect and, where appropriate, enhance waahi tapu, waahi taoka, cultural property and mahinga kai (Objective 1.3.4(B) and Policies 1.3.5(B)). As these matters have previously been assessed in CIAs prepared for Coronation and Coronation North projects and OceanaGold continues to consult with Nga runanga regarding these values, it is considered that the extension project is consistent with these provisions in the WDP.

### 4.9.2 Nature Conservation Values

Policies relating to the management of conservation values under Issue 8 of the WDP apply to the Project. The WDP has an objective to maintain biological diversity, nature conservation values and ecosystem functioning by protecting section 6(c) RMA areas and maintaining other areas with particular nature conservation values (Objective 16.9.3(1)). Another objective focuses on the maintenance or enhancement of the quality of water, wetlands, and rivers and their margins and the protection of them from inappropriate development (Objective 16.9.2(2)). Further, a policy recognises that areas, other than section 6(c) areas, may have conservation values in terms of maintaining connectivity and providing important habitat for species reliant on patchworks of indigenous vegetation (e.g. birds and lizards) (Policy 16.9.3(4)). Other policies include those seeking to manage the effects of use and development on the natural character of wetlands, rivers and lakes and their margins, and those noting that the WDC takes the opportunity to

promote the retention of indigenous vegetation and habitat when considering resource consent applications (Policy 16.9.3(7), (9) and (10)).

The Project will have some effects on terrestrial ecology and wetland values. The scale of the effects have been assessed in the context of an existing operating mine, and the broader environment, and in comparison to the effects that are already allowed by the existing consented baseline. Overall it is considered that the effects are of lesser consequence than those permitted by the existing consented baseline. Through the avoidance of existing consented land, an overall net gain in biodiversity values is expected from the Project.

#### **4.9.3 Heritage Values**

Under the WDP district wide policies on heritage an objective is to seek the conservation and enhancement of the heritage values of the district, including historic places, waahi tapu sites, and archaeological sites, in order to preserve and manage the character and history of the district (Objective 2.3.1(A)). However the associated policies focus on identifying and protecting important heritage items in the WDP and there are no heritage items listed in Appendix B of the WDP that are proposed to be modified by the Project.

Another policy in the WDP seeks to ensure that all development proposals in the vicinity of recorded waahi tapu and archaeological sites are notified to the takata whenua and the NZHPT (Policy 2.3.2(2)). There are no such known sites but OceanaGold operates accidental discovery protocols that would require notification of any discovery. As such it is considered that OceanaGold has satisfied the intent of this policy.

#### **4.9.4 Natural Hazards**

Part 2, section 4 of the WDP addresses the issue of seismic risk. Expert reports have assessed the geotechnical risk associated with the proposed Pit Extension and waste rock stack and concluded that there is no additional increase in risk profile. Therefore it is considered that the project is consistent with the policies in this part of the WDP.

#### **4.9.5 Transport**

Part 3, section 12 of the WDP contains transport and car parking rules which seek to achieve safe and efficient transport systems within the district. As these rules were all addressed by the previous Coronation and Coronation North projects, and the extension project does not alter any transport or roading but rather continues to operate on the existing haul road using the existing vehicle crossing, it is considered that there will be no change to the safe and efficient movement of traffic.

#### **4.9.6 Rural Amenity**

Part 2, section 16.5 relates to the protection of rural amenity. The WDP has the objective of providing a level of rural amenity that is consistent with the range of activities anticipated in rural areas – and OceanaGold considers that necessarily includes mining activity that is provided for in the mining zone and which has been operating in this rural environment for over 28 years. The intent of the WDP is to ensure that activities do not create “unacceptably unpleasant living or working conditions for the District’s residents and visitors, nor a significant deterioration of the quality of the rural environment” (Objective 16.5.1(4)). Policy 16.5.2(4).3 is relevant as it provides for performance standards to be applied to activities that may cause unpleasant conditions for other people in the rural community. OceanaGold already operates under consent conditions that require it to manage and control noise and dust within specified parameters and it intends to continue to do so.

#### **4.9.7 Hazardous Substances**

An objective within the WDP is to avoid or mitigate adverse environmental effects arising from storage, transportation and disposal of hazardous substances (Part 2, Objective 12.2.2 and associated policies 12.2.3). The MGP has been operating for over 28 years and there have not been any significant issues over the use, transport or storage of hazardous substances on the site. The HSNO Act requires a range of safety and environmental standards to be met at the site, which OceanaGold does. Accordingly, it is considered that the extension project continues to be consistent with the objectives and policies of this part of the WDP.

#### **4.10 KTKO NRMP 2005**

It is recognised that manawhenua have both a spiritual and physical relationship with the natural environment and that traditional Maori values are closely linked to the environment. OceanaGold consulted with Kai Tahu ki Otago Ltd (now Aukaha), as representative of all affected manawhenua, and commissioned a cultural impact assessment on the Coronation and then the Coronation North Project. The CIA addressed all of the relevant assessment matters raised within the KTKO Natural Resource Management Plan 2005 (NRMP). OceanaGold does not consider that any new issues arise in relation to the extended area of the pit or amended waste rock stack proposed in this application.

The NRMP has been developed to:

- Provide the principal planning document for Kai Tahu ki Otago;
- Provide information, direction and a framework to achieve a greater understanding of the natural resource values, concerns and issues of Kai Tahu ki Otago;
- Provide a basis from which the management of the natural, physical and historic resources of Otago is further developed.
- Provide the basis, but not substitute, for consultation and outline the consultation expectations of Kai Tahu ki Otago.

The sections of the KTKO NRMP relevant to the Coronation North Extension Project address:

- Preventing deterioration of water quality;
- The effect of dams on cultural values;
- Ensuring only the minimum amount of water is abstracted;
- Managing instream works to protect nohoanga, mahika kai, fish passage, habitat values;
- Protecting wetlands;
- Encouraging re-vegetation of high altitude ecosystems using indigenous flora of local origin;
- Promotion of Accidental Discovery protocols and other measures to ensure protection of waahi tapu;
- Protection of cultural landscapes.

Overall, the Coronation North Extension Project is considered to be generally consistent with the policies of the NRMP. OceanaGold is consulting on the Extension Project with Aukaha to identify and address concerns (if any).

## 5 EXISTING ENVIRONMENT

The vegetation communities in the Coronation North Project area have been described as mainly narrow-leaved tussock grassland, with limited bluff vegetation associated with rock tors and outcrops, and gully slope matrix vegetation. This environment has been highly modified through pastoral land use. This includes the planting of exotic pasture species, burning of tussock, fertiliser application and the breaking in of land through stock management and grazing.

Figure 1-2 shows the existing landforms as an underlay to the proposed Project Elements of the Coronation North Extension, and includes images of the existing Coronation North and Coronation Pits and Waste Rock Stacks, whilst the current consented footprint of these landforms is shown in Figure 1-3. Because there are existing implemented consents authorising the Coronation North and Coronation Projects, these form part of the existing environment and take into account the mitigation planned and implemented for the Coronation North and Coronation Projects including, but not limited to:

- Plant rescue and relocation for species of concern;
- Establishment of additional lizard stacks for the purposes of research;
- Establishment of Covenants in the Highlay Hill and Island Block;
- Payment into the Habitat Enhancement Fund;
- Progressive Rehabilitation of the WRS in line with rehabilitation objectives which consider long term and short term stability, return to original conditions, visual integration into the surrounding landscape and management of weeds;
- Management and monitoring of amenity effects such as noise, dust, airblast and vibration;
- Management of surface waters in line with the Erosion and Sediment Control Plan;
- Reinstatement of public roads effected by the mine as part of the cessation of mining activities;
- Continuing to implement the Accidental Discovery Protocol, as part of chance finds associated with archaeology and heritage.

Therefore, it is only those additional effects, over and above those which have been consented, which should be considered. It should also be noted that as the Coronation North Extension Project has led to a redesign, the assessment of effects is not only based on negative effects, but also positive effects associated with relinquishment of already consented, but not disturbed, areas within the Coronation North WRS.

The majority of the MGP is situated within the takiwās of Kāti Hūirapa Runaka Ki Puketeraki and Moeraki. Portions of the Coronation Project and the majority of the Coronation North Project fall within the takiwā of Otakou.

OceanaGold, Te Runanga o Moeraki, Kati Huirapa Runaka ki Puketeraki and Te Runanga o Otakou are parties to a Protocol of Engagement signed in July 2018. Under the Protocol the four parties agree to develop a sincere and honest practice of sharing of information to provide for a mutual education to promote a greater knowledge of the operation of the MGP and an understanding and respect for the spiritual and cultural values and customary rights of the whanau and hapu represented by Nga Runanga.

Cultural Impact Assessments (CIA) have been completed for the Macraes Phase III expansion and for the Coronation and Coronation North Projects.

There are existing diesel fuelling facilities in place at Coronation North for refuelling of the heavy vehicle mining fleet. In addition explosives are used as part of the blasting of the open pit areas.

In relation to the Ministry for the Environmental Hazardous Activities and Industries (HAIL) List, the MGP falls under Item D4 “Metal extraction, refining and reprocessing, storage and use, Metalliferous ore processing including the chemical or physical extraction of metals, including smelting, refining, fusing or refining metals”. This is mainly in relation to the MGP Processing Plant area and tailings storage facilities.

## 6 ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 6.1 Terrestrial Ecology

An initial assessment of the terrestrial biodiversity was undertaken by Dr Mike Thorsen for the Coronation North Project on the 16<sup>th</sup> of December 2015, 7<sup>th</sup>, 14<sup>th</sup> and 21<sup>st</sup> January 2016.<sup>2</sup> This information was presented as part of the joint ORC, WDC and DCC Coronation North hearing.

In preparation for the Coronation North Extension Project a further terrestrial biodiversity assessments were undertaken by Dr Mike Thorsen to extend the study area to include the extended Coronation North Pit footprint in July 2018 (refer **Appendix A**) and the newly designed Trimbells WRS and 'give up' area in November 2018 (refer 20 **Appendix B**). Findings are detailed below under the appropriate headings. It is acknowledged that the survey work was conducted during winter for the Pit Extension and therefore was not ideal for identification of plants or herpetofauna, however the original Coronation North EIA which encompasses the extension area was undertaken in summer

#### 6.1.1 Flora

Based on the Coronation North EIA and confirmed in the subsequent survey work the following habitat types and areas were identified within locality of the Pit extension:

- Short tussock grassland;
- Shubland;
- Basalt Contact Seepage Wetland;
- Bluff vegetation; and
- Riparian herbfield & sedgeland.

The Trimbells WRS is composed entirely of narrow leafed grassland 50% ground cover that is recovering from recent burning.

In the footprint of the Pit Extension eight plant species were identified of interest, with seven of those five being registered on the recently updated New Zealand Threat Classification System ("NZTCS") threatened species list. These are *Aciphylla subflabellata*, *Anthosachne falcis*, *Carmichaelia petriei*, *Deyeuxia quadriseta*, *Discaria toumatou*, *Epilobium insulare* and *Leptinella pusilla*, and are all classified as At Risk – Declining. The eighth species of interest is *Oleria bullata*, identified as a 'Threatened Plant' in Appendix 16A of the DCC's District Plan

Of this list of nationally threatened species, the following plants were not identified in the original Coronation North EIA:

- desert broom *Charmichaelia petriei* - widespread in natural vegetation areas of the Macraes Ecological District ("Macraes E.D.");
- inconspicuous grass *Deyeuxia quadriseta* - the status of the inconspicuous grass in the area, and nationally, is poorly known due to its inconspicuous nature;
- small button daisy *Leptinella pusilla* – known from at least eleven sites in the Macraes E.D.; and
- matagouri *Discaria toumatou* – very common throughout most of the natural vegetation areas of the Macraes E.D.

In the original Coronation North EIA, the ecological importance of the dwarf wheatgrass *Anthosachne falcis* was identified as moderate-high on the basis of its naturally uncommon conservation status and discovery

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<sup>2</sup> Reports produced relevant to Coronation Pit (not Coal Creek Dam) were: Coronation North Ecological Impact Assessment, April 2016 [Appendix 6a Coronation North AEE]; Clarifications regarding Coronation North EIA, 23 May 2016 [Appendix 6b Coronation North AEE]; Impact Management of Project Ecological Effects, May 2016 [Appendix 22 Coronation North AEE]. Copies of these reports can be provided on request.

in the Macraes area<sup>3</sup>. Plants of this species are scattered in the extension area and the surrounding Coronation area.

The inconspicuous grass *Deyeuxia quadriseta* was noted at one locality of the Pit extension, outside of the unconsented area. This species is a new addition to the Threat list. It has been noted at a few localities in the Macraes E.D., but its status in the area (and nationally) is poorly known due to its inconspicuous nature.

Small-leaved shrub daisy *Oleria bullata* was identified in the original Coronation North EIA with an ecological importance assessed as low on the basis of its rarity within the DCC boundary, but it was noted that although the species is rare within DCC it is not a nationally rare species or rare within the Macraes E.D.<sup>4</sup> The species is widespread within the Macraes E.D.

The only species of interest within the unconsented area of Trimbells WRS was the At Risk – Declining, matagouri *Discaria toumatou*.

### 6.1.2 Avifauna

The composition of avifauna is likely to be the same as that described in the Coronation North EIA. Pipits (*Anthus novaeseelandiae*) are the only species of interest that might have used this area, but were not found in the Pit Extension of the unconsented Trimbells WRS footprints.

### 6.1.3 Herpetofauna

The composition of the herpetofauna is likely to be the same as described in the Coronation North EIA, with probable habitats for the Declining korero gecko *Woodworthia* “Otago/Southland large” and Not Threatened McCann’s Skink ((clade 4 genotype). However there were no areas of lizard habitat thought to be significant identified during these surveys.

### 6.1.4 Ecological Significance and Mitigation

The additional impacts of the Pit extension and the unconsented area of Trimbells WRS, beyond those that are already consented under the Coronation North consents, include:

- The loss of 33.14 ha of narrow-leaved tussock grassland, 12.42 ha of short tussock grassland, 1.66 ha of shrubland, 1.33 ha of bluff vegetation and 0.64 ha of riparian herbfield and sedgeland, all of mostly moderate quality;
- The 1.48 ha of basalt contact seepage wetlands. These wetlands were identified and assessed in the Coronation North Ecological Impact Assessment. Impacts on the wetlands due to changes in hydrological conditions were assessed as high, and the agreed mitigation package for Coronation North took this effect into account.
- The loss of the flora and fauna that inhabits these communities;
- Loss of some plants of six plant species, and the loss of many plants of matagouri, classified as Declining in the NZ Threat Classification System;
- The loss of some plants of *Olearia bullata*, a plant listed as threatened by the Dunedin City Council;
- Probable loss of some individuals of the korero gecko classified as Declining in the NZ Threat Classification System;
- Probable loss of some individuals of the Not Threatened McCann’s skink.
- Loss of c. 36 ha of moderate quality habitat for pipit, but which is not currently likely to be used due to disturbance from existing mine activities.

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<sup>3</sup> Coronation North Ecological Impact Assessment, April 2016 [Appendix 6a Coronation North AEE] page 67

<sup>4</sup> Ibid, page 94

Dr Thorsen does not consider the additional loss from the Coronation North Extension to materially alter overall the stated impact of the Coronation North Project. Whilst some of the vegetation at this site is categorised as significant under the criteria in the ORC Regional Plan and DCC District Plan as it is inhabited by two to four rare species, this narrow leaved tussock grassland is not considered a rare vegetation community, and the tussock grassland at Coronation North has probably been impacted by anthropogenic process such as Maori burning of eastern South Island dryland forest and influence from agricultural practises such as burning and grazing. Overall, while the Coronation North Extension project will have an adverse, direct, permanent, and irreversible local impact on terrestrial ecology, the magnitude of the project's impact on the areas vegetation at a local scale is assessed as moderate, and at a national level as moderate.

As part of a mitigation package for effects of the Coronation North Extension project, OceanaGold proposes to set aside an area of previously consented footprint of the Coronation Waste Rock Stack. This area, which has previously been mitigated as part of the Coronation North Project consent, consists of 52.5ha within the limits of Area B & C of the consented waste rock stack. It is noted that the original decision to stage the waste rock stack was based on the higher biodiversity values contained within the areas B & C, when compared to Area A and to avoid these values if possible.

The detailed scheduling of waste movement to allow for pit backfilling and the design of the Trimbells WRS has resulted in a modified footprint as described in section 1.3. Surveys of the area set aside, or 'give-up' area, were conducted on 23<sup>rd</sup> November and 14<sup>th</sup> December 2018, by Dr Thorsen and are detailed in the file note found in **Appendix B**. Despite the conditions of the survey being more favourable for the proposed set aside area, when compared with the unconsented areas of the Pit Extension and Trimbells WRS, the ecological features were found to be of higher value. In addition, by shifting the WRS further up the catchment, it becomes more removed from the core of the Recommended Area of Protection, or RAP (as shown in Figure 6-1), which was identified in the original Coronation North consent, thus reduce the fragmentation associated with this area.

Dr Thorsen concludes that the set aside area of the consented waste rock stack, would 'address the effects of the Coronation North Extension in an ecologically meaningful way so that there is a net gain to biodiversity'. Dr Thorsen goes on to note that the only exception to this is the effect to the basalt contact seepage wetland found in the Pit Extension and recommends the rehabilitation of existing wetlands found in the Highlay Hill Covenant.

Therefore, the mitigation package proposed for effects to terrestrial biodiversity from the Coronation North Extension Project will include:

- Avoidance of 52.5ha of existing consented footprint with higher biodiversity value than the proposed footprint; and
- Rehabilitation of basalt contact seepage wetlands found in existing Highlay Hill Covenant;

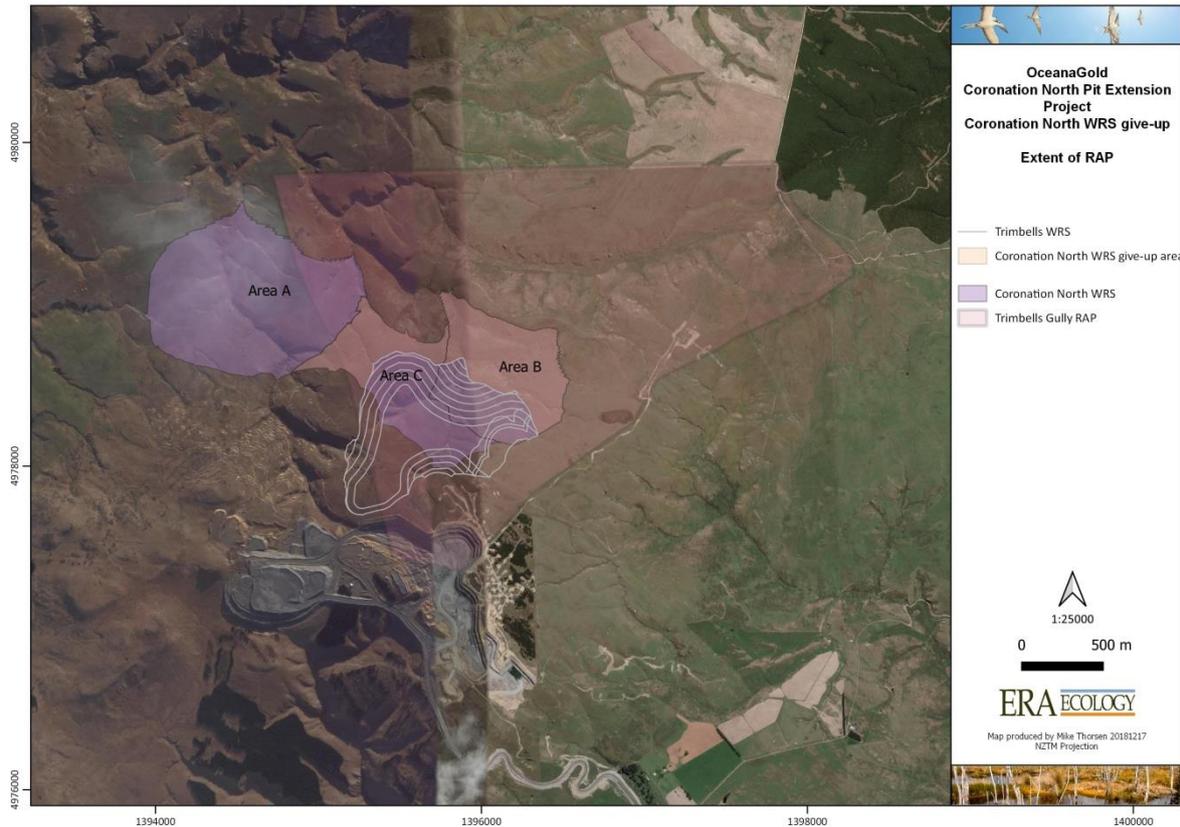


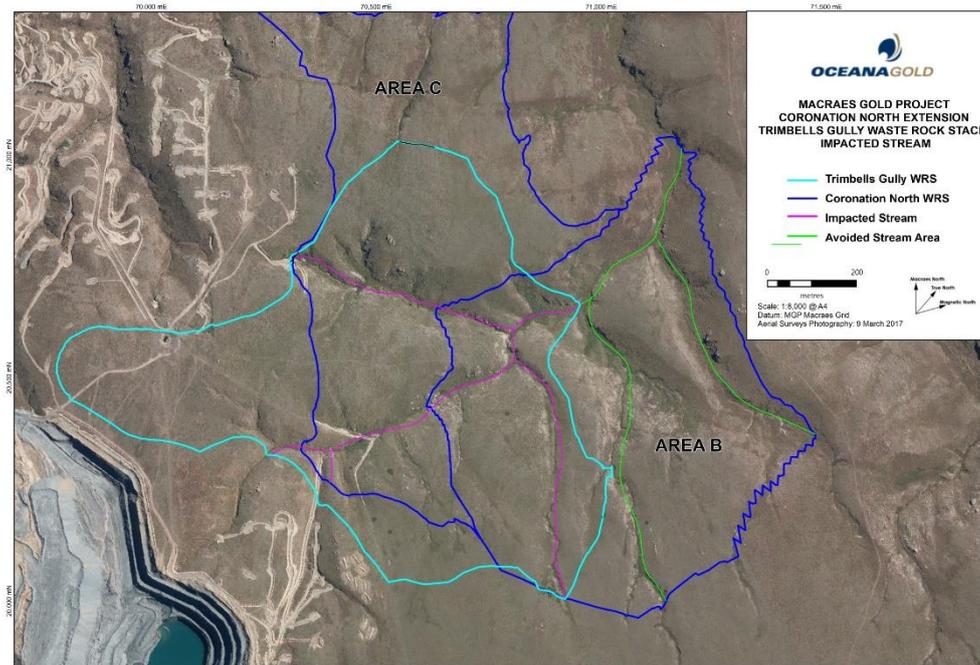
Figure 6-1 Location of Trimbells WRS with respect to RAP

## 6.2 Aquatic Ecology

An ecological assessment of the impact area of the Pit Extension was conducted by Ryder Environmental Limited (“Ryder”) as a desk top exercise and is attached as **Appendix C**. Ryder assessed the project extension area against information gathered for both the Coronation and Coronation North Projects. Their findings were that only a small area of creek will be disturbed by the Coronation North Pit Extension and this is located in the upper reaches of Maori Hen Creek. The amended footprint being the focus of these applications would therefore not constitute additional disturbance in this catchment.

The design of Trimbells WRS has shifted the area of disturbance, further up Trimbells Gully Tributary. The Coronation North Project AEE indicated that most of Trimbells Gully Tributary catchment would be altered, primarily due to the placement of waste rock in the Coronation North WRS. A GIS analysis of Trimbells Gully (as shown in Figure 6-2 Affected & Avoided Streams in Trimbells indicates that the new waste rock stack will affect approximately 2.02km of order 1 stream, almost all of which lies within the consented Coronation North WRS footprint. The length of order 1 stream already consented that would be avoided through the establishment of the set aside would be 2.00m, thus indicating a net gain in overall stream length.

The Pit Extension will affect tributaries that would not support stable aquatic habitat and contribute only a small proportion of flow to Maori Hen, and the Mareburn and the overall effect of Trimbells WRS will be to increase the overall stream length within Trimbells Gully. Therefore the effect of the Coronation North Extension proposal on aquatic ecology can be regarded as less than minor and no further mitigation is offered.



**Figure 6-2 Affected & Avoided Streams in Trimbells Gully**

### 6.3 Geotechnical Assessment

The Coronation North Pit extension and the newly designed Trimbells Waste Rock Stack have been assessed geotechnically by Pells Sullivan Meynink (PSM) and the reports can be seen in **Appendix D**. As with other infrastructure at MGP, the assessment takes into account seismicity as the key natural hazard. In the first report (dated 22<sup>nd</sup> August) PSM confirm that the Pit Cutback will not lead to any change in the geotechnical risk profile of the Coronation North Pit. The second report (dated 28<sup>th</sup> November 2018) confirms that the proposed location and design of the Trimbells Waste Rock stack is suitable and that the waste rock stack does not adversely impact on the stability of the adjacent Coronation and Coronation North open pits. PSM’s assessment is there will be no material changes between the interaction of the pit and WRS than existed and were assessed<sup>5</sup> when Coronation North was originally consented, and that there will be negligible interaction between the pit and the WRS.

From this, it can be inferred that the extension of the pit will not impact upon the waste rock stack, and that no geotechnical hazards will be left as a result of mining in the area. This should give assurance that the extensions can be safely mined and the area rehabilitated and left stable post-closure.

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<sup>5</sup> PSM Impact of the Coronation and Coronation North Waste Rock Stack on open pits, 12 April 2016 [Appendix 19 Coronation North AEE]. A copy of this report can be provided on request.

## 6.4 Heritage and Archaeology

The Macraes District consists of a complex and extensive heritage landscape. There are a variety of historic site types, representing farming, alluvial and quartz mining operations. Since the early 1990s a vast amount of archaeological and heritage assessments and inventory work has been undertaken.

The Coronation North Project included a comprehensive review and survey of the Project footprint and surrounds. Heritage sites were identified relating to historical mining activities in the lower Trimbells Gully and Mare Burn streams. A review of these findings show that no heritage sites were found within the footprint of the Coronation North Extension.

OceanaGold has an "Accidental Discovery Procedure" which outlines the steps to stop work and notify the appropriate authorities. In addition a heritage management plan is in place to assist in identifying and protecting significant archaeological sites. The Management Plan was developed with the objective of ensuring that "*identified heritage sites (including archaeological sites both pre- and post- 1900 in origin) would only be modified or destroyed where no other reasonable options exists*". Within the Management Plan criteria for the assessment of archaeological and heritage values are outlined.

No additional heritage sites, or sites of significance have been identified within the Coronation North Extension area and so it is considered that no update to the Heritage Management Plan is required.

## 6.5 Amenity

Effects on amenity (i.e. noise, vibration, airblast, lightspill and dust) from the Coronation North Extension Project will not result in measurable changes from that experienced for the existing Coronation North Project based on:

- Mining activities will continue to be conducted in the same geographical location;
- No planned increase in mine production rate to the current 5 MT per annum;
- No planned additional mining fleet to the existing available equipment; and
- No additional haul road movements.

Effects on amenity will continue to be managed using existing processes to preferentially avoid and, where avoidance is not possible, mitigate duration and/or intensity of those effects.

Following concerns raised by an affected party, Craig and Erin Howard, regarding night time noise disturbance, OceanaGold have committed to not hauling ore at night from the Coronation North/Coronation mining complex to the Processing Plant, until such time as an agreement can be reached between the Howards and OceanaGold.

## 6.6 Landscape and Visual

The landscape and visual impact of the Coronation North Extension has been assessed by David McKenzie of WSP Opus. Using the consented landscape as the baseline<sup>6</sup>, Mr McKenzie has taken into account all the Project Elements identified in the Project Description to assess the visual effects of the development as detailed in the report in **Appendix E**. The assessment finds that although the changes to the waste rock stack will not affect the consented landscape and visual effects, however visually, the Pit Extension will be balanced by the Pit Backfill, and Pit Backfill will have a positive landscape effect in negating part of the pit void and re-forming the northern aspect of the Sisters Peaks promontory and a positive effect on the view from Longdale Road (as shown in Figure 6-3 Simulation of Coronation North Pit Extension from Longdale Road).

The assessment concludes the effects on landscape and visual from the Coronation North Extension are no more than minor. On this basis no further mitigation is proposed.

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<sup>6</sup> Oceana Gold (NZ) Ltd MGP Coronation North Project Landscape and Visual Assessment, April 2016 [Appendix 16 Coronation North AEE].



**Figure 6-3 Simulation of Coronation North Pit Extension from Longdale Road**

## **6.7 Hazardous Substances and HAIL**

The Coronation North mining area currently contains a 10,000lt portable double skinned, diesel tank. No explosives are stored within the Coronation North mining area.

In relation to the Ministry for the Environmental Hazardous Activities and Industries (HAIL) List, the MGP falls under Item D4 “Metal extraction, refining and reprocessing, storage and use, Metalliferous ore processing including the chemical or physical extraction of metals, including smelting, refining, fusing or refining metals”.

In relation to the National Environmental Standard for Assessing and Managing Contaminants in Soils, the proposal does not involve subdivision of land, change in use of the land, disturbance of contaminated soil or removal or replacement of a fuel storage system. The processing of ore at the MGP processing plant and disposal of tailings (HAIL type activities) are an existing use and appropriate resource consents are held for these activities.

## **6.8 Effects on Tangata Whenua Values**

The maintenance of natural landscapes, protection of waahi tapu and waahi taonga, for taonga species and impacts on the mauri of the land, water and air are all of cultural importance. Cultural Impact Assessments have been completed for the Macraes Phase III and Coronation North Projects.

### **6.8.1 Culturally Important Landscape Features**

Previous consultation and assessments undertaken in the vicinity of the Macraes Mine have not identified any culturally important landscape features. It is unlikely there will be adverse effects on culturally important landscape features.

### **6.8.2 Taonga Species**

Taonga species are native birds, plants and animals of special significance and importance to iwi and it is important that these resources are treated with care.

As identified in the Ecological Assessments undertaken by Dr Mike Thorsen (see Appendix A), 19 indigenous flora species of interest were identified in the unconsented area, along with an indication of possibly two indigenous bird species and three indigenous reptile species. Whilst the consented area that will be set aside hosts at least 22 plant, 3 reptile and 1 bird species.

In addition the proposed Trimbells area provides improved connectivity for indigenous species within the set aside due to its closer proximity to existing infrastructure.

### **6.8.3 Sites of Significance, Waahi Tapu and Waahi Taonga**

OceanaGold has commissioned extensive archaeological surveys of its entire project area since commencement of exploration and mining in the area. While it is acknowledged that early Maori were known to have passed through the area no evidence of areas of significant interest was found within the proposed pit expansion area.

It is therefore unlikely the project will impact on any site of significance. However, it is possible that an unrecorded or unknown site may exist within the area and OceanaGold has an established “accidental discovery” procedure which is communicated to all earthworks staff.

#### **6.8.4 Water**

The protection and enhancement of the mauri of water is a primary natural resource management principle. Diversion, mixing of waters from different catchments and contamination are activities that negatively impact on the mauri of some waterways.

Mitigation will be undertaken by OceanaGold to ensure that the MGP operates through to the end of mine life, and in post closure phase, within the water quality compliance criteria for surrounding waterways that have been previously accepted by Iwi.

Preservation of wetlands have been identified in the NRMP. The Coronation North Extension is expected to result in the total loss of a small area of already significantly modified wetland. In order to remedy this, OceanaGold proposes the rehabilitation of similar wetlands within the Highlay Hill Covenant (see section 6.1.4).

The proposed Pit Expansion is not expected to have any discernible effect on flow rates in Mare Burn Creek or the Taieri River.

#### **6.8.5 Air**

Dust will continue to be managed at the MGP under current air discharge consents. The existing air discharge consent for the Coronation North Extension includes the area of the proposed expansion and the activities proposed are similar. Extensive dust monitoring is in place already and the pit expansion proposal is not expected to change this. The pit expansion proposal will not have any adverse air quality effects that are more than minor.

#### **6.8.6 Conclusion**

The Cultural Impact Assessment prepared to cover the Coronation North Project should adequately cover the proposed Coronation North Extension.

## **7 PROPOSED MONITORING**

No changes are proposed from the current monitoring being conducted under the Coronation and Coronation North consents. This includes monitoring of noise, airblast, vibration, dust, water quality and quantity, as well as rehabilitation.

## **8 ALTERNATIVES**

The Coronation North Extension has undergone a number of iterations which included detailed design of additional areas required around the Coronation North Pit, scheduling of waste rock movement, the Pit Backfill and the redesign of the Coronation North Waste Rock Stack to form the proposed Trimbells Waste Rock Stack. Through the optimisation of design, considerable effort has been made to identify benefits across a range of values associated with the physical and biological environment.

## 9 AFFECTED PARTIES & CONSULTATION

In determining the consultation requirements for the Coronation North Extension Project, OceanaGold has considered the nature of the effects of project activities previous submissions and appeals – particularly those relating to Coronation and Coronation North – and feedback and concerns raised by stakeholders and Treaty Partners on general operational activities.

In undertaking the above analysis, the following parties were considered but ultimately not deemed to be affected, as follows:

- Macraes Community Incorporated (MCI) – Submitted in opposition to, and then appealed, the Coronation North Project. Although the appeal was broad the key issues for the MCI related to the Macraes Dunback Road, the use of covenants for ecological mitigation, and the standard and rate of progressive rehabilitation. The Macraes Dunback Road has subsequently been refurbished and a consent application recently lodged with Waitaki District Council to further improve the road alignment. Covenants are not being considered for ecological mitigation related to the Coronation North Extension project at this stage. On rehabilitation, OceanaGold has committed to a three year program for non-operational rehabilitation and a specific engagement project is underway to better incorporate local farmers' expectations on rehabilitation. The rehabilitation for Coronation North extension project will be the same as is applied site-wide at the MGP and will incorporate any changes that result from the engagement project.
- Mr Neil Roy – Mr Roy has provided regular feedback on road related issues for MGP. The Coronation North Extension will not result in changes to roading alignments and management of Golden Point Road will continue to be implemented for the additional four months of operation required for the Coronation North Extension.
- Heritage New Zealand – No sites of significance were identified within the footprint of the Coronation North Extension, based on the Coronation North Project Heritage assessment, and no subsequent sites have been identified through the Accidental Discovery Protocol. Should any sites be discovered during operations within the extension area the protocol would apply and HNZ would be notified.

### 9.1 Affected Parties

Given the narrow nature of the effects of the Coronation North Extension Project, OceanaGold considers the application could be appropriately limited notified. The following parties have been identified by OceanaGold as being affected by the Coronation North Extension Project:

- Department of Conservation
- Kati Huirapa ki Puketeraki, Moeraki and Otakou
- Craig and Erin Howard

A summary of the affected parties interests and the level of consultation undertaken are presented below.

#### 9.1.1 Department of Consultation (DOC)

The Department of Conservation submitted on the Coronation North Project, seeking a decision that appropriate conditions were implemented to address effects, compensate or offset to achieve no net loss in biodiversity, limit local land use disturbance where possible and feasible, and that the appropriate regulatory approvals were granted to kill, disturb, or move wildlife. Through the consenting process consultation was undertaken with DOC which resulted in design modification, an agreed mitigation package and consent conditions acceptable to both parties.

Consultation with DOC on the Coronation North Extension commenced on 31<sup>st</sup> October 2018, during a site visit. Representatives of DOC briefly visited the site of the Pit Cutback, and the idea of avoiding the already consented footprint within the WRS was discussed and received positively as a concept. DOC have requested, and subsequently received copies of the Terrestrial Ecology Studies (as presented in Appendix A & B). Further consultation on the terrestrial ecology effects is expected to be undertaken.

### **9.1.2 Kati Huirapa ki Puketeraki, Moeraki and Otakou**

OceanaGold acknowledges, understands and respects that Nga Rūnanga - Te Rūnaka o Moeraki, Kati Hūirapa Rūnaka ki Puketeraki and Te Rūnaka o Ōtākou maintains the Mana Whenua as Tangata Whenua of the associated lands regarding this application.

As they are the kaitiaki (guardians) we understand that the cultural landscapes, taonga species, customary fish species, māhika kai, biodiversity, historical resources are of significance for Nga Rūnanga.

OceanaGold has an existing relationship with Nga Rūnanga whereby a Memorandum of Understanding with Puketeraki and more recently a Protocol of Engagement with Nga Rūnanga has been developed to work collaboratively in developing and implementing initiatives to address any adverse impacts of the MGP on the cultural values within the receiving environment.

As an affected party OceanaGold has held consultation meetings with “Aukaha – Mana Taiao” who have been mandated by Te Rūnaka o Moeraki, Kati Hūirapa Rūnaka ki Puketeraki and Te Rūnaka o Ōtākou to engage in discussions. Initial discussions and site visits are currently being conducted and we await the formal response and will provide this in due course once it is received.

### **9.1.3 Craig and Erin Howard**

Craig and Erin Howard reside on Horse Flat Road nearby the haul road. Acoustic mitigation measures were applied to their property as a result of consenting of the Coronation Project. The Howards initially submitted on the Coronation North Project regarding noise from the mining operation, drinking water quality and the increase in sulphate in the surrounding water, visual pollution, increased dust, and increased traffic on the local roading infrastructure. Subsequent to the commencement of operational activities for the Coronation North Project, OceanaGold has received a number of complaints from the Howards relating to noise associated with night timing hauling of Ore from Coronation/Coronation North Pits to the Process Plant from the Howards. Since October 2018, OceanaGold has adopted a ‘no hauling at night policy’ in order to avoid night time noise effects on the Howards. The policy will remain in place until such time as an agreement can be reached with the Howards on night time hauling.

The Howards have been informed of the proposed consent application for the Coronation North Extension and will be provided with a copy of the lodged AEE and application.

## **10 PROPOSED CONSENT CONDITIONS**

### **10.1 Otago Regional Council**

The Otago Regional Council issued a number of consents in 2016 for the Coronation North Project. This was for a range of activities including the formation of pit lakes, water diversion, discharge to land and also discharge to water. Within Coronation North Extension Project no consent condition changes are being sought. This application will however vary the maps annexed to the consent documents.

### **10.2 Dunedin City Council**

The Dunedin City Council issued land use consent for Coronation in 2013 and for Coronation North in 2016. The Coronation consents were amended with the application for the Coronation North Project in 2016. The consents issued by the Dunedin City Council are LUC-2016-234 & LUC-2013-225A.

It is proposed that the existing land use consent (LUC-2013-225A) be varied to recognise the relinquishment of the set aside area within the Coronation North WRS. In addition a new land use consent be issued which recognises the additional unconsented land associated with the Pit Cutback and the Trimbells WRS.

Although OceanaGold has not submitted any proposed consent conditions with this application it is considered appropriate to achieve consistency across MGP operations by applying consent conditions that are the same as, or very similar to, the existing consent conditions for Coronation and Coronation North projects. OceanaGold would be open to providing the Council with draft proposed consent conditions for the new land use consent on request or alternatively working with the Council to formulate them.

### **10.3 Waitaki District Council**

The Waitaki District Council issued land use consent for Coronation in 2013 and for Coronation North in 2016. The Coronation consents were amended with the application for the Coronation North Project in 2016. The consents issued by the Waitaki District Council are 201.2016.779 and 201.2013.360.1. The Coronation North Extension Project does not seek any consent condition changes apart from varying the maps annexed to the consent documents to show the project extension areas, and to update naming conventions throughout the consents to reference the Coronation North Extension Project.

## 11 CONCLUSION

This assessment of environmental effects has identified and evaluated potential effects on the environment of the proposed Coronation North Extension Project and demonstrated that the extension is able to be undertaken with minimal adverse environmental effects.

In reaching this conclusion OceanaGold has been guided by the expert technical reports that are submitted in support of these applications.

The activities for which new resource consent and variations to existing consents are sought are consistent with the purpose and principles of the Resource Management Act 1991 and will promote sustainable management of resources. Accordingly, it is considered that requested resource consent and variations to existing consents should be granted for the Coronation North Extension.

**APPENDIX A** *TERRESTRIAL BIODIVERSITY OF CORONATION NORTH PIT EXTENSION,  
TRIMBELLS WRS AND IMPACT OF EXTENSION AND WRS – ERA ECOLOGY,  
DECEMBER 2018*



Reference:

17 January 2019

Gavin Lee  
OceanaGold

Dear Gavin,

Re: *Terrestrial biodiversity of Coronation North Pit Extension, Trimbells WRS and impact of Extension and WRS*

While much of the Coronation North Pit Extension (CNE) and Trimbells WRS areas are covered by the existing Coronation and Coronation North consents, and the ecological Impact Assessment for Coronation North also included consideration of impact to 100 m beyond the consent boundary, I recommended that the terrestrial biodiversity of the CNE area be reinspected as a matter of due diligence to capture information that might not have been obtained during the Coronation and Coronation North assessment, and to cover areas that had not been inspected during the previous assessments. The CNE reinspection was conducted by myself on 13 July 2018 and an inspection of the unconsented portion of Trimbells WRS on 23 November 2018. This file note is based on the information obtained during these field visits, the Ecological Impact Assessment (EclA) submitted in support of the Coronation North project, and the extent of the pit extension and buffer as provided as a GIS shapefile on 18 December 2018.

On the basis of this inspection I believe the EclA submitted in support of the Coronation North project is sufficient to encompass this area in general. This file note is to provide additional detail specific to the CNE and the Trimbells WRS.

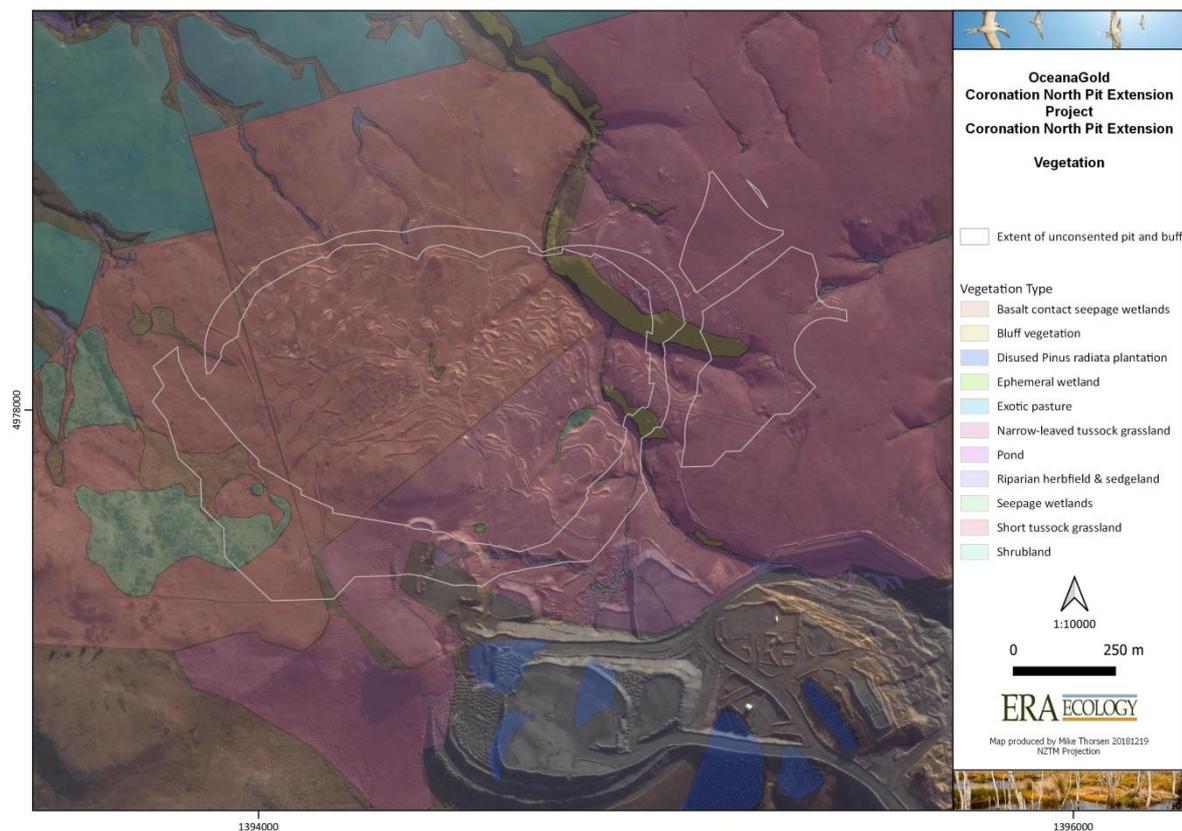


# 1. Terrestrial biodiversity features within CNE

## Flora

The vegetation communities of the 42.81 ha of the unconsented parts of the CNE (Map 1) are of those described in the Coronation North EclA, mainly narrow-leaved tussock grassland (24 ha, 56%) and short tussock grassland (12.42 ha, 29%), with limited shrubland ( 1.66 ha, 4%), basalt contact seepage wetlands (1.48 ha, 3.5%), bluff vegetation (1.33 ha, 3%) associated with rock tors and outcrops, and riparian herbfield and sedgeland (0.64 ha, 1.5%) (Table 1). The balance of 1.28 ha is pf unclassified land types, mainly those associated with mine activities. The vegetation communities in the CNE are of varying quality, but are mostly highly degraded following recent burning of the area, invasion by exotic plants, and earthworks associated with exploration drilling. A photograph of the site is presented at the end of this document.

The plant species recorded and an estimate of their abundance during the site visit is provided in the spreadsheet included with this document, and the Species of Interest recorded in the CNE area during the site visit are listed in Table 2, and discussed below. Note: since the EclA, the Threat Classification of NZ Plants has been updated (de Lange et al. 2018). This file note follows the new (2017) classifications.



Map 1. Vegetation types in the CNE.

Vegetation Type	Area within CNE (ha)
Narrow-leaved tussock grassland	24

Short tussock grassland	12.42
Shrubland	1.66
Basalt contact seepage wetlands	1.48
Bluff vegetation	1.33
Riparian herbfield & sedgeland	0.64

Table 1. Areas of vegetation types within the CNE area

<b>Current Name + Authority</b>	<b>Common name</b>	<b>Group 1</b>	<b>Family (Tribe)</b>	<b>Threat Category (2017)</b>	<b>Threat ranking (2017)</b>	<b>Threat ranking (2017) Qualifiers</b>
Aciphylla subflabellata W.R.B.Oliv.	Spaniard	DICOTYLEDONOUS HERBS	Apiaceae	At Risk	Declining	DP, Sp
Anthosachne falcis (Connor) Barkworth & S.W.L.Jacobs	wheat grass	MONOCOTYLEDONOUS HERBS	Poaceae	At Risk	Declining	DP, Sp
Carmichaelia petriei Kirk	desert broom	DICOTYLEDONOUS TREES AND SHRUBS	Fabaceae	At Risk	Declining	DP, RF
Deyeuxia quadriseta (Labill.) Benth.		MONOCOTYLEDONOUS HERBS	Poaceae	At Risk	Declining	DP, EF, SO
Discaria toumatou Raoul	matagouri, wild Irishman	DICOTYLEDONOUS TREES AND SHRUBS	Rhamnaceae	At Risk	Declining	
Epilobium insulare Hausskn.	willowherb	DICOTYLEDONOUS HERBS	Onagraceae	At Risk	Declining	DP, RR, Sp
Leptinella pusilla Hook.f.		DICOTYLEDONOUS HERBS	Asteraceae	At Risk	Declining	
Olearia bullata H.D.Wilson & Garn.-Jones		DICOTYLEDONOUS TREES AND SHRUBS	Asteraceae	Not Threatened	DCC Threatened Plant	

Table 2. Species of Interest recorded from within the CNE area.

Several plants of the speargrass *Aciphylla subflabellata* are present in the unconsented area of the CNE. This plant has a localised distribution in the Macraes E.D. and is known as a host of at least two rare moth species.

Plants of the wheatgrass *Anthosachne falcis* are scattered in the CNE, including in parts of the unconsented area. This species is present as scattered plants in most open areas of natural and semi-natural vegetation in the surrounding area.

Desert broom *Carmichaelia petriei* is a new addition to the Threat list. There were several plants present in the CNE outside of the unconsented area. This species is widespread in natural vegetation areas of the Macraes E.D., however regeneration appears to be poor and the species is sometimes sprayed with herbicide when mistaken for exotic broom.

The inconspicuous grass *Deyeuxia quadriseta* was noted at one locality in the CNE outside of the unconsented area. This species is a new addition to the Threat list. It has been noted at a few localities in the Macraes E.D., but its status in the area (and nationally) is poorly known due to its inconspicuous nature.

Matagouri *Discaria toumatou* is a new addition to the Threat list. It is very common throughout the CNE, including inside the unconsented area. It is common throughout most of the natural vegetation areas of the Macraes E.D. Most losses of this species appear to have been from the North Island, Canterbury, the Mackenzie Country, and intermontane basins of Central Otago which probably led to the inclusion of this species on the Threat list.

The small button daisy *Leptinella pusilla* is a new addition to the Threat list. It was recorded at one site in the CNE outside of the unconsented area. It is known from at least 11 sites in the Macraes E.D. It appears to need sparsely vegetated shaded herbfield such as which occurs at the base of tors where stock have been grazing heavily.

The willowherb *Epilobium insulare* was noted as scattered plants in one wetland in the unconsented part of the CNE. This species is sparsely distributed in wetlands in the Macraes E.D.

The small-leaved shrub daisy *Olearia bullata* is included as it is listed as a 'Threatened Plant' in Appendix 16A of the DCC District Plan. In the Macraes E.D. this species is widespread, with small groves occurring in the heads of most gullies. A few plants were present at one site in the gully of the CNE outside of the unconsented area.

In addition two plants were recorded that could not be confidently identified, but that could be Species of Interest.

A St Johns Wort was noted in crevices of one schist tor outside of the unconsented area. The most likely identity of these plants is the Not Threatened *Hypericum pusillum*.

Young plants of a species of indigenous *Ranunculus* was recorded at two sites outside of the unconsented area. They appear similar to the Not Threatened *Ranunculus foliosus*.

Material of these two plants are in cultivation for confirming their identity.

It should be noted that the survey time was not ideal for identification of plants.

### *Avifauna*

The composition of the avifauna is likely to be the same as that described in the EclA. No area was thought to be habitat of consequence for indigenous birds. Pipit *Anthus novaeseelandiae* are the only species of interest that might have used this area, but, if present, would have been displaced by the existing mine workings.

### *Herpetofauna*

The composition of the herpetofauna is likely to be the same as that described in the EclA. No area was thought to be habitat of consequence above that described in the EclA for indigenous lizards, though there is small amount of rock tor habitat of the Declining korero gecko *Woodworthia* "Otago/Southland large". The habitat appears of limited suitability for the southern grass skink *Oligosoma polychroma* (clade 5 genotype) which has a classification of Declining in the NZ Threat Classification System. It is likely the CNE, including the unconsented area, harbours a population of the Not Threatened McCann's skink (clade 4 genotype), but the winter timing of this survey makes an estimate of population size impossible. The area appears to offer moderate quality habitat for this species.

### *Invertebrates*

The Coronation North EclA did not include a consideration of invertebrates. It is not possible to assess invertebrate communities in winter.

## 2. Terrestrial biodiversity features within unconsented area of Trimbells WRS.

The 17.51 ha area of the unconsented area of Trimbells WRS (Map 2) is comprised entirely of narrow-leaved tussock grassland of moderate stature of c. 50% ground cover that is recovering from recent burning. The area is likely providing habitat for a small population of the Not Threatened McCann's skink (clade 4 genotype) and is likely to be visited by some of the bird species noted in the EclA. No Pipit *Anthus novaeseelandiae* have been recorded from this area. The only plant species of interest recorded from this area are scattered plants of the Declining matagouri.

## 3. Impact of CNE and Trimbells WRS on terrestrial biodiversity features

Construction of the CNE pit will result in the loss of all the biodiversity features described above. The loss attributable to the unconsented portion of the CNE and Trimbells WRS consists of:

- The loss of 41.51 ha of narrow-leaved tussock grassland, 12.42 ha of short tussock grassland, 1.66 ha of shrubland, 1.48 ha of basalt contact seepage wetlands, 1.33 ha of bluff vegetation and 0.64 ha of riparian herbfield and sedgeland, all of mostly moderate quality.
- The loss of the flora and fauna that inhabits these communities.
- Loss of some plants of six plant species, and the loss of many plants of matagouri, classified as Declining in the NZ Threat Classification System.
- The loss of some plants of *Olearia bullata*, a plant listed as threatened by the Dunedin City Council.

- Probable loss of some individuals of the korero gecko classified as Declining in the NZ Threat Classification System.
- Probable loss of some individuals of the Not Threatened McCann's skink.
- Loss of c. 36 ha of moderate quality habitat for pipit, but which is not currently likely to be used due to disturbance from existing mine activities.

I do not consider this loss to materially alter the stated impact of the Coronation North project described in the EclA, but the area of natural vegetation loss increases by c. 59.04 ha (27% above the 216.5 ha in the original Coronation North footprint) and this will also reduce the populations or habitats of the plants, lizards, birds, insects that occur in the unconsented area.



Map 2. Location of the unconsented area of Trimbells WRS.

This vegetation at this site is categorised as **significant** under the proposed ORC Regional Plan and DCC District Plans as it is inhabited by some rare species.

Overall, the vegetation present within the unconsented area is assessed as being of **moderate** ecological importance. The narrow-leaved tussock grassland and short tussock grassland is of moderate size, fragmented by consented land clearance, of moderate species diversity and moderate integrity. Neither of these grasslands is considered a rare vegetation community, and the tussock grasslands at Coronation North are probably anthropogenic, being created following early Maori burning of eastern South Island dryland forest. It is well represented on lower-elevation hillslopes of Central Otago, though its extent is being reduced by conversion to pasture, invasion by exotic shrubs (particularly broom) and, in places, repeated burning. However, of greater concern is the increased loss of basalt contact wetlands, which is a rare vegetation community in the Macraes E.D.

Therefore, the impact of this project is assessed as having an **adverse, direct, permanent, irreversible, local impact** on the vegetation communities, with a **higher impact** on the rarer vegetation communities.

The magnitude of the project's impact on the area's vegetation communities at a local scale is assessed as **moderate**, and at a national level as **moderate**.

The overall degree of the project's effect on the biodiversity features is **moderate**.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'M-J Thorsen', with a long horizontal flourish extending to the right.

Dr Michael J. Thorsen  
Director & Principal Ecologist  
ERA Ecology NZ Ltd

Cited literature:

de Lange, P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwieser, I.; Schonberger, I.; Hindmarsh-Walls, R.; Heenan, P.B.; Ladley, K. 2018: Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series 22*. Department of Conservation, Wellington. 82 p.

Inclusions:

Plant species recorded from CNE: file: CoronationNorthExtension\_PlantList.xlsx

## Site Photograph



Narrow-leaved tussock grassland vegetation and part of tor in the unconsented area of the CNE, from point 1395135.089 4978505.490, looking to South, 13 July 2018.

**APPENDIX B** *TERRESTRIAL BIODIVERSITY OF CORONATION NORTH WRS GIVE-UP AREA –  
CORONATION NORTH PIT EXTENSION PROJECT – ERA ECOLOGY, DECEMBER 2018*



Reference:

17 December 2018

Gavin Lee  
OceanaGold

Dear Gavin and Scott,

Re: *Terrestrial biodiversity of Coronation North WRS give-up area – Coronation North Pit Extension Project*

At your request on 23 November and 14 December 2018 I visited the area in the Coronation North WRS consent area identified as a potential 'give-up area' (Figure 1) to further document its biodiversity values. The results of this visit are provided here together with information obtained during previous visits to this general locality and in comparison with the known biodiversity features of the proposed new impact site to be created by the Coronation North Pit Extension. The biodiversity of the give-up area has previously been documented in the Ecological Impact Assessment (EclA) of the Coronation North Project, and this file note builds on the information contained there-in.

The 52.55 ha give-up area is as described in the EclA; predominantly moderate-stature previously-burnt narrow-leaved tussock grassland with tussock plants usually about 50 cm to 1 m tall and covering 50 to 80% of land area over 50.13 ha. Within this grassland there are areas of herbfield dominated by the exotic hawkweed *Pilosella officinarum* and 1.99 ha of bluff communities on the schist outcrops which are present mainly along gully edges with a few examples on the gully slopes. Low diversity riparian herbfield and sedgeland occupies 0.43 ha of the lower elevation beds of the gullies and the upper elevations of these gullies are occupied by exotic grasses and rushes with rare scattered shrubs of *Olearia bullata* and *Carmichaelia petriei*. Scattered patches and individual plants of low-stature matagouri shrubs are present throughout.



Many individuals of the Not Threatened McCann's skink (clade 4 genotype) were seen at it is considered that a moderately large population occurs in the give-up area.

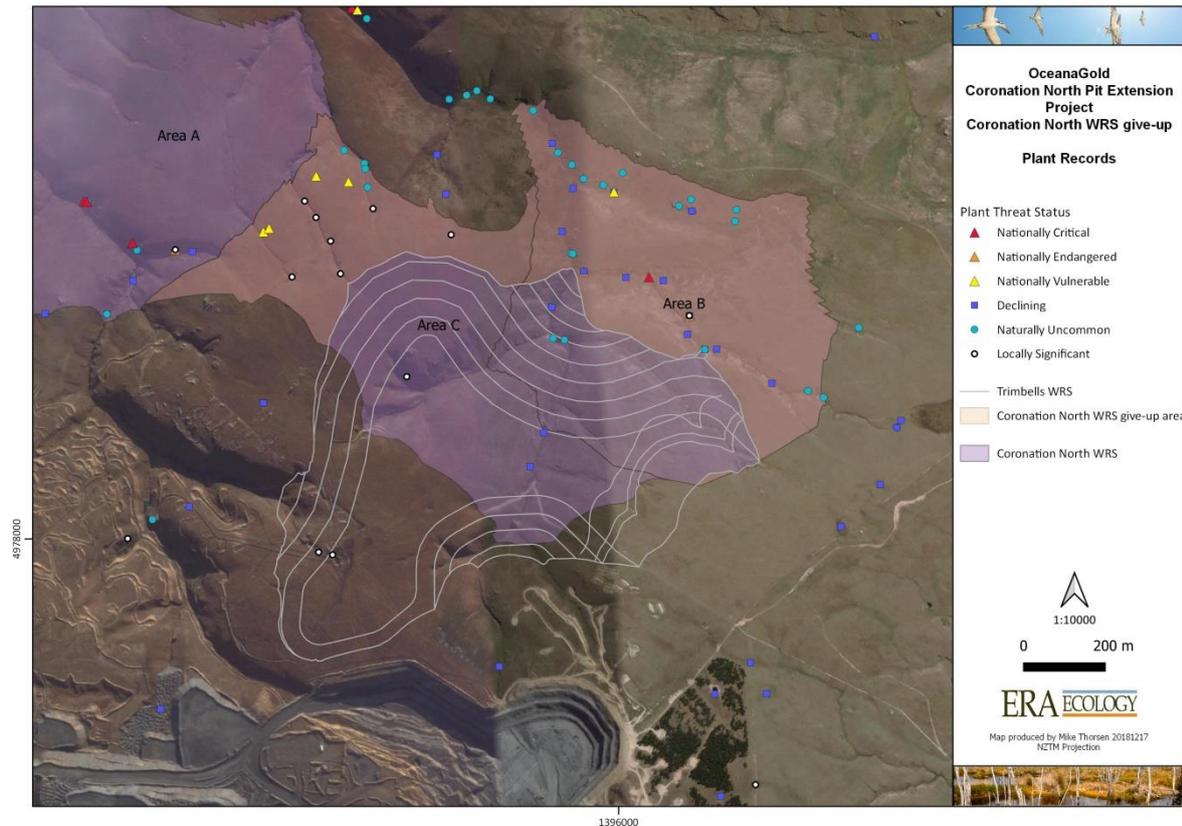


Figure 1. Location of plant species of interest in the vicinity of the Coronation North WRS give-up area.

Within the vegetation communities are 22 plant, 3 reptile and 1 bird species of interest (Figure 1). These are described further here.

1. *Anthus novaeseelandiae* Gmelin subsp. *novaeseelandiae* (pipit, Motacillidae): At Risk - Declining.

Three individuals were recorded in the give-up area during this inspection at the sites where pairs of pipit had been recorded in the EclA. It is likely that 1-3 pairs of pipit are breeding in the give-up area.

2. *Oligosoma polychroma* (Patterson & Daugherty 1990) (clade 5 genotype) (southern grass skink, Scincidae): At Risk - Declining.

This species was noted in the EclA as occurring in areas of suitable habitat. Some areas of suitable habitat were noted during this inspection, mainly in the lower parts of the gullies and around the larger schist outcrops. It is likely that the give-up area hosts a small breeding population of this species.

3. *Woodworthia* "Otago large" (korero gecko, Gekkonidae): At Risk - Declining.

This species was noted in the EclA as occurring in areas of suitable habitat. Some areas of suitable habitat were noted during this inspection in the schist outcrops and droppings, probably from this species, were seen at three locations. It is likely that the give-up area hosts a moderately-sized breeding population of this species.

4. *Oligosoma inconspicuum* (Patterson & Daugherty 1990) (cryptic skink, Scincidae): At Risk - Declining.

This species was noted in the EclA as possibly occurring in low numbers and one individual was seen in a gully bottom during this inspection. It is likely that the give-up area hosts a very small breeding population of this species.

5. *Lagenophora montana* Hook.f. (papataniwha, Asteraceae): Threatened – Nationally Critical.

One patch of this species was found during this visit on the bank of a stream. Plants were not in flower so this identification is provisional. This species is poorly known in New Zealand, and Macraes, together with Kuratau Clearing in the central North Island are the only localities where this species is currently known. In the Macraes area it has been recorded from about 5 sites.

6. *Hypericum rubicundulum* Heenan (a native wort, Hypericaceae): Threatened – Nationally Endangered.

A few plants tentatively identified as this species were recorded at two sites in the give-up area. The identity of these plants is tentative as they share some characters with *Hypericum rubicundulum*, but occur in anomalous shaded habitats and have not yet been found flowering. Similar plants have been recorded from several sites in the Macraes area.

7. *Carmichaelia corrugata* Colenso (common dwarf broom, Fabaceae): Threatened – Nationally Vulnerable.

Approximately 100 plants of this species were found at five sites in the give-up area. This species was first discovered in the Macraes E.D. in the EclA and this site brings the total number of known natural occurrences in the E.D. to five. It is included in the Coronation Plant rescue package and has been transferred to one site in the nearby Deepdell Covenant with high over-winter survival of plants.

8. *Acaena buchananii* Hook.f. (a bidibid, Rosaceae): At Risk: Declining.

A patch of this species was recorded at one site in the give-up area. There are very few records of this species in the Macraes E.D.

9. *Aciphylla subflabellata* W.R.B. Oliver (needle-leaved spargrass, Apiaceae): At Risk: Declining.

One plant of this species was recorded from the give-up area in the EclA. This species is patchily distributed in the Macraes E.D.

10. *Anthosachne falcis* (Connor) Barkworth & S.W.L.Jacobs (dryland wheatgrass, Poaceae): At Risk: Declining.

This grass was recorded at two sites in the give-up area. This species was first discovered in the Macraes E.D. in the EclA, and is now known to occur at multiple sites in the E.D.

11. *Carex kaloides* Petrie (a wetland sedge, Cyperaceae): At Risk: Declining.

A small patch of this species was recorded in the give-up area in the EclA. This species is now known from several sites in the Macraes E.D. with most of the populations occurring in the vicinity of the Coronation North project.

12. *Carmichaelia petriei* Kirk (desert broom, Fabaceae): At Risk: Declining.

This species was recorded at several sites in the give-up area during this assessment and in the EclA. It is widespread in natural areas of the Macraes E.D., but it is mostly recorded as a few mature plants. Regeneration appears lacking in this area.

13. *Discaria toumatou* Kirk (matagouri, Rhamnaceae): At Risk: Declining.

This species is common in the give-up area and is widespread and usually abundant throughout natural areas of the Macraes E.D.

14. *Deyeuxia* aff. *quadriseta* (AK 252511; Volcanic Plateau) (a grass, Poaceae): At Risk: Declining.

This species was recorded from one site in the give-up area. The distribution of this species in the Macraes E.D. is poorly known and it has only been definitively recorded from a further 2 sites. Its distribution nationally is very poorly known.

15. *Leptinella pusilla* Hook.f. (a button daisy, Asteraceae): At Risk: Declining.

This species was recorded at one site in the give-up area. This species is widely but sparsely distributed in the Macraes E.D., particularly in grazed, shrubby areas.

16. *Mentha cunninghamii* Benth. (native mint, Lamiaceae): At Risk: Declining.

This species was recorded at two sites at the bases of schist outcrops in the give-up area. This species is known from scattered sites in the Macraes E.D.

17. *Pterostylis tristis* Colenso (a dwarf greenhood orchid, Orchidaceae): At Risk: Declining.

Six plants of this species were recorded from *Pilosella* herbfield at one site in the give-up area. This species is widely distributed in low numbers throughout natural low stature vegetation areas of the Macraes E.D.

18. *Brachyscome longiscapa* G.Simpson & J.S.Thomson (a daisy, Asteraceae): At Risk: Naturally Uncommon.

This species was recorded at two sites in the give-up area, both with 20-30 plants present. One was on a steep bank, the other in *Pilosella* herbfield. This species can be common at sites in the Macraes E.D., but sites are often widely spaced.

19. *Celmisia hookeri* Cockayne (Hooker's mountain daisy, Asteraceae): At Risk: Naturally Uncommon.

This species has been recorded from ten sites on schist outcrops in the give-up area with up to 200 plants at each site. The total population in the give-up area exceeds 1,500 plants and most populations were noted to have some recruitment occurring. This species is found on most of the larger schist outcrops in this area, particularly those with a shaded southerly aspect.

20. *Euchiton polylepis* (D.G.Drury) Breitw. & J.M.Ward (A small daisy, Asteraceae): At Risk: Naturally Uncommon.

One plant of this species was seen at the base of a schist outcrop in the give-up area. This is the fourth locality known for this species in the Macraes E.D.

21. *Juncus distegus* Edgar (Two-storey rush, Juncaceae): At Risk: Naturally Uncommon.

This rush was seen at three sites in shallow damp gullies where it is present over a combined area of 44 m x 16 m. This species is patchily distributed in the Macraes E.D.

22. *Lagenophora barkeri* Kirk (a wetland daisy, Asteraceae): At Risk: Naturally Uncommon.

This species was noted in the EclA as being widespread in the Coronation North area and one site was recorded from a stream margin and at one site in a seepage in the give-up area. This species has scattered populations along natural streamsides in the Macraes E.D.

23. *Celmisia densiflora* Hook.f. (a mountain daisy, Asteraceae): Locally Significant.

This species was recorded at three sites on schist outcrops in the give-up area in association with *Celmisia hookeri*. This species is considered Locally Significant as these localities are at an unusually low altitude for this species which is common on Central Otago mountains. There is only one other known occurrence of this species in the Macraes E.D.

24. *Oxalis rubens* Haw. (native oxalis, Oxalidaceae): Locally Significant.

This species was recorded at one site in the give-up area where it occupies approximately 1 m x 50 cm around the margin of a schist flake. This is apparently the first record of this species in the Macraes E.D.

25. *Poa pusilla* Berggr. (a grass, Poaceae): Locally Significant.

This grass was recorded from one schist outcrop in the give-up area. This species is considered Locally Significant as it is rare in the Macraes E.D. where it is known from a total of five localities.

26. *Olearia bullata* H.D.Wilson & Garn.-Jones (a small-leaved shrub daisy, Asteraceae): Dunedin City Council Threatened Species.

Several plants and small groves of this species were recorded in the upper gullies of the give-up area. *Olearia bullata* is listed as a 'Threatened Plant' in Appendix 16A of the DCC District Plan. In the Macraes E.D. this species is widespread, with small groves occurring in the heads of most gullies.

A further value associated with the give-up area is that avoiding impact in the give-up area will reduce fragmentation of the Trimbell's Gully RAP by restricting the area of impact to a portion of the western side of this RAP (Figure 2).

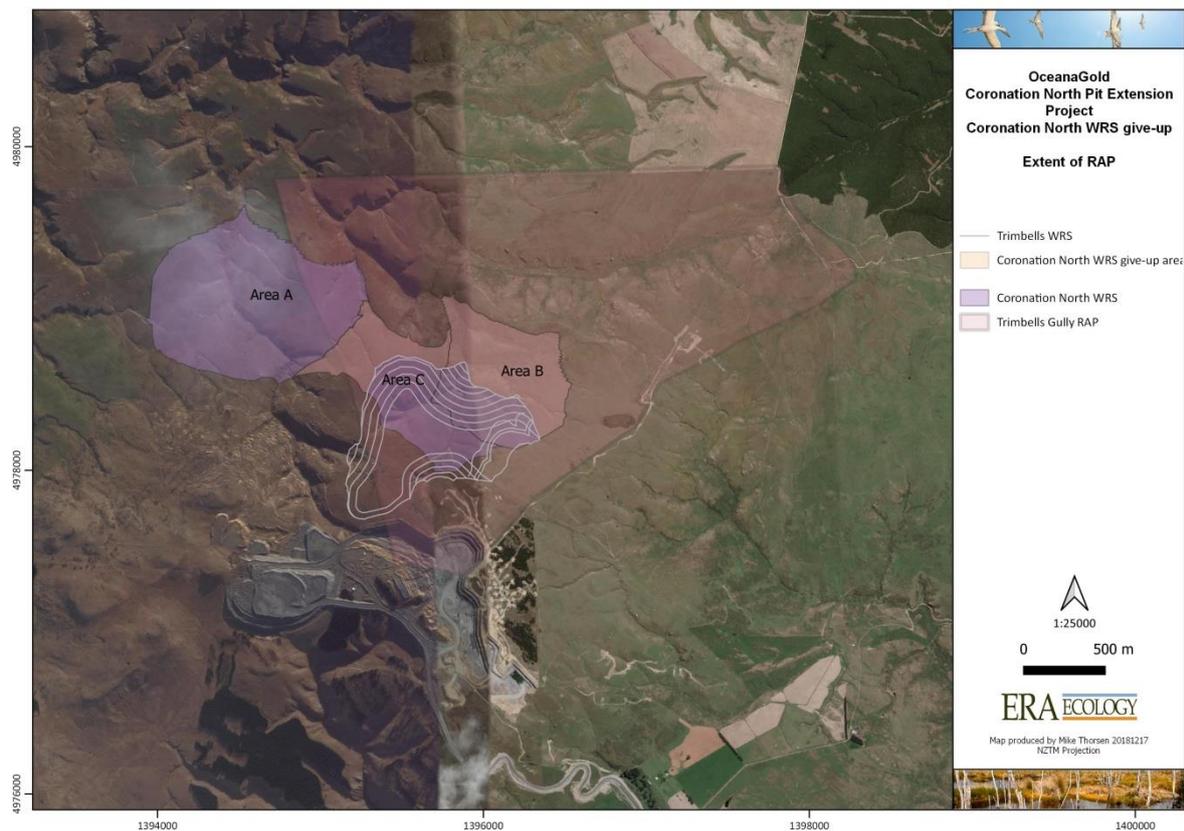


Figure 2. Extent of the Trimbell's Gully RAP in relation to the Coronation North WRS give-up area.

In comparing the biodiversity values of the Coronation North WRS give-up area with those within the unconsented area of the proposed Coronation North pit extension and Trimbell's WRS (letter 17 January 2019), there are more ecological features within the give-up area and these ecological features are mostly of better quality, contains species of higher importance or with greater extent or numbers, and fragmentation of a RAP will be reduced. Table 1 compares the biodiversity features of the two areas.

I consider that the biodiversity values within the give-up area together are ecologically more important than those within the unconsented portion of the CNE, and that adopting the give-up would address the effects of the CNE in an ecologically meaningful way so that there is a net gain to biodiversity. However, the CNE contains vegetation types that are not present in the give-up area, and there are unaddressed effects on the rare basalt contact seepage wetlands which should be considered, possibly by undertaking some restoration of this vegetation community in the nearby Highlay Hill Covenant.

Yours sincerely,



Dr Michael J. Thorsen  
 Director & Principal Ecologist  
 ERA Ecology NZ Ltd

<b>Biodiversity feature</b>	<b>Unconsented part of CNE &amp; Trimbell's WRS</b>	<b>Give-up area</b>
Total area	59.04 ha	52.55 ha
Narrow-leaved tussock grassland	41.51 ha	50.13 ha
Short tussock grassland	12.42 ha	
Shrubland	1.66 ha	
Basalt contact seepage wetlands	1.48 ha	
Bluff vegetation	1.33 ha	
Riparian herbfield & sedgeland	0.64 ha	0.43 ha
Habitat quality	Moderate to low and impacted by mine activities	Moderate and mostly intact, though recovering from a fire
Plant species of interest	7 At Risk species, 1 DCC Threatened Plant	3 Threatened species, 15 At Risk species, 3 Locally Significant species, 1 DCC Threatened Plant
Reptile species of interest	Small populations of 2 At Risk species and 1 Not Threatened species	Very small to moderate populations of 3 At Risk species and a moderately-large population of a Not Threatened species
Bird species of interest	None recorded	A few breeding pairs of an At Risk species

Table 1. Biodiversity values recorded from the CNE and Trimbell's WRS and the give-up area.

**APPENDIX C** *CORONATION NORTH PROJECT CONSENT VARIATION – MINING FOOTPRINT  
AMENDMENT – RYDER, AUGUST 2018*



195 Rattray Street  
PO Box 1023  
Dunedin, 9054

T 03 477 2119  
C 021 177 4291  
b.ludgate@ryderenv.nz

## Memorandum

**To:** Scott Mossman, Environmental Supervisor, **Oceana Gold (NZ) Limited**

**From:** Ben Ludgate, Environmental Scientist, **Ryder Environmental Limited**

**Date:** 23 August 2018

**Subject:** **Coronation North Project Consent Variation – Mining Footprint Amendment**

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Dear Scott,

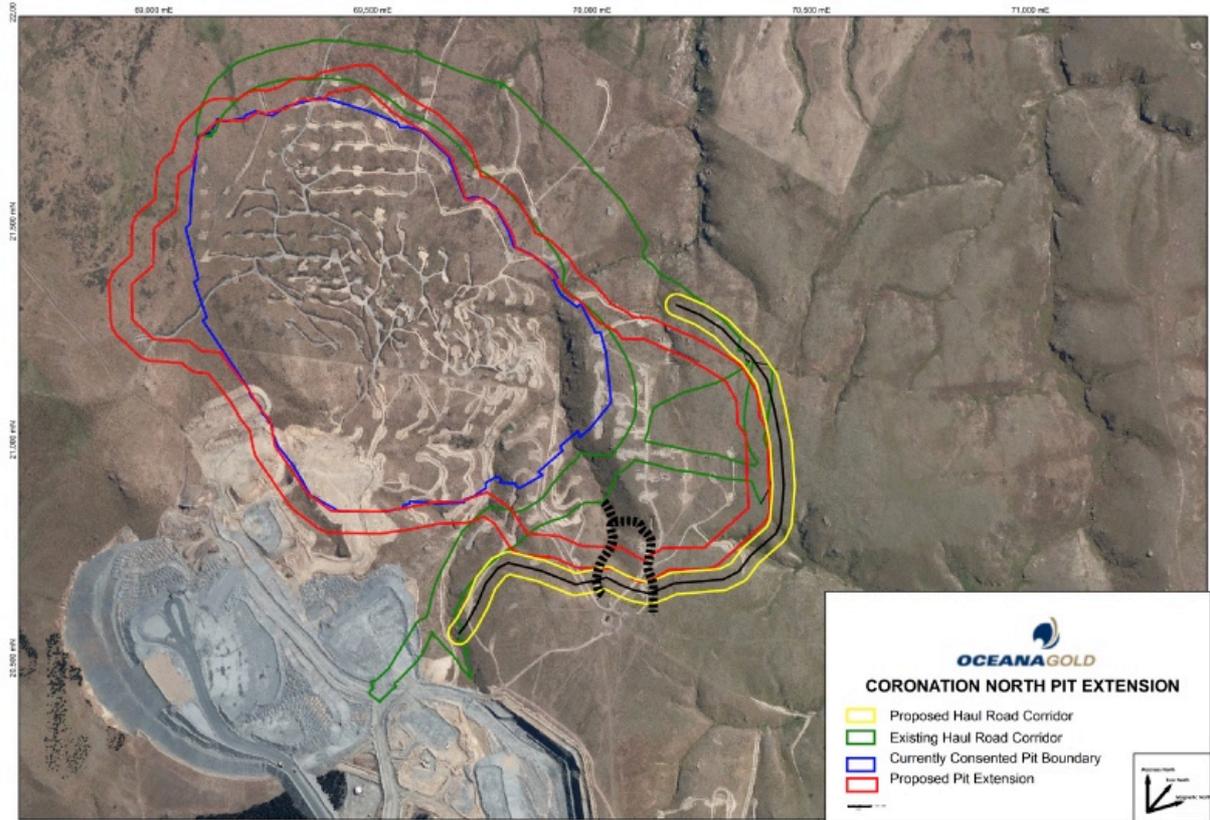
Oceana Gold (NZ) Limited are proposing to apply for a variation to resource consents for the Coronation North Project, to move a section of the footprint of the pit boundary and haul road corridor to outside the consented footprint. You have requested an assessment of any potential effects of this proposal on the aquatic ecology of the affected area.

The areas to be affected by the proposed footprint amendment include the upper reaches of a small tributary of 'Trimbells Gully tributary' and the upper reaches of a small tributary of Maori Hen Creek (Figure 1). However, the affected area in the tributary of 'Trimbells Gully tributary' is located within consented waste rock stacks and stockpile areas for the Coronation North Project, and therefore any potential effects of mining activity in this area have been assessed and mitigated as part of the consenting process. As the footprint amendment would not constitute additional disturbance in this area, the assessment below only considers the Maori Hen Creek tributary.

The area to be affected by the proposed footprint amendment in the upper reaches of a small tributary of Maori Hen Creek is approximately 500 m long (Figures 1 and 2). Aquatic ecology assessments completed during the consenting process for the Coronation North Project (Ryder 2016<sup>1</sup>) described the physical habitat and biological communities of Maori Hen Creek, and assessed the effects of the loss of habitat in the whole catchment, including the section of the Maori Hen Creek tributary that will be affected by the proposed amendment. Consequently, recommended measures for mitigating aquatic ecology effects of the mining projects (e.g., translocations of fish and crayfish/kōura) have already taken account of the loss of habitat in this upper section of the tributary. Despite this, a description of values and assessment of effects for this area is provided below.

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<sup>1</sup> Ryder, G. 2016. Oceana Gold (New Zealand Ltd) Coronation North Project. Aquatic Ecology Assessment. Report prepared for Oceana Gold (New Zealand Limited) by Ryder Consulting Limited.



**Figure 1** Aerial photo of Maori Hen Creek indicating proposed amendments to the pit boundary (red lines) and haul road corridor (yellow lines). Photo and mining boundaries provided by Oceana Gold (NZ) Ltd. Black dashed lines represent Maori Hen Creek tributary areas affected by proposed amendments.



**Figure 2** *Photograph looking upstream at the confluence of Maori Hen Creek and the affected tributary, May 2017. Maori Hen Creek flows from the top right to the bottom of the photo. The affected tributary area is in the top left of the photo.*

### **Physical habitat**

Physical habitat in Maori Hen Creek was described in the Coronation North Project aquatic ecology assessment (Ryder 2016) as:

Maori Hen Creek lies within a relatively narrow gully with steeply-sided faces throughout most of its length (about 1.6 km from the current boundary of the Coronation project to the confluence with Trimbells Gully). Its catchment is approximately 152 ha in size, representing about 2.4% of the total Mare Burn catchment. The Coal Creek catchment lies to the west of it and the Trimbells Gully Tributary catchment lies to the east.

The wetted channel is narrow throughout most of its length, typically varying from about 50 to 20 cm wide. While the creek typically carries a small flow through summer (a few litres per second), some sections have reasonable water depth due to the confined nature of the channel, brought about by the steep sided gully faces often coupled with underlying bedrock. There are some areas where the flow spreads out and the channel becomes unconfined, resulting in little obvious surface flow, and more akin to wetland habitat as opposed to stream

habitat. In these places, the bed is typically comprised of damp mud covered with plants capable of tolerating wet feet.

Prior to mining, the upper reaches of Maori Hen Creek were comprised of a tussock and pasture filled basin with low gradient, wetland habitats. Flowing water was not observed in this area, with habitat dominated mainly by boggy ground. These areas had low stream ecosystem values, with wetland areas drying out following periods of low rainfall. This section of the catchment has now been mined.

Further downstream, the creek flows through a gully dominated by tussocks and pasture grasses, grazed by cattle and sheep. Instream habitat through the gully is comprised of shallow riffles, runs and small drops and pools. Bed substrate is dominated by gravels and cobbles, with some areas of boulders and bedrock. There is evidence of stock damage to the channel particularly in the lower reaches.

The above description of Maori Hen Creek does not describe the habitat in the affected tributary area, which is located downstream of the low gradient basins previously found in the upper catchment, but upstream of the creek sections within gullies. The tributary has tussock and pasture throughout its catchment, but during previous surveys surface water has not been observed at the downstream end of the tributary (at the confluence with Maori Hen Creek – see Figure 2). The tributary drains a very small catchment area, and therefore the upper reaches of the tributary would have less surface water, and subsequently support less aquatic habitat, than in Maori Hen Creek.

### **Stream communities**

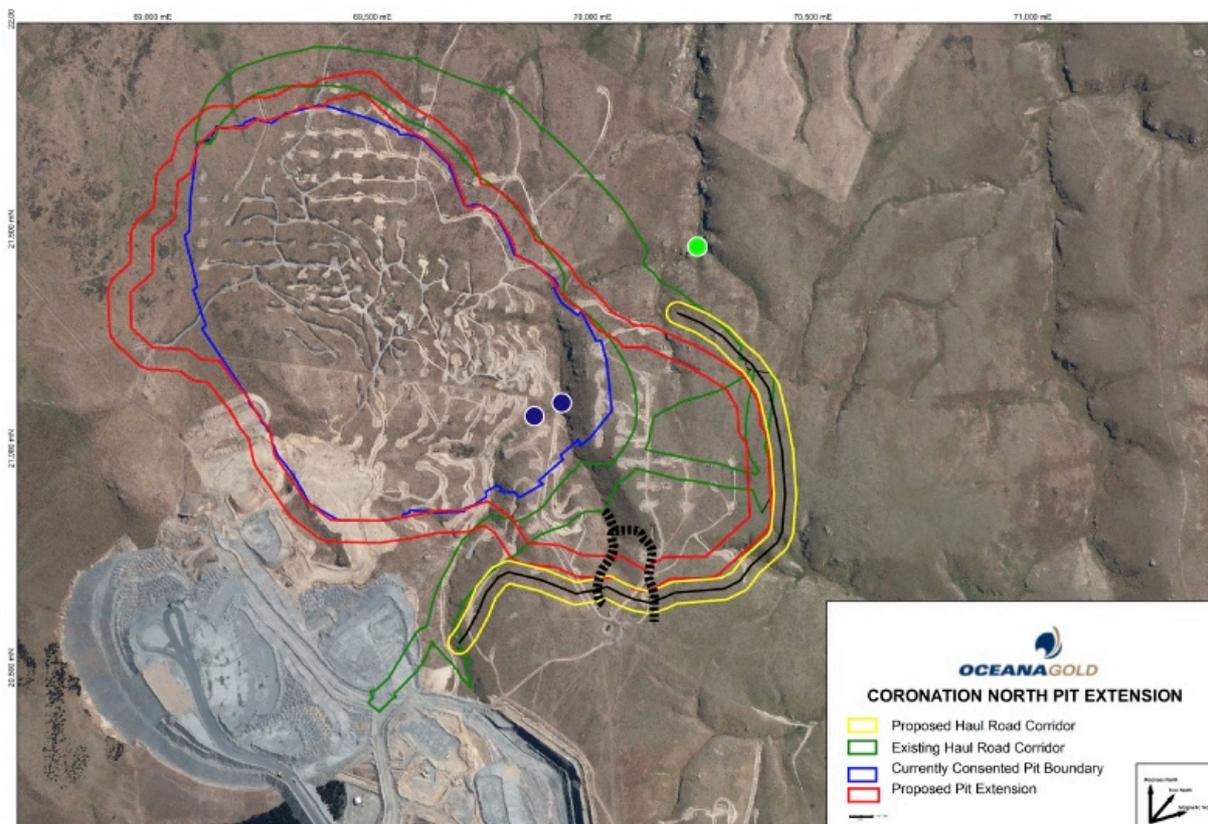
The Coronation North Project aquatic ecology assessment (Ryder 2016) included information regarding the New Zealand River Environment Classification (REC) data for the Mare Burn catchment. The REC groups streams based on variables derived from geology, climate, source of flow and position in the river network. Headwater streams are assigned a stream order of 1. The total length of the Mare Burn stream network for stream orders greater than 1 (i.e., stream orders 2 – 4) is 50.7 km, and if order 1 streams are included in this analysis, 102 km of stream network is present in the Mare Burn catchment.

Surveys of order 1 streams in Mare Burn sub-catchments have found many do not support galaxiid populations, typically because they have no surface flow. But surveys have found that some order 1 streams that do carry surface flow also support galaxiid populations, including Maori Hen Creek. According to the REC classification system, the whole length of Maori Hen Creek is identified as an order 1 stream, but small tributaries of Maori Hen Creek are not identified as order 1 streams. This indicates that, based on the variables defined above that are used to identify the stream order, the smaller tributaries of Maori Hen Creek contribute little towards flows in Maori Hen Creek. This is supported by observations during surveys of stream communities in Maori Hen Creek, with many gullies draining into Maori Hen Creek, including the affected tributary, being dry.

Surveys and translocation operations undertaken in 2015 and 2017 within Maori Hen Creek used nets and electric fishing to capture and remove flathead galaxias (*Galaxias depressiceps*) and crayfish/kōura (*Paranephrops zealandicus*). The surveys were undertaken throughout Maori Hen

Creek, and covered habitat deemed to be suitable to support fish and/or crayfish/kōura (i.e., flowing water or areas of deeper water). Based on the results of these surveys, the upstream extent of fish and crayfish/kōura in Maori Hen Creek was determined (Figure 3). The upstream limit for galaxiids was approximately 800 m downstream of the affected tributary area, and the upstream limit for crayfish/kōura was approximately 250 m downstream of the affected tributary area (Figure 3).

At the time of each translocation/survey, the lower reaches of the affected tributary (i.e., immediately upstream of the confluence with Maori Hen Creek) were not surveyed as this area did not have any visible surface water and therefore did not provide habitat suitable for fish or crayfish/kōura. Further upstream, the upper reaches of the tributary would also have been devoid of surface water and suitable habitat.



**Figure 3** Aerial photo of Maori Hen Creek indicating proposed amendments to the pit boundary (red lines) and haul road corridor (yellow lines). Photo and mining boundaries provided by Oceana Gold (NZ) Ltd. Black dashed lines represent tributary areas affected by proposed amendments. Blue dots represent the upstream extent of surface water suitable for fish and/or crayfish/kōura, and the most upstream sites where crayfish/kōura have been found (November 2015 and May 2017). The green dot represents the most upstream site where galaxiids have been found (November 2015 and May 2017).

### Assessment of effects

Approximately 500 m of the Maori Hen Creek tributary will be affected by the proposed mining footprint amendment. The tributary drains a very small catchment area, and based on previous assessments it does not provide the permanent habitat needed to support fish and crayfish/kōura communities. Indeed, the affected tributary area is well upstream of the most upstream sites where galaxiids and crayfish/kōura have been caught. Also, the affected area of the tributary is isolated from other areas of the Maori Hen Creek catchment by consented mining activity (e.g., pit, waste rock stack); mitigation for effects of these activities have already been provided.

Of the 102 km of stream network (stream orders 1-4) in the Mare Burn catchment, the Coronation North Project resulted in an approximately 11% loss of 'stream' network, although the actual proportional loss of galaxiid habitat would be less than this (Ryder 2016). As indicated above, many of the order 1 streams in the Mare Burn catchment are typically dry, and therefore do not support fish and/or crayfish/kōura populations. The loss of the 500 m of 'stream' network in the affected tributary, that does not support stable stream communities, was not included in the 11% as the tributary area was identified as smaller than an order 1 stream and therefore does not contribute to the overall stream network. Regardless, the short length of the tributary area comprises a very small proportion of the overall stream network in the Mare Burn catchment.

These results and observations reveal that the affected tributary area would not support stable aquatic habitat, and contribute only a very small proportion of flow and associated aquatic habitat in downstream reaches of Maori Hen Creek and the Mare Burn. As such, the effects of the loss of this length of the tributary can be regarded as less than minor.

Do not hesitate to contact me should you require any further information or clarification of the above.

Kind regards,



Ben Ludgate  
*Environmental Scientist and Director*  
**Ryder Environmental Limited**

**APPENDIX D GEOTECHNICAL REPORTS - PELLIS SULLIVAN MEYNINK**

Coronation North Changes in Geotechnical Risk Profile of V7 Pit Design, August 2018

Trimbles Waste Rock Stack, November 2018



Our Ref: PSM71-227L

22<sup>nd</sup> August 2018

OceanaGold Corporation  
Golden Point Road  
RD3, Macraes Flat 9483  
East Otago  
NEW ZEALAND

ATTENTION: ANDY WINNEKE

Dear Andy,

**RE: CORONATION NORTH  
CHANGES IN GEOTECHNICAL RISK PROFILE OF V7 PIT DESIGN**

## **1 INTRODUCTION**

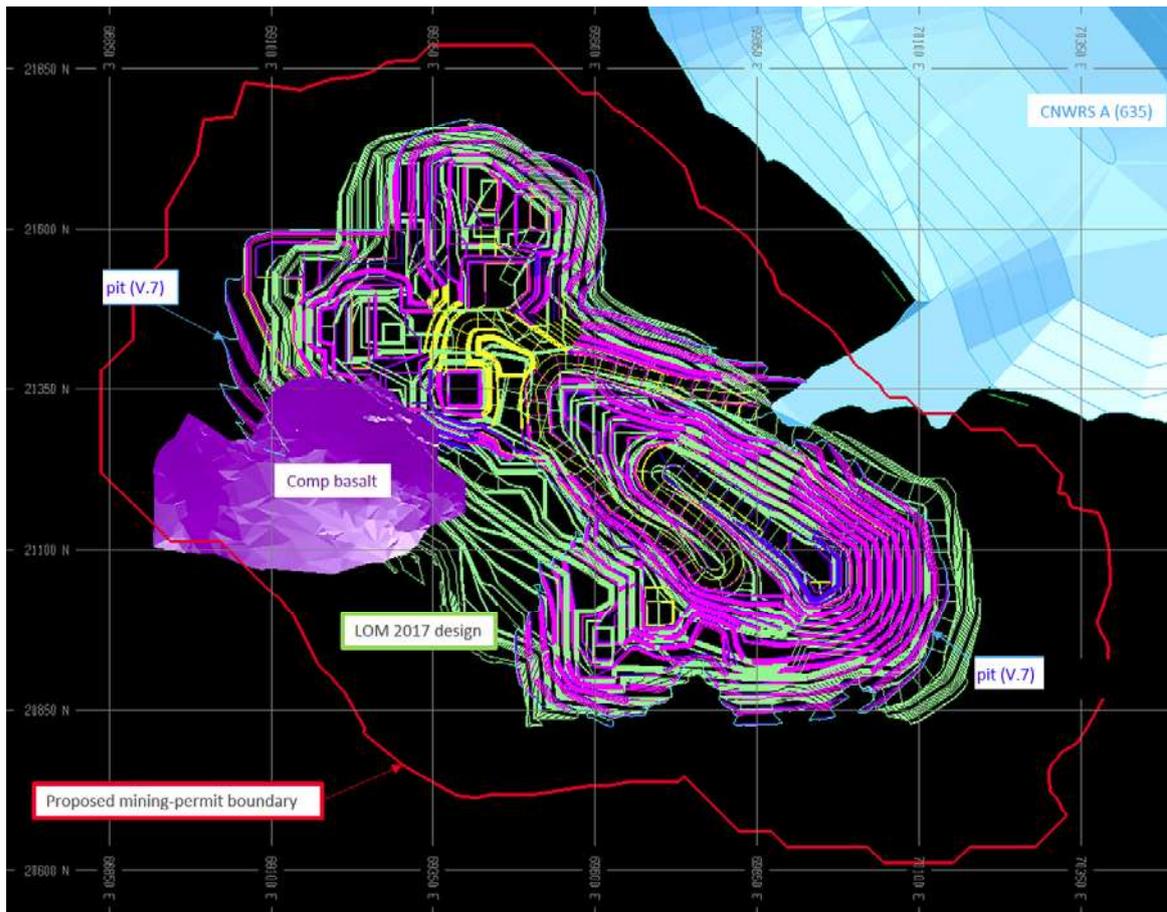
OceanaGold Corporation is evaluating its Coronation North pit and has prepared a revised design, called the V7 Pit, largely in response to the behaviour of the rock mass as encountered. This letter outlines the changes in the geotechnical risk-profile of the walls arising from this revised pit design.

Figure 1 presents a plan view comparing the V7 pit design with the Life-of-Mine (LOM) design developed in 2017. The 2017 LOM pit design was geotechnically assessed in a previous report <sup>(1)</sup>. By inspection of Figure 1, the changes between the two pit designs comprise the following.

- A 250 m length of the west wall, between 21350 and 21600 mN, is pushed 50 m further to the west.
- A 200 m length of the west wall north of 21600 mN is brought in 50 m.
- A 250 m length of the south wall, between 69850 and 70100 mE, is pushed out approximately 50 m further to the south.
- A 600 m length of the east wall north of 20850 mN is brought in by 20 to 50 m.
- The pit depths remain essentially the same.

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<sup>(1)</sup> PSM71-223R *Geotechnical review of Macraes LOM Design 2017*, 25<sup>th</sup> January 2018.



**Figure 1** Plan view comparing the Coronation North pit plans from the 2017 LOM design which is drawn in green lines and the recently updated V7 pit which is drawn in blue lines. This plan also shows the location of the basalt (purple mass on the mid-left) and the waste rock stack (light blue in top-right). The red line shows the extent of the proposed mining permit boundary.

The differences are relatively small changes in the position of the pit crest. Considering the understanding gained from mining and the existing pit exposures, it is not credible that the two areas that are proposed to be pushed back (sections of the western and southern walls) will encounter new geotechnical conditions or domains.

It is considered therefore that there is no change in the geotechnical risk-profile of the walls arising from V7 Pit design.

## 2 WASTE ROCK STACK

The physical distance between the V7 pit and the Coronation North Waste Rock Stack (CNWRS) is approximately 180 to 250 m and has not materially changed from the 2017 LOM design as evidence in Figure 1. The proposed mining permit boundary is also more than 50 m from the CNWRS.

There is negligible interaction between the pit and the CNWRS as reported previously <sup>(2)</sup>.

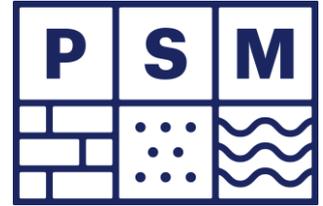
For and on behalf of  
PELLS SULLIVAN MEYNINK

A handwritten signature in black ink, appearing to read 'Rob' followed by a stylized 'B'.

ROBERT BERTUZZI  
Principal

---

<sup>(2)</sup> PSM71-204L *Impact of the Coronation and Coronation North Waste Rock Stack on open pits*,  
12 April 2016



Our Ref: PSM71-230L

28 November 2018

Oceana Gold Corporation  
via email: [Andy.Winneke@oceanagold.com](mailto:Andy.Winneke@oceanagold.com)

Attention: Andy Winneke

Dear Andy,

**RE: TRIMBLES WASTE ROCK STACK**

G3 56 Delhi Road  
North Ryde NSW 2113

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**F** +61-2 9812 5001

**E** [mailbox@psm.com.au](mailto:mailbox@psm.com.au)

[www.psm.com.au](http://www.psm.com.au)

## 1 INTRODUCTION

This letter provides our geotechnical review of the proposed Trimbles Waste Rock Stack in response to the request from Oceana Gold Corporation <sup>(1)</sup>.

The Trimbles Waste Rock Stack is proposed to occupy the ground between and east of the Coronation and Coronation North pits. It is shown in a plan view in Figure 1 and in three sections in Figure 2.

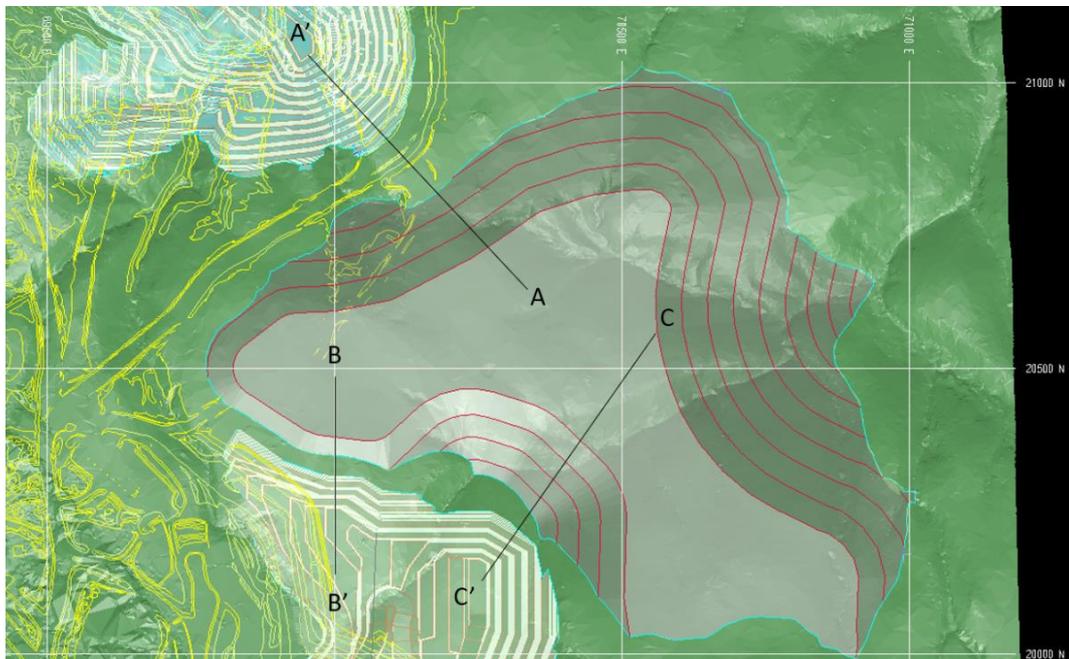


Figure 1: Plan location of the proposed Trimbles Waste Rock Stack, which lies between Coronation (south) and Coronation North (north) pits. Section lines are drawn.

<sup>(1)</sup> Email from Andy Winneke dated 16 November 2018

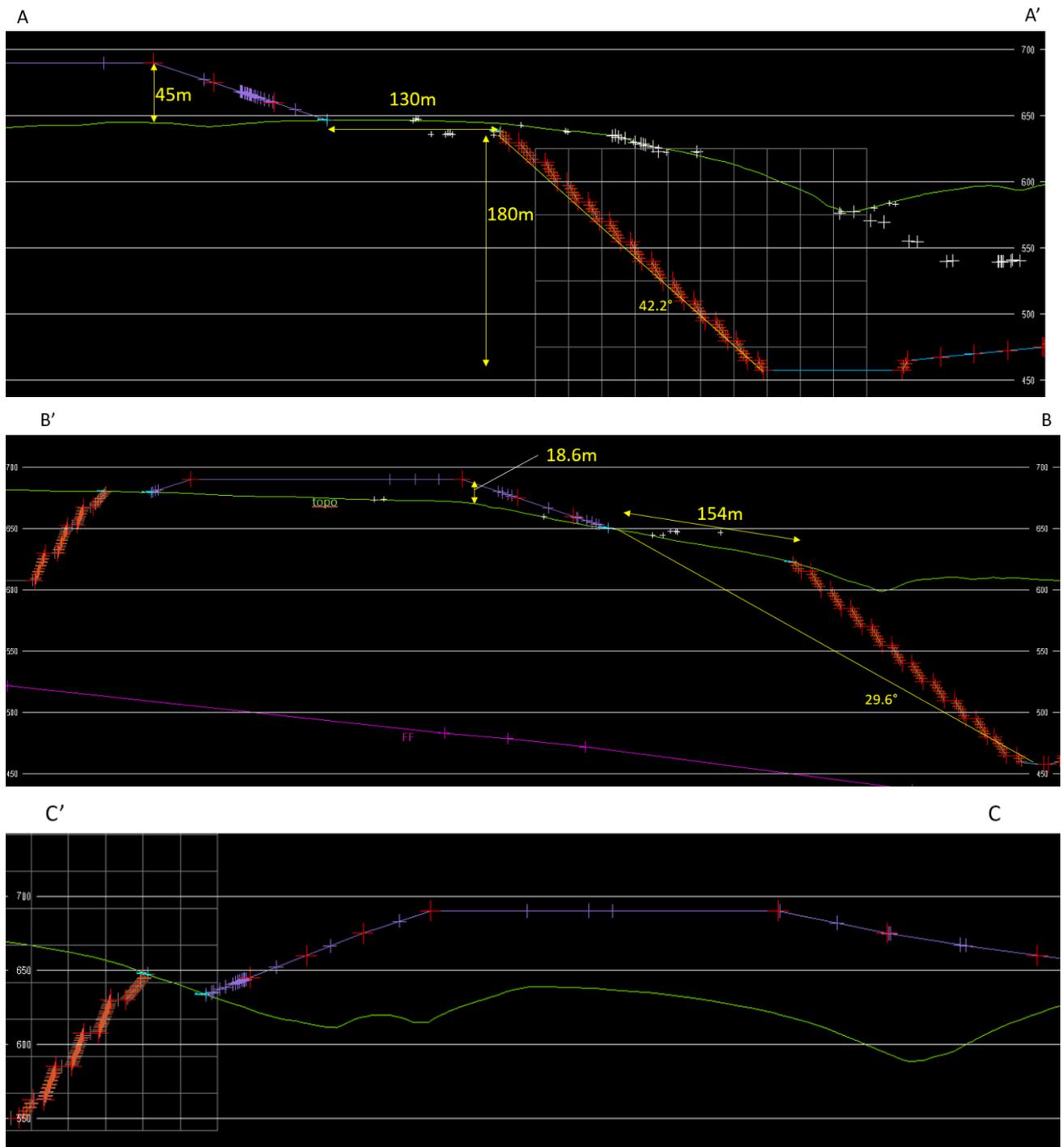


Figure 2: Three sections through the proposed Trimbles Waste Rock Stack.

The sections are selected to represent the most critical geometry in terms of proximity to the pit walls and height of the waste rock stack. The overall slopes of the final waste rock stack are approximately 18°.

- Section A. The waste rock stack is 45 m high. Its base is 130 m from the crest of the Coronation North pit. At this location the pit wall is 180 m high at an overall angle of 42°.
- Section B. Adjacent to the Coronation pit, the waste rock stack is less than 12 m high and 36 m from the pit's crest. Here the Coronation pit wall is 65 m high at an overall angle of 51°.

- Section B. Adjacent to the Coronation North pit, the waste rock stack is less than 20 m high and is 154 m from the pit's crest. The Coronation North pit wall is approximately 165 m high at an overall angle of 43°.
- Section C. The waste rock stack is 50 m from the crest of the Coronation pit and abuts against the existing topography. The waste rock stack is up to 75 m high in this area. The Coronation pit wall here is approximately 100 m high at an overall angle of 49°.

By inspection, the most critical geometry is Section C. This section was used to assess slope stability.

## 2 LIMIT EQUILIBRIUM ANALYSIS

### 2.1 General

Limit equilibrium analysis using RocScience's Slide software was used by OceanaGold to assess the impact of the proposed Trimbles Waste Rock Stack on the overall pit wall stability based on the Factor of Safety (FoS) concept. Typically, for mining applications an acceptable static FoS is one greater than 1.2. For earthquake cases, the target FoS is greater than 1.0.

The GLE Morgenstern Price method was selected for the analysis as it better suited to capture the potential failure mechanisms at Macraes, i.e. sliding along crushed rock/gouge infill associated with first and second order geological structures.

### 2.2 Material Properties

This study has adopted established rock mass shear strength properties used in a suite of previous studies. The equivalent Mohr-Coulomb strength parameters are presented in Table 1.

**Table 1 – Strength parameters**

Lithology	Unit Weight [kN/m <sup>3</sup> ]	Cohesion [kPa]	Friction Angle [°]
Waste Rock	20	1	35
Weathered Schist	25	120	35
Inter-shear Pelite	25	180	43
Faults	20	0	15
Footwall Fault	25	0	9

The groundwater level is assumed to be towards the base of the waste rock stack and drawn down to the base of the open pit.

### 2.3 Seismic Loading

The potential effects of an equivalent 150-year return period earthquake on the stability of the dump and pit walls is considered by including a horizontal acceleration of 0.13g into the stability analysis (Table 2).

**Table 2 - Macraes PGA for different return periods (Litchfield et al., 2005)**

Return Period (years)	150	475	1000	2500	10000
PGA (g)	0.13	0.25	0.38	0.65	1.1

## 2.4 Results

The results, which are shown in Figures 3 to 6 and summarised in Table 3, show a FoS greater than 1.7 and greater than 1.4 under earthquake event.

**Table 3 – Summary of limit equilibrium analyses**

Run	Seismic Loading (g)	Minimum FoS
No Groundwater	0	1.75
	0.13	1.46
Groundwater	0	1.73
	0.13	1.46

## 3 CONCLUSION

Our geotechnical review of the proposed Trimbles Waste Rock Stack presented in the letter confirms that the proposed location and design of the Trimbles Waste Rock stack is suitable. The waste rock stack does not adversely impact on the stability of the adjacent Coronation and Coronation North open pits.

For and on behalf of  
PELLS SULLIVAN MEYNINK



ROBERT BERTUZZI  
PRINCIPAL

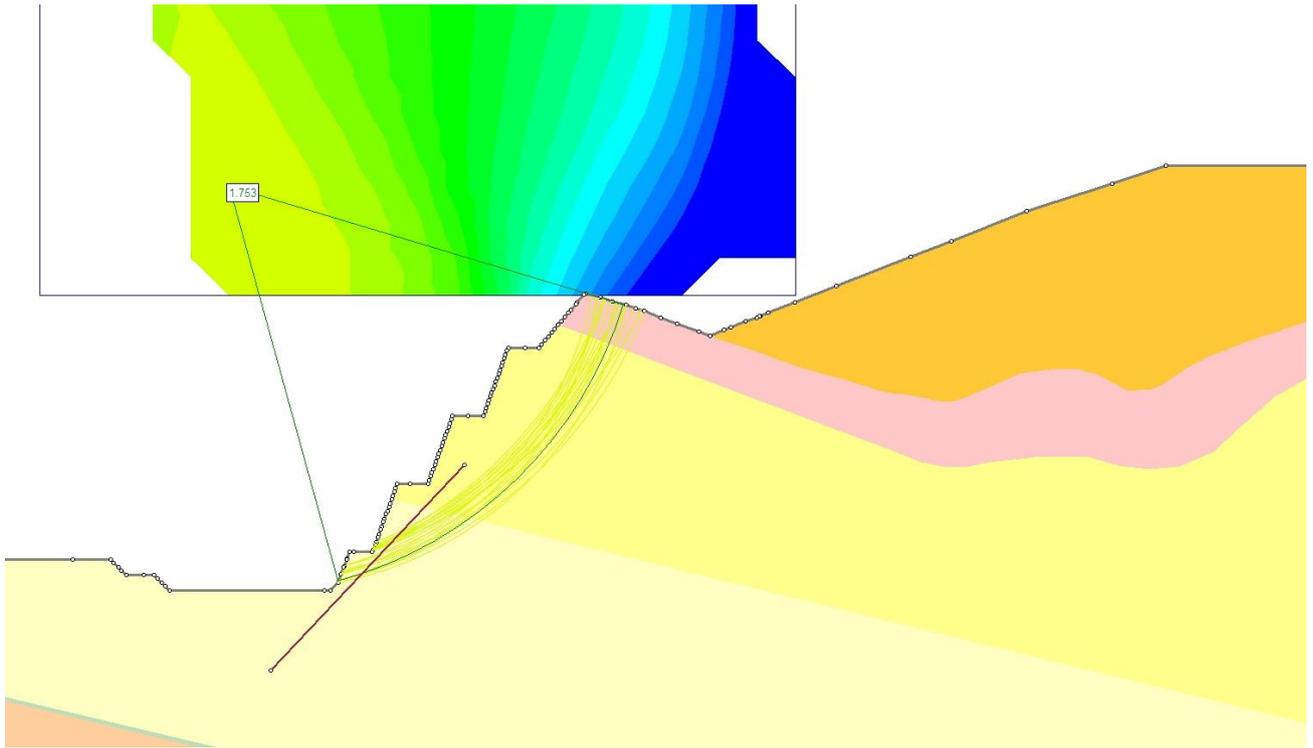


Figure 3: FoS result for Section C – no groundwater. Minimum FoS = 1.75

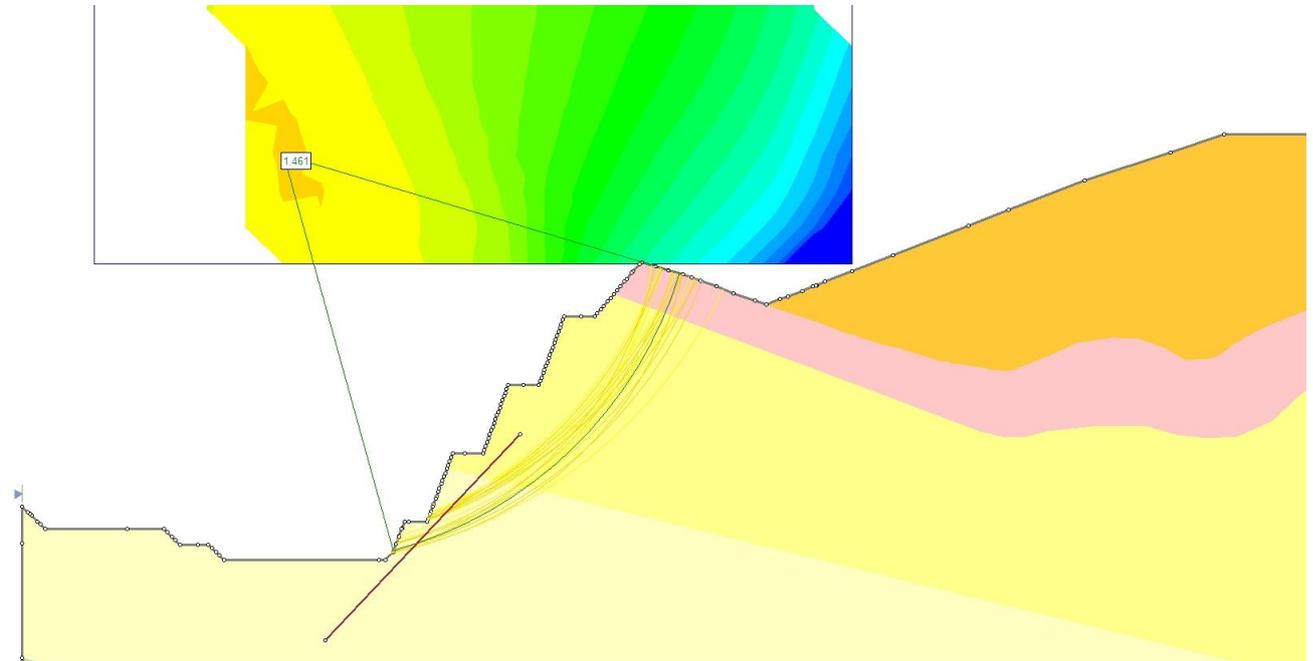


Figure 4: FoS result for Section C – no groundwater, 0.13g seismic. Minimum FoS = 1.46

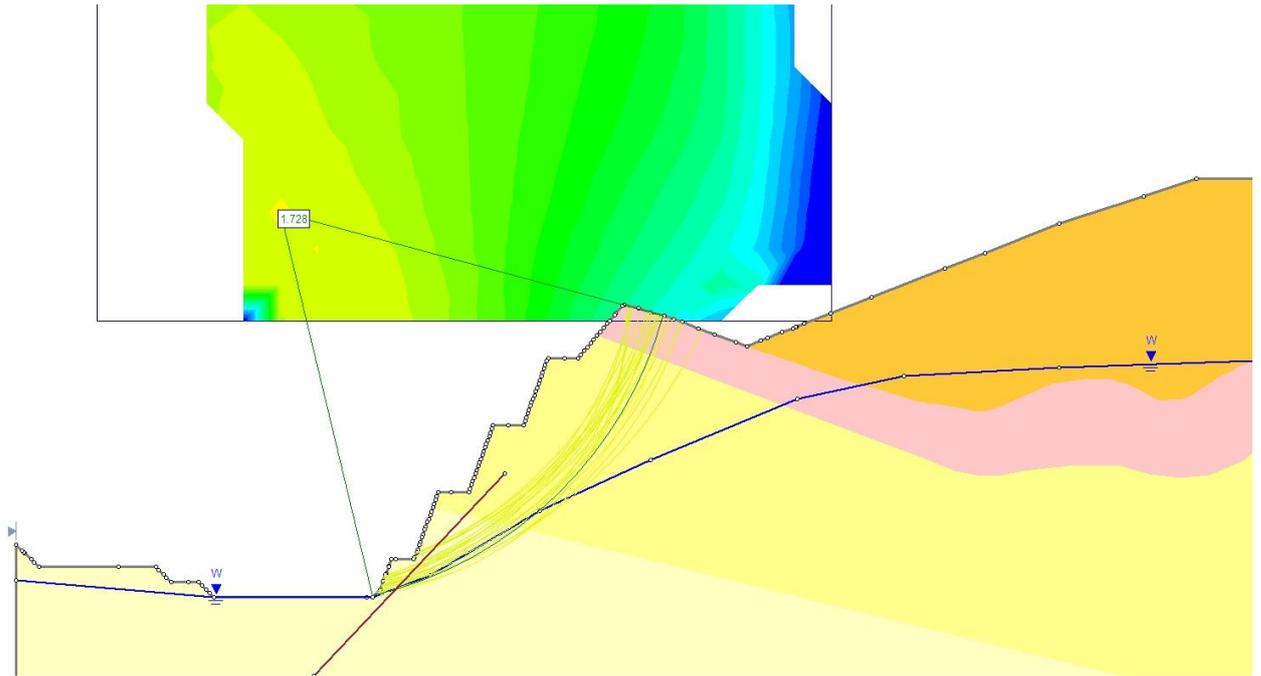


Figure 5: FoS result for Section C – groundwater. Minimum FoS = 1.73

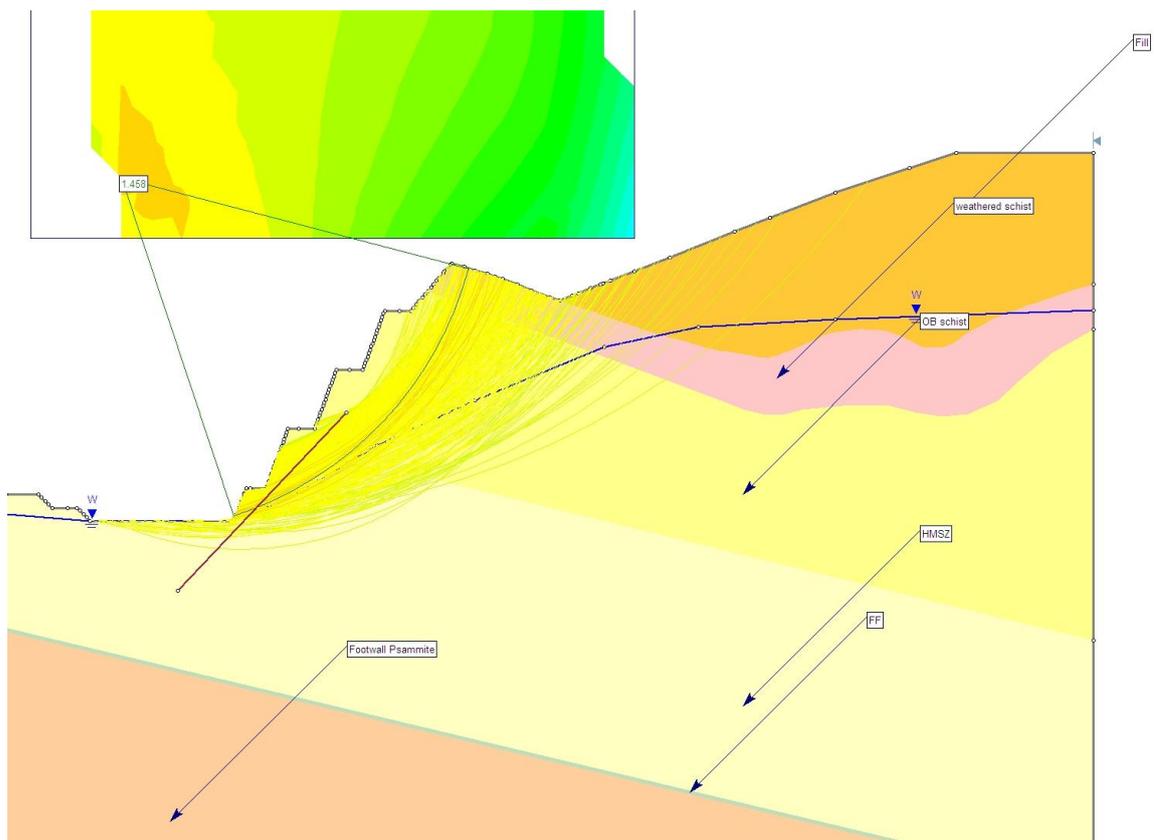


Figure 6: FoS result for Section C – groundwater, 0.13g seismic. Minimum FoS = 1.46

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**APPENDIX E** *CORONATION NORTH EXTENSION PROJECT - LANDSCAPE AND VISUAL EFFECTS –*  
WSP OPUS, JANUARY 2019

29 January 2019

Gavin Lee  
Environmental and Community Manager  
Oceana Gold (NZ) Ltd  
Golden Point Road  
RD3, Macraes Flat 9483

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New Zealand

 +64 3 363 5400  
 [www.wsp-opus.co.nz](http://www.wsp-opus.co.nz)

Ref: 3-C1680.05

## OceanaGold: Coronation North Extension Project - Landscape and Visual Effects

Dear Gavin

As requested, the following is my assessment of the potential landscape and visual effects of the proposed extension of the consented Coronation North Mine, Macraes Operation, Macraes Flat.

My assessment is based on the Coronation North Extension Project Description and the supporting plans that you provided earlier this month; refer **Appendix 1**. This information notes four succinct areas where it is proposed to change aspects or components of the mine relative to what was consented as part of the Coronation North development in 2016. These components are:

- **Pit Cutback** – A south eastward<sup>1</sup> extension of the open cut pit, which is to be excavated to access ore-bearing rock and will result in a near-vertical high wall that will have the same configuration as the rest of the consented pit;
- **Pit Wall Stability Layback** – An extension of the western ‘corner’ of the open cut pit, which is to be excavated to address geotechnical concerns as this area of high wall is not standing up as well as had been expected and needs to be battered back further;
- **Pit Backfill** – The waste rock excavated from eastward extension of the pit will be backfilled into the northwest aspect of the pit rising up above natural ground level in the western ‘corner’. The latter will be shaped to tie-in with the existing and pre-existing landform of the adjoining Sisters Peaks; and
- **Trimbells Waste Rock Stack** – A new waste rock stack (WRS) in the upper southeast extent and slightly beyond of the consented mine area that will be separate from the consented Coronation North WRS. In relinquishing the area between the proposed and consented WRSs, various ecological values will now be retained untouched.

Where the proposed changes relate to extending aspects of a consented activity that has already changed the landform and landuse of the immediate area, the landscape effect and associated effect on natural character of this change will be minimal. This is due the scale and extent of these potential changes are very small relative to that which is already consented. However, the proposed changes may have a visual effect as they have the potential to increase the extent of the open cut pit that is visible. The Trimbells WRS in its more elevated position has the potential to increase the visibility of the extent of waste rock stack in the immediate area.

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<sup>1</sup> Compass orientation is based on Macraes North/Macraes Grid

I have compared these proposed changes to the 'footprint' of the consented open cut pit that I addressed in the Coronation North Project Landscape and Visual Assessment (LVA) that I prepared in April 2016. The LVA was supported by several photo simulations of which the 'Viewpoint 12 - Longdale cattleyards, Longdale Road' (Vpt 12) images are relevant to this current assessment; refer **Appendix 2**.

I have attached section 6.3.12 from the April 2016 LVA that addressed the effects on the view from Longdale Road; refer **Appendix 3**. This northern viewpoint represents the broad view from a relative short section of Longdale Road from which the Coronation North Project is visible. It also represents the one public road with Dunedin City district from which the mine is visible.

Attached also to this assessment is a set of new Vpt 12 photo-simulations<sup>2</sup> based on photographs I took on Thursday, 17 January 2019; refer **Appendix 4**. This set of images has the four components of proposed extension named and these components have been outlined and 'coloured' in the Vpt 12 False Colour - January 2019 image. These components have then been 'naturalised' in the final Vpt 12 Photo Simulation - January 2019 image.

I note that that as an A3 printed image of what is quite a wide panoramic view, this does shrink what you would see when 'on the ground' considerably. The visible portions of the waste rock stacks and the open cut pit will appear to be closer and bigger when you are standing at the viewpoint. The comparative scale of the change, though, is quite small relative to what can be seen of the already consented pit and relative to the broader consented mine activities; being the combination of open cut pit, the Coronation North WRS and haul roads and less yet relative to the broad sweep of the upper Mare Burn basin area.

As noted, the main part of the extension to the pit shell is to the mine east. This extension will push over the currently consented haul road boundary towards the proposed Trimbells WRS. Relative to Vpt12, it will extend the pit away from the viewpoint and the local road. This will potentially make the pit appear somewhat longer.

The other part of the extension in the mine west 'corner' is slightly more elevated and will add to the section of the consented pit high wall that extends upslope against Sisters Peaks. However, the Coronation North Pit Back will progressively 'rise up' within the northern margin of the pit above natural ground level and obscure the pit void as seen from Vpt 12. The final placement of the pit backfill will be shaped to re-form the pit edge up against the slope of the northern promontory of the Sisters Peaks. In so doing, the backfill will cover the cut face within the western 'corner' of the pit and obscure the remainder of the western pit face beyond.

As noted at section 6.3.12 of the April 2016 LVA: *The mitigating factor for the pit void relative to potential views from Longdale Road is that much of the pit will be obscured by land along its northern or near edge, though the upper extent of the side and back walls of the pit will remain visible.* As outlined above, the proposed pit backfill will form a new 'northern frontage' to the mine that will obscure the open cut and its side walls from Vpt 12 and potentially most, if not all, of the proposed eastern pit cutback. At RL 640 m, it is expected that top of the backfill will be approximately 30 m above the edge of the existing pit on the western edge.

The proposed active pit backfilling will also have a positive landscape effect in negating part of the pit void and re-forming the northern aspect of the Sisters Peaks promontory.

Trimbells WRS will have a lesser 'footprint' than the combined Area B and Area C of the consented Coronation North WRS, but will still obscure part of the Taieri Ridge, rising up to the skyline of the ridge. As shown in the Vpt 12 - January 2019 images, the visual effect of this is consistent with what is consented relative to Coronation WRS.

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<sup>2</sup> The Vpt 12 - January 2019 photo-simulations have been generated in the same manner as the previous April 2016 photo-simulations. The methodology is outlined at Appendix 8 - Photos and Photo-simulations of the April 2016 LVA

From the April 2016 LVA, the concluding comment relative to VPT: was:

*In essence, the combined landscape and visual effects of the Coronation North WRS and the Coronation North Pit as seen from this viewpoint will be high in the first instance. In 10 – 15 years, these effects will be countered, to some degree, by the established rehabilitation of the slopes of the waste rock stack. Given that these mine elements are relatively close to the viewpoint and the open cut pit will be a lasting feature, the visual effect on this view will remain, but in the longer term will reduce to moderate-high to moderate.*

In regard to the proposed Coronation North Expansion, the potential waste rock stack-related landscape and visual effects will remain much as before, but with the lesser landscape effect of having a strip of land left untouched between what would be the smaller, stand-alone Coronation WRS and the proposed Trimbells WRS. While this strip of land is not directly visible from Vpt 12 on Longdale Road, it's retention will have positive ecological outcome.

In regard to the proposed changes to the Coronation North open cut pit, both the proposed south-east pit cutback and the western pit wall layback will increase the worked area of the pit. however, the effect of this will be 'balanced' by the proposed backfilling on the north to northwest aspect of the pit. The placement of the backfill rising up above natural ground level and being placed against the Sisters Peak promontory will have a positive outcome. This will be due to the reinstatement of a portion of the local landscape and the visual screening of pit relative to Longdale Road.

In my opinion, the landscape and visual effect of the changes proposed by the Coronation North Extension will be no more than minor within the context of the consented Coronation North Project.

Regards

A handwritten signature in black ink, reading "David McKenzie". The signature is written in a cursive, flowing style with a large, prominent 'D' and 'M'.

David McKenzie  
Registered FNZILA  
Technical Principal: Landscape Architecture



## Appendix 1

### Coronation North Extension Project Description

The Coronation North Extension Project is driven by several aspects, as follows:

- Successful exploration activity OceanaGold has located an additional resource not previously identified at the time of consenting the previous project.
- Geotechnical constraints with pit wall stability.
- Optimisation in design of waste rock movement from the Coronation North Pit and the Coronation Pit extension (consented as part of the Coronation North development) and subsequently waste rock stack design.

The overall effect of these aspects is to:

- Increase the volume of ore being excavated from the mining operation to:
  - Extend the life of mining by approximately 4 months.
  - Increase in unconsented area of 57.39 ha, balanced by the set aside of 52.9 ha of consented area resulting in a net increase/decrease of 4.49 ha.
  - Reduce effects (in almost all cases) to significant biodiversity values, when compared with the existing consented baseline.
  - Provide a reduction of visual effects when compared with the existing consented baseline.
  - Improve the safety of current operations and long-term stability of the pit walls.

The specific Project Elements of the Coronation North Extension are:

- **Pit Cutback** – Following more detailed exploration drilling and pit optimisation, approximately 2.8 million tonnes of gold bearing ore have been identified close to the existing Coronation North Pit. It is proposed to extend the Coronation North Pit to the south east in order to access the underlying gold resources, in an area partially consented for haul road and topsoil access. The cutback will result in approximately 28.8 million tonnes (or 12.2 million m<sup>3</sup>). The additional area required for this cutback is 25.76 ha.
- **Pit Wall Stability Layback** – As the Coronation North Pit has developed, greater knowledge and understanding of the underlying geology and pit wall behaviour has been gathered. In order to ensure the safe removal of ore from the Coronation North Pit, the Pit wall is required to be laid back. This will result in approximately 14.12 ha of additional unconsented area.
- **Pit Backfill** – The Pit Cutback will allow for approximately 19.3 million tonnes (9.2 million m<sup>3</sup>) of waste rock to be placed at the north western end of the Coronation North Pit. The pit backfill will rise approximately 30 m above the natural ground level on the north western side of the Pit to an elevation of RL 640 m.
- **Trimbells Waste Rock Stack (Trimbells WRS)** – Detailed scheduling of waste movement has led to the design of Trimbells WRS, which is located high in the catchment of Trimbells Gully and partially covers Area B and area C of the consented Coronation North Waste Rock Stack. Trimbells WRS requires an additional 17.51 ha of unconsented area and has a final elevation of RL 675 m. The design of the Trimbells WRS as a replacement for the Area B and C of the consented Coronation North WRS has allowed for a significant area of consented land to be relinquished. The area equates to 52.9 ha which has several benefits as outlined in the Section 6<sup>3</sup>.
- Surface runoff will continue to be diverted around the open pit and waste rock stack workings and managed with diversion drains and silt control dams located in gullies of disturbed areas, as is currently implemented. Any additional sediment control required will be installed prior to any additional disturbance within each catchment area.

These Project Elements are shown in the following plans.

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<sup>3</sup> Refer to Section 6 of the Proposal's AEE.

Mining of the Coronation North Pit Cutback will be conducted in conjunction with the Coronation Pit extension (consented as part of the Coronation North Project). Waste rock will be placed in the consented Coronation North Waste Rock Stack (Area A), Coronation North Pit Backfill and Coronation Waste Rock Stack. A detailed materials balance of waste rock movement is summarised in **Table 1 Waste Rock Materials Balance**<sup>4</sup>. The overall balance suggests net surplus of available volume of 3.6 million m<sup>3</sup> (8.9 million tonnes) in the designed waste rock storage. For the purposes of design and subsequently consenting, it is preferable to take a more conservative approach to ensure suitable capacity of storage.

*Table 1 Waste Rock Materials Balance*

Source	Volume	Tonnes	Destination	Volume	Tonnes
Coronation North Pit	7.7	15.6	Coronation North WRS	12.2	25.6
Coronation North Pit Extension	12.6	26.2	Coronation WRS	2.1	4.4
Coronation Pit Extension	16.9	35.0	Trimbells WRS	17.6	36.3
			Coronation North Backfill	9.2	19.3

In addition to the Project Elements the following measures will be taken as part of the good practice for environmental management at Macraes:

- Surface runoff will continue to be diverted around the open pit and Waste Rock Stack workings and managed with diversion drains and silt control dams located in gullies of disturbed areas, as is currently implemented. Any additional sediment control required will be installed prior to any additional disturbance within each catchment area.
- Surface and ground water collected within the pit will continue to be used for dust suppression activities onsite. This water will be utilised in the watercarts for keeping the dust on the haul roads, waste rock stack, and pit floors to a minimum.
- Discharges to air will continue to be managed by the operative Dust Management Plan. The plan includes methods which may be used to minimise dust generation. Dust and Total Suspended Particulate (“TSP”) will continue to be monitored at existing monitoring sites.
- In preparation for excavation of the Coronation North Pit extension, Coronation Pit extension and Trimbells Gully WRS, topsoil and the underlying brown rock (i.e. weathered schist) will be stripped for the purposes of rehabilitation. It is not envisaged that additional footprint will be needed for temporary stockpiles as this material will be used directly on existing waste rock stack final surfaces.
- The closure plan will continue to be comprised of progressive rehabilitation of Trimbells WRS, Coronation North WRS, Coronation WRS and the Pit Backfill. The open pit will form a pit lake within the remaining pit shell. All other rehabilitation programmes will remain as previously planned and consented.
- Access to Trimbells WRS will still be utilise existing consented alignments. The main access from the Coronation to the Coronation North Pits will be diverted approximately 300 m to the mine’s south east but will be contained within the proposed disturbance envelope.
- Temporary pedestrian access will largely remain unchanged from that established for the Coronation North Project. There will be a slight realignment in the mine west corner where the access will be pushed westward.

<sup>4</sup> All volumes and weights in the table are expressed in millions.

- The Coronation North Extension will be carried out, managed and monitored on substantially the same basis as the consented Coronation and Coronation North projects during operations in terms of mining methods, operating 24 hours a day seven days a week, drilling and blasting, use of the existing fleet of diesel powered mining equipment, transport movements, dust management, surface and groundwater management, sediment control, progressive rehabilitation of waste rock stacks.
- The existing haul road access to the Coronation North project area will largely remain unchanged. Mining access will continue to be from the haul road leading up from Horse Flat Road.
- Hauling of Ore will be undertaken under a 'no night time hauling' policy until such time that agreement can be obtained with the affected party to alter that policy (see Section 6 for more information).
- Ore will continue to be processed at the existing processing plant and the existing processing rate at the plant of approximately 5-6 Mt per annum will also remain the same.

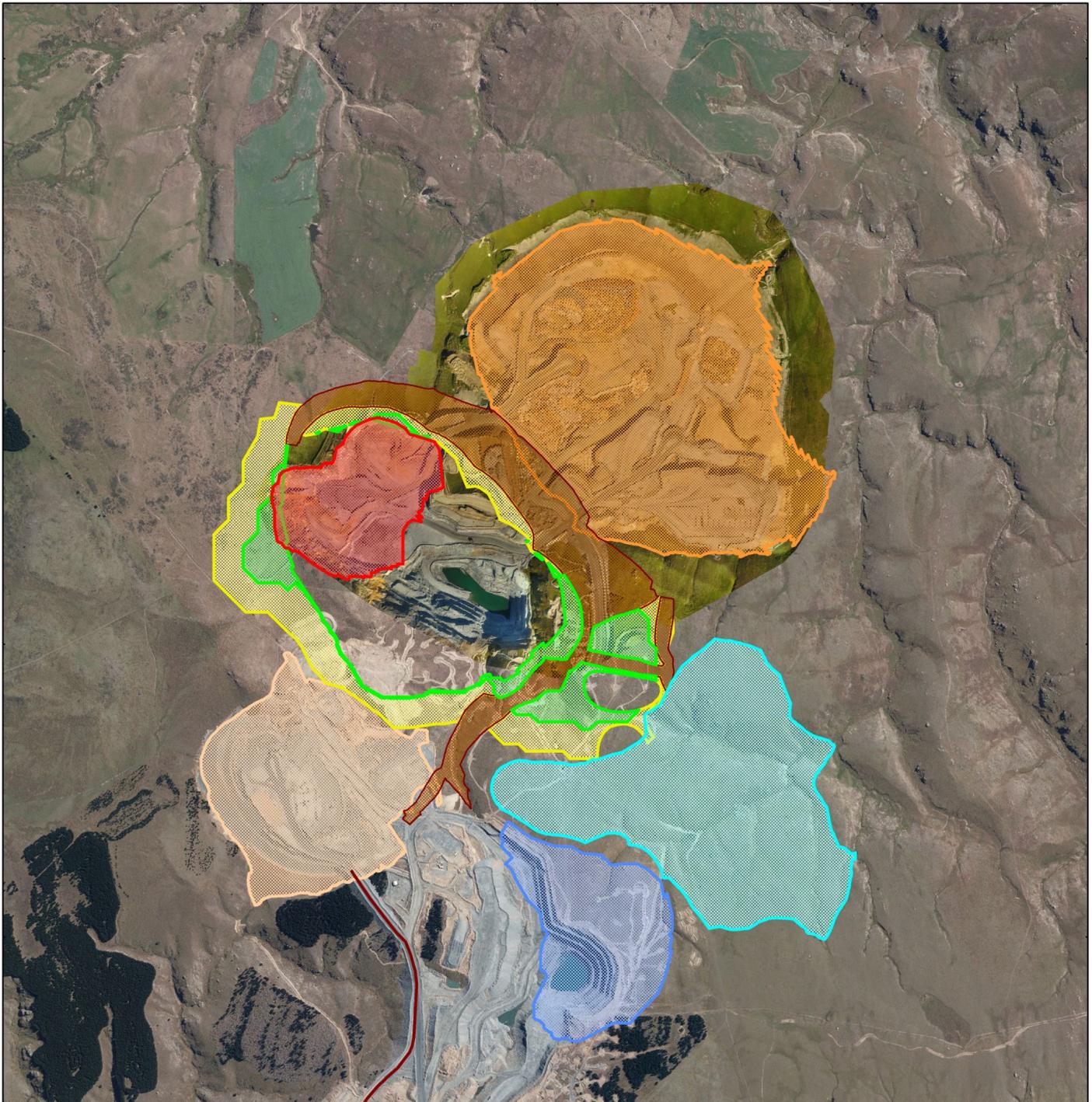


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70,000 mE

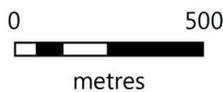
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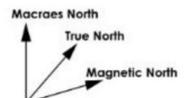


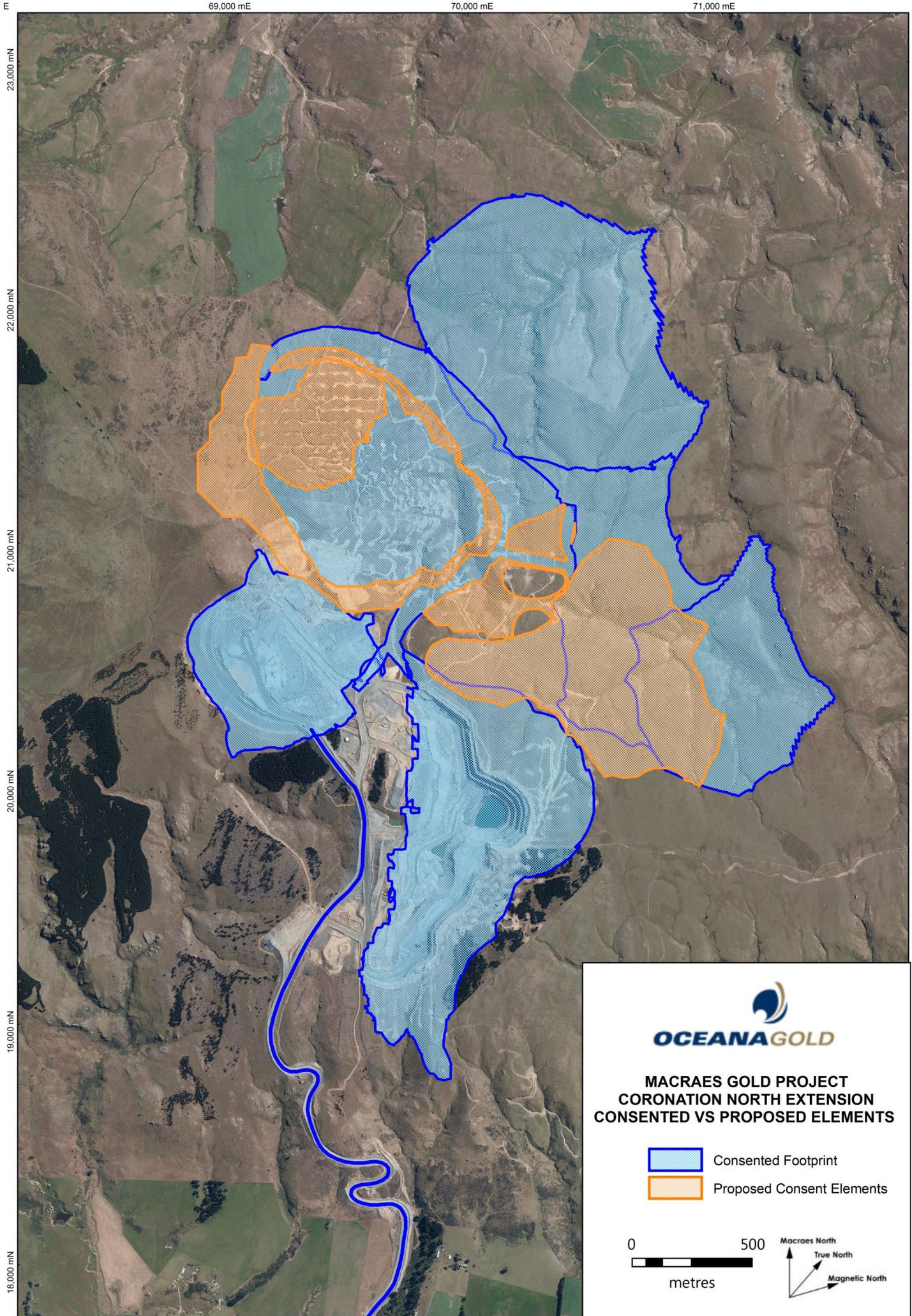
**MACRAES GOLD PROJECT  
CORONATION NORTH EXTENSION-PROJECT ELEMENTS**

- |  |   |
|--|---|
|  Haul Road                  |  Coronation North Waste Rock Stack |
|  Trimbells Waste Rock Stack |  Coronation Waste Rock Stack       |
|  Pit Backfill               |  Coronation Pit                    |
|  Coronation North Cutback   |  Pit Wall Stability Layback        |



Scale: 1:20,000 @A4  
Datum: MGP Macraes Grid  
Aerial Surveys Photography: 9 March 2017





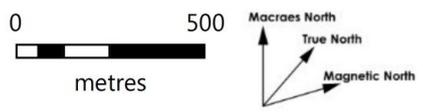
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69,000 mE 70,000 mE 71,000 mE



**MACRAES GOLD PROJECT  
CORONATION NORTH EXTENSION  
CONSENTED VS PROPOSED ELEMENTS**

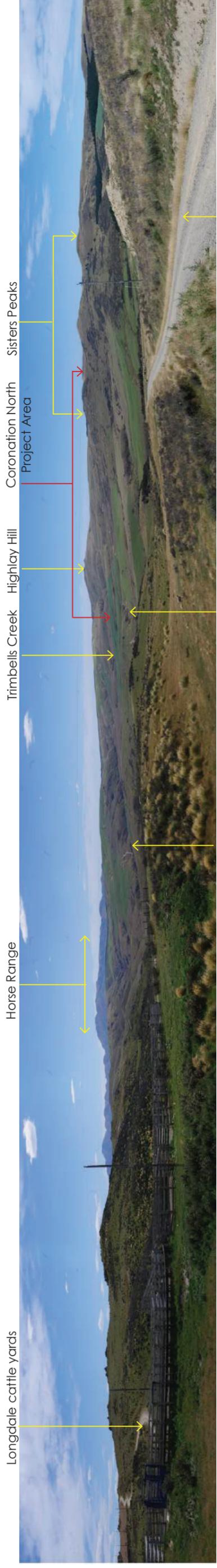
-  Consented Footprint
-  Proposed Consent Elements



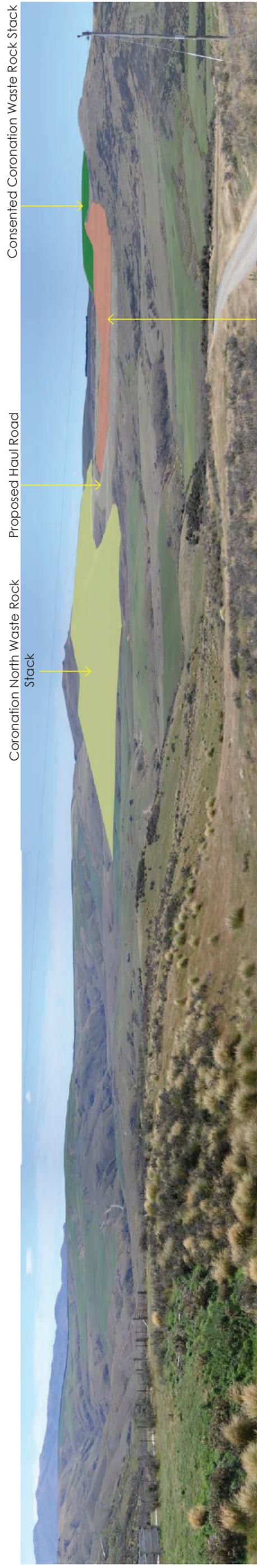
## Appendix 2

'Viewpoint 12 – Longdale Cattleyards, Longdale Road' images from Coronation North Project:  
Landscape and Visual Assessment, April 2016





Viewpoint 12 - Longdale cattleyards, Longdale Road



Viewpoint 12 Enlargement - Photo simulation (False Colour)



Viewpoint 12 Enlargement- Photo simulation

## Appendix 3

### Section 6.3.12 Extract from Coronation North Project: Landscape and Visual Assessment, April 2016

#### 6.3.12 View 12 - Longdale Cattleyards, Longdale Road

Travelling 'east' from Hyde – Macraes Road along Matheson Road, which becomes Longdale Road north of Station Hill, the area of the Project does not become visible until just past the conifer plantation beyond 'Hill 721' and then as the traveller descends to Longdale homestead.

The **View 12 photo** provides a broad view of the upper catchment basin of the Mare Burn that drains much of eastern 'back' slopes of the Taieri Ridge. As indicated on the Viewpoint Map, the View 12 viewpoint is approximately 3.5 km from the central high point of the proposed Coronation North WRS. This viewpoint is indicative of what will be seen of the Coronation North Project Area from the nearest public point on the DDC side of the Taieri Ridge.

In the View 12 photo the Kakanui Mountains can be seen in the distance in the centre left edge of the photo. Highlay Hill is on the skyline in the middle left of the photo and high points of the Sister Peaks are in the centre right of the view. The conifer plantations above Longdale homestead are in the right of the photo. The land falls away to Coal Creek in the foreground, which flows to the Mare Burn. Part of the proposed Coal Creek freshwater storage reservoir will be visible from the viewpoint. Maori Hen Creek and Trimbells Creek drain the slopes between the Sister Peaks and Highlay Hill and also flow to the Mare Burn.

The Longdale homestead is the closest residence to the Coronation North Project on the north side of the Taieri Ridge; being approximately 3.2 km northwest of the central point of the proposed waste rock stack. The proposed haul road around the northern edge of the Coronation North Pit will be approximately 1.8 km from the homestead. However, there are shelterbelts and rising land immediately to the southeast of the homestead that will obscure the waste rock stack from the homestead. The Longdale property is owned by OceanaGold and has been leased back to the previous owner who will continue to farm that part of the property that is not within the Coronation North Project area.

Approximately 1.5 km further north on Longdale Road is the Mount Highlay homestead (the O'Neil residence). This homestead is set within a sheltered gully that drains to the Mare Burn and the Taieri River to the north and west. There is a sizable local ridge that rises up to 658 masl immediately southeast of the Mount Highlay homestead that obscures the Coronation North Project area from the O'Neil residence. Consequently, there will be no visual effects that will potentially affect this isolated residence.

Viewshed Map 1 indicates that an aspect of the proposed Coronation North WRS will be directly visible from the View 12 viewpoint and this is verified by the **View 12 photo-simulation**. The photo-simulation shows that the northern faces and a portion of the western flank of the proposed Coronation WRS will be visible in the middle ground of the view with Highlay Hill rising behind it. The north-running arm of the proposed Coal Creek freshwater storage reservoir will be visible in the middle ground between the local road and the proposed waste rock stack. The western portion of the consented Coronation WRS will be seen to the left of the highest of the Sister Peaks and the northern-most of the peaks will be removed by the excavation of the Coronation North Pit. Aspects of the upper western, southern and eastern cut slopes of the proposed Coronation North open cut pit will be visible, as will sections of the proposed haul road run across the north end of the pit and then running between the pit and the waste rock stack to the south. The southern extent of the haul road and the land it traverses will obscure the Coronation Pit Extension from this viewpoint.

Viewshed Map 2 implies that the Coronation Pit Extension or at least aspects of its upper cut slopes will be visible from this viewpoint. However as mentioned above, this pit will be obscured by the unmined section of land between the two pits. This section of land will be

within the working mine and is likely to be used as a stockpile area for lower grade ore and for topsoil. It would then be rehabilitated to pasture at mine closure.

As shown in the photo-simulation, the elevated southern portion of the Coronation North WRS will occupy a portion of the skyline to the west of Highlay Hill. The waste rock stack will grade into the Taieri Ridge with the natural ridge line visible in the centre of the view. The ridgeline will then grade into the consented Coronation WRS that then grades into the highest of the Sister Peaks.

The proposed Coronation North WRS, having a maximum footprint that is approximately 2.8 km long by 1 km long and being up to 200 m high in parts, will form a distinct landform within the upper Mare Burn 'basin'. As shown in the photo-simulation, this new 'central ridge' will have a similar 'stepped' configuration to, but will be more pronounced, than the natural ridge to its immediate east; being immediately east of Trimbells Gully. It will, however, be somewhat smaller than the natural ridge to the east of that; being the elevated landform that sits between two, larger eastern tributaries to the Mare Burn.

The natural drainage pattern of the local ridges in this 'quarter' of the upper Mare Burn 'basin' has become more pronounced as a result of the flatter areas above and the sloping headlands between the side gullies having been cultivated and established in higher yielding pasture. The result of this is that their green pasture cover stands out from the un-improved 'tussock' grassland in the gullies and on other ridge tops and headlands. This further emphasises the natural drainage pattern.

The flanks of the Coronation North WRS will not be as dissected as those of the natural ridges or headlands and will be smooth and uniform by comparison. The vegetation cover of the waste rock stack will also be uniformly green at the outset. As the grazing regime on the waste rock stack will be managed to ensure the grass swale thickens up to protect the flanks of the stack from erosion, the waste rock stack will stay 'green' for quite some years. As has been required by past conditions, *tussock species, which are as far as practicable sourced from the Macraes Ecological District* are to be included in the revegetation process, but it will take considerable time for the tussock plantings to become distinguishable from a distance, especially in the face of on-going grazing.

In time, this vegetation cover will mature to a similar colour to that of the cultivated and grazed slopes in the left and right middle ground of the view as occurs elsewhere in the Macraes Gold Project site. With a greater length of time, it is expected that the consented Coronation WRS, being above and set back from the land in the Mare Burn basin that is more intensively grazed, will re-colonise with tussock and return to a colour and texture that will be similar to that of the Sister Peaks.

The proposed Coal Creek freshwater storage reservoir will be visible in 'front' of the Coronation North WRS with its north-running arm confined within the local, incised gully section of Coal Creek. The reservoir dam will not be visible as it and the downstream section of the reservoir will be obscured by a low ridge that the creek currently flows around. What will be seen of the reservoir will have the appearance of an upland, stock water or duck pond and will be in context with the farming activities around it.

The proposed Coronation North Pit will create a void that will be approximately 1 km in diameter at its upper edge and result in a landform that is not commonplace in the upper Mare Burn 'basin'. In the excavation of the pit void the north-eastern of the four Sister Peaks promontories will be removed.

As shown in the Viewpoint 12 photo-simulation, there will be sections of new haul road traversing around much of the upper perimeter of the Coronation North Pit. The northern section of haul road will have the effect of blocking a portion of the potential view into the pit and will be retained as a visual buffer at the end of mining operations. However, the majority of the haul road sections and formation will be broken down as part of site rehabilitation, shaped and grassed and, like the slopes of the waste rock stack, returned to productive use.

Locally, both the landscape and visual change brought about by excavating the open cut pit and the immediate landform change that creates, along with the formation of sections of haul road and the more gradual building-up of the Coronation North WRS will be very obvious. The landscape mitigation of the waste rock stack and the redundant sections of haul road will limit the effect of these two mine components, with time. The pit void will remain and over a long period of time will fill with water and become a steep sided lake. The mitigating factor for the pit void relative to potential views from Longdale Road is that much of the pit will be obscured by land along its northern or near edge, though the upper extent of the side and back walls of the pit will remain visible.

As with the previous Coronation Mine conditions, OceanaGold locate, form and shape all earthworks so that their profiles, contours, skylines and transitions closely resemble and blend with the surrounding natural landforms with the intent of maximizing their integration into the surroundings. As is the expectation of Dunedin City's 2GP, the disturbed land will be restored to an acceptable standard.

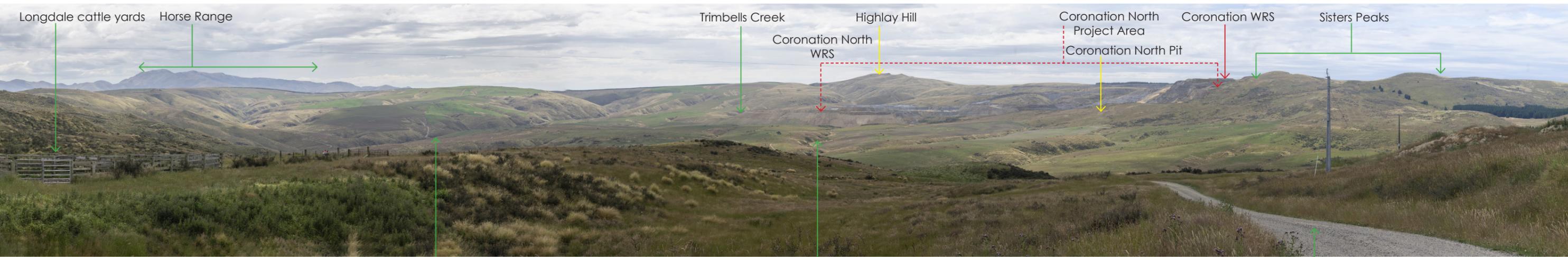
In essence, the combined landscape and visual effects of the Coronation North WRS and the Coronation North Pit as seen from this viewpoint will be high in the first instance. In 10 - 15 years, these effects will be countered, to some degree, by the established rehabilitation of the slopes of the waste rock stack. Given that these mine elements are relatively close to the viewpoint and the open cut pit will be a lasting feature, the visual effect on this view will remain, but in the longer term will reduce to moderate-high to moderate.



## Appendix 4

'Viewpoint 12 – Longdale Cattleyards, Longdale Road' images, January 2019





Viewpoint 12 - Longdale cattleyards, Longdale Road - January 2019



Viewpoint 12 Enlargement - Photo simulation (False Colour) - January 2019



Viewpoint 12 Enlargement- Photo simulation - January 2019