NI 43-101 Technical Report
Macraes Gold Mine
Otago, New Zealand

Effective Date: December 31, 2023
Report Date: March 28, 2024

Report Prepared for

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TECHNICAL REPORT CERTIFICATION

The effective date of this Technical Report is December 31, 2023

Matthew Grant	Date:	March 28, 2024
Euan Leslie	Date:	March 28, 2024
Knowell Madambi	Date:	March 28, 2024
Jonathan Moore	Date:	March 28, 2024
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Forward-Looking Information

This report contains forward-looking statements. All statements, other than statements of historical fact regarding OceanaGold Corporation or Macraes Operations, are forward- looking statements. The words "believe", "expect", "anticipate", "contemplate", "target", "plan", "intend", "project", "continue", "budget", "estimate", "potential", "may", "will", "can", "could" and similar expressions identify forward-looking statements. In particular, this report contains forward-looking statements with respect to cash flow forecasts, projected capital, operating and exploration expenditure, targeted cost reductions, mine life and production rates, potential mineralisation and metal or mineral recoveries, and information pertaining to potential improvements to financial and operating performance and mine life at the Macraes Operations that may result from. All forward-looking statements in this report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this report, where applicable. In addition to such assumptions, the forward-looking statements are inherently subject to significant business, economic and competitive uncertainties, and contingencies. Known and unknown factors could cause actual results to differ materially from those projected in the forward-looking statements. Such factors include, but are not limited to: fluctuations in the spot and forward price of commodities (including gold, diesel fuel, natural gas and electricity); the speculative nature of mineral exploration and development; changes in mineral production performance, exploitation and exploration successes; risks associated with the fact that the Macraes Operations is still in the early stages of evaluation and additional engineering and other analysis is required to fully assess their impact; diminishing quantities or grades of reserves; increased costs, delays, suspensions, and technical challenges associated with the construction of capital projects; operating or technical difficulties in connection with mining or development activities, including disruptions in the maintenance or provision of required infrastructure and information technology systems; damage to OceanaGold Corporation's or Macraes Operations reputation due to the actual or perceived occurrence of any number of events, including negative publicity with respect to the handling of environmental matters or dealings with community groups, whether true or not; risk of loss due to acts of war, terrorism, sabotage and civil disturbances; uncertainty whether the Macraes Operation's will meet OceanaGold Corporation's capital allocation objectives; the impact of global liquidity and credit availability on the timing of cash flows and the values of assets and liabilities based on projected future cash flows; the impact of inflation; fluctuations in the currency markets; changes in interest rates; changes in national and local government legislation, taxation, controls or regulations and/or changes in the administration of laws, policies and practices, expropriation or nationalisation of property and political or economic developments in Canada; failure to comply with environmental and health and safety laws and regulations; timing of receipt of, or failure to comply with, necessary permits and approvals; litigation; contests over title to properties or over access to water, power and other required infrastructure; increased costs and physical risks including extreme weather events and resource shortages, related to climate change; and availability and increased costs associated with mining inputs and labour. In addition, there are risks and hazards associated with the business of mineral exploration, development, and mining, including environmental hazards, industrial accidents, unusual or unexpected formations, pressures, cave-ins, flooding and gold bullion, copper cathode or gold or copper concentrate losses (and the risk of inadequate insurance, or inability to obtain insurance, to cover these risks).

Many of these uncertainties and contingencies can affect OceanaGold Corporation's actual results and could cause actual results to differ materially from those expressed or implied in any forward- looking statements made by, or on behalf of, OceanaGold Corporation. All of the forward-looking statements made in this report are qualified by these cautionary statements and OceanaGold Corporation and the Qualified Persons who authored this report undertake no obligation to update publicly or otherwise revise any forward-looking statements whether as a result of new information or future events or otherwise, except as may be required by law.

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1 Summary

1.1 Overview

OceanaGold Corporation (OGC) / OceanaGold (New Zealand) Limited (OGL) has prepared this National Instrument 43-101 (NI43-101) Technical Report (Technical Report) on the Macraes Gold Mine (Macraes or the Project) as at December 31, 2023.

The Project is controlled by OceanaGold Corporation through its wholly owned subsidiary OceanaGold (New Zealand) Limited. OceanaGold Corporation is listed on the Toronto stock exchange under the code “OGC” and is the Issuer of this Technical Report.

The areas included in the Project mine plan comprise the following:

- Innes Mills and Frasers Gay Tan open pits;
- Frasers and Golden Point Underground mines;
- Processing plant; and
- Tailings Storage Facilities, including a new storage facility that is currently being constructed for use from 2025.

OceanaGold is directing efforts focused on identifying potential additional ore sources that could extend mine life at gold prices above the current $1,500 /oz Mineral Reserve price to increase mining inventories and extend the mine life of Macraes.

1.2 Property Description and Ownership

The Project is located approximately 30 km to the northwest of Palmerston in the Otago Region of the South Island, New Zealand (NZ). The mining operation occurs 2-5 km north and east of Macraes township and is predominantly surrounded by farmland. The general location of the Macraes Project is shown in Figure 1-1.

The Macraes mining and exploration permits cover a contiguous area of 14,576 ha.

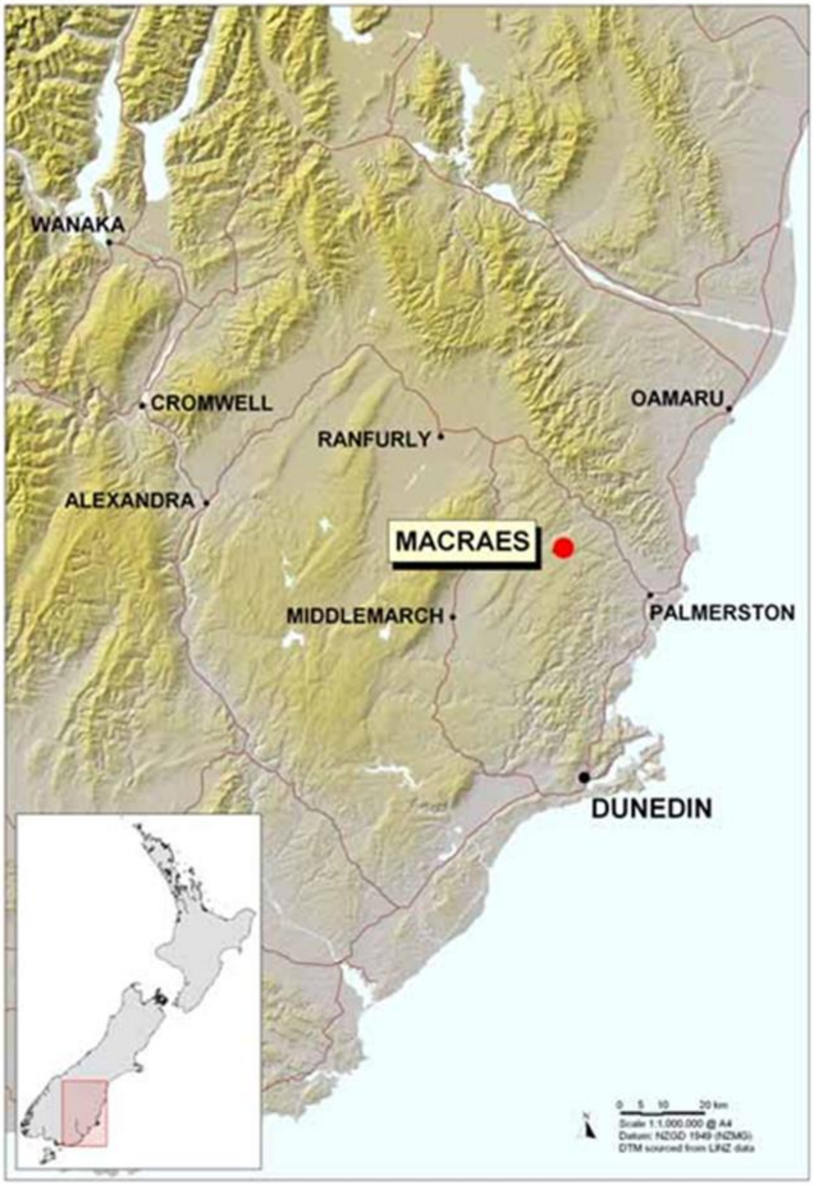


Figure 1-1: General location of the Macraes project

1.3 Geology and Mineralisation

The Macraes gold deposits are located within a low-angle (~15-20°) shear zone, the Hyde Macraes Shear Zone (HMSZ). Mining has centred on mineralisation developed along this regionally continuous structure that has been traced for over 30 km along strike.

Mineralisation within the HMSZ is hosted within lower greenschist facies metamorphosed, pelitic to psammitic sediments that are variably altered, deformed, and mineralized. This package of schist, known as the Intrashear Schist, is bounded above by the Hangingwall Shear, and below by the Footwall Fault, and can be up to 150 m thick. The thickest parts of the HMSZ comprise multiple, stacked shears and associated quartz vein arrays. The shears have ductile deformation textures overprinted by cataclasis (Craw et al., 1999). The

Hangingwall shear, which is the most continuous and intensely mineralised structure, can be up to 25 m thick and is commonly darker coloured due to fine grained graphite and sheared sulphide minerals (McKeag et al., 1989).

There is a strong empirical correlation between gold, arsenic, scheelite, silicification and deformation intensity within the HMSZ. Gold-scheelite-pyrite-arsenopyrite mineralisation is associated with replacement and fissure quartz veins within post-metamorphic shear zones. Shear-parallel quartz veins and cataclastic shears contain the highest gold and scheelite grades (Lee et al. 1989). Dore is typically comprised of 5% silver.

The following four types of mineralisation are recognized within the HMSZ at Macraes (Mitchell et al., 2006):

- Mineralized schist. This style of mineralisation involved hydrothermal replacement of schist minerals with sulphides and microcrystalline quartz. Mineralisation was accompanied by only minor deformation;
- Black, sheared schist. This type of schist is pervaded by cm to mm scale anastomosing fine graphite and sulphide bearing micro shears. This type of mineralisation is typically proximal to the Hangingwall Shear. Scheelite mineralisation occurs in the silicified cataclastic shears;
- Shear-parallel quartz veins. These veins lie within and/or adjacent to the black sheared schist and have generally been deformed with the associated shears. The veins locally crosscut the foliation in the host schist at low to moderate angles. Veins are mainly massive quartz, with some internal lamination and localized brecciation. Sulphide minerals are scattered through the quartz, aligned along laminae and stylolitic seams. These veins range from 1 cm to > 2 m. Scheelite mineralisation is associated with quartz veining in some areas; and
- Stockworks (aka quartz vein arrays). These veins occur in localized swarms that are confined to the Intrashear Schist. Individual swarms range from100 to 2000 m^2 in area and consist of numerous (10 – 100) subparallel veins. Most of these veins formed sub-perpendicular to the shallow east dipping shear fabric of the Intrashear Schist. Stockwork veins are typically traceable for 1-5 m vertically with most filling fractures that are 5 – 10 cm thick but can be up to 1 m thick. Swarms of stockwork veins within the Intrashear Schist were lithologically controlled by the dimensions and locations of more competent pods of Intrashear Schist.

Gold is associated with pyrite and arsenopyrite in all the above styles of mineralisation. Rarely free gold up to 300 µm occurs in quartz veins, but mostly presents as 1-10 µm scale blebs hosted in and near sulphide grains (Angus, 1993).

Tungsten as scheelite is found predominantly within mineralised quartz veins, although a subordinate phase of disseminated scheelite and a remobilised phase are also observed (Farmer, 2016). The main phase of tungsten mineralisation occurred early in the development of the deposit and typically occur in the same lode and vein structures as gold mineralisation. However, tungsten mineralisation is not genetically related to gold mineralisation. MacKenzie (2015) recognised 5 types of scheelite. Types 1,3,4,5 are fine grained and disseminated varieties. Type 2 scheelite is the coarse grained to massive creamy coloured scheelite that was mined historically.

1.4 Drilling and Sampling

The drill hole and sampling data quality is acceptable for resource estimation purposes. The quality control database is however incomplete for some of the earlier campaigns of drilling (1980's) prior to OceanaGold's ownership. Much of the resource based upon these earlier drilling campaigns has now been mined out. The residual risk associated with this early drilling is considered to be low.

Prior to 1998 some of the reverse circulation (RC) drill holes were sampled under wet drilling conditions leading to the potential for sampling bias and contamination. Much of the legacy risk associated with wet RC sampling has been mitigated by subsequent replacement of wet RC drill holes by diamond twins. Where however, wet RC drill holes have not been replaced, RC sample grades have been factored, based on relationships between twinned RC versus diamond core sample grades. This approach has been applied by OceanaGold for several pits at Macraes and has resulted in acceptable resource estimate to mine reconciliations. The relatively low proportions of remaining wet RC samples, and previous mining history are the basis for OceanaGold considering the residual risk to the resource estimates to be low.

1.5 Exploration

The Macraes area is a mature exploration province and much of the strike potential has been tested near surface. There remains potential for discovery both down dip of previously mined open cuts and underground operations and along strike to the north and south.

1.6 Mineral Processing and Metallurgical Testing

Over the last 32 years OceanaGold has developed considerable experience in development and operation of the complex ore processing technology required to optimise gold recovery from the Macraes refractory ores.

Emphasis is placed on efficiency, recoveries and the control of costs. The relatively high tonnage processed, the simple flotation reagent regime and economies resulting from concentration of the gold into a flotation product comprising between 1.5% and 3% of the ore mass treated reduce operating cost. Labour costs are competitive in country but lower for mining industry roles than in most comparable developed countries. The low operating cost of the core sulphide process is due to low comminution costs (contributed to by the coarse grind, and relatively soft ore).

Plant utilisation has been maintained at about 94% which is at the high end of typical industry benchmarks. Gold recovery on open pit ore and underground combined, for 2023 averaged 82.5%. Overall, recoveries are considered reasonable given the refractory nature of the ores.

The Processing Plant has the capacity to treat up to 6.4 Mt of ore per annum and is planned to operate at this level over the remaining life of mine plan.

1.7 Mineral Resource Estimate

The reported Mineral Resources were derived via three-dimensional geological interpretation and grade estimation for each deposit. Technique selection is based on the mineralisation style, drill hole spacing, population statistics and end use of the estimate. Ordinary Kriging is used for underground estimates as well as for satellite, non-producing open pits. All other open pit deposits use Large Panel Recoverable estimation using Multiple Indicator Kriging.

Resource classification considers drill hole spacing, geological confidence, and in some cases, the grade of the estimate relative to cut-off grade.

OceanaGold's mineral resource estimation processes are well established and are maintained by a process of internal peer review. The estimates are supported by appropriate drilling data, with acceptable sampling and assaying quality. The estimates have been constrained within domains based upon appropriate geological / grade criteria.

The resource models to mill-adjusted mine reconciliation for the six years to 2023 shows variable performance from year to year, albeit the long-term average performance for this period has been reasonable; + 17% for tonnes, - 5% for grade and + 11% for contained gold at a 0.5 g/t cut-off.

For 2023, at a 0.5 g/t cut-off, there was a 27% positive reconciliation in ore tonnage, an 8% negative grade reconciliation, and a 16% positive contained gold reconciliation. The reconciliation improves at a 0.3 g/t Au cut-off, which better reflects the remaining mine plan.

While annual reconciliation fluctuations are expected to continue, the Macraes open pit and underground resource estimates are believed to provide an acceptable basis for medium to long term mine planning purposes.

Table 1-1 represents the Macraes Project Mineral Resource Statement as at December 31, 2023, reported in accordance with the Canadian National Instrument 43-101, Standards of Disclosure for Mineral Projects of June 2011 (the Instrument) and the classifications adopted by Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Council in December 2011. A detailed description of these resources by deposit, geology and by the applicable cut-off grade is provided in Section 14 of this report.

Table 1-1: Macraes project mineral resource statement as at December 31, 2023

Resource Cut-off (g/t Au)	Resource Area	Measured		Indicated		Measured & Indicated			Inferred Resource		
		Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz	Mt	Au g/t	Au Moz
0.40	Nunns	-	-	0.22	0.83	0.22	0.83	0.01	0.62	0.93	0.02
0.30	Coronation North	0.46	0.93	0.69	0.64	1.15	0.75	0.03	0.23	0.64	0.00
0.30	Coronation	0.13	0.97	2.26	0.81	2.39	0.82	0.06	0.64	0.75	0.02
0.30	Deepdell	0.22	1.25	0.36	0.92	0.58	1.04	0.02	0.21	0.66	0.00
1.19	Golden Point Underground	0.28	2.56	7.60	2.42	7.88	2.43	0.62	2.49	1.95	0.16
0.30	Innes Mills	3.56	1.14	10.77	0.65	14.33	0.77	0.35	2.75	0.49	0.04
0.30	Frasers-Gay Tan	0.43	0.58	1.54	0.45	1.97	0.48	0.03	0.24	0.43	0.00
1.28	Frasers Underground	0.01	3.91	0.03	2.72	0.04	2.95	0.00	0.00	1.51	0.00
0.40	Ounce	-	-	-	-	-	-	-	0.76	0.75	0.02
0.40	Golden Bar	0.17	1.35	1.00	1.08	1.17	1.11	0.04	3.53	1.24	0.14
0.40	Taylors	-	-	0.19	0.88	0.19	0.88	0.01	0.21	0.70	0.00
0.40	Stoneburn	-	-	-	-	-	-	-	1.43	0.71	0.03
0.30	Stockpiles	5.26	0.41	6.49	0.48	11.75	0.45	0.17	-	-	-
Totals		**10.51**	**0.78**	**31.17**	**1.07**	**41.68**	**1.00**	**1.34**	**13.12**	**1.05**	**0.44**

Notes:

- Cut-off grades are based upon a gold price of NZD2,429 /oz (US$1,700 /oz @ USD:NZD 0.70);
- Open pit resources are reported within shells optimized using a gold price of NZD2,429 /oz (US$1,700 /oz @ USD:NZD 0.70);
- Mineral Resources reported are included in the Mineral Reserves reported for the same deposit;
- There is no certainty that Mineral Resources that are not Mineral Reserves will be converted to Mineral Reserves;
- It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration;
- No dilution is included in the reported figures and no allowances have been made for mining recoveries or processing losses; and
- The tabulated resources are estimates of metal contained as troy ounces of gold.

1.8 Mineral Reserve Estimate

The Mineral Reserves reported by category are presented in Table 1-2. These Mineral Reserves are a subset of the Mineral Resources tabulated in Table 1-1.

Table 1-2: Macraes mineral reserve estimate as at December 31, 2023

Area	Proven		Probable		Total		
	Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz
Innes Mills	0.71	1.22	7.00	0.92	7.72	0.94	0.23
Frasers	0.00	0.00	0.09	0.75	0.09	0.75	0.00
Stockpiles	5.26	0.41	6.49	0.48	11.75	0.45	0.17
Subtotal - Open Pit	**6.00**	**0.51**	**13.60**	**0.71**	**19.60**	**0.65**	**0.41**
Frasers Underground	0.01	1.63	0.01	1.61	0.02	1.61	0.00
Golden Point Underground	0.19	2.02	2.78	1.97	2.96	1.97	0.19
Subtotal – Underground	**0.19**	**2.00**	**2.79**	**1.97**	**2.99**	**1.97**	**0.19**
Total Macraes	**6.20**	**0.55**	**16.40**	**0.92**	**22.50**	**0.82**	**0.60**

Notes:

- All figures are rounded to reflect the relative accuracy of the estimates. Totals may not sum due to rounding;
- Mineral reserves are reported based on a cut-off grade based on metal price assumptions, exchange rates and mining, processing, general and administrative costs;
- Open pit reserves are stated using a 0.4 g/t Au cut-off;
- Underground reserves are stated using 1.28 g/t Au cut-off for Frasers underground, 1.35 g/t Au for Golden Point underground where ore drive development is required and 1.06 g/t Au for Golden Point underground where development is in place;
- Reserves are based on a USD1,500 /oz Au gold price (@ USD:NZD 0.70);
- The Macraes processing plant recovery varies based on ore source and feed grade – an average recovery of 78% is estimated. Open pit dilution and recovery estimates are built into the underlying resource models and no further adjustments are made;
- Underground insitu recovery, mining recovery and dilution modifying factors have been applied resulting in an average underground mining recovery of 95% of the designed tonnage and 88% of the designed grade;
- Mineral reserves have been estimated based on mine designs and plans consolidated into a Life of Mine Schedule;
- Knowell Madambi, Manager - Technical Services & Projects at Macraes is the Qualified Person for the Open Pit Mineral Reserve Estimate; and
- Euan Leslie, Group Mining Engineer based in New Zealand is the Qualified Person for the Underground Mineral Reserve Estimate.

1.9 Mining Methods

OceanaGold has prepared life of mine production plans from Mineral Reserves only which cover 2024-2027 for Macraes. This schedule sees a new open pit at Innes Mills Stage 8 and continuation of the Golden Point Underground from 2024 to 2027. Underground production from FRUG ceases in 2024. The production rates forecast are consistent with recent performance and the anticipated grades. The mine production plans are considered reasonable for the purpose of long-term scheduling.

The physical and financial projections presented in this report are based upon Mineral Reserves only as at December 31, 2023. The topography used was as of December 31, 2023.

The Macraes Project is the largest gold producing operation in NZ and has been in operation since 1990. To December 31, 2023, over 5 million ounces of gold have been produced. The Project consists of large-scale open pit mining, underground mining and an adjacent process plant inclusive of an autoclave for pressure oxidation of the ore.

The Deepdell North Stage 5, Innes Mills Stages 6 and 7, and Gay Tan Stage 4 were the only open pit stages mined in 2023, and supplied approximately 4.4 Mt of ore, while the Frasers Underground (FRUG) and Golden Point Underground (GPUG) mines supplied a further 0.6 Mt of ore. Stockpiles provided supplementary feed when required. The combined Macraes production for the twelve months, ended December 31, 2023 was 137.0 koz.

Mining of Deepdell North Stage 5 was completed in 2023. Mining of Innes Mills Stage 6 and Gay Tan Stage 4 is expected to be completed in 2024. Mining of Innes Mills Stage 7 is expected to be completed in 2025 and Innes Mills Stage 8 in 2026. Mining of FRUG is expected to be completed in 2024. Innes Mills Stage 8 is an expansion on the main Innes Mills pit and is scheduled to start in late 2024.

The Macraes process plant can treat approximately 6.4 Mtpa of ore and incorporates a semi-autogenous grinding (SAG) mill, flotation circuit, autoclave for pressure oxidation of the concentrate, CIL plant and smelting facilities.

The current combined open pit, stockpile and underground reserves of 0.60 Moz support a mine life at Macraes extending to 2027. The combined open pit and underground schedule from 31 December 2023 is shown in Table 1-3. As noted previously, Macraes is actively seeking to identify potential additional ore sources that could extend mine life at gold prices above the current $1,500 /oz Mineral Reserve price to increase mining inventories and extend mine life beyond the existing reserve life.

Table 1-3: Combined open pit and underground ore processing schedule

	Units	2024	2025	2026	2027	LoM
Open Pit Schedule						
Total Ore Milled Quantity	Mt	5.59	5.46	5.67	2.84	**19.55**
Total Milled Gold Grade	g/t Au	0.62	0.74	0.69	0.43	**0.65**
Total Milled Contained Gold	koz	111	130	126	39	**406**
Underground Schedule						
Total Ore Milled Quantity	Mt	0.79	0.98	0.79	0.43	**2.99**
Total Milled Gold Grade	g/t Au	1.97	2.13	1.88	1.78	**1.97**
Total Milled Contained Gold	koz	50	67	48	25	**189**
Combined Open Pit and Underground						
Total Ore Milled Quantity	Mt	6.37	6.44	6.46	3.27	**22.54**
Total Milled Gold Grade	g/t Au	0.78	0.95	0.84	0.61	**0.82**
Total Milled Contained Gold	koz	161	196	174	64	**595**

Following a prefeasibility assessment of the costs and risks associated with re-locating the mixed tailings impoundment adjacent to the Round Hill pit, the economic return generated was not sufficient to justify the technical risk of undertaking this project and therefore was removed from Mineral Reserves in 2023, which resulted in a 0.5 Moz reduction in Mineral Reserves at Macraes. This reduction in Mineral Reserves has triggered an updated NI 43-101 Technical Report for Macraes.

The open pit fleet is held to a consistent size from 2024 to March 2025. The fleet includes three Hitachi EX3600 backhoe excavators, one Hitachi EX3600 electric shovel and one Hitachi EX2500 excavator to load nineteen to twenty-two Caterpillar 789C/D haul trucks. For most of 2025, the open pit hauling fleet is reduced to fifteen trucks, reducing to five trucks in 2026 and 2027.

The current underground fleet will be maintained in 2024. The majority of the Frasers Underground fleet has transitioned to Golden Point Underground with the remainder expected in 2024.

The underground ore is dumped at an in-pit stockpile for periodic re-handling by the open pit fleet to the process plant's run of mine stockpile. OceanaGold is satisfied with the accuracy of the dilution factors, ore loss factors and constraints placed upon the mining schedule, which are supported by extensive operating experience.

Macraes is mined by a combination of conventional open pit and underground retreat uphole stope methods along the line of strike.

The open pit mining operation utilises hydraulic excavators and rear dump diesel trucks to extract both waste and ore, while the Hitachi EX3600 electric shovel is restricted to bulk waste only. Blasting requires relatively light powder factors compared with some other operations due to the comparatively weak and fractured rock mass. Ore is blasted in 7.5 m high benches and excavated in three, nominally 2.5 m high flitches. For backhoe excavators waste is blasted in 15 m benches and excavated in four flitches, and for the electric shovel, waste is blasted and excavated in 10 m benches.

The underground retreat uphole stope mining operation utilises electro-hydraulic development jumbos, diesel load-haul-dump units, diesel haul trucks and longhole drill rigs to extract both waste and ore. The uphole retreat stope voids are not backfilled and the mine design utilises yielding pillars between adjacent extracted stopes to gradually deform over a timeframe that permits ore extraction.

The open pit and underground operations are owner-operated by OceanaGold with support from a range of contractors supporting the mining operations.

OceanaGold's performance at Macraes has shown that the mining equipment and mining methods are suited to the required mining rates and deposit geometry. Open pit and underground mine design procedures are appropriate and have been conducted in accordance with established industry standards and with input from appropriately qualified geotechnical specialists, hydrological specialists, and consultants.

Historical productivity and safety records are generally in line with or better than industry standards.

The open pit and underground life of mine plan schedule has been prepared to 2027. The schedules rely only on Mineral Reserves and are considered appropriate and reasonable.

The mining and ore processing schedules have factors applied to account for poor weather, public holidays, equipment availability, equipment utilisation, historically justified limitations on mine production and historically justified limitations on mill throughput.

There is an additional opportunity to lower the open pit cut-off grade with recent strengthening of the gold price providing this lower grade material can be successfully recovered in the process plant. Currently low grade (0.3-0.4 g/t Au) material is being stockpiled. This lower grade in-situ material is not included in the Mineral Reserves.

1.10 Infrastructure

OceanaGold continues to maintain appropriate infrastructure at Macraes, including road access, power, water supplies and administration facilities.

Environmental management and mitigation measures are maintained at Macraes, including ongoing monitoring to ascertain compliance with resource consent conditions and permit requirements. These consents and permits are issued by the Otago Regional Council (ORC), the Dunedin City Council (DCC), Environment Canterbury (ECAN) and the Waitaki District Council (WDC). Tailings and waste rock disposal facilities are maintained and managed on an ongoing basis. Progressive rehabilitation is ongoing.

There is enough tailings storage capacity in the current Top Tipperary Tailings Storage facility (TTTSF) to store tailings until March 2025 and then Frasers Tailing Storage Facility (FTSF) is utilized for the remainder of mine life. Capacity of FTSF is sufficient for continued operations well beyond 2030.

The project reserves, plant site, tailings dams and waste rock stacks are located on land that is covered by mining permits, and which OceanaGold owns or has access to mine. All material tenements and landholder agreements are in good standing.

1.11 Environmental Studies and Permitting

The Project is fully consented for current operations, with actual and potential environmental effects regularly monitored and reported to the relevant agencies.

The project reserves, plant site, tailings dams and waste rock stacks are located on land that is covered by mining permits, and which OceanaGold owns or has access to mine. All material permits and landholder agreements are in good standing.

The mineral permits are in good standing, and their duration is sufficient to allow future mining of the resource within the permits as MP 41 064 expires in 2030 and MP 52 738 expires in 2045.

The site environmental documentation is appropriate and follows Environment Management System (EMS) principles, although a full EMS is not in place. Documentation is reviewed and updated regularly.

Resource consent applications have been lodged for the Innes Mills Stage 8 pit, Golden Point underground extension and Frasers Tailings Storage Facility Stage 1. A resource consent application will need to be lodged in 2024 for capacity increase of Frasers Tailings Storage Facility Stage 2.

There are no material compliance issues relating to the principal mining and processing operations. OceanaGold is in partnership with Otago Fish and Game, a semi-government organisation, to manage a Trout Hatchery on the Macraes mine site.

Overall, no material environmental issues have been identified to limit the ongoing operation of the mine within the planned schedule.

1.12 Capital and Operating Costs

Capital and operating costs are well known from the 33 years of operations and have been appropriately applied to develop cut-off grades and inputs into economic analysis.

There is no material expansion of the current production at Macraes based on the reported Mineral Reserves. The production schedule is being implemented through to completion of the open pits and underground operations. Capital and operating costs were estimated in NZD and then converted to USD using an exchange rate of 0.62 USD:NZD.

Plant operating cost estimates for Macraes are generally considered reasonable and consistent with recent experience and trends, and are regarded as accurate to ±10%.

Capital cost estimation and forecasting are considered reasonable and consistent with proposed development programmes and ongoing requirements. Capital expenditures over the period will vary against the forecast due to unforeseen problems, modifications, upgrades and introduction of new technology.

Total capital expenditures are provided by area in Table 1-4 and by year in Figure 1-2, and the total operating costs are provided by area in Table 1-5, and by year in Figure 1-3.

Table 1-4: LoM - Capital expenditure summary

Capital Expenditure	LoM Total (NZD M)	LoM Total (USD M)
Pre Strip	90.7	56.2
Tailings	29.7	18.4
Mining Rehab/Closure	87.8	54.4
Underground Decline	89.4	55.4
Processing	9.9	6.1
Exploration	2.4	1.5
General Capital	37.7	23.5
Asset Sales	-44.3	-27.5
Total Capital Expenditure	**303.3**	**188.0**
Leased Vehicles		
Open Pit Mining Equipment	2.8	1.7
Underground Mining Equipment	5.9	3.6
Total Leased Mobile Equipment	**8.7**	**5.3**

Notes: Exchange rate – USD:NZD 0.62

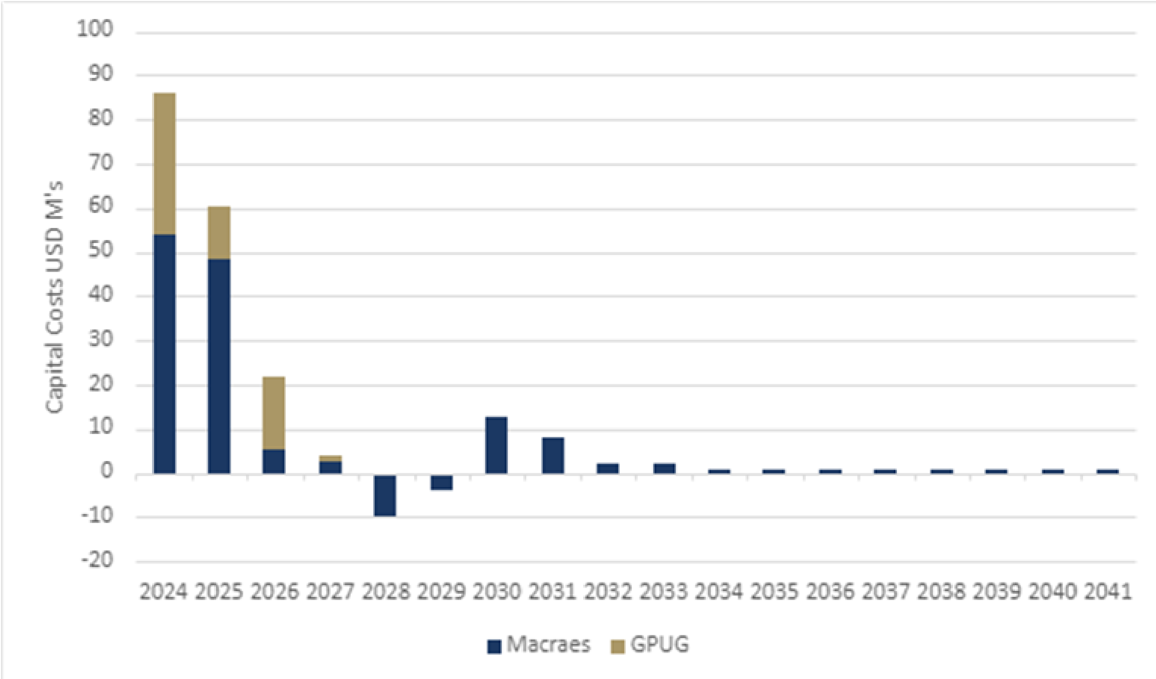


Figure 1-2: Capital expenditures for LoM

Table 1-5: LoM - operating cost summary

Operating Expenditure	NZD		USD	
	LoM Total $M	$/t	LoM Total $M	$/t
Open Pit Mining	153.5	2.79	95.2	1.73
FRUG Underground Mining	0.7	32.82	0.4	20.35
GPUG Underground Mining	146.9	65.31	91.1	40.49
Processing Costs	263.4	11.69	163.3	7.25
General and Administration Costs	110.0	4.87	68.0	3.01
Total Direct Costs	**674.5**		**418.1**	

Notes: Exchange rate – USD:NZD 0.62

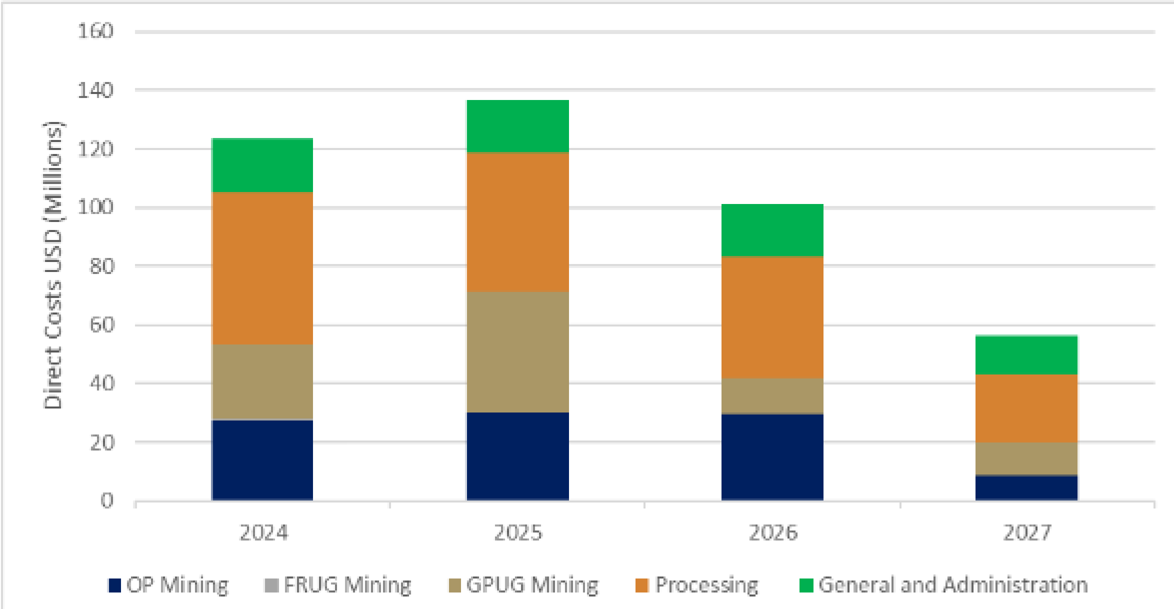


Figure 1-3: LoM direct operating costs

1.13 Conclusions

The following conclusion have been drawn from this Technical Report:

- The Mineral Resources have been estimated in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum Standard Definitions for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM definitions); and
- While the geological setting and mineralisation styles are well understood, the extent of drilling is the current limit on expansions to known resources. The nature of the mineralisation at Macraes means there is a significant alignment to gold price. When gold price increases more resource becomes economic. In many of the current or previously mined areas the resource estimates have reached the limits of drill data.

1.14 Recommendations

The recommended work programme costs are included in the operating and capital costs for Macraes and are not listed separately.

Exploration programmes and budget are determined annually for the following year as part of the annual budgeting process.

Based on the conclusions of the Technical Report, the following actions are recommended:

- Continue assessment of the tungsten extraction potential;
- Complete infill drilling at Coronation and GPUG as planned in 2024 for a total cost of around NZD2.4 million;
- Maintain annual exploration investment to define viable resources made available by an increasing gold price, replacing mining depletion and adding additional ore sources;

- Complete testwork on metal recoveries for any additional potential mineable inventory identified to allow risk mitigation and support conversion to mineral reserves;
- Continue assessment of potential mineable targets along strike;
- Continue assessment of the tungsten extraction potential;
- Continue evaluation of the Round Hill underground potential;
- Complete and lodge the TTTSF embankment lift consent application in 2024;
- Complete TTTSF 568 m RL construction;
- Upon granting of building consent, complete TTTSF 570 m RL construction;
- Progress FTSF Stage 1 detailed design and lodge permit applications in Q1 2024;
- Progress FTSF Stage 2 resource consent design and lodge permit application in Q1 2024;
- Progress FTSF Stage 2 detailed design and lodge permit application in Q2 2024; and
- Keep the current permits and consents in good standing by continuing with the established monitoring and compliance practices.

2 Introduction

2.1 Terms of Reference and Purpose of the Report

This report has been prepared at the request of OceanaGold Corporation and OceanaGold (New Zealand) Limited (Oceana). OceanaGold Corporation is the ultimate holding company in which OceanaGold (New Zealand) Limited is a subsidiary. OceanaGold Corporation is the reporting issuer in Canada.

References in this report to OceanaGold include OceanaGold (New Zealand Limited, OceanaGold Corporation, and their subsidiaries.

The cut-off date for data to be included in this report is December 31, 2023. Permit boundaries are as at the December 31, 2023.

2.1.1 Purpose of the Report

This report was prepared as a National Instrument 43-101 (NI 43-101) Technical Report for OceanaGold by internal qualified persons employed by OceanaGold to provide updated technical information for Mineral Reserves and Mineral Resources for the Macraes Project.

This report includes an economic analysis of open pit and underground mining and ore processing based on open pit and underground reserves.

This report updates the previous NI43-101 Technical Report on Macraes dated 14th October 2020 (Cooney & others, 2020) which covers the period up to the end of 2019. References to this earlier document will be made throughout this report where appropriate for historical context, however all relevant information is contained within this report.

2.1.2 Reporting Standards

This report has been prepared in accordance with Canadian National Instrument 43-101 for the 'Standards of Disclosure for Mineral Projects' of June 2011 (the Instrument) and the resource and reserve classifications adopted by CIM Council. This report complies with disclosure and reporting requirements set forth in the Instrument, Companion Policy 43-101CP, and Form 43-101F1.

2.2 Authors of the Report

This technical report has been prepared by or under the supervision of the following authors, who are all employees of OceanaGold:

- Matthew Grant, as Senior Geologist - Resource Development at Macraes;
- Jonathan Moore, as Group Manager - Resource Development in Brisbane;
- Knowell Madambi, as Manager - Technical Services & Projects at Macraes;
- Euan Leslie as Group Mining Engineer in Waihi, New Zealand; and
- David Carr as Group Manager - Metallurgy in Brisbane, Australia.

2.3 Qualifications and Experience of Qualified Persons

The persons preparing this technical report are specialists in the fields of geology, exploration, Mineral Resource and Mineral Reserve estimation and classification, underground mining, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, capital and operating cost estimation, and mineral economics.

The following individuals, by virtue of their education, experience and professional association, are considered Qualified Persons (QP) as defined in the NI 43-101 standard and are members in good standing of appropriate professional institutions. QP certificates of authors are provided in Appendix A.

The QP's are responsible for specific sections as follows:

- Jonathan Moore, (OceanaGold Group Manager - Resource Development) is the QP responsible for Section 1.7, open pit subsections of 14 and 24.1 of this Technical Report;
- Matthew Grant, PhD Applied Geology, MAIG, MAusIMM (OceanaGold Senior Geologist – Resource Development, Macraes) is the QP responsible for Sections 4, 5, 6, 7, 8, 9, 10, 11, 12 and the underground subsections of 14 of this Technical Report;
- Knowell Madambi, BSc Eng (Hons) Mining MAusIMM CP(Min) (OceanaGold Manager - Technical Services & Projects, Macraes) is the QP responsible for Sections 1, 2, 3, 18, 19, 20, 21, 22, 23, 24, 25, 26 and the open pit portions of Sections 15 and 16 of this Technical Report;
- Euan Leslie BEng Mining, BCom Econ, MAusIMM CP (Min) (OceanaGold Group Mining Engineer) is the QP responsible for the underground portions for sections 15 and 16 of this Technical Report; and
- David Carr BEng (Hons) Metallurgical MAusIMM CP (Met), (OceanaGold Group Manager - Metallurgy) is the QP responsible for Sections 13, 17 and portions of Sections 24 and 25 of this Technical Report.

2.4 Site Inspections

Knowell Madambi and Matthew Grant are based at Macraes. Euan Leslie is based in Waihi and visited Macraes in September 2023. Jonathan Moore and David Carr are based in Dunedin and Timaru respectively and visit the Macraes mine site regularly.

2.5 Sources of Information

The authors of this technical report have not relied upon other experts in its preparation, other than obtaining input from persons employed within OceanaGold who have provided information concerning legal, environmental, mine closure or other matters relevant to this report.

The information used to prepare all sections relating to Mineral Resources and Reserves was furnished by OceanaGold.

OceanaGold furnished all data, modelling, test work and financial analysis to verify the information relating to Mineral Resources and Reserves and the conclusions regarding the resource and reserve estimates.

As far as other persons have had input into the preparation of this report, the authors have conducted appropriate due diligence and consider such reliance to be reasonable.

A list of the publications and internal reports that were used in the preparation of this report, and to which specific reference is made in the body of this report, appears in section 26.

2.6 Effective Date

The effective date of this report is December 31, 2023.

2.7 Units of Measure

The Metric System for weights and units has been used throughout this report. Tonnes are reported in metric tonnes of 1,000 kg. All currency is in NZ Dollars (NZD) unless otherwise stated.

3 Reliance on Other Experts

3.1 General

This report has been written entirely by OceanaGold personnel and no external Experts were directly relied on. The Authors relied on the internal memo that Suzanne Watt, OceanaGold Environment & Community Manager, Macraes issued on January 29, 2024 for the following sections:

- Chapter 4, section 4.7; and
- Chapter 20.

The Authors used their experience to determine if the information from previous reports was suitable for inclusion in this technical report and adjusted information that required amending. This report includes technical information, which required subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, the Authors do not consider them to be material.

4 Property Description and Location

4.1 Property Location

The Macraes Project is located approximately 60 km north of Dunedin in eastern Otago and is located north and east of the small township of Macraes.

The current activity is mining from the Frasers and Innes Mills Open Pits, and from underground at Frasers (FRUG) and Golden Point (GPUG) all within Mining Permit (MP) 41 064. The process plant, several waste rock stacks, and tailings impoundments are located within MP52 738.

The Project is located at, -45.36°S, 170.43°E (Latitude/Longitude – World Geodetic System 1984) or at 5,535,600 m N, 2,308,500 m E New Zealand Map Grid (New Zealand Geodetic Datum 1949) or at 4,973,945 m N, 1,398,635 m E New Zealand Transverse Mercator (New Zealand Geodetic Datum 2000).

A local grid has also been established for the Macraes Project. This grid is rotated 45° west of true north, parallel with the local trend of the mineralised structures.

The Macraes Project has a total area of 14,576.3 ha. The Macraes Project location map and 2023 aerial image are shown in Figure 4-1 and Figure 4-2.

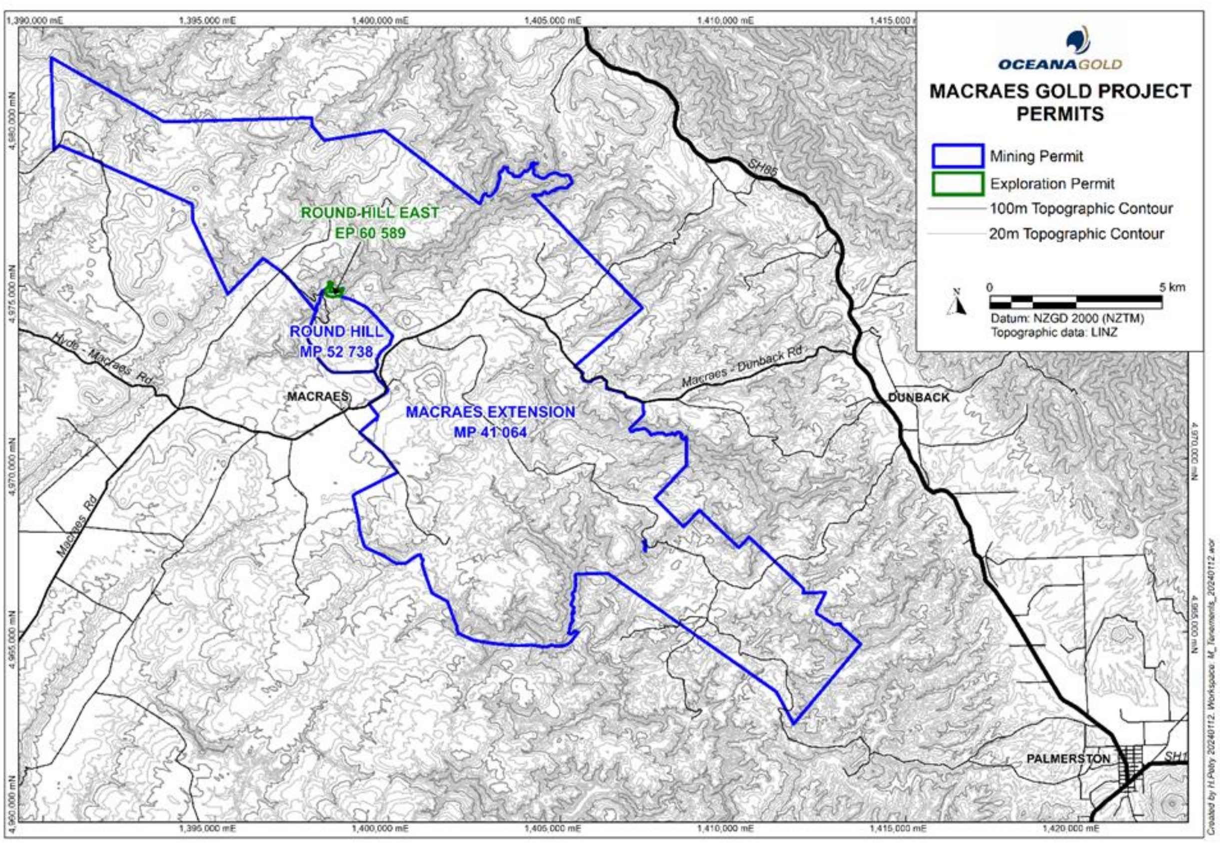


Figure 4-1: Macraes, project location map

Macraes is predominantly surrounded by farmland in grass and tussock used for high country grazing Figure 4-2.

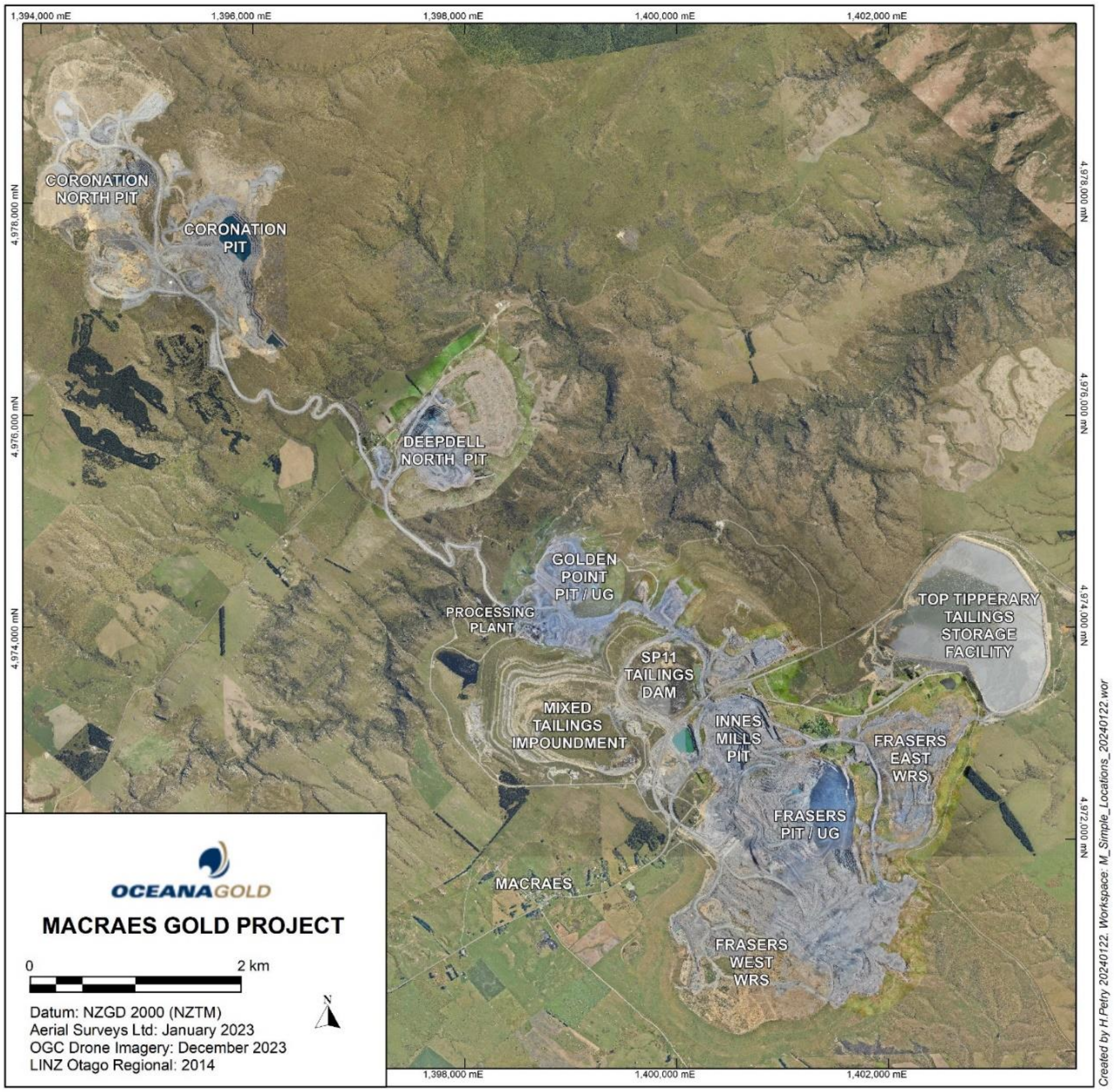


Figure 4-2: Macraes, aerial image of project from 2023

4.2 Ownership

Land in the immediate vicinity of the OceanaGold mining operations, and most of the land in permits MP52 738 and MP41 064, is owned by OceanaGold. Land not used for active mining activities is leased to local farmers. OceanaGold land ownership extends beyond those two permits as shown in Figure 4-3. Land outside the OceanaGold holdings is currently owned by a variety of landowners.

In general, OceanaGold property boundaries follow existing cadastral boundaries. Where OceanaGold boundaries have departed from these, the boundaries have been surveyed by registered surveyors.

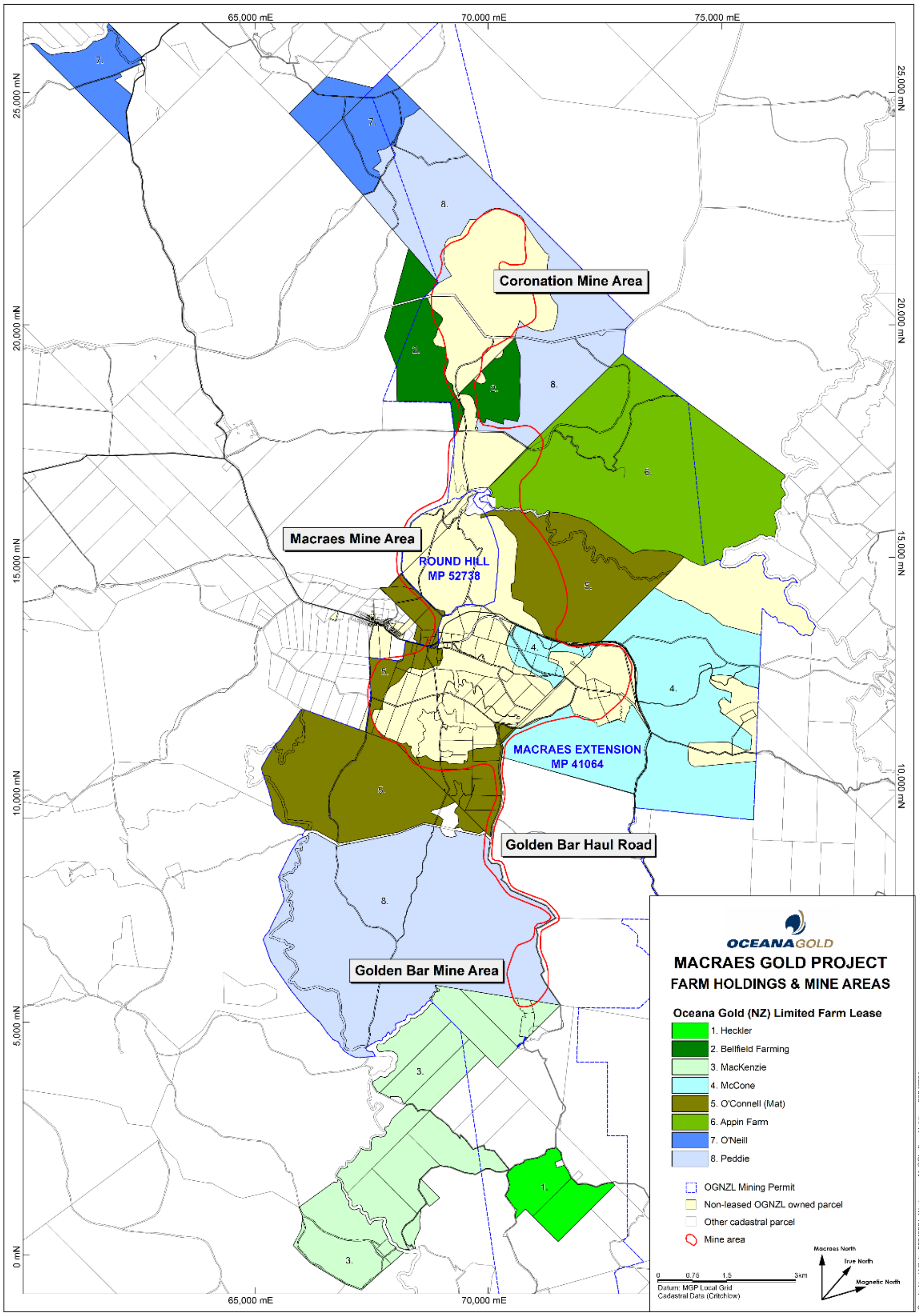


Figure 4-3: Macraes project farm holdings and mine areas

4.3 Mineral Titles

OceanaGold holds a contiguous group of permits to the north-west and south-east of Round Hill, covering approximately 27 km of strike along the mineralized Hyde Macraes Shear Zone (HMSZ) as shown in

Figure 4-1 and detailed in Table 4-1.

The permits comprise two Mining Permits (MP) and an Exploration Permit (EP) granted under the Crown Minerals Act 1991.

An exploration permit can have an initial term of five years with the right of extension of term, over 50% of the area (in one contiguous piece), for a further term of up to five years but not exceeding 10 years. An exploration permit can be converted into an appraisal permit for further terms exceeding the initial 10 years. The Crown Minerals Act 1991 allows for extensions of the permit areas subject to certain conditions for compliance.

Table 4-1: Macraes project permits

Permit No.	Licensee	Location Name	Date Commenced	Term/ Expires	Area (Hectares)	Interest in Permit
MP52 738	OceanaGold	Round Hill	31/10/2010	35 yrs 30/10/2045	395.4	100%
MP41 064	OceanaGold	Macraes Extension	1/02/1994	36 yrs 31/01/2030	14,171.5	100%
EP60 589	OceanaGold	Round Hill East	14/07/2020	5yrs 13/07/2025	9.4	100%

The area held under title remains at 14,576.3 ha. A portion of exploration permit EP60 589 was absorbed into MP41 064 in December 2023.

4.4 Nature and Extent of Title

The granting of a mineral permit does not confer a right of access to land subject to the permit. A permit holder must arrange land access with the owner and occupier of the land before beginning any prospecting, exploration or mining for minerals on or in land (other than minimum impact activity as defined in the Crown Minerals Act 1991). Access arrangements are binding on successors in title provided they are registered against affected land titles where the term is longer than six months.

OceanaGold currently has no access agreements for land covered by mineral permits it does not own and is not currently negotiating any land access agreements, However, in the future Oceana may need to negotiate access agreements to the properties that cover the Nunn's, Stoneburn and any extension to Golden Bar resources. OceanaGold has a set of principles that guide its approach to land access aimed at minimising impacts and delivering access agreements that are fair and reasonable.

Any activity carried out below the surface of any land subject to a permit will not be considered, for the purposes of the land access requirements of the Crown Minerals Act, to be prospecting, exploration or mining on or in the land and consequently will not require an access arrangement, if the activity will not or is not likely to:

- cause any damage to the surface of the land or any loss or damage to the owner and/or occupier of the land;
- have any prejudicial effect regarding the use and enjoyment of the land by the owner and/or occupier; and

- have any prejudicial effect regarding any possible future use of the surface of the land.

4.5 Location of Mineral Resources

Mineralised zones at Macraes are located along the surface trace of the HMSZ, a major northwest- southeast trending structure (see section 7.3). All previous mining production and current resources are located along this zone. Figure 4-4 shows the location of mineral resources within OceanaGold's Macraes permits. Local grid coordinates for the limits of the resource areas at Macraes areas are given in Table 4-2.

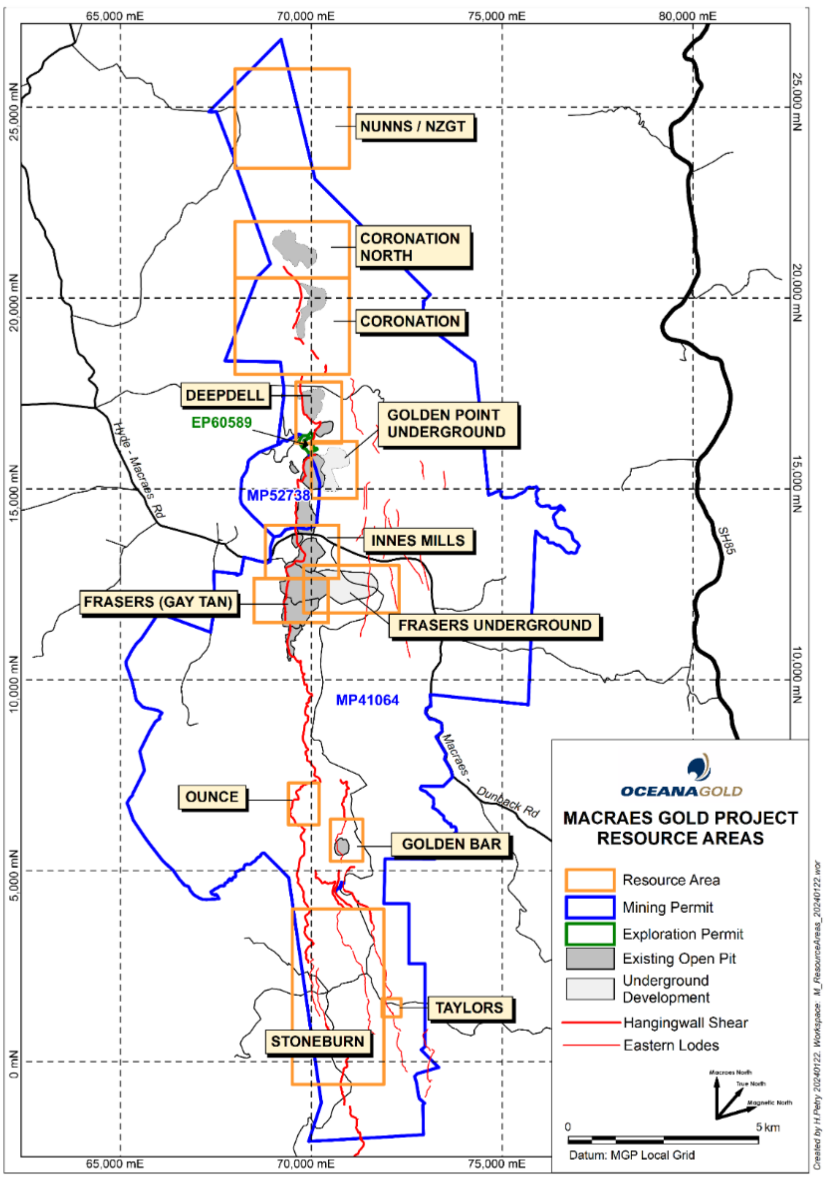


Figure 4-4: Macraes project resource locations

Table 4-2: Macraes resource area boundaries

Resource Area	Northing (Local Grid)		Easting (Local Grid)	
	From	To	From	To
Nunns/NZGT	23,400	26,000	68,000	71,000
Coronation North	20,525	22,000	68,000	71,000
Coronation	18,000	20,525	68,000	71,000
Deepdell	16,200	17,800	69,600	70,800
Golden Point UG	14,750	16,240	70,000	71,200
Innes Mills	12,650	14,050	68,800	70,725
Frasers – Gay Tan	11,500	12,650	68,500	70,450
Frasers UG	11,750	13,000	69,800	72,300
Ounce	6,200	7,300	69,400	70,200
Golden Bar	5,250	6,350	70,500	71,350
Stoneburn	-600	4,000	69,500	71,900
Taylors	1,175	1,650	71,850	72,350

4.6 Royalties, Agreements and Encumbrances

MP52 738 is covered under a Royalty Agreement between OW Hopgood and OceanaGold, where OceanaGold pays Hopgood a royalty 5% of revenue if recovered by open pit mining and 3% if recovered by underground mining on any gold, scheelite or other minerals recovered from the area which was formerly PL31 595 and ML32 3047.

Under the Crown Minerals Act 1991 which applies to MP41 064 and MP52 738 royalties are payable to the Crown annually in respect of all gold, silver and scheelite that are recovered from the land pursuant to the mining permits. Royalties are calculated based on net sales revenue or accounting profits whichever is the greater. Royalties are generally calculated and payable at the following rates:

- no royalty is payable if net sales revenue from the permit is less than NZD100,000 for an annual reporting period or averages less than NZD8,333 per month if the annual reporting period for the permit is less than 12 months. Where the permit is part of a production unit, the thresholds will apply to net sales revenues from all permits in the production unit;
- a royalty of 1% Ad Valorem is payable if net sales revenue from a permit is between NZD100,000 and NZD1,000,000; and
- a royalty of either 1% Ad Valorem or 5% of the accounting profits, whichever is greater, if the net sales revenue from a permit is more than NZD1,000,000.

4.7 Environmental Permitting & Compliance

4.7.1 Overview

This report provides an overview of the principal environmental statutes that OceanaGold operates under to understand the extent of OceanaGold's environmental liabilities and how these liabilities arise.

There are four principal agencies that oversee OceanaGold's mining activities together with several secondary agencies. The four principal agencies are:

- Otago Regional Council;
- Environment Canterbury;
- Waitaki District Council; and
- Dunedin City Council.

In order to undertake mining of Crown owned minerals (such as gold) there are three key types of permits required:

- access arrangements with the owner of the land;
- a mining permit under the Crown Minerals Act 1991; and
- Resource consents to use land, water, and air.

As OceanaGold is a significant landholder in the district and the area covered under the mining permits covers most of the foreseeable mining target, the key ongoing approval process is related to resource consents.

Resource Consents Description

The Resource Management Act 1991 (RMA) is the primary piece of legislation governing the use of land, water and air resources in New Zealand. The Government is developing a fast-track process for consenting projects of regional or national significance. The Macraes Operation is preparing to take up any opportunity that may become available and be suitable, as the new legislation is developed, to utilise this new fast-track option to accelerate consenting processes.

Under the RMA process as it stands territorial authorities and regional councils have primary responsibility for administering the consenting regime. Their functions are defined within the RMA (sections 30 and 31 RMA) but in simple terms, relevant to OceanaGold's activities, territorial authorities manage the effects of land use change and noise, whilst regional councils manage effects associated with:

- water quality (surface, ground and coastal water);
- taking, damming, diversion of water;
- discharges of contaminants into or onto land, air, or water, and discharges of water into water; and
- the bed of any water body, and the planting of any plant in, on, or under that land.

In managing the effects of activities on the matters above, both territorial authorities and regional councils seek to give effect to the purpose of the RMA (section 5 RMA), which is "to promote the sustainable management of natural and physical resources". Sustainable management is defined by the RMA to mean managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enable people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while:

- sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations;
- safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
- avoiding, remedying, or mitigating any adverse effects of activities on the environment.

Supporting the purpose of the RMA are several principles relating to managing the use, development, and protection of natural and physical resources, that OceanaGold recognises and provides for (section 6 RMA), has particular regard to (section 7 RMA), and takes into account (section 8 RMA).

The term "effect" includes (section 3 RMA):

- any positive or adverse effect;
- any temporary or permanent effect;
- any past, present, or future effect;
- any cumulative effect which arises over time or in combination with other effects – regardless of the scale, intensity, duration, or frequency of the effect, and includes;
- any potential effect of high probability; and
- any potential effect of low probability which has a high potential impact.

The RMA places restrictions on the use of land (section 9 RMA), the subdivision of land (section 11 RMA), the use of the coastal marine area (Section 12 RMA), on certain uses of beds of lakes and rivers (section 13 RMA), water (section 14 RMA), and the discharge of contaminants into the environment (section 15 RMA). Activities that 'use' land, water, and air cannot legally occur unless they are permitted by a rule in a district or regional plan or have a resource consent granted.

A resource consent is therefore permission from a territorial authority or regional council to undertake an activity that would otherwise contravene a statutory plan prepared under the RMA (or sections 9, 11, 12, 13, 14, or 15 RMA).

Applications for resource consents are typically processed in one of three ways:

- Non-notified;
- Limited notified; and
- Publicly notified.

Non-notified applications (no general public submissions allowed) may occur when the environmental effects of the activity to be consented are no more than minor and written approvals have been obtained from any party considered potentially affected by the application. Limited notified applications may occur where the environmental effects are no more than minor, but written approvals are unable to be obtained or potentially affected parties are difficult to identify. Notified applications occur when the environmental effects of the activity to be consented may be minor or more than minor and provide an opportunity for any person in New Zealand to make a submission supporting or opposing the application.

Consents are granted subject to conditions such as the requirement for an environmental bond to be paid by the consent holder, conditions to avoid, remedy, or mitigate significant adverse effects on the environment and provide for the monitoring of these effects. Failure to meet the conditions of consent may lead to prosecution, payment of fines, and in severe circumstances the cancellation of the consent. The maximum penalties available under the RMA are imprisonment for a term not exceeding 2 years, or a fine not exceeding NZD600,000. If the offence is a continuing one, an additional fine may be imposed not exceeding NZD10,000 for every day or part of a day during which the offence continues.

OceanaGold has been deemed, in obtaining the consents to license activities with environmental effects for its Macraes operation, to have met the purpose and requirements of the RMA, which establishes a not insignificant threshold for the granting of such consents.

OceanaGold holds all required resource consents for the activities it currently undertakes. Compliance with the conditions of resource consents is discussed below.

Although expectations over how effects from activities are assessed and the level of mitigation required for managing those effects have changed overtime, OceanaGold has a robust understanding of the resource consenting process, engages competent specialists (many of whom have a long-standing relationship with the Macraes Mine) to undertake assessments, and has solid relationships with the territorial and regional councils.

Mining Permits / Crown Minerals Act 1991

Mining permits for the Macraes Operation have been issued under the Crown Minerals Act 1991 (CMA) for life of mine mining requirements.

The allocation of rights to prospect, explore or mine for minerals owned by the Crown is carried out by the issuing of permits under the "Crown owned" minerals include all naturally occurring gold and silver and some coal and other metallic and non-metallic minerals and aggregates.

4.7.2 Access Arrangements

Access Arrangements under the CMA are agreements sought with landowners to allow for surface access to allow exploration activities to be conducted. At the time of entering into an access arrangement, it is OceanaGold's practice to include an option to purchase should exploration results prove favourable.

OceanaGold currently owns approximately 13,540 ha of land covering and in the immediate vicinity of the Macraes Operation. The current exploration forecast suggests that the only access arrangement that may be required is associated with Crown Land associated with Golden Point Reserve, currently being managed by the Department of Conservation. If exploration drilling is required from the surface of this land, negotiations with the Department of Conservation will be undertaken, to determine the conditions of the access arrangements. The land is within tenements MP52 738 and MP41 064.

4.7.3 Compliance

Management of compliance by the regulating authorities is undertaken through several mechanisms:

- submission of and in some cases presentation of annual plans and reports for activities;
- compliance audits and inspections, undertaken; and
- self-reporting of incidents which result in or have the potential to result in non-compliance with consents and permits.

The primary agencies involved in the submission of annual plans are New Zealand Petroleum and Minerals (in the case of the Mineral Permits) and the territorial and regional authorities in the case of resource consents.

Audits are conducted by the Councils either on an annual basis or on a consent or topic specific basis, whilst inspections are ad-hoc. In some cases, the Councils will work with other related government institutions such as the Department of Conservation, on topic specific audits.

Progress against corrective actions identified in audits and inspection are tracked in the Corporate Database, InControl.

5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

5.1 Accessibility

Access to the mine is by sealed highway from Dunedin, and then via sealed roads from Middlemarch and Palmerston. There is good access along mine roads and farm tracks throughout the project area.

The Macraes mine is within short driving distance to several populated centres:

- Macraes, approximately 6 km by road from the Macraes mine plant, consists of approximately 40 families (including surrounds);
- Dunedin, a university city with a population of 130,000, is 90 km away by road;
- Oamaru with a population of 14,000 is 105 km by road; and
- Palmerston, with a population of 800, is 37 km by road.

Transport to the site is typically by vehicle. OceanaGold provides bus services from Oamaru and Dunedin with many pick-up points enroute. A domestic and international airport is in Dunedin, which also has an operating seaport. A national trunk railway line from Christchurch to Dunedin passes through Palmerston.

5.2 Physiography

The project area is situated on an elevated (approximately 490 m above sea level) plateau drained by a trellis pattern of north-westerly and north-easterly trending streams. Parts of the plateau are deeply dissected. Elevations range from 200 m to 820 m above sea level.

Vegetation is comprised of a combination of improved pasture and tussock grassland, while streams and gullies are choked by matagouri, gorse, thistles and wild rose. The predominant land use is stock grazing, with small areas covered by pine plantations.

5.3 Climate

Daily temperatures average 15 °C in summer and 5 °C in winter, with maximums ranging up to just over 30 °C in summer with winter minimums down to -7 °C. Snow regularly falls during the winter months but rarely enough to severely restrict access.

Rainfall averages 650 mm per year but can vary by about 80 mm per year depending on topography. There is little seasonal variation in rainfall, but monthly totals can be quite variable, and the area is susceptible to long dry periods. Droughts, which last two or three years, have been recorded in the east Otago region every 10 to 20 years.

Climatic influence translates to approximately 500 hours of lost open pit mining time per year due to rainfall, snow or fog. Underground mining and processing plant operations are unaffected by weather.

5.4 Land Resources and Infrastructure

5.4.1 Sufficiency of Surface Rights

OceanaGold has all necessary rights and mining permits for current mining operations at the Macraes Project. Planned mining extensions in Innes Mills and GPUG along with required tailings storage require approval of additional resource consents, applications for which were submitted in 2023 or (in the case of continued tailings storage) will be submitted in 2024.

Future discoveries may require new consents and conversion of ground currently held as an exploration permit to a subsequent mining permit prior to the commencement of mining.

5.4.2 Power

Macraes is connected to the local power grid, which provides a reliable electrical power supply. The power line has adequate capacity to supply the mine at full operating limits.

5.4.3 Water

Water is drawn from the Taieri River and pumped to the site. Through storage and active recycling, an adequate reservoir of process and potable water is maintained to enable continuous operation, even in times of drought conditions.

5.4.4 Communications

Macraes is connected to the New Zealand ultrafast broadband fibre network, providing both voice and internet access. The mine site utilises a local area network for computer connections.

A multi-channel radio network is utilised for operations communication in the mine and process plant.

5.4.5 Mining Infrastructure

The Macraes Project area is sufficient to contain the current open pit mines and underground, process plant, haulage roads, tailings storage areas and waste rock storage areas. Furthermore, sufficient surface area is available within Macraes project area for the construction of any infrastructure necessary for the potential development and mining of other deposits under consideration.

5.4.6 Labour

Mining, processing and support staff are drawn from the local region, with all living in the nearby towns or commuting from Dunedin. Recruitment of suitably skilled and experienced employees for all areas of the operation has been achieved and maintained.

Contract support services are readily available from Palmerston, Oamaru, Waikouaiti and Dunedin.

6 History

6.1 Historic Mining

The earliest alluvial mining in the district commenced at Murphy's Flat in 1862, with Macraes Flat, Deepdell and some parts of Horse Flat being worked soon after (Hamel, 1992). Murphy's Creek was the major early alluvial workings and there is evidence that all of its tributaries were being worked in the 1860's. The Murphy's Creek alluvial workings are reasonably well preserved and are of historic significance (Hamel, 1992).

Lode quartz mining commenced in the 1860's, but the scale of operations was very small. The Golden Point/Round Hill lode system was not discovered until 1889. Development of Golden Point commenced in 1889 and it became established as a significant scheelite and gold producer. From 1890 to 1933, it produced an estimated 13,000 ozs of gold and 800 tons of scheelite (Williamson, 1939). Other areas mined included Maritana, Golden Bell and Deepdell but quantities were small with a total reported of 8,463 tons of crushed ore for 1,630 ozs of gold and 50 tons scheelite (Williamson, 1939). Lodes were worked for either scheelite or gold depending on the price at the time. This was because the fine grinding required to liberate the gold resulted in poor recovery of scheelite.

Areas continued to be mined after 1939 as tungsten was in demand during the Second World War but gold prices were sharply reduced during this time. The scale of operations was small, and work was discontinuous. As a result, records of ore production are poor. Local miners suggest that less than 100 tonnes of scheelite was mined since 1939 but estimates are widely varied. It was a question of economics (due to preferential recoverability of gold or tungsten) not availability that controlled the scheelite industry at Macraes Flat.

The first lode worked in the Macraes field was probably the Duke of Edinburgh, described by Ulrich in 1875 (Williamson, 1939). He also mentions the Golden Bar Reef and the Moonlight Reef, at the head of Macraes Flat, but gives no details about them. In 1888, the Highlay Reef was discovered on the Mareburn, and the lode was soon traced to Golden Point, where it was opened out in 1889. Further prospecting soon resulted in the opening of other mines along the lode, some of them, however, being little more than surface workings.

The mines that have been worked, given in order eastward, are Mount Highlay, New Zealand Gold and Tungsten, Coronation, Golden Bell, Maritana, Deepdell, Golden Point, Round Hill, Innes, Mills, Griffins, Golden Ridge, Ounce and Golden Bar (Williamson, 1939).

Figure 6-1 shows historic mining areas in relation to modern open pit and underground mining zones.

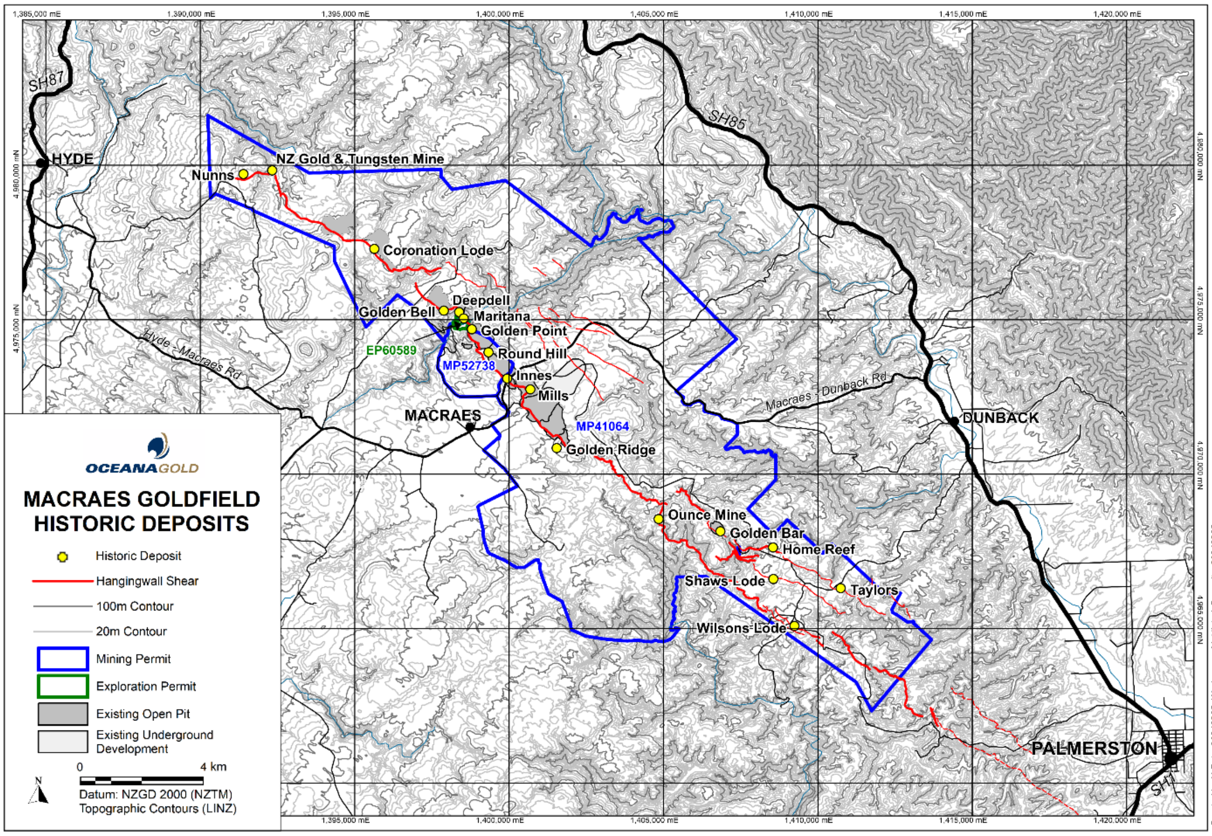


Figure 6-1: Macraes historic deposits

6.2 Prior Ownership

The original permits at Macraes were owned by Golden Point Mining Limited and BHP Gold Mines (New Zealand) Limited, owned by BHP Gold Mines Limited. During December 1989, Macraes Mining Company Limited (MMCL) obtained 100% ownership of these permits. On May 14, 1999, Macraes Mining Company Limited changed its name to Gold and Resource Developments (New Zealand) Limited and again to GRD Macraes Limited on June 30, 2000. Finally, on May 18, 2004, the name was changed to OceanaGold (New Zealand) Limited.

6.3 Previous Work pre-1990

Details on the exploration activities conducted in the Macraes region prior to 1990 when MMCL acquired the Macraes permits are from Redden and Moore (2010). This included approximately 56,000 metres of RAB, RC and diamond drilling in 779 holes.

6.3.1 Geochemistry

Stream Sediment Sampling

During 1987, an orientation stream sediment sampling survey was conducted by BHP Gold Mines (New Zealand) Limited (BHP), in the Round Hill Area. The results from a total of 64 samples taken showed total sediment fine fraction samples (-20# and -80#), gave the best results.

Although the bulk cyanide leach method returned lower-level results, this method was adopted for use on a regional basis due to ease of sample collection.

6.3.2 Geophysics

Two geophysical surveys have been carried using induced potential (IP)/Resistivity; one by Homestake New Zealand Exploration Limited (HNZEL), in April 1985.

The objective of the survey was to test the ability of IP to discriminate between ore grade Au-scheelite- sulphide mineralisation at Round Hill (intersected by diamond drilling) from weakly mineralized parts of the lode shear system south of Round Hill employing dipole-dipole and gradient array IP surveys. The survey lines were orientated both grid east, across the line of lode, and grid north, parallel with the strike of the lode system but across the trend of the Round Hill shoot. A dipole spacing of 50 m was used.

Dipole-dipole traverses revealed chargeability responses more or less associated with outcrop of the main lode, however the anomaly was stronger than what would be expected from the sulphide content of the lode system (generally less than 1% total sulphide with maximum of 2-5% in sulfidic zones) and may be related to graphite associated with the shear system. A chargeable source near the centre of line 14900 m N was associated with very weak mineralisation intercepted in diamond drill hole (DDH) 5.

The surveys across the Round Hill Shoot failed to clearly discriminate between the shoot and weakly mineralized lode to the south. The gradient array surveys on these lines revealed anomalies in the vicinity of Ferguson's workings (Southern Pit – 14200-14400 m N) in which graphitic rocks are exposed. In summary, IP chargeability anomalies may define a shear system of the Macraes type, especially if sufficient graphite is present, but the variability of sulphide content within the lode system is too low to discriminate between high grade mineralized shoots and low grade or barren parts of the lode system (Robinson, 1986).

In 1986, BP Oil New Zealand Limited (Minerals Division), (BP Oil), carried out a total of 32-line km of dipole-dipole IP/Resistivity surveying at Nunn's-New Zealand Gold and Tungsten, Frasers (south of the alluvial flats along Macraes Road), Golden Ridge, Golden Bar and Frasers East (Coochey, 1986; Moore,1986). The bulk of this survey, 19-line km, was over Frasers and Golden Ridge. A comparative analysis of the IP survey results with subsequent drilling was not completed, however it appears that the results were like those of HNZEL.

On November 17, 1987, BP Oil undertook a down-hole geophysical survey on drill hole GRRC 14 (Moore,1987). BPB Instrument Limited carried out the demonstration log recording dip-meter analysis, density logs, focused electric and resistivity logs, neutron-neutron and gamma logs. Moore reported that the logs which provided the most information, and which correlated with the down-hole geology were resistivity, focused electric, density, and dip-meter analysis.

During 1987, the Ministry of Works and Development Central Laboratories used portable "OYO" equipment to log 13 holes on the eastern high wall side of the (then proposed) Round Hill pit (Brown,1988). BPB Instruments Limited also logged one of these holes which enabled a comparison between the two contractors. The surveys were reasonably successful with a similarity of results between the two contractors. The results of the survey became very useful allowing for the interpretation of structures required for slope stability analysis.

6.3.3 Drilling

During 1970, Helpet Mining Company Limited drilled 28 holes in the Macraes Flat area exploring for tungsten mineralisation. Core recovery was poor, and mineralisation was found to be sporadic and discontinuous. Kennecott Exploration (Australia) Pty Ltd also undertook exploration in the area in 1970-71, but their reconnaissance work did not include drilling.

In 1984, Homestake New Zealand Exploration Limited commenced exploration at Round Hill and by the end of 1986 had drilled over 5.5 km of strike on the Deepdell, Round Hill and Frasers systems at 100 m to 200 m drill hole spacings. This drilling defined the Round Hill shoot which was amenable to open cast mining (Lee et al, 1989).

Following HNZEL’s success in the Macraes Flat region, BP Oil obtained licences to the north-west and south-east of Macraes along the HMSZ. Between 1986 and 1988, BP Oil carried out drilling at Nunn’s, Golden Ridge, Ounce, Golden Bar and Frasers East.

Drilling has continued at Round Hill and adjacent prospects since the purchase of HNZEL by BHP in 1987 and subsequently by MMCL in 1990.

6.4 Historical Estimates

Prior to 2010 there were no relevant historical resource estimates for the Macraes Operation compliant with NI 43-101 rules or CIM guidelines (Redden and Moore 2010). However, the mine had been in production for approximately 19 years to that date and resource estimates for the deposits were routinely updated and refined over time.

Since 2010 all resource estimates have been completed in accordance with CIM guidelines. The current resource estimates (as of December 31, 2023) are presented in Section 14.

6.5 Previous Production

Historical production from the Macraes Goldfield is poorly recorded. The Golden Point mine produced an estimated 13,000 ozs of gold and 800 tons of scheelite from 1890 to 1933 (Williamson, 1939).

Since the commencement of mining in 1990, the combined Macraes open pits and underground mines have produced over 5 Moz. Since 2000, annual gold production from Macraes has ranged between 130 koz and 210 koz.

7 Geological Setting and Mineralisation

7.1 General

The Macraes gold deposits are in a major, low-angle (~15-20°) structure known as the Hyde Macraes Shear Zone (HMSZ). This regionally continuous, late metamorphic deformation zone cuts greenschist facies metasedimentary rocks of the Otago Schist. The Otago Schist is a moderately high-pressure metamorphic belt (Yardley, 1982) that formed by collisional amalgamation ("Rangitata" Orogeny) of the Caples and Torlesse terranes in the Early-Middle Jurassic (Coombs et al.,1976; Bishop et al., 1985; Little et al., 1999).

7.2 Regional Geology

The Otago Region derives its characteristic landscape from extensive ranges of metamorphic rocks (collectively named the Otago Schist) which form a broad belt running from coastal Otago through to the Southern Alps where they are bounded and offset by the Alpine Fault (Figure 7-1). These basement rocks represent the deepest exhumed portion of a thick pile of sea-floor mudstones and sandstones that accumulated as an accretionary wedge above a long-lived convergent plate margin of the Gondwana supercontinent during the Late Paleozoic-Mesozoic (~300 to ~100 million years ago).

Thickening and compression of the accretionary wedge during ongoing plate convergence resulted in regional metamorphism of the deeply buried sediments and associated deformation and recrystallization to schist from the Early to Middle Jurassic (Adams et al, 1985). Evidence of regional cooling from the Early Cretaceous is described as marking the onset of rapid erosional unroofing following crustal thickening and the start of uplift of the schist (Little et al, 1999). Extension in the brittle upper part of the crust is recorded by the local preservation of late Cretaceous fault-bounded and non-marine sedimentary units with abundant schist clasts (Mitchell et al, 2009). The extensional rifting culminated in the opening of the Tasman Sea around 85 million years ago which initiated separation of New Zealand continental crust from the Australian-Antarctic landmass. Cessation of tectonic activity following the separation allowed steady erosion of the rifted landmass to a terrain of low relief by the early Cenozoic, the resulting peneplain is preserved as the planar and gently rolling form of the present-day Central Otago ranges.

The quiescent tectonics through the Early to Middle Cenozoic produced a transgressive marine sequence of mudstones and limestones that form the cover rocks unconformably overlying schist well exposed around coastal Otago. Further inland, the deposition of fluvial and lacustrine sediments is locally preserved in fault basins. Sporadic intraplate volcanic activity occurred during this time, however the bulk of local volcanic activity occurred during the Middle Miocene. Many monogenetic volcanic centres erupted in the Otago province, whereby flow deposits and tuffs capped the cover sediments and schist basement.

With the inception of the Australian/Pacific Plate boundary through the Late Miocene-Pliocene the tectonic regime radically changed to one of active compressional deformation and regional uplift. Across Otago this is accommodated by reverse faulting, including the reactivation of some existing Cretaceous faults (with an opposite sense of motion). Faulting has disrupted the schist, eroded most of the cover sequences and formed the present-day basin and range topography in Central Otago (Forsyth, 2001).

Within the Otago Schist there are widespread examples of orogenic gold style (Groves et al 1998, 2003) that formed throughout the post-metamorphic peak uplift history (Craw and Norris, 1991). A general model for ore formation within the Otago Schist describes metal-bearing fluids produced by dehydration reactions during prograde metamorphism channelled to structurally higher levels in the crust through large scale shear zones and faults (Craw and Norris, 1991; Pitcairn et al 2006). Mineralisation occurs at sites where changes in temperature and pressure of migrating fluids, or the chemistry of the surrounding rocks allows precipitation of minerals such as quartz and sulphide minerals. Where mineralisation conditions and fluid flow are sustained over time, then gold and or tungsten can accumulate as ore (McKeag and Craw, 1989; Allibone et al, 2018).

The estimated crustal depth of the Otago Schist orogenic gold deposits varies by deposit and ranges from ~12 km to less than 1 km (McKeag and Craw, 1989). Faulting during uplift of the schist and subsequent Cenozoic block faulting and erosion has juxtaposed different structural levels at the present-day surface. Depth of formation also broadly correlates in the mineralisation age, with the deepest examples being the oldest (Mortensen et al, 2010).

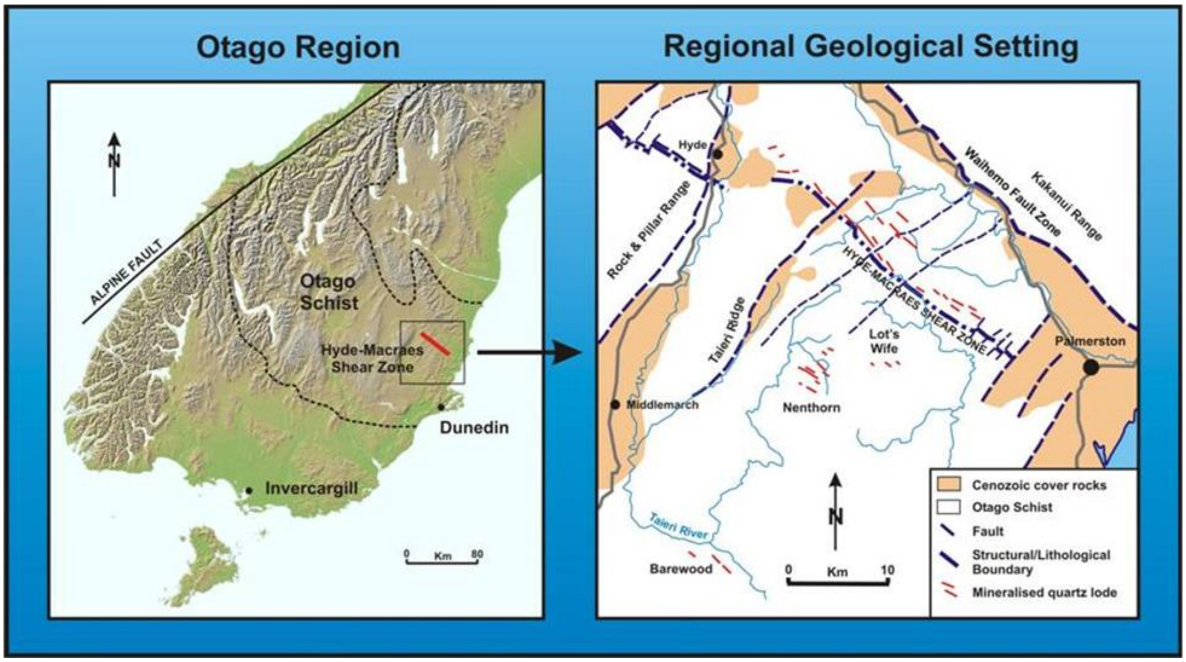


Figure 7-1: Regional Geological setting

7.3 Local Geology

The Macraes mining area is centred on the Hyde-Macraes Shear Zone (HMSZ), the largest gold-bearing feature within the Otago Schist. Striking north (Mine Grid) and dipping shallowly (15-20 °) towards the east, the shear zone can be traced 30 km along strike where schist is exposed at surface and only ends where it is covered by younger volcanic rocks in the north at Hyde and sedimentary rock cover in the south towards Palmerston.

The HMSZ consists of variably altered, deformed, and mineralised schist up to 150 m thick, known as the Intrashear Schist. The thickest part of the shear zone consists of several mineralised zones stacked on metre-thick shears. These shears have ductile deformation textures overprinted by cataclasis (Craw and Angus, 1999). The HMSZ is hosted in lower greenschist facies (chlorite zone) schist and has been juxtaposed against upper greenschist facies schist along a normal fault, the Footwall Fault (Angus et al., 1997). The Footwall Fault is younger than the HMSZ and truncates mineralisation at its base.

The upper boundary between mineralised HMSZ schist (Intrashear Schist) and unmineralised lower greenschist facies schist is commonly a well-defined structure, the Hangingwall Shear. This shear ranges up to 25 m thick and is typically black due to the presence of fine-grained graphite and sheared sulphide minerals (pyrite and arsenopyrite) (McKeag et al, 1989; Craw, 2002). The Hangingwall Shear can be traced through the mined pits in the main mining area.

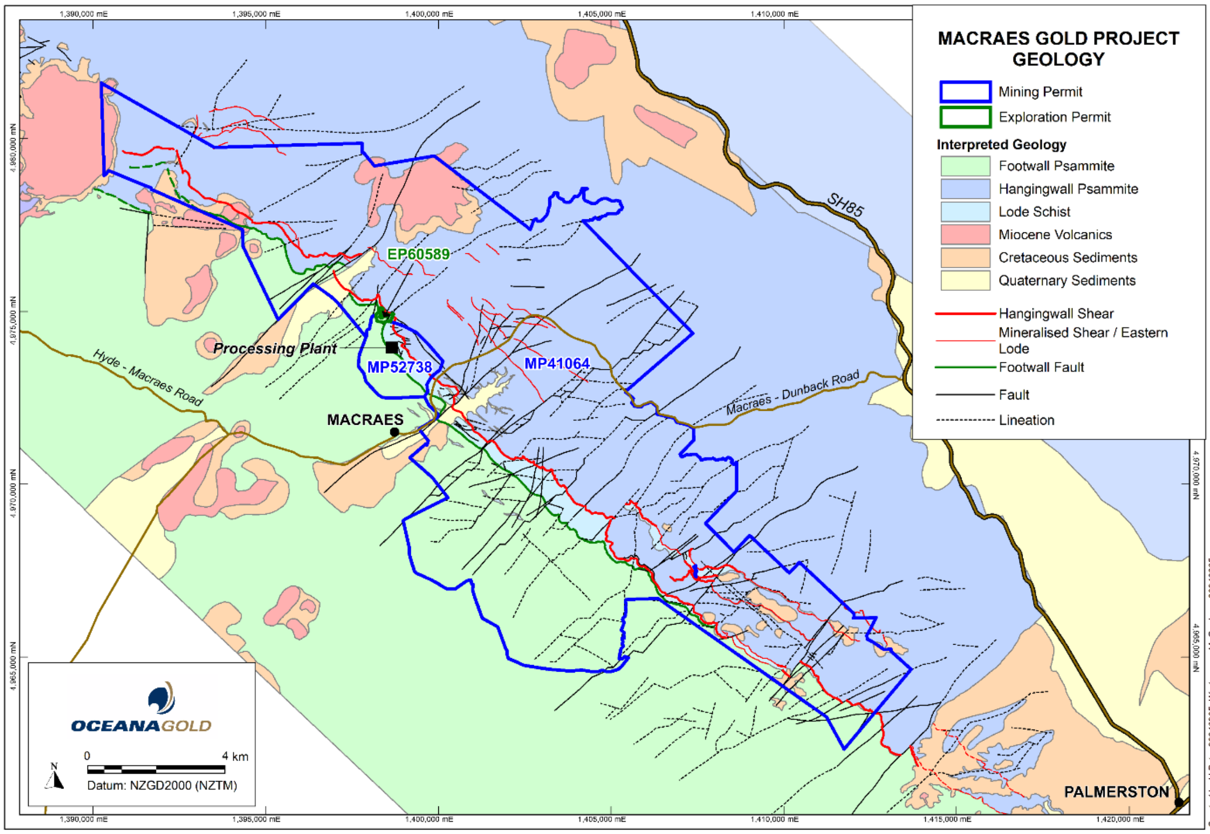


Figure 7-2: Macraes geology map

7.4 Mineralisation

7.4.1 Mineralised Zones

The mineralisation at Macraes is principally developed within the gently dipping HMSZ, though anomalous grades are also recorded in narrow, steeply dipping quartz veins locally occurring in the hanging wall schists, collectively known as the Eastern Lodes (Figure 7-3). Mining to date has occurred along a continuous strike length of 6 km in numerous staged open pits, four discrete satellite pits immediately to the north, and at Golden Bar, approximately 7 km to the south.

Within the shear zone, mineralisation is generally constrained between the Hangingwall Shear and the Footwall Fault. Schists above the Hangingwall Shear and below the Footwall Fault are generally barren though there are exceptions to this rule, for example at Innes Mills and the Eastern Lodes. Economic mineralisation is typically restricted to the upper part of the HMSZ. The Hangingwall Shear, which varies from 1 m to >30 m in thickness contains the most continuous and consistent mineralisation. This zone is locally underlain by extensive but low grade stockwork zones which may be developed over a width of up to 100 m.

Higher grade zones of mineralisation within the shear zone form tabular shoots that may have strike lengths of >300 m and extend up to 800 m down-dip (i.e. Frasers and Round Hill). In most cases these zones are observed to trend towards the north, oblique to the shear zone dip direction. This orientation is interpreted to be due to the interaction of the HMSZ with folds within the host schist units, creating a preferred lineation direction for mineralisation. The exception to this is the most recently discovered deposit Coronation North where the trend of the mineralisation is south-east.

Mineralisation distribution is broadly consistent along the HMSZ but shows considerable variability in grade, width, continuity and geometry at mine-scale. This variability is attributed to the local development of the HMSZ structure during mineralisation and the influence of host rock lithology, particularly with respect to competency contrasts.

There is a strong empirical correlation between gold, arsenic, scheelite, silicification and strain intensity within the HMSZ. Gold-scheelite-pyrite-arsenopyrite mineralisation is associated with replacement and fissure quartz veins within post-metamorphic shear zones. Shear parallel quartz veins and cataclastic shears contain the highest gold and scheelite grades (Lee et al. 1989).

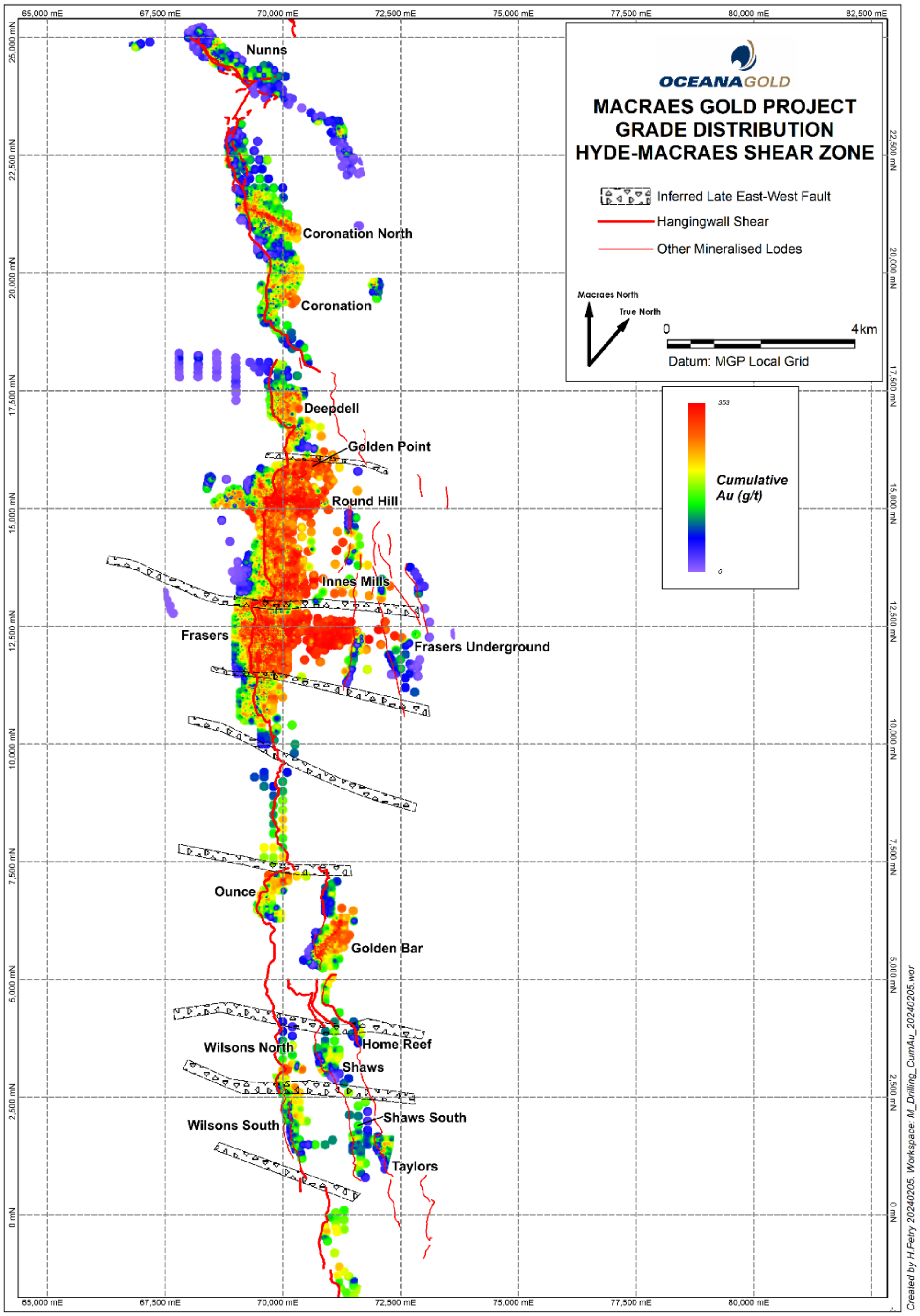


Figure 7-3: Grade distribution along the HMSZ

7.4.2 Mineralisation Types

The following four types of mineralization occur within the HMSZ at Macraes (Mitchell et al., 2006):

- Mineralised schist. This style of mineralisation involved hydrothermal replacement of schist minerals with sulphides and microcrystalline quartz. Mineralisation was accompanied by only minor deformation;
- Black sheared schist. This type of schist is pervaded by cm to mm scale anastomosing fine graphite and sulphide bearing micro shears. This type of mineralisation is typically proximal to the Hangingwall Shear. Scheelite mineralisation occurs in the silicified cataclastic shears;
- Shear-parallel quartz veins. These veins lie within and/or adjacent to the black sheared schist and have generally been deformed with the associated shears. The veins locally crosscut the foliation in the host schist at low to moderate angles. Veins are mainly massive quartz, with some internal lamination and localized brecciation. Sulphide minerals are scattered through the quartz, aligned along laminae and stylolitic seams. These veins range from 1 cm to > 2 m. Scheelite mineralisation is associated with quartz veining in some areas; and
- Sheeted veins (laminated veins) locally known as 'stockwork veins'. These veins occur in the Intrashear Schist and can consist of numerous steeply dipping veins. Stockwork veins are typically traceable for 1-5 m vertically with most filling fractures that are 5 – 10 cm thick but can be up to 1 m thick. These veins generally display evidence of incremental opening.

Gold is associated with pyrite and arsenopyrite in all the above styles of mineralisation. Rarely free gold up to 300 µm occurs in quartz veins, but mostly presents as 1-10 µm scale blebs hosted in and near sulphide grains (Angus, 1993).

Tungsten as scheelite is found predominantly within mineralised quartz veins, although a subordinate phase of disseminated scheelite and a mineralisation phase are also observed (Farmer, 2016). The main phase of tungsten mineralisation occurred early in the development of the deposit and typically occur in the same lode and vein structures as gold mineralisation. However, tungsten mineralisation is not genetically related to gold mineralisation. MacKenzie (2015) recognised 5 types of scheelite. Types 1,3,4,5 are fine grained and disseminated varieties. Type 2 scheelite is the coarse grained to massive creamy coloured scheelite that was mined in the past.

Within the Macraes open-pits, gold mineralisation comprises a combination of Hangingwall, shear-parallel quartz veins ('concordant lodes'), and 'stockwork' veins.

Apart from Coronation, a large amount of irregular mineralisation occurs between the base of the Hangingwall and the Footwall Fault. This is stockwork mineralisation and generally appears in the drilling as clusters of elevated gold grades. Stockwork mineralisation refers to mixtures of steeply dipping narrow quartz veins and concordant lodes, which appear discontinuous at the resource drilling scale. The Footwall Fault lies between 80 m and 120 m below the Hangingwall Shear and is easily identified in drill holes as a distinctive light-grey fault gouge between 5 and 30 cm thick. To date, no economic mineralisation has been located below the Footwall Fault.

A schematic sketch cross section through the HMSZ of the stratigraphy and mineralisation is shown in Figure 7-4.

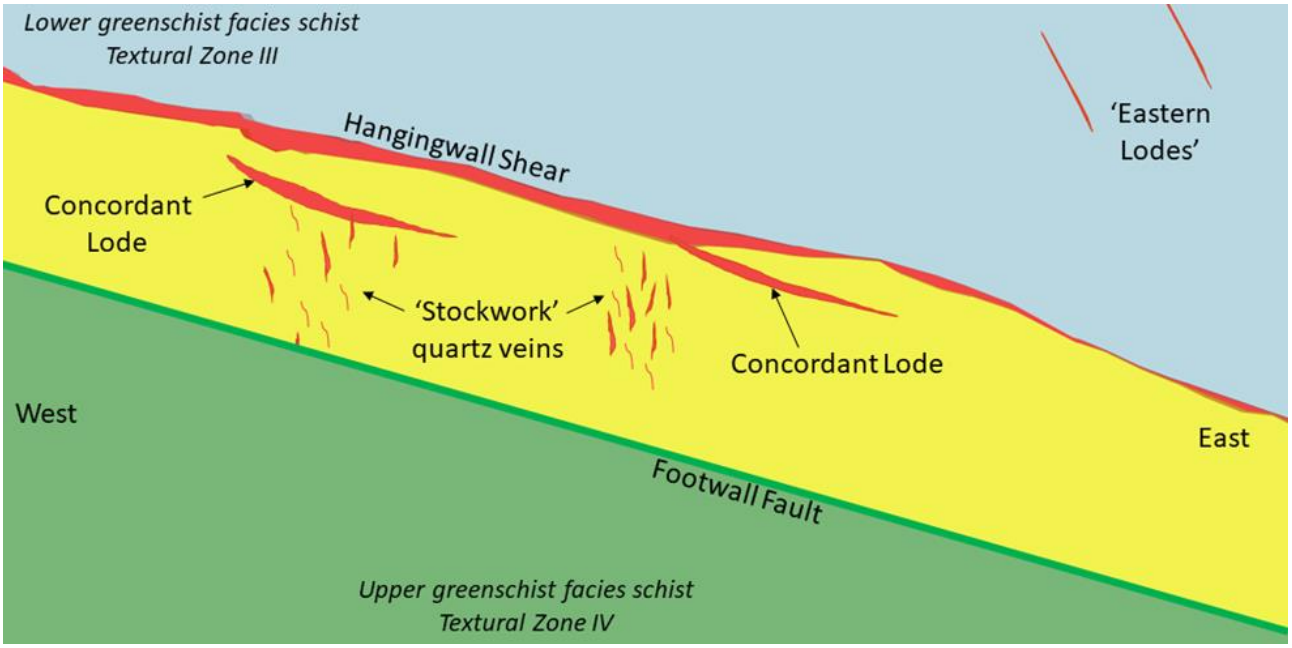


Figure 7-4: Schematic Sketch Cross section through the HMSZ showing styles of mineralisation.

7.5 Deposit Geology

At present mining is concentrated in four areas: Innes Mills and Frasers open pits and by underground from the down dip extensions of Frasers (FRUG) and Golden Point (GPUG).

Mining is expected to finish in Frasers and FRUG in 2024. Future mining is planned at Innes Mills and GPUG.

Descriptions of individual deposit geology is included where appropriate in Section 14.

8 Deposit Type

8.1 General

The Macraes deposit is the largest known orogenic style gold deposit in the South Island of New Zealand (Figure 8-1). This style of deposit is recognized to be broadly synchronous with deformation, metamorphism, and magmatism during lithospheric-scale continental-margin orogeny (Groves et al., 1998). Most orogenic gold deposits like Macraes occur in greenschist facies rocks. Orogenic deposits typically formed on retrograde portions of pressure- temperature time paths during the last increments of crustal shortening and thus postdate regional metamorphism of the host rocks (Powell et al., 1991 and references therein). Orogenic deposits can be subdivided into epizonal, mesozonal, and hypozonal based on pressure-temperature conditions of ore formation. The Macraes deposit falls into the mesozonal category with mineralisation having occurred near to the brittle-ductile transition at about 300°C.

In orogenic deposits the association between gold and greenschist grade rocks is commonly thought to be related to: 1) the large fluid volume created during the amphibolite and/or greenschist transition and released into the greenschist zone; 2) the structurally favourable brittle-ductile zone that lies just above this transition; 3) fluid focusing and phase separation that are most likely to occur as fluids ascend into the greenschist pressure-temperature regime and/or gold solubility shows a sharp drop under greenschist facies temperatures (Phillips, 1991). Fluid migration along fault-fracture networks was likely to be driven by episodes of major pressure fluctuations during seismic events.

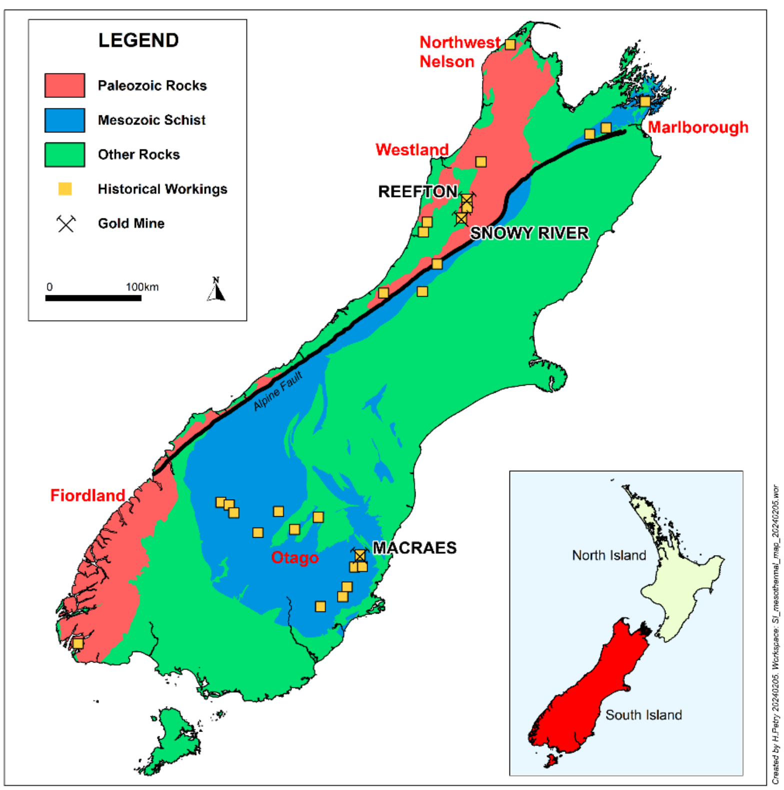


Figure 8-1: Orogenic gold deposits of New Zealand

9 Exploration

9.1 General

Exploration conducted in the Macraes region prior to 1990 when MMCL acquired the Macraes permits is summarized in Section 6.

Exploration by OceanaGold and its predecessor companies from 1990 to the end of 2009 is covered in Redden & Moore (2010) updated to end of 2019 in Cooney et al. (2020).

9.2 Geology

9.2.1 Geological Mapping

Detailed geological mapping has been completed at various times along the strike of the HMSZ. The last major mapping exercise was in Macraes North in 2016 covering the gap between Coronation and Nunns but only interpreted rather than outcrop geology was plotted. Fact and interpreted geology are shown in Figure 9-1.

9.3 Geophysics

No new geophysical surveys have been completed since 2007 apart from re-processing of data from the 2007 Fugro survey.

Between 1990 and 2009 the following surveys completed by OceanaGold, and its contractors is listed in Table 9-1.

Table 9-1: Geophysical surveys completed

Date	Survey Type	Contractor
1991	Seismic	Works Consultancy Services
1994	Seismic	Institute of Geological & Earth Sciences (IGNS)
2004	Seismic	Otago University
1994	Electromagnetic (LOTEM, CSAMT, TEM, HEM)	IGNS
1995, 1997	DIGHEM	Geoterrex Ltd
2007	Electromagnetic	Fugro

Results of these surveys are covered in detail in Redden & Moore (2010) and will not be repeated here.

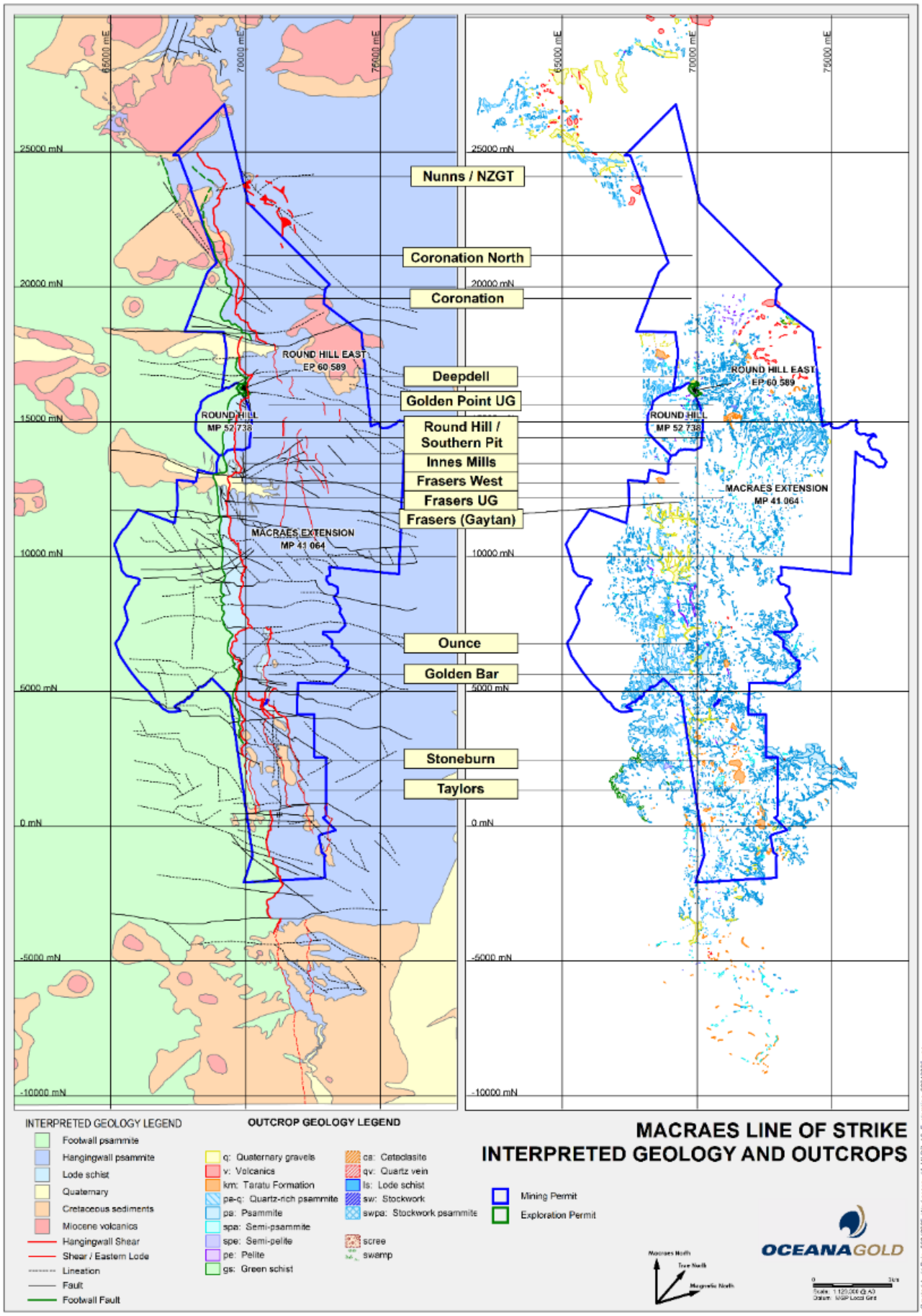


Figure 9-1: Macraes interpreted and outcrop Geology

9.4 Geochemistry

9.4.1 Stream Sediment Sampling

Stream sediment sampling was undertaken in 1991 (Grieve, 1991), in 1994 (Bleakley, 1994) and during 1995. As of June 30, 1997, 803 BLEG (bulk leach extractable gold) stream sediment samples had been collected on the Macraes Project area to complete first pass sampling and infill anomalous catchments. 241 total sediment fine fraction (TSFF) stream sediment samples were also collected. The location of all stream sediment samples collected on the project is shown on Figure 9-2.

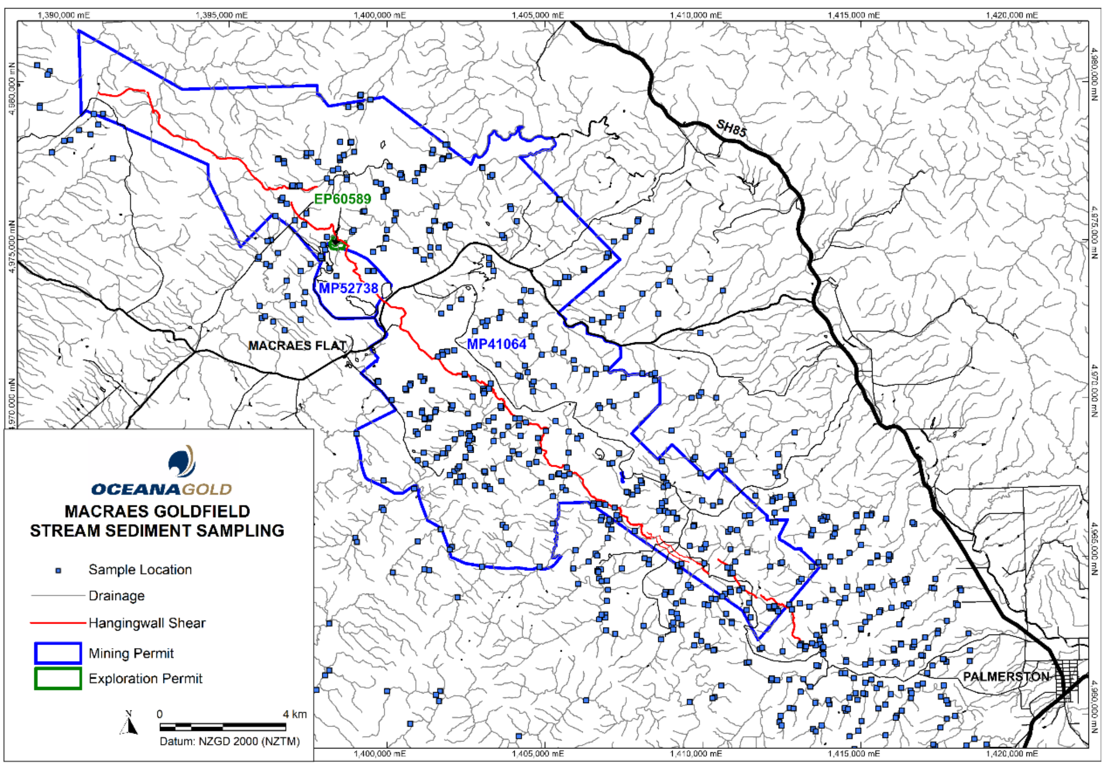


Figure 9-2: Macraes stream sediment sampling

Bulk leach extractable gold (BLEG) samples consisted of approximately 2 kg to 3 kg (dry weight), of -2 mm sediment, collected from multiple points ranging from trap sites in active creek channels to over bank fines. Many samples were collected from creeks with low water flow and small active sediment content. Sediment from these creeks consisted of organic-rich fine silts and clays trapped by vegetation. Recent orientation sampling from creeks draining known mineralisation (i.e., the Frasers and Golden Ridge Prospects), produced assays from 78.7 ppb to 3,353 ppb gold and 40 ppm to 170 ppm arsenic.

Total Sediment Fine Fraction (TSFF) samples were also collected for the first time during early 1997. The samples consisted of 1 kg to 2 kg of -1 mm sediment collected from the same trap site as the BLEG samples.

These samples were then analysed for a multi-element suite using the Inductively Coupled Plasma (ICP) analytical technique.

9.4.2 Soil Sampling

Soil sampling of B horizon soils using a hand or motorised hand auger has been carried out over a large part of the Macraes current and former permit areas. Samples are routinely analysed for arsenic, with some samples also analysed for gold, tungsten and antimony. Arsenic is interpreted as the most reliable path finder element.

In total, approximately 18,000 soil samples have been collected across the Macraes current and former permit areas. The location of all soil samples collected on the project is shown as Figure 9-3.

For conventional sampling, a 2 kg un-sieved sample is collected from 0.25 m to 1 m depth using an auger at each station. Samples usually reached the soil/bedrock interface and consisted of B and C horizon material.

During 1997, two new soil geochemistry techniques were trialled. A two-phase orientation survey testing the Mobile Metal Ion (MMI) technique was conducted, with a total of 604 samples collected. The technique is based on the location of ‘blind’ mineralisation through the detection of highly mobile ionic species, including gold, which is shed from mineralisation at depth and moves up through the substrate to become weakly bound to soil particles. A very weak solute is used followed by ICP-MS analysis. The results of the orientation were inconclusive, and the programme was suspended.

In addition, considerable work has been conducted on determining whether ICP-OES multi-element suites are more effective at discriminating lithological variations and highlighting mineralisation at the Macraes Project. Work included a 607-sample orientation survey, and an 848 sample follow up survey taken over various areas of the line of strike.

From November 2008 to end 2012, all soil samples have been analysed by ICP-MS at SGS Waihi for Au, As, Sb and W. This has included an extensive soil programme over the eastern parts of the Macraes North and Hyde exploration permits.

In 2015 a soils sampling programme by Hardie Resources on an adjacent permit crossed over into EP40576, then held by OceanaGold. 19 samples were collected and analysed by a portable XRF analyser for a range of elements including arsenic but not gold.

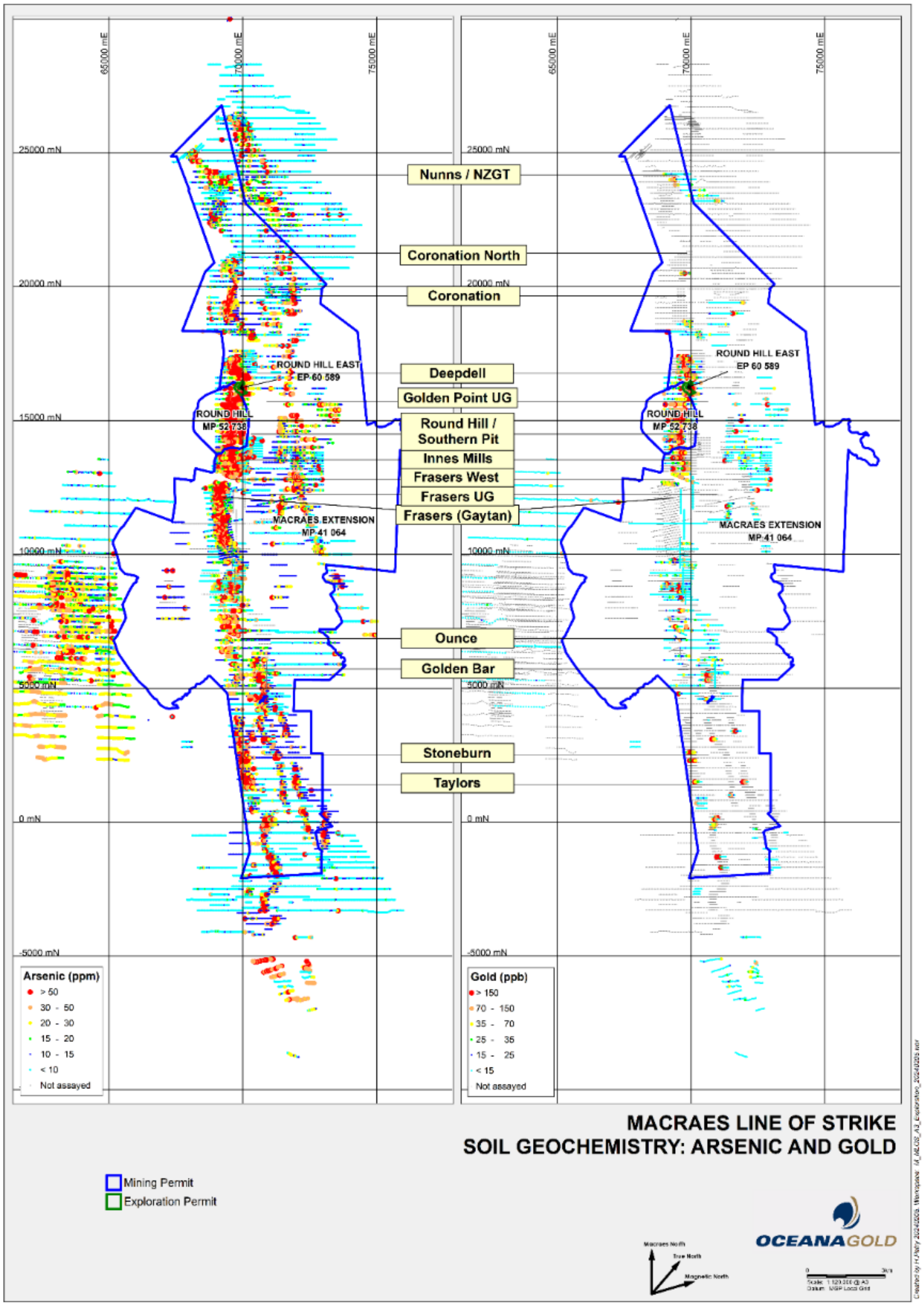


Figure 9-3: Macraes soil sampling locations

9.5 Trenching

Approximately 17,000 m of trenches have been excavated at Macraes, with approximately 5,300 trench rock samples collected.

Trenches are mapped and rock chip sampled, with samples traditionally analysed for gold ± arsenic, ± tungsten ± antimony. In general, the soil profile is shallow in the Macraes area allowing trenching to be undertaken by light (12 tonne) excavators in most areas. Although stream beds and areas of extensive alluvial cover present some difficulties, trenching has proven to be an excellent exploration tool for geological mapping and geochemical sampling.

Trenches are mapped at 1:100 scale with horizontal channel samples collected over geological intervals from 0.5 m to 6 m. Samples were submitted to the AMDEL laboratory on site for gold, arsenic and tungsten analysis.

9.6 Remote Sensing

In 1994, MMCL purchased a 10 m resolution, monochrome 1990 Spot image of the eastern Otago region.

Digital satellite imagery over the Macraes Operation was purchased from Digital Globe Limited in July 2005, March 2006, March 2007, January 2008 and June 2009. The Quickbird satellite imagery is in the visible spectrum, with a resolution of 5 m.

9.7 Aerial Photography

Colour aerial photography was flown by New Zealand Aerial Mapping Limited during January 1996. Photography was captured at a nominal scale of 1:30,000. 1:5,000 colour enlargements were produced as an aid to programme planning, geological mapping and interpretation.1:5,000 black and white orthophotographs have been rectified differentially to the Macraes local grid.

Updated colour aerial photography was flown over the Macraes area in March 2005 by Terralink International Limited. Images were supplied as 0.5 m resolution digital orthophotographs on the Macraes local grid.

Since 2012 updated colour aerial photography is flown over the Macraes every 1-2 years by Aerial Surveys Ltd. The most recent photography was in January 2023 with the images supplied at a 0.15 m resolution.

9.8 Exploration Statement

Exploration surveys and investigations of the Macraes area detailed above have been carried out by OceanaGold, except where a contractor or consultant is named.

10 Drilling

10.1 Summary

By the end of 2023 nearly 1.2 million metres from over 9,300 exploration/resource infill holes had been drilled across the Macraes Goldfield since the 1980's. About 60% of the total metres were completed by Reverse Circulation percussion drilling and 33% by diamond coring (including percussion pre-collars) from surface. Exploration diamond drilling from underground platforms comprise 6% of total metres, with other drilling methods such as open hole percussion, aircore and sonic drilling making up the final 1% of metres.

The Mineral Resource inventory is based on the results of 1.05 million metres of exploration drilling in 7,869 holes used in twelve resource estimate areas.

Four companies, BP Minerals, Homestake, BHP and OceanaGold have drilled the holes but only holes drilled by OceanaGold are used in the resource estimates. The exceptions are the Stoneburn resources which also used the earlier drilling.

The two underground resource estimates (FRUG and GPUG) also used underground diamond drill holes and channel cuts completed for grade control and stope definition.

A breakdown of drilling by resource area as at the end of December 2023 are summarised in Table 10-1. Note that the total exploration holes listed for Innes Mills, Frasers - Gay Tan and Frasers Underground resource include some holes that inform more than one resource estimate. The three resource areas together use only 4,055 unique holes for 577,394 m.

Table 10-1: Drilling summary by resource area

Resource Area	Exploration Holes used in the Current Resource Estimates		Unique Holes used in the Current Resource Estimates	
	Holes	Metres	Holes	Metres
Nunns	144	9,808	144	9,808
Coronation North	494	60,941	494	60,941
Coronation	360	36,168	360	36,168
Deepdell	528	51,166	528	51,166
Golden Point Underground[1]	1,647	251,151	1,647	251,151
Innes Mills[2]	1,637	213,089	4,055	577,394
Frasers – Gay Tan	2,220	272,550		
Frasers Underground[3]	1,016	238,945		
Ounce	54	6,530	54	6,530
Golden Bar	282	39,921	282	39,921
Taylors	82	3,479	82	3,479
Stoneburn	223	11,747	223	11,747
Total	**8,687**	**1,195,496**	**7,869**	**1,048,306**

Note: 1 For GPUG 138 UG grade control diamond holes (8,274 m drilled) were also used in estimation. These are not included in the totals listed here.

2 For Innes Mills 337 UG grade control diamond holes (10,412 m drilled) were also used in estimation. These are not included in the totals listed here.

3 For FRUG 2,649 UG grade control diamond holes (71,407 m drilled) and 89 channel cuts (850 m cut) were also used in estimation. These are not included in the totals listed here.

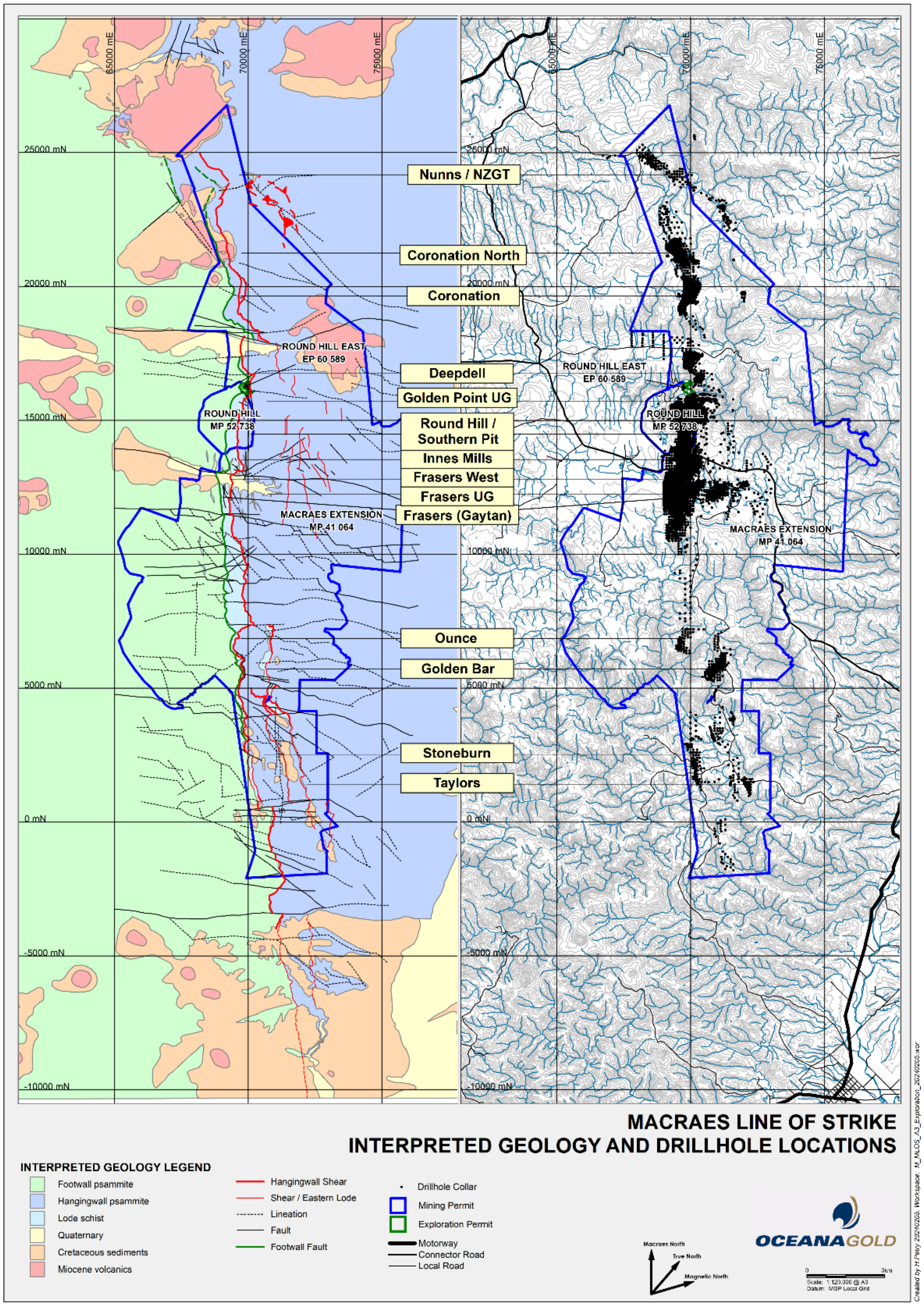


Figure 10-1: Macraes drill hole locations

10.2 Historical Drilling

Limited information is available regarding the specific details of drilling prior to 1990. Drilling was principally completed on the near surface parts of Golden Point, Round Hill, Southern Pit, Innes Mills and Frasers (Figure 10-2). All resources associated with this drilling have been mined.

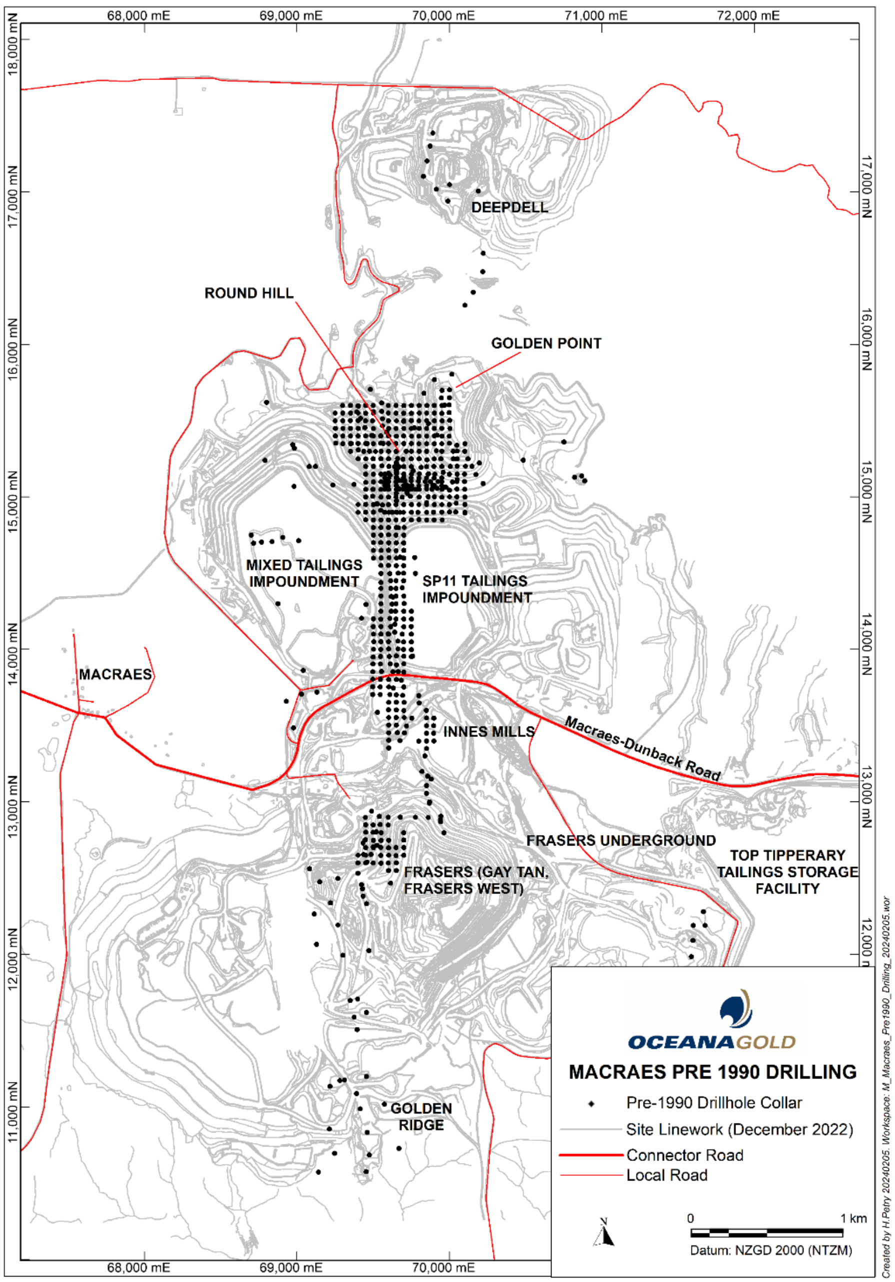


Figure 10-2: Drill hole locations prior to 1990

10.3 OceanaGold Drilling

Details of the drilling completed by OceanaGold post 1990 is shown in Table 10-2 and Figure 10-3. Historical drilling (pre-1990) completed by Homestake and BHP minerals has been included where available.

Over 8,500 holes for a combined 1.13 million metres have been drilled between 1990 and 2023. The majority of metres (60%) were completed using Reverse Circulation (RC) Percussion drilling delineating open pit resources. A third of the metres (33%) were completed by diamond coring from surface or a diamond tail including the percussion precollar and since 2007 exploration drilling of diamond core from underground platforms comprises 7% of total metres. The remaining metres (<1%) include open hole percussion, aircore and sonic drilling methods from surface.

Table 10-2: Macraes drilling summary

Year	Hole Type	No. Holes	No. Metres
1984	DDH	15	2,163
1985 - 1989	DDH	75	9,193
	OPH	185	5,156
	RC/DD	29	4,225
	RCH	475	35,342
1990 - 1994	DDH	56	4,517
	OPH	74	1,712
	RC/DD	9	1,952
	RCH	1,186	110,629
1995 - 1999	DDH	23	3,175
	OPH	18	589
	RC/DD	199	49,727
	RCH	2,273	317,452
2000 - 2004	DDH	15	2,350
	RC/DD	206	78,700
	RCH	479	33,595
2005 - 2009	Aircore	77	2,638
	DDH	48	18,296
	RC/DD	102	39,641
	RCH	107	6,501
	UGDD	39	3,673
2010 - 2014	DDH	16	2,450
	RC/DD	65	22,245
	RCH	494	54,452
	UGDD	231	41,941
2015 - 2019	DDH	137	30,122
	OPH	24	561
	RC/DD	136	26,180
	RCH	1,615	125,006
	Sonic	6	476
	UGDD	228	21,899
2020 - 2023	DDH	267	81,074
	RC/DD	67	14,874
	RCH	306	23,266
	UGDD	79	8,959

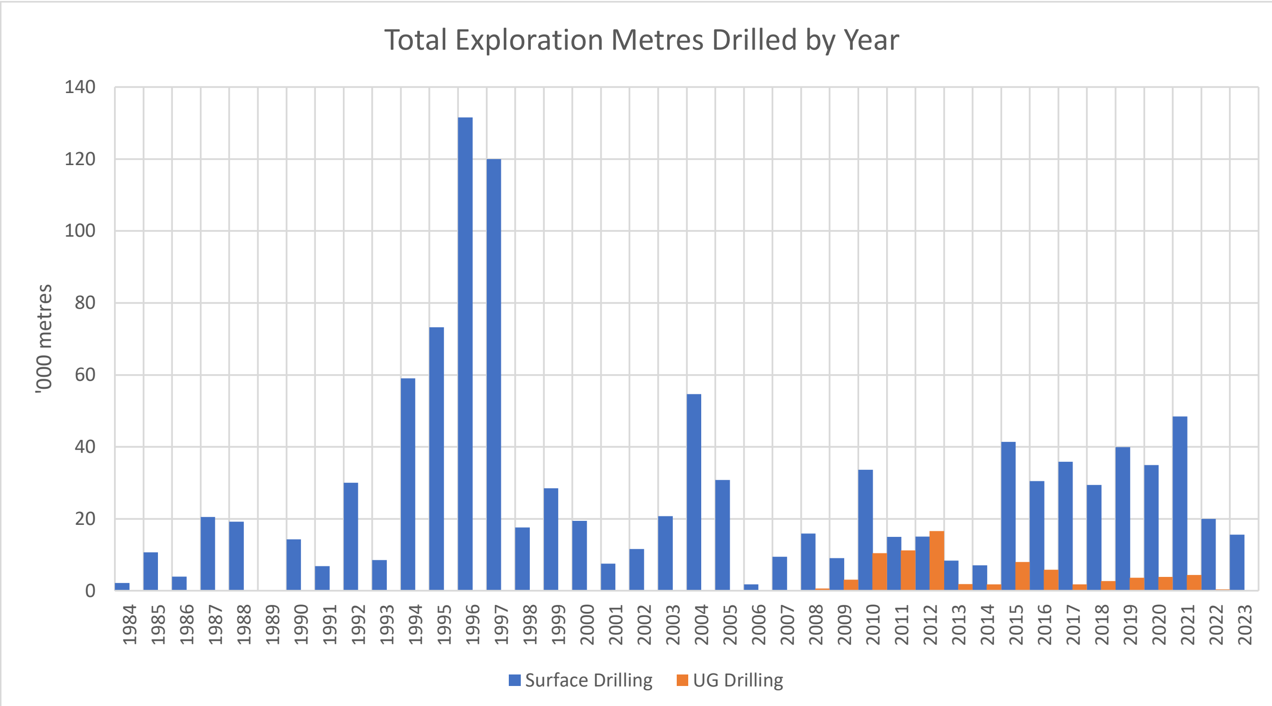


Figure 10-3 Drill meters by year from surface and underground

10.4 Surveys

All drill hole collars were surveyed using the Macraes local grid to ± 10 mm accuracy in easting, northing and elevation.

Prior to March 1994, down-hole deviation surveys were not completed on any of the RC percussion or percussion drill holes. For holes drilled since March 1994, down-hole deviation surveys have been attempted on all RC percussion holes that exceeded 50 m in depth, using an Eastman single shot or multi-shot camera. Holes are generally surveyed at 50 m intervals to the end of the hole.

Surface diamond holes are routinely surveyed every 25 m to 50 m. Current survey equipment is typically an electronic single shot or multi-shot camera. Survey information is routinely recorded in an *acQuire* geological database.

Underground diamond holes are routinely surveyed at 10 m then at every 15 m to the end of hole.

Air-core holes do not have down-hole surveys.

10.4.1 Magnetic to Macraes Grid Conversion

For downhole surveys magnetic azimuths are recorded then converted to Macraes mine grid azimuths by adding a correction. Up until the end of 2011 this correction was assumed to be 67 ° (that is 67 ° is added to the magnetic reading to give the Macraes grid azimuth).

However, in September 2011 a check using a 105 m long underground probe hole along a development drive in the Frasers Underground found that this correction should have been 69.5 ° relative to the Macraes grid.

This is due to the location of the magnetic North Pole drifting east by around 4.5 minutes per year at this location in NZ. It is uncertain when the original Macraes grid was set up but if it was based on a topographical map from the early 1980s this would explain the difference.

As a result of this study, the earlier drill hole azimuths were adjusted in the *acQuire* database at the end of 2011 as shown in Table 10-3.

Table 10-3: Magnetic to Macraes grid azimuth corrections

Drill hole Date Range	Correction Factor	Records Affected
1/1/2005 to 2011	70.5	4,127
1/1/1995-31/12/2004	70	13,408
1/1/1985-31/12/1994	69.5	3,667
Pre 1985	69	36

Drill hole surveys from 2011 to 2015 had a correction factor of 70.5 ° applied.

Drill hole surveys from 2016 onwards have a correction factor of 71 ° applied.

The next adjustment is expected to be in 2026 when a correction factor of 71.5 ° will likely apply.

10.5 Logging Procedures

RC percussion and most air core programme drill holes are geologically logged at one-metre intervals, with each metre being classified into one of twenty summary rock codes listed in Table 10-4. Rock code classification is based on a combination of textural and mineralogical properties.

Diamond drill core is photographed and then geologically logged using the same twenty summary rock codes and additional detailed pre, post and syn-mineralisation structure and mineralogy are recorded. The summary rock codes are plotted on cross sections and are used in combination with the assays to develop a geological interpretation which include three mineralised elements.

These elements are the Hangingwall Shear, concordant lodes and stockwork. The Hangingwall and concordant lodes consist of a combination of Cataclasite, Quartz Cataclasite, Silicified Breccia and Lode Schist. In general, the Hangingwall has greater proportion of cataclasite lithologies logged than the concordant lodes, which typically consist of more Lode Schist lithologies. The stockwork mineralisation is identified on cross sections by a combination of Stockwork and Quartz vein lithologies.

Drill hole information is stored in an *acQuire* database. For holes prior to 1994 only collar, interval and assay information has been entered into the database, while for all holes from 1994 onward the database contains all logged information.

Aircore drilling holes on the tailings storage facilities are geologically logged using two codes only: 'C' records the schist boulders and gravel used to build mattresses, causeways and embankment lifts; 'T' is used to record tailings material of fine-medium grained sand. The distinction is easily recognized by field technicians and the contacts are typically defined to within a decimetre by the drilling crew. The colour the tailings material is usually a monotonous grey although thin (<2 m) horizons of yellow-brown oxidation staining are noted and can be correlated between holes.

Table 10-4: Summary of rock code descriptions

	Code	Description
Cataclasite	ca	Quartz poor (<15%) dark grey/black fine grained cataclasite
Quartz cataclasite	qca	Quartz rich (15-50%) dark grey/black fie grained cataclasite
Silicified breccia	sb	>50% brecciated quartz. Generally associated with cataclasite
Quartz vein	qv	>50% banded or milky quartz veins with no associated brecciation or cataclasis
Lode schist	ls	Weakly sheared schist with minor cataclasite/brecciated quartz
Stockwork	swpe or swpa	From trace to 50% banded or milky quartz veins with no associated brecciation or cataclasis and hosted by either pelitic (swpe) or psammitic (swpa) schist
Pelite	pe	Massive to laminated medium to dark grey mica-quartz-chlorite schist
Semi-pelite	spe	Inter-layered pelite and psammite, more than 50% pelitic layers > 1 cm thick
Semi-psammite	spa	Inter-layered psammite and pelite, more than 50% psammitic layers > 1 cm thick
Psammite	pa	Massive to light grey-green quartz-feldspar-mica-chlorite schist, 90% psammitic
Footwall psammite	fwpa	Light greenish-grey, often finely laminated quartz-feldspar-chlorite+/- biotite +/- garnet psammite, grain size typically 0.1-0.3 mm. Found beneath the Footwall Fault
Greenschist	gs	Light green/brown massive quartz-mica schist
Basalt	Ba	Massive, grey fine-grained volcanic rock of Miocene age
Basalt breccia	bab	As for basalt but brecciated
Lapilli tuff	tuff	Basaltic fragments 2-64 mm in diameter in fine matrix. Product of ashfall from basaltic eruptions.
Clay	cly	Clay of variable colour and origin. May form through weathering or deposition
Sandstone	ss	Sandstone of variable origin and colour. May form through weathering or deposition
Alluvial	alv	Transported cover
Fault	flt	Light to medium grey gouge or pug, may be associated with mineralisation

10.6 Drilling Orientation

Drill holes at Macraes have typically been collared vertically, although many diamond drill holes targeting potential underground resources are started with an inclination of ca. -75º oriented towards the northwest. Down-hole survey information indicates that within a shallow depth (~100 m) the holes can significantly deviate, generally veering perpendicular to the schist foliation and to the HMSZ orientation. Exceptions to this trend may occur where the foliation orientation has been disrupted, or where the schists are cut by later fault zones.

Underground drill holes are restricted to whatever mine development is available at the time and are collared in a variety of orientations and inclinations, including up-hole directions.

10.7 Sampling Methods and Approach

10.7.1 Introduction

The diamond drilling sampling approach has remained relatively constant over the life of the project while the sampling of the percussion drilling has changed dependent on the drilling method. A discussion of the sampling methods applied is provided below.

Drilling has typically been conducted on a regularly spaced grid. Measured deviation of drill holes indicates that holes quickly trend sub-perpendicular to the host schist foliation direction and consequently drilling intersections from surface drilling typically represent the true width of the mineralized shear zone. Underground drill holes are drilled in a wide range of inclinations and directions and true widths need to be assessed on an individual basis.

10.7.2 RC Percussion Sampling

The percussion drilling methods have varied substantially over the life of the project. Early drilling was open hole percussion where the drill cuttings are returned outside the drill rod and captured in a stuffing box on the drill collar prior to being sampled via a cyclone. This drilling method is historically of a lesser quality than face sampling RC due to down-hole sample contamination and loss of sample.

After the open hole percussion programmes, RC percussion drilling was completed using a crossover sampling sub. This method of RC percussion drilling collects the drill cuttings via a sampling tool (the crossover sub) which was positioned in the drill string above the RC hammer. The sample quality of this form of RC percussion drilling is superior to that of the open hole percussion, however down-hole contamination is still more prevalent than samples collected with a face sampling RC hammer.

Programmes of RC percussion drilling since 1990 were completed with a face sampling RC hammer. This technology is considered to provide the most representative sample.

Sampling of the RC percussion drilling has been completed by trained OceanaGold employees and is supervised by OceanaGold technical staff. Definition of sampling intervals for RC percussion drilling has generally been based on 1 m intervals, over the full depth of the drill hole.

Sampling of RC percussion drill holes up until 2009 was completed using the methods detailed below:

- RC cuttings from the drill hole are blown into a trailer-mounted or rig-mounted cyclone, then pass through a tiered riffle splitter. At the completion of each metre, the overall sample is split into a smaller analytical “A” split and larger “B” split. Both samples are collected in uniquely numbered polythene bags;
- Where the drilling sample is mineralised, the full A split is sent for analysis. Where geology is less well constrained, all A split samples are analysed. The B split is taken to a storage area, to be kept for any further possible test work that may be required;
- Where the drilling sample is collected from rocks considered to be unmineralised (i.e. schist sequence overlying the HMSZ) then composite samples may be collected. In this case, either four or six sub-samples are collected from the B samples, transferred to a new bag, and submitted for analysis. Anomalous assay results from composite samples are verified by analysis of the original A splits;
- Sample tickets were used in the sampling process with one half (identical halves) of each ticket placed in the sample bag; and

- Once the entire metre had been sampled and placed in the polythene bag, along with the sample ticket, the bag was closed and sealed. Certified standards and blanks were also regularly inserted into the sample sequence as part of the quality control protocols. Samples were transported directly to the on-site laboratory for preparation and subsequent analyses, along with a dispatch sheet. Bags were transported by OceanaGold personnel.

From 2010 onwards the following changes have been made to the sampling protocol:

- The A split is collected in calico bags rather than polyethylene bags and the B split is left on site at the drill site. If not required, the B split bags are then emptied or buried on completion of the programme; and
- composite sampling was largely abandoned.

Further changes were made in 2017 with the replacement of the SchrammT660H drill rigs by the KWL700 drill rig:

- The B split is collected as a duplicate sample in a similar sized calico bag to the A split. Both samples are weighed. The B split samples are taken back to the core shed and stored in larger plastic bags in case later required for duplicate sampling; and
- where possible the remainder of each metre is captured in a large plastic bag and weighed before being discarded. This is to enable sample recoveries to be more accurately determined (previously visually estimated).

Prior to 1998, samples were collected from wet percussion drilling. The wet RC percussion drilling is further discussed later in the text. The sampling of wet percussion drilling has been discontinued since 1998.

The (OceanaGold) RC percussion drilling sampling protocols were assessed by external consultants in 2007 and were considered acceptable and consistent with industry standards.

An internal review was conducted by OceanaGold personnel in 2016 and some changes to the sample collection made which have since been implemented with the arrival of the KWL700 drill rig in 2017.

Historical drilling completed by Homestake and BHP had defined sampling protocols, which included the logging of moisture content and some twin drilling. Where holes were not wet, a good correlation was observed. These historical drilling practices are acceptable to OceanaGold. All resources associated with this drilling have been mined out.

10.7.3 Diamond Core Sampling

After drill core has been geologically logged and photographed, the sections of core considered to be mineralized, or proximal to mineralized zones are cut in half using a core saw. The drill core was sampled in intervals from 0.3 up to 1.3 m by trained and supervised technicians and geologists. Each interval was sampled by taking the same half of each piece of core for that metre (i.e. leaving the half with the orientation line and / or metre marks in the tray) and placing them into the appropriate sample bag.

Definition of sampling intervals for diamond drilling are based on geological intervals or 1 m intervals, within and beyond the margins of mineralised zones identified during logging. Higher grade intervals within a lower grade intersection are characterised by more abundant sulphide mineralisation and generally can be detected visually during core logging. The 1 m sampling interval established by OceanaGold is sufficient to define these higher-grade intervals and sampling intervals can go as low as 0.3 m to honour geological boundaries

Sample tickets were also used in the sampling process with one half (identical halves) of each ticket placed in the sample bag.

Once the entire metre had been sampled and placed in the polythene bag (calico bags since 2010), along with the sample ticket, the bag was closed and sealed. Certified standards and blanks were also regularly inserted into the sample sequence as part of the quality control protocols. Samples were transported directly to the on-site laboratory for preparation and subsequent analyses, along with a dispatch sheet. Bags were transported by OceanaGold personnel.

The diamond drilling and sampling is consistent with industry standard practice.

10.7.4 Aircore Sampling

An Edson aircore rig was used in September 2008 and January 2009 to sample the tailings storage facilities (both the Mixed Tailing Impoundment and SP11) as part of a project to assess the contained scheelite and gold resource. This technique is a fast and convenient method to sample the tailings although excessive torque on the rod string limited final depths to ~90 m.

Water injection is used during drilling to maintain recovery of the unconsolidated tailings and consequently the samples are saturated. Therefore, a sample from each 1 m interval down-hole is contained in a pre- numbered calico bag, fastened directly beneath the cyclone. The bag is securely tied with as much water and suspended fines contained as possible. Inevitably, some water along with suspended fine material is lost through spillage and overflow.

The calico bags are left on the ground in the field to de-water for a day, and then are transported directly to the on-site laboratory for preparation and subsequent analyses, along with a dispatch sheet. Bags were transported by OceanaGold personnel. Certified standards (both gold and tungsten) and blanks are regularly inserted into the sample sequence as part of the quality control protocols.

10.7.5 Sonic Core Sampling

In 2015 six core holes (475.9 m) were drilled into the Mixed Tailings Impoundment facility using the Sonic drilling method to provide samples for geotechnical testwork as part of the Macraes Gold-Tungsten project. The Sonic method is a way to maximise core recovery in soft sediment and relies on vibration and pressure to advance the drill string rather than cutting by rotation.

Once the geotechnical testwork was completed the core was sampled in 0.5 m lengths and analysed for gold and tungsten. The core was split in half with a spatula with the half core bagged in calico bags for dispatch to the laboratory.

10.8 Sample Quality

10.8.1 Summary

The sample quality for diamond drilling is high. Sample quality for RC percussion drilling is lower than for diamond drilling but generally sufficient to define the position and grade of mineralisation. Where RC sample quality issues have caused a grade bias, this bias has been addressed (section 10.8.3).

10.8.2 Sample Recovery

Sample recovery from RC percussion drilling and diamond drill core is routinely recorded in geological logs and recovery data is stored in an acQuire database. Recovery is generally high and there is no observed correlation between recovery and grade. From 2018, where possible, each metre of RC sample drilled has been weighted to give a better estimate of sample recovery.

10.8.3 RC Wet Sample Bias

The potential for wet sampling bias for RC percussion drilling was first identified at Frasers in June 1997; some reverse circulation (RC) drill holes were sampled under wet drilling conditions leading to the potential for sampling bias and contamination. Since that time, biases have also been identified at Golden Bar, Innes Mills and Round Hill.

Much of the legacy risk associated with wet RC sampling has been mitigated by subsequent replacement of wet RC drill holes by diamond twins. Where however, wet RC drill holes have not been replaced, RC sample grades have been factored, based on relationships between twinned RC versus diamond core sample grades.

This approach, which has been applied by OceanaGold for a number of pits, the relatively low proportions of remaining wet RC samples, and acceptable annual resource estimate to mine to mine reconciliations for areas mined with wet RC samples, mean that the residual risk to the resource estimates is considered to be low.

10.9 Definition of Sample Intervals

Definition of sampling intervals for RC percussion drilling has generally been based on 1 m intervals through mineralized zones, or more recently, over the full depth of the drill hole.

Definition of sampling intervals for diamond drilling are based on geological intervals or 1 m intervals, within and beyond the margins of mineralized zones identified during logging. Sample intervals can range from 0.3 m up to a maximum of 1.3 m.

Higher grade intervals within a lower grade intersection are characterised by more abundant sulphide mineralisation and generally can be detected visually during core logging. The 1 m sampling interval established by OceanaGold is enough to define these higher-grade intervals.

Sampling intervals in air-core holes on the tailings storage facilities include all intersections of tailings material. If the hole is collared in on the embankment, then sampling is not started until the first tailings material is recovered (typically ca. 7 m depth).

Drilling has typically been conducted on a regularly spaced grid. Measured deviation of drill holes indicates that holes quickly trend sub-perpendicular to the host schist foliation direction and consequently drilling intersections typically represent the true width of the mineralized shear zone.

10.10 Summary of Mineralised Widths

Most mineralized intersections have been accounted for in the resource estimates for the Macraes Project (see Section 14).

11 Sample Preparation, Analysis and Security

11.1 Sample Preparation Statement

Half cut core samples (diamond drill core) and drill cuttings (RC percussion drilling) samples from the OceanaGold drilling programmes at Macraes were collected from the source drill samples by employees of OceanaGold.

Subsequent sample preparation and assay was not conducted by any employee, officer, director or associate of OceanaGold except for tungsten analyses of pulps using a portable XRF analyser as discussed in Section 11.3.

11.2 Sample Preparation, Assay and Analytical Procedures

11.2.1 Graysons/AMDEL Limited

From 1990 to 1998, RC percussion drill chips and diamond drill core samples from the OceanaGold drilling programmes at Macraes have typically undergone sample preparation and assay for Au, As and S by Graysons Laboratories (Table 11-1), initially at Palmerston and then at Macraes. Graysons was bought by AMDEL Limited (AMDEL) in 1998 who then ran the laboratory until 2009.

Sample preparation of geological samples by AMDEL routinely includes drying, crushing (to 4 mm), splitting (if required) to a maximum of 1 kg and pulverising to obtain an analytical sample of 250 g with >95% passing 75 µm.

Table 11-1: Graysons/AMDEL assay techniques

Element	Sub – Sample Size (g)	Digest	Analysis	Detection Limit (ppm or %)
Gold Arsenic Sulphur	50	Aqua Regia Perchloric/Mixed Acid N/A	Fire/AAS Leco	0.01
	0.2 – 1			10
Tungsten (WO3)	0.25 – 0.5	Sodium perchloride	ICP-OES	100
	0.2			0.001%

WO_3 Analysis undertaken by OceanaGold for the air-core drilling between September 2008 and January 2009 (see Section 11.4) had been performed by AMDEL in Auckland, New Zealand. Sample preparation was undertaken on site and pulps sent to the Auckland Laboratory for analysis. The analytical method for tungsten (reported as WO_3) is preparation of a fusion bead from a 0.2 g sample followed by ICP-OES.

11.2.2 SGS New Zealand Limited

From June 2009 until the end of 2012 most exploration samples were prepared and analysed off site, with the remainder (mainly Frasers in-pit infill drilling) prepared and analysed at the on-site AMDEL laboratory. Samples were prepared at the SGS New Zealand Limited (SGS) Laboratory at Ngakawau, Westport, and analysed there for arsenic, tungsten (by pressed pellet XRF) and sulphur (Leco). Pulp splits were sent on to the SGS New Zealand Waihi Laboratory for gold analysis by Fire Assay (Table 11-2).

Samples were dried, coarse crushed to a nominal -6 mm, riffle split and then pulverised in Cr steel grinding mills to -75 µm.

One 50 g pulp split was then sent to SGS Waihi for gold analysis by fire assay. A second 50 g sample was retained at Westport and used to make pressed powder pellets for x-ray fluorescence spectrometry (XRF) analyses for arsenic and tungsten. Pulp from core samples were also analysed at Westport for total sulphur by furnace/ IR.

Table 11-2: SGS (NZ) limited assay techniques 2009-2012

Element	Method	Sub-sample size (g)	Digest	Analysis	Detection Limit (ppm or %)
Gold	FAA515	50	Aqua regia	Fire/AAS	0.02
Arsenic	XRF75W	20	N/A	XRF	2
Sulphur (total)	CSA06V	0.5	N/A	Leco/IR	0.03%
Tungsten	XRF75W	20	N/A	XRF	10

11.2.3 ALS Minerals Laboratory, Australia

During 2009, three diamond drill holes were sent to ALS Laboratory Group Minerals Laboratory, Brisbane, Australia for sample preparation and analyses for gold (Fire Assay), sulphur (Leco) and arsenic and tungsten (pressed pellet XRF). Samples returning relatively high grades of tungsten (>1000 ppm) or arsenic (>5000 ppm) were re-analysed by fused bead XRF (Table 11-3).

Drill core samples were first crushed to a nominal 70% passing -6 mm, then riffle split to a maximum weight of 3 kg and pulverised to 85% passing 75 µm. A 50 g sub-sample was analysed for gold by fire assay. 20 g samples were taken for pressed powder XRF for tungsten and arsenic.

Table 11-3: ALS minerals laboratory assay techniques 2009-2012

Element	Method	Sub-sample size (g)	Digest	Analysis	Detection Limit (ppm or %)
Gold	Au-AA26	50	Aqua regia	Fire/AAS	0.02
Arsenic	MEXRF05	20	N/A	XRF	5
Arsenic	ME-XRF15b	20	Acid	XRF	0.01%
Sulphur (total)	S-IR08	1	N/A	Leco/IR	0.01%
Tungsten	MEXRF05	20	N/A	XRF	10
Tungsten	ME-XRF15b	20	Acid	XRF	0.001%

11.2.4 SGS NZ Limited 2013 Onwards

SGS New Zealand Limited took over the Macraes on-site laboratory from AMDEL in June 2011 and from 2013 onwards all the exploration samples have been processed at this laboratory. Since March 2014 the laboratory has certified accreditation conforming to standard ISO/IEC 17025.

Gold is usually the only element analysed for but at times sulphur, arsenic, carbon and tungsten are required (Table 11-4). Samples requiring arsenic or tungsten analyses are sent to SGS Westport for pressed powder XRF after being prepared at Macraes. Any samples greater than 1000 ppm tungsten are re-analysed using the fused bead method.

The sample preparation process for both diamond and RC samples process is as follows.

- Samples are dried at 150 °C, coarse crushed to a nominal –2 mm, split on a linear divider to 350 g and then pulverized with a Cr steel grinding head to 90 % passing – 75 µm. From this 350 g a 50 g pulp was taken for fire assay and analysed for gold using the atomic absorption method. From mid-2019 this was changed to a 30 g pulp to be consistent with grade control drill samples; and since 2023 the instrument finish has routinely been with a MPAES instead of AAS.

Table 11-4: SGS (NZ) limited assay techniques 2013 onwards

Element	Method	Sub-sample size	Digest	Analysis	Detection Limit (ppm)
Gold	FAA505	50	Aqua regia	Fire/AAS	0.01
Gold (from mid-2019)	FAA303	30	Aqua regia	Fire/AAS	0.01
Arsenic	XRF75V	20	N/A	XRF	2
Sulphur (total)	CSA06V	0.2 g	N/A	Leco/IR	0.01%
Carbon (organic)	CSA03V	0.25 g	acid	Leco/IR	0.01%
Tungsten	XRF74V	20	N/A	XRF	6
Tungsten	XRF78S	20	acid	XRF	80

11.2.5 Historical Analyses

From commencement of the project to when Macraes mining took over in 1988 (i.e. under Homestake and BHP), various laboratories and analytical methods have been used for gold and tungsten analysis. Most of these methods are documented and appear to be the valid methods of the day. Assay methods and detection limits are shown in Table 11-5.

Apart from some drill holes at Round Hill, all the resources associated with areas drilled, sampled and assayed by Homestake and BHP have now been mined out.

Table 11-5: Historical laboratories and assay techniques

Year	Company	Element	Laboratory	Analysis	Detection Limit
Pre 87	Homestake BHP	Gold Tungsten (WO3) Gold	Analabs (Auckland)	FA-AAS XRF CFA	0.001 ppm
			Analabs (Perth)		
		Tungsten (WO3) Gold	Analabs (Auckland)	PP XRF CFA	0.002%
			Analabs (Carins)		
1987	Macraes	Tungsten (WO3) Gold	Graysons (Auckland or Palmerston)	PP-XRF	
		Tungsten (WO3)	Southland Co- operative Phosphate Company Ltd Graysons (Macraes) Environment (Sydney)	FA-AAS ICP	
1989					0.01 ppm

11.3 OceanaGold Tungsten Analyses

11.3.1 Introduction

Routine analysis of exploration and resource definition drill sample intervals for tungsten ceased around 1990 though selected sampling of gold mineralised intervals for tungsten continued until 1995 (Robinson, 2008). Regular analysis of exploration drill samples for tungsten only re-started in about 2009 but ceased in 2012. The frequency of tungsten sampling has been variable since that time. Hence there are many 10s of thousands of samples that were analysed for gold but never analysed for tungsten.

A programme of tungsten sampling to address this commenced in August 2013 focusing initially on Round Hill/Southern Pit (14,500 m N to 16,000 m N) but later extended to include the proposed extension to Frasers pit, Frasers Stage 6 (12,300 m N to 13,200 m N). This phase of work was completed in February 2014.

Tungsten analysis was done by a combination of a portable XRF analyser (pXRF) and commercial laboratory XRF analyses (SGS Westport in this case) with all higher-grade samples sent to SGS for fused bead ("fusion") tungsten analysis. Initially this higher-grade threshold was set at 2,000 ppm W for raw pXRF readings and 4,000 ppm W for SGS but was subsequently lowered to 1,000 ppm W for all.

Tungsten sampling by both pXRF analyser and commercial laboratories has continued since then with specific campaigns analysing samples from Innes Mills, Coronation North and Round Hill/Golden Point. Over 50,000 exploration and resource samples have now been analysed for tungsten by pXRF.

The use of pXRF to obtain tungsten analyses for use in resource estimation required an orientation study to be completed and protocols and procedures developed to ensure consistent presentation of each sample to the instrument. Factoring studies were also required to convert the raw pXRF tungsten readings to readings that reflected the true tungsten value, considering the interferences from other elements. These issues were addressed in 2013 prior to the commencement of the analytical programme (Edwards, 2015) and repeated when required subsequently, for example with the purchase of a new analyser in 2018.

The detection limit for tungsten using pXRF is 10 ppm W.

11.3.2 QA/QC Studies for the Use of pXRF Analysers for Tungsten Analysis

In 2013 several studies were carried out and procedures implemented to ensure the tungsten results obtained by the pXRF were of a high quality. These include:

- developing sampling procedures/work Instructions for using a pXRF analyser for tungsten analysis;
- orientation studies to examine and quantify issues that could affect the readings obtained by the pXRF analyser;
- audit of the procedures and studies by an external consultant; and
- factoring studies for converting the raw tungsten pXRF readings to “true” tungsten readings.

Additional studies were also undertaken to check several specific issues:

- check analyses of historical samples with W assays already in the database; and
- comparison of SGS pressed powder results versus fusion results.

Sampling Procedures

A sampling procedure was developed with assistance from external consultant Quantitative Group (QG) prior to the orientation study to demonstrate that as many of the variables as practicable have been removed or minimised and to show each sample is presented in as true and consistent a fashion as possible.

In order to standardise the presentation of the sample to the analyser plastic sample cups were used. The sample is placed into the cup and tamped down firmly. This could then be placed on top of the analyser beam in the workstation and analysed as per the Work Instruction.

Tungsten Standards

OceanaGold and SGS have used 3 certified W standards obtained from the Canadian Certified Reference Material Project:

TLG-1	830 ppm W
MP-2	6,500 ppm W
CT-1	10,400 ppm W

These three standards were supplied to SGS Westport for use as a standard when carrying out tungsten analyses. Two internal tungsten standards using Macraes material were also developed and certified by Rocklabs for the higher-grade samples. These standards are run every 20 samples as a check on performance.

Factoring Studies for Using the pXRF Analyser

In order to convert raw pXRF readings to true analysis values a factor needs to be determined for each element to account for interference due to other elements in the matrix and by the sample container. Factors were determined by analysing a standard set of approximately 200 samples which had been previously analysed for tungsten by a certified commercial laboratory. Factors will vary from instrument to instrument and even for different software versions on the same instrument, so it is important that the factoring exercise is repeated with each new instrument and software update.

A summary of the factors applicable to the current analysers is shown in Table 11-6.

Table 11-6: Conversion factors for current pXRF analysers

Container	Analyser	W Factor			As	Factor
		<0.4%W	0.4-1% W	>=1% W	<1% As	>= 1%As
Paper Envelope	511320	1.4	1.4	1	1	1
Sample Cup	511320	1.35	1.29	1	1	1
Paper envelope	804265	1.56	1.52	1	0.89	0.89
Sample cup	804265	1.50	1.40	1	0.89	0.89

11.3.3 Data Checking of Historical Assays

Over 58,000 W by AAS assays (W_AAS field) exist in the Macraes acQuire database. These assays date from the 1980s and 1990s and are mainly from drilling in the now mined out parts of Round Hill, Southern Pit, Innes Mills and Frasers.

A verification programme was undertaken to check the quality and accuracy of these historical results by check sampling as many of the higher-grade W samples as possible. Several errors were found and corrected.

11.4 Sample Security

11.4.1 On-site sample preparation

OceanaGold managed drilling has been sampled and submitted to the on-site SGS (AMDEL to June 2011) laboratory by trained OceanaGold staff. Once the samples have been submitted to the laboratory, AMDEL/SGS staff process the samples and have completed all aspects of the assaying independent of the OceanaGold personnel.

No measures are in place to ensure the samples’ security. However, the substantial reconciliation data supports the veracity of the data.

11.4.2 Off-site sample preparation

From June 2009 to end 2012 most exploration samples were sent off-site for sample preparation and analysis.

SGS Westport and Waihi

The samples (RC and half drill core) were dispatched in calico bags to SGS Westport by OceanaGold personnel for sample preparation and arsenic, tungsten and total sulphur analysis. Once the samples have been submitted to the laboratory, SGS staff process the samples and have completed all aspects of the assaying independent of the OceanaGold personnel.

No measures are in place to ensure the samples’ security however the substantial reconciliation data supports the veracity of the data.

ALS Minerals Laboratory, Brisbane

The half drill core samples were dispatched in calico bags to ALS Minerals Laboratory, Brisbane by OceanaGold personnel for sample preparation and arsenic, tungsten and total sulphur analysis. Once the samples have been submitted to the laboratory, ALS staff process the samples and have completed all aspects of the assaying independent of the OceanaGold personnel.

No measures are in place to ensure the samples' security however the substantial reconciliation data supports the veracity of the data.

11.5 Sample Analysis

The laboratories used are all accredited and have internal quality control procedures to manage the quality of the data reported to the clients.

Analytical methods and detection limits are described in Section 11.2.

11.6 Quality Assurance/Quality Control Procedures

11.6.1 Standards

Gold

Certified standards are routinely inserted at a rate of one in twenty samples (5%). Standards used by OceanaGold are purchased from and certified by Rocklabs up to May 2018 and Geostats Pty Limited from June 2018 onwards and include various grades. Most standards are sulphide standards.

Tungsten

Three certified tungsten standards from the Canadian Certified Reference Material Project were used throughout the project by the commercial laboratories and by OceanaGold. In addition, two standards were created and certified by Rocklabs in 2013 using known tungsten bearing material from Macraes. Standards are inserted every 20-30 samples during analysis.

11.6.2 Blanks

Blanks are routinely inserted at a rate of around one in 40 samples. Blanks used by OceanaGold include blanks supplied by Rocklabs, basalt blanks (from Tertiary basalt near Macraes) and Footwall schist samples from under the Footwall fault which assayed <0.01 ppm Au.

11.6.3 Duplicates

Duplicate sampling is now routinely carried out as part of the drilling programmes and are designated field duplicates ("FD") in the datafiles. For RC drilling field duplicates are a second split off the sample interval. For diamond drill core a quarter core sample is taken from selected intervals of the remaining half core after the first pass sampling.

In addition, coarse reject and pulp duplicate sampling and replicate sampling is routinely carried by the laboratory.

11.6.4 Core and Sample Storage

All pulps are returned to OceanaGold and stored in one of three storage sheds at Macraes. However, many of the pulps from the pre-2010 drilling have been lost or destroyed over time.

Exploration drill core is stored in core boxes in either one of three storage sheds or outside in a yard on pallets with the boxes strapped. Not all the core is kept and the waste rock intervals above the Hangingwall shear have been discarded in many cases.

11.6.5 Actions

Sample submissions are typically done by hole. When the results are received from the laboratory the standards are checked against the expected values before the data is loaded into the acQuire database. If any standards are found to be more than three standard deviations from the expected value, then that run of samples (typically 40 samples) around that standard is re-assayed. If more than two standards in a submission are found to be more than three standard deviations out the entire submission batch is re-assayed.

Monthly meetings are held with the on-site laboratory to discuss results and address any problems with the data quality, sample quality and sample volume.

11.7 Opinion on Adequacy of Sample Preparation, Analysis and Security

The adoption of the sample preparation and analytical methods, including fire assay for gold, is entirely appropriate. Enough quality control data exists to allow review of the analytical performance of assay laboratories for the recent drilling only.

The sampling methods, sample preparation procedures and analytical techniques are all considered appropriate when supported with the production and reconciliation data.

12 Data Verification

12.1 Introduction

In early 2007, external consultants reviewed the data collection protocols and quality control procedures (Redden & Moore, 2010). Only minor changes to current practices have been made since this review.

The Macraes Project has a long history of exploration and mining. Data collection protocols and quality control procedure have varied substantially over this period. The analytical quality is monitored by the submission of certified standards, blanks, laboratory duplicates and field duplicates. In addition to the quality control data, a substantial amount of reconciliation data is available and has been used as the final measure of data quality.

12.2 Drill Hole Database

12.2.1 Historical Data

Homestake and subsequently BHP data was stored digitally and transferred to Macraes Mining when BHP left the project. Original Au assay data was recorded in parts per million and grams per tonne format. Tungsten was recorded in parts per million or percentage WO_3 format to three significant figures. This data was entered into the Macraes Mining Techbase Database with all tungsten data recorded as percentage WO_3. The percentage values were rounded to two decimal places. Repeat analyses were combined and the average result recorded in Techbase.

Digital data and metadata for all drilling post 1994 was captured in the Techbase database.

In 2002 the acQuire geoscientific database was installed and Techbase assay data transferred to acQuire. Tungsten assays in acQuire are denoted as W but represent WO_3 values (checks against historical digital files and original reports confirm this).

Further checking of the historical tungsten data was carried out in 2013 and again in 2019. Some errors were detected and corrected.

12.2.2 Recent Data

The drill hole database is stored in acQuire geoscientific database software with the assay data directly loaded from digital data supplied by AMDEL up to 2010 and then by SGS from 2011 onwards. A review of the drill hole database and data flow processes was completed by external consultants in 2005, including random checks of the drill hole database against laboratory assay data during the site visit with no material errors identified. While no exhaustive review of the data has been completed, the mining and reconciliation data can be used as a check of the data robustness.

The surface drilling, underground and open pit grade control data are held in three separate databases within acQuire.

OceanaGold consider the drill hole database management is appropriate and the final database to be robust.

12.3 Comparison of Wet RC Percussion Drilling

The Macraes Project database contains surface diamond and RC percussion drill holes and trench samples, although the assaying from the trench samples has been excluded from resource estimates. Prior to 1998 samples were collected from wet percussion drilling which is a quality issue. Diamond twinning of some wet percussion holes has been carried out at Frasers, Innes Mills and Round Hill to quantify and address the problem along with globally determined grade dependent factors as discussed in Section 10.8.3.

Further discussion on the wet RC percussion drilling, where applicable, is also provided on a deposit by deposit basis in Section 10.8.3.

12.4 Analysis of Assay Quality Control Data

Redden and Moore (2010) included statistical analysis of the available exploration assay quality control data on drilling results up to 2009 in the onsite laboratory. These showed that although there was no systematic bias in standard accuracy and total bias for each standard was generally less than 5%, there was also, at that time, no reasonable monitoring and follow-up of exploration quality control results. The limited number of available field duplicates also showed relatively poor precision.

There was subsequently a period from 2010-2012 when the majority of exploration samples were analysed offsite. Summary analysis of assay quality control data during this period is included in the annual technical reports on exploration.

From 2012, exploration samples have been analysed by the onsite laboratory with monthly tracking of standards, blanks and duplicates routinely carried out and results discussed in the monthly meetings with the laboratory so any issues can be addressed immediately.

An internal audit was completed in 2016 and some improvements made to the way assay quality control data is managed.

This section presents a summary statistical analysis for the quality control data submitted to the onsite SGS laboratory since 2012 up to the end of 2023. Results are presented for only those quality control samples associated with sample submissions accepted into the database. These relate quality control samples submitted with drill holes that comprise about half of all the drill holes used in the current resource estimates. Quality control results for the remaining drill holes used in resource estimates are summarized in Redden and Moore (2010).

12.4.1 Blanks

Between 2012 and 2023 a total of 1,160 blank samples were included with drill samples. Overall, 89% blank samples were below the 0.05 g/t threshold (Figure 12-1).

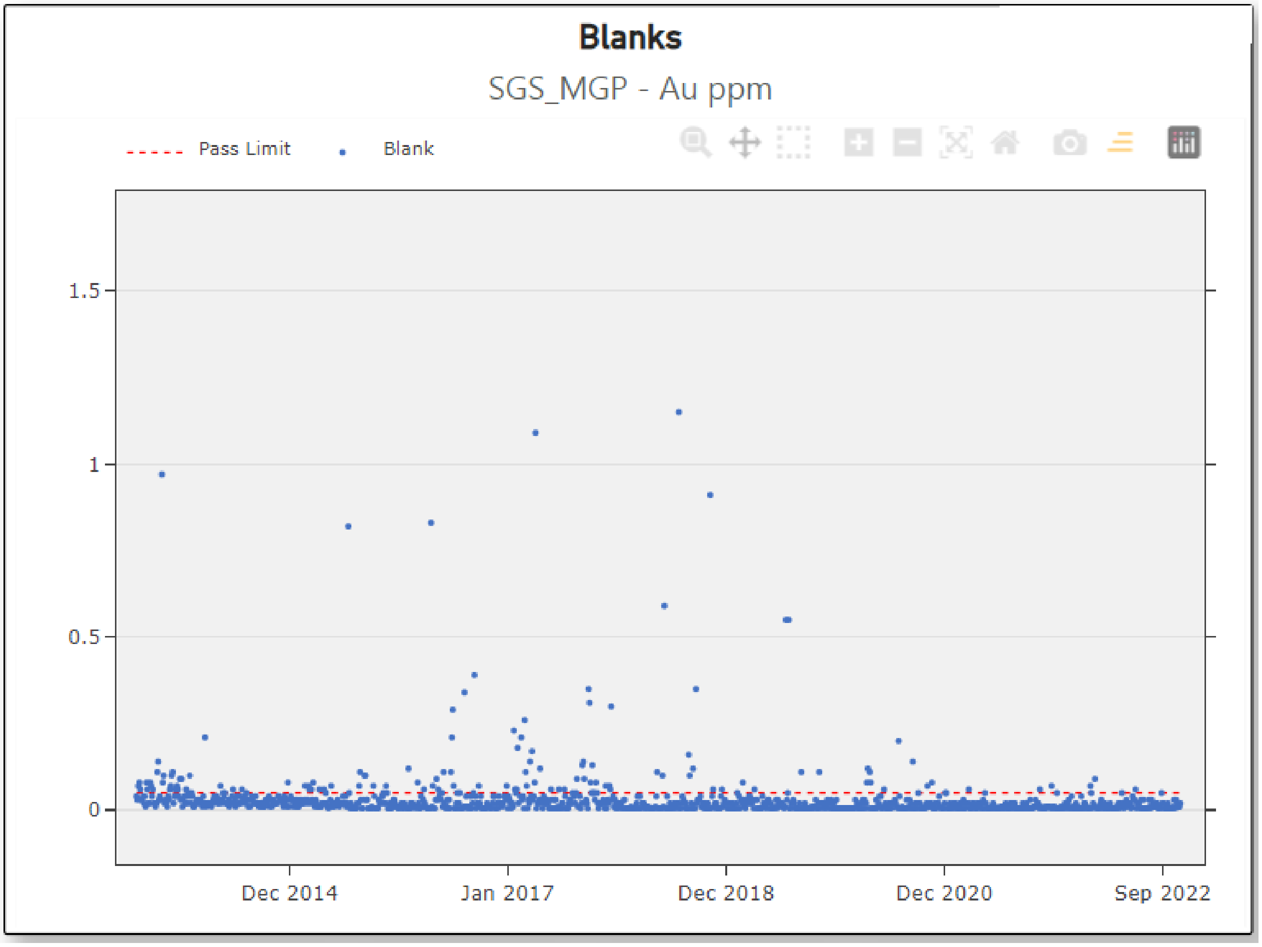


Figure 12-1 Blank samples submitted 2011-2023 (six outliers excluded)

12.4.2 Standards

Between 2012 and 2023, 12,311 assay results were reported from 60 different gold certified reference material standard pulps submitted along with drill samples. Standard grades ranged from a pulp blank up to 12.05 g/t Au.

96% of results were within 10% of the certified value, and 91% were within the +/- 2 SD.

The exact bias of most standards was <4%. Four standards returned exact bias >5% (maximum 6.67%) but these represent only 14 analyses.

Results for six standards with a range of grades are shown in Figure 12-2.

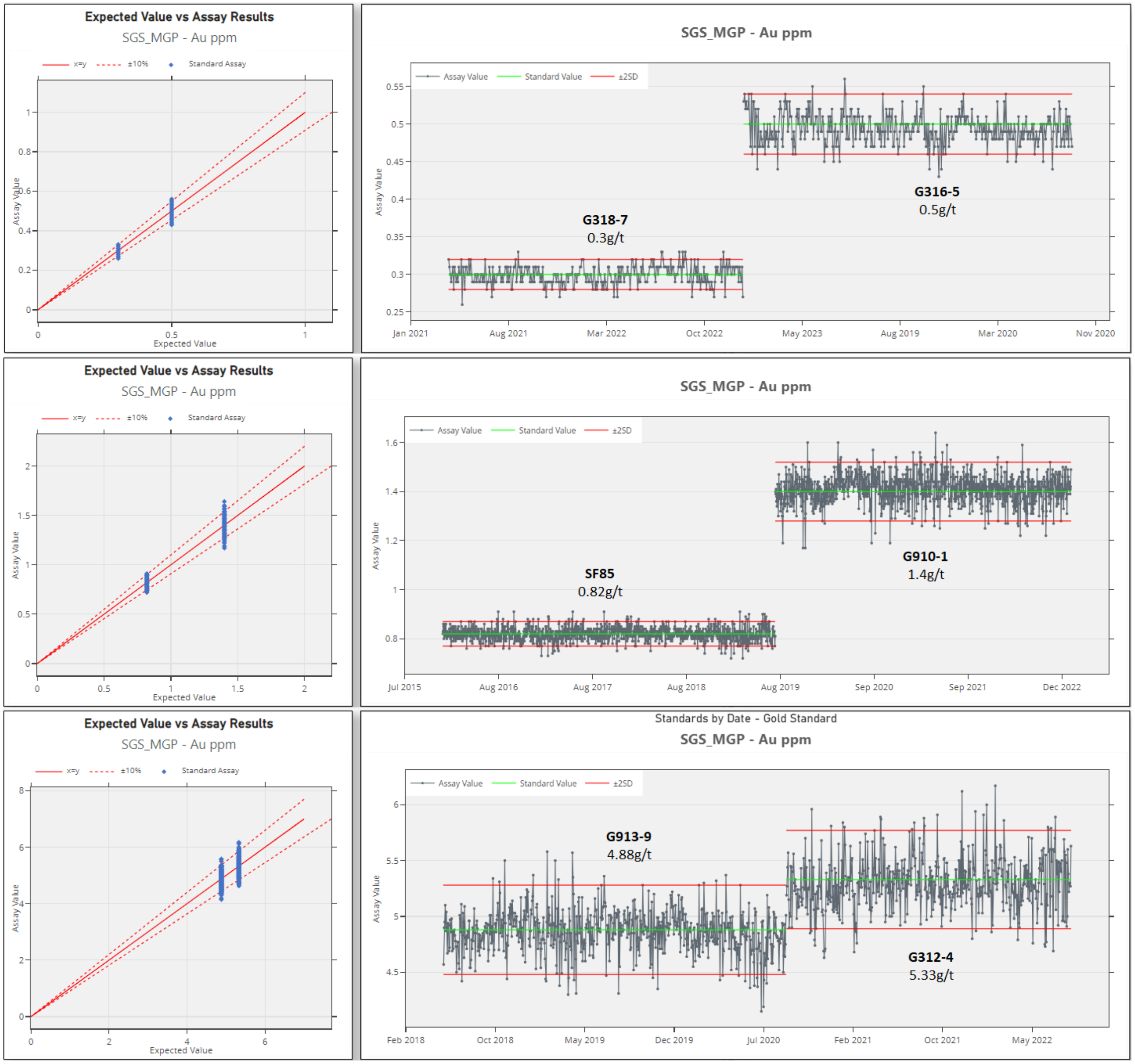


Figure 12-2: Selection of six gold standards from SGS Macraes Lab

12.4.3 Duplicates – SGS Macraes

Since 2012, 452 field duplicates, 5656 coarse crush duplicates, 4452 pulp duplicates and 13,856 laboratory repeat pairs have been reported from drill samples by SGS Macraes. Charts and summary statistics are presented in Figure 12-3 and Figure 12-4.

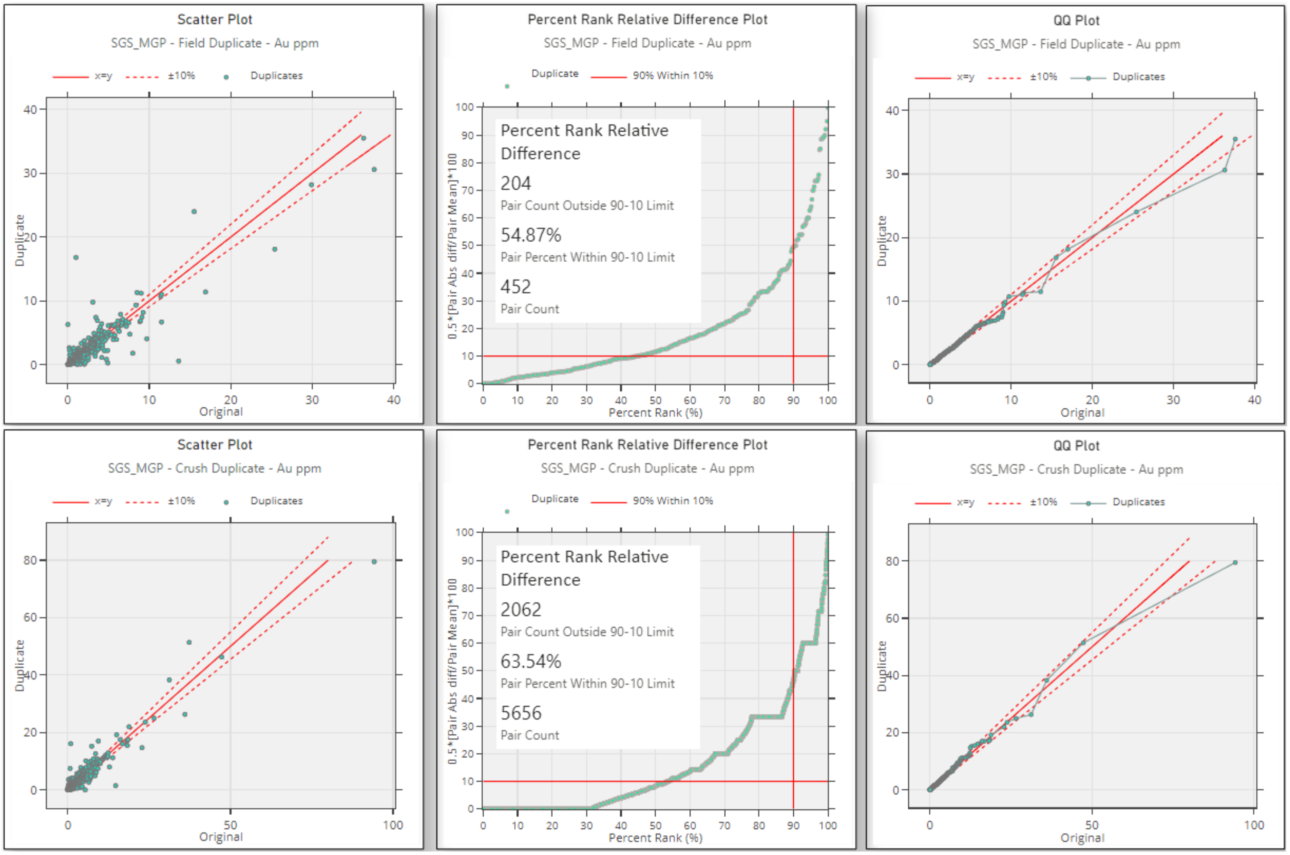


Figure 12-3: Field duplicate and coarse crush duplicate pairs from SGS Macraes

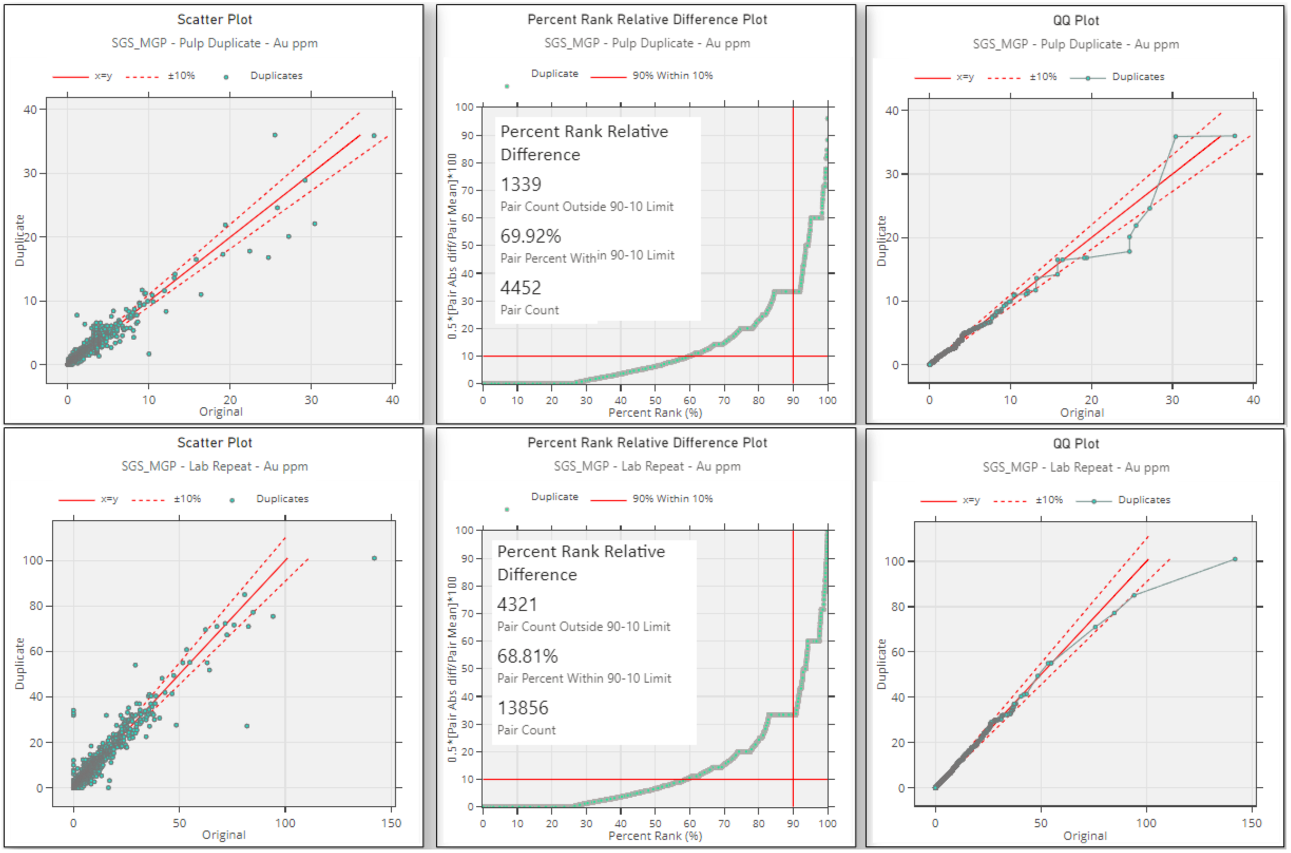


Figure 12-4: Pulp duplicate and laboratory repeat pairs from SGS Macraes.

12.5 Summary

Due to the long exploration and mining history of the project, the quality control database is incomplete for the Macraes Project making complete and thorough investigation impossible. The risk associated with the incomplete quality control data set is offset by the available mining and reconciliation data which supports the quality of the data.

Notwithstanding the limitations in the data set, the available recovery and QAQC data indicates the assay data meets acceptable limits of accuracy and precision and is therefore suitable for the purposes of grade estimation. OceanaGold has taken steps to mitigate the risks associated with the RC drilling sampling under wet conditions. Whilst ultimately only removal of this data can remove the risk, the relatively low proportions of remaining wet RC samples and previous successful mining history provide the basis for OceanaGold considering the residual risk to the resource estimates to be low.

The introduction and use of a portable handheld XRF analyser for tungsten analysis in 2013 is well implemented and the assay is suitable for the purposes of grade estimation.

In addition to the assay data, the survey data (both collar and down-the-hole survey), is robust and present little risk.

It is the opinion of the QPs (Jonathan Moore and Matthew Grant) that the drill hole data used in the production of the resource estimates reported in this report meet acceptable limits of accuracy and precision and that all reasonable steps and process have been undertaken to validate the drill hole data.

13 Mineral Processing and Metallurgical Testing

13.1 Introduction

The Macraes processing facility is projected to treat 6.4 Mtpa of gold bearing sulphide ore sourced from the Macraes Open Pit and Underground projects. The Macraes sulphide ore is partially refractory containing preg-robbing carbonaceous material. The metallurgical processes of treating the gold bearing sulphide ore is crushing, milling, flotation, pressure oxidation, Carbon in Leach (CIL), elution and electrowinning unit operations to extract maximum value. Approximately 1.1 Mt of oxide ore stockpiled will be processed proportionally at a rate of up to 15% of feed ore composition.

Up to 88% of the gold present can be recovered to a flotation concentrate at a primary grind P_{80} of 120-140 µm targeting a sulphur content above 8.5% for pressure oxidation feed. The reserves in the updated Life of Mine plan (LoM) are from cutbacks or underground extensions of pits previously mined with operating experience treating the ore types in the plant.

13.2 Throughput

Throughput predicted for each month is based on mill utilisation and historical throughputs. The main SAG mill processes approximately 70% of the total feed at a maximum throughput rate of 550 tph with processing soft to medium ore hardness material. ML-500 throughput is limited to 230 tph due to infrastructure design. The target grind size in the plant remains in the 120-140 µm P_{80} range.

13.3 Mass Pull

Approximately 2.5% of total feed tonnes is recovered to the concentrate stream, the tailings tonnage is 97.5% of feed tonnes. The split proportion of contained gold is used to determine flotation recovery.

The mass pull to the concentrate stream is calculated from a model based on feed sulphur grade, which is generated from daily process data of the active pit and underground ore sources.

13.4 Flotation Tails Gold Grade

The tails gold grade is calculated from a model based on recent plant performance of the active open pit and underground ore sources.

13.5 CIL Recoveries

The average Macraes CIL recovery, 95.5%, is based on CIL performance and historical tail grades and the achievable oxidation in the autoclave. For low Total Organic Carbon (TOC) concentrate, oxidation extent is not significant but on higher TOC levels slightly lower oxidation extent targeting 96-97% minimised the impact of preg robbing. Figure 13-1 demonstrates the actual plant CIL recovery achieved over the last five years of plant operation against budget with under-performance in Q2 2020 from the covid induced operating restrictions and in Q2 2022 when treating the Deep Dell North pit at elevated blends above 50% of mill feed. With the more aggressive organic carbon in the Deep Dell North pit ore blend control was utilised with traditional operating strategies to minimise the effect for the remainder of the year.

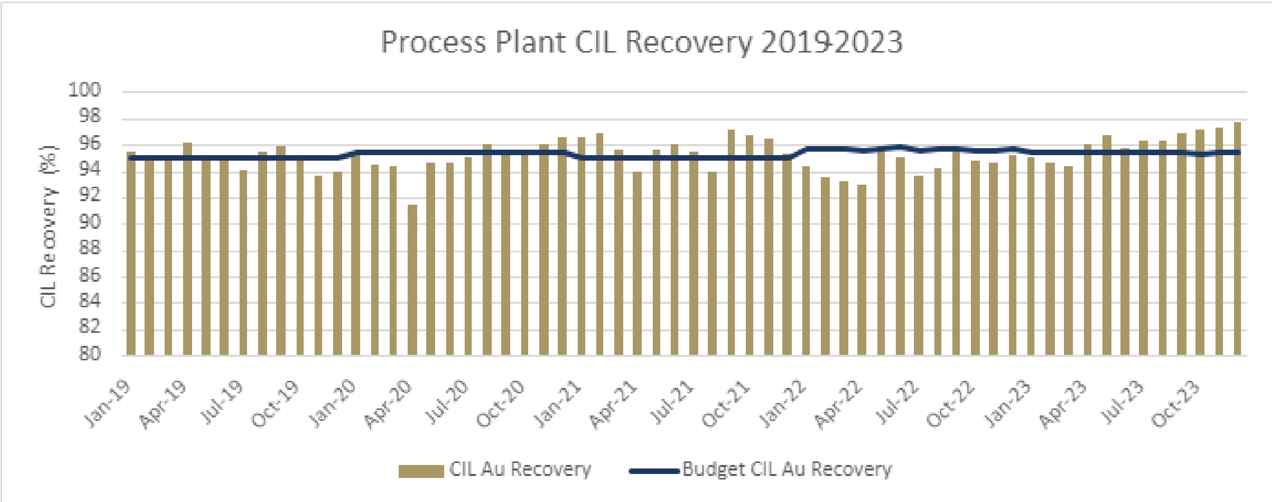


Figure 13-1: Plant CIL recovery comparison between budget and actual CIL recovery from 2019-2023

13.6 Flotation Recovery

Flotation recovery is calculated using the feed grade-recovery curve relationships based on recent plant performance and from plant operating data from treating adjacent pit stages. Figure 13-2 demonstrates the actual plant flotation recovery of gold over the last eight years compared to the budget forecast. Decreasing head grade over the last six years has not had a substantial impact on flotation recovery.

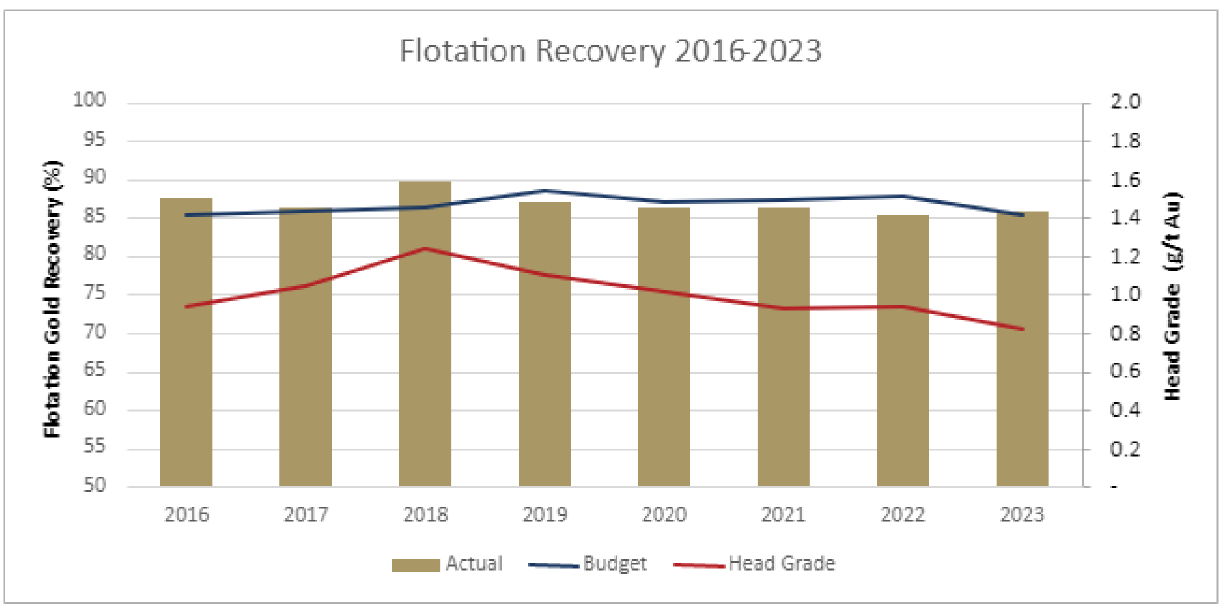


Figure 13-2: Plant flotation recovery comparison between budget and actual flotation recovery

13.7 Overall Recovery

The flotation and CIL recoveries for the open pit and underground ore sources at Macraes are combined. Yearly forecast recoveries for Macraes open pit and underground mines are presented in Table 13-1.

Table 13-1: Forecast recoveries used for production planning

Year	Flotation Recovery (%)	CIL Recovery (%)	Overall Recovery
2024	81.7	95.5	78.0
2025	86.0	95.8	82.4
2026	84.0	95.8	80.5
2027	76.9	95.4	73.4

13.8 Future Ore Testing

The purpose of metallurgical testing of the future ore samples is to determine metallurgical performance of new future planned ore sources such as mill throughputs, flotation recovery and CIL recovery, and to benchmark performance in the laboratory to other ore sources that have been processed through the plant. It also provides valuable information to understand any variations in ore hardness and address any potential process risk that may affect current process plant performance.

The future ore test programme is only performed on diamond core samples of existing and new ore sources. The future test programme involves a series of tests:

- Grind Determination Test. This test is derived from the time taken in the laboratory rod mill to achieve a P80 of 106 μm for the flotation testwork from core samples stage crushed to -3.35 mm. This test work provides data on relative hardness in relationship to SAG and ball mill throughput;
- Kinetic flotation testing. This is a float test that produces four concentrates and one tail stream for assay. Concentrates are floated off over a one-, four-, eight- and 13-minute time period using the standard OceanaGold laboratory float procedure and reagent doses. This float test indicates the expected rougher-scavenger flotation performance;
- Release analysis flotation testing. This is a two-staged cleaner float test that produces a primary, cleaner and re-cleaner concentrate as well as a primary, cleaner and re-cleaner tail. Three concentrates are floated off over 26 minutes for the primary float. The times are three-, eight- and 15-minutes time period. For the cleaner and re-cleaner, three concentrates are floated off over three-, eight- and 10-minutes time period. This test produces a grade recovery curve to determine the 'optimum' grade and recovery of the Macraes flotation plant. The test products are analysed for Au, S, As, Fe and TOC; and
- Standard bottle roll Preg-Robbing Factor (PRF) leach testing. This test assesses the preg-robbing characteristics and leach recovery of the ore prior to the pressure oxidation process. This is a leach of a concentrate produced using a bulk float test. The concentrate is then bead milled to a P90 of 18 μm for a standard PRF leach to be conducted. While the test cannot determine a CIL recovery, it highlights the impact of high PRF areas within the orebody for budget planning and forecasting.

13.9 Golden Point Underground Testing

During 2019/20 a series of ore composites were prepared from diamond drilling of the proposed Golden Point Underground (GPUG) resource for metallurgical testing. Between 1998 and 2003, ore from the Golden Point open pit resource was processed through the Macraes plant with flotation reported recoveries of 87-89% for gold. This period coincided with the installation of the Pressure Oxidation circuit leading to improved leach recoveries of 95%.

Four lithologically-based composites were prepared from geological interpretation of the predominant domains expected for the mining method planned. The overall estimate of mined mill feed by lithology type was estimated as:

- Lode Schist 43%;
- Quartz Cataclasite/Silicified Breccia/Quartz Vein 18%; and
- Other Lithologies 39%.

These were subjected to grind determinations, kinetic flotation testing and the two stage release analysis tests described above to provide estimates of flotation recovery at a target 8% sulphur concentrate grade. The key conclusions of the testwork on these samples were:

- Grind determination showed the sampled material to be highly competent, although consistent with FRUG ore grindability, so should not cause a restriction when being treated through ML-500;
- The sampled material responded reasonably well to flotation, although kinetics were variable. Despite the observed variability between samples, it was possible to upgrade the concentrate to 8% sulphur while achieving relatively high recovery rates;
- TOC concentrations indicate that PRF will be low which may result in higher CIL recovery. Nonetheless, leach testing is required to better understand the aggressiveness of the TOC; and
- The ROM recovery rate of 83.7% can be used as an approximation of expected performance, although given the limited data set, a significantly larger second stage programme is required to better define the ore source and improve confidence in recovery rates.

Table 13-2 summarises the results of the testing programme. Estimated flotation recovery is used when targeting an 8% sulphur concentrate grade required for autoclave feed, and an estimated ROM recovery at a 95% CIL recovery was used based on the low TOC assays. The weighted recovery from this programme is based on a geological assessment of the proportion of each lithology.

Table 13-2 Result of GPUG round 1 composites

Composite	Grind Time to 106um	Flotation Recovery @ 8% Sulphur	CIL Recovery %	ROM Recovery %	Resource Weighting %
GPM004	6’46”	89.2	95	84.7	43
GPM005	5’06”	83.3	95	79.1	19.5
GPM006	8’28”	91.9	95	87.3	18
GPM008	6’32”	87.0	95	82.7	19.5
Weighted Average	6’43”			83.7	

A subsequent variability programme was undertaken with a further eight composites prepared from drill core representing stope intercept lengths commensurate with the expected extracted grades based upon assumed mining selectivity. Intercepts were selected across the GPUG deposit for this round of testing capturing a larger portion of the contained gold in the mine design and representing expected mill feed grades from stope extraction. The results of the second round of variability testing is outlined in Table 13-3

Table 13-3 Results of GPUG round 2 variability composites

Composite	Grind Time to 106um	Flotation Recovery @ 8% Conc Grade	CIL Recovery %	ROM Recovery %
GPM011	7'11"	91.1	95.0	86.5
GPM014	7'42"	91.0	95.0	86.5
GPM022	6'36"	89.7	95.0	85.3
GPM038	6'04"	90.2	95.0	85.7
GPM043	6'58"	89.8	95.0	85.3
GPM046	6'27"	87.4	95.0	83.0
GPM048	4'58"	85.6	95.0	81.3
GPM050	7'00"	91.3	95.0	86.8
Average	**6'37"**	**89.5**	**95.0**	**85.0**

From this round of variability testing, the results continue to show similar grind times to the initial programme and are in line with those for FRUG samples tested previously. Current practice of feeding FRUG ore to the ML-500 SAG mill up to 50% of its feed is expected to be applicable to GPUG ore without any significant issues.

Flotation recovery from the release analysis test indicates an average of 89.5% over the 8 composites. Some variability was seen in flotation recovery as interpreted at the target 8% sulphur concentrate grade, in practice GPUG would provide a maximum of 15% of the overall flotation feed, with the remainder being sourced from other open pit sources. At these blend ratios there appears no issue with being able to generate a target concentrate grade at high flotation recovery on the proposed resource. Overall low TOC levels indicate that a low to moderate level of organic pre-robbing material is expected. Given the inclusion of the autoclave, current practice typically achieves a 95% leach recovery.

The overall recovery of 85.0% remains in line with both historical plant performance on previously mined Golden Point open pit material as well as results of the initial programme of testwork. The improved result from the second round of testing was not available at the time assumptions were finalised for cut-off grade determination. This value exceeds the 83.7% that has been assumed for the cut-off grade calculations, economic analysis and reserve calculations, and shows a robust assumption was used relative to laboratory testwork.

13.10 Innes Mills

During 2021/2022 metallurgical testing on available diamond drill core samples was conducted to support additional cutbacks of the Innes Mill open pit for stages 6 through to 8. Historically the Innes Mills pit was mined and processed through the process plant from 1998-2003 and responded well to the current flowsheet.

Laboratory grind times were in the 4.5 to 5 minute range and regarded as soft to average for Macraes ore types.

The recovery performance of the 2022 programme is summarized below in Table 13-4 below with head grades spanning the range from 0.51 to 3.43 g/t gold and with overall gold recoveries ranging from 68.4% to 84.5%. Two of the composites in the programmes did not make the target 8% concentrate grade and flagged that treating a 100% feed of Innes Mills material to the mill would be problematic. As the mill feed is generally a blend of open pit and underground ore this was not considered a significant risk operationally.

Head grades tested focused on primarily >0.5 g/t gold typical of the previous future ore test programmes with lower flotation and overall recovery associated with the lower head grades. The TOC levels in the concentrate varied depending on location from <1.3% considered low risk for preg robbing to in excess of 2.5% and expected to have a higher preg robbing impact. For recovery predictions the lower post autoclave CIL assumption of 94.5% was used based on plant operating performance.

Table 13-4 Innes Mills composite summary

Composite ID	Domain	Grade Bin	Head Grade		Flotation Recovery	Conc TOC %	CIL Recovery %	ROM Recovery %
			Au (g/t)	S (%)	@ 8% S (%Au)			
MET_IM2022_001	Stockwork	Low Grade	0.57	0.27	80.2	0.60	95	74.9
MET_IM2022_002	Stockwork	Low Grade	0.65	0.11				
MET_IM2022_003	Stockwork/Lode	Low Grade	0.83	0.21	74.9	1.10	94.5	68.4
MET_IM2022_004	Mainly Stockwork	Low Grade	0.59	0.19	77	1.60	94.5	71.6
MET_IM2022_005	Stockwork	Super Low Grade	0.51	0.21	82.2	2.10	64	73.2
MET_IM2022_006	Stockwork/Lode	Medium Grade	0.81	1.36	85	0.96	95	80.3
MET_IM2022_007	Stockwork/Lode	High Grade	1.21	0.50	85.2	0.85	95	80.6
MET_IM2022_008	Stockwork	High Grade	1.02	0.18	86.4	1.40	94.5	80.3
MET_IM2022_009	Stockwork/Lode	High Grade	1.63	0.26	79.3	1.10	94.5	84.5
MET_IM2022_010	Mixed lodes, QVS, Stockwork	High Grade	1.53	0.25	80.6	1.10	94.5	74.5
MET_IM2022_011	Stockwork	Medium Grade	1.35	0.46	86.8	1.52	94.5	82.0
MET_IM2022_012	Stockwork/Lode	Low Grade	0.57	0.22	76.8	2.45	94.5	72.6
MET_IM2022_013	Lode	High Grade	1.37	0.32	76.7	3.57	94.5	72.5
MET_IM2022_014	Dom 20 Lode	High Grade	3.43	0.39	85.9	2.67	94.5	81.2
MET_IM2022_015	Stockwork/Dom 20	Medium Grade	1.45	0.20	64		94.5	60.5
MET_IM2022_016	Dom 20 Lode	High Grade	1.65	0.53	87.9	1.11	95	83.5
MET_IM2022_017	Dom 30 Lode	High Grade	1.30	0.24	83.5	1.94	94.5	78.9
MET_IM2022_018	Dome 30 Lode	Medium Grade	0.96	0.26	86.7	1.95	94.5	81.9
MET_IM2022_019	Stockwork	Low Grade	0.69	0.30	79.7	1.83	94.5	75.3
MET_IM2022_020	Stockwork	Super Low Grade	0.61	0.33	87.9	1.495	94.5	83.1

13.11 Super Low Grade testwork

With the increased gold price over the last 6 years and plant operating experience that there was a minimum flotation tailings grade achieved in the plant as head grade dropped additional testwork was instigated to look at what would be expected in terms of overall recovery for 0.3-0.5 g/t gold head grades. Diamond core intercepts were located for the lower head grade targets for both the Innes Mills pit cutbacks and for the Gay Tan pit (stockwork zone mineralisation previously categorised as Frasers West pit).

5 composites were tested for the Gay Tan material and results are presented in Table 13-5 with flotation recoveries averaging 73% and overall recovery of 69%. The TOC levels for Gay Tan were elevated at over

2% organic carbon and triggers the use of the lower 94.5% CIL recovery assumption. The lowest grade 0.37 g/t Au sample still achieved a 61% overall recovery.

Table 13-5 Gay Tan super low grade testwork results

Composite ID	Head Grade		Flotation Recovery	Conc TOC %	CIL Recovery %	ROM Recovery %
	Au (g/t)	S (%)	@ 8% S (%Au)			
MET_GT2020_001	0.51	0.21	64.90	2.51	94.5	61.3
MET_GT2020_002	0.50	0.18	83.80	2.65	94.5	79.2
MET_GT2020_003	0.50	0.21	76.40	2.88	94.5	72.2
MET_GT2020_004	0.66	0.21	71.90	2.13	94.5	67.9
MET_GT2020_005	0.37	0.13	68.75	2.96	94.5	65.0
Average	**0.51**	**0.19**	**73.15**	**2.62**	**94.50**	**69.13**

A total of seven composites were identified for the Innes Mills cutback targeting the low grade and super low grade categories with grades below 0.5 g/t achieved for two of these. Flotation recovery averaged 75.6% for gold at the target 8% sulphur grade and with TOC level generally moderate to high given the lower sulphur head grade around 0.2% sulphur. The overall recovery estimates averaged 71.4% ranging from 65.5% for the lowest head grade composite. The results are summarized in Table 13-6.

Table 13-6 Innes Mills super low grade testwork results

Composite ID	Grade Bin	Head Grade		Flotation Recovery	Conc TOC %	CIL Recovery %	ROM Recovery %
		Au (g/t)	S (%)	@ 8% S (%Au)			
MET_IM2021_001	Super Low Grade	0.46	0.23	69.4	2.68	94.5	65.6
MET_IM2021_002	Super Low Grade	0.53	0.18	75.9	3.03	94.5	71.7
MET_IM2021_003	Low Grade	0.64	0.28	75.3	1.73	94.5	71.2
MET_IM2021_004	Super Low Grade	0.43	0.18	76.9	2.51	94.5	72.7
MET_IM2021_005	Low Grade	0.64	0.2	69.9	2.09	94.5	66.1
MET_IM2021_006	Super Low Grade	0.72	0.2	77.2	2.95	94.5	73.0
MET_IM2021_007	Low Grade	0.77	0.31	84.6	1.59	94.5	79.9
Average		**0.60**	**0.22**	**75.6**	**2.37**	**94.5**	**71.4**

From the testwork programmes undertaken and plant operation on lower feed grade blends lower grade ore from 0.35-0,5 g/t gold is predicted to generate a recovery in excess of 68% and is economically viable to process when available as mill feed.

13.12 Issues

Allocation of gold between Macraes open pit and underground mines can be challenging as the ore is mixed within the crushing process. Higher underground gold grades could reasonably be expected to return higher recoveries and produce concentrates with higher gold grades. However, in practice, measuring actual flotation recovery and concentrate grades produced individually by Macraes open pit and underground ores is not possible. These differences, although not affecting total gold recovered, do impact on the financial performance of both mines. Investigations to accurately measure and attribute gold recovered between Macraes open pit and FRUG ore streams in 2010 concluded that the split was not achievable due to insufficient supply of underground ore required to consistently process in the smaller SAG mill and maintain steady flotation circuit performance.

14 Mineral Resource Estimate

14.1 Introduction

All mineral resource estimates are carried out by OceanaGold personnel at Macraes under the supervision of Jonathan Moore, Group Manager - Resource Development or Matthew Grant, Senior Geologist - Resource Development. All estimates are peer reviewed by OceanaGold's Group Manager - Resource Development, Principal Geologist - Resources or site geologists.

This section summarises the methodology used by OceanaGold to prepare and classify the mineral resource estimates. The open pit and underground resource estimates are described separately.

14.2 Qualified Persons Responsible for Resource Estimates

Mr. Jonathan Moore, Group Manager - Resource Development is the Qualified Person responsible for the Macraes Project open pit Resource Estimates. Matthew Grant, Senior Geologist - Resource Development is the Qualified Person responsible for the Macraes Project underground Resource Estimates.

14.3 Open Pit Mineral Resource Estimate

14.3.1 Drillhole Database

Drill holes are extracted from the surface drilling acQuire database for each of the areas of resource estimates as defined by the X, Y, Z coordinates.

Generally only holes with DDH, DDW, RCD and RCH prefixes are used for resource estimates. Occasionally select RCL prefixed holes are used. These prefixes are diamond core (DDH), diamond daughter (DDW), Reverse Circulation (RC), reverse circulation pre-collars with diamond tails (RCD), and Grade Control RC holes (RCL) drill holes respectively. Some holes with these prefixes may be excluded, usually where wet sampling may have led to downhole contamination or sampling bias. This will be discussed in the individual resource estimate sections below.

14.3.2 Software Used

Hexagon 'HxGN MinePlan 3D' (MinePlan) software is used for creating the wireframes for database extraction, geologic modelling, coding and final resource reporting. The use of Leapfrog Geo software is also used in more recent updates to assist in creating geological models and their wireframe solids.

GS3M software is used for geostatistical analysis and large panel recoverable resource estimation for open pit estimates. The block models created are then imported into MinePlan for final reporting.

14.3.3 Geologic Model Methodology

Wireframes are created in MinePlan of the domains to be used in resource estimation. A combination of grade (0.4 g/t gold) and lithology is used to define the top and bottom contacts of the ore domains.

Most of the economic mineralisation is confined to the Intrashear schist. The top of the Hangingwall shear usually marks the top of the Intrashear schist and the bottom marked by the Footwall fault. Within the Intrashear schist there may be domains for the Hangingwall shear, one or more concordant lodes, and zones of quartz vein arrays with subsidiary shears. Domains will vary from area to area and are discussed for the individual areas below.

14.3.4 Assay Capping and Compositing

Outliers

For resources estimated by Multiple Indicator Kriging (MIK) top caps may be applied to mitigate outliers. Top caps applied are specified for each resource estimate below. Typically, the top-class mean is replaced with a value between the mean and median of the top MIK class.

For resources estimated by Ordinary Kriging (OK) top caps are always applied, typically at around the 95 or 97.5 percentile. Top caps applied are specified for each resource estimate below.

Compositing

The raw assay data is composited to one metre lengths for resource estimation. The one exception is the Frasers (Gay Tan) resource estimate which used 2 m composites. No wireframe constraints are used for this estimate.

14.3.5 Density

The density assumptions for all estimates are shown in Table 14-1. These are based upon core immersion test results and are assigned to blocks based on geological coding. The only exception to this is the Gay Tan density which was calculated using a surveyed mining volume and the weight of the material moved as recorded by the trucks.

Table 14-1: Density assumptions

Material Type	Density (t/m3)
Fresh rock	2.65
Weathered rock	2.50
Loose rock fill	2.18
Gay Tan*	2.35
Tailings	1.77

Gay Tan covers an area of the failed Frasers west wall.

14.3.6 Variogram Analysis and Modelling

Variogram modelling is carried out in GS3M for each of the domains specified in the resource estimate. 14 indicator variograms (typically each variogram is modelled in five to 10 directions) and one gold variogram is required for each domain using MIK. So, between 75 and 150 directional variograms are modelled for each domain.

Ordinary kriging only requires a single gold variogram for each domain.

Once completed the resource estimates are exported out of GS3M in ascii format and imported into MinePlan.

14.3.7 Block Model

Block model dimensions will vary for area to area but the standard block size for open pit resources is:

X = 25 m, Y = 25 m, Z = 2.5 m.

14.3.8 Estimation Methodology

Search distances and directions are derived from a combination of geology, drill spacing, variography and previous modelling. Typical drill spacings are 25 m, 37.5 m, and 50 m so the primary search distance is generally set around these lengths.

Since 2001, large panel recoverable resource estimation using Multiple Indicator Kriging (MIK) has been the preferred estimation for open pit resources where there is sufficient data. Ordinary Kriged (OK) E-Type estimates are used where data is sparse. Ordinary Kriged (OK) E-Type estimates are also the current method for underground resource estimates given that large panel recoverable estimates selectivity assumptions are not appropriate for UG estimates.

Ordinary Kriging (OK)

Ordinary kriging is a form of linear estimation. In simple terms, linear estimation assumes the influence of a sample on the grade of a block is some function of its distance from that block. Inverse distance weighting (IDW) is another example of linear estimation. (Schofield, 2016).

Large Panel Recoverable Resource Estimation using MIK

Large panel recoverable resource estimation is implemented at Macraes using multiple indicator kriging (MIK), a non-linear approach suited well to skewed gold distributions. Grades are estimated into large blocks, with dimensions typically reflecting the nominal drill hole spacing. Rather than providing more traditional whole block grade estimates, the estimates are expressed as a series of nested proportions and grades estimated for a range of cut-off grades; in essence, a cumulative histogram for each block. The approach provides significantly more accurate estimates for the less continuous styles of mineralisation at Macraes, namely quartz vein arrays and erratic subsidiary shear-hosted mineralisation.

Large panel recoverable resource estimation has been used successfully at Macraes since 2001

14.3.9 Model Validation

Several methods are used to check to resource estimates.

Visual Comparison

The block model is viewed in MinePlan against the drilling and domains to see that the block grades reasonably represent the input data.

Comparative Statistics

Methods include:

- Check mean composite grade versus average estimate grade for each domain. Results should be reasonably close; and
- swath plots of mean composite grade against model grade.

Against Previous Models

The new estimate is compared against previous estimate to see what the variation is. Variations that cannot be explained are investigated.

Reconciliations

Where a deposit has been partially mined the estimate is reconciled against the actual mined tonnage, grade and contained metal. See section 14.6.

14.3.10 Resource Classification

The resource classifications for MIK resource estimates are determined in GS3M during the estimation process using a combination of the search criteria, the expansion factor, and cut-off grade reporting threshold. These are tabulated in Table 14-2. The parameters used for resource classification for the OK resource estimates are shown in Table 14-3.

Table 14-2: MIK resource classification parameters

Resource Area	Domain	Search	Exp an	Min Data	Min Octants	Max Data	Classification Grade	Measured Threshold	Indicated Threshold
Coronation North	Dom1-5	27x27x6	0.5	16	4	48	0.4 g/t	80%	30%
Coronation	Dom1	30x30x4	0.75	16	6	48	0.4 g/t	80%	30%
	Dom2	30x30x4	0.75	16	4	48		80%	30%
	Dom3	30x30x4	0.75	16	4	48		80%	30%
Deepdell	Dom10,11,12,31,32,33	27x27x8	0.5	8	4	48	0.3 g/t	80%	30%
	Dom50	37x37x5	0.5	12	4	48		80%	30%
Innes Mills	Dom5,6	23x23x5	0.6	16	4	48	0.4 g/t	80%	30%
	Dom10,12	27x27x6	0.6	16	4	48		80%	30%
	Dom50	23x23x5	0.6	16	4	48		80%	30%
Frasers-Gay Tan	Dom1	28x28x6	0.6	16	4	48	0.3 g/t	80%	30%
Golden Bar	Dom1,29,47,48	25x25x4	0.6	16	4	48	0.5 g/t	80%	30%

Table 14-3: OK resource classification parameters

Resource Area	Domain	Resource Classification	Search	Min Data	Min Octants	Max Data
Nunns	Dom1	Ind	50x50x5	16	6	64
NZGT	Dom1	Inf	50x50x5	12	4	32
	Dom2	Inf	80x80x5	12	4	32
Taylors	Dom1-3	Ind	50x50x5	12	6	32
	Dom1-3	Inf	50x50x5	4	4	32

All open pit resources are quoted at a 0.3 g/t or 0.4 g/t gold cut-off unless otherwise stated.

14.3.11 Resource Estimate Tonnes and Grade

Unless otherwise stated, all reported open pit resources are constrained within pit shells optimised via Whittle (at an assumed gold price of USD1,700 and NZ:US exchange rate of 0.70) and either surface topography or as-mined surface as at 31 December 2023.

An open pit cut-off grade of 0.3 g/t Au is based on the NZD2,394 gold price, mining costs and recovery assumptions. Not all the open pit estimates have been rebuilt to the 0.3 g/t Au cut-off grade, in these cases, a 0.4 g/t Au cut-off grade is used.

14.3.12 Nunns

Background

Small scale mining and prospecting in the Nunns and adjacent NZGT area occurred intermittently from 1868 to 1918, yielding around 650 oz. of gold and 29 tons of scheelite (Williamson, 1939).

Modern exploration commenced in 1985 by BP Oil followed by Kiwi International who between them drilled 49 shallow holes (1,981.9m). OceanaGold conducted drilling campaigns in 2002/2003 and again in 2016/2017. Metallurgical test work on diamond drill core was completed in 2017.

Geology & Mineralisation

Mineralisation at Nunns is mostly confined to a single, shallowly dipping lode of low angle grey-white quartz veins with associated silicified and brecciated schist containing arsenopyrite, pyrite, scheelite and gold.

Resource Estimation

- Last resource estimate completed in 2017;
- 0.2 g/t Au cut-off grade used to define the lode horizon for kriging;
- Drill spacing 37.5 m or 50 m;
- OK estimation was used with search distances of X, Y = 50 and 80 metres, Z = 5 m;
- Only RCH and DDH prefixed drill holes used in the estimation; and
- A gold top cut of 8 g/t was applied affecting 5 assays (0.7% of the data).

14.3.13 Coronation North

Background

In 2014 two sterilisation drill holes returned weak gold intercepts. The results were sufficiently encouraging for additional 250 m spaced holes to be drilled which led to the discovery intercept in the twelfth hole drilled in the area: RCH5759: 15 m @ 0.95 g/t from 114 m. A 100 m spaced drilling programme immediately followed, and as more gold intercepts were recorded and the drill spacing reduced to 50 m spacing, locally 25 m spacing as the core of the higher grade mineralisation was defined. Diamond drilling commenced in June 2015 to confirm the RC intercepts, provide samples for metallurgical test work and for geotechnical information.

The first resource estimate was released at the end of 2015. Drilling continued through 2016 and mine planning commenced. Following the granting of resource consent, pre-stripping commenced in April 2017 and first ore was excavated in June 2017. Infill drilling continued through 2017 and 2018 to reduce the drilling spacing to 37.5 m or 25 m spacing.

Mining was completed in March 2022. Coronation North has produced 12.4 Mt @ 1.02 g/t for 404 kozs of gold.

Geology & Mineralisation

Coronation North has some unique features that set it apart from the other deposits in the HMSZ.

- The projected surface expression of the HW shear and adjacent mineralisation lies under Cretaceous sediments and Tertiary volcanics and hence there were no geochemical indications of the deposit; and

- Higher grade mineralisation at Coronation North is located on a left-hand bend in the strike of the Hangingwall shear (HWS) that plunges to the ENE (Figure 14-1). The dip of this bend decreases as the strike curves towards the west. Steeply dipping, en-echelon mineralised splays are developed beneath this bend in the HWS. Finely laminated mineralised quartz veins that strike perpendicular to the HWS are also present beneath the bend. The WSW-strike of the HWS, narrow (~100 m) width, and ENE-plunge of the mineralised zone distinguish Coronation North from other deposits in the HMSZ. The core of the mineralised Intrashear schist is highly fractured pelite riddled with clayey fractures and thin quartz veins.

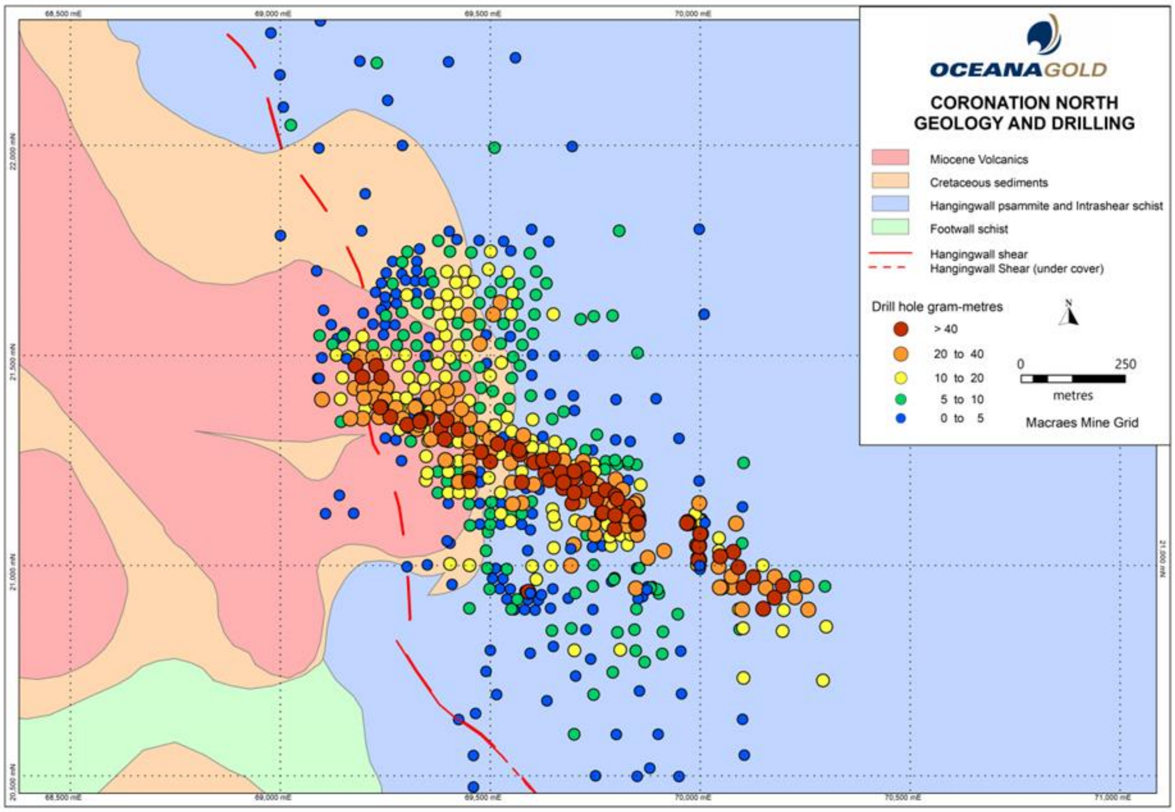


Figure 14-1: Coronation North surface geology and drill intercepts

Resource Estimates

- Last updated in February 2020;
- Only holes prefixed RCH, RCD, DDH or DDW used in resource estimate;
- Drill spacings mainly 25 m or 37.5 m;
- Simple 4 domain model used with the Intrashear Schist containing the mineralisation divided into north, south and high-grade domains; and
- MIK used for the estimation.

Mining & Reconciliation

Mining of ore commenced in June 2017 and reconciliations against resource estimates have been carried out on a monthly basis until March 2022 when current mining stopped.

To date 12.4 Mt @ 1.02 g/t for 404 kozs of gold have been mined.

Mining commenced at a 0.4 g/t au cut-off, however, in January 2020 the cut-off was lowered to 0.3 g/t Au.

Since mining commenced the Coronation North resource estimate has consistently underestimated the contained gold. This is a function of insufficient drilling density to adequately define the complexity of the mineralisation and vertical drill hole orientation (Macraes standard hole orientation) when inclined at 60° @ 225° would be more appropriate. Wall movement and floor heave from October 2020 has made reconciliations problematic. The overall reconciliation is shown in Table 14-4. 6% more tonnes were mined than indicated by the resource estimate and at a 4% higher grade, resulting in 11% more contained ounces.

Table 14-4 Coronation North reconciliation 2017-2022

Coronation North Mined				Res Est : MII		
Year	Tonnes (Mt)	Grade (g/t Au)	Contained Gold (Moz)	Tonnes (Mt)	Grade (g/t)	Contained Gold (Moz)
Total	**12.31**	**1.01**	**0.40**	**11.59**	**0.97**	**0.36**
Mine/ Model	1.06	1.04	1.11			

14.3.14 Coronation

Background

The Coronation area was first worked in 1886 with a second period of activity in 1911/12. During the 1980s the landowner at Coronation dug a series of trenches and pits. In 1992 12 RC holes were drilled by Sigma Resources. Between 1998 and 2001 OceanaGold's predecessor company GRD Macraes drilled 31 holes and the first resource estimate was produced.

OceanaGold conducted further drilling campaigns in 2008, 2011, 2012 and 2014. Mining commenced in 2014. Infill drilling of stages five and a potential stage six was undertaken in 2015, 2016 and 2018. Mining of stage five commenced in 2019 and was completed in September 2020.

Geology & Mineralisation

The HMSZ at Coronation is a predominately pelitic package of schist up to 90 m thick. The package is constrained above by the Hanging wall Shear and below by the Footwall Fault as shown on Figure 14-2. The geology of the Coronation deposit is comparatively simple. It comprises the Hangingwall Shear which has a generally planar geometry and dips 15° to 20° to the east. A second, less extensive shear has been interpreted immediately below the Hangingwall Shear. A north-south subvertical fault has been interpreted to offset both mineralised shears. Quartz vein arrays and subsidiary shears styles of mineralisation are generally absent at Coronation.

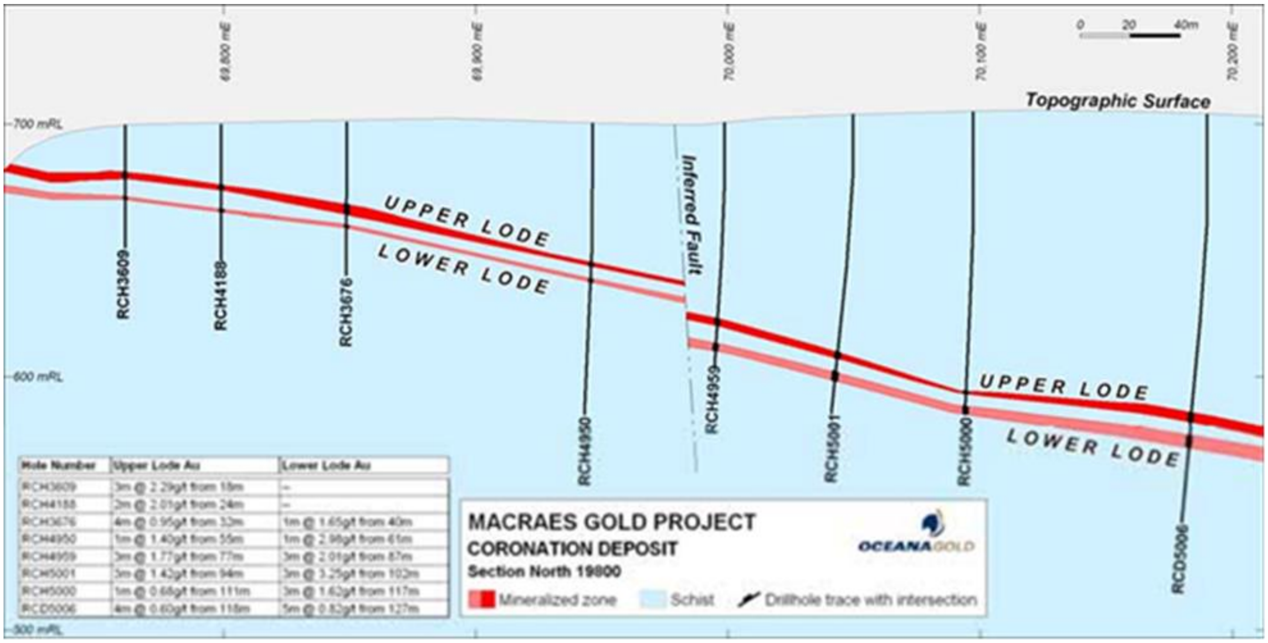


Figure 14-2: Coronation schematic cross-section

Resource Estimate

- Last updated in November 2020;
- Only hole prefixed RCH, RCD, DDH and DDW used in resource estimate;
- Drill spacings 37.5 m or 50 m;
- The two lodes were combined into a single domain for modelling cut by North-south fault; and
- MIK used for the estimation.

Mining and Reconciliation

Pre-stripping commenced at the end of September 2014 with the first ore mined in December 2014. Mining has progressed in stages with stage five finishing in 2020.

To the end of 2022 8.09 Mt at a grade of 1.00 g/t Au and containing 260 koz of gold have been mined. Coronation stage five finished in September 2020.

Mining commenced at a 0.4 g/t cut-off grade, however, in January 2020 the cut-off grade was lowered to 0.3 g/t Au.

During mining of stages 1-4 at Coronation the resource estimate consistently under-estimated the contained gold due to insufficient drilling density (initially on 50 m x 50 m) to representatively test a series of 10 m to 20 m wide high-grade shoots. The drilling spacing was infilled to 37.5 m x 37.5 m prior to commencement of mining Coronation Stage five.

Following the completion of mining in Coronation Stage five the resource estimate was recompiled to reflect the current 0.3 g/t Au cut-off and investigate strategies to improve the reconciliation. The current pit optimisation at NZD2,394 is drilling limited.

14.3.15 Deepdell

Background

Alluvial mining on Horse Flat to the north of Deepdell Creek was first recorded in 1892. Quartz mining started in 1901 and continued intermittently until 1924 as the lines of lode were followed south to Deepdell creek.

There have been several phases of drilling at Deepdell leading up to the start of mining in 2001. The first phase of modern exploration commenced in 1985 when Homestake drilled five percussion and seven diamond holes. This was followed by another six phases of drilling by OceanaGold's predecessor companies Macraes Mining and GRD Macraes.

Mining of the north pit commenced in 2001 and continued to 2003. Mining of the south pit concluded in October 2003. The north pit was subsequently backfilled with waste rock.

Drilling for down-dip extensions to the north pit began in 2013 and further infill drilling was conducted in 2017 and 2018 following which the resource estimate was updated.

A resource consent application was lodged in 2019 to re-open the Deepdell North pit. The resource consent was approved towards the end of 2020 and pre-stripping commenced in December 2020 with first ore produced in January 2021.

Mining of Deepdell North stages three, four, & five was completed in October 2023 and has yielded 5.70 Mt of ore @ 0.80 g/t gold for 146 kozs of gold at a 0.3 g/t cut-off.

Geology & Mineralisation

The HMSZ at Deepdell consists of a 50 m to 60 m thick pelite, constrained by the Hangingwall and Footwall shears. The geology of Deepdell North is comparatively simple. It comprises the Hangingwall shear, which has a planar geometry and dips 15° to 20° to the east. Beneath the Hangingwall shear, up to three subparallel shears have been identified. These shears are generally thin (less than three m thick), weakly mineralized, and do not have the continuity of the Hangingwall shear.

At Deepdell South the Hangingwall shear geometry is a little more complex. The Hangingwall shear has been rotated into a south to southeast orientation and is cut by a northeast-southwest striking fault. The western portion of the Hangingwall dips at 20° to 25° to the southeast while the eastern section dips at 35° to 40° to the southwest. The Hangingwall shear is well developed to approximately 70,400 m E where it is either offset by a north-south trending faults or is pinched out against a fault. At both Deepdell North and Deepdell South quartz vein arrays and subsidiary shear development beneath the Hangingwall is relatively poor.

A complex fault zone separates Deepdell South from Deepdell North. Four east-west trending faults, which terminate the northeast – southwest trending fault in Deepdell South, have been interpreted. From Deepdell South to Deepdell North the effect of these faults is to uplift the Hangingwall and progressively displace the Hangingwall outcrop position to the west.

Resource Estimate

The current resource lies under and down dip of the mined-out pits.

- Last updated in March 2022 – DD2203;
- Only holes prefixed RCH, RCD, RDDH and DDW used in resource estimate;
- Drill spacings 25 m or 37.5 m, out to 50 m or more on the outside;

- Four lode domains in Deepdell North, two lode domains in Deepdell South; and
- MIK used for the estimation.

Mining & Reconciliation

The original Deepdell pits produced 2.55 Mt @ 1.44 g/t Au for 0.117 Mozs at a 0.5 g/t Au cut-off grade.

Mining re-commenced in Deepdell North in January 2021 (Stages three, four, and five) and was completed in October 2023, producing 5.7 Mt @ 0.80 g/t for 0.15 Mozs at a 0.3 g/t cut-off for this period. Compared to the resource model DD2203, 12% more tonnes were mined but at 6% less grade for 7% more ounces.

14.3.16 Round Hill/Golden Point Open Pit

Background

Quartz reefs were mined in the area from the 1860s and with the discovery of the Golden Point Lodes in 1889 the area surrounding Round Hill became a significant producer of gold and scheelite at the time.

Round Hill was the focus of exploration and drilling in the 1980s and mining commenced in 1990. By 1998 mining was completed and the pit partly backfilled as the adjacent Golden Point and Southern Pit deposits were mined. Mining of these pits was completed in mid-2002. A small cut-back of Round Hill was mined in 2003 and the combined deposits produced 1.3 Moz.

The remaining open pit inventory was removed from resources and reserves in 2023. See section 16.3 for more details.

14.3.17 Innes Mills

Background

The earliest prospecting shaft and adit is thought to date back to around 1900 (Hamel, 1991) with report of an “80 ft” shaft and “150 ft” drive. From 1915 the landowner, Mr. A. Innes, worked the property in partnership with others. Mining via shafts, adits or small open cuts continued intermittently until 1944. No records of production have been located.

OceanaGold and its predecessor company Macraes Mining, mined the area as an open cut from 1996 to 2004 producing 8.11 Mt @ 1.58 g/t Au for 0.41 Moz. The open cuts were then backfilled. A small extension, Innes Mills West, was mined in 2016 and was backfilled to allow realignment of the Macraes-Dunback road to cross it.

From 2004 to 2014 only a limited amount of drilling was conducted at Innes Mills. In 2005, 2011 and 2012 small drilling campaigns tested for extensions down-dip of the mined-out pit. Drilling resumed at the end of 2014 and continued in 2015, defining the Innes Mills West resource, subsequently mined in 2016. Limited drilling was conducted in 2017, targeting quartz vein arrays / subsidiary shears in the west wall of the mined-out pits. Infill and step-out drilling re-commenced in 2021 and continued through 2022 covering the proposed stages six, seven and eight open pits. Mining of stage six commenced in 2022 and stages seven and eight in 2023. Innes Mills will be the main open pit ore source from 2024-2026.

Geology & Mineralisation

Innes Mills represents a set of stacked mineralised lodes north of the Macraes Fault Zone, which is a 150-200 m wide structure representing post-mineralisation faulting across which the Hangingwall shear has apparent vertical offset of ~150 m (up-to-the-north). The fault zone is a mess of fault gouge and broken schist, but the disrupted trace of the Hangingwall Shear and associated mineralisation can be roughly traced through it.

The Hangingwall Shear, or uppermost concordant lode, is offset (down-to-the-east) downdip. Previous workers have suggested a fault offset although this is not certain. Additional subparallel lodes beneath the Hangingwall Shear are more extensive in Innes Mills segment compared to Frasers to the south, and there is also evidence of extensive linking structures dipping at a higher angle between the concordant lodes.

Instead of using tightly constrained geological domains for modelling, broad mineralised domains were used to enclose multiple stacked lodes and stockwork mineralisation.

Gold Resource Estimate

The latest resource gold only estimate was completed in February 2023;

- Drill spacing 25 m in the core out to 50 m on the periphery;
- Surface Holes prefixed RCH, RCD, DDH and DDW used from surface, UDH diamond holes from underground also included in the southern margin;
- Wet Bias correction factors applied to gold;
- Four broad mineralisation domains used; and
- MIK used for the estimation.

Relevant Factors

Re-alignment of the Macraes-Dunback road across the northern end of the resource will be required in the future to allow the mining of the northern quarter of the resource.

Like Frasers and Round Hill, in the deeper sections of Innes Mills, some RC drill holes were sampled under wet conditions. To mitigate the potential for wet sample bias 18 diamond twin holes were completed and a set of gold grade factors generated for factoring wet RC sample grades. The 18 RC holes twinned by diamond holes were excluded from the resource estimate. Mining in stages three and four mined out some of the areas drilled with wet RC and based on an acceptable reconciliation was achieved. As a result, the residual resource estimation risk for Innes Mills is considered low.

14.3.18 Frasers – Gay Tan

Background

Mining in Frasers pit commenced at the end of 1998 and it provided a significant source of mill feed until 2014. As the pit deepened, failure along the Footwall Fault plane was observed and monitoring stations were installed. In January 2013 the block on the west wall within the pit failed, temporarily preventing access to FRUG. Mining resumed and increasing movement along the Footwall fault occurred. In April 2014 a major failure occurred along the entire west wall and resulted in material slumping and pushing up against the east wall of the Frasers pit. Mining was stopped and a Prohibition Notice placed by WorkSafe NZ.

At the end of June 2014, the Prohibition Notice was partially lifted allowing mining of Frasers-Innes Mills on the northern edge of the slip and a small pit on the southern boundary of the slip. However, access was precluded to the bulk of the slumped material, estimated to contain 400 kozs of gold. By 2018 the combination of successful mining and continual monitoring showed that slumped material was stable enough to allow mining to safely resume. An evaluation of the slumped material identified potential mineralised areas that could be mined safely but as the material had moved significantly, the entire area required re-drilling. A major RC drilling programme commenced in January 2019 and continued through to the end of September 2019. This enabled stage one of the newly named Gay Tan pit (within the larger Frasers pit) to be designed and mining commenced in July 2019. Further drilling in two stages has been completed in 2020 to complete the drill-out of Gay Tan stages two and three. Stages one, two and three have now been completed. Stage four is currently being mined and should be completed in the first half of 2024. The possibility of a stage five is being investigated.

Geology & Mineralisation

The Frasers open pit deposit is defined by the Hangingwall shear. In outcrop, the shear dips 15° to 20° to the east and is ~5 m thick. At depth, the dip of the shear flattens to around 5° to 10° and develops into a ~20 m to 30 m thick high-grade zone of quartz cataclasite and lode schist. This interpreted ramp-flat geometry is relatively common at Frasers (Figure 14-3).

Within the Frasers pit, gold mineralisation comprises a combination of Hangingwall shear, shear-parallel quartz veins, and quartz vein arrays and subsidiary shears. Hangingwall shear and quartz vein arrays comprise the majority of mineralisation within the Frasers pit, although there are several shear-parallel quartz veins. These veins typically splay off the Hangingwall and dip at between 5° and 10° to the east. A large amount of erratically developed mineralisation occurs between the base of the Hangingwall and the Footwall Fault. This is quartz vein array and subsidiary shear mineralisation and generally presents as clusters of elevated gold grades that appear discontinuous at the resource drilling scale. The Footwall Fault lies between 80 m and 120 m below the Hangingwall Shear and is easily identified in drill holes as a 10 m wide zone of shearing. To date, no economic mineralisation has been located below the Footwall Fault.

Gold-scheelite-pyrite-arsenopyrite mineralisation is associated with replacement and fissure quartz veins within post-metamorphic shear zones (Lee et al. 1989). Within the Frasers pit scheelite mineralisation is predominantly found in proximity to the Hangingwall shear. It is associated with gold mineralisation, associated quartz veining, and displays complex crosscutting relationships.

At Gay Tan the mineralisation is pre-dominantly quartz vein array and subsidiary shear style but with remnants of HW lode towards the bottom of the Frasers pit.

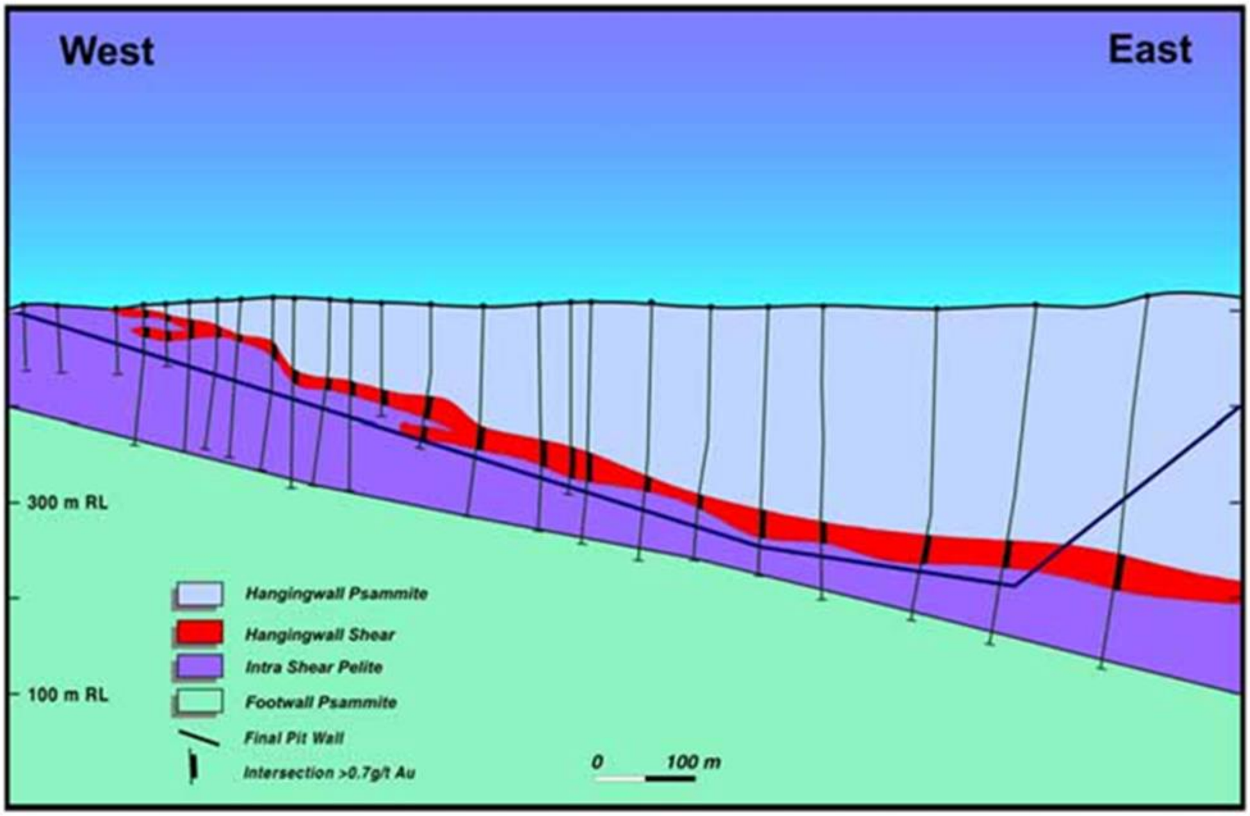


Figure 14-3 Fraser pit schematic cross-section

Resource Estimate

- Completed in November 2020 following completion of drilling;
- Drill spacing 25 m or 37.5 m;
- DDH, RCD, RCH and RCL prefixed holes used in the estimate. The 2019-2020 drill holes are angled at various dips and orientations due to access difficulties on the slip face;
- Two metre composites used;
- One domain; and
- MIK used for the estimation.

The Annual reconciliation for mining up to 31 December 2023 against the current resource estimates is shown in section 14.6.

Relevant Factors

Continuous monitoring of movement at Gay Tan is in place. Further geotechnical evaluation is required before mine designs will be finalised.

14.3.19 Ounce

Background

The first recorded mining activity at Ounce dates to 1898 but alluvial mining in the creek bed may have occurred as early as 1862. Mining by various parties continued intermittently until 1952.

The area was first drilled by BP Minerals (NZ) Ltd in 1985. Macraes Mining Company followed in 1994 and 1997. The last campaign was by OceanaGold in 2010/2011. Only three diamond holes have been drilled (1985 and 1994). No metallurgical test work has been completed.

Geology & Mineralisation

The Ounce deposit lies along HMSZ, to the south of Frasers. The Ounce structure is a low angle thrust zone with an unusual orientation for the HMSZ, dipping 28° towards the southeast and cross-cutting dominantly psammitic schists. The main package is bound by a weakly mineralised cataclastic upper concordant shear with another mineralised horizon located approximately 30 m structurally above this zone. Mineralisation is hosted by concordant, sigmoidal and rare quartz vein arrays. Sigmoidal veins merge with, and are truncated by, concordant structures providing evidence of repeated cycles of vein formation/activation.

Resource Estimation

The last resource estimate was completed in 2017. A schematic cross-section showing the domains used is in Figure 14-4. Domain 20 is the lode domain and is defined by a 0.2 g/t cut-off. Scattered mineralisation does occur outside this zone.

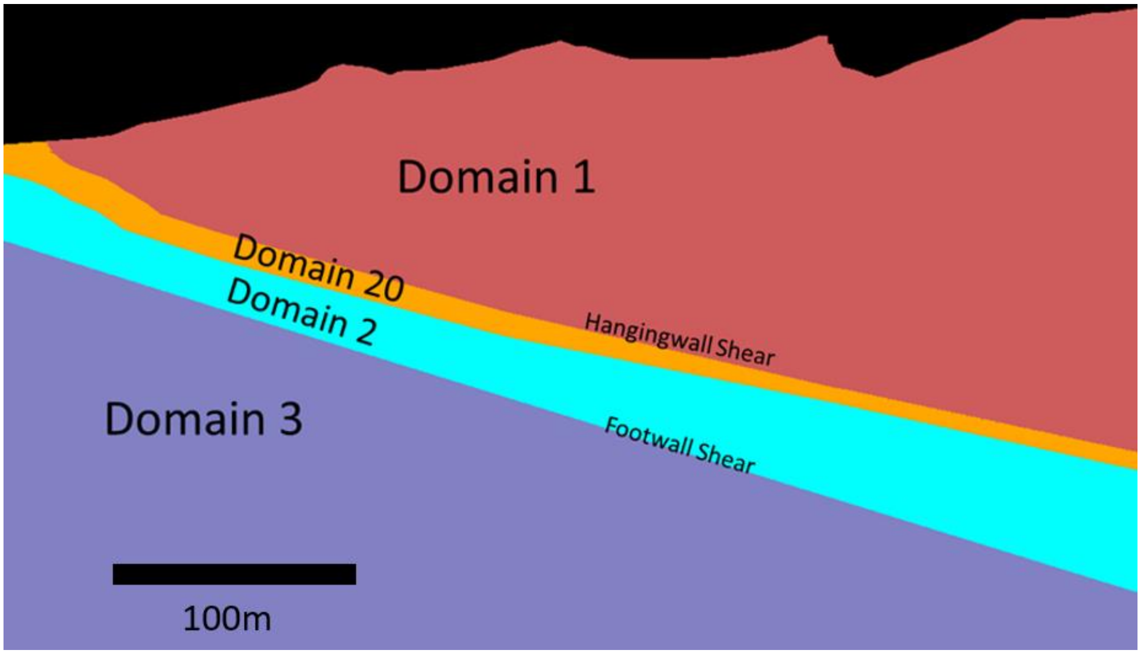


Figure 14-4: Ounce schematic cross-section with 2017 resource domain

- Drill spacing 50 m;
- OK estimation was used with search distances of X, Y =75 m, Z = 5 m;
- Only RCH, RCD and DDH prefixed drill holes used in the estimation;
- A gold top cut at the 97.5 percentile was applied. This was 2.6 g/t Au gold for domain 20; and

- Entire resource is classified as inferred.

14.3.20 Relevant Factors

While OceanaGold owns the land on which the resource is located, OceanaGold does not currently hold the necessary resource consents to mine this resource.

14.3.21 Golden Bar

Background

The Golden Bar resource area is centred on the small historic Golden Bar workings, approximately 9 km south of Macraes. These were worked at various times from 1889-1942, producing approximately 5,000 oz and a minor amount of scheelite.

The area was drilled initially by BP Minerals (NZ) Ltd in 1985 and then by OceanaGold from 1994-1997. The main drilling phase was completed in 1997 with drilling on 25 m x 25 m centres. During 2002 several RC and diamond holes were drilled to twin previously drilled wet RC percussion holes.

The current resource model, GB02a, was built in November 2002 and has been used for all subsequent resource reporting.

OceanaGold mined Golden Bar from February 2004 to October 2005. The open cut yielded 1.74 Mt @ 1.72 g/t Au for 0.096 Mozs at a 0.5 g/t Au cut-off grade for oxide ore and a 0.7 g/t Au cut-off grade for sulphide ore.

Geology & Mineralisation

The Golden Bar deposit lies to the south of Frasers.

The current interpretation has the Golden Bar prospect lying some 400 m vertically above the interpreted position of the HMSZ Footwall Fault and located within the Hangingwall psammites. By this interpretation Golden Bar is grouped with the Eastern Lodes, which outcrop 2-3 km to the east of the main shear zone. The main shear zone thins to the south of the Ounce deposit, which is coincident with the start of the Golden Bar shear zone (Figure 14-5).

An alternative interpretation has the Hangingwall Lode at Golden Bar is in the same structural position as the Hangingwall lodes seen at Ounce and further north and may be an offset of this main lode system. Doyle and Stewart (1997) suggested that the main Hangingwall Lode at Golden Bar lies at the contact between psammitic schist above and pelitic schist which is a typical Hangingwall lode position.

Two distinctive structural styles have been identified at Golden Bar:

- Concordant lodes which anastomose and are generally thinly developed, and
- sigmoidal vein structures. The sigmoidal veins are strongly mineralized and dominated by quartz veining. These structures link between the upper and lower concordant lodes.

The concordant lodes vary in style from thin (<1 m) discrete cataclastic shears to thick (15 m) quartz rich lode schist. South or south-easterly dipping shears are generally thin, highly sheared, while flat or northerly dipping shears are thick, strongly mineralized and show evidence of extension.

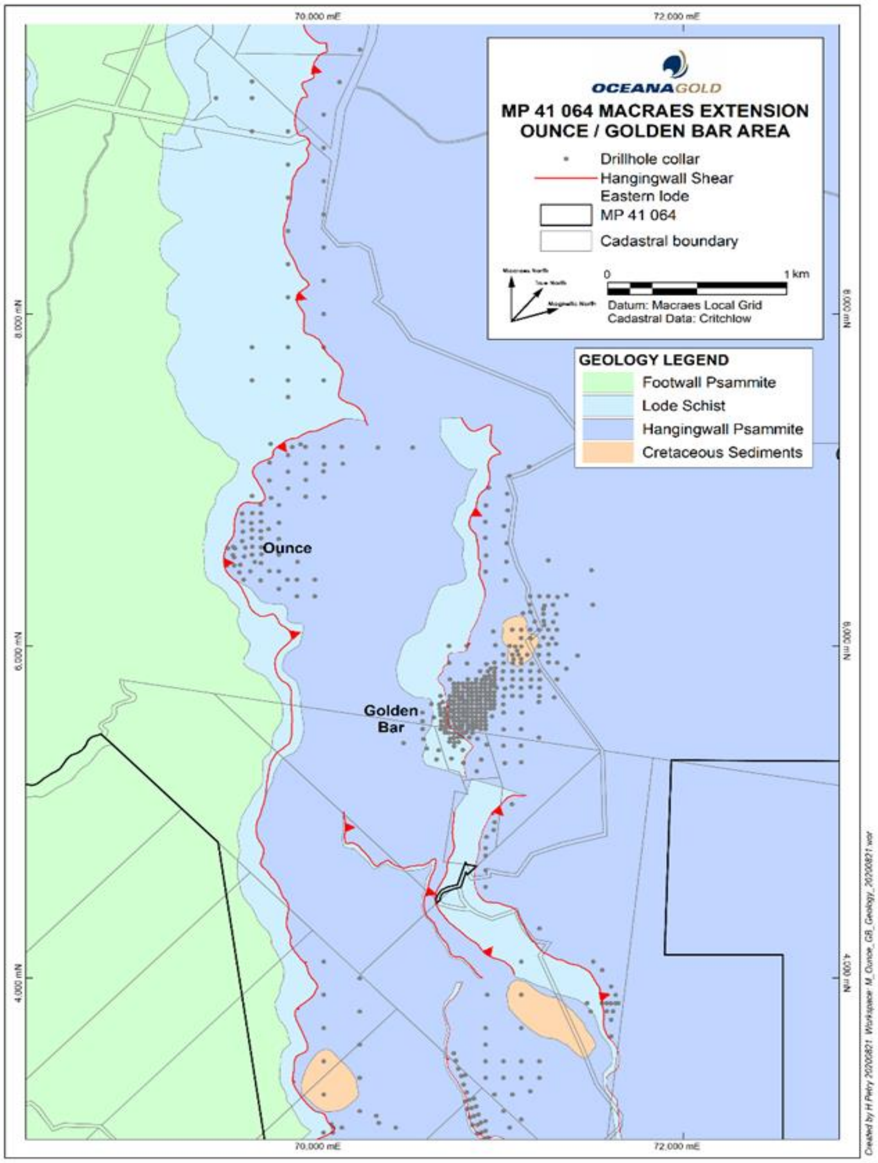


Figure 14-5 Ounce and golden bar geology and deposits

Two major shears are present as illustrated in Figure 14-6. These structures are 40 m apart at surface but converge into a single structure at depth with the line of intersection trending northeast. The lower shear to the west of this splitting is thickly developed and strongly mineralized. The rock between the shears contains several sigmoidal extension veins. Although no gross lithological differences could be clearly identified from logging, it is likely that this rock is more competent than the surrounding rock mass and has accommodated deformation by brittle extension, thus creating sites for development of the sigmoidal veins.

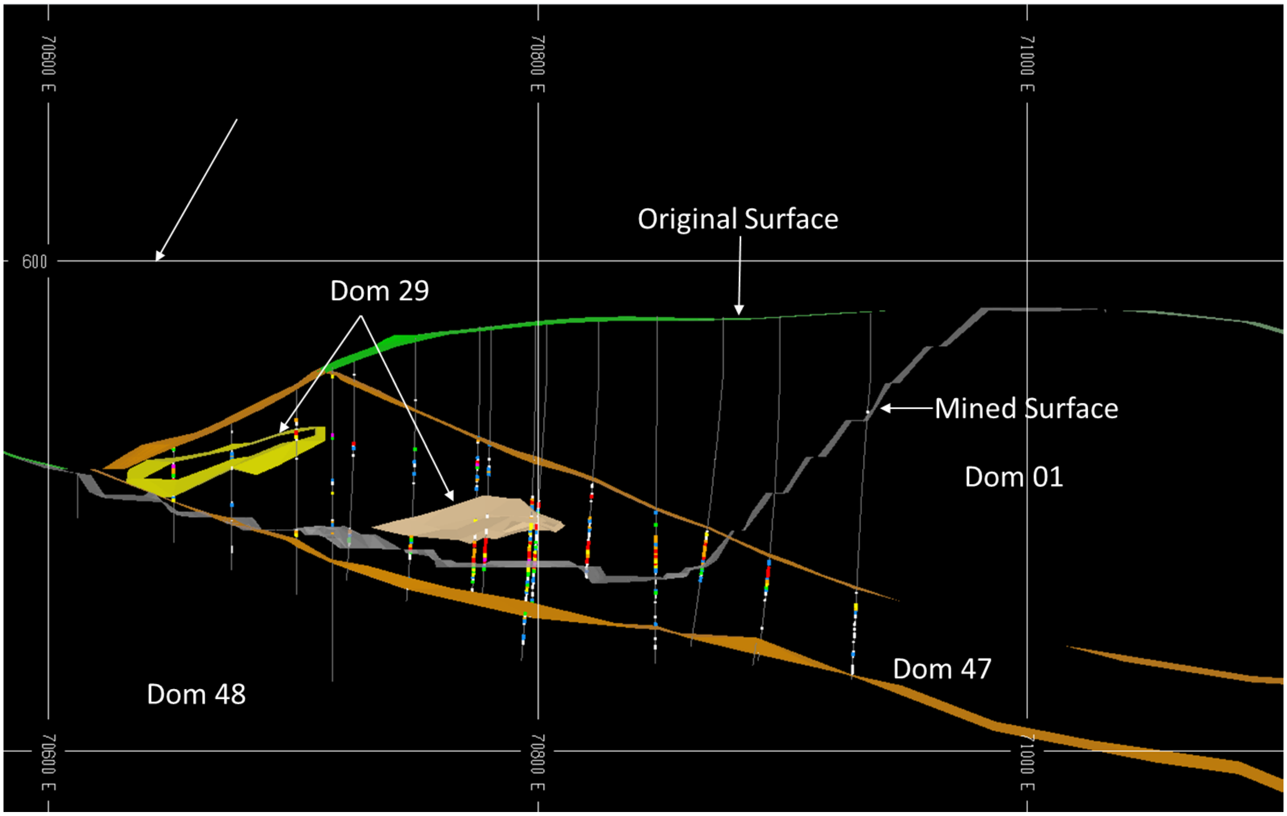


Figure 14-6: Golden bar schematic cross-section 5575 m N

The sigmoidal vein packages have a curved tabular geometry, striking to the northeast and dipping to the northwest at around 25°. The vein dip is steepest (and most dilatational) where the intra-shear distance between upper and lower concordant structures is larger. In areas where these structures converge, the sigmoidal veins are more concordant.

The sigmoidal veins were the target of historic underground mining. All accessible mine workings have been mapped in detail and the observations included in interpretation of the geological wire frame.

Resource Estimate

The current resource estimate GB2110 was completed in 2021 and provided an update of the previous model completed in 2002.

A broad zone, called the Golden Bar Mineralised Zone (GBMZ) was defined loosely on a 0.1 g/t cut-off to capture the mineralisation (Domain 47). Three north-west dipping lodes within this zone were wireframed separately but treated together for estimation together as Domain 29, these have been largely mined out. Two weakly mineralised zones above and below the GBMZ were defined (Domain one and Domain 48 respectively).

Mining and Reconciliation

Golden Bar was mined by open pit from February 2004 to October 2005. A total of 1.74 Mt @ 1.72 g/t for 0.096 Mozs was mined at a 0.5 g/t cut-off for oxide ore and 0.7 g/t cut-off for sulphide ore.

- The current model under-calls tonnes by 8% and grade by 3% for a net under-call of contained gold by 11% at the mined cut offs.

Relevant Factors

- Most of the land under MP41 064 is owned by OceanaGold, however the land to the east of the Golden Bar road as shown on Figure 14-6 containing the resource extension is privately owned. OceanaGold does not have an access agreement/option to purchase on this land; and
- A further cut-back at Golden Bar would require the Golden Bar public road to be re-located and an application for resource consents to mine.

The current pit optimisation is to a degree drilling limited. Step-out drilling would allow evaluation of a potential cut back.

14.3.22 Taylors

Background

The Taylor's gold deposit is one of several small gold deposits found at the southern end of the Hyde-Macraes Shear Zone. Other deposits include Wilsons North and South, Shaws and Home Reef and these are referred to collectively as the Stoneburn Resource Group.

A few historic workings are present but there is no record of production.

BHP drilled 14 shallow percussion holes in the 1980s from Home Reef down to Taylors. Between 1994 and 1999, Macraes Mining Company drilled 29 RC holes in the Stoneburn area including Taylors. In 2003, 39 RC holes were drilled at Taylors on a 25 m spacing.

No diamond drilling or metallurgical test work has been completed at Taylors.

Geology & Mineralisation

Aldrich (2003) describes the mineralisation at Taylors as two sub-concordant mineralised shears ("lodes") that are thought to be the southern extension of the Home Reef and Golden Bar structures.

The upper lode is 1-3 m thick and lies 25-30 m above the lower lode. The lower lode is more extensive and thicker (up to 8 m). There are no indications that these 2 shears link as at Golden Bar. The shear zones strike 350 ° and dip 12-20 ° to the east. An NNE plunging ore shoot on the lower lode has been identified and remains open at depth. Mineralisation in the shear zones is dominated by quartz veining with minor arsenopyrite and pyrite. The few tungsten assays available indicate some scheelite is present (up to 1.46% W recorded in assay). No quartz vein array mineralisation has been identified below the lower zone.

Resource Estimation

The lode mineralised zones were defined based on a 0.2 g/t Au cut-off grade and a minimum 2 m mining width. Each drill interval had to include at least 1 metre of waste below the 0.4 g/t Au economic cut-off grade.

Surfaces were created for both the upper and lower lodes and for the surrounding schist and oxide zones and these were used to construct the lode solids for coding. The interpretations were in general extended 25 m beyond the last drill hole or halfway to next drill hole if that hole was unmineralised.

A schematic cross-section is shown in Figure 14-7.

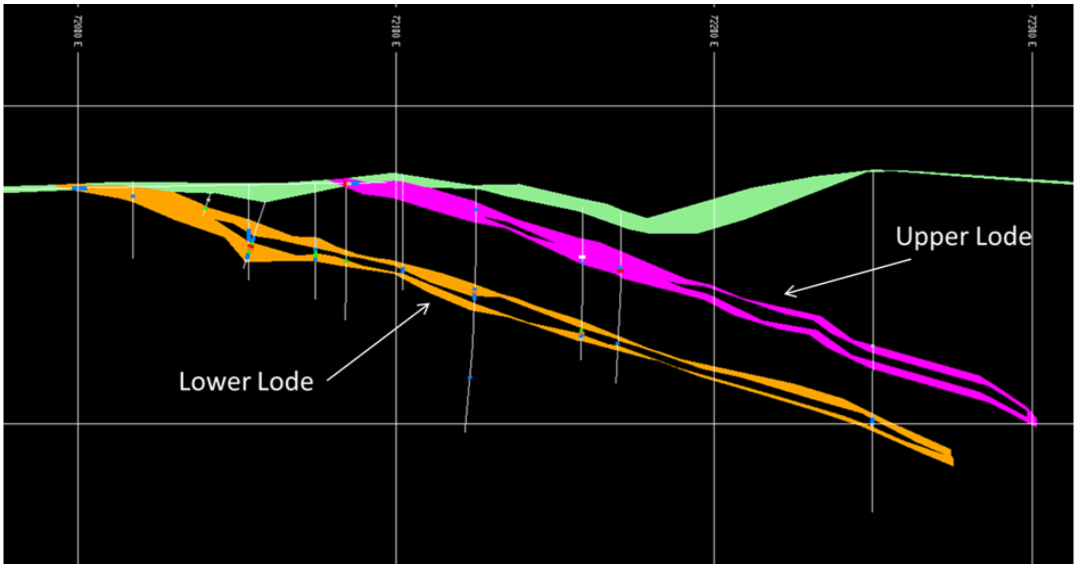


Figure 14-7: Taylors schematic cross section – line 1400 m N

- Drill spacing 25 m to 50 m;
- Only RCH prefixed holes used in the estimation;
- Top cut of 8 g/t Au applied affecting 6 assays; and
- OK estimation with search distances of X, Y = 50 m, Z = 5 m.

14.3.23 Stoneburn Group

Background

The Stoneburn group refers to five small gold resources in the Stoneburn area: Wilsons North, Wilsons South, Home Reef, Shaw's and Shaw's South as shown on Figure 14-8.

Historic mining in the area is generally limited to pits, trenches and adits along strike of the lode traces with minor alluvial workings throughout.

Production records from the Stoneburn area are poor. In 1902, 60 tons of quartz from the "Stoneburn Mine" was crushed and returned 4.2 g/t gold. Between 1915 and 1917 a further 2,264 tons of quartz was treated returning 1.7 g/t gold. Apparently mining ceased in 1917 as the gold grade was too low and only scheelite was worth recovering. The location of the "Stoneburn Mine" is not known but was probably the combined workings of Wilsons and Shaws (Aldrich 2003).

BHP conducted percussion drilling from 1988 to 1989 along the strike of the lodes targeting the shallow areas of the lodes (<20 m) with 25 m drilling traverses across the trace of the lode spaced 50 m apart. In 1996 and 1998 RC drilling by OGL tested the deeper sections of the lodes (up to 200 m) on a 100 m x 100 m drilling grid, with localised 50 m x 50 m infill. There is no diamond drilling, and no metallurgical test work was completed.

Geology & Mineralisation

Mineralisation in the Stoneburn resource area is associated with shallow east-dipping shears, slightly oblique to the regional penetrative schistosity. These structures consist of four concordant shears within a 450 m package of finer grained schists forming the southern continuation of the HMSZ Zone.

The Wilson's Lode structures has been mapped through scattered shallow pits and adits, outcrops and float of mineralised quartz, cataclasite and sheared pelitic schist for 8 km. The Wilson's Lode is thought to be the extension of the Hangingwall shear from Ounce to the north and extends to the south until it is obscured by overlying sediments. The Footwall Fault is interpreted to lie immediately below the lower Lode structure at Wilsons (Bleakley, 1996, Aldrich, 2003). At least two lodes are present with potentially more concordant lodes at the northern end of the Wilsons North area.

Shaw's Lode and Shaw's Lode South consist of structures hosted by narrow semi-pelitic to semi-psammitic units 1.5 km east of the Hangingwall-Footwall contact. The Home Reef structure is thought to be a continuation of the Golden Bar structure and extends over a strike length of 3.3 km. In places it occurs as a series of stacked lodes as at Taylor's. Individual shears consist of quartz veins generally less than 1 m thick within concordant lode structures from one to seven metres thick. The Shaw's Lode, a single concordant shear from one to five metres thick, has a strike length of at least 4.5 km.

Two styles of mineralisation are evident at Stoneburn: quartz veins up to 1 m thick within concordant lode structures up to 8 m thick and broad zones of shearing with associated mineralized quartz, cataclasite and lode schist situated above the Footwall fault on the Wilsons lode structure.

Gold-scheelite-pyrite-arsenopyrite mineralisation occurs within the lode structures. Silicification is the dominant form of alteration. As a rule, the higher the lode quartz content, the stronger the gold mineralisation. Argillic alteration is present within lode schist associated with quartz veining.

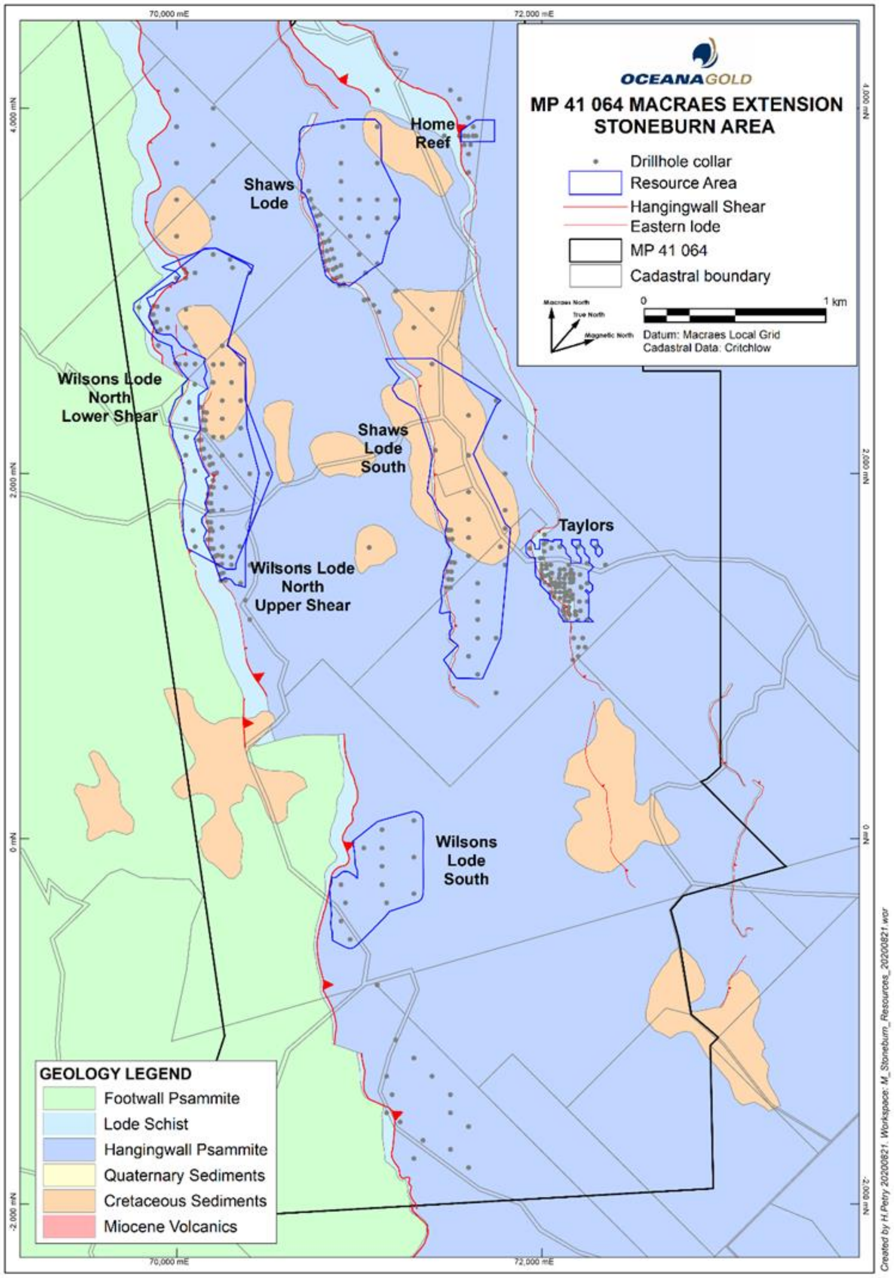


Figure 14-8: Stoneburn geology and deposits

Resource Estimation

The lode zones were based on a combination of lithology and a 0.2 g/t gold cut-off. All the drill holes were used in the interpretation but only RCH prefixed holes were used in the resource estimation.

- Drill spacing generally 100 m;
- Only RCH prefixed holes used in the estimation;

- Top caps applied at the 97.5 percentile (gold grades 2.5-5 g/t Au); and
- OK estimation with search distances of X, Y=150 m, Z = 5 m.

Relevant Factors

The Stoneburn deposits are small shallow resources with a high proportion of oxide ore.

No resource consents have been applied for to mine the Stoneburn resources. The resources at Stoneburn are covered by privately owned properties. OceanaGold does not have access agreements with options to purchase for these properties. OceanaGold is not currently in negotiation to secure access or purchase options for these properties.

14.4 Underground Mineral Resource Estimate

14.4.1 Drillhole Database

Resource estimation uses a combined dataset of both surface and underground drilling.

Exploration holes from surface (diamond core and percussion RC) are combined with diamond drill holes completed from underground from both FRUG and GPUG. Sub horizontal channel samples collected along development drives within the 'stockwork' domain at FRUG are also included.

14.4.2 Software Used

Up until 2019, MinePlan/Compass has been used for creating the wireframes for database extraction, geologic modelling, coding and final resource reporting. As of 2019, Leapfrog software has been used to create the geologic wireframes which are the imported into MinePlan for coding and final resource reporting.

Pangeos software is used for geostatistical analysis and block grade estimation. The block models created are then imported into MinePlan for domain compilation and final reporting.

14.4.3 Geologic Modelling

Domain boundaries are based on geology and structure rather than grade.

Most of the economic mineralisation is confined to the Intrashear schist. The top of the Hangingwall shear usually marks the top of the Intrashear schist and the bottom marked by the Footwall fault. Within the Intrashear schist there may be domains for the Hangingwall lode, one or more concordant lodes and zones of quartz vein arrays with subsidiary shears. Domains will vary from area to area and are discussed for the individual areas below.

14.4.4 Assay Capping and Compositing

Outliers

The underground resources are estimated using Ordinary Kriging (OK). Top caps are always applied. For gold, this varies for each domain but is usually between the 97.5 and 99 percentiles and are specified for each resource estimate in the relevant sections below.

Compositing

The raw assay data is composited to one metre lengths for resource estimation.

14.4.5 Density

A density of 2.65 t/m3 is assigned based upon average core immersion test results.

14.4.6 Variogram Analysis and Modelling

Prior to spatial analysis, the composite sample locations are 'flattened' (essentially unfolded and un-faulted) by assigning a relative elevation equivalent to the elevation difference of each composite midpoint to a reference surface defined by the geological model. This is done primarily to preserve the vertical grade trends observed in the drill hole sample grades and to allow orientation of search directions to the geological structures.

Variograms and resource estimations are done using the Pangeos software using the flattened composites. Block grades are first estimated using Ordinary Kriging into 10 m x 10 m x 1 m parent blocks and subsequently divided into four 5 m x 5 m x 1 m daughter cells.

14.4.7 Block Model

Gold grades are estimated into blocks with dimension X= 10 m, Y= 10 m, Z= 1 m for all the underground models. These are subsequently divided into four 5 m x 5 m x 1 m size blocks. The smaller blocks are then folded back into real space using Pangeos, exported in ASCII text format and imported into MinePlan/Compass.

14.4.8 Estimation Methodology

Ordinary Kriging (OK) was used for the underground resource estimate with search ranges between 25 – 125 m.

14.4.9 Model Validation

Model validation is like that described in Section 14.3.9.

14.4.10 Resource Classification

Resource classifications for the FRUG resource estimates are based on a manually defined combination of drill spacing, domain, and geological limits. These are used to define shapes for each class and domain (3-8 only) in MinePlan which are then used to code the Class field in the block model. As a rule, Measured resource classification represents drilling spacing <20 m, Indicated resource classification 20 m to 50 m and Inferred resource classification > 50 m up to 125 m drilling spacing.

The GPUG resource classifications are defined by a combination of data density and within constrained geological domains. A minimum of at least 8 informing composites were required for any classified block. Horizontal extents were defined by kriging search parameters, 32 m for indicated and 62 m for inferred for most geological domains. However, these distance criteria were expanded for DOMG 11 and DOMG 15 which are both considered to represent the main 'Hangingwall Shear' of the Hyde-Macraes Shear Zone where the regional continuity is well established. For the two Hangingwall Shear domains horizontal search distances up to 62 m were classed as indicated with distances to 120 m classified as inferred. The vertical extent of all classified resources is restricted to geological domain limits.

Measured resources at GPUG were only defined within the two domains representing the main Hangingwall Shear (11 and 15). Areas of DOMG 11 within kriging search parameter of 32 m were classified as Measured.

Within DOMG 15 measured resource classification was limited to an area partially within kriging search parameters up to 32 m in Golden Point only. Although there is a density of drilling at Round Hill that satisfies this distance and minimum samples condition - the bulk of the Round Hill drilling remains early RC drilling where both the sample quality is lower, downhole surveys less well constrained and there is less confidence in correlation of geological structures between drill holes.

14.4.11 Frasers Underground (FRUG) Resource Estimate

Background

The potential for the Frasers mineralisation to support an underground mining operation was first recognized in 1996 when a number of drill holes intersected locally high grades of gold mineralisation (ca. 6 g/t Au) in the top 5-6 m of the Hangingwall down-dip from the Frasers Open Pit in the area eventually known as FRUG Panel 1. In the following years various conceptual and scoping studies were undertaken leading to a pre-feasibility study that was completed in June 2004.

A decline commenced in the north wall of the Frasers open pit in April 2006 using Byrnecut Mining as the contractor. Development and production of Panel one commenced in 2007, with production from Panel two starting in 2008. OGL took over as owner-operator of the underground operation in 2011.

Exploration drilling for resource extensions was on-going during the life of FRUG with the main phase occurring between 2009 and 2012. The mine has now entered partial retreat mode with the commencement of mining regional pillars and permanent development in gold mineralisation. Mining is currently scheduled for completion sometime in 2024.

Geology & Mineralisation

The mineralisation at FRUG is the down-dip extension of the Hangingwall shear mined in the Frasers open pit. There are two main areas: Panel one and Panel two. Panel one is located immediately under and to the northeast of the current pit wall and while Panel two is located a further 300 m to the southeast.

The geological controls for FRUG are consistent with those described in the Frasers Open Cut. The mineralisation is contained within the 80 m to 100 m thick intra-shear pelite, bounded by Hangingwall and Footwall psammites. Cataclasite, lode schist (concordant zones) and quartz vein arrays and subsidiary shears gold mineralisation have been identified with the highest-grade mineralisation located proximal to the hanging wall contact. In Panel two mining is focused along the Hangingwall Lode and a concordant lode lying approximately 10 to 20 m below, called the Lower Zone.

There are also several large, steeply dipping quartz veins mined by narrow vein mining methods. The grades of these veins tend to be higher than the overall FRUG average grade of around 2-3 g/t Au.

At depth Panel two is truncated to the north by the Macraes Fault zone. Attempts to locate a possible faulted offset on the other side of the Macraes Fault from surface drilling have so far proved unsuccessful.

Resource Estimation

- The most recent estimation is dated October 2023;
- Eight domains were used of which three contain the bulk of the economic mineralisation: and
- Domains boundaries are based primarily on geology as shown on Figure 14-9.

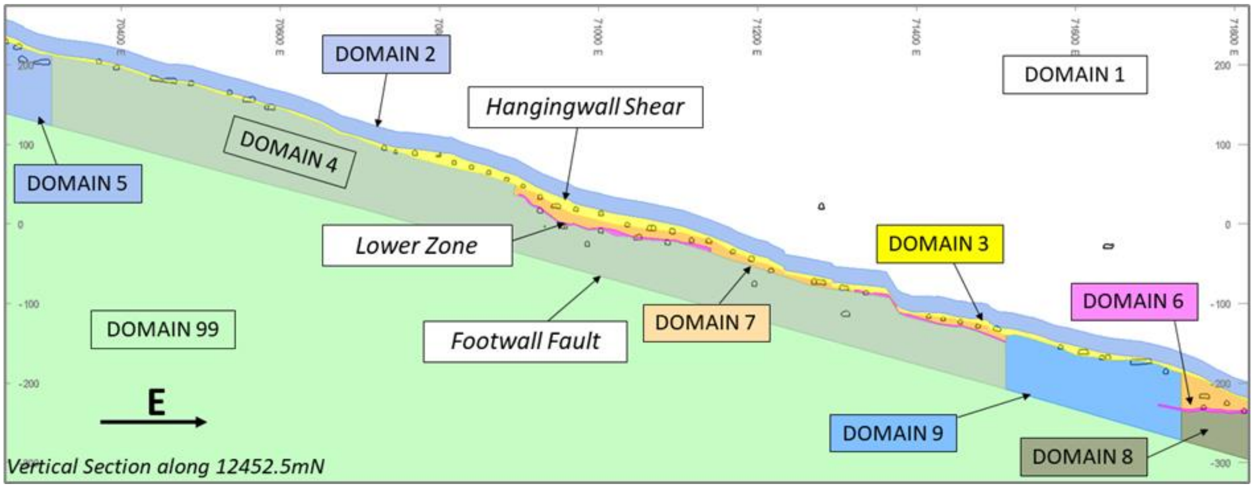


Figure 14-9: FRUG resource estimation domains

- Surface holes prefixed DDH, DDW, RCD and RCH were used together with underground holes prefixed UDH and underground channel samples prefixed "CH";
- Drill spacing varies from over 100 m to <25 m;
- Top caps applied at between 97.5 and 99 percentiles. Domains 2,4,5,7 and 8 top capped at 5 g/t Au, Domain 3 at 10 g/t Au and Domain 6 at 15 g/t Au; and
- Ordinary Kriging was used for the estimation.

Relevant Factors

Mining in FRUG is currently expected to cease in 2024.

14.4.12 Golden Point Underground (GPUG) Resource Estimate

Background

The Golden Point Mine was the largest hard rock producer in the Otago Schist belt yielding approximately 13,000 oz. of gold and 800 tonnes of scheelite from underground workings up to 1934.

A Pre-Feasibility study on underground mining at Golden Point commenced in 2019 and was completed in July 2020. Infill and step-out diamond drilling commenced in 2017 and is ongoing.

The Golden Point underground is immediately down-dip of the Golden Point and Round Hill open pits which were mined by OceanaGold between 1990 and 2002 producing approximately 1.3 Moz. As a result of this mining, most of the historic underground mine was unearthed. The only remaining part of the historic workings are in the north wall of the Golden Point pit which is not proposed to be mined.

Geology & Mineralisation

OceanaGold's open pit mining at Golden Point encountered several stacked lodes 2-10 m thick dipping gently (10-15 °) to the east. A re-interpretation of the geology in 2017 identified five west-dipping lodes as well as the east-dipping lodes (see Figure 14-10). At depth the stacked lodes disappear, and mineralisation becomes focused along the Hangingwall shear. The Golden Point lodes are more distinct (less diffuse boundaries) than lodes elsewhere at Macraes and quartz vein array mineralisation is noticeably absent.

The lodes contain a variable mix of silicified breccia, quartz cataclasite breccia and lode schist with pyrite, arsenopyrite, scheelite and occasionally visible gold.

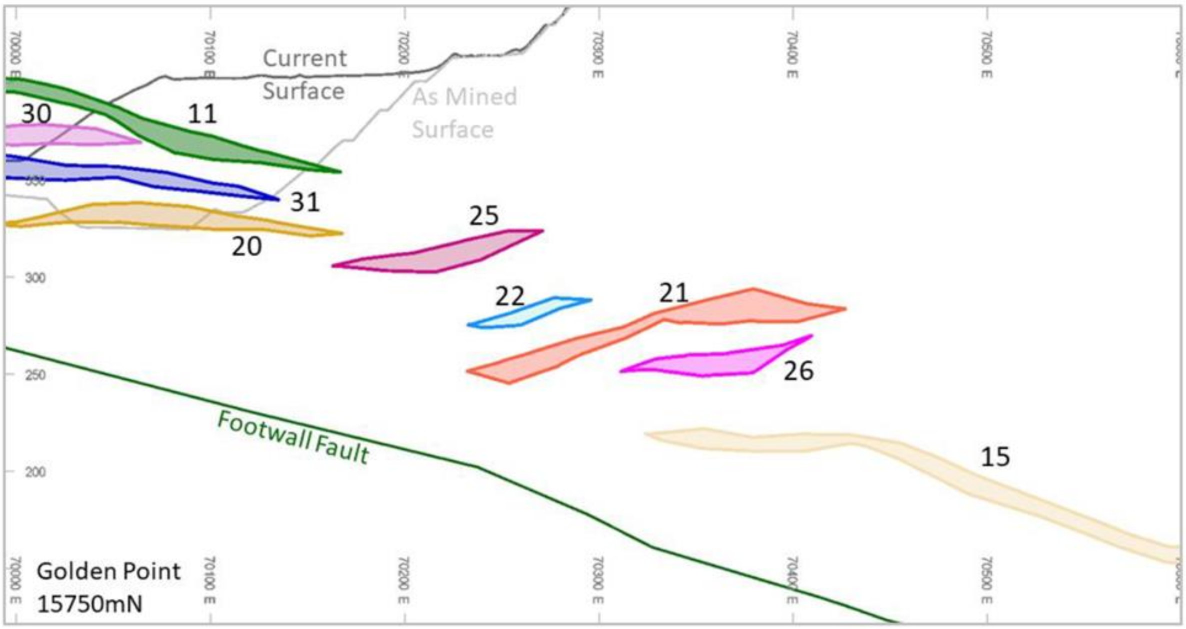


Figure 14-10: Golden Point lode domains

Wet Bias Factors

Like Frasers and Innes Mills, in the deeper sections of Round Hill, some RC drill holes were sampled under wet conditions to mitigate the potential for wet sample bias Diamond twin holes were completed and a set of gold grade factors generated for factoring wet RC sample grades. Given this approach, the residual resource estimation risk is low.

Resource Estimation

- Completed August 2023;
- Only surface drill holes prefixed RCH, RCD, DDH and DDW used. 14 RCH holes excluded due to excessive wet sample bias and down hole contamination;
- Drill spacing 25-50 m;
- Top caps at between 97.5 and 99 percentiles for most domains. Domain 30 top capped at 6 g/t. Domains 20, 22, 24, 26,31 and 32 top capped at 8 g/t Au. Domain 17 top capped at 9 g/t, Domains 11,15 and 16 top capped at 10 g/t Au, Domains 21 and 25 top capped at 15 g/t Au; and
- Ordinary Kriging used for resource estimation.

Relevant Factors

The Golden Point Underground mine is a new operation at Macraes; however, OceanaGold and its predecessors have been open pit mining for over 30 years and underground mining for 16 years. As a result of this OceanaGold has a high degree of confidence in the geological interpretation and mining assumptions used to construct the respective resource estimates.

Drilling is currently ongoing and there is a reasonable expectation that the resource will be extended down-dip.

14.5 Resource Model to Mine Reconciliation

The resource model to mill-adjusted mine reconciliation for the five years to 2023 shows variable performance from year to year, albeit the long-term average performance for this period has been reasonable; + 24% for tonnes, - 8% for grade and + 14% for contained gold at a 0.5 g/t cut-off.

In 2023, there was a 27% positive reconciliation in ore tonnage, an 8% negative grade reconciliation, and a 16% positive contained gold reconciliation at a 0.5 g/t Au cut-off.

Annual Resource model to Mine reconciliation tables are presented for Macraes Open Pit resources in Table 14-5, Underground resources in Table 14-6. Results are presented for cut off grades above 0.5 g/t which has been the ROM cut off.

The 2024 mine plan includes the processing of ore at a 0.3 g/t Au cut-off. The model reconciliation for Open Pit improves at this lower cut-off (Table 14-8).

While annual reconciliation fluctuations are expected to continue, the Macraes open pit and underground resource estimates are believed to provide an acceptable basis for medium to long term mine planning purposes.

Table 14-5 Open pit resource estimate versus mill-adjusted trucked estimates at 0.5 g/t cut off

Year	Resource Model (OP)			Mill-Adjustment Mine			Mine/Model Factor (%)		
	Mt	Au	Au Moz	Mt	Au	Cu Mt	Mt	Au	Cu Mt
2023	3.74	0.91	0.11	4.84	0.81	0.13	130%	89%	116%
2022	3.57	0.85	0.10	5.11	0.78	0.13	143%	92%	131%
2021	3.55	0.94	0.11	4.18	0.85	0.11	118%	90%	106%
2020	2.96	0.93	0.09	3.94	0.84	0.11	133%	90%	120%
2019	3.37	1.00	0.11	3.86	0.96	0.12	114%	95%	109%
Total	**17.19**	**0.93**	**0.51**	**21.94**	**0.84**	**0.60**	**128%**	**91%**	**116%**

Table 14-6 Underground resource estimate versus mill-adjusted trucked estimates at 0.5 g/t cut off

Year	Resource Model (UG)			Mill-Adjustment Mine			Mine/Model Factor (%)		
	Mt	Au	Au Moz	Mt	Au	Cu Mt	Mt	Au	Cu Mt
2023	0.55	1.46	0.03	0.60	1.62	0.03	109%	111%	121%
2022	0.79	1.70	0.04	0.96	1.76	0.05	122%	103%	126%
2021	0.56	1.79	0.03	0.60	1.85	0.04	107%	103%	110%
2020	0.78	2.03	0.05	0.77	2.15	0.05	99%	106%	104%
2019	0.97	1.97	0.06	0.94	2.03	0.06	97%	103%	100%
Total	**3.64**	**1.82**	**0.21**	**3.87**	**1.90**	**0.24**	**106%**	**104%**	**110%**

The combined Open Pit and Underground Macraes Resource models to Mine reconciliation for the last five years at 0.5 g/t cutoff are in Table 14-7.

Table 14-7: Open pit resource estimate versus mill-adjusted trucked estimates at 0.5 g/t cut off

Year	Resource Model (OP + UG)			Mill-Adjustment Mine			Mine/Model Factor (%)		
	Mt	Au	Au Moz	Mt	Au	Cu Mt	Mt	Au	Cu Mt
2023	4.29	0.98	0.14	5.44	0.90	0.16	127%	92%	116%
2022	4.36	1.01	0.14	6.04	0.94	0.18	139%	93%	129%
2021	4.11	1.06	0.14	4.78	0.97	0.15	116%	92%	107%
2020	3.74	1.15	0.14	4.71	1.04	0.16	126%	90%	114%
2019	4.34	1.23	0.17	4.80	1.18	0.18	111%	96%	106%
Total	**20.84**	**1.09**	**0.73**	**25.77**	**1.00**	**0.83**	**124%**	**92%**	**114%**

For the past five years low-grade material 0.3 – 0.5 g/t has been stockpiled, but in 2024 will be included straight for ROM processing. For comparison, the last two years of mine reconciliation at 0.3 g/t cut off is presented in Table 14-8. The mill-adjustment assumes similar factor for the 0.3 – 0.5 g/t material as was measured for the processed material >0.5 g/t.

Table 14-8 Open pit resource estimate reconciliation at 0.3 g/t cut-off

Year	Resource Model (OP)			Mill-Adjustment Mine			Mine/Model Factor (%)		
	Mt	Au	Au Moz	Mt	Au	Cu Mt	Mt	Au	Cu Mt
2023	6.18	0.71	0.14	7.49	0.66	0.16	121%	93%	113%
2022	5.67	0.68	0.12	7.62	0.65	0.16	134%	95%	128%
Total	**11.84**	**0.70**	**0.26**	**15.11**	**0.66**	**0.32**	**128%**	**94%**	**120%**

14.6 Open Pit and Underground Combined Mineral Resource Statement

Mineral Resource estimates for the Macraes Project as of December 31st, 2023, by resource category and deposit are shown in Table 14-9. The Mineral Resources have been prepared in accordance with CIM standards and guidelines.

Table 14-9: Macraes resource inventory as at December 31, 2023

Resource Cut-off (g/t Au)	Resource Area	Measured		Indicated		Measured & Indicated			Inferred Resource		
		Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz	Mt	Au g/t	Au Moz
0.40	Nunns	-	-	0.22	0.83	0.22	0.83	0.01	0.62	0.93	0.02
0.30	Coronation North	0.46	0.93	0.69	0.64	1.15	0.75	0.03	0.23	0.64	0.00
0.30	Coronation	0.13	0.97	2.26	0.81	2.39	0.82	0.06	0.64	0.75	0.02
0.30	Deepdell	0.22	1.25	0.36	0.92	0.58	1.04	0.02	0.21	0.66	0.00
1.19	Golden Point Underground	0.28	2.56	7.60	2.42	7.88	2.43	0.62	2.49	1.95	0.16
0.30	Innes Mills	3.56	1.14	10.77	0.65	14.33	0.77	0.35	2.75	0.49	0.04
0.30	Frasers-Gay Tan	0.43	0.58	1.54	0.45	1.97	0.48	0.03	0.24	0.43	0.00
1.28	Frasers Underground	0.01	3.91	0.03	2.72	0.04	2.95	0.00	0.00	1.51	0.00
0.40	Ounce	-	-	-	-	-	-	-	0.76	0.75	0.02
0.40	Golden Bar	0.17	1.35	1.00	1.08	1.17	1.11	0.04	3.53	1.24	0.14
0.40	Taylors	-	-	0.19	0.88	0.19	0.88	0.01	0.21	0.70	0.00
0.40	Stoneburn	-	-	-	-	-	-	-	1.43	0.71	0.03
0.30	Stockpiles	5.26	0.41	6.49	0.48	11.75	0.45	0.17	-	-	-
Totals		**10.51**	**0.78**	**31.17**	**1.07**	**41.68**	**1.00**	**1.34**	**13.12**	**1.05**	**0.44**

- Open pit resources are reported within shells optimized using a gold price of US$1,700 /oz @ USD: NZD 0.70;
- Mineral Resources reported include the Mineral Reserves reported for the same deposit;
- There is no certainty that Mineral Resources that are not Mineral Reserves will be converted to Mineral Reserves;
- No dilution is included in the reported figures and no adjustments have been allowed for mining recoveries;
- No processing recovery adjustments have been made in the reported figures. The 0.3 to 0.4 g/t grade range recovery is based on grade/recovery curve extrapolation and a small amount of metallurgical testing; and
- The tabulated resources are estimates of metal contained as troy ounces of gold.

15 Mineral Reserve Estimate

15.1 General

A Mineral_Reserve estimate was generated for the open pit and underground mining methods. The following sections explain the open pit and underground Mineral Reserve estimate separately. A combined Mineral Reserve statement is provided in Section 15.4.

15.2 Open Pit Mineral Reserve Estimate

15.2.1 Conversion Assumptions, Parameters and Methods

The Macraes Mineral Reserve estimate represents that part of the Measured and Indicated resource which can be economically mined and for which the necessary design work and mine planning have been carried out. Proven and Probable reserve blocks are based on Measured and Indicated resource blocks respectively. Inferred blocks are inadequately defined and therefore are not included in reported reserves. When the inferred blocks fall within pit outlines, they represent potential additions to ore mined if confirmed by grade control drilling. The reserves are included within the overall resource figures.

Macraes open pit reserve tonnages and grades are from designs guided by Whittle 4X pit optimisations. Optimisations use projected costs, slope angles based on geotechnical studies, plant recoveries and USD1,500 /oz gold price at 0.70 USD:NZD exchange rate. An ad valorem royalty of 1% is payable to the New Zealand government and refining and handling charges are included at USD5 /oz.

Reserve tonnages and grades are reported in accordance with CIM criteria and, include any anticipated mining losses and mining dilution.

For open pit inventory, the resource block model estimation methodology incorporates adequate dilution and provides a reasonable estimate of mined tonnage and grades. No additional dilution or mining losses are applied during Whittle 4X optimisations.

Pit optimisation and design inputs and methodologies are described in section 16.

15.2.2 Open Pit Reserve Estimate

The open pit Mineral Reserves summarised in Table 15-1, are reported at a 0.4 g/t Au cut-off.

Table 15-1: Macraes open pit mineral reserve estimate as at December 31, 2023

Area	Proven		Probable		Total		
	Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz
Innes Mills	0.71	1.22	7.00	0.92	7.72	0.94	0.23
Frasers	0.00	0.00	0.09	0.75	0.09	0.75	0.00
Stockpiles	5.26	0.41	6.49	0.48	11.75	0.45	0.17
Total	**5.97**	**0.51**	**13.58**	**0.71**	**19.55**	**0.65**	**0.41**

15.2.3 Relevant Factors

- CIM (2014) definitions were followed for Mineral Reserves;
- The effective date of the Mineral Reserves is December 31, 2023; estimated by Knowell Madambi MAusIMM CP(Mining), an employee of OceanaGold (NZ) Ltd; and
- Not all required permits and consents are in place to enable mining of the entire Mineral Reserve, however there are reasonable expectations that such permits and consents will be granted. Resource consent applications were submitted at the end of 2023 for those areas that are not consented.

15.3 Underground Mineral Reserve Estimate

15.3.1 Conversion Assumptions, Parameters and Methods

Mining Dilution and Recovery

Macraes underground mines (Frasers Underground and Golden Point Underground) are operating mines and have experienced the stope modifying factors summarised in Table 15-2. Mining recovery is expected to be poor during regional pillar extraction (pillar robbing) due to open stope instability. In this case the mining recovery factor was reduced. Reverse fire open stopes (RFOS) are described in Section 16.5.1.

Table 15-2: Stope modifying factors

lethod	Insitu Recovery (%)	Stope Dilution (%)	Stope Dilution Grade (g/t)	Mining Recovery (%)
Long Hole Open Stope (LHOS)	89.5	19.3	0.80	0.92
Reverse Fire Open Stope (RFOS)	88.0	24.2	0.64	0.92
Pillar Robbing Long Hole Open Stope (PRLHOS)	89.5	19.3	0.80	0.60

Mineral Reserves Derivation

The full mine designs were depleted for:

- Areas outside the bounds of the Measured and Indicated classification shells in plan view; and
- Areas for which a mining consent is not currently granted or expected to be granted (e.g. due to a requirement for further technical work before applying for a consent).

Stopes were assessed individually to determine if they met the relevant cut-off grade. The grade of each stope was determined as the measured and indicated ounces distributed across the tonnes of the entire stope solid, including any inferred and unclassified tonnes near the backs or floors.

Two cut-off grades are used at Frasers Underground:

- minimum grade to warrant stoping if the ore development drive is already in place; and
- minimum grade to warrant processing of any development material that has been hauled to surface.

These cut-off grade scenarios are shown in Table 15-3.

Table 15-3: Frasers underground cut-off grade calculations

Parameter	Unit	Stoping Cut-off when Development in Place	Process Cut-off When Material is at Surface
Mining Cost	NZD/t	56.85	0
Ore Re-handle Cost (portal to mill, including ROM loader)	NZD/t	2.92	2.92
Processing (including tails dam construction)	NZD/t	11.78	11.78
Sustaining capital	NZD/t	0.00	0.00
Gold price	NZD/oz Au	2,143	2,143
	NZD/g Au	68.89	68.89
Plant Recovery	%	82.7	82.7
Selling Cost (refining & royalty)	NZD/g Au	0.94	0.94
Calculated Cut-off Grade	g/t Au	1.28	0.24
Cut-off Grade Used	g/t Au	1.28	0.50

Three cut-off grades are used at Golden Point Underground:

- minimum grade to warrant ore drive development;
- minimum grade to warrant stoping if the ore development drive is already in place; and
- minimum grade to warrant processing for development material that has been hauled to surface.

These cut-off grade scenarios are shown in Table 15-4.

Table 15-4: Golden point underground cut-off grade calculations

Parameter	Unit	Ore Drive Development Cut-off	Stoping Cut-off when Development in Place	Process Cut-off When Material is at Surface
Mining Cost	NZD/t	54.41	38.62	0
Ore Re-handle Cost (portal to mill, including ROM loader)	NZD/t	2.09	2.09	2.09
Processing (including tails dam construction)	NZD/t	11.78	11.78	11.78
Sustaining capital	NZD/t	2.47	2.47	2.47
G&A	NZD/t	3.12	3.12	3.12
Gold price	NZD/oz Au	2,143	2,143	2,143
	NZD/g Au	68.89	68.89	68.89
Plant Recovery	%	81.0	81.0	81.0
Selling Cost (refining & royalty)	NZD/g Au	0.94	0.94	0.94
Calculated Cut-off Grade	g/t Au	1.35	1.06	0.35
Cut-off Grade Used	g/t Au	1.35	1.06	0.50

In addition, a profit/loss assessment was completed for each stope. This included the cost of any access development attributable to that stope.

Stopes that made money on measured and indicated ounces (only) after including access development costs, satisfied the cut-off grade requirements and were either within the current consent footprint or have a reasonable expectation of being granted consent were included in the reserves.

15.3.2 Reserve Estimate

The Underground Mineral Reserves are summarised in Table 15-5. Frasers Underground reserves are reported at an Au cut-off of 1.28 g/t. Golden Point Underground reserves are reported at an Au cut-off 1.35 g/t where ore drive development is required and 1.06 g/t where all development is in place.

Table 15-5: Macraes underground mineral reserve estimate as at December 31, 2023

Area	Proven		Probable		Total		
	Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz
Frasers Underground	0.01	1.63	0.01	1.61	0.02	1.61	0.00
Golden Point Underground	0.19	2.02	2.78	1.97	2.96	1.97	0.19
Total	**0.19**	**2.00**	**2.79**	**1.97**	**2.99**	**1.97**	**0.19**

15.3.3 Relevant Factors

- CIM (2014) definitions were followed for Mineral Reserves.
- The effective date of the Mineral Reserves is December 31, 2023; estimated by Euan Leslie, an employee of OceanaGold (NZ) Ltd; and
- Not all required permits and consents are in place to enable mining of the entire Mineral Reserve, however there are reasonable expectations that such permits and consents will be granted. Resource consent applications were submitted in 2023 for those areas that are not consented.

15.4 Macraes Combined Mineral Reserves Statement

The combined Macraes Mineral Reserve estimate is presented in Table 15-6.

Table 15-6: Macraes combined mineral reserve estimate as at December 31, 2023

Area	Proven		Probable		Total		
	Mt	Au g/t	Mt	Au g/t	Mt	Au g/t	Au Moz
Innes Mills	0.71	1.22	7.00	0.92	7.72	0.94	0.23
Frasers	0.00	0.00	0.09	0.75	0.09	0.75	0.00
Stockpiles	5.26	0.41	6.49	0.48	11.75	0.45	0.17
Subtotal - Open Pit	**6.00**	**0.51**	**13.60**	**0.71**	**19.60**	**0.65**	**0.41**
Frasers Underground	0.01	1.63	0.01	1.61	0.02	1.61	0.00
Golden Point Underground	0.19	2.02	2.78	1.97	2.96	1.97	0.19
Subtotal – Underground	**0.19**	**2.00**	**2.79**	**1.97**	**2.99**	**1.97**	**0.19**
Total Macraes	**6.20**	**0.55**	**16.40**	**0.92**	**22.50**	**0.82**	**0.60**

Notes: All figures are rounded to reflect the relative accuracy of the estimates. Totals may not sum due to rounding.

- Mineral reserves are reported based on a cut-off grade based on metal price assumptions, exchange rates and mining, processing, general and administrative costs;
- Open pit reserves are stated using a 0.4 g/t Au cut-off;
- Underground reserves are stated using 1.28 g/t Au cut-off for Frasers underground, 1.35 g/t Au for Golden Point underground where ore drive development is required and 1.06 g/t Au for Golden Point underground where development is in place;
- Reserves are based on a USD1,500 /oz Au gold price (at USD:NZD 0.70 exchange rate);
- The Macraes processing plant recovery varies based on ore source and feed grade – an average recovery of 78% is estimated;..
- Open pit dilution and recovery estimates are built into the underlying resource models and no further adjustments are made;
- Underground insitu recovery, mining recovery and dilution modifying factors have been applied resulting in an average underground mining recovery of 95% of the designed tonnage and 88% of the designed grade;
- Mineral reserves have been estimated based on mine designs and plans consolidated into a Life of Mine Schedule;
- Knowell Madambi, Manager – Technical Services & Projects at Macraes is the Qualified Person for the Open Pit Mineral Reserve Estimate; and
- Euan Leslie, Group Mining Engineer based in New Zealand is the Qualified Person for the Underground Mineral Reserve Estimate.

16 Mining Methods

16.1 General

The following sections explain the open pit and underground mining methods separately. A combined open pit and underground production schedule is provided in Section 16.5.

16.2 Open Pit Mining Methods

16.2.1 Current or Proposed Mining Methods

Conventional open cut mining methods are used at the Macraes Goldfield. Pits are excavated on level benches 2.5 m high within the ore zone (approx. 2.8 m high after blasting), 4 m high within the waste zone for backhoe excavators and 10 m for the shovel.

Hydraulic backhoe excavators in the 250t and 360t class are used for mining ore and waste and a 360t electric-hydraulic shovel is used for mining waste only.

Ore is mined with different techniques depending on the style of mineralisation.

- Hanging wall lode ore is mined by first removing the hanging-wall waste with an excavator under visual control of a geological technician, then mining the exposed ore. Footwall ore is selectively removed from the underlying footwall waste if it can be visually controlled, otherwise the footwall ore is diluted with the wedge of underlying waste; and
- Stockwork ore is generally mined within the defined ore blocks. Ore blocks are defined with the guidance from a conditionally simulated grade control model.

For this mining method and equipment, the smallest selective mining unit (SMU) used when defining ore blocks is 4 m by 4 m by 2.5 m high (approximately 100 t), however blocks are generally a minimum of 500 t to minimise dilution.

16.2.2 Parameters Relevant to Mine or Pit Designs and Plans

Geotechnical

The slope design philosophy is one of accepting and managing minor localised slope instability rather than incurring the additional costs of designing conservative slopes to guarantee a zero-failure rate. It is accepted that on average 20% of any wall may experience some minor bench scale failures, however these will largely be contained on berms and will not adversely affect production. However, to optimise pits and reduce costs, slope angles are designed specifically for each pit, based on kinematic analysis and interpretation of existing geotechnical data. For new pit excavations, data is collected from air photo interpretation; surface trenching and diamond drill holes, whilst wall performance and in-pit mapping are used to further refine and optimise staged and final pit walls. This practice has proven to be successful.

Overall slope angles vary by deposit and these are stated in each individual deposit section.

For all pits the consequences of wall failure are similar, usually requiring additional movement to lay slopes back or alternatively ore loss if the design slope toe cannot be achieved.

Mining Dilution and Recovery

Resource models are recoverable indicator kriged models. Dilution is accounted for in the resource model calculations by adding a waste veneer to the hanging wall contact and using dilution estimation during the kriging process. The result is a dilution/recovery factor of close to 2%, which is realistic considering the control techniques applied during mining. To avoid double accounting, Macraes models do not add dilution during optimisation.

Selective ore mining procedures are utilised. This is done to maximise ore recovery and minimise mining dilution. Grade control blasthole assays are used as the input data to a conditional simulation grade control process. The results of bench grade estimates are then used in conjunction with detailed geological mapping to produce mining blocks. Ore mining is supervised by geologists and ore spotters. Mining of the ore waste contacts is done by backhoe excavator. It is assumed that:

- mining recovery is 100%; and
- dilution is 0%.

16.2.3 Pit Optimisation

Open pit optimisations are completed in-house using Whittle 4X software. Due to the maturity of the Macraes operation, optimisations are largely assessments of changes to previous pit designs caused by updates to resource models or input parameters.

Mineral Resource Models

Resource models are prepared by the site resource geologists, and this includes classification into Measured, Indicated, and Inferred categories. Some additional manipulation is performed by the mining engineers to construct a ‘reserve model’ ready for further mine planning work. These manipulations include:

- removal of all in-situ blocks above the chosen ‘as-mined’ topography surface;
- classification of blocks as fill that are below the ‘as-built’ surface and above the ‘as-mined’ surface;
- calculation of tonnes and grade for each material type, where material types are defined by Weathering, Classification, basic geology (hanging wall / stockwork), and grade classification (0.4-0.7, 0.7-1.0, 1.0+ g/t Au);
- identification of majority geology zone for the purposes of assigning slope angles; and
- assigning positional mining and processing costs.

The open pit resource models at Macraes are recoverable resource models built using GS3 estimation techniques and constructed in MinePlan. Each block in the model reports the proportion and the grade that can be recovered at various cut-offs. A summary of the underlying resource models used in optimisations is shown in Table 16-1.

Table 16-1: Resource models used in pit optimisations

Area	Innes Mills / Frasers (in-situ)
Resource model name	230215.623
Date published	27/02/2023
Block size	25x25x2.5
Northing Extent (Macraes Grid)	12,650 m N to 14,000 m N
Topography cut to [date]	As mined 30/06/2023
Costs current at [date]	Dec 2023
Reserve model name	im723.wit

Optimisation Constraints

Pit optimisations are normally only limited by the boundary of the underlying resource model to avoid optimisation shells artificially daylighting into space. For Innes Mills the optimisation is further constrained by the public road and bridge corridor to the north.

Optimisation Parameters

Individual blocks in the block model were coded with mining and processing costs. Block model mining cost adjustment factors (MCAF) and processing cost adjustment factor (PCAF) fields were coded with mining and processing costs respectively. Blocks within the Footwall Fault (FF) stand-off zone were coded with high mining and processing cost to exclude these blocks from optimisation.

A summary of the optimisation inputs for each deposit are shown in Table 16-2. Note that the PCOST is the base cost to mine and process a tonne of ore and is made up of:

- Any additional (or lesser) mining costs associated with mining ore compared to waste;
- ROM ore re-handle into the crushers;
- Ore processing;
- General and administration overhead charges; and
- Sustaining capital and financing charges (includes tails dam construction).

Table 16-2: Optimisation inputs

Area	Innes Mills / Frasers (in-situ)
Metallurgical Recovery (%)	Sulphide = 82% / Oxide = 75%
PCOST (NZD/t)	16.91
Indicative waste mining cost at design basis shell (NZD/t)	2.18
Gold price used for shell generation & analysis (NZD/oz)	2,143
Selling costs	1% royalty and NZD5.00 /oz refining cost
Pit Slopes	Detailed in section below for each deposit
Shell Selection Method	Maximum Specified case cashflow at a 50 Mtpa mining / 2.8 Mtpa process rate (ex-pit)

Geotechnical Parameters

Slope angles used in optimisations are coded depending on the rock type, and slope rosettes are used to control those angles that depend on the wall orientation. At Macraes, final ramps can usually be sited within the footwall of the ore so additional slope laybacks are not needed to allow for pit ramps. A summary of the overall slopes used for each area is shown in Table 16-3.

Table 16-3: Pit slopes used in optimisations

Area	Material / Location	Overall Angle (degrees)
Innes Mills / Frasers (in-situ)	Oxide schist	37°
	Fresh Schist/NE and SW wall	42°
	Fresh Schist/SE and NW wall	49°
	Backfill Waste	37°
Frasers Gay Tan	Fresh Schist	42°
	Backfill Waste/Slip Material	37°

Optimisation Results

Summary pit optimisation results are shown in Table 16-4 below for Measured and Indicated (M+I) material classifications only, Inferred or Unclassified material is treated as waste in the pit optimisations. Note that some deposits have been actively mined between when the optimisations were completed and December 31, 2023, in these cases the optimisation results do not reflect the current potential inventory.

Table 16-4: Optimisation results

Area	Innes Mills / Frasers (in-situ)
Gold price used for analysis (NZD/oz)	2,413
Shell selected for design (NZD/oz)	2,413
M+I shell inventory (Mt processed)	10.87
M+I shell gold grade (g/t processed)	0.85
M+I shell strip ratio (t:t)	6.72
Active Mining?	Yes

16.2.4 Design Criteria

Generic design parameters used in pit and waste rock stack designs are shown in Table 16-5.

Table 16-5: Generic pit design parameters

Parameter	Value
Minimum mining width of lowest 5 m cut	30 m
Minimum mining width of cutbacks	60 m
Ramp width (including 1 x windrow)	30 m
Inside turning radius on switchbacks	15 m
Maximum ramp gradient	10%
Maximum bench height	22.5 m
Minimum berm width	7.5 m (15 m berm interval)
	10 m (22.5 m berm interval)

16.2.5 Waste Rock Storage

Sufficient locations exist to store the anticipated waste rock quantities expected from the various open pits. These are grouped into geographical areas and summarized in Table 16-6.

Table 16-6: Waste rock storage

Waste Sources	Source Quantity (Mt)	Waste Storage Options	Sink Capacity (Mt)
Gay Tan	0.1	Frasers South Backfill	0.1
Innes Mills	79.8	Frasers Pit Backfill	77.0
		Frasers West Backfill	4.8
		Golden Point Backfill	5.6
		Frasers South Backfill	61.9
Total – IM / Frasers Area	79.9	Subtotal – IM / Frasers Area	149.4

The location of the various waste rock stacks is shown in Figure 16-1.

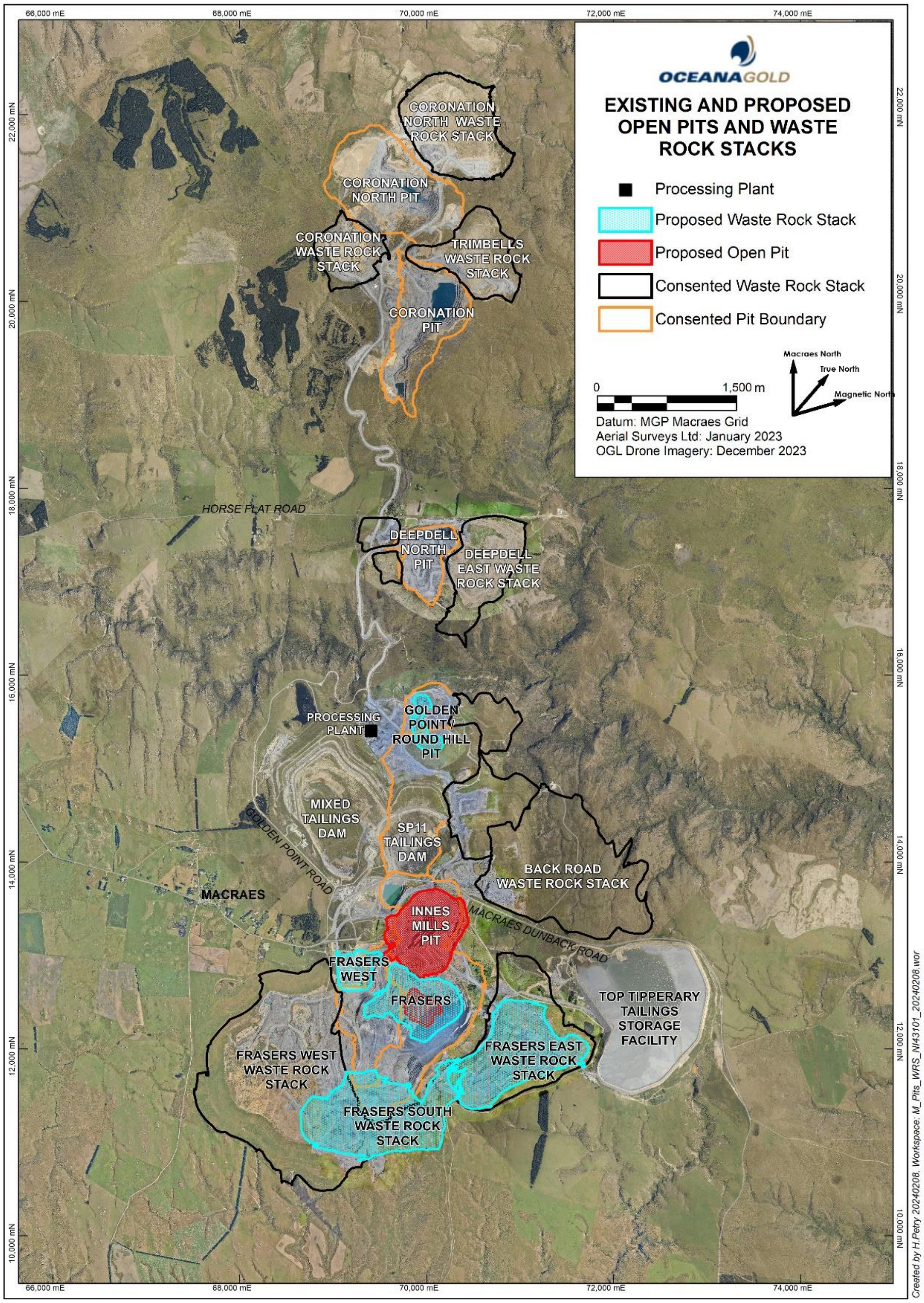


Figure 16-1: Existing and proposed waste rock stacks and tailings dams

16.2.6 Mine Production Schedule

Scheduling Method

Open pit mine scheduling is undertaken using RPMGlobal's *Open Pit Metals Solution (OPMS)* software. This method integrates the mining and dumping schedule, along with the haulage modelling. The OPMS scheduling model was implemented at Macraes in 2016 and is a successor of the Xpac scheduling model that has been used at Macraes since 1998.

Scheduling Objectives

Schedules aim to:

- ensure that the process plant can run at its capacity in all schedule periods and at the maximum mill head grade possible;
- minimise truck haulage cycle time and therefore haulage costs; and
- operate within the loading and hauling fleet capacity constraints.

Scheduling Parameters and Assumptions

Key schedule assumptions are noted in Table 16-7.

Table 16-7: Key open pit schedule assumptions

Parameter	Value
Mill feed target	UG material has priority for mill feed due to higher grades, typical OP targets are approx. 5.5 Mtpa
Cut-off grade	0.4 g/t
Starting topography	31 December 2023
Operating time	Max 5,700 hrs/yr for loading units and 5,500 hrs/yr for trucks
Truck payloads	178 dry tonnes
Excavator productivity	EX3600: 2,800 dry tph
	EX2500: 1,850 dry tph
Vertical advance	10 m per month in ore zone
	15 m per month in waste zone
Excavator proximity	50 m

Scheduling Results

The open pit mine is scheduled once the underground mine schedules are completed. Open pit mining quantities by year are shown in Figure 16-2.

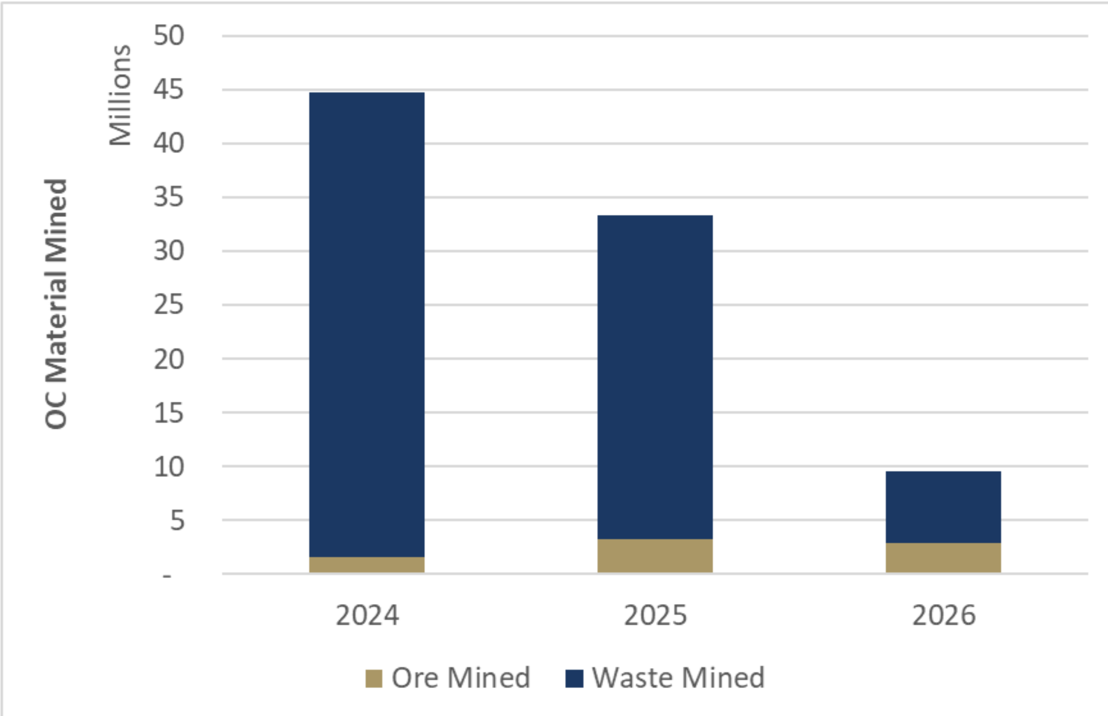


Figure 16-2: Mined quantities by material type

Annual total movement by the main excavator and truck mining fleet averages 30 Mt between 2024 and 2026. Mining movement by area is shown in Figure 16-3.

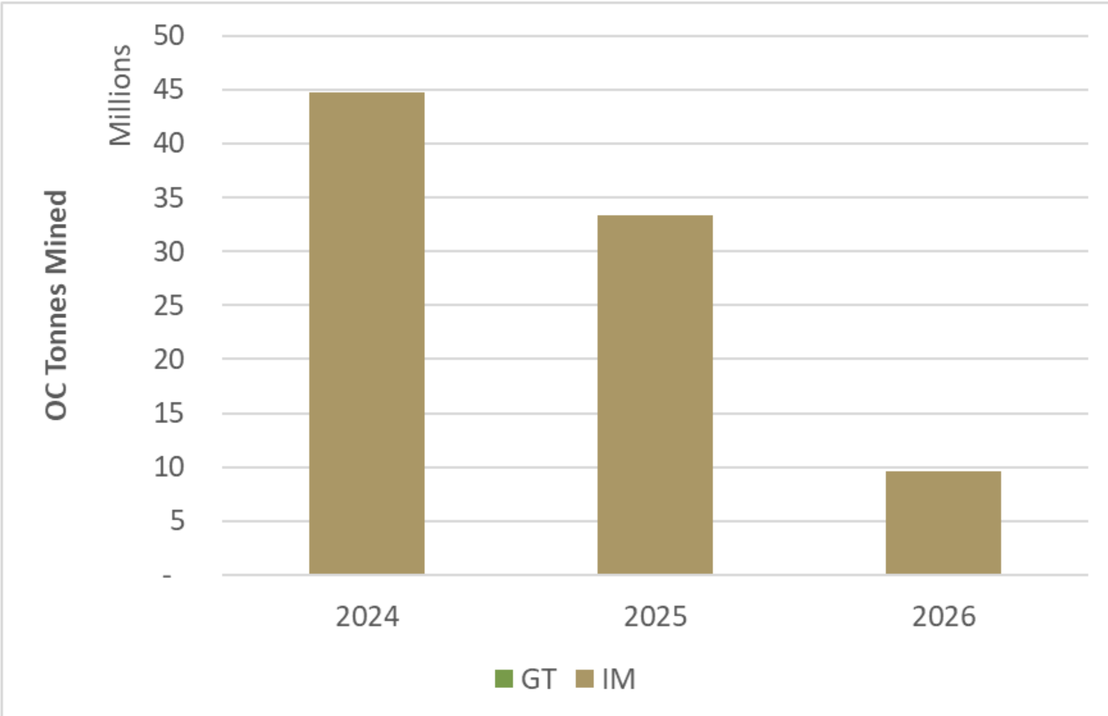


Figure 16-3: Movement by sources

Figure 16-4 shows the mill feed makeup by material source, where:

- GT = Frasers Gay Tan;
- IM = Innes Mills;
- SP = Stockpiles; and
- UG = Underground sources (FRUG and GPUG).

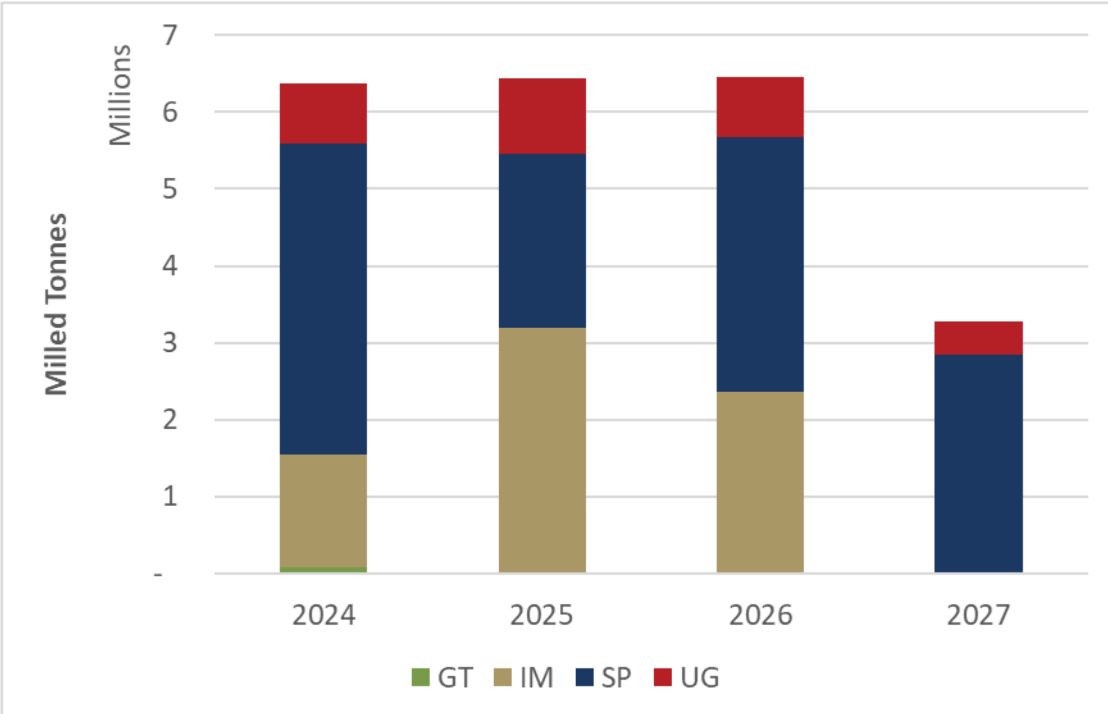


Figure 16-4: Ore milled by sources

Ore processing continues at 6.4 Mt per annum up to 2026 when open pit mining is completed. In 2027 processing tonnes are at 3.3 Mt made up of open pit stockpiles and underground ore.

Stockpile movements are shown in Figure 16-5. The mine scheduling strategy is to maximise the gold grade to the process plant and hence process plant gold cut-off grades are elevated when the pits have large ore exposures. The material below the current process plant gold cut-off grade is stockpiled and then reclaimed in later schedule periods.

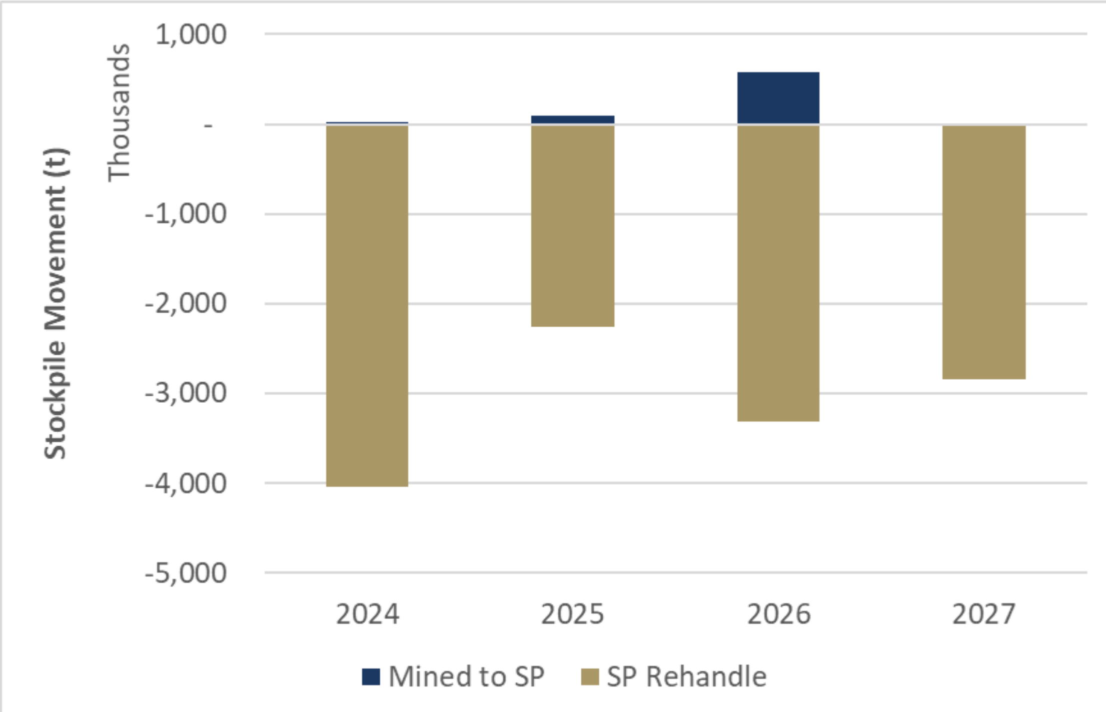


Figure 16-5: Stockpile movements

16.2.7 Mining Fleet and Requirements

General Requirements and Fleet Selection

The mine fleet used in this schedule assumes no change to the existing fleet configuration. This fleet configuration has been refined over the 30 years that the mine has been in operation.

Drilling and Blasting

Drilling and blasting requirements differ depending on the material zone. Ore zone material includes all material within the main hanging wall shear zone including all ore grade material, and the waste zone is the overlying overburden waste rock.

Summary drill and blast parameters are shown in Table 16-8.

Table 16-8: Open pit drill and blast parameters

Parameter	Unit	Ore Zone	Waste Zone
Drill type (model) used		Top hammer percussion (Montabert CPA X-Tend)	Rotary (Sandvik D45KS)
Hole diameter	mm	102	200
Sampling frequency	t	128	No sampling
Bench height	m	7.5	15.0
Burden x spacing	m x m	4.3 x 4.5	7.4 x 8.5
Blasting powder factor	kg/m3	0.31	0.52

Loading

The primary mine loading fleet consists of three Hitachi EX3600 hydraulic backhoe excavators, one Hitachi EX3600 shovel (22 m^3 capacity) and one Hitachi EX2500 hydraulic excavator (15 m^3 capacity).

These machines are rated at 2,800 dry tph and 1,850 dry tph respectively.

Hauling

A single haulage fleet consisting of Caterpillar 789C and 789D mechanical drive rear-dump trucks are used for all mine haulage duties. These trucks match up with the 22 m^3 and 15 m^3 hydraulic excavators and shovel with a nominal four and six passes per truck respectively. Truck rated payload is 178 dry tonnes (182 wet tonnes).

The mine scheduling software dynamically accumulates the truck hours for every source/destination increment and is constrained by the number of available trucks.

Crusher Feed

Cat 992 and 988 wheel loaders are used to re-handle ore from the ROM blending stockpiles into the crushers.

Ancillary Equipment

A fleet of other equipment is used to support the primary production fleet. This consists of:

- Caterpillar D10 track dozers;
- Caterpillar 16 & 18 motor graders;
- Caterpillar 844 wheel dozers; and
- Caterpillar 773, 777 & 785 water trucks.

Ancillary equipment allocations are made based on historic actual usage and is either a fixed allocation per time interval or factored from the total truck hours.

Open pit equipment requirements by year are shown in Table 16-9.

Table 16-9: Major open pit equipment fleet by year

Equipment Model	2024	2025	2026	2027
Drill – Montabert CPA	3	2	2	
Drill – Sandvik D45	1	1	1	
Excavator – Hitachi EX2500	1	1		
Excavator – Hitachi EX3600	3	3	2	1
Truck – Cat 789C/D	19	15	6	5
Track dozer – Cat D10	5	4	3	2
Wheel dozer – Cat 844	1	1	1	
Grader – Cat 16	1	1		
Grader – Cat 18	2	2	2	1
Water carts (785/777/773)	3	2	2	1
Wheel loader – Cat 992	1	1	1	1
Wheel loader – Cat 988	1	1	1	1

During the term of the mine schedule, there will be no additional equipment required except for a Cat 990 wheel loader which will be replaced in 2024.

16.2.8 Mine Water

Groundwater

Open pits at Macraes produce only a small quantity of groundwater. Dewatering wells are not used, with the occasional exception of depressurisation bores to reduce the risk of slope instability. Groundwater is managed by pumping from pit sumps to the surface water management network.

Surface Water

Surface water is managed by:

- diverting clean water away from active working areas; and
- collecting runoff water in pit sumps or silt ponds and either using it for dust suppression or pumping into the site water network where it is used as process water in the mill.

16.3 Round Hill Open-pit – Removal from Mineral Reserve

During 2023 a Pre-feasibility Study (PFS) was completed on the Round Hill Open pit (RHOP) with the aim of further expanding the existing design that had been used for reporting of Mineral Reserves. A plan of the RHOP and surrounding area is shown in Figure 16-6. Components of the PFS included:

- Geotechnical investigation and analysis of RHOP and surrounding area;
- RHOP open-pit optimisation;
- RHOP design;
- Integration of RHOP into Life-of-mine plan;
- Capital and Operating Cost estimates; and
- Economic Analysis.

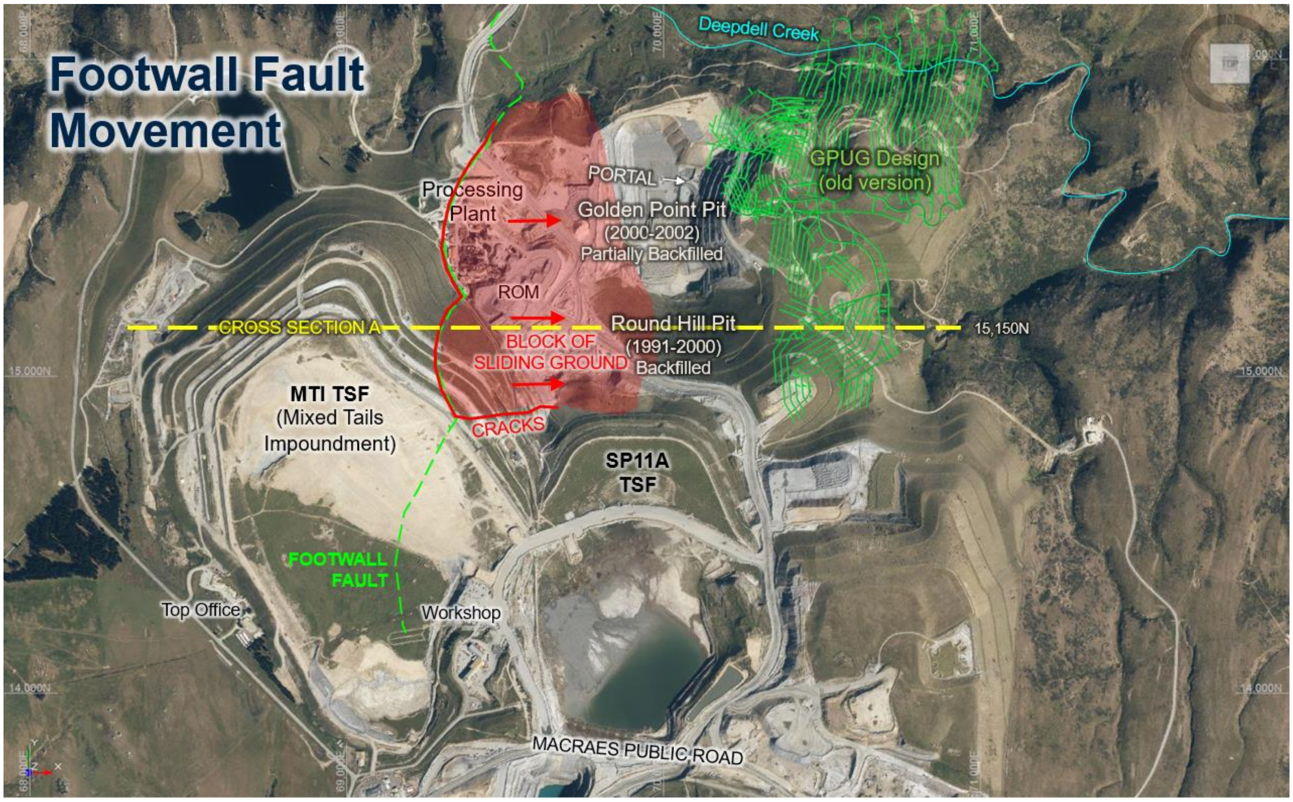


Figure 16-6: RHOP area plan showing infrastructure and Footwall Fault surface outcrop on original topographical surface

The results of the geotechnical analysis indicated that mining at RHOP could potentially cause movement along the Footwall Fault downdip from the decommissioned Mixed Tailings Impoundment (MTI), which might lead to differential movement within the MTI embankment wall. OGC considers this an unacceptable risk. A cross-section of the RHOP Mineral Reserve pit design, footwall fault, and MTI embankment layout is shown in Figure 16-7.

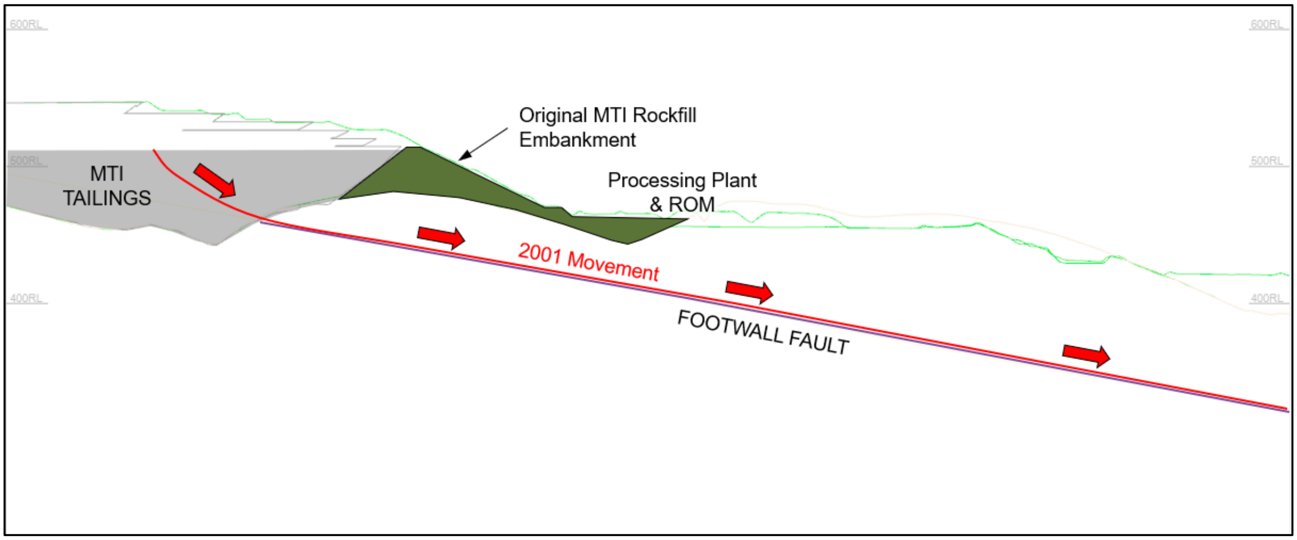


Figure 16-7: Cross-section at 15,150 m Y, looking north, showing RHOP, MTI, and Footwall Fault

An option considered in the PFS to remove the identified risk of movement on the footwall fault was to relocate all historical tailings from the MTI into the planned Frasers in-pit tailings facility using hydraulic mining methods. Previous hydraulic mining studies had shown that this method will work on a practical basis with Macraes historical tailings. The RHOP design and mine plan used to report Mineral Reserves also already incorporated hydraulic mining to remove part of the neighboring South Pit 10/11 (SP10/11) tailings storage facility.

However, due to cost escalation and further detailed design, the operating and capital cost of hydraulic mining has increased significantly over previous estimates. The result is that the RHOP did not generate sufficient economic return on capital, and therefore has been removed from Mineral Reserves.

There is potential for the Golden Point Underground to access and extract a portion of the Mineral Resource that was formerly within the RHOP design. However, this work is not sufficiently advanced to include in Mineral Reserves. This investigation will continue in 2024 as part of ongoing life-of-mine planning.

16.4 Frasers Underground Mining Methods

16.4.1 Mining Methods

The Frasers Underground orebody encompasses the down dip continuation of the Hangingwall shear mined in the Frasers open pit. The orebody is relatively shallow dipping (15 – 20°) to the east. The orebody is tabular with undulations and has a thickness varying between 5 to 30 metres.

The Frasers Underground mine targets the high-grade ore zone at the top of the Hangingwall shear.

The mining method used is retreat uphole open stoping and entails 15 m wide open stopes with 6 m wide yielding pillars between stopes. Mining areas are separated by 20 m to 60 m wide regional pillars. The mining areas are generally restricted to about 120 m width and 160 m length. Stope heights vary between drive height (5 m) up to 25 m.

16.4.2 Parameters relevant to Underground Mining

Mine Design Strategy

The resource model presents the orebody in regular 5 m long x 5 m wide x 1 m high rectangular blocks. Working from the top of the mineralisation down, blocks were progressively added to the bottom of a "stack" of blocks to create a column of ore. Stacking is continued to satisfy:

- minimum mining height of 5 m;
- minimum cumulative grade of 1.5 g/t Au; and
- minimum grade of 0.5 g/t Au of the block cell.

Within the modelled resource, an area for mining called the mining resource target was identified. Mining constraints require pillars between the stopes, transverse pillars, regional pillars, ore loss factors, dilution, and recovery assumptions. The mined tonnes and ounces are consequently less than the mining resource target. For a typical panel layout recovery is 62% of the tonnes and 50% of the ounces.

16.4.3 Mine Design Criteria

The most utilised mining method at FRUG is retreat long hole open stoping. Declines and access drives are mined to a 5.0 m W x 5.5 m H arched profile. Ore drives are mined to a 5.0 m W x 5.0 m H rounded shoulder profile. This allows enough space for services, secondary fans, vent ducts and mobile equipment.

Stoping panels were designed based on the main considerations below:

- Ore drives placed at 21 m centres to allow for 15 m wide stopes with 6 m yielding pillars between them. There are no secondary stopes designed to be extracted following the mining of the primaries;
- Ore drives positioned such that they will have a gentle uphill gradient for water drainage but not orientated directly north-south, parallel to the strike of many of the faults present, to maintain drive stability;
- Regional pillars maintained between panels of 30 m width if they contained no development and 60 m wide if they contained development drives. In some cases, pillars containing access drives were reduced to a width of 40 m if the contained drives were no longer needed following stoping of the surrounding areas;
- The stoping panels are retreated towards a solid abutment rather than towards an internal regional pillar; and
- Panel accesses designed in conjunction with primary ventilation return loops and secondary egress routes and positioned such that they will stay intact following stoping of nearby areas.

The assumptions made for ore loss and dilution in stopes are documented in Section 15.3.1.

16.4.4 Mine Production Schedule

Scheduling Method

Underground mine scheduling is undertaken using *Deswik Sched* software. After establishing task dependencies, mining priorities, task and resource rates and capacity constraints the schedule is generated using the software's auto-scheduler. The scheduler first ranks the stoping tasks with the goal of achieving the desired production rate and works backwards to schedule the preceding tasks.

Scheduling Objectives

The schedule aims to:

- ensure monthly stoping rate is consistent; and
- maintain a sufficient number of active stopes to meet the desired stoping rate.

Scheduling Parameters and Assumptions

Key schedule assumptions are noted in Table 16-10.

Table 16-10: Key underground schedule assumptions

Parameter	Units	Value
Maximum drilling rate per manual long hole drill	m/day	275
Maximum productivity per remote loader	t/day	900

16.4.5 Underground Mining Schedule Results

A summary of the scheduled physicals is presented in Table 16-11.

Table 16-11: Schedule physicals

Schedule Physical	Units	Year 2024
Total Ore Tonnes	kt	21.8
Total Ore Grade	g/t Au	1.61
Total Mined Ounces	oz	1,132
Total Mill Ounces	oz	924
Total Waste Tonnes	kt	0
Total Movement Tonnes	kt	21.8
Stope Ore Tonnes	kt	21.8
Stope Ore Grade	g/t Au	1.61
Stope Ore Ounces	oz	1,132
Development – Lateral	m	0
Devt Ore Tonnes	t	0
Devt Ore Grade	g/t Au	0
Devt Ore Ounces	oz	0
Production Drill	m	3,907
Cable Drill	m	2,160
Total Haulage	tkm	42,746

16.4.6 Mining Fleet and Requirements

General Requirements and Fleet Selection

The mine fleet used in the schedule is based on the existing operation and utilizes existing equipment items.

Drive Development

There is no remaining development scheduled to be completed.

Stope Drilling & Blasting

A Sandvik DS420 Cable Bolter is used to install cable bolts at planned brow positions in ore drives. A Tamrock Solo seven is used to drill blind up holes for stope production. A Normet Charmec is used to load production blast holes.

Summary drill and blast parameters are shown in Table 16-12.

Table 16-12: Underground drill and blast parameters

Parameter	Unit	Value
Drill type (model) used	-	Tamrock Solo 7-7V
Hole diameter	mm	76
Ring Burden	m	1.8
Toe Spacing	m	2.2

Loading

The primary mine loading fleet consists of a Caterpillar R1700 LHD on remotes to remove ore from open stopes and a Caterpillar R2900 LHD to load trucks.

Hauling

The underground haulage fleet consists of a single Sandvik TH550 articulated rear dump truck.

Ancillary Equipment

A fleet of other equipment is used to support the primary production fleet. Key ancillary equipment includes:

- a Caterpillar 12H motor grader;
- Normet Charmec charge-up vehicle;
- Volvo L120 integrated tool carriers, and
- Jacon flat deck truck.

These are shared with the nearby Golden Point Underground mine.

Underground equipment requirements by year are shown in Table 16-13.

Table 16-13: Major underground equipment fleet by year

Equipment Model	2024
Drill – Tamrock Solo7	1
LHD – Caterpillar R2900	1
LHD – Caterpillar R1700	1
Truck – Sandvik TH550	1
Charge Vehicle – Normet Charmec	1
Grader – Caterpillar 12H	1
Integrated Tool Carrier – Volvo L120	1
Service Truck – Jacon Flat deck	1

16.4.7 Mine Ventilation Requirements

The ventilation requirements for the key mobile equipment used are shown in Table 16-14. This is based on a minimum air quantity requirement of 0.05 m^3/s per kW of maximum engine power.

Table 16-14: Mine ventilation requirements

Equipment Item	Engine Power (kW)	Number Utilised	Ventilation Requirements (m3/s)
Sandvik TH550	429	1	21
Caterpillar R2900	333	1	17
Caterpillar R1700	243	1	12
Caterpillar Grader	104	1	5
Volvo 120E (IT)	180	1	9
Total			**64**

16.4.8 Mine Services

Water

Mine services water is supplied from settling dams on the surface, which receive water pumped from various open pits on site. Water services are run into the portal via a single 110 mm PN16 polyethylene pipe. Pressure reducers are placed along the length of the pipe as required. Panel accesses are serviced by 110 mm PN16 pipe branching off the decline, ore drives are serviced by 63 mm polyethylene pipe branching off the access.

As the mine is in retreat the pumping system has been removed. Mine services water is allowed to drain to the bottom of the mine which is no longer active.

Compressed Air

Compressed air is supplied to the portal via a 110 mm PN16 polyethylene pipe from a compressor and receiver on the surface. To distribute compressed air to the working areas 110 mm pipes are used in declines and access and 63 mm pipes used in ore drives.

16.5 Golden Point Underground

16.5.1 Mining Methods

The Golden Point Underground orebody encompasses the down dip continuation of the Hangingwall shear mined in the Golden Point and Round Hill open pits. The orebody is relatively shallow dipping (15 – 20°) to the east. Most of the orebody is tabular with undulations and has a thickness varying between 5 m – 20 m. In addition, some concordant lodes are present in the west of the mine extents parallel to the main shear. The Golden Point Underground mine targets the higher-grade zone at the top of the main tabular orebody and within the concordant lodes.

The mining method used is based on the method that has been successfully used at Frasers Underground – retreat uphole open stoping. At Golden Point this method entails 11 m and 15 m wide open stopes with 5 m yielding pillars between stopes. Mining areas are separated by 25 m – 60 m wide regional pillars. The mining areas are generally restricted to hydraulic radius of 25 m – 30 m. Mine production targets the higher-grade zones within the mineralized zone. Stope heights vary between minimum drive height (5 m) and 20 m.

In areas of expected poorer ground (RQD < 50) a method termed reverse fired open stopes (RFOS) is used. This involves firing material back towards the brow. Each firing has a rise at the back of the blast away from the existing stope void, into which the remaining rings are fired. This deposits more material at the brow reducing the distance a loader must travel into the stope to recover the blasted rock, thus reducing exposure of the loader to potentially unstable ground.

16.5.2 Parameters relevant to Underground Mining

Mine Design Strategy

The minable target area was defined using the Deswik Stope Optimiser (DSO). Key inputs to DSO were as follows:

- Minimum mining height of 4 m;
- Block size in plan view of 5 m long and 5 m wide;
- Minimum combined solid grade of 1.5 g/t; and
- Geological domain surfaces were used to control the orientation of the target mining solids.

Lower surfaces of the DSO solids were extracted, and floor contours generated to guide the placement of ore drives. Ore drives were placed on the 'mining floors' at centre-centre intervals of 16 m or 20 m and orientated such that the development was driven at a gentle uphill gradient wherever possible. The decline, accesses and vent return were placed to best service the ore drives while minimising the capital development required. A minimum separation of 30 m was maintained between permanent accesses and stopes.

For a typical panel layout recovery is 71% of the tonnes and 65% of the ounces.

16.5.3 Geotechnical Considerations

In areas where the RQD is less than 50, stope widths are reduced from 15 m to 11 m to improve stability.

Drives have been orientated to reduce the likelihood and severity of wedge failures in the backs and walls.

16.5.4 Mine Design Criteria

The decline is mined to a 5.5 m W x 6.0 m H arched profile and access drives to a 5.0 m W x 5.5 m H arched profile. Ore drives are mined to a 5.0 m W x 5.0 m H rounded shoulder profile. This allows enough space for services, secondary fans, vent ducts and mobile equipment.

Stoping panels were designed based on the main considerations below:

- Ore drives placed at 20 m centres to allow for 15 m wide stopes with 5 m yielding pillars between them. In areas of RQD<50 ore drives are placed at 16 m centres, allowing for 11 m wide stopes with 5 m yielding pillars between them. There are no secondary stopes designed to be extracted following the mining of the primaries;
- Ore drives positioned such that they have a gentle uphill gradient for water drainage but not orientated for a long distance on a 350° bearing, parallel to the strike of many of the faults present, to maintain drive stability;
- Regional pillars of 25 m width and containing no development are designed between panels. A 60 m wide regional pillar is maintained around the permanent declines;
- Hydraulic radius of each panel is limited to 25 m where possible but never exceeds 30 m; and
- Panel accesses designed in conjunction with primary ventilation return loops and secondary egress routes, and positioned such that they will stay intact following stoping of nearby areas.

The assumptions made for ore loss and dilution in stopes are documented in Table 15-5.

16.5.5 Mine Production Schedule

Scheduling Method

Underground mine scheduling is undertaken using *Deswik Sched* software. After establishing task dependencies, mining priorities, task and resource rates and capacity constraints the schedule is generated using the software’s auto-scheduler.

Scheduling Objectives

The schedule aims to:

- ensure monthly stoping rate is consistent;
- ensure monthly development advance is consistent; and
- maintain a sufficient number of active headings and stopes to meet the desired developing and stoping rates.

Scheduling Parameters and Assumptions

Key schedule assumptions are noted in Table 16-15.

Table 16-15: Key underground schedule assumptions

Parameter	Units	Value
Maximum single heading advance rate (decline)	m/month	80
Maximum single heading advance rate (non-decline)	m/month	60
Maximum advance rate per development jumbo	m/month	240
Maximum drilling rate per automated LH drill	m/day	350
Maximum productivity per remote loader	t/day	1592

16.5.6 Underground Mining Schedule Results

A summary of the scheduled physicals is presented Table 16-16.

Table 16-16: Schedule physicals

Schedule Physical	Units	Year 2024	Year 2025	Year 2026	Year 2027
Total Ore Tonnes	kt	763.4	978.3	788.8	433.5
Total Ore Grade	g/t Au	1.98	2.13	1.87	1.78
Total Mined Ounces	koz	49	67	48	25
Total Mill Ounces	koz	38	55	38	18
Total Waste Tonnes	kt	377.7	249.1	23.8	3.6
Total Movement Tonnes	kt	1,141.0	1,227.4	812.5	437.0
Stope Ore Tonnes	kt	454.0	590.4	743.4	427.4
Stope Ore Grade	g/t Au	1.86	2.01	1.86	1.77
Stope Ore Ounces	koz	27	38	44	24
Development – Lateral	m	9,520	9,351	1,015	147
Devt Ore Tonnes	kt	309.4	387.9	45.3	6.1
Devt Ore Grade	g/t Au	2.15	2.31	2.17	2.38
Devt Ore Ounces	koz	21	29	3	1
Production Drill	m	120,763	112,109	120,577	64,337
Cable Drill	m	35,952	55,296	58,656	37,872
Total Haulage	tkm	1,968,908	2,603,675	1,659,722	760,452

16.5.7 Mining Fleet and Requirements

General Requirements and Fleet Selection

The mine fleet used is a mix of new plant and plant relocated from Fraser's Underground as that mine nears completion and plant becomes available.

Drive Development

Development is done by Sandvik DD420 and DD421 twin boom drill jumbos, taking 3 m rounds and installing friction bolts and mesh in the backs and walls. A Normet Spraymec and Normet Concrete Agitator truck are used to apply shotcrete in areas of friable ground and a Normet Charmec is used to load development face blast holes.

Stope Drilling & Blasting

A Sandvik DS420 Cable Bolter is used to install cable bolts at planned brow positions in ore drives. A Tamrock Solo 7 and Sandvik DL432 are used to drill blind up holes for stope production. A Normet Charmec is used to load production blast holes.

A summary of the designed drill and blast parameters are shown in Table 16-17.

Table 16-17: Underground drill and blast parameters

Parameter	Unit	Open Stope 11 m wide	Open Stope 15 m wide
Drill type (model) used	-	Tamrock Solo 7-7V Sandvik DL432	Tamrock Solo 7-7V Sandvik DL432
Hole diameter	mm	64	76
Ring Burden	m	1.4	1.8
Toe Spacing	m	1.8	2.2
Blasting powder factor	kg/m3	0.35	0.30

Loading

The primary mine loading fleet consists of Sandvik LH517 LHDs. These will remove ore from stopes on remotes, bog out development headings and load trucks.

Hauling

The underground haulage fleet consists of Sandvik TH550 & TH551 articulated rear dump trucks.

Ancillary Equipment

Ancillary equipment is used to support the primary production fleet. Key ancillary equipment includes:

- a Caterpillar 12H motor grader;
- Normet Charmec charge-up vehicles;
- Volvo L120 integrated tool carriers, and
- Jacon flatbed truck.

The underground equipment requirements by year are shown in Table 16-18.

Table 16-18: Major underground equipment fleet by year

Equipment Model	2024	2025	2026	2027
Drills – Sandvik DD420/DD421	4	4	1	1
Drills – Tamrock Solo7/Sandvik DL432	2	2	2	2
Drills – Sandvik DS420	2	2	2	2
LHDs – Sandvik LH517	4	4	4	3
Trucks – Sandvik TH550/TH551	4	4	4	2
Charge Vehicle – Normet Charmec	2	2	2	1
Shotcrete Sprayer – Normet Spraymec	2	2	2	1
Shotcrete Agitator Truck – Normet Transmix/Komatsu HM300	3	3	3	2
Shotcrete Agitator and Sprayer combination unit – Jacon Transmix Combo	1	1	1	1
Grader – Caterpillar 12H	1	1	1	1
Integrated Tool Carrier – Volvo L120	5	5	5	4
Service Truck – Jacon flat deck	1	1	1	1
Water Truck – TRex	1	1	1	1

16.5.8 Mine Ventilation Requirements

The ventilation requirements for the key mobile equipment used are shown in Table 16-19. This is based on a minimum air quantity requirement of 0.05 m^3/s per kW of maximum engine power. Equipment numbers shown are maximum concurrent units within mine life.

Table 16-19: Mine ventilation requirements

Equipment Item	Engine Power (kW)	Number Utilised	Ventilation Requirements (m3/s)
Sandvik TH551	515	4	103
Sandvik LH517	310	4	62
Caterpillar 12H Grader	104	1	5
Volvo 120E (IT)	180	3	27
Total			**197**

The primary fans required for the life of mine (3 x 250 kW) are installed on the surface at the ventilation return portal and the initial primary ventilation circuit is established. Fresh air is drawn through the main portal and down the haulage decline.

16.5.9 Mine Services

Water

Mine water is sourced from the Round Hill pit sump. Water services are run into the portal via a single 110 mm PN16 polyethylene pipe. Pressure reducers are placed along the length of the pipe where required. Panel accesses are serviced by 110 mm PN16 pipe branching off the decline, ore drives are serviced by 63 mm polyethylene pipe branching off the access.

The main pumping system currently consists of 2 x WT103 helical rotor pumps placed side by side pumping into a 160 mm PN16 polyethylene pipe to the Round Hill pit sump. The planned mine extents will necessitate two additional pumping locations - one at the bottom of the mine and one mid-way between this and existing pump cuddy. The pump cuddies will be linked in series to the cuddy above and each contain 2 x WT103 helical rotor pumps feeding a 160 mm PN16 polyethylene pipe.

Compressed Air

Compressed air is supplied to the portal via a 110 mm PN16 polyethylene pipe from a compressor and receiver on the surface. 110 mm pipes are used in declines and access and 63 mm pipes used in ore drives to distribute compressed air to the working areas.

16.6 Combined Open Pit and Underground Production Schedule

The combined open pit and underground ore processing schedule is shown in Table 16-20.

Table 16-20: Combined open pit and underground ore processing schedule

	Units	2024	2025	2026	2027	LoM
Open Pit Schedule						
Total Ore Milled Quantity	Mt	5.59	5.46	5.67	2.84	19.55
Total Milled Gold Grade	g/t Au	0.62	0.74	0.69	0.43	0.65
Total Milled Contained Gold	koz	111	130	126	39	406
Underground Schedule						
Total Ore Milled Quantity	Mt	0.79	0.98	0.79	0.43	2.99
Total Milled Gold Grade	g/t Au	1.97	2.13	1.87	1.78	1.97
Total Milled Contained Gold	koz	50	67	48	25	189
Combined Open Pit and Underground						
Total Ore Milled Quantity	Mt	6.37	6.44	6.46	3.27	22.54
Total Milled Gold Grade	g/t Au	0.78	0.95	0.84	0.61	0.82
Total Milled Contained Gold	koz	161	196	174	64	595

17 Recovery Methods

17.1 Ore Mineralogy

Gold is mostly present as microbleb particles <10 µm in sulphide grains or adjacent to grain boundaries, principally within pyrite and arsenopyrite. This gold is partially refractory with up to 20% not readily recoverable by standard cyanidation methods when reground to 15 µm. Up to 90% of the gold can be readily recovered to a sulphide flotation concentrate with the flotation losses associated with poorly liberated sulphide particles or locked in non-sulphide gangue. Pressure oxidation in an autoclave is used to break down the sulphide grain structure to make the contained gold particles amenable to cyanidation with leach recoveries on the autoclaved concentrate typically 95%.

The Macraes ore also contains a carbonaceous fraction. Coarse grained ores tend to contain less organic carbon, while finer grained ores contain higher levels of carbon. The carbonaceous material has a negative impact in the CIL circuit, adsorbing some of the dissolved gold from the CIL circuit liquor; this effect is not uncommon and is termed 'preg-robbing'. The carbonaceous material is typically recovered to the flotation concentrate, although its flotation kinetics are slower than those of the sulphide minerals, so that carbon recovery is generally lower than sulphide recovery. The soft carbonaceous material also tends to smear on the gangue components of the ore, imparting some degree of hydrophobicity increasing the recovery of non-sulphides in the flotation concentrate. Experience at Macraes and at other plants worldwide indicates that the autoclave pressure oxidation under normal oxidising conditions tends to further activate the carbonaceous material. Macraes has adopted technology developed by Newmont Limited of the US that allows passivation of the carbonaceous material by introducing limestone into the feed to the autoclave. This, along with the use of a blinding agent in the CIL circuit and judicious management of the activated carbon in the CIL circuit has provided an effective means of controlling and mitigating the preg-robbing effect.

17.2 Plant Description

The Macraes Process Plant recovers gold by concentrating the metal into a relatively small fraction of flotation concentrate, regrinding the concentrate to a P80 of 15 µm, oxidising the reground concentrate in a pressure oxidation autoclave, washing the oxidised residue and then utilising a carbon-in-leach process to recover gold from the residue. The overall process flowsheet is shown in Figure 17-1.

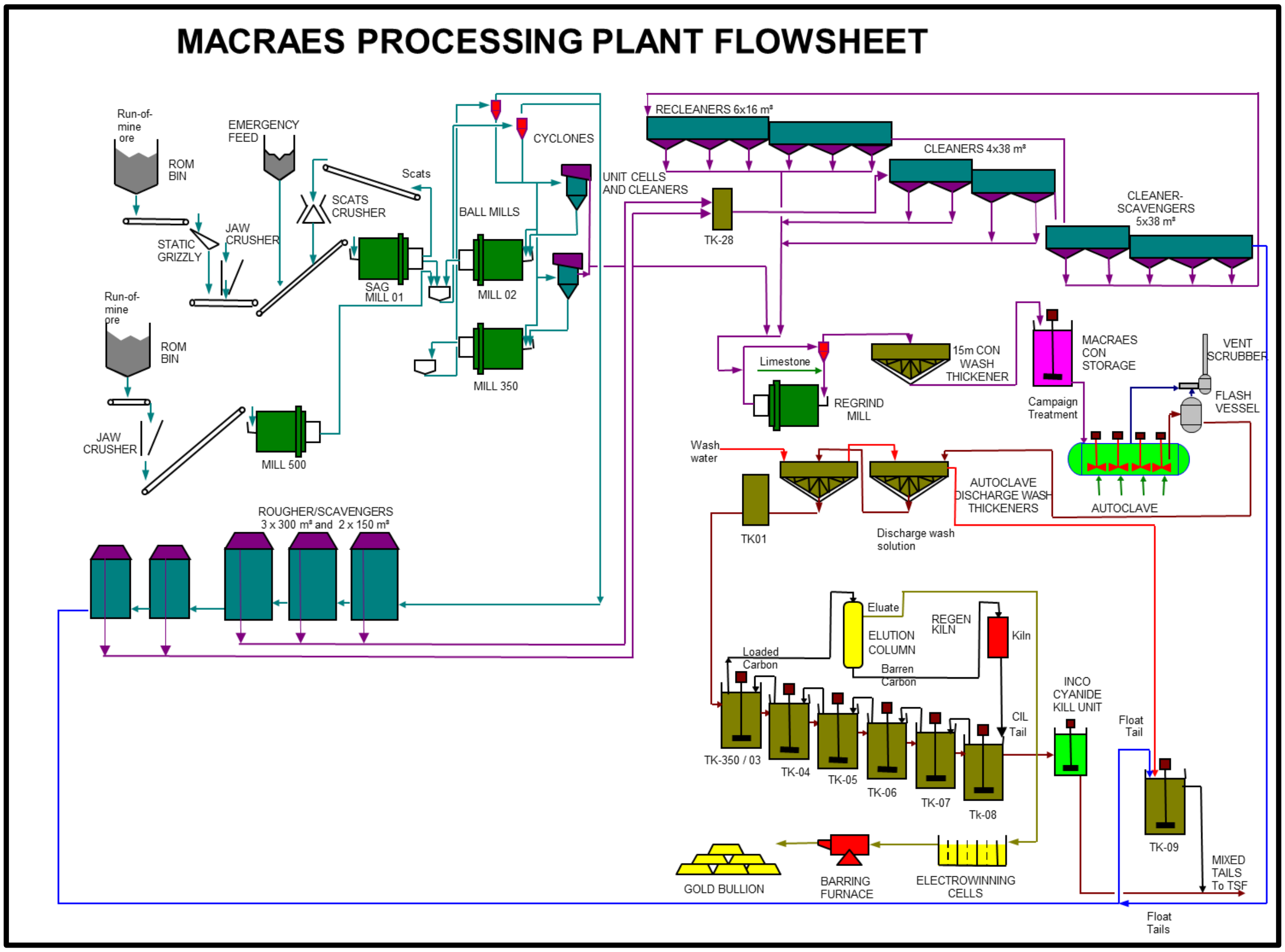


Figure 17-1: Macraes process plant flowsheet

In detail the plant comprises the following components and stages:

- Two single stage jaw crushing circuits, which reduce the ore to a top size of approximately 200 mm; the products from these two circuits are directly fed to the two SAG mills and an emergency feeder on the conveyor system feeding the higher capacity circuit provides continuity of feed to the grinding circuit if the jaw crusher feed is interrupted;
- A complex grinding circuit to reduce the particle size of the ore to 80% passing at 130 µm; the original, higher capacity crushing circuit feeds a 2,300 kW SAG mill and the new crushing circuit feeds a 1,500 kW SAG mill; discharge from the two SAG mills is combined with the discharge from one of the two ball mills (2,300 kW) and directed to the primary cyclone cluster. Discharge from the higher capacity ball mill (2,500 kW) is fed to the secondary cyclone cluster. The underflows from both cyclone clusters are combined and fed in parallel to the flash flotation circuit and two ball mills (2,300 kW and 2,500 kW);
- Re-introduction of an impact crusher on the pebble recycle stream from the SAG trommel screen to reduce the recycle of competent material;
- A flash flotation circuit made up of roughing and cleaning stages. The circuit is fed from the circulating load of the grinding circuit via cyclone underflows to recover the bulk of fast floating sulphide minerals

containing high gold content in the coarser size fraction utilising two Outotec SK-500 flash flotation roughers and two Outotec TC-6 cleaner cells;

- The main flotation circuit made up of roughers, scavengers, cleaners, recleaners and cleaner scavenger flotation cell trains to produce a gold bearing sulphide concentrate at optimum sulphur grade for the downstream pressure oxidation circuit;
- Regrind of the flotation concentrate is performed in a 900 kW ball mill to 80% passing of 15 µm to improve pressure oxidation kinetics; limestone is added to the regrind circuit discharge to control net acid generation in the pressure oxidation circuit;
- Pressure oxidation is performed in a 77 m^3 autoclave operating at 3,150 kPa and 225°C to achieve greater than 96% oxidation of the sulphide component of the Macraes concentrate; oxygen is supplied to the autoclave from a cryogenic plant operated by BOC;
- Washing and thickening of the oxidised residue post the pressure oxidation (POX) process is performed in a two-stage counter current decantation thickener circuit to cool the temperature and dilute acidity of the hot oxidised residue, remove presence of iron and arsenic, and increase pulp density in preparation for downstream CIL process;
- Neutralisation of the acidic, cooled oxidised residue is conducted using quicklime in an agitated opened tank; solvent is also added to passivate the carbonaceous surfaces of oxidised residue;
- Leaching of the gold from the oxidised residue is performed in the CIL circuit using cyanide. The leached gold liquor is adsorbed by high concentrations of activated carbon to mitigate the impact of preg-robbing by the carbonaceous species in the ore;
- Destruction of the cyanide ions prior to CIL tailings disposal is performed using the INCO process with chemical reagents of sodium metabisulphite, source of sulphur dioxide (SO_2); and chemical reaction catalyst, copper sulphate;
- Tailings disposal after further neutralisation of the acidic liquor from the pressure oxidation process performed using flotation tailings and lime and then combined with CIL tailings after the INCO cyanide detoxification process and discharged into the tailings storage facility; and
- Recovery of concentrated, adsorbed gold from the loaded activated carbon is performed using the AARL elution process and single pass electrowinning circuit, followed by smelting to produce gold bullion.

The pressure oxidation process uses technology that minimises formation of gold chloride complexes in the autoclave. Formation of these soluble gold complexes in the presence of naturally occurring carbonaceous species has the potential to preg-rob soluble gold prior to contact with cyanide in CIL circuit. Minimising the chloride content in the reground concentrate is achieved through monitoring of the process and selection of key reagents with minimal chloride content in the flotation circuit. The acidity of the oxidised residue is controlled by the addition of limestone in the regrind circuit. The sulphur oxidation extent was designed to about 75% of the total sulphide present but more recently test work indicated that oxidation extent greater than 75% has enabled increased gold extractions in CIL to be achieved with increased throughput at high oxidation extents through the autoclave.

The process plant utilises a Yokogawa CentumVP DCS control system for all operational control. In addition, a number of analysers and systems complement the DCS to improve process control including:

- FLS LoadIQ mill load sensors on both the composite lined ML-500 and steel lined ML-01;
- FrothSense cameras to control the TC-300 scavenger flotation circuit;
- Courier 5i on stream analyser; and
- Gekko carbon scout to monitor key CIL circuit parameters.

17.3 Plant Performance

The Macraes process plant has been in operation since 1991 with progressive upgrades completed to debottleneck the plant and improve recovery. The current plant operating circuit has been in place largely unchanged since 2015 with an experienced workforce, maintenance strategies and planning teams in place. The process plant performance is fairly consistent with a well-established process for production planning in place to estimate mill utilisation, throughput, recovery and operating cost parameters.

Recent plant performance over the last 8 years is summarized in Figure 17-2 and Figure 17-3 below.

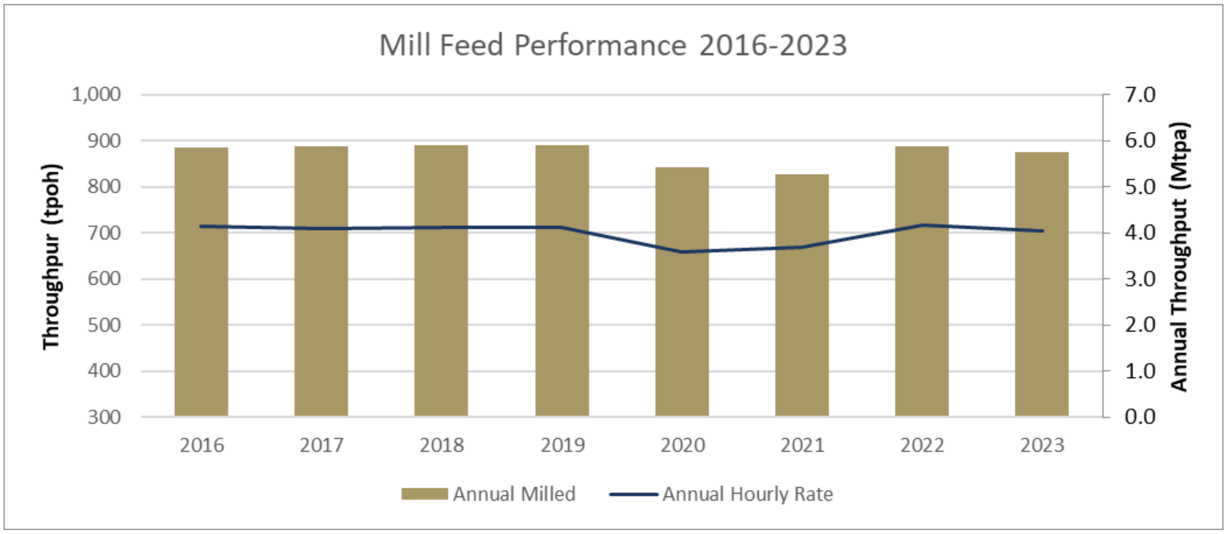


Figure 17-2: Actual milled tonnages and combined mill throughput

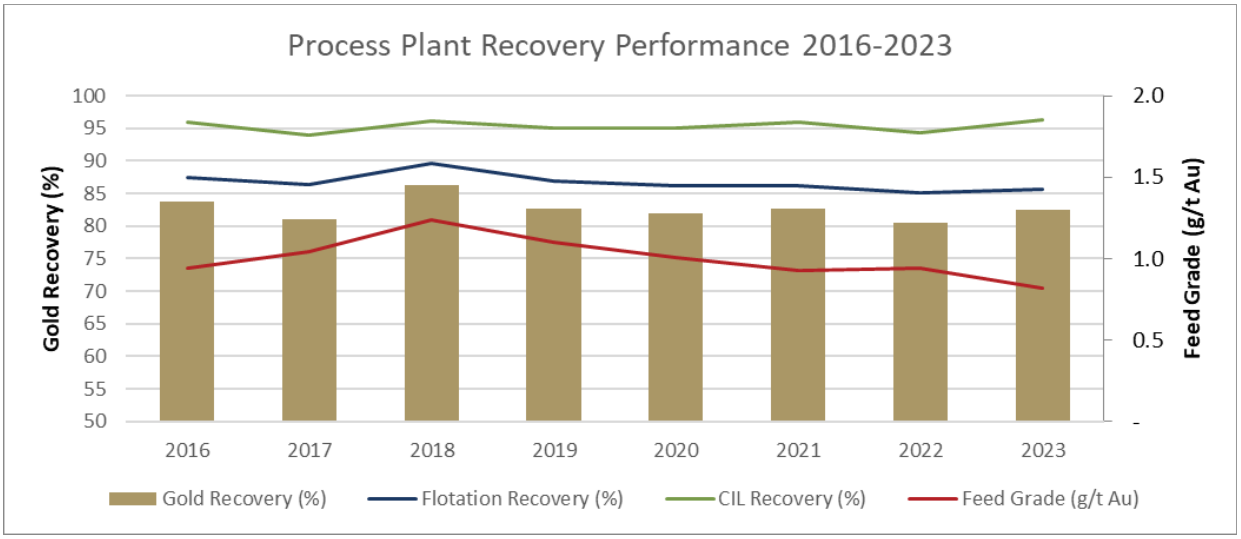


Figure 17-3: Actual overall circuit, flotation and CIL recoveries

Mill throughput since 2016 has generally targeted 5.7-6 Mtpa with variations in ore hardness and overall utilisation affecting the total tonnes milled. The exception to this was the impacts in 2020/21 from Covid-19 restrictions to site operations and the failure of the smaller ML-500 SAG mill motor in first half of 2021 reducing throughput by 0.4-0.6 Mt in these years. The throughput rate in terms of tonnes per operating hour (tpoh) over the year has been steady around 710 tpoh in these years.

Overall plant recovery of gold has been fairly consistent over the same eight-year period averaging 82.7% with a slight decrease in flotation recovery offset with improved CIL recovery from reduced preg-robbing impacts in the ore and autoclave control. Feed head grades have declined over the last five years without an appreciable impact on overall recovery and grind size has been maintained in the 120-140 µm range.

Since Q3 2022 the throughput rate has increased on a monthly basis to 768 tpoh in 10 of the 16 months following the installation of an impact crusher on the SAG mill scats recycle screen along with modifications to the SAG grates and ball mill classification circuit. In addition, the installation of the FLS LoadIQ sensor on the composite lined smaller ML-500 has allowed increased throughput with better charge load estimation increasing from an average 185 tpoh prior to 2022 to 220-240 tpoh since. Figure 17-4 below shows the monthly milled tonnes and throughput rate as the operation of the pebble crusher has matured. The drop in throughput in Q1 2023 was related to the detection of a crack in the ML-02 ball mill feed head leading to extended outage of the mill for a temporary repair followed by the downtime of this ball mill for the permanent repair in Q3. Outside of these periods milling rates in excess of the 6.4 Mt planned in the LoM has been exceeded (as represented by the red line).

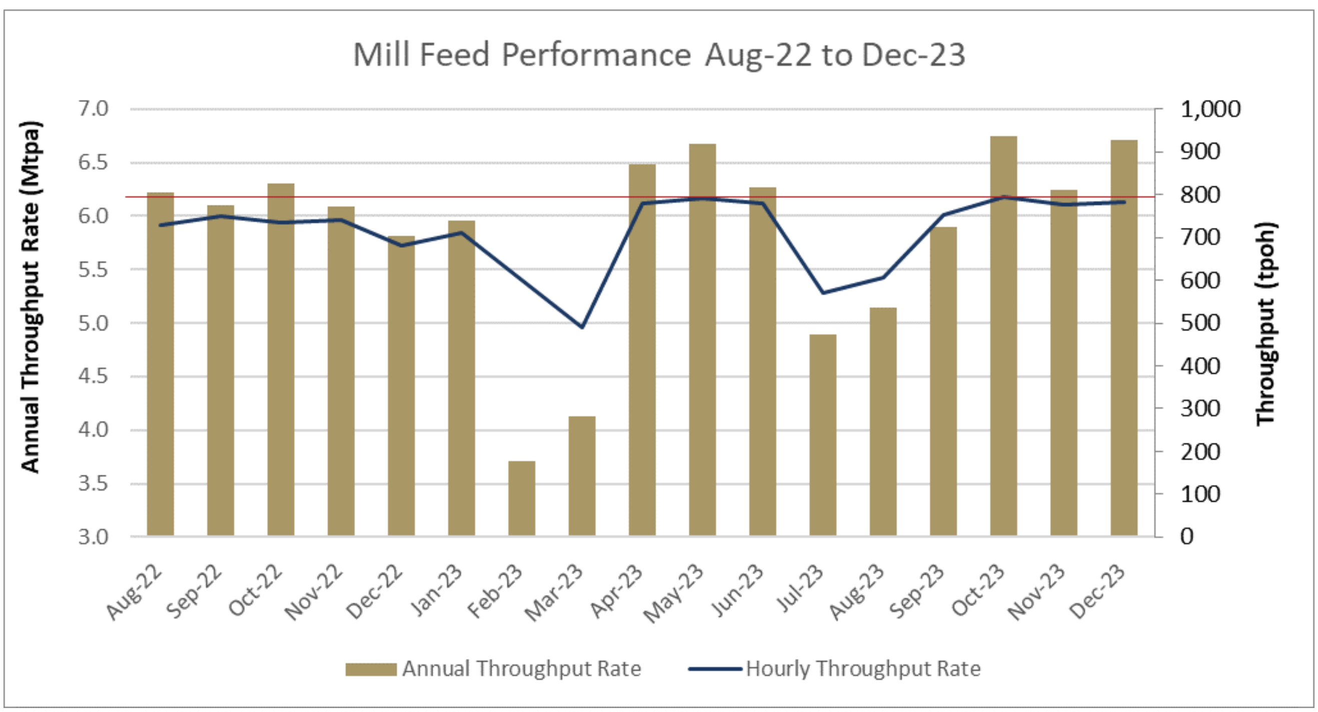


Figure 17-4 Mill throughput post pebble crushing installation

Overall mill utilization above 92.9% has been achieved over the eight-year period and in excess of 94.3% when the impacts of unplanned events of 2020/21 are excluded and is calculated on the tonnage weighted utilization of the two primary SAG mills. Unit costs over the last 8 years are shown in Figure 17-5 along with the budgeted unit cost. Overall, the process plant unit cost has averaged within 5% of the budget forecast over this extended period indicating a fairly robust process for estimating the unit cost. Process unit costs were higher in 2022/23 with an increased spend on critical spares inventory and increased condition monitoring programmes to address utilisation risk with the increasing age of the primary assets.

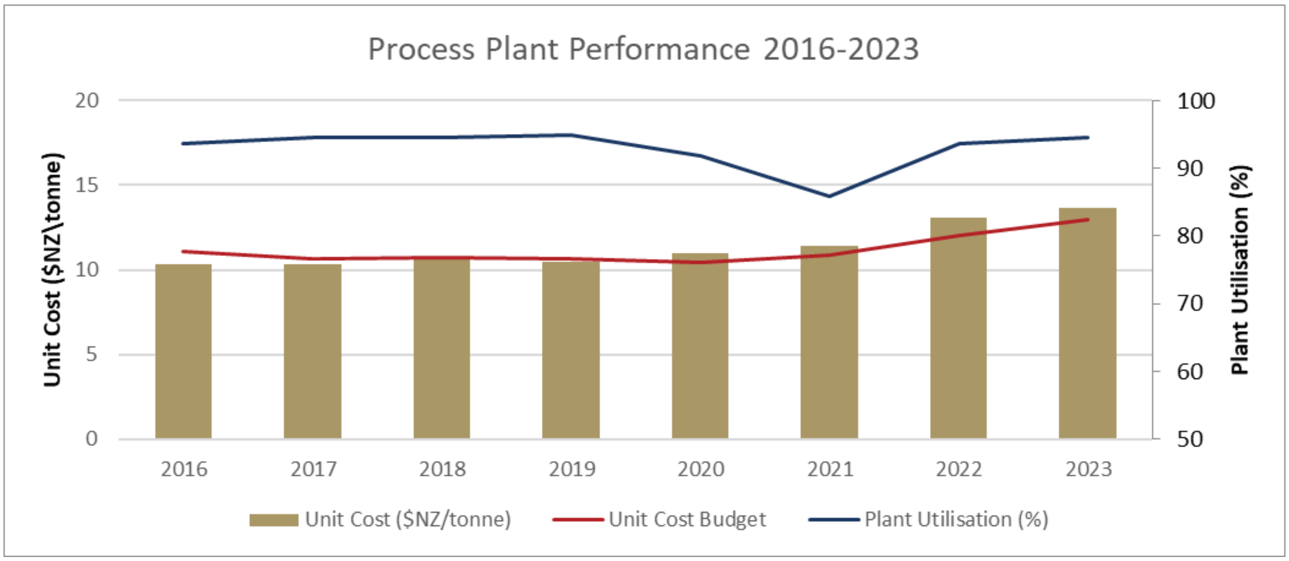


Figure 17-5: Overall mill utilisation and unit costs for 2016-2023

17.4 Oxide Ore Milling

Over the life of mine approximately 1.5 Mt of stockpile ore classified as oxide material at an average grade of 0.82 g/t Au will be processed. Historically oxide ore at Macraes was treated primarily in dedicated campaigns with ore fed to the grinding circuit sent direct to the CIL circuit. This was the case up to 2003 when the second SAG mill was installed as a dedicated oxide circuit as the overall primary milling capacity when dedicated to oxide exceed the CIL circuit regeneration and carbon management capacity. From 2003-2005 oxide ore was milled by the ML-500 SAG mill in closed circuit and the product send direct to CIL with three of the CIL tanks dedicated to the oxide ore and three to POX material with a combined final tank to provide 18 hours of residence time. ML-500 was then converted to operate in an open circuit configuration on sulphide ore increasing the plant capacity from 5.4 Mtpa to 5.9 Mtpa.

Classification and testwork on some of the oxide stockpiles has identified material that can recover up to 70% of the gold into a flotation concentrate and in 2024 it is planned to add this source as up to 15% of mill feed to utilise the available mill capacity rather than accelerate milling of lower grade sulphide material to bring cashflow forward from the stockpiled resource. It is not planned to convert the ML-500 SAG mill back to a dedicated oxide processing circuit during the remaining LoM plan.

17.5 Process Costs

Process costs are derived from a first principals model based on drivers developed against milled tonnes, operating hours and fixed cost components. Drivers for key consumables are benchmarked against plant consumption rates and unit prices are derived from current supply contracts and exchange rate assumptions. Table 17-1 outlines the key consumables used in the process plant along with the relevant throughput driver and consumption rate.

Table 17-1 Consumable consumption rates

Reagent	UOM	Rate
SIBX	kg/Total Mill Tonnes	0.1635
CMS41	kg/Total Mill Tonnes	0.003
Flotanol 60	kg/Total Mill Tonnes	0.0031
Flotanol 63500	kg/Total Mill Tonnes	0.0063
Soda Ash	kg/Total Mill Tonnes	0.0625
Copper Sulphate	kg/Total Mill Tonnes	0.06
	kg/Total CIL Feed tonnes	0.31
Cyanide	kg/Total CIL Feed tonnes	2.6
	kg/Oxide CIL Feed tonnes	6
Activeaed Carbon	kg/Total CIL Feed tonnes	0.229
Antiscalent, Milsperse 830P	Vstrip	5.1
Casutic Soda	Vstrip	262
LPG	Vstrip	928
Nitric Acid	Vstrip	89
Quicklime	kg/Total Mill Tonnes	0.159
	kg/Total CIL Feed tonnes	10.7
	kg/Oxide CIL Feed tonnes	6
Sodium Metabisulphite	kg/Total CIL Feed tonnes	2.5
Limestone	kg/MGM Flot Con tonnes	1.044
Antiscalent, Millsperse 806P	Vtotal Mill tonnes	0.0003
Antiscalent, Antiprex 100	kg/Total Mill Tonnes	0.0003

A long-term maintenance schedule is used to forecast relines and major rebuilds of equipment and to calculate plant operating hours. Contractor hours and maintenance consumables are calculated for each process area based on operating hours.

The key processing metrics over the life of mine plan are outlined in Table 17-2. Mill throughput is maintained at 6.3 Mtpa up until Q3 of 2027 when milling operations will cease.

Table 17-2: Life of mine processing metrics

	Unit	2024	2025	2026	2027
Milled Tonnes	kt	6,374	6,436	6,456	3,274
Sulphide Feed	kt	5,415	6,436	6,456	3,092
Oxide Feed	kt	958			182
Feed Grade	g/t Au	0.78	0.95	0.84	0.61
Gold Recovery	%	78	79.87	80.5	73.43
Unit Cost	NZD/t	13.40	12.36	10.83	11.83

18 Project Infrastructure

18.1 Roads

18.1.1 Site Access Roads

The site is well serviced with existing bitumen road connections to the west (Middlemarch & Ranfurly) and to the east (Palmerston, Dunedin, Christchurch).

The Macraes-Dunback Road, which is the main road into the site, was realigned in 2020 to allow access to Frasers West. This realignment consists of a bridge to cross the mine haul road and about 2.4 km of new public road pavement.

18.1.2 Mine Haul Roads

The site already has an established haul road network to connect the pits to the waste rock stockpiles, ore stockpiles and the process plant. Some additions to this network will be required when new mining areas are developed.

Haul roads are generally constructed from materials already available on site and using the site mining equipment.

18.2 Mine Services Facilities

18.2.1 Open Pit Mine

All major facilities are in place and no significant new construction is required during the current mine life. A Hitachi EX3600 electric shovel was purchased during 2023 which resulted in additional power infrastructure for the open pit. The electric shovel is expected to be commissioned in early 2024. Minor support infrastructure will be required for new pits, for example lunchrooms for operators and portable fuel tanks.

Maintenance Workshops

The primary maintenance facility is located about 1.3 km south of the processing plant. This facility consists of a fully enclosed multi-bay heavy vehicle workshop, boilermaker bay, light vehicle workshop, parts and component storage, tyre maintenance and repair facility, wash-down facility, and offices.

Offices

Open pit management and technical services staff are located at the main administration office located on Golden Point Road.

18.2.2 Underground Mine

All major facilities are in place and no significant new construction is required during the current mine life.

Maintenance Workshops

The maintenance facility consists of an enclosed workshop with a service pit, boilermaker bay, parts storage and a wash-down facility.

Concrete Batching Plant

The site includes a self-contained Simen Zingo Plus 50 m^3/hr concrete batching plant. This plant is portable and is primarily used for fibrecrete batching. Aggregates are sourced from suppliers within Otago.

Offices

Management and technical services staff are located within the main underground infrastructure area.

Electricity

The underground mines require electricity for ventilation, pumping and drilling. Electricity is supplied underground at 11 kV which is stepped down to 1,000 V for the underground equipment with a series of transformers located at various points within the underground workings.

Frasers Underground electrical supply is fed underground via a raisebored air rise. The mine is in retreat phase and requires about 250 kW of electricity.

Golden Point Underground electrical supply is fed underground via the haulage portal. This mine currently consumes 1.2 MW which will increase to 1.5 MW as the mine expands.

Ventilation

The 550 kW primary ventilation fan previously located in Frasers Underground has been removed as the mine retreats. This has been replaced by two 90 kW fans mounted in parallel in a bulkhead. Fresh air is drawn into the mine through the haulage portal and exhausts through a shaft back to surface.

Golden Point Underground has 3 x 250 kW fans located on the surface at the ventilation return portal. Fresh air is drawn through the main portal and down the haulage decline. Currently only two of the fans are required. The third will be turned on as the primary ventilation circuit extends.

Secondary and auxiliary ventilation uses a series of axial fans and ventilation ducts to achieve a minimum of 6.1 m^3/s of fresh air at each working face.

18.2.3 Assay Laboratory

An on-site assay laboratory is operated by SGS and is accredited to ISO standards. This facility consists of sample preparation and fire assay capabilities. The lab runs on a 24 hr /7 day a week basis and can process a nominal 900 samples per day.

18.2.4 Fuel Storage and Dispensing

Diesel fuel is transported to site using road tankers. Total site diesel storage capacity is about 400,000 L, which represents about 6 days of consumption. Substantial diesel supplies are available at Port Chalmers in Dunedin, and this is the primary buffer to supply chain disruptions.

Site dispensing is primarily through an electronic tag system for each authorised equipment item. Secondary dispensing occurs via the site fuel trucks.

18.2.5 Explosives

Red Bull Powder Company Ltd have an on-site emulsion plant, with a capacity of about 10,000 tonnes of emulsion per year. Other precursor ingredients and ready-made explosives are delivered and stored on-site shown in Table 18-1.

Table 18-1: Explosives used on site

Explosive Type	Where Used	Origin
Blast initiation	OP & UG	Delivered ready-made, stored on site
Bulk emulsion	OP	Manufactured on-site
Heavy ANFO	OP	Manufactured at the delivery point from AN prill and site sourced emulsion
ANFO	UG	Pre-mixed bulk bags
Packaged (various types)	Primarily UG	Delivered ready-made, stored on site

18.2.6 Electrical Power

Electricity requirements on site are serviced by the national grid. Most power comes from Ranfurly on a 66 kV line, and a secondary connection is available from Palmerston on a 33 kV line. Incoming power is transformed down to 11 kV for distribution around the site.

The incoming transmission line capacity is currently 37 MVA but is currently limited to 28 MVA due to upstream equipment limits. The Macraes site currently requires 22 MVA, most of the site demand is from the process plant and underground mine.

18.2.7 Communications

The site has various communications connections:

- Fibre optic connections for voice and data;
- Mobile phone coverage to offices; and
- Mobile radio network that covers the entire open pit mining area and the underground mine via a leaky feeder system.

18.3 Tailings Storage

18.3.1 Design Criteria

All tailings' embankments and impoundments at the Macraes site are designed and operated in accordance with guidance provided in the New Zealand Dam Safety Guidelines published by the New Zealand Society on Large Dams (NZSOLD) and in alignment with the Global Industry Standard on Tailings Management (GISTM) published by the International Council on Mining and Metals, United Nations Environmental Programme and Principles for Responsible Investment. Design requirements are related to the Potential Impact Classification (PIC). The Top Tipperary TTSF (TTTSF) has been previously assessed as 'High' based on the criteria in the New Zealand Dam Safety Guidelines. While the Frasers TSF (FTSF) Stage 1 detailed design and PIC has not yet been completed, it is expected that this will be a 'Low' classification dam.

NZSOLD require a minimum factor of safety of 1.5 under static loading conditions and this is adopted for design.

For earthquake design, NZSOLD state that medium and high impact potential dams must be designed to two levels of earthquake, the Safety Evaluation Earthquake (SEE) and the Operating Basis Earthquake (OBE). For the TTTSF, the OBE has been taken to be the 1 in 150-year return period earthquake and the SEE as the one in 10,000-year return period earthquake.

In terms of flood protection, the storage facilities are required to be designed and operated to completely contain the runoff from a 48-hour probable maximum precipitation (PMP) rainfall event with a 1.0 m freeboard. The PMP for this site if 0.761 m.

Settled tailings bulk density has been observed to increase over time as the tailings consolidate, and the void space reduces. Density parameters adopted for design purposes are:

- Year 1: 1.25 dry t/m3;
- Year 2-4: 1.30 dry t/m3; and
- Year 5 onwards 1.35 dry t/m3.

18.3.2 Existing Facilities

There are currently three tailings storage facilities (TSF) at Macraes. Two of the TSF's are progressing towards closure, namely the Mixed Tailings Impoundment and the SP11 Impoundment as shown in Figure 18-1.

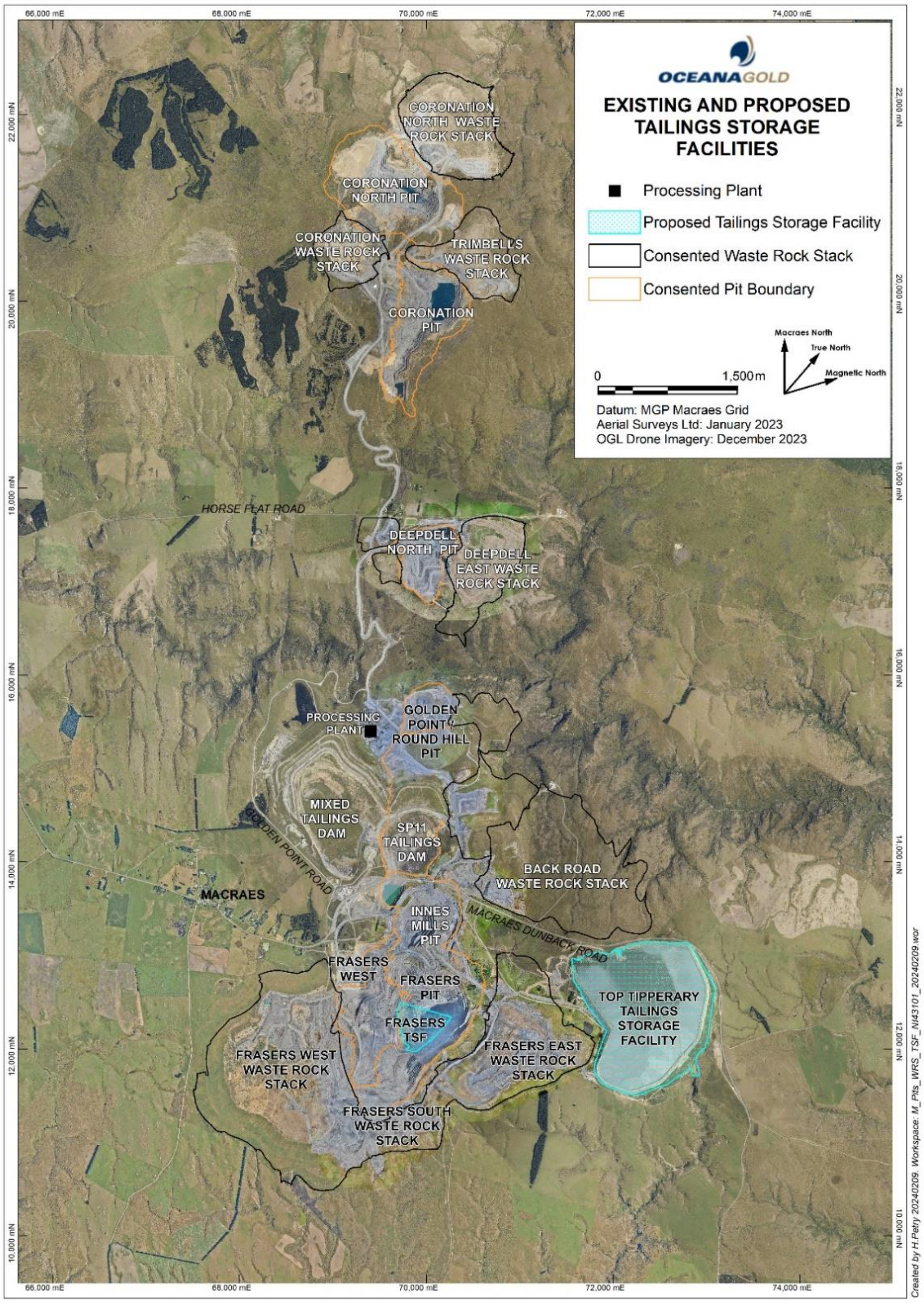


Figure 18-1: Existing and proposed tailings storage facilities

The currently active facility is the Top Tipperary TSF (TTTSF), which has been the primary point of discharge since 2011. The currently consented crest height of this facility is 568 m RL.

The TTTSF crest height was approximately 566 m RL at the end of 2023, and the company is in the process of consenting an extension to 570 m RL. The extended TTTSF is expected to have sufficient storage volume to support processing operations into 2025.

18.3.3 New Facilities

The Frasers open pit void is planned to store tailings when the TTTSF is full, with estimated capacity to well beyond 2030.

Figure 18-1 shows existing and proposed tailings storage facilities.

Table 18-2: Future tailings storage options

Name	Crest Level (m RL)	Remaining Volume Capacity (Mm3)	Remaining Tonnage Capacity (Mt)	Comment
Top Tipperary 570mRL	570	3.0	4.1	This will bring the total storage of tailings at TTTSF to 49.6 Mm3 or 67.0 Mt
Frasers Open Pit	480	24.1	32.5	High initial head for return water pumping. Timing reliant on mining completion. Storage is based upon tailings filling to 420 m RL

The FTSF is being consented as a staged development. Stage 1 resource consent application was submitted in late 2023 and the detailed design is currently progressing towards submission in Q1 2024. The Stage two resource consent application is being finalised for submission in Q1 2024.

18.3.4 Tailings Deposition Plan

The deposition plan for this schedule is two-fold:

- complete the TTTSF 568 and 570 m RL; then
- dispose tailings into FTSF until the end of the mine life.

For the planned tailings deposition quantities, the deposition quantities are shown in Table 18-3.

Table 18-3: Tailings deposition plan

Year	Source	Destination	
	Milled Tails (Mt)	TTTSF (Mt)	Frasers TSF (Mt)
2024	6.4	6.4	
2025	6.4	1.0	5.4
2026	6.4		6.4
2027	3.3		3.3
Total	**22.5**	**7.4**	**15.1**

Construction of the FTSF is planned to commence in 2024.

18.4 Water

18.4.1 Surface Water Management

Water used for mining purposes is predominantly dust suppression water for the site haul roads. This water is typically sourced from pit and waste rock stack runoff water that is collected in sumps and pumped to storage ponds.

Stormwater runoff water is diverted away from the active mining areas where possible. All water that cannot be diverted is collected and used for dust suppression as a priority. Excess water is pumped into the overall site water system.

Where there is excess stormwater collected on site, this is disposed of in two ways:

- evaporated with surface sprinklers during summer months; or
- discharged into local waterways during periods of high flow in order to dilute any elevated sulphate or nitrate levels.

18.4.2 Underground Water Management

At Frasers Underground water used for mining is allowed to drain to the bottom of the mine which is no longer active.

At Golden Point Underground water used for mining activities flows under gravity back to sumps or is pumped to sumps using portable submersible electric pumps. From the sumps water is pumped by submersible electric pumps to high head helical rotor pumps, which in turn send water to the Round Hill Pit sump for re-use underground.

18.4.3 Process Plant Water Management

Water required for processing purposes is primarily sourced from the decant pond at the tailings storage facility. Additional make-up water is required to allow for water contained within the tailings and that lost in evaporation. Most make-up water is sourced from the Taieri River and this is stored in a large reservoir, sufficient to last during a summer drought period. Additional make-up water is sourced from various seepage collection ponds around the site.

19 Marketing Studies and Contracts

19.1 General

The mine has been operational continuously for the last 33 years and has current contracts in place for doré refining and other goods and services required to operate an underground mine and open pit mine.

Contracts are in place covering the provision of goods and services to support open pit and underground mining, transportation and refining of bullion, and the purchase and delivery of fuel, electricity supply, water supply, explosives and other commodities. These agreements conform to industry norms.

19.2 Bullion Production and Sales

A contract to refine the produced doré is with Perth Mint. This contract sets prices for transporting and refining the doré under conditions which comply with industry norms.

OceanaGold has agreements at typical industry benchmark terms for metal payables and refining charges for doré produced from the Macraes operations. Gold and silver bearing doré are shipped to an Australian refinery for further processing under a toll refining agreement.

19.3 Hedging and Forward Sales Contracts

OceanaGold has periodically entered short and long-term hedges, both on a company wide basis and directly for Macraes. Currently there are no hedging contracts in place for gold sales.

19.4 Contracts and Status

19.4.1 Open Pit Mining

Open pit and underground mining at Macraes are carried out by OceanaGold personnel using mining equipment leased or owned by OceanaGold. Leasing facilities are supplied by Caterpillar Financial. Mining equipment is maintained by OceanaGold and is supported by several OEMs or dealers:

- Terra Cat;
- Sandvik; and
- Cable Price Hitachi.

Tyres for rubber-tyred mobile mining equipment are sourced directly from local suppliers Tyreline Distributors Ltd (Michelin brand) and Bridgestone Firestone New Zealand Limited with a minimum number of branded tyres secured by a long-term supply agreement.

All the mining contracts in place and under negotiation are structured, and include terms and conditions and pricing arrangements, which comply or are expected to comply with industry norms.

19.4.2 Explosives

The supply of Ammonium Nitrate is provided by Orica Mining Service and mixing of explosives for mining is provided by Redbull Powder Company Limited under a contract through to September 30, 2026.

19.4.3 Diesel

Diesel is supplied by BP under a long-term contract. BP has been the supplier to the operation since 2012. The current contract expires 30 November 2024. OceanaGold has a 12-month diesel hedge in place for 80% of diesel volume.

19.4.4 Power Supply

Electricity is supplied by Genesis Energy Limited. The current contract expires 30 November 2024.

19.4.5 Water Supply

Water supply is provided via a water right take off agreement.

19.5 Bonds

Rehabilitation bonds are provided through the Oceana Gold Corporate Banking facilities. All bond values are approved by the relevant authority.

19.6 Comments on Market Studies and Contracts

In the opinion of the Qualified Persons:

- OceanaGold can market the doré products produced from the Project; and
- The terms contained within the sales contracts are typical and consistent with standard industry practice and are like contracts for the supply of doré elsewhere in the world.

20 Environmental Studies, Permitting and Social or Community Impact

20.1 General

Macraes currently has 222 permits which are operational or partially operational dating back to 1996. Table 20-1 summarises the type of permits and the relevant issuing authority.

Table 20-1: Operational permits at Macraes Mine

Type of Resource Consent	Number of Resource Consents	Issuing Authority
Land Use Consents	15	Waitaki District Council
	2	Waitaki District Council and Dunedin City Council
	33	Otago Regional Council
Water Permits	90	Otago Regional Council
Discharge Permits	67	Otago Regional Council
Discharge to Air Permits	6	Otago Regional Council
Building Consents	153	Waitaki District Council
Heritage Authorities	3	Heritage New Zealand
Wildlife Permits	3	Department of Conservation
Exploration Consents	1	Waitaki District Council
Mineral Rights (Mining/Exploration Permits)	2	New Zealand Petroleum and Minerals

Permits are managed in the corporate database, Inform, which includes tracking of obligations associated with issued permits and expiry dates. Where activities have not been completed within the life of the permit, renewals are sought from the relevant Authority.

20.2 Required Permits and Status

To achieve the current Life of Mine several major permits and renewals will be required. Table 20-2 provides a summary of these permits and the current status.

Table 20-2: Required permits and status

Activity Description	Types of Permits required	New/ Renewal	Status
Mining - Back Road Waste Rock Stack	Land Use Consent, Discharge Permit, Wildlife Permit	Renewal	Submitted Q3 20202
Mining – Fraser West Waste Rock Stack	Land Use Consent, Discharge Permit	Renewal	Submitted Q3, 20202
Mining - Golden Point Underground Extension	Land Use Consent, Discharge Permit, Water Permit	New	Submitted, Q4, 20203
Tailings – Tipperary Tailings Storage Facility Embankment Lift	Land Use Consent, Building Consent	New	Submitted Q4, 2023
Mining / Tailings - Continuity Consents	Land Use Consent, Discharge Permit, Water Permit, Building Consent, Wildlife Permit	New	Submitted Q4, 2023
Mining - Coronation Pit and Waste Rock Stack	Land Use Consent, Discharge Permit, Water Permit	Renewal	Submitted Q3. 2023
Macraes Phase 4	Land Use Consent, Discharge Permit, Water Permit, Building Consent, Wildlife Permit	New	Due for submission in Q1, 2024

The key risks and opportunities identified with future permitting at Macraes pertains to the evolving and continually changing expectations of the New Zealand Government, regional and local councils and expectations of iwi and the wider community.

20.3 Environmental Study Results

On-going permitting dictates the need for environmental studies to be required. The nature and scale of an activities requiring permitting determines the complexity of studies needed to fulfil the requirements of Assessment of Environmental Effects (AEEs) for resource consenting purposes.

Many consent applications require the submission of independent environmental assessments or studies to support the application in the following fields.

- Surface Water;
- Groundwater;
- Terrestrial Ecology;
- Aquatic Ecology;
- Erosion and Sediment Control;
- Geotechnical Stability;
- Noise and vibrations assessment;
- Air Quality assessment;
- Economic Effects;
- Traffic Effects;
- European Heritage & Archaeology; and
- Maori Heritage & Archaeology.

Smaller scale activities will require one or a number of the studies outlined above depending on the location and complexity of the activity. Typically, these studies are not as comprehensive as those required for the large-scale consent applications.

In almost all cases specialists are engaged to undertake the environmental studies. In cases where there is the potential to be challenged on issues, a third-party specialist is used to add further rigour to the studies outcome.

20.4 Environmental and Social Issues

There are two material issues related to environmental and social management currently experienced by the Macraes Mine:

- Land use; and
- Long term water quality.

These are both outlined in more detail below.

20.4.1 Land Use

With evolving expectations around the management of effects to biodiversity, OceanaGold has established covenants (i.e. parcels of land) for the purposes of conservation since 2012. Although these covenants are viewed as having a positive impact on biodiversity, the local farming community do not share this view and in 2017 chose to appeal the Coronation North consent, in part due to the establishment of covenants. Although the appeal was negotiated through mediation there remains an underlying tension between farming and conservation.

In 2018/2019 the University of Otago conducted a stakeholder study which sought the views of the farmers, the Councils, Dept of Conservation and the Mining Company, and endeavoured to draw out the fundamental values associated with land use held by each stakeholder. The study found that there are basically three views on land use (land as economic, land as biodiverse and hence protected, land as multifaceted), and although stakeholder groups aligned with values as expected, there was also a fluidity for individual stakeholders crossing into values that they were not traditionally aligned to. These findings remain in the community today.

With ongoing central and regional Government reforms including changes to the RMA, consenting policy and the proposed introduction of a new fast-track consenting regime outlined in section 4.7.1 as well as the recent introduction of a National Policy Statement for indigenous biodiversity, OceanaGold is working with landholders to minimise the potential for negative impacts on the business.

20.4.2 Long Term Water Quality

A recent focus from central and regional governments on managing effects on water quality from the dairy industry has led to targets being established for a range of contaminants including nitrate. Changes in environmental standards and expectations of water quality throughout New Zealand, notwithstanding current Government proposals to revisit aspects of previously signalled reforms in this area, are expected to result in a future lowering of contaminant limits in waterways. These limits are irrespective of whether the activity giving rise to discharge was already consented at a higher level.

To ensure that OceanaGold and the Macraes Operation remain ahead of these potential changes, and to lower the potential for non-compliance as a result of them, trials of passive water treatment systems are being undertaken should they be needed in the future.

20.5 Operating and Post Closure Requirements and Plans

Resource consents dictate operational requirements which are then translated to management plans. Currently at Macraes, operational management plans include the following items:

- Dust Management Plan;

- Noise, Vibration and Air Blast Management Plans;
- Operations, Maintenance and Surveillance Management Plans for Tailings Storage Facilities;
- Emergency Action Plans for Tailings Storage Facilities;
- Dam Safety Assurance Plan for the Top Tipperary Tailings Storage Facility;
- Closure Plan for the Top Tipperary Tailings Storage Facility;
- Waste Rock Stack Operations, Maintenance and Surveillance Plans;
- Erosion and Sediment Control Plans;
- Heritage Management Plan;
- Ecology Management Plans;
- Weed and Pest Management Plans; and
- Water Quality Management Plan.

These management plans are reviewed annually and updated on issue of new resource consents.

Post Closure requirements are detailed in resource consents and covered in the Assurance Bond (see section 20.6). A Contingency Closure Plan covers actions to be undertaken in the event of unplanned or forced closure.

20.6 Post-Performance or Reclamations Bonds

The Assurance Bond for Macraes is based on a calculation which includes the following:

- reclamation works to make good the site and comply with resource consent conditions. Reclamation works include all works outstanding for the next 12-month period;
- environmental monitoring to be conducted during the period of reclamation works and for a period of 20 years after the cessation of works; and
- closure risks which have been identified through a collaborative process and are based on current uncertainties or gaps in knowledge, including poor long-term water quality and geotechnical instability.

Assurance Bonds are held as bank guarantee for the quantum of the bond. Councils can draw on the bond facility at any time should it be deemed necessary. The bond quantum is divided between the three Councils with the territorial Councils (Waitaki District and Dunedin City) having responsibility for most of the reclamation works, whilst Otago Regional Council is responsible for the environmental monitoring and long term management of effects on water.

The current bond in place for 2022/2023 for the Macraes Site is NZD68.41 million with an estimate of NZD72.12 million for 2023/2024.

20.7 Stakeholder Engagement

Stakeholder engagement is an integral part of the Resource Management Act (RMA), and hence the resource consenting process. Although the RMA does not require engagement be conducted prior to the lodging of resource consent applications, it does require the Council's to engage with parties affected by the application.

At Macraes stakeholder engagement is undertaken, where possible, pro-actively i.e. prior to lodging of resource consent applications, in order to ensure that affected parties can voice their concerns and there is sufficient time to integrate these concerns into the Project Design.

Key Stakeholders for Macraes Gold Project are:

- The local Macraes Village community including surrounding farming families;
- The local and regional councils;
- Iwi with a special relationship to the area and their representative agents;
- Fish and Game, a community-based organization responsible for managing fishing and hunting resources;
- Department of Conservation; and
- Heritage New Zealand.

Aside from resource consent-based engagement, OceanaGold also endeavours to collaborate with stakeholders on areas where mutual benefits can be derived. Examples of such engagement include:

- Research on water, ecology and social science undertaken by University of Otago;
- Restoration of heritage sites in partnership with Middlemarch Historical Society and Heritage New Zealand;
- Foundational Sponsorship of the Waitaki Whitestone Geopark, with the Waitaki Whitestone Geopark Trust; and
- Partnership with the Macraes Community Incorporated on maintenance of the Macraes Village assets.

20.8 Mine Closure

A contingency closure plan has been developed which includes detailed calculations formulated for the purposes of the Assurance Bond (a consent requirement that includes risks associated with Closure) and the Rehabilitation Provision (see section 20.11). Closure concerns have been identified by the local community and, while a closure plan for Macraes Gold Project is well progressed, it is not yet available for community discussion.

The contingency plan indicates that for closure, open pits will be allowed to fill naturally with water, waste rock stacks will be rehabilitated to pasture for future grazing, consistent with the surrounding landscape.

20.9 Reclamation Measures During Operations and Project Closure

Rehabilitation activities are conducted concurrently with operations. To date (31 Dec 2023) approximately 619 ha of land has been rehabilitated to its final land use, which in most cases is land for pastoral purposes, while the remaining area requiring rehabilitation is 1,169 ha.

The current Rehabilitation Provision which allows for additional disturbance as part of Life of Mine activities has an estimated 920 ha of land required to be rehabilitated over a period of four years during Closure.

20.10 Closure Monitoring

A closure monitoring calculation has been developed as part of the Assurance Bond/Rehabilitation Provision. The calculation includes identifying resources and supervision needed for undertaking monitoring of surface water, groundwater, aquatic biota, dust, vegetation/rehab, geotechnical stability, tailing storage surveillance monitoring and review, and administration and miscellaneous costs. Cost estimates are updated annually and consider changes in consent conditions.

20.11 Reclamation and Closure Cost Estimate

The Rehabilitation Provision is updated annually for internal purposes to determine the financial liability associated with operations and closure. The Rehabilitation Provision differs from the Bond in that it estimates costs based on the Life of Mine of the operation, whereas the Bond assumes unplanned closure within the next 12 months.

The Rehabilitation Provision is currently NZD88.0 million, including a 10% contingency.

21 Capital and Operating Costs

21.1 Introduction

The capital and operating costs have been estimated to deliver the LoM production schedule and the process plant production. This section of the report presents and details the basis of the Capital and Operating costs estimates. All estimates are based on annual inputs of physicals and all currency is in NZ dollars (NZD) unless otherwise stated.

21.2 Capital Expenditure Estimates

21.2.1 Basis of Estimate

The range of accuracy for the capital cost estimate is +/- 15%.

The capital expenditure is required for the open pit, underground and processing activities to achieve the LoM plan. Most of the capital expenditure relates to pre-strip mining, underground capitalised decline costs, new tailings storage facility and new or refurbished mobile equipment costs. The capital cost estimate is based on a combination of equipment supplier quotations, supplier pricing and estimates based on previous costs for similar activities.

The cost to rehabilitate the site and long-term monitoring as well as the sale of excess landholdings are included in the estimates.

21.2.2 Labour Assumptions

The construction labour and equipment costs were included in the factors that were used in the estimation to account for installation costs or in the unit costs when applied.

21.2.3 Material Costs

All materials required for facilities construction are included in the capital cost estimate. Material costs include freight to the site. Material costs related to the Frasers TSF such as concrete, structural steel, piping and fittings, and electrical cable were included within the installation factors applied to the mechanical equipment costs.

Material cost related to the Frasers TSF, power infrastructure and planned access roads were determined by material-take off quantities from sketches/drawings and installation unit costs.

All earthworks' quantities were assumed to be in situ volumes, with allowance for swell, waste or compaction of materials. Industry-standard allowances for swell and compaction were incorporated into the unit rate.

21.2.4 Mine Capital Expenditures - Underground

This item accounts for the capital costs associated with the underground mine development, mining equipment fleet leases and support mine infrastructure and services.

The underground mine development costs were estimated based on the development quantities obtained from the reserves-only mine design and schedule and unit costs estimated by OceanaGold based on prior underground mining adjusted for the specific site conditions.

Mine equipment costs were estimated based on previous budgetary quotations sourced from OceanaGold's internal database and converted to an operating lease. Underground operating estimates are based on an owner-mining scenario.

Resource drilling for Measured and Indicated definition and Infill drilling has been included. Costs for conversion of Inferred Resources, not included in Mineral Reserve have not been included in the analysis.

21.2.5 Mine Capital Expenditures – Open Pit

This item accounts for the capital expenditure associated with the surface mine development, pre-stripping, mining equipment fleet, haul roads and support mine infrastructure and services. The initial capital expenditure for surface mining are shown in Table 21-1.

The site preparation and haul roads costs were mainly based on earthworks quantities estimated from the preliminary general site layout and sketched sections and unit costs sourced from OceanaGold's internal database.

The open pit pre-stripping costs were estimated based on the pre-strip quantities obtained from a preliminary conceptual mine design and schedule and costs estimated by OceanaGold based on prior surface mining.

Mine mobile plant costs were estimated based on previous budgetary quotations sourced from OceanaGold's internal database and converted to an operating lease. Estimates are based on an owner-mining scenario.

21.2.6 Infrastructure Expenditures

Infrastructure areas include:

- TSF embankment and water management system;
- Waste rock stack;
- Frasers TSF electrical and pumping infrastructure;
- Internal access roads;
- On-site general facilities; and
- External access road.

The costs associated with the internal access roads were based on earthworks quantities estimated from the preliminary general site layout and sketched sections and unit costs sourced from OceanaGold's internal database.

The sustaining capital expenditures for general and administrative functions have been estimated based on previous years expenditures.

21.2.7 Sustaining Capital

OceanaGold developed the sustaining capital expenditure estimate to account for underground mine development, mine equipment and TSF construction capital expenditure through the LoM, by applying the same estimating methodology.

21.2.8 Capital Expenditure Summary

Capital expenditures include the direct costs for project execution, as well as the indirect costs associated with design, construction and commissioning.

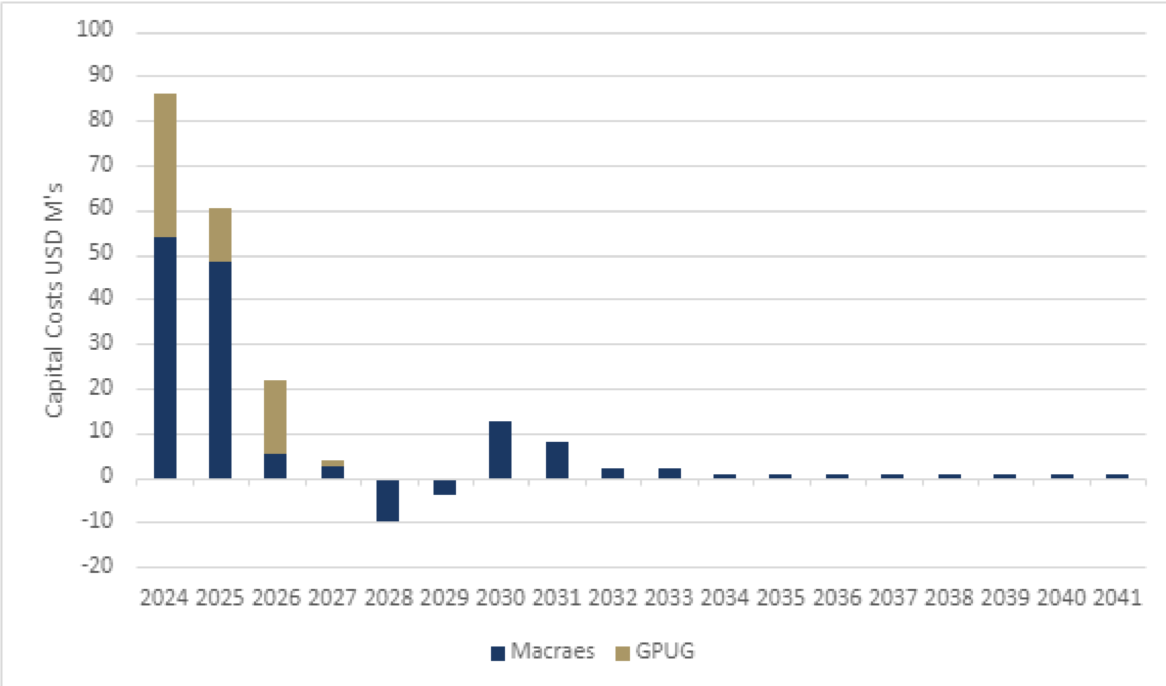
Indirect project capital expenditures include third-party consultants, construction facilities and services, equipment freight, vendor support. Percentage factors based on OceanaGold's experience with similar projects were used to determine indirect project costs, based on the project direct cost.

The capital expenditures including sustaining capital is outlined in Table 21-1 and shown by year in Figure 21-1.

Table 21-1: LoM capital expenditures initial and sustaining

Capital Expenditure	LoM Total (NZD M)	LoM Total (USD M)
Pre-Strip	90.7	56.2
Tailings	29.7	18.4
Mining Rehab/Closure	87.8	54.4
Underground Decline	89.4	55.4
Processing	9.9	6.1
Exploration	2.4	1.5
General Capital	37.7	23.5
Asset Sales	-44.3	-27.5
Total Capital Expenditure	**303.3**	**188.0**
Leased Vehicles		
Open Pit Mining Equipment	2.8	1.7
Underground Mining Equipment	5.9	3.6
Total Leased Mobile Equipment	**8.7**	**5.3**

Notes: Exchange rate – USD:NZD is 0.62.



Notes: Negative capital costs in 2028 and 2029 are due to asset sales.

Figure 21-1: LoM capital costs for project

21.3 Operating Cost Estimates

21.3.1 Basis of Estimate

The operating cost estimate is based on the historical operating costs and continuation of the current operating practices and procedures. It has an expected accuracy range of ±10%, attributed to the site operating history over a range of conditions and is expressed in 2024 NZD.

Separate cost models were developed for open pit and underground mining and processing, based on unit costs from historical performance and first principles using physical inputs as drivers and demonstrated unit rates sourced from site and suppliers.

The cost structure is based on fixed costs and variable / driver derived costs and was used to estimate operating costs.

The estimate includes the underground mining, open pit mining, processing and G&A operating costs. It excludes costs associated with escalation beyond 2024, currency fluctuations, off-site costs, interest charges and taxes. No contingency has been included in the operating costs.

Continuous Improvement (CI) cost initiatives representing 3.39% of the total cost base have been included in the cost estimate.

21.3.2 Mining Operating Costs

Open pit operating costs include Drill and Blast, Load, Haul, Ancillary and mine overheads. Underground mining operating costs include lateral and vertical ore and waste development, stoping costs, backfilling costs, mine services and mine overheads.

21.3.3 Processing Operating Costs

Operating costs associated with Process Plant include Crushing, SAG and Ball mill crushing and grinding, Flotation, CIL, Autoclave, Gold Room, operating and maintenance, water treatment and tailings disposal.

The process operating cost estimate accounts for the operating and maintenance costs associated with the 6.4 Mtpa process plant operation, water treatment, supporting services infrastructure, and tailings disposal to the various TSF's.

Process plant operating costs were estimated using the following cost categories: power, labour, reagents and consumables, maintenance supplies and services. In general, the process operating cost estimate is based on the following preliminary documentation: conceptual process flowsheet, conceptual mass balance, mechanical equipment list, list of reagents and consumables, and a referential staffing plan.

Power consumption was estimated based on the power requirements by the major and secondary Processing Plant equipment (excluding stand-by equipment) and adjusted using benchmark factors to account for auxiliary and minor equipment power demand. Assumptions included:

- 94% annual availability; and
- A unit power cost of NZD0.12 /kWh.

Reagent consumptions and crushing / grinding consumables were estimated based on the results of metallurgical testwork and previous experience at the Macraes plant.

General consumables for the process plant (personnel protective equipment, metallurgical laboratory, chemical laboratories, maintenance, office supplies and others) were estimated from the total consumable and reagent costs.

Labour costs are estimated based on ongoing staffing plan for the operation and maintenance of the process plant based on OceanaGold's experience at the site. The estimate accounts for management personnel, plant operators and supervisors, as well as maintenance personnel.

Services costs include the following areas: chemical assays, maintenance services by contractors, personnel mobilisation, as well as water and compressed air supply and distribution and other general services.

The chemical assay costs were estimated based on a preliminary testwork programme for control of the process plant and unit costs for laboratory tests.

The maintenance services costs associated with the replacement of mill liners and grinding media were estimated based on previous experience at the process plant. The costs associated with the personnel mobilisation, scheduled maintenance services for plant shutdowns (carried out by contractor companies) and other general services are included as a percentage of the total direct capital process plant cost, while the water and compressed air supply and distribution costs were assumed as a percentage of the direct capital cost of these systems, based on historical performance.

21.3.4 General and Administrative Operating Costs

The G&A operating cost was estimated, based on previous costs at the Macraes Operation and include general on-site infrastructure operating costs.

21.3.5 Operating Cost Summary

Table 21-2 summarizes the estimated operating costs per tonne of ore processed and the operating costs by year are shown in Figure 21-2.

Table 21-2: Operating costs summary

Operating Expenditure	NZD		USD	
	LoM Total $M	$/t	LoM Total $M	$/t
Open Pit Mining	153.5	2.79	95.2	1.73
FRUG Underground Mining	0.7	32.82	0.4	20.35
GPUG Underground Mining	146.9	65.31	91.1	40.49
Processing Costs	263.4	11.69	163.3	7.25
General and Administration Costs	110.0	4.87	68.0	3.01
Total Direct Costs	**674.5**		**418.1**	

Notes: Exchange rate – USD:NZD is 0.62

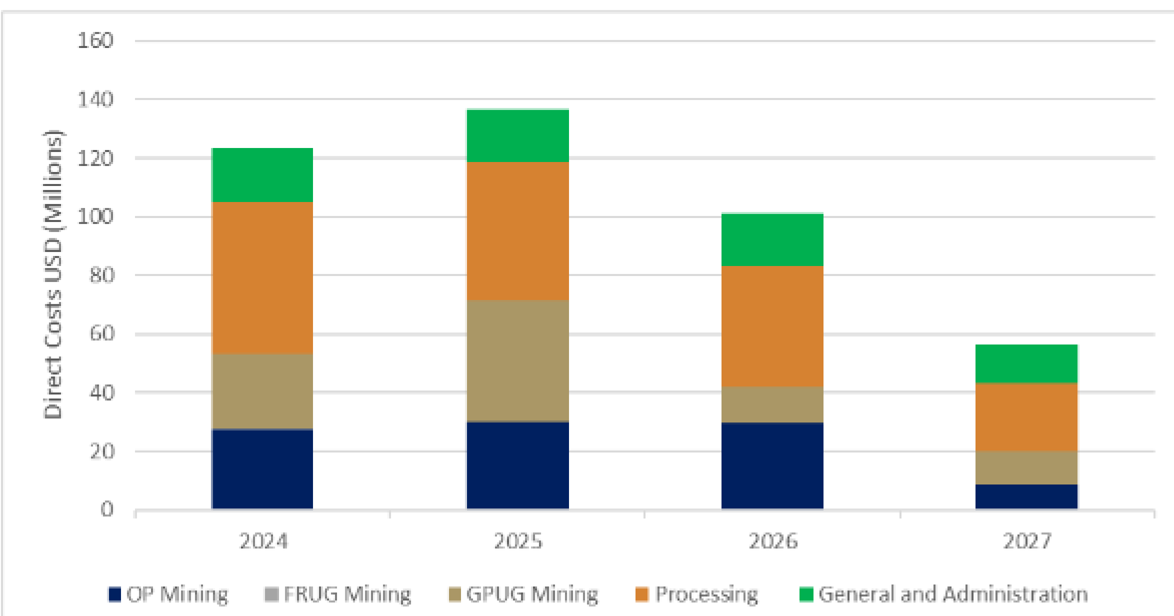


Figure 21-2: LoM direct operating costs

21.4 Comments

No contingency was applied to the capitalised mine development, pre-strip, mobile equipment leases and site surface and underground infrastructure costs.

Other capital cost items include 20-30% contingency.

22 Adjacent Properties

There are no other historical or operating hard rock gold mines of comparable size in the district.

23 Other Relevant Data and Information

23.1 Topography

The surface topography used for the Coronation North, Coronation, Deepdell, Innes Mills, Frasers-Gay Tan and Golden Bar resource estimates was a combination of 2.5 m contour information derived from a detailed aerial survey completed in early 1994 by the Department of Survey and Land Information (DOSLI) on behalf of OceanaGold, surveyed drill hole collars, and the December 31, 2023 end of month mine survey.

The surface topography for Nunns, Ounce, Taylors and the Stoneburn estimates was derived from the 20 m DOSLI contour data and drill hole collars. This topography is very coarse and needs to be resurveyed at 2.5 m contours prior to any mining.

23.2 Bulk Density

A bulk density of 2.5 t/m³ is assigned to oxide blocks and 2.65 t/m³ to sulphide (fresh) blocks. These are the accepted standard values for the Macraes Goldfield and have been applied everywhere to ensure consistency between resource estimation, grade control and mine planning. They are slightly lower than the experimentally determined density but are thought to more accurately reflect the bulk density of the overall rock mass. The experimental measurements are determined on small pieces of core, which do not include the joints, fractures, and faults present in the overall rock mass. Long-term reconciliation of truck volumes against milled tonnes has confirmed the validity of these bulk density values.

Table 23-1: Bulk density data by area

Prospect	Oxide Ore		Oxide Waste		Sulphide Ore		Sulphide Waste	
	No.	Mean	No.	Mean	No.	Mean	No.	Mean
Nunns	-	-	-	-	-	-	-	-
Coronation North	-	-	-	-	14	2.63	15	2.65
Coronation	-	-	-	-	-	-	-	-
Deepdell	4	2.55	7	2.49	9	2.64	18	2.68
Golden Point	-	-	-	-	-	-	-	-
Round Hill	6	2.61	2	2.58	54	2.68	64	2.68
Southern pit	-	-	-	-	4	2.67	3	2.66
Innes Mills	-	-	6	2.45	32	2.71	37	2.7
Frasers pit	2	2.32	10	2.47	62	2.69	73	2.67
Frasers underground	-	-	-	-	211	2.7	100	2.68
Golden Ridge	-	-	-	-	-	-	-	-
Ounce	-	-	-	-	-	-	-	-
Golden Bar	-	-	-	-	3	2.63	3	2.57
Stoneburn Group	-	-	--	-	-	-	-	-
Total / Average	**12**	**2.54**	**25**	**2.48**	**389**	**2.69**	**313**	**2.68**

24 Interpretation and Conclusions

24.1 Geology

The Macraes tenement area is a mature exploration area and much of the near-surface, along-strike exploration potential has been tested. Numerous studies have been completed on the mineralisation and the geological setting and controls are generally well understood.

The immediate resource potential is downdip/plunge of the known resources in the open pits and that has been the focus of exploration in recent times. Exploration potential exists between the Coronation North and Nunns deposits to the north. The areas to the south of Golden Bar contain several known gold deposits that have seen little exploration since 2003. Further work on these areas may be warranted. The 2024 exploration/resource budget of NZD2.4M is focused on infill drilling for resource conversion at Coronation and Golden Point Underground.

While the geological setting and mineralisation styles are well understood the current limit on immediate expansion to known resources is the extent of drilling. The nature of the mineralisation at Macraes means there is a significant alignment to the gold price, as the price increases more resource becomes an economic mining target. In many of the current or previously mined areas the resource estimates have reached the limits of the drill data. There is significant opportunity with increased drilling in targeted areas to increase the potentially minable resources and thereby the mine life both short and long term.

The OceanaGold sampling procedures adopted for the drilling activities are considered appropriate and the programmes are well supervised by suitably qualified technical personnel.

The drill hole and sampling data quality is acceptable for resource estimation purposes. The quality control database is however incomplete for some of the earlier campaigns of drilling (1980's) prior to OceanaGold's ownership. Much of the resource based upon these earlier drilling campaigns has now been mined out. The residual risk associated with this early drilling is considered to be low.

Prior to 1998 some of the reverse circulation (RC) drill holes were sampled under wet drilling conditions leading to the potential for sampling bias and contamination. Much of the legacy risk associated with wet RC sampling has been mitigated by subsequent replacement of wet RC drill holes by diamond twins. Where however, wet RC drill holes have not been replaced, RC sample grades have been factored, based on relationships between twinned RC versus diamond core sample grades. This approach has been applied by OceanaGold for several pits at Macraes and has resulted in acceptable resource estimate to mine reconciliations. The relatively low proportions of remaining wet RC samples, and previous mining history are the basis for OceanaGold considering the residual risk to the resource estimates to be low.

Reconciliation data indicates the resource models represent robust estimates of metal and are generally acceptable estimators of tonnage and grade. The standard practice for resource estimation now is to exclude the pre 1990 assays from the estimation process to mitigate any data quality issues. The resource modelling process is well established and a process for internal review and sign-off was implemented in 2018.

The Mineral Resource statement determined as at December 31, 2023 has been prepared and reported in accordance with Canadian National Instrument 43-101, 'Standards of Disclosure for Mineral Projects' of June 2011 (the Instrument) and the classifications adopted by CIM Council in December 2011.

24.2 Mining

Macraes is mined by a combination of conventional open pit and underground retreat uphole open stope methods along the line of strike.

The open pit mining operation utilises hydraulic excavators and rear dump diesel trucks to extract both overburden and ore. Blasting requires relatively light powder factors compared with some other operations due to the comparatively weak and fractured rock mass. Ore is blasted in 7.5 m high benches and excavated in three, nominally 2.5 m high flitches. Waste is blasted in 15 m benches and excavated in four flitches.

The underground retreat uphole stope mining operation utilises electro-hydraulic development jumbos, diesel load-haul-dump units, diesel haul trucks and longhole drill rigs to extract both waste and ore. The uphole retreat stope voids are not backfilled. Instead, the mine design utilises yielding pillars between adjacent extracted stopes to gradually deform over a timeframe that permits ore extraction.

The open pit operation and the underground operation is owner-operated by OceanaGold. A range of other contracts support the mining operations.

OceanaGold's performance at Macraes has shown that the mining equipment and mining methods are suited to the required mining rates and deposit geometry. Open pit and underground mine design procedures are appropriate and have been conducted in accordance with established industry standards and with input from appropriately qualified geotechnical specialists, hydrological specialists and consultants. Historical productivity and safety records are generally in line with or better than industry standards.

The open pit and underground life of mine plan schedule has been prepared to 2027. The schedules rely only on reserves and are considered appropriate and reasonable.

The mining and ore processing schedules have factors applied to account for poor weather, public holidays, equipment availability, equipment utilisation, historically justified limitations on mine production and historically justified limitations on mill throughput.

The mining schedules contain other ore sources that are not currently in production. The Innes Mills Stage 8 open pit and some sections of the Golden Point underground are under resource consent application as at the Effective Date.

There are studies underway which have the potential to enhance the production schedule from 2025 onwards:

- Round Hill Underground study to recover some of the ore which was to be mined by the Round Hill open pit;
- Expansion of the Innes Mills pit to the North East;
- Expansion of the Coronation and Coronation North pits; and
- Expansion of the Golden Bar open pit.

24.3 Mineral Processing

Over the last thirty-two years OceanaGold has developed considerable experience in development and operation of the complex ore processing technology required to optimise gold recovery from the Macraes refractory ores.

Emphasis is placed on the control of costs. The relatively high tonnage processed, the simple flotation reagent regime, and economies resulting from concentration of the gold into a flotation product comprising between

1.5% and 3% of the ore mass treated, reduce operating cost. Labour costs are also lower than in most comparable developed countries. The operating cost of the core sulphide process is due to low comminution costs (contributed to by the coarse grind, and relatively soft ore).

Plant utilisation has been maintained at about 94% which is at the high end of typical industry benchmarks. Gold recovery on open pit ore and underground combined, for 2023 averaged 82.5%. Overall, recoveries are considered reasonable given the refractory nature of the ores.

The Processing Plant has the capacity to treat 6.4 Mt of ore per annum. The forward life of mine plan does not require capacity above this established level.

24.4 Project Infrastructure

OceanaGold continues to maintain appropriate infrastructure at Macraes, including road access, power, water supplies and administration facilities.

Environmental management and mitigation measures are maintained at Macraes, including ongoing monitoring to ascertain compliance with resource consent conditions and permit requirements. These consents and permits are issued by the Otago Regional Council (ORC), the Dunedin City Council (DCC), Environment Canterbury (ECAN) and the Waitaki District Council (WDC). Tailings and waste rock disposal facilities are maintained and managed on an ongoing basis. Progressive rehabilitation is ongoing.

There is enough tailings storage capacity in the current TTTSF to store tailings until March 2025 and then FTSF is utilised for the remainder if mine life. Capacity of FTSF is sufficient for continued operations well beyond 2030.

The project reserves, plant site, tailings dams, and waste rock stacks are on land covered by mining permits, and which OceanaGold owns or has access to mine. All material tenements and landholder agreements are in good standing.

24.5 Environmental Studies, Permitting and Tenement Status

The Project is fully consented for current operations, with actual and potential environmental effects regularly monitored and reported to the relevant agencies.

The project Reserves, plant site, tailings dams and waste rock stacks are located on land covered by mining permits, and which OceanaGold owns or has access to mine. All material permits and landholder agreements are in good standing.

The mineral permits are in good standing, and their duration is sufficient to allow future mining of the Resource within the permits as MP 41 064 expires in 2030 and MP 52 738 expires in 2045.

The site environmental documentation is appropriate and follows Environment Management System (EMS) principles, although a full EMS is not in place. Documentation is reviewed and updated regularly.

Resource consent applications have been lodged for the Innes Mills Stage 8 pit, Golden Point underground extension and Frasers Tailings Storage Facility Stage 1. A resource consent application will be lodged in 2024 for capacity increase of Frasers Tailings Storage Facility Stage 2.

There are no material compliance issues relating to the principal mining and processing operations. OceanaGold is in partnership with Otago Fish and Game, a semi-government organisation, to manage a Trout Hatchery on the Macraes mine site.

Overall, no material environmental issues have been identified to limit the ongoing operation of the mine within the planned schedule.

24.6 Production

OceanaGold has prepared life of mine production plans from reserves only which cover 2024-2027 for Macraes. This schedule is based on open pit mining at Innes Mills and Frasers Gay Tan from 2024 to 2026. Underground production from Frasers Underground ceases in 2024 while Golden Point Underground runs until 2027. The mine production plans are considered reasonable for the purpose of long-term scheduling.

The fleet includes one Hitachi EX3600 electric shovel, three Hitachi EX3600 and one Hitachi EX2500 backhoe excavators to load 20-22 Caterpillar 789C/D haul trucks. OceanaGold is satisfied that there are enough working areas for the excavators to operate.

The current underground fleet will be maintained in 2024. Most of the Frasers Underground fleet has transitioned to Golden Point Underground with the remainder expected in 2024.

The underground ore is dumped at an in-pit stockpile for periodic re-handling by the open pit fleet to the process plant's run of mine stockpile. OceanaGold is satisfied with the accuracy of the dilution factors, ore loss factors and constraints placed upon the mining schedule, which are supported by extensive operating experience.

24.7 Capital and Operating Costs

Capital expenditures estimation and forecasting are considered reasonable and consistent with proposed development programmes and ongoing requirements. Capital expenditures over the period will vary against the forecast due to unforeseen problems, modifications, upgrades and introduction of new technology.

Capital expenditure provisions (2024 to 2027) include expenditures for capitalised mining costs and sustaining capital of NZD303.3 million and are considered accurate to within ±15%.

Plant operating cost estimates for Macraes are generally considered reasonable and consistent with recent experience and trends and are regarded as accurate to ±10%.

Capital and operating costs were estimated in NZD and then converted to USD using an exchange rate of 0.62 USD: NZD.

25 Recommendations

25.1 Recommended Work Programmes

The recommended work programme costs are included in the operating and capital costs for Macraes and are not listed separately.

Exploration programmes and budget are determined annually for the following year as part of the annual budgeting process. The approved budget for 2024 is NZD2.4 million and exploration costs are currently not included in the site operating costs

25.1.1 Exploration & Resource Conversion

- Complete the infill drilling at Coronation and GPUG as planned in 2024 for a total cost of around NZD2.4 million;
- Maintain annual exploration investment to define viable resources made available by an increasing gold price, replacing mining depletion and adding additional ore sources; and
- Carry out targeted drilling campaigns to define additional minable resources which may extend the mine life. Almost all resource estimates in current or previously mined deposits have reached the limits of drilling data.

25.1.2 Mineral Processing and Metallurgical Testing

Complete testwork on metal recoveries for any additional potential mineable inventory identified to allow risk mitigation and support conversion to mineral reserves.

25.1.3 Mining and Reserves

- Continue assessment of potential mineable targets along strike;
- Continue assessment of the tungsten extraction potential; and
- Continue evaluation of the Round Hill Underground potential.

25.1.4 Project Infrastructure

- Complete TTTSF 568 m RL construction;
- Upon granting of Building consent, complete TTTSF 570 m RL construction;
- Progress FTSF Stage 1 detailed design and lodge permit applications in Q1 2024;
- Progress FTSF Stage 2 resource consent design and lodge permit application in Q1 2024; and
- Progress FTSF Stage detailed design and lodge permit application in Q2 2024.

25.1.5 Environmental Studies and Permitting

- Keep the current permits and consents in good standing by continuing with the established monitoring and compliance practices;
- Complete and lodge the TTTSF Embankment Lift consent application in 2024; and
- Commence permitting process for the Frasers Tailings Storage Facility stage 2 2024.

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27 Glossary

The Mineral Resources and Mineral Reserves have been classified according to CIM (CIM, 2014). Accordingly, the Resources have been classified as Measured, Indicated or Inferred, the Reserves have been classified as Proven, and Probable based on the Measured and Indicated Resources as defined below.

27.1 Mineral Resources

A **Mineral Resource** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

27.2 Mineral Reserves

A **Mineral Reserve** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. The public disclosure of a Mineral Reserve must be demonstrated by a Pre-Feasibility Study or Feasibility Study.

A **Probable Mineral Reserve** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

A **Proven Mineral Reserve** is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

27.3 Definition of Terms

The following general mining terms may be used in this report.

Table 27-1: Definition of Terms

Term	Definition
Assay	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure	All other expenditures not classified as operating costs.
Composite	Combining more than one sample result to give an average result over a larger distance.
Concentrate	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Crushing	Initial process of reducing ore particle size to render it more amenable for further processing.
Cut-off Grade (CoG)	The grade of mineralized rock, which determines as to whether it is economic to recover its gold content by further concentration.
Dilution	Waste, which is unavoidably mined with ore.
Dip	Angle of inclination of a geological feature/rock from the horizontal.
Fault	The surface of a fracture along which movement has occurred.
Footwall	The underlying side of an orebody or stope.
Gangue	Non-valuable components of the ore.
Grade	The measure of concentration of gold within mineralized rock.
Hangingwall	The overlying side of an orebody or slope.
Haulage	A horizontal underground excavation which is used to transport mined ore.
Hydro cyclone	A process whereby material is graded according to size by exploiting centrifugal forces of particulate materials.
Igneous	Primary crystalline rock formed by the solidification of magma.
Kriging	An interpolation method of assigning values from samples to blocks that minimizes the estimation error.
Level	Horizontal tunnel the primary purpose is the transportation of personnel and materials.
Lithological	Geological description pertaining to different rock types.
LoM Plans	Life-of-Mine plans.
LRP	Long Range Plan.

Term	Definition
Material Properties	Mine properties.
Milling	A general term used to describe the process in which the ore is crushed and ground and subjected to physical or chemical treatment to extract the valuable metals to a concentrate or finished product.
Mineral/Mining Permit	A lease area for which mineral rights are held.
Mining Assets	The Material Properties and Significant Exploration Properties.
Ongoing Capital	Capital estimates of a routine nature, which is necessary for sustaining operations.
Ore Reserve	See Mineral Reserve.
Pillar	Rock left behind to help support the excavations in an underground mine.
RoM	Run-of-Mine.
Sedimentary	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore and waste.
Sill	A thin, tabular, horizontal to sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.
Smelting	A high temperature pyrometallurgical operation conducted in a furnace, in which the valuable metal is collected to a molten matte or doré phase and separated from the gangue components that accumulate in a less dense molten slag phase.
Stope	Underground void created by mining.
Stratigraphy	The study of stratified rocks in terms of time and space.
Strike	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Sulfide	A sulfur bearing mineral.
Tailings	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening	The process of concentrating solid particles in suspension.
Total Expenditure	All expenditures including those of an operating and capital nature.
Variogram	A statistical representation of the characteristics (usually grade).

27.4 Abbreviations

The following abbreviations may be used in this report.

Table 27-2: Abbreviations

Abbreviation	Unit or Term
%	percent
°	degree (degrees)
°C	Temperature in Degrees Centigrade
2D	two-dimensional
3D	three-dimensional
AGP or AP	acid generating potential
ARD	acid rock drainage
AT	after tax
Au	gold
BT	before tax
BTS	Brazilian tensile strength
cfm	cubic feet per minute
CIL	Carbon-In-Leach
CoG	cut-off grade
CPS	Coastal Plan Sand
CRF	cemented rock fill
DSS	direct shear strength
ELOS	equivalent linear overbreak/slough
EPCM	Engineering, Procurement and Construction Management
FF/m	frequency fracture per metre
GPa	gigapascal
HDPE	height density polyethylene
hp	horsepower
IRR	initial rate of return
IRS	intact rock strength
ISRM	International Society of Rock Mechanics
Ja	joint alteration
Jn	joint number
Jr	joint roughness
kN	kilonewton
kN/m3	kilonewton per cubic metre

Abbreviation	Unit or Term
koz	thousand troy ounce
kt	thousand tonnes
kV	kilovolt
kW	kilowatt
LHD	long-haul-dump
LoM	life-of-mine
m	metre
m3	cubic metre
ML	metal leaching
MPa	megapascal
Mt	million tonnes
MW	million watts
NGO	non-governmental organization
NI 43-101	Canadian National Instrument 43-101
NNP	net neutralization potential
NPV	net present value
OP	open pit
OSA	overburden storage area
oz	troy ounce
PAG	potential acid generating
PEA	preliminary economic assessment
PLT	point load test
PMP	Probable Maximum Precipitation
ppb	parts per billion
ppm	parts per million
Q	rock mass rating (according to the Barton 1974 criteria)
Q'	Barton's (1974) Q with the JW and SRF both set to a value of 1
QA/QC	Quality Assurance/Quality Control
RMR	rock mass rating (according to the Bieniawski 1989 criteria)
RoM	run-of-mine
RQD	rock quality designation
S.G.	Specific Gravity
sec	second
SRF	stress reduction factor
STD	standard deviation
t/d	metric tonnes per day

Abbreviation	Unit or Term
TCC	total cash costs
TCR	total core recovery
TCS	triaxial compressive strength
TSF	tailings storage facility
UCS	uniaxial compressive strength
UG	underground
USD	United States Dollar
V	volts
VFD	variable frequency drive
W	watt
y	year

Appendices

Appendix A: Certificates of Qualified Persons

Appendix B: