



NI43-101 Technical Report  
for the  
Waihi Gold Mine  
23rd November 2015

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# TECHNICAL REPORT CERTIFICATION

The effective date of this Technical Report and sign off is 23rd November 2015.



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Trevor Maton

Date: 23rd November 2015



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Peter Church

Date 23rd November 2015



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Dino Bertoldi

Date 23rd November 2015

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## CERTIFICATE OF QUALIFIED PERSON

As a qualified person and co-author of the report titled "NI 43-101 Technical Report for the Waihi Gold Operation, New Zealand" (Technical Report) dated 23rd November 2015, to which this certificate applies, I, Trevor William Maton do hereby certify that:

1. I, Trevor William Maton, am the Study Manager for OceanaGold Corporation. My business address is Moresby Avenue, Waihi, New Zealand.
2. I graduated with a B.Sc.(Hons) Mining Engineering in 1981 from Imperial College of Science and Technology and an MSc. Economics in 2002 from Curtin University School of Business. I hold first class mine manager certificates of competency in Queensland and New Zealand.
3. I am a member and Chartered Professional (Mining) in good standing with the AusIMM.
4. I have worked as a mining engineer and study manager in the mining industry for a total of 30 years since my graduation.
5. I have read the definition of "qualified person" set out in the National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* ("NI 43-101") and confirm that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am based at the Waihi Operation.
7. I am responsible for Sections 1.1 – 1.6, 1.12, 1.14 – 1.20, 1.22, 2 - 5, 13, 15, 16.1 – 16.5, 17 - 22, 24, 25.5 – 25.9, 26.2 and 27 of the "NI 43-101 Technical Report for the Waihi Gold Mine" dated November 20, 2015.
8. I am not independent of OceanaGold Corporation applying all the tests in item 1.5 of NI 43-101 because I am an employee of OceanaGold (New Zealand) Limited.
9. I have had involvement with the Waihi Gold Operation since 2003.
10. I have read NI 43-101 and the items of the Technical Report under my responsibility have been prepared in compliance with NI 43-101.
11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



Trevor William MATON

Date of Signature: 23rd November 2015

## CERTIFICATE OF QUALIFIED PERSON

As a qualified person and co-author of the report titled “NI 43-101 Technical Report for the Waihi Gold Operation, New Zealand” (Technical Report) dated 23rd November 2015, to which this certificate applies, I, Peter Church do hereby certify that:

1. I, Peter Church, am the Principal Operations Geologist for OceanaGold Corporation. My business address is Moresby Avenue, Waihi, New Zealand.

2. I graduated with a BSc. Geology.

3. I am a member and Chartered Professional in good standing with the AusIMM.

4. I have worked as a geologist for a total of 23 years since my graduation.

5. I have read the definition of “qualified person” set out in the National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* (“NI 43-101”) and confirm that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am based at the Waihi Operation.

7. I am responsible for Items 1.7 – 1.11, 1.13, 1.21, 6 – 12, 14, 23, 25.1 – 25.3, 26.1.1 of the “NI 43-101 Technical Report for the Waihi Gold Mine” dated November 20, 2015.

8. I am not independent of OceanaGold Corporation applying all the tests in item 1.5 of NI 43-101 because I am an employee of OceanaGold (New Zealand) Limited.

9. I have had involvement with the Waihi Gold Operation since 2003.

10. I have read NI 43-101 and the items of the Technical Report under my responsibility have been prepared in compliance with NI 43-101.

11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



---

Peter CHURCH

Date of Signature: 23rd November 2015

## CERTIFICATE OF QUALIFIED PERSON

As a qualified person and co-author of the report titled “NI 43-101 Technical Report for the Waihi Gold Operation, New Zealand” (Technical Report) dated 23rd November 2015, to which this certificate applies, I, Dino Bertoldi do hereby certify that:

1. I, Dino Bertoldi, am the Process Manager for OceanaGold Corporation. My business address is Moresby Avenue, Waihi, New Zealand.
2. I graduated with a Bachelor of Applied Science in Metallurgy from the South Australian Institute of Technology.
3. I am a Fellow of the AusIMM and a Member of the SME.
4. I have worked as Metallurgist and Process Manager for a total of 29 years since my graduation.
5. I have read the definition of “qualified person” set out in the National Instrument 43-101 – *Standards of Disclosure for Mineral Projects* (“NI 43-101”) and confirm that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I am based at the Waihi Operation.
7. I am responsible for Items 13.1 – 13.5, 17.1 – 17.7 and 21.2 of the “NI 43-101 Technical Report for the Waihi Gold Mine” dated November 20, 2015.
8. I am not independent of OceanaGold Corporation applying all the tests in item 1.5 of NI 43-101 because I am an employee of OceanaGold (New Zealand) Limited.
9. I have had involvement with the Waihi Gold Operation since 2011.
10. I have read NI 43-101 and the items of the Technical Report under my responsibility have been prepared in compliance with NI 43-101.
11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.



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Dino Bertoldi

Date of Signature: 23rd November 2015

# 1 SUMMARY

## 1.1 Overview

The Waihi operation is a gold mine in the North Island of New Zealand with Mineral Reserves currently estimated to be 0.31 million ounces gold. The average ore grade is 6.3 g/t Au. The Mineral Reserves are currently estimated to be 0.31 million ounces gold, supporting a mine life of 2 years with currently drilled additional resources projected to provide a further year.

No previous NI 43 101 technical reports have been filed for the Waihi operation. This technical report prepared in accordance with Canadian National Instrument 43-101 – Standards of Disclosure for Mineral Projects (“NI 43-101”) for the Waihi operation (“Technical Report”) summarises study work completed during the past twelve months covering optimisation of existing operations and completion of feasibility studies into the Correnso underground mine. This report supports Mineral Resources and Mineral Reserves as at June 30, 2015.

## 1.2 Introduction

Open pit mining and processing commenced at the site in 1988 and underground mining commenced in 2004 with the extraction of ore commencing in late 2006. The Waihi Gold operation holds the necessary permits, consents, certificates, licences and agreements required to conduct its current operations, and to construct and operate the Martha Open Pit and Correnso underground mine.

The Waihi Gold Mine comprises two areas of mineralization, which are at different stages of development. The Martha Open Pit is in the final stages of production. Open pit operations are currently suspended following a localised ramp failure in April 2015. The second area, Correnso, referred to as the Correnso project is in the initial production stage. The Correnso project is comprised of the main Correnso underground mine and the up-dip and down-dip extensions of the Correnso underground mine and the addition of the Daybreak and Empire veins referred to as the Correnso Extensions.

Recovery of gold at Waihi is achieved through a conventional SAG Mill-Ball Mill grinding circuit followed by Carbon in Pulp (CIP) leach circuit with a conventional elution and electro-winning circuit.

## 1.3 Reliance on Other Experts

The authors, Qualified and Non-Independent Persons as defined by NI 43-101, were engaged by OceanaGold to study technical documentation relevant to the Technical Report, to contribute to or review the Technical Report on the Waihi operation, and to recommend a work programme if warranted.

The authors believe the information used to prepare the report and formulate its conclusions and recommendations is valid and appropriate considering the status of the operation and the purpose for which the Report is prepared. The authors, by virtue of their technical review of the project’s exploration potential, affirm that the work programme and recommendations presented in the Report are in accordance with NI 43-101 and the Canadian Institute of Mining, Metallurgy and Petroleum (“CIM”) technical standards.

## 1.4 Property Description, Location and Ownership

The Waihi mine is located within the township of Waihi, 142 km southeast of Auckland, in the North Island of New Zealand. The township which lies within the Hauraki District had a population of 4,503 at the 2006 census.

Waihi is located at the foot of the Coromandel Peninsula. To the west are the hills of the Kaimai Ranges. Road access along State Highway 2 from this direction is through the winding Karangahake Gorge road. Waihi has an unusually wet and damp microclimate for New Zealand's east coast with an average annual rainfall of 2,147 mm.

The project is managed by Waihi Gold Company Ltd, a 100% owned subsidiary of the OceanaGold Corporation. The Martha Mine open pit operation commenced in 1988 in accordance with Mining Licence 32 2388 which is an existing privilege, as defined by section 106 of the Crown Minerals Act 1991 (CMA). The Licence was granted in July 1987 and covers an area of approximately 400 hectares comprising two main elements; the open pit (approximately 40 ha) located in the middle of Waihi, and the processing and waste disposal areas located approximately 2 km away to the south east. These two areas are linked by a conveyor which is also within the boundary of ML 32 2388.

The Martha Mine Extended Project commenced in 1999 and increased the life of the mine open pit operations by an additional seven years. The consenting process for the Extended Project was partly by way of applications for new resource consents, including Land Use Consent 97/98-105 granted by Environment Court decision A114/99, and partly by way of applications for variations to the existing Mining Licence. These consents cover the layback to the east wall of the pit which is current underway. ML 32 2388 and/or the conditions of Land Use Consent 97/98-105 includes activities within the Mining Licence and Extended Project areas such as stockpiling, the processing of ore and the disposal of tailings to existing tailings storage facilities. While ML 32 2388 expires in July 2017 and Land Use Consent 97/98-105 expires in June 2019, the land use regime for mining and related activities set out in these existing authorizations is continued after their respective expiry dates through the permitted activity rule framework set out in the Proposed District Plan. Similarly, the provisions for renewal of permits under the CMA provide for the continuation of mineral extraction rights, following the expiry of the Mining Licence, under a mining permit.

Resource consents for the Favona exploration decline were granted in 2003 and work began on the decline in 2004. The Favona Mining Permit 41 808 (MP 41 808), allowing the commencement of underground operations, was granted in March 2004, under the provisions of the Crown Minerals Act 1991CMA, for a duration of 25 years. An Extension of Land to Favona MP 41 808 was granted and extended in area in March 2006. Waihi Gold holds a suite of resource consents from Waikato Regional Council (WRC) which covers all mining and associated discharge activities for the Mining Licence and Extended Project areas. Resource consents for the Favona exploration decline were granted in 2003 and work began on the decline in 2004. Resource consents for the Favona Mine underground operations consents were granted in 2004 with the extraction of ore commencing in late 2006. An Extension of Land to Favona MP 41 808 was granted in March 2006. The permit covers an area of approximately 121.4 hectares and in addition to Favona underground mine, covers the Trio and Correnso Underground Mines. Resource consents for the Trio development were granted in September 2010 and for the Trio underground mine in December 2010. Resource consents for the Correnso development were granted in October 2013.

Waihi Gold also holds a suite of resource consents from Waikato Regional Council (WRC) which covers all mining and associated discharge activities for the Mining Licence and Extended Project areas.

The various resource consents comprised include consent for discharge from ventilation shafts servicing the underground mining operations, discharge of groundwater for flooding the mine workings, placing rock underground for backfill and undertaking dewatering, as well as capping of the tailings storage facilities and eventual closure of the open pit as a lake.

## **1.5 Accessibility, Climate, Local resources, Infrastructure and Physiography**

The climate is temperate. Mean monthly temperatures range from 8.9 °C in July to 18.9 °C in January. New Zealand does not have a large temperature range, but the weather can change rapidly and unexpectedly. Winds in New Zealand are predominantly from the West and South West, in winter, when the climate is dominated by regular depressions. In summer, winds are more variable with a northerly predominance associated with the regular large anti cyclones which cover all the country.

Road, rail and air networks cover the country but road transport is the dominant method of passenger and freight transport. Transport funding in New Zealand is still heavily dominated by money for road projects. Bulk freight still continues to be transported by coastal shipping and by rail transport, and there are attempts to re-introduce public transport as a major transport mode in the larger population centres.

New Zealand's system of utilities is extensive. Large hydroelectric dams generate about 65 per cent of electricity. Most of the rest is generated by fossil fuels, although 6 per cent comes from geothermal plants, and small amounts from wind, wood, and biogas. Gas is piped from oilfields in the west of North Island, mostly to larger population centres. The telephone and internet system is extensive with 96 per cent of New Zealand households having a telephone.

## **1.6 Project History**

Waihi is a historic mining centre. The original Martha mine began as an underground operation in 1879 and by 1952, about 12 million tonnes of ore had been mined to yield 1,217 tonnes of gold-silver bullion. The historic mine extracted four main parallel lodes (the Martha, Welcome, Empire and Royal) together with numerous branch and cross lodes.

Exploration drilling between 1979 and 1984 by Waihi Mining and Development Ltd. and AMAX Exploration Ltd. identified large open pit reserves within the confines of the historic mining area. Following the granting of permits, the Martha Mine open pit operation commenced operation in 1988 as an unincorporated joint venture between subsidiaries of Normandy Mining Limited Group and Otter Gold Mines Ltd. The Otter Gold holding was acquired by Normandy in 2002 and the Newmont Mining Corporation acquired full ownership of the Waihi Mine in 2002 through the acquisition of the Normandy Mining Group. OceanaGold obtained the Waihi property as an operating open pit mine and process plant in October 2015.

The Martha Mine open pit operation commenced in 1988 in accordance with Mining Licence 32 2388 which is an existing privilege, as defined by section 106 of the Crown Minerals Act 1991 (CMA). The Mining Licence, ML 32 2388, was granted in July 1987 and covers an area of approximately 400 hectares comprising two main elements; the open pit (approximately 40 ha) located in the middle of Waihi, and the processing and waste disposal areas located approximately 2 km away to the south east. These two areas are linked by a conveyor which is also within the boundary of ML 32 2388.

The Martha Mine Extended Project commenced in 1999 and increased the life of the mine by an additional seven years.

Resource consents for the Favona exploration decline were granted in 2003 and work began on the Favona decline in 2004. The Favona Mine consents were granted in 2004 with the extraction of ore commencing in late 2006. The Favona Mining Permit 41 808 (MP 41 808) was granted in March 2004, under the provisions of the Crown Minerals Act 1991, for a duration of 25 years. An Extension of Land to Favona MP 41 808 was granted in March 2006.

Resource consents for the development of the Trio development were granted in September 2010 and for the Trio underground mine followed in December 2010. Resource consent for the Correnso Project was granted in October 2013 and commenced development in December 2013, with a current mine life remaining of 2 years.

## **1.7 Geology Setting and Mineralization**

The Waihi area is situated at the southern end of the Coromandel range which is part of an andesite, rhyolite, and dacite sub-aerial volcanic complex. The oldest rocks in the Waihi area are late Miocene, Coromandel Group andesites (7.9 to 6.3Ma) which contain extensive zones of hydrothermal alteration, and epithermal gold-silver deposits. The Miocene geology is unconformably overlain by a sequence of post-mineral andesitic to rhyolitic volcanics and volcanic-derived sediments up to 1.5km thick, which include ignimbrites, rhyolite tephra's, lacustrine sediments, occasional inter-bedded paleosols, and boulder alluvium. This sequence of volcanics infilled paleo-topographic depressions in the andesite rocks which are formed by erosional processes - as well as an inferred fault-controlled caldera structure, at the larger scale.

The major gold - silver deposits of the Waihi District are classical low sulphidation adularia-sericite epithermal quartz vein systems associated with north to northeast trending faults. Larger veins have characteristically developed in dilational sites in the steepened upper profile of extensional faults with narrower splay veins developed in the hanging wall of major vein structures. Moderate to steeply dipping

veins or vein systems are characterised by 200 to 2000m of strike, 170 to 700m vertical range and upwards of 30m individual vein widths; – but more typically 1-5m. The main ore minerals are electrum and silver sulphides with ubiquitous pyrite and variable though usually minor sphalerite, galena and chalcopyrite in a gangue consisting of quartz, locally with calcite, chlorite, rhodochrosite and adularia. Base metal sulphide content generally increases with depth.

The geological understanding of the setting, and lithologies – as well as the structural and alteration controls on mineralization, mineralization continuity, and geometry is sufficient to support estimation of Mineral Resources and Mineral Reserves. The geological knowledge of the area is also considered sufficiently acceptable to reliably inform mine planning. The mineralization style and setting is well understood and can support declaration of Mineral Resources and Mineral Reserves.

## 1.8 Deposit Types

The deposits discovered by Waihi Gold to date are considered to be typical of epithermal vein gold – silver deposits. In the opinion of the Qualified Persons (QPs), features that the Waihi deposits display that are typical of epithermal gold deposits include:

- Host lithologies for veins are andesite flows and volcanoclastics.
- Gold-silver mineralisation is hosted in localized bands within multiphase quartz veins.
- Host andesitic volcanics have undergone pervasive hydrothermal alteration, often with complete replacement of primary mineralogy.

## 1.9 Exploration

Work completed since 1986 has comprised surface reconnaissance exploration, geological and structural mapping, geochemical sampling, airborne, ground and down-hole geophysical surveys, surface and underground drilling, engineering studies and mine development.

Underground drilling of the Correnso deposit for resource conversion and drilling of associated vein systems (Daybreak, Grace and Empire) is on-going. Current drill programmes are planned to complete 35km's of diamond drilling for the calendar year 2015. This drilling is comprised of infill on known veins (~50%), step out on known veins (~30%) and exploration in areas adjacent to known mineralisation (~20%). Exploration drilling proposed for Q3/4 2015 is designed to test extensions of known mineralisation and untested margins of the gravity high associated with the Waihi vein deposits where there is potential for the discovery of significant new mineralised vein deposits.

Remnant mining options have been identified below the existing Martha Pit. A significant data collection and mining option study was completed in 2010 and 2011, but no resources have been reported.

The exploration programs completed to date are appropriate to the style of the deposit and prospects.

### 1.10 Drilling

Approximately 414,000m has been drilled in 2,864 core and RC drill holes on the Project since 1980. Most surface diamond drill holes were drilled by triple tube wireline methods with some holes precollared through post-mineral rocks by tricone or stratapac. Surface holes are collared using large-diameter PQ core, both as a means of improving core recovery and to provide greater opportunity to case off and reduce diameter when drilling through broken ground and historic stopes. All drill core was routinely oriented below the base of the post-mineral stratigraphy, either by plasticine imprint or using the Ezimark or Reflex core orientation tool.

Drillhole location is recorded relative to a local mine grid Mt Eden Old Cadastral. Initial set-out and final survey of drill hole location for all recent drill holes (2004 onwards) has been carried out by mine surveyors using real time differential GPS. Downhole surveys were performed at 30m intervals using a digital single shot camera. Magnetic readings from downhole surveys are loaded to the drilling database, which calculates true north and local grid north (Mt Eden Old Cadastral) based on the current magnetic declination.



Core recovery is recorded for all drilled intervals and is typically greater than 95%. No grade vs recovery relationship is evident.

The quantity and quality of the lithological, geotechnical, collar and down hole survey data collected in the exploration, delineation, underground, and grade control drill programs are sufficient to support the Mineral Resource and Mineral Reserve estimation.

### **1.11 Sample Method and Analysis**

Since mid-2006, sample preparation has been carried out at the SGS Waihi laboratory. Prior to then the sample preparation facility was located at the Martha mine site and operated by Waihi Gold personnel. SGS has continued to use the same methods and protocols that were established by the Martha Mine geologists. Current standardised sample preparation consists of crushing to 80% passing 3.3mm, rotary splitting to 800g, then ring pulverising to 80% passing 75µm. Of the pulverised material approximately 300g is sent for analysis. Pulps are assayed by SGS for Gold and Silver by 30 g Aqua Regia Digest (RC) or 50g fire assay (Core).

Underground face samples are determined by the Geologist according to changes in lithology, vein texture and/or alteration. The minimum sample interval size is 0.3m with a maximum interval of 2.0m. Intervals greater than 2.0m should be sub-sampled. The Geologist assigns three QAQC samples per face. The sample is taken by chipping rock into the collection hoop on a continuous line across the interval, starting with the first interval on the left-hand side of the face.

Drill core QAQC sample preparation at the SGS Waihi lab is monitored through sieving of jaw crush and pulp products, routine generation of duplicate samples from a second split of the jaw crush and calculation of the fundamental error. One or two standards and a blank are inserted for every 20 samples.

The Waihi protocol requires Certified Reference Material (CRMs) to be reported to within 2 Standard Deviations of the Certified Value. The extraction method used by SGS for gold was by fire assay followed by AAS determination, whereas silver has been extracted by Aqua Regia and analysed by AAS (UW212, UW222, UW310, UW313) or by ICP-MS (UW320 onwards).

In addition to routine quality control procedures, umpire assays are carried out at Ultratrace Laboratories in Perth. Multielement data is obtained routinely from the Waihi SGS Laboratory for all exploration assay samples for the elements silver, copper, arsenic, lead, zinc and antimony, which are potential pathfinders for epithermal mineralisation. For samples with over-range silver and lead, these elements are found to be extracted more efficiently by using a more dilute Aqua Regia digest (1 gram sample weight rather than the standard 10 gram per 50 ml).

The sampling methods are acceptable, meet industry-standard practice, and are acceptable for Mineral Resource and Mineral Reserve estimation and mine planning purposes. The quality of the analytical data is reliable and sample preparation, analysis, and security are performed in accordance with exploration best practices and industry standards.

A number of data verification programs and audits have been performed over the Project history, primarily in support of compilation of technical reports on the Project and in support of mining studies. This work supports the geological interpretations and the database quality, and therefore supports the use of the data in Mineral Resource and Mineral Reserve estimation, and in mine planning.

### **1.12 Metallurgical Test Work**

Metallurgical test work has been conducted in a number of programs since 1980. Composites of various ore types were developed using drill core samples. Metallurgical testing programs continue to be conducted as required to evaluate possible changes in feed types from new mining areas, proposed changes in processing to improve recoveries and to investigate factors causing lower than desired recoveries.

Metallurgical test work and associated analytical procedures were appropriate to the mineralization type, appropriate to establish the optimal processing routes, and were performed using samples that are typical

of the mineralization styles found within the Project. Samples selected for testing were representative of the various types and styles of mineralization. Samples were selected from a range of depths within the deposit. Sufficient samples were taken so that tests were performed on sufficient sample mass. Test work results have been confirmed by production data.

**1.13 Mineral Resource Estimate**

**1.13.1 Reporting Date**

Mineral Resources for the Waihi open pit and underground are reported as at June 30, 2015.

**1.13.2 Qualified Persons**

The mineral resources quoted here were prepared by, or under the supervision of Peter Church, Senior Operations Geologist for OceanaGold, with assistance from the Waihi Mine Geology team.

**1.13.3 Mineral Resources**

The geological models developed for the Waihi operation have used standard industry methods. Models incorporate lithology, structure, alteration, density, mineralization, geotechnical and metallurgical characteristics, using Vulcan® or MineSight® modelling software.

The construction of the resource block models follow a typical construction path that includes section and plan interpretation and subsequent 3D validation of geology and mineralization solids; compositing of analytical data; exploratory data analysis; variography and establishment of ranges; investigation into the use of grade caps; examination of interpolation boundaries; and establishment and review of waste and metallurgical classifications.

Estimation is completed using either ordinary kriging (OK) or inverse distance weighting as deemed suitable by the density of data in each domain. Vulcan tetramodelling, that unfolds the vein wireframes for resource interpolation, was adopted for the Correnso, Daybreak, and Grace/Empire models as a way of dealing with the sinuous character of the veins.

Mineral Resources were classified to Australasian Joint Ore Reserve Committee (JORC) Code categories, using the following parameters:

Project	Drill Spacing for Measured Resource	Drill Spacing for Indicated Resource	Drill Spacing for Inferred Resource
Martha Open Pit ELB	20 meters	50 meters	100 meters
Correnso	10 meters	30 meters	60 meters

Mineral Resource classifications are based solely on gold using a combination of data density, spatial arrangement of the data, quality of estimation, and geological interpretation. Mineral Resource classification reflects the confidence levels in the supporting data.

Mineral Resources are inclusive of Mineral Reserves, and are presented in Table 1-1, Table 1-2, Table 1-3 and Table 1-4. Mineral Resources are reported on a 100% basis. The resource estimate is sub-divided for reporting purposes: an open-cut resource that includes material within the limits of the Martha pit; and an underground resource within the Correnso Extended Permit Area. The resources are depleted for mining as at June 30, 2015.

Table 1-1: Open Cut Resource Estimate

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.155	3.05	30.5	0.015	0.152
Indicated	0.656	2.90	29.1	0.061	0.614
<b>Measured &amp; Indicated</b>	<b>0.811</b>	<b>2.93</b>	<b>29.4</b>	<b>0.076</b>	<b>0.766</b>
Inferred	0	0	0	0	0

Table 1-2: Stockpiles Resource Estimate

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0	0	0	0.000	0.000
Indicated	0.009	7.70	15.4	0.002	0.005
<b>Measured &amp; Indicated</b>	<b>0.009</b>	<b>7.70</b>	<b>15.4</b>	<b>0.002</b>	<b>0.005</b>
Inferred	0	0	0	0	0

Table 1-3: Underground Resource Estimate

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.172	10.40	16.6	0.058	0.092
Indicated	0.529	10.20	18.4	0.173	0.312
<b>Measured &amp; Indicated</b>	<b>0.701</b>	<b>10.25</b>	<b>17.9</b>	<b>0.231</b>	<b>0.404</b>
Inferred	0.612	7.73	16.72	0.152	0.329

Table 1-4: Combined Mineral Resource Statement, Effective Date 30 June, 2015

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.327	6.92	23.3	0.073	0.244
Indicated	1.194	6.17	24.2	0.237	0.931
<b>Measured &amp; Indicated</b>	<b>1.521</b>	<b>6.33</b>	<b>24.0</b>	<b>0.310</b>	<b>1.175</b>
Inferred	0.612	7.73	16.72	0.152	0.329

## Notes to Accompany Mineral Resource Table:

- Mineral Resources are inclusive of Mineral Reserves;
- Mineral Resources are reported on a 100% basis;
- Mineral Resources are reported to a gold price of NZD\$1,714/oz,
- Tonnages include allowances for losses resulting from mining methods. Tonnages are rounded to the nearest 1,000 tonnes;
- Ounces are estimates of metal contained in the Mineral Resource and do not include allowances for processing losses. Ounces are rounded to the nearest thousand ounces;
- Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
- Tonnage and grade measurements are in metric units. Gold ounces are reported as troy ounces.

## 1.14 Mineral Reserve Estimate

### 1.14.1 Reporting Standard

The Mineral Reserve estimates were compiled with reference to NI 43-101 and JORC.

This section summarizes the main considerations in relation to the estimation of Mineral Reserves and provides references to the sections of the study where more detailed discussions of particular aspects are covered. The basis for the estimation of Mineral Reserves is metal prices of NZ\$1,714 per ounce (US\$1,200 per ounce) for gold

### 1.14.2 Reporting Date

Mineral Reserves for the Waihi open pit and underground are reported as at June 30, 2015.

### 1.14.3 Mineral Reserves

Mineral Reserves are reported within a detailed crest and toe Mineral Reserve pit design for the Martha Project and within underground stope and development designs for the Correnso Project. Only Measured and Indicated Resources that fall within the Mineral Reserve pit or underground designs have been directly converted to Proven and Probable Reserves respectively. Mineral Reserves are estimated using a gold price of NZD\$1,714 per ounce.

A localised failure of the north wall occurred in April 2015 which undercut the main access ramp. Operations were suspended in April 2015 and the mining contract terminated in June 2015. Studies are in progress to regain access to the bottom of the pit. It is planned to undertake a wall strip in the north east to regain access to the ramp below the failure to allow full recovery of the remaining Mineral Reserve. Whilst input parameters to the design have been based on local site experience, geotechnical studies have not been completed to demonstrate that the planned north east wall strip to regain access has adequate Factor of Safety.

The Mineral Reserve estimates are compliant with CIM Definition Standards for Mineral Resources and Mineral Reserves as incorporated by reference in NI 43–101. Mineral Reserves are shown in Table 1-5

**Table 1-5: Mineral Reserve Statement, Effective Date 30 June 2015; Trevor Maton**

Source`	Reserve Class	Tonnes (Mt)	Au (g/t)	Ag(g/t)	Contained Au (Moz)	Contained Ag (Moz)
Open Pit	Proved	0.155	3.05	30.50	0.015	0.152
	Probable	0.656	2.90	29.10	0.061	0.614
Underground	Proved	0.172	10.40	17.00	0.058	0.094
	Probable	0.529	10.20	18.20	0.173	0.310
Stockpile	Proved	-	-	-	-	-
	Probable	0.009	7.70	15.40	0.002	0.004
Total Proved		0.327	6.92	23.40	0.073	0.246
Total Probable		1.194	6.17	24.16	0.237	0.927
Total (June 30, 2015)		1.521	6.33	23.99	0.310	1.173

#### Notes to Accompany Mineral Reserve Table:

- Mineral Reserves are reported on a 100% basis;
- Mineral Reserves are reported to a gold price of NZD\$1,714/oz;
- Tonnages include allowances for losses resulting from mining methods. Tonnages are rounded to the nearest 1,000 tonnes;
- Ounces are estimates of metal contained in the Mineral Reserves and do not include allowances for processing losses. Ounces are rounded to the nearest thousand ounces;

- Rounding of tonnes as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;

Tonnage and grade measurements are in metric units. Gold ounces are reported as troy ounces. The change in Mineral Reserves reported at June 30, 2015 compared with those previously reported at December 31, 2014 is reported in Table 1-3.

Changes between the June 30, 2015 Reserve and December 31, 2014 Reserve estimate primarily reflect the depletion of ore from the Martha pit and the Correnso underground mine and adjustments in gold and silver grades as a result of grade control drilling.

The Mineral Resources for the mine, which have been estimated using surface and underground core drill data and underground chip data, have been performed to industry best practices, and conform to the requirements of CIM (2014).

Factors which may affect the geological models, the preliminary stope designs and therefore the Mineral Resource estimates include commodity price assumptions, metallurgical recovery assumptions, and the assumptions in relation to stope size and mining method.

**Table 1-3: Jun 2015 Reserve Estimates vs. Dec 2014 Reserve Estimates**

Reserve Area	Tonnes (Mt)	Au (g/t)	Ag(g/t)	Contained Au (Moz)	Contained Ag (Moz)
<b>December 31, 2014 Reserve</b>					
Open Pit	1.131	2.78	27.78	0.101	1.010
Underground	0.884	9.09	18.18	0.258	0.517
Stockpile	0.026	3.27	32.66	0.003	0.027
<b>Total (Dec 31, 2014)</b>	<b>2.041</b>	<b>5.52</b>	<b>23.68</b>	<b>0.362</b>	<b>1.554</b>
<b>Changes to Reserve, Dec 14 vs. Jun 15</b>					
Open Pit	(0.320)	2.39	23.74	(0.025)	(0.244)
Underground	(0.183)	4.64	19.21	(0.027)	(0.113)
Stockpile	(0.017)	0.92	42.63	(0.001)	(0.023)
<b>Total (Dec 31, 2014)</b>	<b>(0.520)</b>	<b>3.14</b>	<b>22.77</b>	<b>(0.052)</b>	<b>(0.381)</b>
<b>June 30, 2015 Reserve</b>					
Open Pit	0.811	2.93	29.37	0.076	0.766
Underground	0.701	10.25	17.91	0.231	0.404
Stockpile	0.009	7.70	13.82	0.002	0.004
<b>Total (Jun 30,, 2015)</b>	<b>1.521</b>	<b>6.33</b>	<b>23.99</b>	<b>0.310</b>	<b>1.173</b>

## 1.15 Mining Methods

### 1.15.1 Open Pit

The open pit mining process at Martha is determined largely by the land use consents granted to the Company. Ore and waste is mined by conventional drill, blast, load and haul methods from the open pit. Waste and ore is categorised into hard and soft material. Waste is further categorised into potentially acid forming or non-acid forming rock. Ore sampling is conducted in-pit by RC drilling. Ore blocks are blocked out on the basis of this sampling and take into account the capacities of the equipment to selectively mine these blocks. Soft material is ripped by D9 dozer whereas hard material is blasted. Strict controls on blast vibration determine the blast hole spacing and the maximum allowable charge weight per delay. Generally ore is blasted in 5 metre vertical intervals (two flitches), but blast vibration limitations may require blast holes to be drilled at 2.5metre vertical intervals. Electronic detonators are used in all holes to ensure detonation of charges occur as per the design sequence. The Company monitors each blast vibration for conformance. All ore and waste is loaded via 190 tonne backhoe excavators into 85 tonne rear dump trucks and trucked via a 1 in 10 ramp and generally direct tipped to a Jaw Crusher or Stamler Breaker station. Small quantities of ore and waste are stockpiled close to the jaw crusher. The presence of historic workings in the open pit requires probe drilling to identify voids or weak pillars which create both a safety hazard and an operating constraint. Underground voids are either banded off or marked with hazard tape. Excavators and trucks must operate around the void working in towards the void. This process can at times influence the bench extraction sequence. All ore and waste is crushed. Ore is conveyed 1.5 km to the process plant and placed in a 40,000t stockpile. A surge (Polishing Pond) stockpile (up to 1.2MT) is available close to the water treatment plant for excess ore.

### 1.15.2 Underground Mining

Mining options available for Correnso were limited because of the permit conditions, blasting and backfill constraints and AVOCA mining was selected as the preferred mining method. Correnso has been designed with a 15m level spacing, floor to floor, primarily to limit blast vibration but this also assists hanging wall and footwall stability. This is a lesser level spacing than used in Trio but similar to Favona and has been selected to reduce blast vibration.

Access to the Correnso underground is via a decline from previously mined areas, and also serves as a fresh air intake. Two primary exhaust raises and a single fresh air raise has been raise bored to surface and equipped. The portal is located close to the processing plant. The mine layout for Correnso can be summarized as follows:

Conventional cross cut accesses are designed for Avoca stoping levels. Ore and waste passes assist with efficient materials handling. Exhaust ventilation is provided from the Trio development to the existing Union Hill ventilation rise.

The Permit and mining method requires all stopes and selected development to be backfilled. Mine waste and supplement from Waste Rock Embankment would be used.

## 1.16 Recovery Methods

Recovery of gold at Waihi is achieved from the use of leaching and adsorption following a conventional SAG Mill-Ball Mill grinding circuit. The plant has been successfully running for 27 years with a well-established workforce and management team in place. The Processing Plant has the capacity to treat up to 1.25 million tonnes of Martha ore or 800,000 tonnes of Correnso ore per annum.

Ore from the surface and underground mine is stockpiled at the ore pad before being fed to a jaw crusher located directly above the mill into the SAG mill. Ore is fed to the SAG mill along with lime, water and steel balls. As the ore moves through the SAG mill it is broken into finer particles. Particles greater than a few millimetres are returned to the SAG mill and the rest go to the ball mill for further grinding until they reach a final product size of less than 100 microns for surface ore and 50 microns for underground ore. Once the

ore has reached the final product size it is thickened to higher density slurry in a thickener before the leaching process begins.

The 500 mm cyclone overflow gravitates to the ball mill discharge hopper, whereby the slurry is combined with the ball mill discharge and pumped to a hydrocyclone distributor, which consists of fourteen Weir Warman Cavex cyclones. The cyclone underflow reports to the ball mill for further grinding, while the cyclone overflow reports to a trash screen to remove mining detritus prior to reporting to the pre-leach thickener.

The pre-leach thickener increases slurry density to approximately 37 to 40% solids prior to the CIP circuit, which comprises of five leach and seven adsorption tanks. The leaching tanks capacity are 700 m<sup>3</sup> and the adsorption tanks have 300 m<sup>3</sup>, providing a total residence leach/adsorption time of 24 hours for Martha ore and 48 hours for Correnso ore.

Wedge wire cylindrical inter-stage screens are installed in each adsorption tank to achieve counter current carbon movement. The cyanide is dosed into the first leach tank and the concentration is maintained at 280 ppm for Martha and 240 ppm for Correnso. Oxygen is added via a shear reactor located on the first leach tank. The slurry decreases in gold and silver concentration until it is barren, once the slurry leaves the last tank it is called tailings and pumped to the Tailings Storage Facility.

The "loaded" carbon is fed into an elution column where the carbon is washed at high temperature and pressure to remove the gold and silver from the carbon and into the water (pregnant eluant). The pregnant eluant is then passed through electrowinning cells where gold and silver is electroplated onto stainless steel cathodes. Once the gold and silver have been removed from the carbon it is reactivated and recycled to the adsorption tanks. The cathodes are periodically harvested and rinsed to yield a gold and silver bearing sludge which is dried, mixed with fluxes and put into a furnace at 1200°C. Once the sludge is molten it is poured as bars of doré (unrefined alloy of gold and silver) bullion ready for shipment to the Mint.

### **1.17 Project Infrastructure**

The Waihi operation has been in full production since 1988 and all mine site infrastructure has been completed to support the open pit and underground operations including; tailings storage facility, workshops, water treatment plant, waste dumps and ore processing facilities.

Construction of the Correnso underground mine access and infrastructure has been completed.

### **1.18 Market Studies and Contracts**

Contracts are in place covering underground mining, transportation and refining of bullion, and the purchase and delivery of fuel, electricity supply, explosives and other commodities. These agreements conform to industry norms.

Waihi Gold maintains a number of operating permits for the importation of reagents into New Zealand. New Zealand has an established framework that is well regulated and monitored by a range of regulatory bodies. Risk associated with renewal of importation permits, is upon that basis regarded as manageable.

A royalty of 2.5% is payable to Coeur d'Alene Mines of Idaho and Viking Mining, New Zealand. The Coeur Viking royalty results from the 1998 agreement to transfer exploration rights to Waihi Gold for a lump sum payment and a royalty payment based on the spot price of Gold / Silver. The agreement extends over east Waihi to the north of Barry Road and includes the Correnso project area.

### **1.19 Environment and Permitting**

The Waihi operation holds the permits, water rights, certificates, licences and agreements required to conduct its current operations.

Environmental data has been collected over the last 25 years of Waihi operations and baseline data was collected prior to the start of operations and reported in the original mining licence application. Data is

routinely collected for noise levels, blast vibration, air quality, and surface and ground water discharge quality from various sources, ground settlement and ground water levels. This data is reported to various regulatory bodies as required by the companies various consents and permits. External independent experts are engaged by OceanaGold to assist in the preparation and review of these reports. The reports are then reviewed and approved by various regulators who utilise independent expert reviewers to assist them.

Waihi has established various stakeholder engagement structures for the representation of stakeholders and project affected people including Iwi, Resident Groups, community based organizations and local government. Stakeholder engagement has been summarized in Section 20.11.4 of this report and detail of the engagement is provided in the various Assessment of Environmental Effect documents for the project.

The operation has established complaints and grievance systems / procedures for the on-going management of all project grievances.

The permits are prescriptive in terms of stakeholder engagement with the Community. Consultation is an on-going component of the existing operation. From a community perspective impacts to be managed, associated with the Correnso project, include:

- effects on property values
- and negative effects on the local community, and
- reputational risk related to mining activity in close proximity to homes.

## **1.20 Economic Analysis**

Given that pit operations have been suspended pending geotechnical evaluation, economic analysis has been performed separately for the open pit reserve and the underground reserve. No inferred material is included in the economic analysis.

As at June 30, 2015, development capital for Correnso has been spent with only minor capital development required for Correnso. Sustaining capital is estimated at NZ\$26M going forward.

Total life of mine operating costs for underground mining, open pit mining, ore processing and general and administration is estimated to be NZ\$ 260million.

The economic analysis for Correnso shows the post-tax free cash flow is US\$74 million and the post-tax NPV is US\$78 million based on US\$1200 gold price and 0.7 exchange rate including full closure and rehabilitation costs.

The economic analysis shows that the open pit reserve adds US\$43M of post-tax cash flow and post-tax NPV of US\$40M.

## **1.21 Adjacent Properties**

There are no adjacent properties that have an impact on the Waihi operation. The Waihi Mining Licence and Permits contains all Mineral Resources and Mineral Reserves on which this Technical Report is based.

## **1.22 Other Relevant Data and Information**

### **1.22.1 Risk Management**

The risk management process is not static and risks may change with time. The current study represents an understanding by the operations personnel and project team of significant risks associated with the Waihi operation, while recognising that the level of risk may change over time and that new risks may emerge. The risk register is considered a 'live' document and will form a part of the risk management plan which will be subject to regular review.

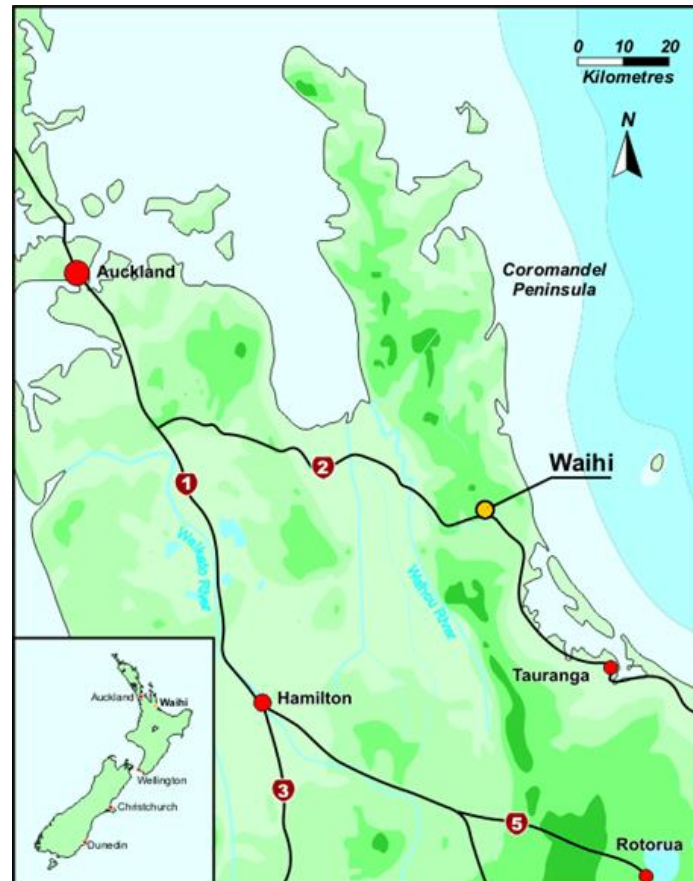


## **1.23 Recommendations**

The QPs have reviewed the information on the Waihi mining operations and have no meaningful recommendations to make for further work.

## 2 INTRODUCTION

The Waihi operation is a gold mine in the North Island of New Zealand with Mineral Reserves currently estimated to be 0.31 million ounces gold supporting a mine life of 2 years with additional resources projected to provide a further year. The average ore grade is 6.3 g/t Au. The mine is located on the north island of New Zealand (Figure 2-1).



**Figure 2-1: Project Location Map**

Open pit mining and processing commenced at the site in 1988 and underground mining commenced in 2004 with the extraction of ore commencing in late 2006. The Waihi Gold operation holds the necessary permits, consents, certificates, licences and agreements required to conduct its current operations, and to construct and operate the Martha Open Pit and Correnso underground mine.

The Project comprises two areas of mineralization, which are at different stages of development. The Martha Open Pit is in the final stages of production. The second area, Correnso, referred to as the Correnso project is in the initial production stage. The Correnso project is comprised of the main Correnso underground mine and the up dip and down dip extensions of the Correnso underground mine and the addition of the Daybreak and Empire veins. These are collectively referred to as the Correnso Extensions.

The open pit mining process at Martha is determined by the permit granted to the Company. Ore and waste is mined by conventional drill, blast, load and haul methods from the open pit. Waste is categorised into potentially acid forming or non-acid forming rock. Ore sampling is conducted in-pit by RC drilling. Strict controls on blast vibration determine the blast hole spacing and the maximum allowable charge weight per delay.

Correnso underground has been designed with a 15m level spacing, floor to floor, primarily to limit blast vibration but this also assists hanging wall and footwall stability. Access to the Correnso underground is via a decline from previously mined areas, and also serves as a fresh air intake. Two primary exhaust raises

and a single fresh air raise has been raise bored to surface and equipped. The portal is located close to the processing plant.

Recovery of gold at Waihi is achieved through a conventional SAG Mill-Ball Mill grinding circuit followed by Carbon in Pulp (CIP) leach circuit with a conventional elution and electro-winning circuit.

## 2.1 Terms of Reference

OceanaGold has prepared this technical report for the Waihi operation according to NI 43-101 and Form 43-101F1 to provide an update on the Waihi operations. The Waihi Gold Mine is owned by Oceana Gold (Waihi) Limited, a wholly owned subsidiary of OceanaGold Corporation (“OceanaGold”). OceanaGold is listed on the Toronto, Australian and New Zealand stock exchanges under the code “OGC” and is the issuer of this Technical Report.

The report is for use by the general investing community. It provides an update on the status of the Waihi operation and will be lodged with SEDAR in accordance with TSX requirements. References in this report to “OceanaGold” include OceanaGold Corporation, Oceana Gold (Waihi) Limited, Waihi Gold Company Limited and their subsidiaries and associates, as the context requires.

This report has been prepared to satisfy OceanaGold obligations as a reporting issuer in Canada. This Report uses metric measurements and Canadian English. The currency used is NZ Dollars unless otherwise noted.

## 2.2 Principal Sources of Information

This Technical Report was prepared by OceanaGold. Information for the Report was based on published material as well as the data, professional opinions and unpublished material obtained from work completed by OceanaGold, and materials provided by, and discussions with, third-party contractors / consultants retained by OceanaGold. Reports and documents listed in Appendix A were also used to support preparation of the report. Additional information was sought from OceanaGold personnel where required to support preparation of this report.

**Table 2-1: Specialist Consultants Who Provided Information for the Study**

Consulting Company	Consulting Package
PSM Consultants Pty Ltd. (“PSM”)	Geotechnical Engineering – Open Pit
SRK Consulting Pty Ltd (“SRK”)	Geotechnical Engineering – Underground
GWS Ltd	Hydrogeology and Groundwater
Engineering Geology Ltd.	Waste Disposal and Tailings Storage

## 2.3 Qualified Persons and Inspections of the Property

The Qualified Persons (QPs) for the Report are OceanaGold employees engaged for the preparation of the Report, as listed in Table 2-2. All the QP’s are based permanently on site,

**Table 2-2: Specialist Consultants Who Provided Information for the Study**

Qualified Person (QP’s)	Employer	Position	Technical Report Item(s) Contributed to or Reviewed
Trevor Maton (not Independent) BSc., M.Sc. MAusIMM (CP Mining) , ARSM,	OceanaGold	Study Manager	Sections 1.1 – 1.6, 1.12, 1.15 – 1.20, 1.22, 2 - 5, 13, 16.1 – 16.4, 17 - 22, 24, 25.5 – 25.9,

			26.2 and 27
Peter Church (not Independent) BSc., MAusIMM (CP Geology)	OceanaGold	Principal Operations Geologist	Sections 1.7 – 1.11, 1.13, 1.21, 6 – 12, 14, 23, 25.1 – 25.3 and 26.1.1
Dino Bertoldi (not Independent) BAppSci (Metallurgy), FAusIMM, SME	OceanaGold	Mill Manager	Sections 13.1 – 13.5, 17.1 – 17.7 and 21.2

## 2.4 Effective Dates

A number of effective dates are applicable for the Report, as follows:

- Mineral tenure and surface rights information: 31 December 2014;
- Database close-out dates:
  - Martha Project Open Pit; April, 2015;
- Correnso Project; April, 2015; Mineral Resource estimates:
  - Martha Project Open Pit; June 30, 2015;
  - Correnso Project; June 30, 2015;
- Information on on-going drill programs: 31 December 2014;
- Information on mining operation: 31 December 2014;
- Information on permitting and environmental: June 30, 2015.

The effective date of the Technical Report is taken to be the supply of the last scientific and technical information, which is the supply of data on the mine development, and is 30 June 2015.

## 2.5 Information Sources and References

OceanaGold has sourced information from appropriate reference documents as cited in the text and as summarized in Section 27 of this Report. Additional information was requested from, and provided by, Waihi Gold site personnel as requested. The QPs have relied upon OceanaGold experts in the fields of mineral tenure, surface rights, permitting, social responsibility and environment.

### 3 RELIANCE ON OTHER EXPERTS

#### 3.1 External Consultants

The authors, Qualified, Independent and Non-Independent Persons as defined by NI 43-101, were contracted by the Issuer to study technical documentation relevant to the Report, to contribute to or review the Technical Report on the Waihi operation, and to recommend a work programme if warranted. The authors relied on reports detailed in Section 27, and opinions as follows for information that is not within the authors’ fields of expertise:

- PSM Consultants Pty Ltd (“PSM”) was retained by Waihi Gold to provide professional services with respect to the Martha pit operation. The scope of services was to determine the geotechnical engineering parameters for the open pit operations and mining inputs. The PSM reports have been referenced for inputs to this report;
- SRK Consultants Pty Ltd (“SRK”) was retained by Waihi Gold to provide professional services with respect to the Correnso Underground operation. The scope of services was to determine the geotechnical engineering parameters for the underground operations, backfill requirements (underground) and mining inputs. The SRK reports have been referenced for inputs to this report;
- GWS was retained by Waihi Gold to provide professional services with respect to the Waihi operation. The scope of services was to determine the hydrology (surface water) and hydrogeology (groundwater) parameters of the Waihi operation and provide management plans for water. The GWS reports were used to as inputs to this report;

The authors believe the information used to prepare the report and formulate its conclusions and recommendations is valid and appropriate considering the operational nature of the Project and the purpose for which the report is prepared. The authors, by virtue of their technical review of the Project’s exploration potential, affirm that the work programme and recommendations presented in the Report are in accordance with NI 43-101 and CIM technical standards.

#### 3.2 Trevor Maton

Mr Maton has relied, and believes he has a reasonable basis to rely, on information provided by the following third parties for the following areas of the report.

**Table 3-1: Specialist Consultants Who Provided Information for the Study**

Section Ref	Subject Matter	Information Source	Date
Sections 15 and 16	Resource block model used in mine design and planning	Peter Church MAusIMM (CP Geology)	April 2015
Sections 16 and 18	Geotechnical design criteria – Open Pit	PSM (Australia)	2010, 2011, 2012, 2013, 2014
Sections 16 and 18	Geotechnical design criteria – Underground	SRK (Australia)	2014
Sections 13.3 – 13.4, 14.4	Metallurgical recoveries and throughput rates	Dino Bertoldi FAusIMM, OceanaGold Mill Manager.	July 2014

#### 3.3 Peter Church

None

## 4 PROPERTY DESCRIPTION AND LOCATION

### 4.1 Location

The Waihi Project is located 142 km southeast of Auckland, New Zealand. It is a town in Hauraki District in the North Island of New Zealand.

### 4.2 Land Strategy and Property Ownership

The project is managed by Waihi Gold Company Ltd, which is a 100% owned subsidiary of the OceanaGold Corporation.

The Martha Mining Licence, ML 322388, encompasses the open pit itself, excluding parts of the North and East Walls, and the conveyor belt corridor, the water treatment plant, the process plant, and the tailings storage facilities. The Mining Licence, while it remains in place, confers all surface rights necessary for operations under that licence.

The majority of the pit itself is on land owned by the Crown and administered by a Crown agency, Land Information New Zealand. The balance of the pit and the land within the Mining Licence that hosts the conveyor belt corridor, the water treatment plant (and an associated pipeline for the discharge of the treated water into the Ohinemuri River), the process plant, and the tailings storage facilities, is all owned by OceanaGold except for one parcel where the conveyor belt corridor runs through land adjoining the Union Hill area, which is in the name of the Commissioner of Crown Lands, and portions of public roads, road reserve and river reserve. When the Mining Licence expires in 2017, the company expects to enter into one or more access arrangements with the Crown or Crown and local government agencies, as required, providing on-going formal licence to enter and operate on the various publically owned land parcels for CMA purposes

The Waihi Correnso project requires mining beneath both publically and privately owned land. Pursuant to section 57 of the Crown Minerals Act 1991 (CMA) landowner consent to entry into the land is not required where such entry:

- (a) will not or is not likely to cause any damage to the surface of the land or any loss or damage to the owner or occupier of the land; or
- (b) will not or is not likely to have any prejudicial effect in respect of the use and enjoyment of the land by the owner or occupier of the land; or
- (c) will not or is not likely to have any prejudicial effect in respect of any possible future use of the surface of the land.

Notwithstanding the position under the CMA, OceanaGold has consulted publically and with relevant landowners in the course of obtaining resource consents, and the resource consent conditions set out a process (including arbitration) for gaining access to land above stopes and development drives. Specific conditions of the principal Land Use resource consent for the Correnso Project include the following

#### Clause 46

At least three months prior to the placement of the first explosives for any blasts immediately beneath any part of the legal title to a residential property overlying stopes for any mining provided for under this consent, the consent holder shall offer to:

- Purchase that property from the registered proprietor at market value this offer shall be set by reference to the two independent valuations required by condition 52); or
- If the registered proprietor prefers, to provide an ex gratia payment equal to 5% of the property's market value to the registered proprietor.

#### Clause 47

Prior to the placement of the first explosives for any development blasts immediately beneath any part of the legal title to a residential property for any mining provided for under this consent, the consent holder shall offer to provide an ex gratia payment equal to 5% of the property's market value to the registered proprietor of that title.

#### Clause 48

If the consent holder's offer under Condition 46 or 47 is not accepted, but the registered proprietor wishes to negotiate, the consent holder shall offer to commit to a binding arbitration process in relation to the property purchase or ex gratia payment referred to above (whichever is applicable), provided that the basis for determining the ex gratia payment is not amenable to further negotiation.

### **4.3 Water Rights**

The original water rights for the Martha Mine were granted in 1987. The Company then applied for the regional resource consents necessary for the Martha Mine Extended Project to proceed, which were granted in 1998. Additional consents were subsequently granted in 2003 as part of the permitting for the Favona Decline and in 2004 for the Favona Underground Mine. Regional resource consents were also granted to provide for the Trio Development project in September 2010 and for the Trio Underground Mine in July 2011. Water rights expire after 35 years and key water rights remain in place through the Correnso operation. Additional water rights have been granted for Correnso (dewatering and re-watering of underground workings, river take and discharge to flood workings and construct water intake structure) by the Waikato Regional Council.

### **4.4 Easements and Road Access**

Public road access is provided to the plant site, Favona and Correnso through Baxter's Road and to the open pit mine by Seddon Street. A number of paper roads exist within the mining area. No additional agreements are required except in the event that Waihi Correnso imports significant quantities of waste rock from the local quarry, in which event the Company is required to fund certain road upgrades.

### **4.5 Regulatory Context**

The regulatory agencies primarily responsible for consents, permits and licences associated with the Correnso project are:

- New Zealand Petroleum and Minerals, which is the Crown agency responsible for administering rights to explore for and extract Crown-owned minerals, including gold and silver, under any Mining Licence under the Mining Act 1971 and Mining and Exploration Permits under the Crown Minerals Act 1991 (CMA).
- The Waikato Regional Council - Environment Waikato (EW), which is the local government agency appointed under the Resource Management Act 1991 (RMA) to take responsibility for air and water quality issues for activities, including vegetation removal and earthworks activities that can give rise to erosion of soils, that affect any of these values in respect of both the Mining Licence and resource consents under the Resource Management Act (RMA) 1991.
- The Hauraki District Council (HDC), which is the local government agency appointed under the RMA to be responsible for the management of land-use and community issues in respect of both the Mining Licence and resource consents. It is also responsible for Building Permits under the Building Act 1991, e.g. for the Trio vent and escape shafts.
- Heritage New Zealand Pouhere Taonga, which is the government agency appointed under the Heritage New Zealand Pouhere Taonga Act 2014 to grant an Authority to modify or destroy any archaeological site. Any impacts on old mine workings or old surface

structures, where these pre-date 1900 or are otherwise specifically protected by law, will require such an Authority.

## 4.6 Permits and Approvals

All Land use, water discharge and take and air discharge permits are in place for the Waihi project.

### 4.6.1 Permitting Schedule

Permitting of the Correnso Underground Project commenced in August 2011 with the public announcement of the Project. Permit documentation was lodged with the Government authorities in June 2012 and the final Permit was issued 7<sup>th</sup> October 2013. No further permits are required for the Martha pit or Correnso project.

### 4.6.2 Hauraki District Council

Land use consent was obtained from HDC for Waihi Correnso. The land use consent covers and places controls on, the majority of activities associated with the project. The key consent conditions relate to blast vibration, ground settlement, property compensation and social / cultural activities. Prior to exercise of the consent and physical works commencing Waihi Gold must provide:

- management plans for vibration and noise,
- additional vibration monitors,
- building structural surveys of selected residences / school,
- offer to make ex-gratia payments to properties overlying development, and
- NZ\$4M for purchase of properties selected by the investment review panel

### 4.6.3 Waikato Regional Council

The following consents have been obtained from the Waikato regional Council and are in place:

- Discharge permit in respect of all air emissions, being dust; CO<sub>2</sub>; blasting fumes; vehicle fumes; emissions from the ventilation shaft; any other minor and/or fugitive emissions.
- Water permit to pump groundwater for the purpose of dewatering the underground mine. Because of the geo-hydrologic connectivity of Correnso with Trio and Martha it is likely the preferred option will be to dewater primarily from the Martha pit.
- Discharge permit to place waste underground as backfill.
- Discharge permit to allow flooding of the underground post-closure with treated water from the water treatment plant.
- Discharge permit to allow degraded-quality groundwater to discharge from the flooded workings into the surrounding ground post- closure.

## 4.7 Mineral Tenure

### Favona Mining Permit MP 41 808

The provisions of the CMA cover the allocation of rights to explore for and mine Crown-owned minerals, including gold and silver. Under the CMA, Favona MP 41 808 was granted on the 22nd March 2004 for the duration of 25 years. Work began on the Favona decline in 2004 with the extraction of ore commenced in late 2006.

An Extension of Land to MP 41 808, obtained in March 2006, takes in the Trio project and potential resource extensions on the Martha vein system. This also provides for mining the Correnso Project.

The development of the Trio underground mine commenced in December 2010 and the Correnso Project commenced development in December 2013.



### Mining Licence ML 32 2388

The Martha Mine open pit operation commenced in 1988. The Mining Licence, ML 32 2388, was granted in July 1987 and covers the open pit located in the middle of Waihi, and the processing and waste disposal areas located approximately 2 km away to the south east. These two areas are linked by a conveyor which is also within the boundary of ML 32 2388.

The Martha Mine Extended Project commenced in 1999 and increased the life of the mine by an additional seven years.

Waihi Gold Company Limited was granted ML 32 2388 under the Mining Act 1971. This Act has since been repealed and replaced by the CMA, however, for the remaining duration of the ML (which expires in 2017) the provisions of the Mining Act still apply under the CMA as if the CMA had not been enacted. This provides for processing the Correnso Project and disposal of tailings through to 2017. Thereafter the CMA provides for the replacement of the Mining Licence with a Mining Permit, upon application to NZPM.

### Exploration Permits

The following Table 4-1 and Figure 4-1 detail the full set of permit interests held by Waihi Gold Company Limited as at June 30th, 2015 including rights to explore for minerals in the vicinity of the Waihi mine and within the wider Hauraki and Thames-Coromandel area:

**Table 4-1: Tenement Status 30 June 2015**

Permit	Licensee	Location	Legislation	Permit Type	Granted	Term (Yrs)	Expires	Area (ha)
322388	Waihi Gold Company Ltd	Martha	Mining Act 1971	Mining	16-07-87	30	15-07-17	394.3
41808	Waihi Gold Company Ltd	Favona	Crown Minerals Act 1991	Mining	22-03-04	25	21-03-29	1094
51041	Waihi Gold Company Ltd	White Bluffs	Crown Minerals Act 1991	Exploration	15-10-08	10	14-10-18	450.97
51630	Waihi Gold Company Ltd	Ohui	Crown Minerals Act 1991	Exploration	22-06-09	10	21-06-19	1490.26
51771	Waihi Gold Company Ltd	Waihi North	Crown Minerals Act 1991	Exploration	28-04-10	10	27-04-20	980.59
52804	Waihi Gold Company Ltd	Twin Hills	Crown Minerals Act 1991	Exploration	17-12-10	5	16-12-15	5704
40598	Waihi Gold Company Ltd/Glass Earth Ltd	Hauraki	Crown Minerals Act 1991	Exploration	22-05-03	14	21-05-17	4751.51
40813	Waihi Gold Company Ltd/Glass Earth Ltd	Glamorgan	Crown Minerals Act 1991	Exploration	07-09-06	10	06-09-16	3550.155
53325	Waihi Gold Company Ltd	Dome Field	Crown Minerals Act 1991	Prospecting	27-01-12	4	26-01-16	22250

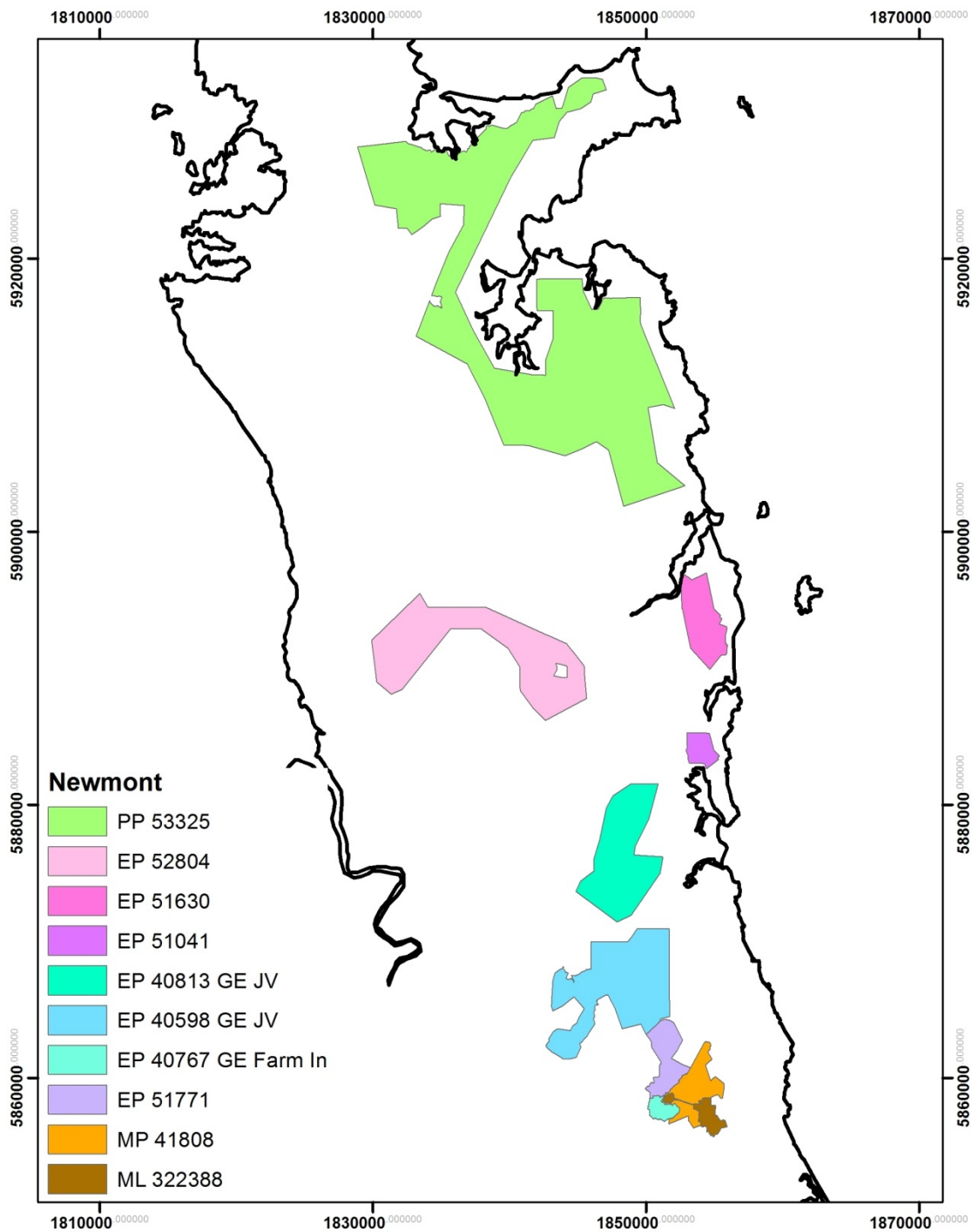


Figure 4-1: Tenement Plan 30 June 2015

## **5 ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES AND INFRASTRUCTURE**

### **5.1 Accessibility**

The Waihi site is located within the township of Waihi in the North Island of New Zealand and close to the major cities of Auckland (150km north), Tauranga (60km south) and Hamilton (100km west). Waihi enjoys a temperate climate with high rainfall (2m per annum). Road access from Auckland and Tauranga is via State Highway 2. No rail access is available to the site.

### **5.2 Climate and Physiography**

The town is at the foot of the Coromandel Peninsula. To the west are the hills of the Kaimai Ranges.

The climate is temperate. Mean temperatures range from 8 °C (46 °F) in the South Island to 16 °C (61 °F) in the North Island. January and February are the warmest months, July the coldest. New Zealand does not have a large temperature range, but the weather can change rapidly and unexpectedly. Winds in New Zealand are predominantly from the West and South West, in winter, when the climate is dominated by regular depressions. In summer, winds are more variable with a northerly predominance associated with the regular large anti cyclones which cover all the country.

New Zealand is seismically active. In the Waihi region:

- Earthquakes are common, though usually not severe, averaging 3,000 per year mostly less than 3 on the Richter scale.
- Volcanic activity is most common on the central North Island Volcanic Plateau approximately 200 to 300km from Waihi.
- Tsunamis would not have any direct impact on Waihi.
- Droughts are not regular and occur less frequently over much of the North Island between January and April.
- Flooding is the most regular natural hazard.

### **5.3 Local Resources and Infrastructure**

#### **5.3.1 Workforce**

Almost all of the employees reside in the nearby towns of Waihi, Waihi Beach, Katikati, Thames and Paeroa. Waihi is a relatively small community of approximately 4,500 people. Statistics New Zealand Census information shows that population numbers have remained relatively stable since 2001, with a small drop (approximately 150) from the 1996 Census. The population pyramid from the 2006 Census shows a noticeable dip in the numbers of young people in the range from 20-30.

The total labour force in Waihi at the time of the 2006 census was reported as 1863 people. The largest sectors for employment in Waihi are the retail trade (14.3%), manufacturing (12.8%), and construction (including mining) sectors (12.5%). Mining is relatively high at 3.2% of the usual resident population compared to the Waikato Region at 0.5% and New Zealand at 0.2%. A large proportion of the construction jobs are likely to be related to the mining sector. Waihi is characterised by a comparatively high level of unemployment. In 2006 the unemployment rate for Waihi was 8.3%, compared to 5.2% for the Waikato Region and 5.1% nationally. Additionally average wages in Waihi are lower than regional averages and are skewed towards lower income levels.

### **5.3.2 Community – Health, Education and Services**

Community health, education and services are well established in Waihi with four primary schools, one secondary school, medical centres and various community health centres present. Most establishments are government funded.

### **5.4 Local Service Industry**

A local service industry has established itself over the last 20 years to support the Waihi Gold mine comprising engineering, cleaning, maintenance, rental, tire and consumable suppliers, security, labour hire and other services. More technically advanced services are available from the regional centres in terms of heavy engineering, large equipment hire and other specialized services. Most suppliers are privately run and not affiliated with Waihi Gold.

### **5.5 Comments on Accessibility, Climate, Local Resources, Infrastructure, and Physiography**

In the opinion of the QPs:

- The existing and planned infrastructure, availability of staff, the existing power, water, and communications facilities, the methods whereby goods could be transported to any proposed mine, and any planned modifications or supporting studies are well-established and can support the declaration of Mineral Resources;
- Within Waihi Gold ground holdings, there is sufficient area to allow construction of any required Project infrastructure;
- The QPs consider it a reasonable expectation that surface rights usages will continue to be granted for the Project with appropriate negotiation.

## 6 HISTORY

Waihi is a historic mining centre. The original Martha mine began as an underground operation in 1879 and by 1952, about 12 million tonnes of ore had been mined to yield 1,056 tonnes of gold-silver bullion. The historic mine extracted four main parallel lodes (the Martha, Welcome, Empire and Royal) together with numerous branch and cross lodes. All lodes dip steeply and are fillings of extensional faults and fractures. Early stoping employed the cut and fill method but this was phased out and largely replaced after 1914 by the shrink stoping method. Stopes were generally not backfilled after 1914 but left open. The workings reached a total depth of 600m from surface on sixteen levels. Man and supply access was by 7 known shafts and IGNS, (2002) report numerous other shafts were developed for ventilation and exploration purposes. In 1894, the Waihi Gold Mining Company adopted the cyanide process for gold extraction, which was first trialled at a nearby mine in Karangahake.

Exploration drilling between 1979 and 1984 by Waihi Mining and Development Ltd. and AMAX Exploration Ltd. identified large open pit reserves within the confines of the historic mining area. Following the granting of permits, the Martha Mine open pit operation commenced operation in 1988 as an unincorporated joint venture between subsidiaries of Normandy Mining Limited Group and Otter Gold Mines Ltd. The Otter Gold holding was acquired by Normandy in 2002 and the Newmont Mining Corporation acquired full ownership of the Waihi Mine in 2002 through the acquisition of the Normandy Mining Group. OceanaGold obtained the Waihi property as an operating open pit mine and process plant in October 2015.

The Martha Mine open pit operation commenced in 1988 in accordance with Mining Licence 32 2388 which is an existing privilege, as defined by section 106 of the Crown Minerals Act 1991 (CMA). The Licence was granted in July 1987 and covers an area of approximately 400 hectares comprising two main elements; the open pit (approximately 40 ha) located in the middle of Waihi, and the processing and waste disposal areas located approximately 2 km away to the south east. These two areas are linked by a conveyor which is also within the boundary of ML 32 2388.

The Martha Mine Extended Project commenced in 1999 and increased the life of the mine by an additional seven years. The consenting process for the Extended Project was partly by way of applications for new resource consents, including Land Use Consent 97/98-105 granted by Environment Court decision A114/99, and partly by way of applications for variations to the existing Mining Licence. These consents cover the layback to the east wall of the pit which is current underway. ML 32 2388 and/or the conditions of Land Use Consent 97/98-105 includes activities within the Mining Licence and Extended Project areas such as stockpiling, the processing of ore and the disposal of tailings to existing tailings storage facilities. While ML 32 2388 expires in July 2017 and Land Use Consent 97/98-105 expires in June 2019, the regime set out in these existing authorizations is continued after their respective expiry dates through the permitted activity rule framework set out in the Proposed District Plan.

Waihi Gold holds a suite of resource consents from Waikato Regional Council (WRC) which covers all mining and associated discharge activities for the Mining Licence and Extended Project areas. Resource consents for the Favona exploration decline were granted in 2003 and work began on the decline in 2004. The Favona Mine consents were granted in 2004 with the extraction of ore commencing in late 2006. The Favona Mining Permit 41 808 (MP 41 808) was granted in March 2004, under the provisions of the Crown Minerals Act 1991, for a duration of 25 years. An Extension of Land to Favona MP 41 808 was granted in March 2006.

Resource consents for the Trio development were granted in September 2010 and for the Trio underground mine in December 2010. Consents comprised discharge from ventilation shafts, discharge of groundwater for flooding the mine, placing rock underground for backfill and undertaking dewatering. The Correnso Project was approved as a standalone option in December 2014. Resource consent for the Correnso Project was granted in October 2013 and executed in December 2013.

**Table 6-1: Historic Production post 1988**

Year End	Martha OP				Favona UG				Union - Trio - Amaranth UG			
	Tonnes	Au (gpt)	Mined Au (Koz)	Recovered Au (Koz)	Tonnes	Au (gpt)	Mined Au (Koz)	Recovered Au (Koz)	Tonnes	Au (gpt)	Mined Au (Koz)	Recovered Au (Koz)
30/06/1988	68,179	2.4	5.3	3.6								
30/06/1989	775,240	2.8	69.8	63.1								
30/06/1990	879,294	3.1	87.6	78.9								
30/06/1991	858,173	3.4	93.8	84.2								
30/06/1992	834,472	3.1	83.2	74.5								
30/06/1993	817,003	3.2	84.1	75.7								
30/06/1994	800,203	3.3	84.9	77.8								
30/06/1995	880,580	2.5	70.8	66.4								
30/06/1996	892,859	2.9	83.3	79.2								
30/06/1997	915,135	3.0	88.3	82.7								
30/06/1998	917,346	3.1	91.4	85.6								
30/06/1999	907,790	3.6	105.1	95.5								
30/06/2000	1,030,062	3.3	109.3	102.0								
30/06/2001	1,202,938	2.7	104.4	95.1								
30/06/2002	1,343,925	3.3	142.6	129.9								
31/12/2002	638,210	3.5	71.6	64.4								
31/12/2003	1,231,521	3.1	120.8	109.7								
31/12/2004	1,274,790	3.4	141.0	127.6								
31/12/2005	1,158,385	4.8	180.2	167.7								
31/12/2006	794,231	4.0	102.9	97.0	135,304	7.9	34.2	30.0				
31/12/2007	273,414	1.7	15.2	13.3	225,276	11.1	80.1	72.2				
31/12/2008	536,360	1.9	32.6	29.7	330,619	11.1	118.0	101.5				
31/12/2009	951,481	2.0	62.4	57.7	333,103	8.2	87.8	79.4				
31/12/2010	564,031	2.4	44.1	39.7	367,577	6.2	73.8	66.1				
31/12/2011	691,763	2.5	54.5	48.9	304,609	6.0	58.4	51.6				
31/12/2012	15,972	4.8	2.5	2.2	51,580	5.6	9.3	8.6	340,391	5.4	59.1	54.6
31/12/2013	165,569	2.8	14.8	12.8	52,756	4.2	7.1	6.5	463,298	6.4	95.8	88.0
31/12/2014	684,473	3.1	68.0	61.8					333,512	7.3	78.6	73.3
<b>TOTALS</b>	<b>22,103,399</b>	<b>3.1</b>	<b>2,214</b>	<b>2,027</b>	<b>1,800,824</b>	<b>8.1</b>	<b>469</b>	<b>3,723</b>	<b>1,137,201</b>	<b>6.4</b>	<b>233</b>	<b>216</b>

## 7 GEOLOGICAL SETTING AND MINERALIZATION

### 7.1 Regional Geology

The Waihi area is situated at the southern end of the Coromandel range which is part of an andesite, rhyolite, and dacite sub-aerial volcanic sequence. Quartz veins in the andesite rocks at Waihi contain alteration zones and epithermal gold-silver deposits. The upper portions of these older rocks are frequently highly to partially weathered. Overlying these sequences is younger volcanic rocks (ignimbrites, rhyolite tephra's and occasional inter-bedded paleosols and boulder alluvium) infilling surface depressions eroded into the andesite rocks. Volcanic ash and pumice showers blanket the area to depths of 1m to 8 m. The Hauraki Goldfield is characterised by low-sulphidation epithermal gold-silver deposits hosted in quartz veins within sub-aerial andesitic to rhyolitic volcanics of the extinct Coromandel Arc. Mid-Miocene to Pliocene volcanics of the Coromandel Group, predominantly andesites and dacites, host the majority of Coromandel epithermal gold-silver mineralisation within NNW to NE-trending vein systems. A smaller number of epithermal deposits are associated with Late Miocene to Early Pliocene rhyolites and ignimbrites of the overlying Whitianga Group, which often occupy small volcano-tectonic depressions on the eastern side of the Coromandel Range, refer Figure 7-1.

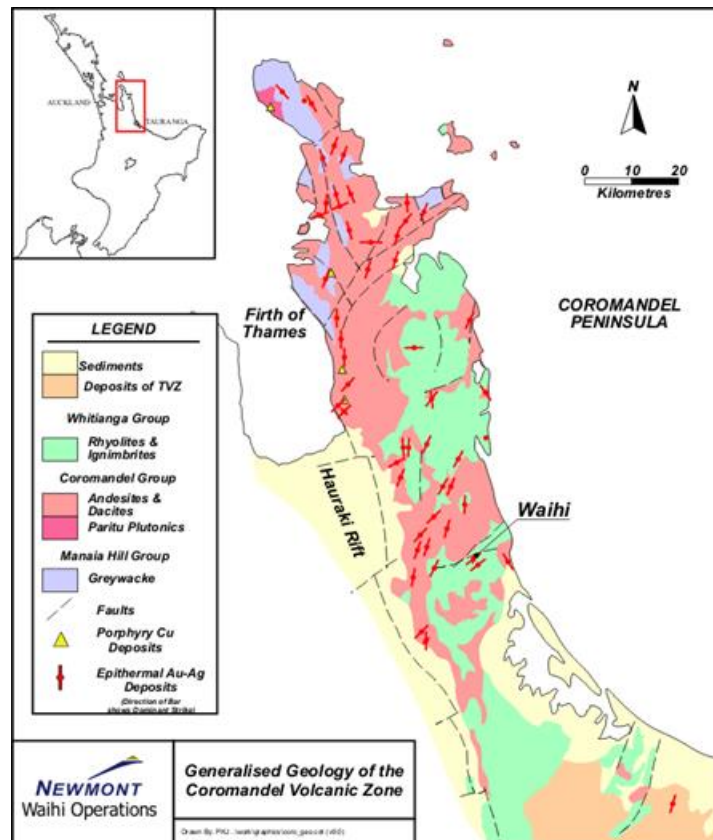


Figure 7-1: Regional Geological Plan

In the Waihi district, greywacke basement is not exposed but is assumed to underlie the volcanic pile at depths of 2-3km. Jurassic greywacke basement and intruded granitic stocks and dikes are only exposed in the northern part of Coromandel, becoming progressively down-faulted to the south beneath younger volcanics. The oldest rocks in the Waihi area are Late Miocene (7.9 to 6.3Myr) Coromandel Group andesites, unconformably overlain by a post-mineral succession of andesitic to rhyolitic volcanics and volcanic-derived sediments. The Miocene geology is overlain by up-to 1.5 km of Pliocene - Pleistocene lake sediments and locally derived ignimbrite, which infill an inferred fault controlled caldera structure. K-Ar dates indicate that hydrothermal alteration and related epithermal gold mineralisation (6.6 to 7.2Myr) followed soon after eruption of host andesite at Waihi (Brathwaite & McKay, 1989). The major gold - silver deposits of the Waihi District are classical low sulphidation adularia-sericite epithermal quartz vein systems

associated with north to northeast trending faults. Larger veins have characteristically developed in dilational sites in the steepened upper profile of extensional faults with narrower splay veins developed in the hanging wall of major vein structures. Moderate to steeply dipping veins or vein systems are characterised by 200 to 2000m of strike, 170 to 700m vertical range and upwards of 30m individual vein widths; – but more typically 1-5m. Mineralised veins are typically bordered by zones of quartz - adularia – illite alteration that grade outwards and upwards into extensive argillic (illite-smectite dominant) and propylitic (calcite - chlorite dominant) zones. The main ore minerals are electrum and silver sulphides with ubiquitous pyrite and variable though usually minor sphalerite, galena and chalcopyrite in a gangue consisting of quartz, locally with calcite, chlorite, rhodochrosite and adularia. Base metal sulphides increase with depth.

## 7.2 Project Geology

A general geology plan of the Project, showing the major veins, is included as Figure 7-2. The Waihi epithermal gold-silver mineralised veins are hosted in Miocene andesite lavas beneath the Waihi township area. The mineralized quartz veins are typically coincident with extensional faults and are believed to have formed in an extensional setting related to back-arc rifting during initiation of the current NNE-trending subduction regime. Waihi veins have been dated at 6.1Myrs. Vein geometry is typically steep-dipping. Vein widths vary both along strike and vertically.

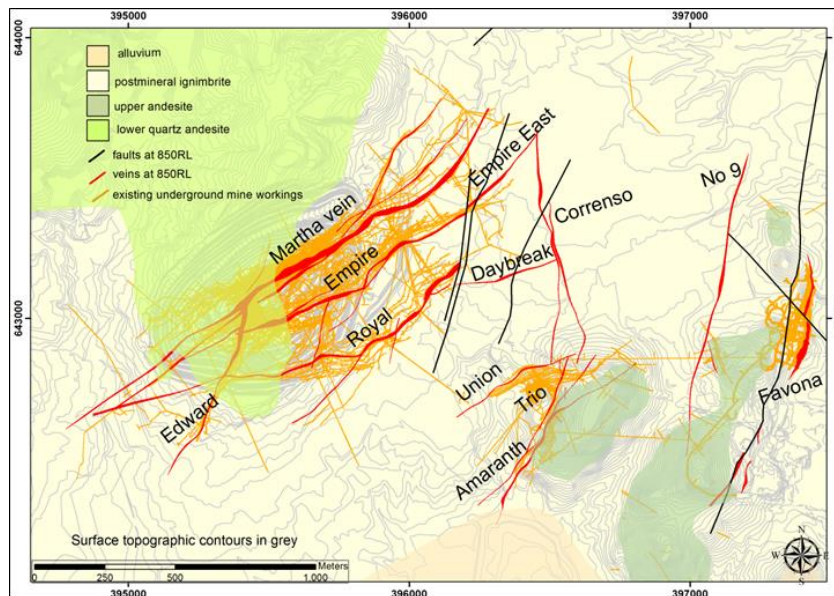


Figure 7-2: Project Geology Plan

## 7.3 Alteration and Weathering

Host andesitic volcanics have undergone pervasive hydrothermal alteration, often with complete replacement of primary mineralogy. Characteristic alteration assemblages include quartz, albite, adularia, carbonate, pyrite, illite, chlorite, interlayered illite-smectite and chlorite-smectite clays extending over tens of metres laterally from major veins.

### 7.3.1 Mineral and Trace Element Associations

The Waihi epithermal veins have a simple gangue mineralogy dominated by quartz. Other gangue minerals that are commonly present within veins include calcite, hydrothermal clays (smectite, illite, interlayered chlorite-smectite or illite-smectite), chlorite, adularia and inesite, a manganese silicate. Quartz crystallinity varies from cryptocrystalline (cherty or chalcedonic) to coarser crystalline quartz. Textures vary from massive to crustiform banded.



Gold occurs mostly as electrum; free gold is rarely observed. The electrum occurs as small inclusions within a variety of minerals. It has been observed within quartz gangue, within the sulphide minerals pyrite, sphalerite and galena and less commonly within chalcopyrite.

The Martha ore has silver to gold ratios of > 10:1, The Favona and Trio ores had silver to gold ratios of ~ 4:1, and Correnso ore has a silver to gold ratio of less than 2:1.

The base metal sulphide content increases with depth within all the Waihi veins. Sphalerite and galena are the most abundant base metal sulphides while chalcopyrite is less common and pyrrhotite is rare. Correnso ore has higher base metal content than other Waihi veins and also contains higher levels of arsenic. The arsenic is thought to occur mostly within arsenian pyrite.

### 7.3.2 Structure

Major controlling structures in the Waihi district appear to be the NE-trending Waihi Fault and Golden Valley Fault. The Martha, Union and Favona quartz lodes are inferred to represent dilation in the steepened upper profile of NE to NNE-trending normal faults, which step down-dip to the southeast. At Favona principal veins and faults trend NNE and dip steeply eastward, and hanging wall quartz splays dip to the west. There is greater development of upward splaying geometry in the North Favona shoot relative to South Favona/Gladstone. As at Martha, principal veins locally exhibit an extensional ramp-flat geometry with greater development of hanging-wall splays from more shallowly-dipping vein segments, and increased vein widths associated with steepening of veins. Several potentially cross-cutting faults have been identified in drill core, including a northeast-trending fault set, which dips at 20 to 30 degrees southward, and is characterized by intense deformation over several metres, and locally by intense pyritisation and acid alteration. The current geological model suggests no evidence for major post-mineral offset within the Favona deposit.

## 7.4 Deposits

### 7.4.1 Martha Project Area

The quartz vein system at Martha is hosted by hydrothermally altered quartz bearing andesite flows and flow breccias inter-bedded with thin tuffaceous sediments, dipping South-East at about 40 degrees. These are unconformably overlain by a post-mineral sequence of late Pliocene to Quaternary ignimbrite and alluvial units. These units thicken to the south and east and are inferred to infill a caldera-like structure. Oxidation extends down the vein margins to over 250m below surface.

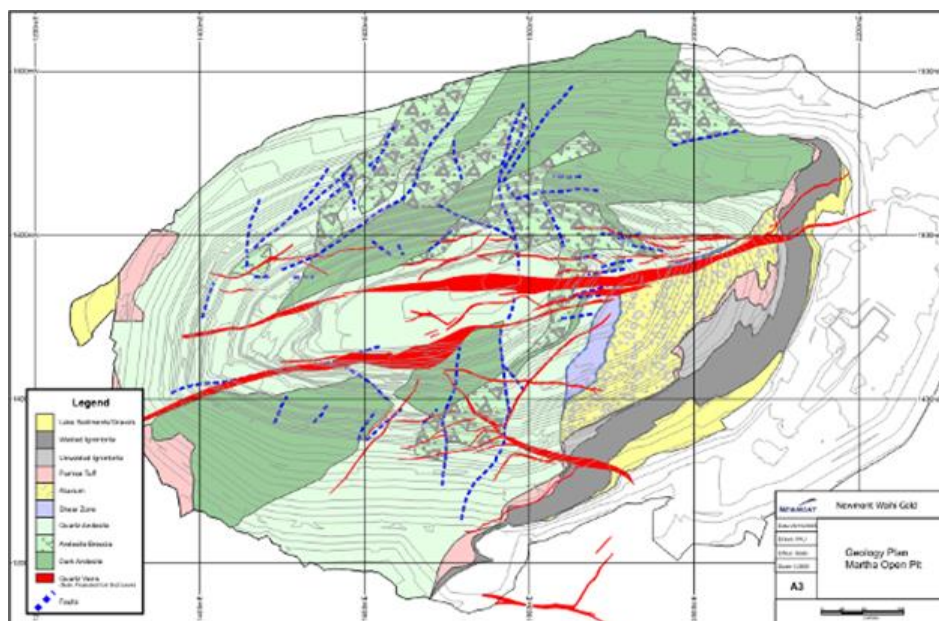


Figure 7-3: Geological Plan, Martha Area

The system comprises of four main northeast trending veins (Martha, Welcome, Empire and Royal) and a two north trending cross-cutting vein structures, the Edward and Albert. The main veins are enveloped by a stockwork of subsidiary veins. Mineralisation extends for 1600 metres along strike with a width of 500 metres and was historically mined to over 600 metres below surface. Multiple stages of vein filling are recognised with sulphide bearing crustiform-banded quartz being the main ore-bearing type. Electrum (averaging 38% silver) is the main gold mineral and occurs as both free grains in the quartz and as inclusions in sulphides (pyrite, chalcopyrite, and sphalerite). Acanthite associated with pyrite and galena is the main silver mineral.

There are two main types of hydrothermal alteration; an outer zone of propylitic type calcite-chlorite alteration is overlapped by quartz-adularia-illite alteration adjacent to the veining. Ore is also associated with historically mined stopes. The main stoping method employed in the upper levels of the mine was cut and fill. A significant amount of ore loss into stope fill occurred with this method, effectively upgrading the barren soil type material used as fill. Stope fill makes up approximately 7% of total tonnes and 12.5% of contained gold in the open pit reserve.

### 7.4.2 Correnso Project

The Correnso epithermal vein system is part of the greater Waihi epithermal vein system. It trends northerly and lies between the Martha Hill deposit to the west and the Union/Amaranth/Trio and Favona deposits to the south and southeast. The dominant host lithology is quartz phyrlic andesite lava, also the main host lithology for the Martha Vein System. The quartz andesite unit attains thicknesses in excess of 400m in the Union Hill – Waihi East area with only minor variation in texture or modal composition. The Correnso system comprises a main lode with smaller splays veins on both the hanging wall and footwall sides. The main mineralized lode is interrupted to the north by a NE trending calcite-quartz (barren) structure. The grade distribution to the north is increasingly complicated by bands / lobes of low grade calcite-quartz which appear to have flooded the system post Au mineralization. The main gold mineralisation lies between 900mRL and 775mRL. Gold-silver mineralisation is dominantly hosted in localized bands within multiphase quartz veins. There is an association of sphalerite, galena and chalcopyrite with gold-silver mineralisation throughout the deposit. The lower part of the deposit is base metal rich with galena (up to +3% Pb) and sphalerite (up to +1% Zn).

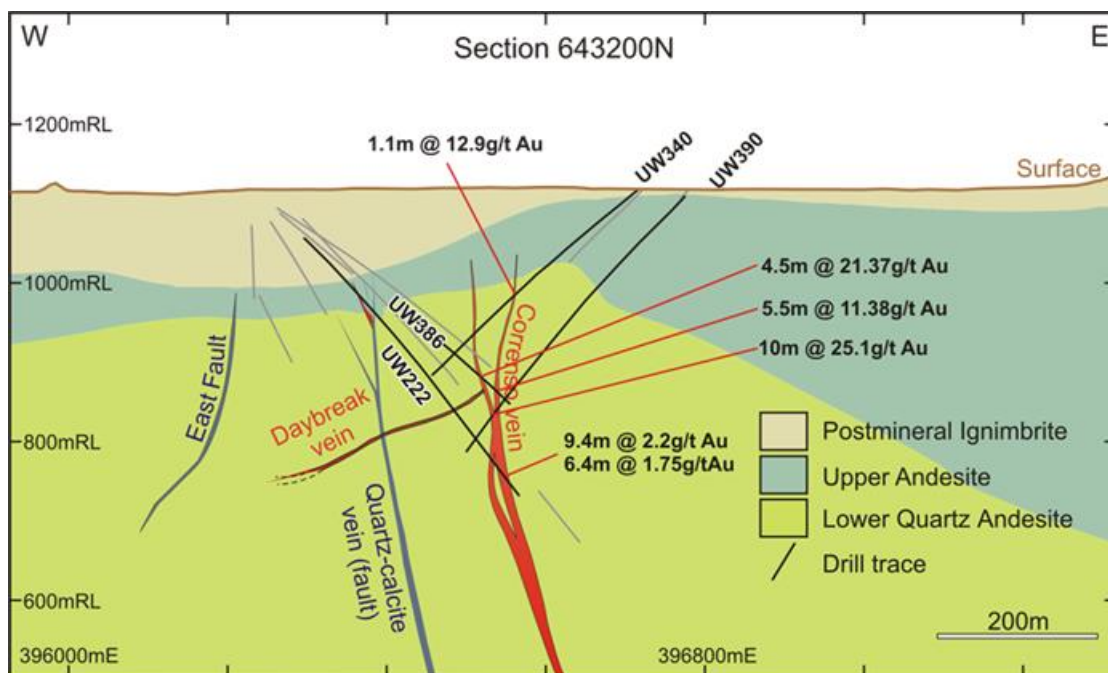


Figure 7-4: Geological Section, Correnso Project (643200mN)

## **7.5 Comments on Geological Setting and Mineralization**

In the opinion of the QPs knowledge of the deposit settings, lithologies, mineralization style, and structural and alteration controls on mineralization is sufficient to support Mineral Resource estimation.

## 8 DEPOSIT TYPES

The deposits discovered by Waihi Gold Company to date in the Project are considered to be typical of epithermal vein gold – silver deposits.

### 8.1 Comments on Deposit Types

In the opinion of the QPs, features that the Waihi deposits display that are typical of epithermal gold deposits include:

- Host lithologies for veins are andesite flows and volcaniclastics.
- Gold-silver mineralisation is hosted in localized bands within multiphase quartz veins.
- There is an association of sphalerite, galena and chalcopyrite with gold-silver mineralisation throughout the deposit. Parts of the deposit towards the base are base metal rich with galena (up to +3% Pb) and sphalerite (up to +1% Zn);
- Host andesitic volcanics have undergone pervasive hydrothermal alteration, often with complete replacement of primary mineralogy. Characteristic alteration assemblages include quartz, albite, adularia, carbonate, pyrite, illite, chlorite, interlayered illite-smectite and chlorite-smectite clays extending over tens of metres laterally from major veins. There is also an association of quartz + interlayered chlorite-smectite (corrensite) + chlorite, producing a distinctive pale green colouration.
- Mineralization is structurally controlled.

## 9 EXPLORATION

Approximately 414,000m have been drilled in 2,864 core and exploration RC drill holes on the Project since 1980. Current drill programmes are planned to complete 35km's of diamond drilling for the calendar year 2015. This drilling is comprised of infill on known veins (~50%), step out on known veins (~30%) and exploration in areas adjacent to known mineralisation (~20%). Exploration drilling proposed for late 2015 is designed to test extensions of known mineralisation and untested margins of the gravity high associated with the Waihi Vein Deposits where there is potential for the discovery of significant new mineralised vein deposits.

No Exploration Results are being presented in this report, rather this report is focused on advanced projects that have well defined geological models and associated resources estimates completed.

### 9.1 Grids and Surveys

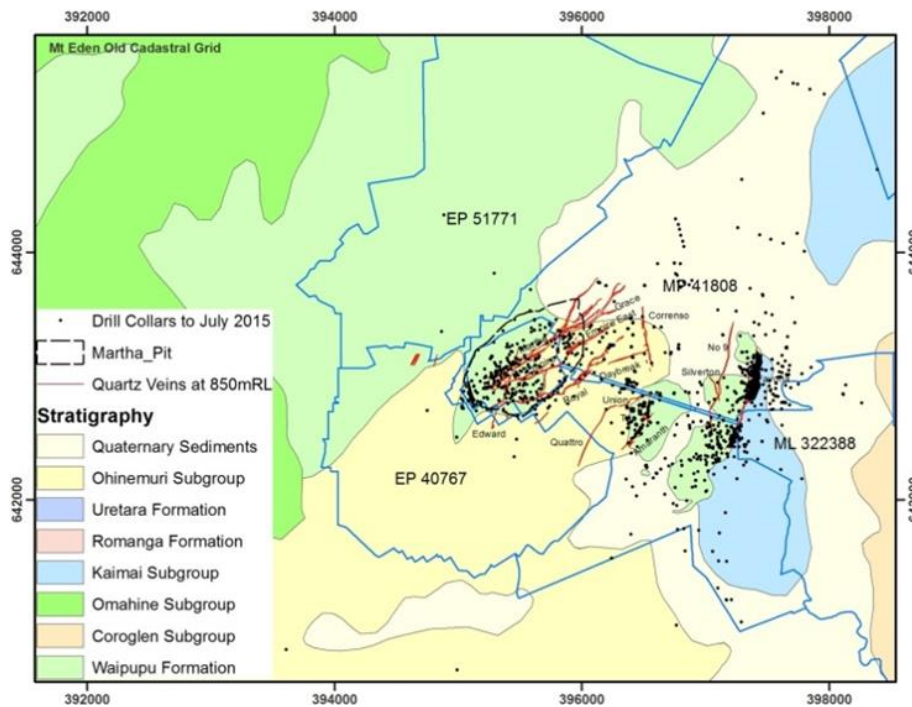
All historic mine data was recorded in terms of Mt Eden Old Cadastral grid. A local mine grid –Martha Mine Grid, oriented perpendicular to the main veins and derived from Mt Eden Old Cadastral is used. The Mine Grid origin is based at No.7 Shaft (1700mE, 1600mN). The grid is rotated 23.98 west of Mt Eden Old Cadastral North. Relative level (RL) calculated as Sea Level + 1000m. Transformation co-ordinates and conversions are presented in Table 9-1.

**Table 9-1: Mt Eden Old Cadastral - Mine Grid Conversion**

Mt Eden E1	394973.96	Mine E1	1500.49
Mt Eden N1	642869.93	Mine N1	1200.22
Mt Eden E2	395867.28	Mine E2	2000
Mt Eden N2	643813.88	Mine N2	2400
Rotation	23.98		
Scale Factor	0.999976337		
Shift East	-393773.74		
Shift North	-641369.44		

### 9.2 Drilling

Exploration drilling is continuing throughout the Waihi Epithermal Vein camp on ML 322388, MP 41808, EP 51771 and EP 40767. EP 40767 has been subject to a 60:40 JV arrangement with Glass Earth Gold whose interest in this permit and the Hauraki JV permits to the north have been bought out by Oceana Gold in a pre-emptive opportunity under the JV Agreements that arose when Glass Earth moved to sell their interests to Aorere Resources. Early in 2015 a significant drill intercept of 10.2m (7.6m true) at 5.6g/t Au, including 3m @ 14.3g/t Au, was returned on a newly discovered vein Quattro within EP 40767. This vein is approximately 300m from existing underground infrastructure and follow up drilling to determine the resource potential is in progress.



**Figure 9-1: Drill Hole Location Plan**

Drilling completed on the Project is further discussed Section 10 of this Report.

### 9.3 Bulk Density

Bulk density determinations are discussed in Section 11 of this Report.

### 9.4 Comments on Exploration

In the opinion of the QPs:

- The exploration programs completed to date are appropriate to the style of the deposits and prospects within the Project;
- The exploration work supports the interpretations of the orogenesis of the deposits;
- The Project retains exploration potential, and additional work is planned.

## 10 DRILLING

Approximately 414,000m have been drilled in 2,864 core and exploration RC drill holes on the Project since 1980. Most surface diamond drill holes were drilled by triple tube wireline methods with some holes precollared through post-mineral rocks by tricone or stratapac. Surface holes are collared using large-diameter PQ core, both as a means of improving core recovery and to provide greater opportunity to case off and reduce diameter when drilling through broken ground and historic stopes. Drill hole diameter is usually reduced to HQ at the base of the post-mineral stratigraphy. All drill core was routinely oriented below the base of the post-mineral stratigraphy, either by plasticine imprint or using the Ezimark or Reflex core orientation tool.

Additionally, 88,000m have been drilled in 4,445 reverse circulation grade control holes during the open pit Southern Stability Cut (SSC) and Eastern Layback (ELB) projects between May 2007 and May 2015, using a 114mm hole diameter and rig-mounted cyclone sampler. Details of the various drilling programs are summarized in Table 10-1 by year. Locations of these drill holes are included in Figure 10-1.

### 10.1 Drill Methods

All surface drill holes were drilled by triple tube wireline diamond methods. Surface holes are collared using large-diameter PQ core, both as a means of improving core recovery and to provide greater opportunity to case off and reduce diameter when drilling through broken ground and historic stopes. Hole diameter is usually reduced to HQ at the base of the post mineral stratigraphy. All drill core was routinely oriented below the base of the post mineral stratigraphy, either by plasticine imprint or using the Ezimark or Reflex core orientation tool.

Drillhole location is recorded relative to the local mine grid Mt Eden Old Cadastral. Initial set-out and final survey of drill hole location for all recent drill holes (2004 onwards) has been carried out by mine surveyors using real time differential GPS. Downhole surveys were performed at 30m intervals using a digital single shot camera. The accuracy of the downhole camera is checked monthly against a fixed camera stand. Magnetic field readings are taken for each camera shot and surveys are rejected if the magnetic field is outside the normal range. Magnetic readings from downhole surveys are loaded to the database, and converted to local grid north (Mt Eden Old Cadastral) based on the current magnetic declination.

Core recovery is recorded for all drilled intervals and is typically greater than 95%. No grade versus recovery relationship is evident.

**Table 10-1: Summary, Drilling by Year**

Year	Number of Surface Drill holes	Surface Drill holes Metres	Number of Underground Drill holes	Underground Drill holes Metres	Drill hole series prefix code
1980	8	1,462			WHD
1981	22	4,938			WHD
1982	48	6,125			WHD
1983	0				
1984	23	3,458			PS, WE, WHD, WR
1985	39	6,306			WE, UW
1986	21	7,046			WE, UW
1987	10	1,729			WE, WHD
1988	5	222			FRC
1989	28	4,311			WE, WHD, WR
1990	9	2,133			UW
1991	13	613			PS, WE, WHD, WR
1992	11	455			PS, WE, WHD, WR

1993	16	975			WHD
1994	9	635			WHD
1995	32	2,615			WHD, WC
1996	31	2,802			WHD, WG, UW, WE
1997	10	1,420			WHD, UW, WG
1998	4	346			WHD, UW, WG
1999	26	5,098			RD, UW, WHD
2000	6	2,115			UW, WHD
2001	38	12,293			UW, WHD
2002	66	19,706			UW, WHD, GM, HDC
2003	36	11,536			UW, WHD
2004	50	20,904			UW
2005	108	26,652			UW, WHD, P, PH, GTK, GTM, MRC
2006	69	19,111	112	4,460	WHD, UW, MRC, GTM, FU, FD
2007	72	11,355	277	10,151	WHD, UW, MRC, MWRC, FU, FD
2008	43	10,784	277	15,273	WHD, UW, MRC, MWRC, MNDDH, FU, FD
2009	50	12,449	219	12,693	UW, FU, FD
2010	32	13,565	150	6,568	UW, TV, FU, FD, F2
2011	75	19,493	114	17,110	UW, UG, P, MED, GT, FU, FD, F2011, CGD
2012	37	11,853	296	35,652	UW, MED, CGD; project TRIUGDD
2013	1	275	114	14,084	project TRIUGDD and project CORUGDD
2014	2	2,351	133	24,464	projects CORUGDD, DAYUGDD, GEMUGDD, UW
2015 30, June	3	2,608	119	24,489	projects CORUGDD, DAYUGDD, GEMUGDD, UW
<b>TOTAL</b>	<b>1,053</b>	<b>249,736</b>	<b>1,811</b>	<b>164,943</b>	

**Table 10-2: Drill Data Used in Mineral Resource Estimation**

Project	Database	No RC	m RC	No DDH surface	m DDH surface	No DDH underground	m DDH underground
Martha Open Pit East Layback	r0515_Martha_BP_DIH.dhqx	4464	86,738	285	40,319		
Correnso	r2014_corr_Stg2C_Final.accdb			102	48,321	132	24997



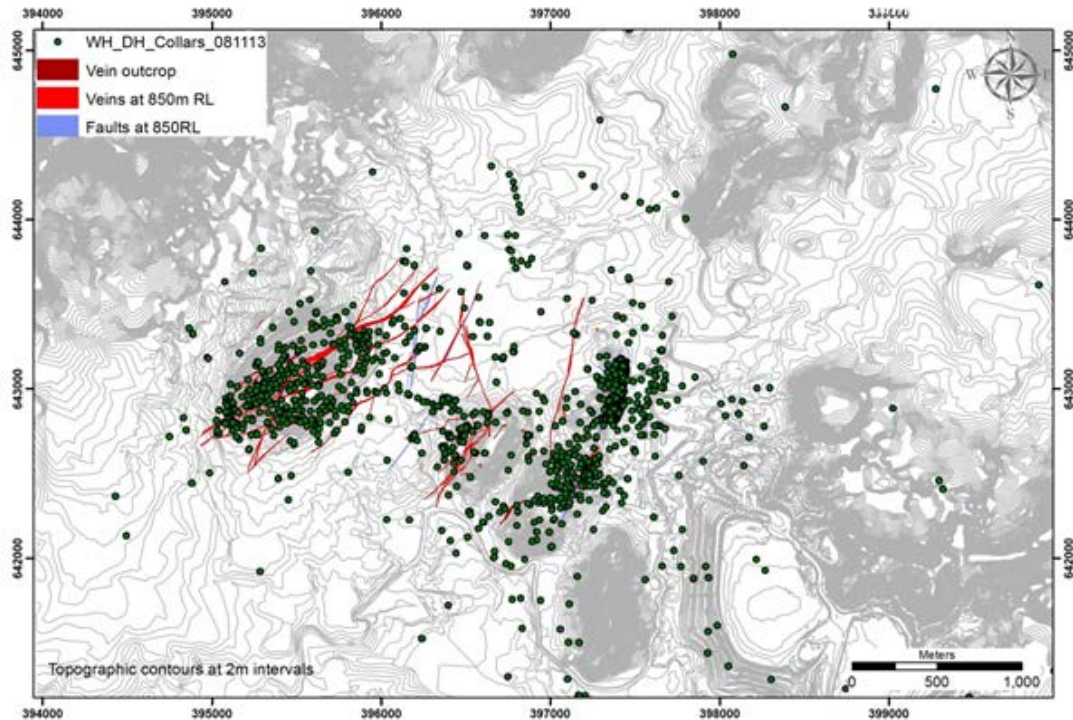


Figure 10-1: Drill Hole Location Plan, Waihi

## 10.2 Geological Logging

Electronic geological logs are now created using Microsoft Excel. As of June 2015 the geological logging data has been migrated to an Acquire database. Newmont’s Visual Logger software was utilised for logging. From Visual logger the logging data was imported directly into an Acquire database for all logging prior to April 2011. Between April 2011 and June 2015 Newmont implemented the proprietary (GED) database package and all drill data was migrated to a web-based GED and subsequent drill log data imported directly to the GED via a Visual Logger interface. A hard copy was printed out and archived.

Log intervals are based on geological boundaries or assigned a nominal length of one or two metres. RC grade control drilling in the open pit is sampled over 1.5m intervals. The geological log incorporates geotechnical parameters, lithology, weathering, alteration and veining.

Logging has been validated using inbuilt validation tables for all recent drilling and has been checked for consistency throughout the project. A complete digital photographic record is maintained for all drill core.

Drill collar and survey information are uploaded directly to the log from the database prior to beginning each drill log, along with inbuilt validation for each of the data fields. Field selection is managed through template views. A dropdown menu for each field allows the geologist to enter data by selecting from the available codes. Descriptions for each code are listed in the dropdown menus. Logs are saved to the drill database daily and all drill information, including hole depth and down hole survey data, is validated on completion of logging. The standard logging template includes fields to record lithology, weathering, alteration, structure and geotechnical information. A text field allows comments of unlimited length. There are additional fields in the template for entering sample details, QAQC samples such as blanks and reference standards and a display for gold and silver values.

All drill core is photographed and stored digitally on the Waihi server.

Qualitative logging of sieved RC grade control chips was undertaken at sample interval lengths using Newmont’s Visual Logger software between May 2007 and May 2015. This assisted in the identification of lithology, alteration, mineralogy, vein continuity and historic workings.

### **10.2.1 Lithology Codes**

Lithology fields include three primary fields, composition, rock type and grain size, which are concatenated in the database to form one composite code, for example AFM, a medium porphyritic andesite flow, is created from Composition A= Andesite, Rock Type F= Lava flow, Grain Size M = Medium porphyritic. Secondary logging fields for lithological information (optional) include fields to record local or formal geological unit names, textural features, intensity of texture, and composition of clasts.

### **10.2.2 Weathering Fields**

There are two fields available for recording weathering information. Weathering is the primary field and records the extent of weathering or oxidation. A second field records the amount of iron oxide present. Both fields use a 1-5 scale.

### **10.2.3 Alteration fields**

The primary fields for alteration use a 1-5 scale to record the intensity of hydrothermal alteration of the host rock, and include fields for intensity of silicification, clay alteration, chlorite alteration, carbonate and hematite. A secondary field "Alteration Style" allows the style of alteration to be described, based on visual identification of alteration mineralogy. The definitions for Alteration Style are based on Terry Leach's temperature-pH chart (Leach, 1995).

### **10.2.4 Structure fields**

The structure fields in the Visual Logger Template are used to record information about veins, faults and discrete hydrothermal breccias. Fields include Vein Percentage, Vein Composition, Vein Texture, Vein Style, Sulphide Content and Sulphide Association. For faults and hydrothermal breccias there are fields available to record the style of brecciation and the matrix of a breccia. The orientation of structures is recorded separately in an excel spreadsheet. The spreadsheet has inbuilt calculations to estimate the dip and dip direction of measured structures.

In order to obtain strike and dip of oriented structures, two drill core measurements are required, as well as the dip and azimuth of the drillhole at that depth:

### **10.2.5 Geotechnical Logging**

Geologists initially recorded basic geotechnical parameters, including RQD, Fractures per Metre and Hardness for all Correnso drill core during routine geological logging. The geotechnical group then logged selected ore and waste intervals in greater detail using geotechnical logging criteria. Relevant aspects of the geology including lithology, structural geology and 3D geology models were reviewed by the geotechnical personnel.

## **10.3 Recovery**

Core recoveries were measured after each drill run, comparing length of core recovered vs. drill depth.

Core recoveries were generally better than 95%. There is no relationship between core recovery and grade.

RC sample recoveries were assessed by weight for representivity by the sampling technician and dispatching geologist, and samples discarded where the recovered sample weight did not correlate well with drilled interval. Expected sample weight was calculated used drilled rock mass, SG, and cyclone sample splitter configuration, with review occurring as part of monthly inspections. There is no observed relationship between sample recovery and grade.

## 10.4 Collar Surveys

All historic mine data was recorded in terms of Mt Eden Old Cadastral grid, this is the grid utilised for all underground and exploration activity.

A local mine grid –Martha Mine Grid, oriented perpendicular to the main veins and derived from Mt Eden Old Cadastral is used within the Open pit operations. The Mine Grid origin is based at No.7 Shaft (1700mE, 1600mN). The grid is rotated 23.98 west of Mt Eden Old Cadastral North. Relative level (RL) calculated as Sea Level + 1000m.

## 10.5 Downhole Surveys

Downhole surveys were performed at 30m intervals using a digital single shot camera. Magnetic readings from downhole surveys are loaded to the drilling database, which calculates true north and local grid north (Mt Eden Old Cadastral) based on the current magnetic declination.

Magnetic readings from downhole surveys are loaded to the database, and converted to the local grid north (Mt Eden Old Cadastral) based on the current magnetic declination. Magnetic declination has been validated for all holes used in the Correnso models.

A gyro survey has been used to validate the downhole survey data for one recent drillhole in the Waihi East area. The recorded hole dip is very similar for the two methods, whereas azimuth readings differ by up to 2.5 degrees; on average the gyro azimuth readings are 1 degree less than the downhole camera readings.

## 10.6 Geotechnical Drilling Correnso

Correnso is a sensitive project given its proximity to the township of Waihi, and the fact that it is located beneath residential housing. This is further complicated by historical occurrences of mine-related surface subsidence events due to the presence of historically unfilled mining voids. Significant data collection has thus taken place as inputs for the original geotechnical study (Parrott, 2012), (SRK, 2014):

- Drilling of 3 pilot geotechnical holes to investigate ground conditions along the planned accesses from the existing Favona mine and Trio Access Incline to the Correnso Project. This drilling totalled 680m and was geotechnically logged.
- Drilling of two dedicated geotechnical drill holes from surface to characterize the rock mass above the Correnso mining area, and to obtain rock samples for a suite of rock properties testing totalling 604m. This drilling had detailed geotechnical logging.
- Geotechnical logging of 62 dedicated resource geology diamond drill holes.

Subsequently the collection of structural orientation measurements, RQD and hardness parameters occur during geological logging of all diamond holes drilled about the Correnso Project. This data collection has been undertaken on core from 311 resource and grade control holes.

## 10.7 Current Drill Spacing's

The drill spacing required to support classification of Indicated Mineral Resources is different for each project area and has gradually lessened over time as the nature of the veins have changed. A review of the Correnso drill spacing was completed in 2013. Available data was insufficient to use conditional simulation to determine the likely spacing so reconciliation data from the mined out Favona area was utilised. The result was a recommendation to use 30 m for Correnso, instead of the previously used 40 m.

Table 10-3: Current drill spacing per project

Project	Drill Spacing for Indicated Resource	Drill Spacing for Inferred Resource
Martha Open Pit	50 meters	100 meters
Correnso	30 meters	60 meters

### 10.8 Current Drill Orientation

Drill holes are designed to intersect known mineralised features in a nominally perpendicular orientation in much as practicable given the availability of underground drilling platforms. Sample intervals are selected based upon observed geological features.

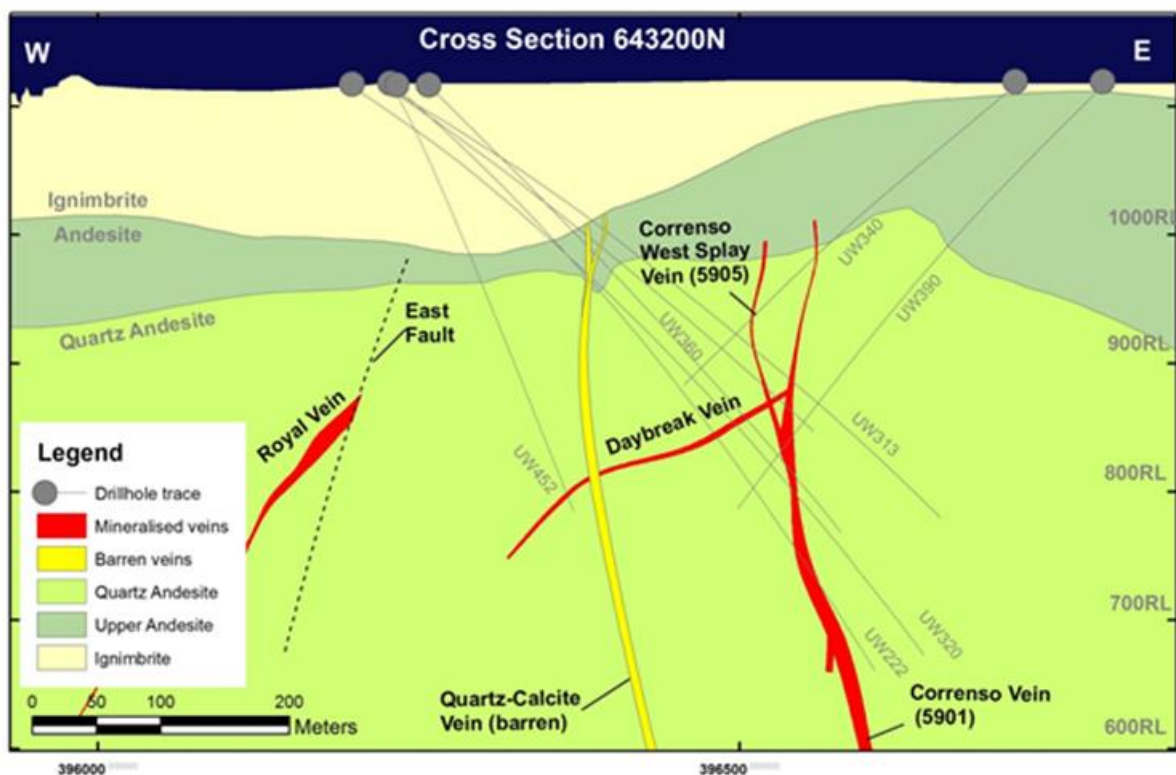


Figure 10-2: Example Drill Cross Sections, Correnso Project Waihi Area

### 10.9 Comments on Drilling

In the opinion of the QPs, the quantity and quality of the lithological, geotechnical, collar and downhole survey data collected in the exploration and infill drill programs are sufficient to support Mineral Resource estimation as follows:

- Geological logging of drill core (surface and underground) and RC chips meets industry standards for gold exploration within an epithermal vein gold setting;
- Collar surveys have been performed using industry-standard instrumentation;
- Downhole surveys were performed using industry-standard instrumentation;
- Recovery data from core drill programs are acceptable;

- Geotechnical logging of drill core meets industry standards for planned underground operations;
- Drill orientations are generally appropriate for the mineralization style, and have been drilled at orientations that are optimal for the orientation of mineralization for the bulk of the areas of the deposits;
- No material factors were identified with the data collection from the drill programs that could affect Mineral Resource estimation (refer to Section 12).

## 11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

### 11.1 Sampling Methods and Preparation

#### 11.1.1 Drill Sampling

##### 11.1.1.1 Core Drilling

Since mid-2006, sample preparation has been carried out at the SGS Waihi laboratory. Prior to then the sample preparation facility was located at the Martha mine site and operated by Newmont personnel. SGS has continued to use the same methods and protocols that were established by the Martha Mine geologists. Standardised sample preparation procedures are based on nomograms that were developed using Gy's Estimation of the Fundamental Sampling Error. Gold particle liberation size for the Waihi gold deposits is based on petrographic studies, which indicate that gold mostly occurs as electrum in the Waihi epithermal vein deposits and has a particle size between <5 to 10µm. Current standardised sample preparation procedures are shown in flow chart form in Figure 11-1 and include:

- Wet and dry weighing before and after oven drying at 90°C overnight;
- Jaw crushing to 95% passing 5mm to 24th September 2004 (UW212 & UW222); to 95% passing 7mm from 24th September 2004 to May 2013 (all other drill hole samples); to 80% passing 3.3mm from May 2013 (844 series holes).
- Rotary split to produce 800g crushed product;
- Ring milled to a nominal 80% finer than 75µm;
- Approximately 300g of pulverized sample placed by scoop into paper sachets to which the original sample tag is affixed.

Sample preparation has been monitored through sieve checks on samples selected at random in each batch and through insertion of duplicate samples at the crushing step. Sample size for resource holes drilled from surface is optimised through initial collection of large-diameter diamond drill core samples, generally PQ3 or HQ3. Subsequent splits include sawing the core in half to approximately 3.8kg, followed by a split from the jaw crusher producing no less than 800gm of jaw crushed material going to the ring mill. Current drilling from underground utilises a HQ3 diameter core size for advanced exploration and resource conversion drilling, this core is then split using a core saw to produce an initial sample size of 3.5-4kg whereas grade control utilises a HQ3 or NQ3 diameter core size which is whole core sampled to produce an initial sample size of 7-8kg or 3.5-4kg respectively.

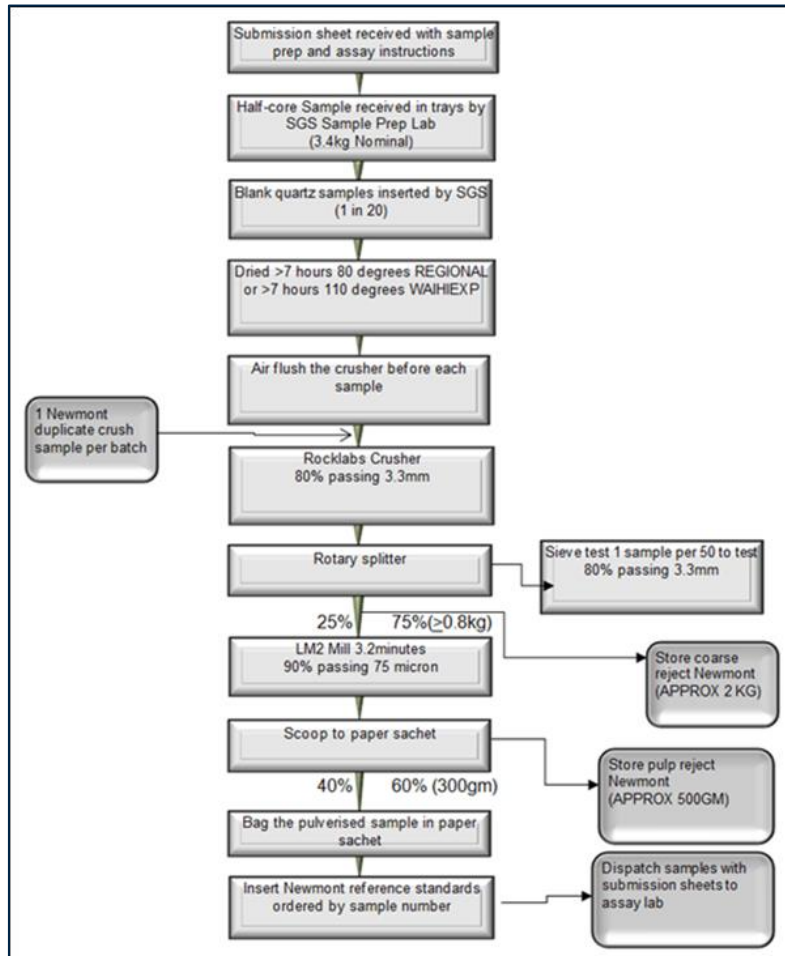


Figure 11-1: Sample Breakdown

**11.1.1.2 RC Drilling**

Sample preparation is carried out as follows:

Samples are dried at >100°C overnight at minimum, longer when sample moisture is high.

The sample is crushed using a Boyd crusher to nominal 95% passing 7 mm.

Crushed product is passed to a rotary sample divider (RSD) via a vibrating feeder; an 800 g minimum in the fraction is retained for pulveriser, the remainder is bagged as crush reject material.

Retained material (approximately 900g) is ground in an LM2 mill for a minimum of 3 minutes to 80% passing 75µm.

200 g of pulp is removed by scoop and sealed in a Kraft envelope with the sample tag attached.

From 28th May 2007 until 20th September 2014 pulps are assayed by SGS for Gold and Silver by 30 g Aqua Regia Digest. From 20<sup>th</sup> September 2014 Fire Assay analysis was conducted on Au only.

**11.1.2 Underground Sampling**

The face sample mark-ups are determined by the Geologist according to changes in lithology, vein texture and/or alteration; e.g. sample breaks positioned at the vein/andesite contacts. Mark these on the face with a single vertical line of blue paint.

Minimum sample interval size is 0.3m with a maximum interval of 1.2m. Intervals greater than 1.2m should be sub-sampled.

The Geologist will assign three QAQC samples per face; a blank sample (to be positioned directly after what is thought to be the highest grade sample), a crush duplicate (a duplicate of what is thought to be the highest grade sample positioned after all the samples) and a standard (positioned after the crush duplicate). (Please see below under Blanks, Standards and Crush Duplicates for more information).

The Sampling Technician then measures the intervals and writes the width to the nearest tenth of a metre on the wall within the marked interval.

- The sample is taken by chipping rock into the collection hoop on a continuous line across the interval, starting with the first interval on the left-hand side of the face, and then working left to right across the face.
- All samples taken during face sampling are placed into pre-labelled calico bags. One label is stapled onto the lip of the bag and the other is placed loosely inside the bag.



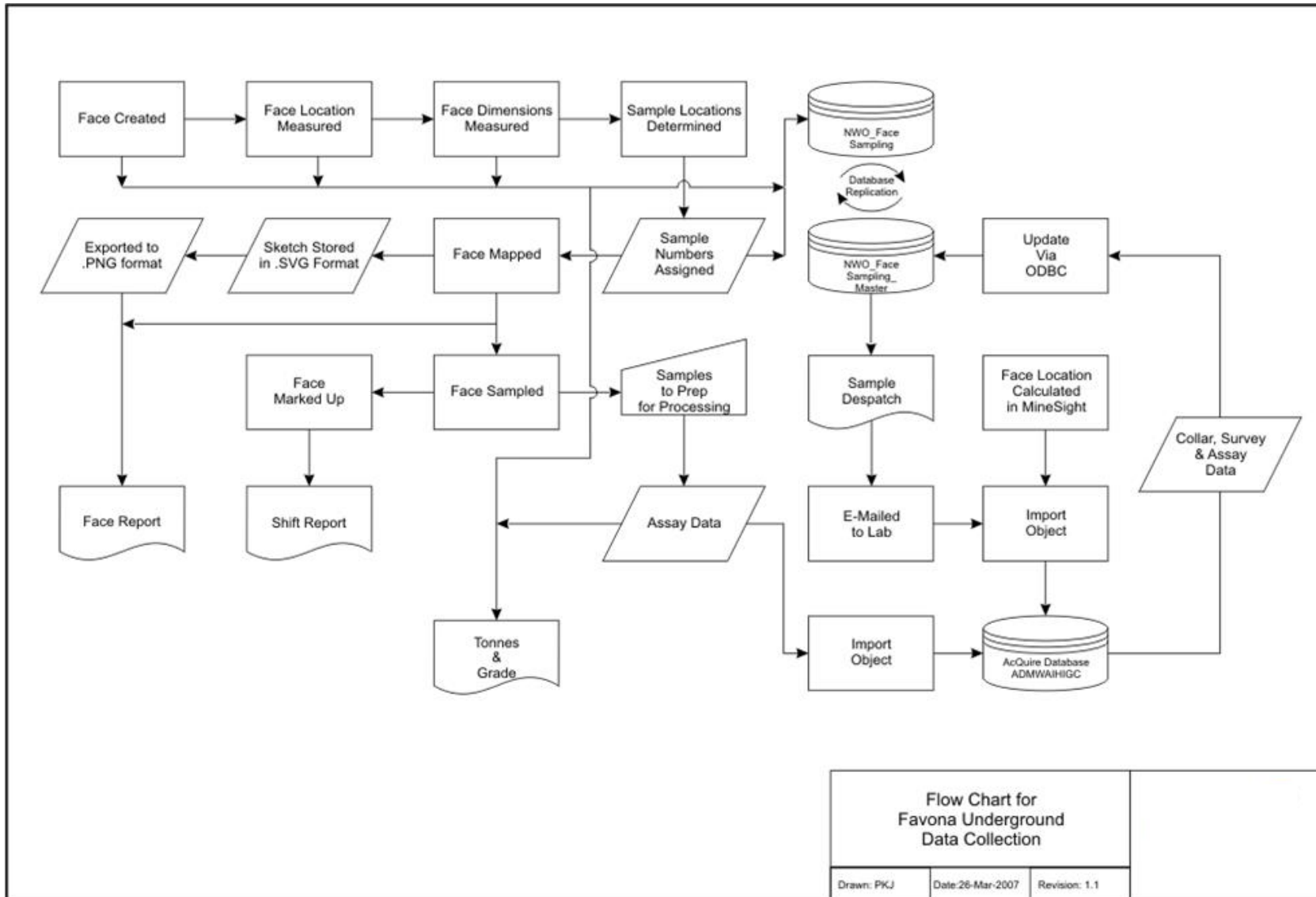


Figure 11-2: Face Mapping Flow Sheet

### 11.1.3 Ore Drive Backs Mapping

Backs mapping of ore drives is to occur with every cut and is part of the face sampling process. A key element of interpreting ore body geology is through backs mapping.

Backs mapping is done in 2 phases:

- While developing the heading on a cut-by-cut;
- In larger increments prior to advancing vent and mine services utilising underground mine surveying to pick up vein contacts in 3D space.

The backs mapping data is utilised for the following processes:

- Geological and grade control modelling
- Stope design
- Structural and geotechnical evaluation

Each development heading is mapped on a daily basis as the heading progresses. This mapping is usually done while the face is being sampled and the area is fully supported, however in some circumstances it may be necessary to map areas of unsupported ground by standing under supported ground and mapping the backs from a distance. Also on some occasions if the backs are to be shotcreted due to bad ground, the backs need to be mapped before shotcreting occurs. This cut-by-cut mapping helps to provide a general geological map; however these maps are often segmented and can be improved. As a result once each development heading is complete or as opportunity allows, the entire heading (backs and ribs) is washed down and re-mapped to produce a detailed finalised map with vein contacts and other features of note being picked up directly using underground surveying.

Due to the complexity of the ore body, the geologist must capture all geological information (vein textures, structures, breccias, alteration type, etc.) in the backs. Mapping must be sketched directly onto an interpreted 1:250 plan of the drive. Features to be mapped include:

- Accurate position, orientation and scale of all quartz veining represented in the backs.
- Structural data such as faults, shear zones and joint sets must be collected along with appropriate orientations.
- Detailed annotations of geological features such as quartz vein textures, brecciation and alteration within the drive.
- Additional notes to describe clearly what type of ground conditions, structural controls and the effects on mineralisation.
- Possible ground support and stripping requirements.
- Any notable features beyond what is noted above.

## 11.2 Quality Assurance and Quality Control

### 11.2.1 Drill Core

Quality control of drill core has been monitored in the following areas:

- Sample preparation at the SGS Waihi lab through sieving of jaw crush and pulp products, routine generation of duplicate samples from a second split of the jaw crush and calculation of the fundamental error.
- Assaying at primary lab SGS through insertion of 1 or 2 standards and a blank for every 20 samples.
- QAQC checks in Waihi Gold database for standards, blanks and duplicates.

**Table 11-1: Current Certified RockLabs Au standards**

Standard ID	Name	Std Value	Std Dev	2 SD Min	2 SD Max
G306-3	Au_FA	8.6	0.52	7.56	9.64
G306-4	Au_FA	21.6	0.8	20	23.2
G306-5	Au_FA	33.5	1.65	30.2	36.8
G308-5	Au_FA	13.3	0.6	12.1	14.5
G308-8	Au_FA	2.45	0.12	2.21	2.69
G311-7	Au_FA	0.4	0.03	0.34	0.46
G907-3	Au_FA	2.9	0.11	2.68	3.12
G907-8	Au_FA	6.8	0.3	6.2	7.4
G908-3	Au_FA	1.03	0.05	0.93	1.13
G908-8	Au_FA	9.7	0.5	8.7	10.7

All assay data is managed in SMP\_RESULT table of the GED\_DRILLHOLES database. WinAssayImport is a tool to load the assay result to the database, and has the capability to view a QAQC report for each lab job prior loading the assay result to the database. Blanks and standards are reviewed on a weekly basis using SQL Server Reporting Services. The Waihi protocol requires Certified Reference Material (CRMs) to be reported to within 2 Standard Deviations of the Certified Value. The criterion for preparation duplicates is that they have a relative difference (R-R1/mean RR1) of no greater than 10%. The criterion for blanks is that they do not exceed more than 4 times the lower detection method of the assay method.

The extraction method used by SGS for gold was by fire assay followed by AAS determination, whereas silver has been extracted by Aqua Regia and analysed by AAS (UW212, UW222, UW310, UW313) or by ICP-MS (UW320 onwards).

In addition to routine quality control procedures, umpire assay has been carried out on 248 samples (Correnso Project) at Ultratrace Laboratories in Perth. Results for gold were consistent with original SGS assay results and showed no effective bias, apart from 3 umpire samples that returned significantly higher gold values than the original assays. Those three samples were repeat assayed by SGS, the re-assay producing results consistent with the Ultratrace umpire assays; the second set of SGS assays have therefore replaced the initial assays in the database.

Multi-element data is obtained routinely from the Waihi SGS Laboratory for all exploration assay samples for the elements silver, copper, arsenic, lead, zinc and antimony, which are potential pathfinders for epithermal mineralisation. Comparison of the Ultratrace data with routine multi-element data produced by SGS Laboratory in Waihi showed good correlation between the parent (SGS) and umpire (Ultratrace) data sets for silver, lead, zinc and arsenic, which gives confidence in the accuracy of SGS data for these elements. For samples with over-range silver and lead, these elements are found to be extracted more efficiently by using a more dilute Aqua Regia digest (1 gram sample weight rather than the standard 10 gram per 50 ml). Antimony is not efficiently extracted by the current Aqua Digest method at SGS and consideration should be given to using the Peroxide Fusion extraction if more accurate antimony results are required.

### 11.2.2 Underground Face Samples

Every face must include a blank, standard and crush duplicate as per the QAQC guidelines. Blank samples (samples that have been certified as containing zero Au values) are entered into the sample sequence preferably after what is thought to be the highest grade sample in the face. A crush duplicate of

the sample preceding the blank, is to be entered in after the sample sequence is completed. The final sample in the sequence is the standard.

### 11.2.3 RC Grade Control Data

Assay quality control procedures for grade control data is set out in “Martha Grade Control Procedures Manual V2 2008”. Quality control procedures are designed to detect any poor sampling and sample preparation practices and ensure that results are within acceptable ranges of accuracy and precision.

Grade control check samples are allocated according to Table 11-2

**Table 11-2: Grade Control Check Samples**

Check	Description	Frequency
Blanks	Coarse Post-mineral Andesite (Tirohia Quarry); Submitted Blind to the lab	1 per Drillhole
Standards	Currently using Rocklabs standards - submitted as pulp to lab	1 per Drillhole
Field Duplicates	Additional RC sample taken from reject material from drill rig split	1 every fifth Drillhole
Crush Duplicates	Split of crush residue repeat assayed by 50 g Aqua Regia Assay	1 every 50 samples
Fire Assay	Repeat Assay of Pulp by 30 g Fire Assay	30 per Month

## 11.3 Database

All QAQC data is managed in Acquire via the CheckAssay and CheckChemistry compound definitions. Blanks and standards are reviewed on a weekly basis using Acquire QAQC objects. Any sample preparation or assay issues are discussed directly with SGS.

## 11.4 Sample Security

Access to site is controlled; Drill core is stored with secure facilities on site. Site employees transport samples to the analytical lab. The laboratory compound is secured.

## 11.5 Density Determinations

### 11.5.1 Martha Project

Oxidation and rock hardness wireframe surfaces / solids based on sectional interpretation of diamond drilling data, with modification based on the current geology model, are used as the basis for assigning density within the Martha Open Pit.

**Table 11-3: Hardness and Oxide Codes – Martha project**

Oxidation	Description	Oxide Code	Density
001_Oxide	Complete Oxidised	1	1.6
002_	Transition Zone	2	2
003_Fresh	Unoxidised Andesite	3	2.3
Hardness	Description	Hardness Code	Density
01_Dig	Free Dig	1	1.6
02_Rip	Rip Material	2	2
03_Blast	Blast	3	2.3
04_Vhard	Hard Blast	4	2.47
Historic Stopes	Description	Stope Code	Density
Stope_filled	Backfilled Stopes	1	1.8
Stope_unfilled	Open Stopes	5	0

### 11.5.2 Correnso Project

Dry bulk densities have been estimated for the Correnso resource using a water displacement method modified from NZS 4402: 1986, which is considered appropriate for competent half-core (Lipton, 2001). The method involves weighing the sample before and after a series of steps, which include oven-drying a drillcore sample, filling surface pores with modelling clay, coating the entire sample with wax and immersing it in water. Ore intercepts were relogged and assigned to several identified geological classes based on the physical properties that are considered most likely to affect density, including porosity, clay content, oxidation, sulphide content, vein per cent and vein texture. Analysis of the data shows a relatively uniform range of density values within each geological class. Porosity, clay content and oxidation contribute to lower density values, while sulphide content contributes to higher density values. Dry bulk densities were determined for 247 samples of Correnso drill core, including representative vein and wall rock material from mineralized intercepts over a downhole depth range of 182.2m to 519.35m, corresponding to approximately 1000mRL to 750mRL. Geological classes were identified on the basis of logged physical characteristics and each main geological class is represented by SG measurements from at least 30 drillcore samples. An overall mean value of 2.52g/cm<sup>3</sup> was obtained for all 247 density values. There is a slight increase in density with depth which corresponds to increasing base metal sulphide content. There is no relationship between the density and the Au grade. The higher SG value obtained for Correnso (2.52g/cm<sup>3</sup>) over Edward and Martha ore (2.44-2.47g/cm<sup>3</sup>) is attributed to higher sulphide content in Correnso. The default density used for the Correnso Resource model is 2.5 g/cm<sup>3</sup>.

### 11.5.3 Density Determinations Used in Mineral Resource Estimation

For estimation purposes, Waihi Gold has used the data summarized in Table 11-4

**Table 11-4: Density Assignment by Project**

Project	Model Density
Martha	
Dig	1.60
Rip	2.00
Blast	2.30
Very Hard	2.47
Stope Fill	1.80
Correnso	2.50

### 11.6 Comments on Sample Preparation, Analyses, and Security

In the opinion of the QPs, sample collection, preparation, analysis and security for all Waihi Gold drill programs are in line with industry-standard methods for gold deposits, and provide data that are sufficiently bias and error free to support Mineral Resource estimation.

## **12 DATA VERIFICATION**

The models were reviewed by Newmont Mining Denver based personnel, prior to completion of the sale to OceanaGold Corporation.

Drill hole data is entered via an Acquire database interface which includes validation protocols. Personnel are well trained and routinely check source versus input data during the entry process.

### **12.1 Geology & Wireframing**

Rhys, DA 2011. Review of the Structural Setting of the Correnso Vein System, Waihi, New Zealand. Unpublished report to Newmont Waihi Gold.

### **12.2 Density**

White, T 2012 Correnso Dry Bulk Density Study. Unpublished Internal Report.

### **12.3 Assay QAQC and Multielement**

Inglis R 2013. Heterogeneity Study.

### **12.4 Static and Kinetic Test work**

Kirk, Anthony. URS New Zealand. March 2012. Correnso Underground Mine - Geochemistry of Ore, Tailings and Waste Rock.

### **12.5 Mineralogy**

Mauk J 2009. Petrographic Examination of Samples from the Reptile North and Number Nine Veins, Waihi. Unpublished Report to Newmont Waihi Gold.

Ross, KV and Rhys, DA 2011. Petrographic Study of Representative Samples from the Correnso Vein System, Waihi District, New Zealand. Unpublished Report to Newmont Waihi Gold.

Menzies A. 2013 QEMSCAN Analysis of Samples from the Waihi District, New Zealand: Correnso. Unpublished report. Universidad Catolica del Norte, Antofagasta, Chile.

### **12.6 Hydrology**

GWS Limited 2012. Proposed Underground Mining Extensions – Waihi. Assessment of Groundwater Inflows and Throughflows. Prepared for Newmont Waihi Gold.

### **12.7 Comments on Data Verification**

The QPs consider that a reasonable level of verification has been completed and that no material issues would have been left unidentified from the programs undertaken.

The QPs have reviewed the appropriate reports, and are of the opinion that the data verification programs undertaken on the data collected from the Project adequately support the geological interpretations, the analytical and database quality, and therefore support the use of the data in Mineral Resource estimation.

Database audits confirm the data are acceptable for use in estimation with no significant database errors identified. No bias corrections were considered warranted on drill and analytical data.

## 13 MINERAL PROCESSING AND METALLURGICAL TESTING

Over the Project history, a number of metallurgical test work campaigns have been undertaken. The Martha Open Pit is currently on hold pending a geotechnical review following a slip in a pit wall. The Correnso Project is in production and the metallurgical test work data for this is presented in this section.

### 13.1 Metallurgical Test Work

#### 13.1.1 Correnso Ore Composites

Metallurgical test work has been completed on 31 composite samples of ore intercepts from Correnso, as well as a further two composite samples from Empire East and one composite sample from the Grace vein. Test work was carried out by the Newmont Inverness testing facility.

The test work has been summarised in a number of internal reports; Pre-feasibility and Feasibility Correnso reports, and the Correnso Extension Prefeasibility Study. A report on Four Correnso Extensions samples was received in June 2015, the results showed similar metallurgy to the previous Correnso results with respect to grinding and leachability.

#### 13.1.2 Sample Selection

Newmont's Bingo chart technique was used to determine the sample requirements by categorising the ore body into different domains based on their metallurgical performance, the number of samples to be tested is calculated using an algorithm which uses the quantum tonnes and ounces in each domain for the whole ore body. Initially the bingo chart was based upon clay content which affected throughput; this was later changed to arsenic when it was found to correlate with the tailings grade. Site metallurgists observed that elevated arsenic levels have a direct negative impact on gold recovery. This is observed as a strong positive correlation between arsenic levels and tails grade. Mineralogical studies have indicated that the arsenic is present as arsenian zones within pyrite grains rather than in arsenopyrite, which is rare within the Correnso system. The high-arsenic/ low-recovery zone is mainly located at the north end of the Correnso vein. A bingo chart is shown below for the Correnso ore body.

Table 13-1: Correnso Bingo Chart

Expected Mine Ore Distribution Percentage by Tonnage							
<i>GeoMet Ore classification</i>							
Ore Class	>g/t Au	<250ppm As	>250ppm As	0	0	0	Total
High grade	15.000	1.2%	13.3%	0.0%	0.0%	0.0%	14.4%
~2x Ave grade	3.000	17.4%	45.8%	0.0%	0.0%	0.0%	63.2%
Average grade	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Near COG	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
COG	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sub COG	1.700	17.7%	4.7%	0.0%	0.0%	0.0%	22.4%
Tonnage Distribution:		36.3%	63.7%	0.0%	0.0%	0.0%	100.0%

Expected Mine Ore Distribution Percentage by Contained Ounces							
<i>GeoMet Ore classification</i>							
Ore Class	>g/t Au	<250ppm As	>250ppm As	0	0	0	Total Oz
High grade	15.000	2.4%	29.8%	0.0%	0.0%	0.0%	32.2%
~2x Ave grade	3.000	18.4%	46.1%	0.0%	0.0%	0.0%	64.5%
Average grade	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Near COG	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
COG	0.000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sub COG	1.700	2.2%	1.2%	0.0%	0.0%	0.0%	3.4%
Ounce Distribution:		23.0%	77.0%	0.0%	0.0%	0.0%	100.0%

### 13.1.3 Waste and Tails (Paste) Studies

Composite samples of representative waste material from Correnso and Empire East were sent to the Newmont test facility in Inverness. Test work confirmed that the physical and metallurgical properties of Correnso wallrock are similar to waste rock and dilution material currently mined from the Trio underground mine. Reject assay pulp samples of Correnso were used in a tails paste study carried out by Newmont to assess the suitability of tails paste for backfill, however it has since been determined that a cemented aggregate will be used as backfill.

### 13.1.4 Static and Kinetic Testing

Static and kinetic test work was performed on representative waste and ore samples from Correnso by URS Consultants of Auckland. Test results were used to assess the acid-forming potential and rates of acid formation from ore and waste and the resulting potential for effects on ground water (from backfill), on tailings pore water and on tailings seepage. URS also commissioned multi-element analyses, which were carried out by Hills Laboratory in Hamilton (mercury only) and by SGS Laboratory in Waihi. Results (Kirk, 2012) indicated that significant neutralizing potential is provided by carbonate present as calcite in Correnso veins and wall rock and that no deleterious effects are expected on groundwater as a result of the proposed mining. The geochemistry of tailings pore water and tailings seepage is expected to be similar to that of current tailings following addition of tailings from proposed Correnso mining.

## 13.2 Analysis of results

Gold recovery regression models were developed for the Correnso resources, viz.

$$\text{Predicted Au residue grade} = -0.1792 + 0.03946 \times \text{Au head grade (g/t)} + 0.00233 \times \text{As head grade (ppm)}.$$

$$\text{Gold Recovery Estimate} = (\text{Au head grade} - (\text{Predicted Residue grade})) / \text{Au head grade} \times 100.$$

Both gold and arsenic have been identified as the statistically significant predictors for estimating residue grade for the Correnso resource. The Adjusted R<sup>2</sup> and correlation coefficient as shown below by Figure 13-1 demonstrates a good fit of the predicted residue grade compared to the actual residue grades achieved from the test work.

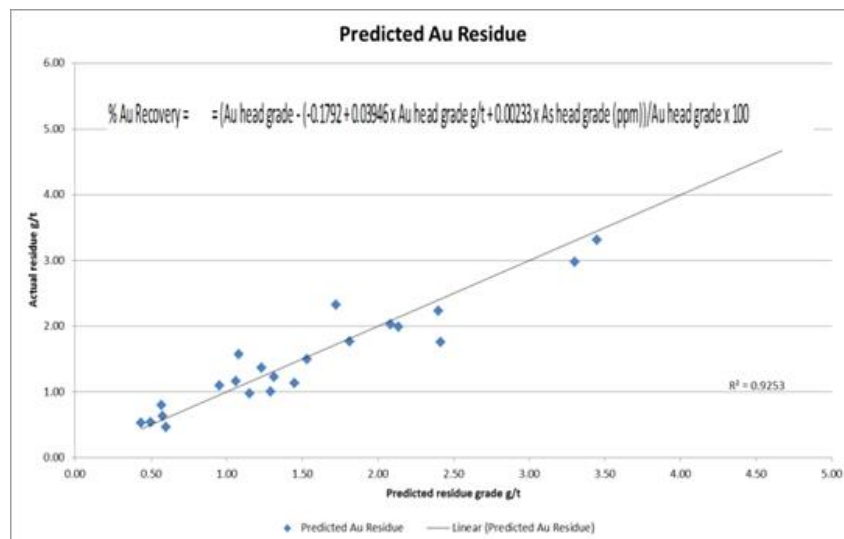


Figure 13-1: Correnso – Predicted Au Residue



### 13.3 Comminution

The overall key test work results for the samples comminution tested are shown in Table 13-2. The results show that the ore is medium to soft according to the JKTech database.

**Table 13-2: Comminution Test Work Summary**

Parameter	Average	Maximum	Minimum
<b>A*b</b>	61.5	41.9	96.1
<b>BWi</b>	16.4	14.5	19.5

The comminution study and test work concluded that a grind size P80 of 53 microns is the optimum that maximises the NPV for the Waihi Correnso project.

### 13.4 Leach

The key conditions that have been applied to the leach test work were:

- 40% solids, 500 ppm NaCN initial dosage and a minimum of 24 hours leach retention
- High oxygen levels were used during the first 4 hours of the leach to replicate plant condition.
- The 24 leach retention was based on the existing leach/CIL capacity of the Waihi process plant at an ore throughput rate of 100 tph at 40% solids.

**Table 13-3: Leach test Summary**

Reagent	Average	Maximum	Minimum
<b>Cyanide</b>	0.5	1.8	1.0
<b>Lime</b>	1.1	2.8	1.6

On review of the test work data, the following observations were evident:

- Arsenic concentration has a strong correlation to tail grade.
- Cyanide soluble Cu and Zn were evident that will lead to higher WAD cyanide levels at discharge
- The majority of the selenium levels in leach solution are below the detection level of 0.5ppm.

### 13.5 Comments on Section 13

In the opinion of the QP, the following conclusions are appropriate:

- Metallurgical test work and associated analytical procedures were performed by recognized testing facilities, and the tests performed were appropriate to the mineralization type;
- Samples selected for testing were representative of the various types and styles of mineralization within the Waihi Project Area. Samples were selected from a range of

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depths within the deposit. Sufficient samples were taken so that tests were performed on adequate sample mass;

- The following equation has been developed to relate arsenic level to recovery for the Correnso project.  $\text{Recovery} = (\text{Au head grade} - 0.039 \times \text{Au head g/t} - 0.0023 \times \text{As head grade g/t} + 0.18) / \text{Au Head Grade}$ . At the time of writing this report, arsenic grades were not included in the resource model, so for the purposes of budgeting, recovery estimates are currently based on a gold-only relationship (see 14.8)
- Average recoveries have been assumed based on test work completed. These recoveries are appropriate to be used in support of Mineral Resource estimation, based on the drill hole spacing and sample selection.

## 14 MINERAL RESOURCE ESTIMATES

### 14.1 Key Assumptions/Basis of Estimate

Two areas have Mineral Resource estimates. All are in current production (Martha OP, and Correnso). Close-out dates for the databases used in estimation are as indicated in Table 14-1.

**Table 14-1: Model Close Out Dates**

Project	Database	Effective Date
Martha Open Pit	ADMWAIHIEXP, ADMWAIHIGC	11-05-2015
Correnso	ADMWAIHIEXP, ADMWAIHIGC	27-05-2015
Correnso Extensions	ADMWAIHIEXP, ADMWAIHIGC	21-10-2014

Data used to support the estimates include surface and underground diamond core, RC, and underground face chips, as noted in Table 10-2.

### 14.2 Geological Models

Open pit and underground mining since 1988 has provided a large database of mapping and grade control sampling, which has confirmed the geological interpretation to date.

The geologic interpretation utilises log data, assay data, underground face and backs mapping – where available, digital core photos and oriented core measurements, all of which are systematically collected and validated. The dip and dip direction of significant veins, faults, bedding and geological contacts are estimated from oriented core measurements and imported into an ISIS geotechnical database in Vulcan. A 3-D display of the orientation data is then created in Vulcan and used to guide the geological interpretation. Vein intercept points are snapped to drillholes in Vulcan and additional control points are added, as required, to inform the geological interpretation. The point data sets are then exported to Leapfrog™, where vein and fault contact iso-surfaces - and solids - are created. The solids are then imported back to Vulcan, where they are validated against drilling and known geological features and undergo final processing; this involves booleaning (truncating) against / merging with adjacent features – where applicable – and checking for consistency. Gold mineralisation is confined to quartz veins and is not disseminated in wallrock; therefore the main vein boundaries are usually coincident with assay intervals, which attempt to honour the geology. There are a small number of instances where high grade assay results located immediately outside the main vein boundary have been included within the vein wireframe; such as where the grade is interpreted as belonging to small-scale, localized, parallel or sub-parallel veins / stringers rather than being attributed to contamination or a cross-cutting structure.

The digital core photographic record is used extensively during the modelling process. Identifiable characteristics of particular veins can be recognised, such as mineralogical and textural characteristics, the nature of particular contacts, and the existence and relative timing of mineral phases within the vein zones. The mineralized veins have a distinctive appearance, and common textures and mineralogy - consisting of chlorite-smectite clays and base-metal sulphides, along with quartz, and which are commonly complex due to internal multi-phase syn- and post-mineralisation deformation - quite different to barren veins such as the 5995 (calcite-quartz lode). Another reference used to guide the geological interpretation is the mapped geometry of veins that have been mined previously, Waihi veins are characterised by sinuous deflections that tend to be continuous over a considerable vertical extent. Where the orientation data varies along the length of a given vein, or down-dip, it is considered in context of the overall geometry of the deflections.

Geological models are integrated with regional geology and with detailed surface topographic models, which are routinely updated by mine surveyors. Geological models and geological concepts have been routinely reviewed by internal and external reviewers.

### 14.2.1 Martha Open Pit

In addition to the quartz veins the Martha Open Pit has a series of sedimentary / volcanic units overlying the host andesite. These are modelled as surfaces. Tables 14-2 and 14-3 list the models used to constrain the estimation.

**Table 14-2: Martha Geology Surfaces**

Geological Unit	Geo Code	Description
500_lac_seds	500	Gravel unit at Base of Lake Sediments
401_weld_ign	401	Welded Ignimbrite
400_unweld_ign	400	Weakly to unwelded ignimbrite
300_tuff	300	Unwelded Pumice & Lithic rich ignimbrite
200_alluvium	200	Alluvial unit – Basal to Tuff
101_blue_shear	101	Blue Shear clay zone
100_andesite	100	Top of Quartz Andesite (Host)
101_blue_shear	101	Top of Andesite

**Table 14-3: Martha Vein Domain Triangulations**

Vein Domain	Domain Code	Description
1100_Martha	1100	Martha Vein
1201_Albert	1201	Albert Vein
1305_Welcome	1305	Welcome Vein
1308_Alexandra	1308	Alexandra Vein
1900_Central	1900	Linking structure domain
1902_Letter North	1902	Linking structure domain
1903_Magazine	1903	Linking structure domain
1904_Martha FW	1904	Linking structure domain
1905_Martha HW	1905	Linking structure domain

### 14.2.2 Historic Stoping Model

A 3D model of historic stoping was utilised in the model. This model was constructed as part of ongoing geotechnical studies and captures the extent of known stoping within the major lode structures. The model was constructed by draping digitised long section polygons of stoping blocks on to the wireframe of the vein footwall to form 3D polygons. These 3D polygons were then extruded, towards the vein hanging wall, the average width of the block as determined from historic data to form a solid wireframe. The stope wireframes were then attributed with stoping type, to determine if filled or void. Unknown types were assumed to be voids, unless verified by current mining. An extensive review of the historic development and stope models of the Martha and Grand Junction workings was conducted during the third and fourth quarter of 2009. This review confirmed that the original interpretation of most historic development and stopes were modelled between 2m and 15m lower than recent data sources suggest. All Models subsequent to May 2010 have used the adjusted stope and level positions.

### 14.2.3 Correnso

Solids for the Correnso Project are listed in Table 14-4

**Table 14-4: Correnso Extensions Vein Domain Triangulations**

Wireframe	Description
5901_16102014_boolean.00t	Main vein south of calcite fault
5902_16102014_boolean.00t	Eastern splay off main vein south of calcite fault
5904_21102014_boolean.00t	Main vein north of calcite fault
5905_16102014_boolean.00t	Western splay off main vein south of calcite fault
5907_16102014_boolean_v2.00t	Western splay off main vein south of Daybreak
5908_16102014_boolean.00t	Eastern splay2 off main vein south of calcite fault
5912_16102014_boolean.00t	small stockwork zone 1
5920_16102014.00t	small stockwork zone 2
5921_16102014.00t	small stockwork zone 3
5931_west_stwk_boolean.00t	small stockwork zone 4
5937_stwk_16102014_boolean.00t	small stockwork zone 5
5950_16102014_boolean.00t	small stockwork zone 6
5995_16102014.00t	Calcite Fault

### 14.3 Exploratory Data Analysis

Available drilling data was extracted from the Waihi Gold global exploration database for each area. The data were statistically analysed to determine domain selection for the resource estimation. The analysis was completed using the composited data.

Tables 14-5 and 14-6 summarize the statistics of the current resource models.

**Table 14-5: Martha Open Pit Model Composite Statistics**

Domain	1100	1201	1305	1308	1900	1902	1903	1904	1905
<b>Samples</b>	298343	46785	166435	25434	65740	156343	481436	682199	136334
<b>Minimum</b>	0	0	0	0	0	0	0	0	0
<b>Maximum</b>	60	35	45	50	20	67	75	35	40
<b>Mean (capped)</b>	5.59	2.19	3.61	1.67	0.46	1.76	1.46	1.44	2.13
<b>Std dev (capped)</b>	7.60	4.46	5.78	4.31	1.67	4.09	3.75	3.44	4.27
<b>CV (capped)</b>	1.36	2.03	1.60	2.58	3.63	2.33	2.57	2.39	2.00
<b>90%</b>	14.11	6.32	9.86	4.09	0.81	4.9	3.72	3.71	5.18
<b>95%</b>	19.94	10.7	15.06	7.72	1.83	8.61	7.16	6.51	8.35
<b>97.50%</b>	26.14	15.91	20.96	12.14	4.23	12.8	11.83	10.31	13.14

**Table 14-6: Correnso Extensions Model 142C Composite Statistics**

	5901	5902	5904	5905	5907	5908
No samples	547	88	356	129	113	15
Min	0.0	0.0	0.0	0.0	0.0	0.4
Max	115.0	152.8	123.5	71.2	107.1	320.7
Mean	8.1	16.2	9.5	10.3	7.1	47.8
Std Dev	12.9	25.2	12.5	12.9	15.4	96.8
CV	1.6	1.6	1.3	1.2	2.2	2.0
Variance	166.3	637.5	157.3	166.6	236.7	9372.7
Skewness	3.1	4.5	3.0	2.7	4.0	3.6
95%	34.1	41.5	32.7	34.1	39.7	58.6
97.5%	50.5	68.7	42.1	49.4	50.4	320.7
99%	64.0	152.8	57.5	68.7	71.3	320.7
Cap Au	60.0	70.0	45.0	50.0	50.0	60.0
Capped Mean Au	7.2	12.6	8.3	9.2	4.4	20.2
Capped Variance Au	104.4	139.6	88.2	99.9	53.8	401.3

### 14.3.1 Density Assignment

A global density value is assigned to the blocks based on the project. The Martha open pit model is the only model that currently has variable densities assigned to it. It is the only area where surface lithologies and weathering influence the model. Table 14-10x lists the density values assigned to the current models.

**Table 14-7: Density Assignment by Project**

Project	Model Density
Martha	
Dig	1.60
Rip	2.00
Blast	2.30
Very Hard	2.47
Stope Fill	1.80
Correnso	2.50

### 14.3.2 Composites

The standard method used to define composites for the majority of the resource models was to flag the raw data in the database against the geology solids. The Vulcan compositing program (run length) was run to generate the composited database at the required sample length. For Martha the composite length is based on the nominal sample interval for each dataset (1.5m for drill (RC / diamond) data, 1m for grade control channels. Compositing was by fixed-length, honouring the domain boundaries.

Open Specification Flagging Interval Triangulations Drillhole Selection Save Specification	Triangulations					
		Triangulation	Value	Priority	Inversion	Projection
	1	5900_dilution.00t	5900	1	None	Along Z
	2	5901_20150519_boolean.00t	5901	2	None	Along Z
	3	5903_20150519_boolean.00t	5903	8	None	Along Z
	4	5904_20150519_boolean.00t	5904	9	None	Along Z
	5	5905_20150519_boolean.00t	5905	4	None	Along Z
	6	5907_20150519_boolean.00t	5907	3	None	Along Z
	7	5908_20150519_boolean.00t	5908	5	None	Along Z
	8	5997_20150519_boolean.00t	5997	6	None	Along Z
	9	5995_20150519.00t	5995	7	None	Along Z
*			1			

Figure 14-1: Example of domain flagging from Correnso 20150519 model

Composite weighting by length was applied during estimation to avoid bias from very small, high grade composites. There has been no change to the compositing method used since May 2010. For Correnso and Daybreak the raw assays are composited to one metre fixed lengths and “distributed” (1MD) across the vein width to eliminate very small remnant composites. For the Grace/Empire estimate two metre distributed (2MD) composites were used.

### 14.3.3 Grade Capping/Outlier Restrictions

Increased drilling density in the Eastern Layback resource between May 2014 and April 2015 allowed for increased geological domain resolution and a review of top cut strategy. This was undertaken using a disintegration approach, whereby log-scale probability plots are used to determine the grade at which sample support for a high-grade tail diminishes. Open pit production records, reconciliation data and grade control modelling were used for estimation validation, as well as comparisons to previous resource models and their retrospective performance.

**Table 14-8: Model Grade Caps Applied**

Triangulation	Domain Code	Uncapped Mean	Uncapped CV	Cap Grade	Total No of samples	No. of Capped Samples	Capped Mean	Capped CV
1100_Martha	1100	5.8	2.1	60	56269		5.6	1.4
1201_Albert	1201	2.2	2.1	35	1112		2.2	2
1220_Edward	1220	1.8	4.7	85	9464		1.7	4.1
1302_Victoria	1302	2.5	1.4	18	239		2.5	1.4
1305_Welcome	1305	3.6	1.7	45	30981		3.6	1.6
1308_Alexandra	1308	1.7	2.9	50	5202		1.7	2.6
1401_Empire East	1401	5.5	2.1	60	48		5.5	2.1
1402_Empire West	1402	2.2	2.4	50	9388		2.2	2.2
1501_Royal West	1501	3.8	1.3	25	49		3.8	1.3
1900_Central	1900	0.5	4.4	20	13691		0.5	3.6
1901_Edward HW	1901	1.7	2.9	33	11918		1.6	2.4
1902_Letter_North	1902	1.8	2.4	67	31607		1.8	2.3
1903_Magazine	1903	1.5	2.6	75	94881		1.5	2.6
1904_Martha_FW	1904	1.5	3	35	133269		1.4	2.4
1905_Martha_HW	1905	2.2	2.2	40	25518		2.1	2
1906_Royal_FW	1906	0.4	11.3	30	1597		0.3	6.2
1907_Royal_HW	1907	1.2	3	25	27272		1.2	2.5
1908_Welcome_FW	1908	0.3	3.6	12	1829		0.3	3.5
1909_Welcome_HW	1909	1.2	2.2	26	1005		1.2	2.2
5901_16102014_boolean.00t	5901	8.1	1.6	60	547	11	7.2	1.4
5902_16102014_boolean.00t	5902	16.2	1.6	70	88	1	12.6	0.9
5904_21102014_boolean.00t	5904	9.5	1.3	45	356	8	8.3	1.1
5905_16102014_boolean.00t	5905	10.3	1.2	50	129	3	9.2	1.1
5907_16102014_boolean_v2.00t	5907	7.1	2.2	50	113	8	4.4	1.7
5908_16102014_boolean.00t	5908	47.8	2	60	15	1	20.2	1
5901_20150519_boolean.00t	5901	11.6	1.7	50	1912	63	10.4	1.2
5903_20150519_boolean.00t	5903	17.5	3.8	60	136	5	11.4	1.3
5904_20150519_boolean.00t	5904	9.7	1.5	50	750	16	9.2	1.3
5905_20150519_boolean.00t	5905	8.6	1.2	40	251	4	8.3	1.1
5907_20150519_boolean.00t	5907	8	1.8	50	195	5	7.4	1.5
5908_20150519_boolean.00t	5908	19.7	1.7	90	300	12	17.4	1.3
5906_24112014_boolean.00t	5906	5.9	2	20	60	2	4.9	1.5
GM1320_vein1320.00t	1320	6.3	1.1	15	38	4	5.5	0.9
1321_26112014_boolean.00t	1321	1.5	2.2	15	34	1	1.4	1.9
1323_25112014_boolean.00t	1323	1.1	2.3	-	13	-	-	-
1400_25112014_boolean.00t	1400	7.7	2.7	68	73	2	6.4	2.2
1410_18112014_boolean.00t	1410	5.8	1	-	9	-	-	-
1411_26112015_boolean.00t	1411	2.4	0.4	-	4	-	-	-

### 14.3.4 Variography

Down hole and directional variography are typically run using Snowden Supervisor v7 software. Variograms are run as a means to test spatial continuity within the selected geological domains. Due to the scarcity of data, variogram models often are not easily obtained so in this instance anisotropic ratios are based on geological observation rather than on fitting data to the variogram models. Dominant mineral continuity is set along the strike of the modelled veins. In 2008 work done by Golder Associates developed a single median indicator variogram to use for all vein domains with the searches changed to align with the individual vein geometry. Ordinary Kriging is able to be applied to four Correnso veins (5901, 5904, 5905, and 5907). All others are estimated solely using Inverse Distance methodology.

### 14.4 Estimation/Interpolation Methods

Vulcan software versions 9.0.0 to 9.1.0 have been used to construct the Correnso, Daybreak, and Grace/Empire models. MineSight® software version 9.10-01 is used to construct the Martha model.

Sub-blocking with either ordinary kriging (OK) or inverse distance weighting to the second power (ID2) or third power (ID3) methods are used for all underground models. With the data density which exists in Correnso and the surrounds ordinary kriging, and tetra-unfolding - using ID2 or ID3 estimates both achieve



comparable results. The method of unfolding was adopted for the Correnso, Daybreak, and Grace/Empire models as a way of dealing with the sinuous character of the veins.

The Martha Open Pit model is run using MineSight® software and is a non-sub-blocked model. Estimation is completed using either ordinary kriging (OK) or inverse distance weighting to the second power (ID2), as deemed suitable by the density of data in each domain.

The underground block models are rotated in bearing to align with the dominant strike of the veins and they are run using Vulcan software. Sub-blocking is used to define narrow veins and to maintain volume integrity with the geology solids. The grade estimation for all models is strictly controlled by the geology, with both sample selection and estimation of blocks limited to domains defined by the geology interpretation solids. Gold is estimated using one of the following methods; either - a single pass with a combined channel and drilling dataset; OR - two-pass estimation using a combined dataset with short search range first, then followed by a second pass using drillhole data only with longer search ranges to estimate blocks not estimated in the first pass.

Blocks model parameters are included in Table 14-11. Minimum and maximum numbers of samples used to inform blocks are summarized in Table 14-12. The orientations and distances for the search ellipses are included as Table 14-13.

### 14.5 Block Model Validation

Swath plots by elevation, northing (Correnso) and easting (Martha) are constructed for each of the veins. A Nearest Neighbour estimate is compared to the Inverse Distance estimate and Ordinary Kriging estimate (where it was used). Examples of the comparisons undertaken are included as Figure 14- (Martha) and Figure 14- (Correnso).

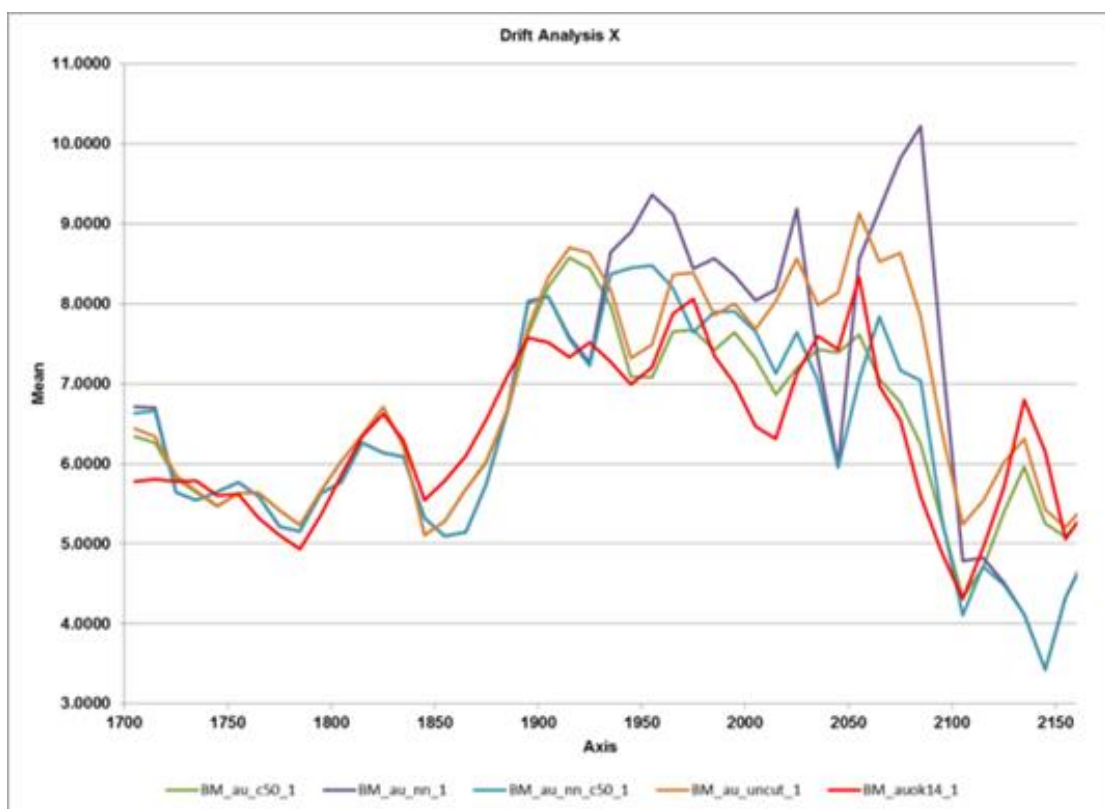


Figure 14-2: Example swath plot Easting Domain 1100 Martha Model

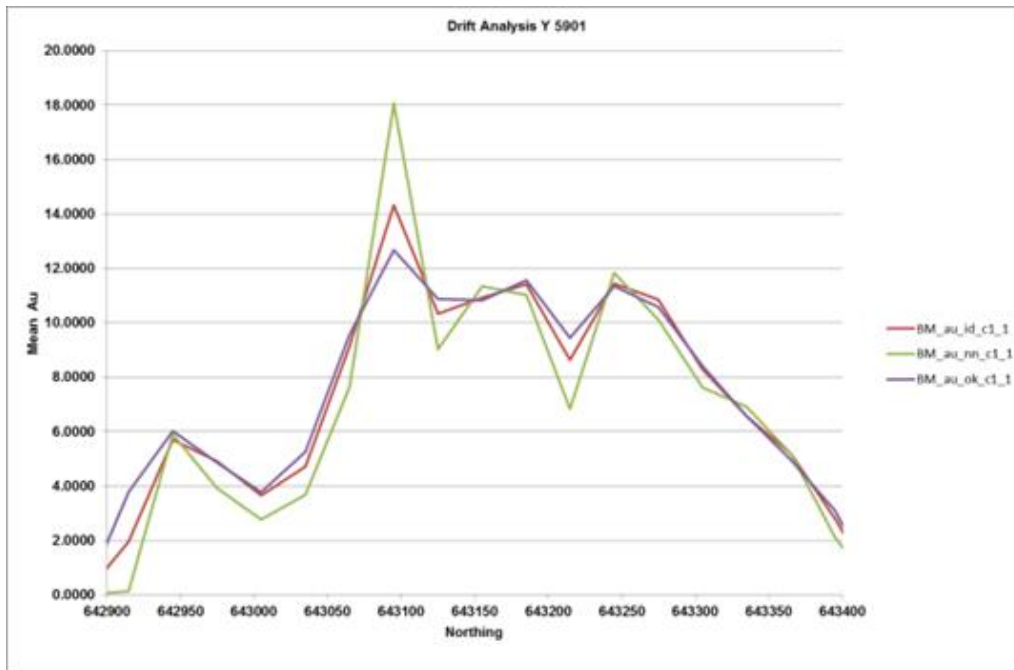
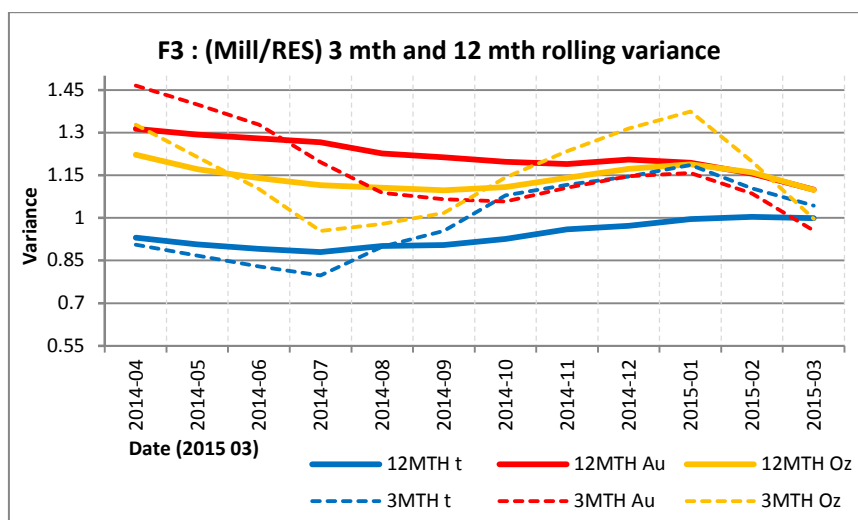


Figure 14-3: Example swath plot Northing Domain 5901 Correnso Model

Reconciliation of actual production to the Martha Mineral Resource model since the commencement of operations indicates that the estimate is representative of the deposit. Comparison of model estimates against the significant known production history of the Martha Pit is used as a calibration check during the reserve estimation process.

Internal Newmont reviews are conducted on all reserve models by competent persons at regional or corporate offices. The Mineral Reserve estimate has been updated to reflect the issuance of recent block modelling, built to include current-state drill sampling density, corresponding refinement of the geological model, and depletion.

Model performance is formally reviewed on site a monthly basis. Investigation of variance between Ore control vs. Reserve model (F1), Received at mill vs. Claimed delivered to mill (F2) and Mill vs. Reserve model (F3) is undertaken at monthly, 3 month rolling and 12 month rolling resolutions. Mitigating actions are identified in order to minimise sources of variance where practicable.



F3 : factors	3 month rolling			12 month rolling		
	Tonnes	Au g/t	Au Oz	Tonnes	Au g/t	Au Oz
Variance	95%	91%	87%	100%	107%	108%

Figure 7: Mill vs. 0514 Reserve Model variance as at March 2015

Table 14-9: Variogram Parameters

Model	Domain	Nugget	Sill 1	Range Spherical Structure 1			Sill 2	Range Spherical Structure 2			Sill 3	Range Spherical Structure 3		
				Major	Semi major	Minor		Major	Semi major	Minor		Major	Semi major	Minor
r0514_Martha_res	200	0.2	0.4	8	6	2	0.2	20	16	8	0.2	90	60	8
corr_142c_final_v1.bmf	5901	0.21	0.46	12.5	13	3	0.33	60.5	34	9	na	na		
corr_142c_final_v1.bmf	5904	0.22	0.56	30	40.5	15.5	0.22	52	49.5	17				
corr_142c_final_v1.bmf	5907	0.28	0.43	29.5	110	2	0.29	74	110.5	7				

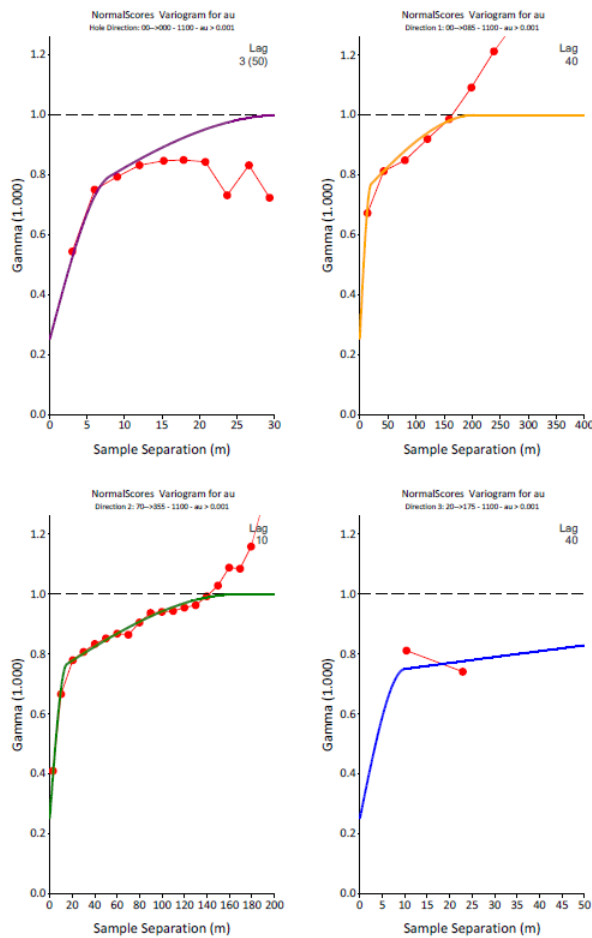


Figure 8: Martha Vein Domain Variogram Model

Table 14-10: Block Model Parameters

Model	Origin	Parent Blocks				Sub Blocks			Distance (m)					
		X	Y	Z	Rot brg	X	Y	Z	X	Y	Z			
Correnso	corr_20150519_gc.bdf	396280	642760	500	80	1	5	5	0.25	2.5	2.5	520	900	630
Correnso Extensions	corr_142C_final_v1.bdf	396280	642760	500	80	1	10	10	0.25	2.5	2.5	520	900	630
Daybreak	r1114_daybreak_INF.bdf	396050	642900	600	70	10	2	5	2.5	0.25	2.5	800	400	450
Grace / Empire	r1114_grace_empireE_INF.bdf	396100	643250	600	60	10	2	5	2.5	0.25	2.5	600	250	400
Martha	07m15.v0;project control file 515m10.dat	1700	1200	870	90	10	3	2.5				55	200	120

The Correnso Project Vulcan block model was oriented parallel to the strike of the 5901 Correnso Vein. The Daybreak and Grace/Empire Project Vulcan block models are oriented parallel to the strike of the dominant Daybreak and Empire East veins. The small sub-block size provides better definition of the

veins, particularly across the width of the typically narrow veins. The Martha block model was oriented with the mine grid.

**Table 14-11: Grade Estimation Sample Selection Parameters**

Model	Code	Estimation Method	Min No. Samples	Max No. Samples	Max No. Samples per Octant	Limit No. samples per Drill Holes	
r0715m15	1100	OK	4	12	6	3	
	1201	OK	4	12	6	3	
	1220	OK	4	12	6	3	
	1302	OK	4	12	6	3	
	1305	OK	4	12	6	3	
	1308	OK	4	12	6	3	
	1401	OK	4	12	6	3	
	1402	OK	4	12	6	3	
	1501	OK	4	12	6	3	
	1900	OK	4	12	6	3	
	1901	OK	4	12	6	3	
	1902	OK	4	12	6	3	
	1903	OK	4	12	6	3	
	1904	OK	4	12	6	3	
	1905	OK	4	12	6	3	
	1906	OK	4	12	6	3	
	1907	OK	4	12	6	3	
	1908	OK	4	12	6	3	
	1909	OK	4	12	6	3	
corr_r142C_final_v1.bmf	5901	OK	3	8	0	2	
	5902	ID2	3	8	0	2	
	5904	OK	3	8	0	2	
	5905	OK	3	8	0	2	
	5907	OK	3	8	0	2	
corr_20150519_gc.bmf	5908	ID2	3	8	0	2	
	5901	ID3	5	8	0	2	
	5903	ID3	5	8	0	2	
	5904	ID3	5	8	0	2	
	5905	ID3	5	8	0	2	
r1114_daybreak_INF.bmf	5907	ID3	5	8	0	2	
	5908	ID3	5	8	0	2	
	5906	ID2	3	8	0	2	
	r1114_grace_empireE_INF.bmf	1320	ID2	3	8	0	2
		1321	ID2	3	8	0	2
1323		ID2	3	8	0	2	
1400		ID2	3	8	0	2	
1410		ID2	3	8	0	2	
	1411	ID2	3	8	0	2	

**Table 14-12: Search Ellipse Parameters**

Model	Code	Orientation			Search Distance		
		Azimuth	Plunge	Dip	Major	Semi-Major	Minor
r0715	1100	81	0	-75	70	70	70
	1201	43	0	-85	70	70	70
	1220	50	0	82	70	70	70
	1302	80	0	-83	70	70	70
	1305	75	0	-80	70	70	70
	1308	97	0	-70	70	70	70
	1401	82	0	80	70	70	70
	1402	90	0	80	70	70	70
	1501	110	0	77	70	70	70
	1900	90	0	90	70	70	70
	1901	45	0	72	70	70	70
	1902	89	0	-76	70	70	70
	1903	75	0	80	70	70	70
	1904	86	0	-80	70	70	70
	1905	70	0	70	70	70	70
	1906	80	0	60	70	70	70
	1907	76	0	90	70	70	70
	1908	70	0	65	70	70	70
	1909	74	0	74	70	70	70
corr_r142C_final_v1.bmf	5901 - P1	345	0	-85	60	40	10
Note: some domains run as two passes.	5901 - P2	345	0	-85	120	80	10
	5902	350	0	85	60	40	10
	5904 - P1	7	0	-58	50	50	15
	5904 - P2	7	0	-58	100	100	15
	5905	345	0	-75	60	40	10
	5907 - P1	10	0	80	80	110	10
	5908	3	0	-70	60	40	10
corr_20150519_gc.bmf	5901	345	0	-85	90	60	0.5
Note: domains were unfolded in estimate - thus plunge and dip are not required for estimation, and minor search axis is a relative proportion.	5903	0	0	-60	90	50	0.5
	5904	5	0	-60	90	60	0.5
	5905	345	0	-75	90	60	0.5
	5907	15	0	90	90	60	0.5
	5908	0	0	90	90	30	0.5
r1114_daybreak_INF.bmf	5906	70	0	60	120	120	12
r1114_grace_empireE_INF.bmf	1320	50	0	-63	120	120	20
	1321	64	0	-59	120	120	10
	1323	50	0	-63	120	120	10
	1400	45	0	-70	120	120	12
	1410	216	0	-57	120	120	10
	1411	213	0	-85	120	120	10

### 14.6 Cut –off Parameters

The cut-off grade used to report the Mineral Reserves and Mineral Resources is derived from the cost of processing ore (including site general and administration costs), additional incremental ore mining costs, metallurgical recoveries, and gold price. Open pit Mineral Reserves are reported using a cut-off grade of 0.5 g/tonne Au based on a gold price NZ\$1714.

Underground mining cut-offs are based on a gold price NZ\$1714, mining costs of NZ\$130 / ore tonne and processing costs of NZ\$55 / tonne. A lower cut-off was used on the Correnso upper extensions due to the limited selectivity of the overhand cut and fill mining method and the incremental cost of handling the material once broken as ore or waste. Cut-off grades used in the Correnso Extensions study are shown in the table below.

**Table 14-13: Cut-offs used in Correnso Extensions**

Area	Stoping	Ore Development
Correnso Upper Extensions	2.5g/t	N/A
Correnso Lower Extensions	4.0g/t	3.5g/t
Daybreak	3.5g/t	3.5g/t
Empire	3.5g/t	3.5g/t

### 14.7 Mining Factors or Assumptions

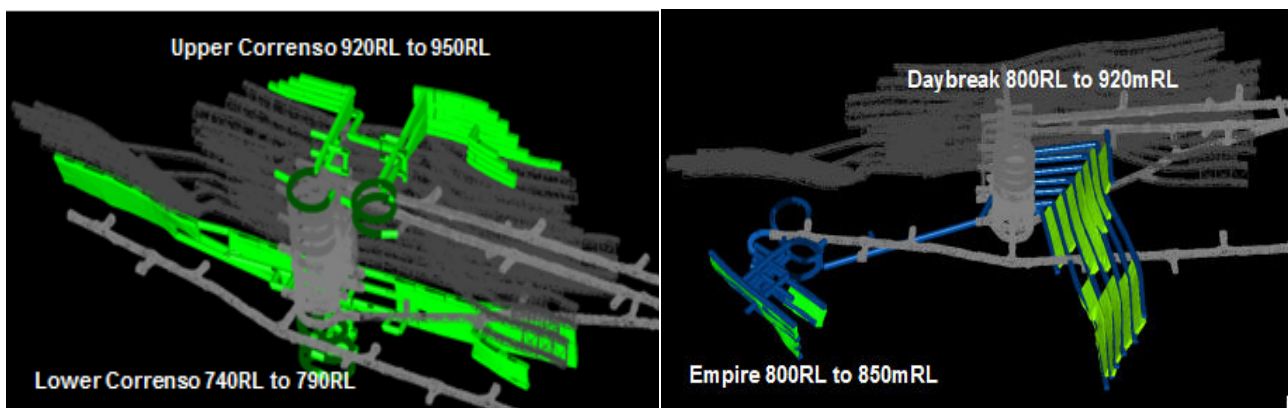
There are no Inferred Resources in the Open Pit, and all Inferred Resources lie within the Correnso Underground and Correnso Extensions Projects

The Correnso Extensions Scoping Study has defined 0.56 million tonnes at 7.5 g/t yielding 135 thousand ounces of Inferred Resource close to existing Correnso underground infrastructure and demonstrated that a positive Business Case exists. The Correnso Extensions comprise up-dip and down-dip extensions of the current Correnso Reserve and the addition of the Daybreak and Empire veins that lie adjacent or close to the Correnso Mine within the current Correnso Consent Area.

A similar mining method to that currently utilized underground at Waihi has been selected due to the similar nature of the mineralized orebodies. The mine designs were prepared using the established site Resource estimation processes, key studies commissioned and items addressed were:

- Geotechnical study and evaluation of the rock masses using standard classification systems to estimate unsupported spans, estimates of dilution and maximum design mining spans.
- Reference to blasting vibration studies due to the close proximity of the deposits to residential dwellings to determine suitable sublevel intervals compliant with the environmental constraints.
- Mine design and scheduling including stope design utilizing the MSO optimization tool or Auto Stope creation tool, development and production scheduling utilizing proprietary software delivering a mine plan which fed directly into the Cost Model.

Mining options available for the Correnso Extensions are limited because of the consent conditions, specifically relating to blasting vibration limits and backfill constraints. Longhole bench mining with waste rock backfill was selected as the preferred mining method for extraction of Correnso Extensions with overhand cut and fill in areas particularly sensitive to vibration. Other supplementary methods involve floor benching. Access to the underground is via declines from the existing Correnso underground mine, which also serves as a fresh air intake. Two primary exhaust raises and a single fresh air raise have been raise bored to surface and equipped at Trio and Favona. The portal is located close to the processing plant.



**Figure 14-4: Isometric Views of Correnso Extensions**

Correnso Extensions have been designed with a 15m level spacing, floor to floor, primarily to limit blast vibration but this also assists hanging wall and footwall stability. Conventional cross cut accesses are designed for Avoca stoping levels. The permitted mining method requires all stopes and selected development to be backfilled. Mine waste and supplement from Waste Rock Embankment would be used. Material can be sourced from the Waste Rock Embankment on surface and transported to the portal waste stockpile.

### **14.7.1 Hydrogeology**

GWS Limited Consulting (GWS) have modelled the groundwater system in Waihi since the late 1980's. Regular monitoring is compared to the modelled predictions and is discussed in the annual settlement and dewatering monitoring report submitted to the Regulators. GWS report that a shallow groundwater system associated with volcanic ash, alluvium and completely weathered rhyolite tephra is present at shallow depth. Monitoring data shows that it is unaffected by mine dewatering except immediately adjacent to the Martha Pit. Shallow groundwater levels are controlled principally by rainfall infiltration, low surface soil permeability and natural and assisted drainage to surface water systems.

GWS report that the higher volumes of water in the deeper aquifer are contained primarily in the quartz vein, the historic underground workings and infiltrated through the open pit which is more permeable than the surrounding andesite country rock. Water levels are maintained at the lowest underground mine level (790mRL) by the current underground pumping system. Further drawdown of the water table is required at a rate of 10,000 to 12,000m<sup>3</sup>/d to extract the Correnso Extensions Mineral Resource.

Consents are in place for the drawdown of the water table. The preferred option is of developing sumps at intervals as the mine develops downwards. These sumps are then pumped to permanent staging pump stations. Water can be drained ahead of the work with short wells or water that drains and accumulates behind the face can be pumped using portable submersible drainage pumps back to the last stage sump. It is proposed to use a slurry pump system capable of handling a high level of entrained solids for the permanent pump stations, and costs for such a system have been included in the financial analysis.

### **14.7.2 Geotechnical**

Geotechnical studies were completed by various external consultants SRK, Engineering Geology Ltd during the Waihi Correnso study.

The extensions of the Correnso vein above 915mRL are for the most part hosted within the Lower Andesite unit with the upper extents of the mineralization persisting through the transition to the upper andesite. Host rock conditions are mostly favourable although the rock mass appears to become slightly less competent than at greater depth. Visual estimates suggest Fair to Good classifications.

Lower Correnso ground conditions appear to be simply an extension to those already exposed by developments along the Correnso Vein on 795 and 810 levels. The ore zone as exposed on 795 and 810 is heavily structured and sugary quartz /calcite veins could create zones of weakness but overall ground conditions are classed as Good.

Overall both the host rock and ore zone of the Daybreak vein appears relatively competent. Daybreak is intersected in Correnso development on the 795 and 810 levels with no apparent adverse impact on ground conditions and no additional ground support was necessary.

The Empire host rock characteristics in the immediate vicinity of the ore-bodies are mostly favourable. Ore body conditions are variable. A zone of broken veining occurs at the northern end of the ore-body which may restrict stope spans to 15m.

### **14.7.3 Mining Recovery and Dilution**

The mining recovery factors applied for Correnso Extensions underground are summarized in the table below. Over-break is included in the capital and operating lateral waste development dimensions so that no additional over-break is assigned. No over-break is assumed for operating lateral ore development as

the over-break tonnes are generally ore which are included in the stope tonnes. Assuming zero over-break in the ore drives removes the risk of either double counting or under calling ore tonnes and metal.

Stopes are designed with 0.7m dilution applied on both the footwall and the hangingwall. This is based on experience gained when stoping Favona orebody, and the first three stopes in the Correnso orebody.

Tonnage recovery factors shown in the table following for stoping include in-situ ore, plus dilution material. Metal recovery factors take into account the difficulties associated with recovering all ore from a stope, particularly under remote control operations. Additionally, it allows for the potential loss of metal due to excess dilution burying ore and not recovering all of the ore.

**Table 14-14: Tonnage Recovery Factors**

Activity	Tonnage recovered	Metal recovered
Lateral Development — Capital Waste	100%	-
Lateral Development — Operating Waste	100%	-
Lateral Development — Operating Ore	100%	100%
Vertical Development — Capital Waste	100%	-
15m high Long hole Stope (includes 5% fill dilution at zero grade)	95%	90%

Underground ore is trucked to the ROM Pad and underground waste will be directly hauled to stope fill or to the surface waste dump as required and subsequently returned to the underground as backfill.

## 14.8 Metallurgical factors or assumptions

Laboratory scale test work has been conducted on samples obtained between 2010 and 2012 for the Correnso upper and lower extensions and Empire. No test work has been completed on Daybreak samples at this time however the results are expected to be consistent with those of the other adjacent mineralised structures. The key focus of the metallurgical work has been to derive gold recovery, throughput rates, reagent consumption and confirm suitability of current Plant configuration. This test work has shown the Correnso Extensions ores to be amenable for processing via the existing Waihi gold treatment plant flow-sheet.

A grind size P80 of 53 microns has been selected for the estimated throughput rates, as plant operating experience has shown that an equivalent laboratory gold recovery at a P80 of 38 microns is achieved. This relationship is due to the laboratory grind test work being in open circuit, whereas in the plant the grinding circuit is in closed circuit. This results in the higher density sulphides being preferentially ground finer and hence liberating more gold particles that are disseminated within the sulphides.

At this stage it is determined that a grind size P80 of 53 microns is the optimum that maximizes value for the Correnso Extensions resource. At the time of writing this report, arsenic grades were not included in the resource model, so for the purposes of budgeting, recovery estimates are currently based on a gold-only relationship. This gold-only relationship however has been derived from an arsenic relationship with gold grade, established from test work.

The relationship at a throughput of 88 tonnes per hour is:

$$\text{Recovery \%} = [\text{Head grade} - (0.09 * \text{Head grade} + 0.25 + 0.02)] / \text{Head grade} * 100\%.$$

This relationship predicts an average recovery for the Correnso Extensions of 87.4% based on the average project head grade of 7.47g/t Au. Both gold and arsenic have been identified as the statistically significant predictors for estimating residue grade for the Correnso Extensions resource.



## 14.9 Classification of Mineral Resources

Resource Classification is based on the average distance of the block to the closest three holes within specified ranges, with the ranges having been determined through drill spacing analysis of mineralisation continuity and site experience with similar veins.

Two methods which give similar results are completed. 1/ Standard average distance to 3 holes, and 2/ Classification is done using a Vulcan lava script based on a hole count within a search distance from each block centroid. The process included steps to remove isolated small clumps of blocks or isolated individual blocks of different classifications that cannot be realistically mined separately. Classification is based on three holes within specific ranges as per corporate standards.

**Table 14-15: Classification Criteria**

Project	Drill Spacing for Measured Resource	Drill Spacing for Indicated Resource	Drill Spacing for Inferred Resource
Martha Open Pit ELB	20 meters	50 meters	100 meters
Correnso	10 meters	30 meters	60 meters

For underground the Measured material is classified on the basis of proximity to drilling and sill drive development, blocks are classified as measured if they are within an average distance of 10 meters of three separate sampled locations, either drill holes or lateral Ore drive development channel sample locations

Two drill spacing studies using conditional simulation were completed during 2014 which validated the spacing of 30m for Indicated for the Correnso deposit.

Models used to estimate the Mineral Resources disclosed in this Report contain the following defined block variables:

- au: estimated gold grade (regardless of method used);
- res\_cat: resource block classification (resource category), where 1 = Measured, 2 = Indicated, 3 = Inferred, and 4 = mineral inventory,
- code: domain name for block estimation;
- sg: density field for tonnage calculation.

The original models contain additional variables and calculations to assess the:

- Impact of the selected cap grade;
- Calculated drill spacing;
- Comparisons to other estimation techniques.

The resource estimate outlined in this document appropriately reflects the Competent Person's view of the deposit.

### 14.10 Mineral Resource Statement

The Waihi Gold resource estimates, as at 30 June 2015, are presented in Table 14-16, Table 14-17, Table 14-18, and Table 14-19 and are classified in accordance with CIM and JORC 2012. Mineral Resources are inclusive of Mineral Reserves and are reported at a commodity price of NZ\$1,714/oz gold.

The resource estimate is sub-divided for reporting purposes: an open-cut resource that includes material within the limits of the Martha pit; and an underground resource within the Correnso Extended Permit Area. The resources are depleted for mining as at 30 June 2015.

Mineral Resources take into account geologic, mining, processing and economic constraints, and have been confined within appropriate LG pit shells, or within appropriate parameters for underground mining

scenarios, and therefore are classified in accordance with the 2014 CIM Definition Standards for Mineral Resources and Mineral Reserves.

Information relating to Geology, Sampling, Data Verification and Mineral Resources in this document was prepared by or under the supervision of Peter Church. Peter Church is a Chartered Professional Member of the Australasian Institute of Mining and Metallurgy and is the Qualified Person for those topics. Mr Church is a full time employee of Waihi Gold Company Limited and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Qualified Person.

**Table 14-16: Open Cut Resource Estimate**

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.155	3.05	30.5	0.015	0.152
Indicated	0.656	2.90	29.1	0.061	0.614
<b>Measured &amp; Indicated</b>	<b>0.811</b>	<b>2.93</b>	<b>29.4</b>	<b>0.076</b>	<b>0.766</b>
Inferred	0	0	0	0	0

**Table 14-17: Stockpiles Resource Estimate**

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0	0	0	0.000	0.000
Indicated	0.009	7.70	15.4	0.002	0.005
<b>Measured &amp; Indicated</b>	<b>0.009</b>	<b>7.70</b>	<b>15.4</b>	<b>0.002</b>	<b>0.005</b>
Inferred	0	0	0	0	0

**Table 14-18: Underground Resource Estimate**

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.172	10.40	16.6	0.058	0.092
Indicated	0.529	10.20	18.4	0.173	0.312
<b>Measured &amp; Indicated</b>	<b>0.701</b>	<b>10.25</b>	<b>17.9</b>	<b>0.231</b>	<b>0.404</b>
Inferred	0.612	7.73	16.72	0.152	0.329

**Table 14-19: Combined Resource Estimate**

Class	Tonnes (Mt)	Au(g/t)	Ag(g/t)	Au(Moz)	Ag(Moz)
Measured	0.327	6.92	23.3	0.073	0.244
Indicated	1.194	6.17	24.2	0.237	0.931
<b>Measured &amp; Indicated</b>	<b>1.521</b>	<b>6.33</b>	<b>24.0</b>	<b>0.310</b>	<b>1.175</b>
Inferred	0.612	7.73	16.72	0.152	0.329

Notes to Accompany Mineral Resource Table:

- Mineral Resources are inclusive of Mineral Reserves;
- Mineral Resources are reported on a 100% basis;
- Mineral Resources are reported to a gold price of NZD\$1,714/oz,
- Tonnages include allowances for losses resulting from mining methods. Tonnages are rounded to the nearest 1,000 tonnes;
- Ounces are estimates of metal contained in the Mineral Resource and do not include allowances for processing losses. Ounces are rounded to the nearest thousand ounces;

- Rounding as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
- Tonnage and grade measurements are in metric units. Gold ounces are reported as troy ounces.

Table 14-20 shows the resources by mining areas.

**Table 14-20: Resource Estimate by Area**

<b>Class</b>	<b>Tonnes (Mt)</b>	<b>Au(g/t)</b>	<b>Ag(g/t)</b>	<b>Au(Moz)</b>	<b>Ag(Moz)</b>
<b>Open Pit Martha</b>					
Measured	0.155	3.05	30.5	0.015	0.152
Indicated	0.656	2.90	29.1	0.061	0.614
<b>Measured &amp; Indicated</b>	<b>0.811</b>	<b>2.93</b>	<b>29.4</b>	<b>0.076</b>	<b>0.766</b>
Inferred	0	0.00	0.0	0.000	0.000
<b>Underground Correnso Stockpile</b>					
Measured	0	0.00	0.0	0.000	0.000
Indicated	0.009	7.70	15.4	0.002	0.005
<b>Measured &amp; Indicated</b>	<b>0.009</b>	<b>7.70</b>	<b>15.4</b>	<b>0.002</b>	<b>0.005</b>
Inferred	0	0.00	0.0	0.000	0.000
<b>Underground Correnso</b>					
Measured	0.172	10.40	16.6	0.058	0.092
Indicated	0.529	10.20	18.4	0.173	0.312
<b>Measured &amp; Indicated</b>	<b>0.701</b>	<b>10.25</b>	<b>17.9</b>	<b>0.231</b>	<b>0.404</b>
Inferred	0.371	7.91	13.8	0.094	0.164
<b>Underground Daybreak</b>					
Measured	0	0.00	0.0	0.000	0.000
Indicated	0	0.00	0.0	0.000	0.000
<b>Measured &amp; Indicated</b>	<b>0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.000</b>	<b>0.000</b>
Inferred	0.152	5.70	8.8	0.028	0.043
<b>Underground Empire</b>					
Measured	0	0.00	0.0	0.000	0.000
Indicated	0	0.00	0.0	0.000	0.000
<b>Measured &amp; Indicated</b>	<b>0</b>	<b>0.00</b>	<b>0.0</b>	<b>0.000</b>	<b>0.000</b>
Inferred	0.090	10.40	42.3	0.030	0.122

#### 14.11 Factors That May Affect the Mineral Resource Estimates

Factors which may affect the geological models and the preliminary stope and pit designs used to constrain the Mineral Resources, and therefore the Mineral Resource estimates include:

- Commodity price assumptions;
- Metallurgical recovery assumptions;
- Geotechnical assumptions.

## **14.12 Comments on Section 14**

The QPs are of the opinion that the Mineral Resources for the Project, which have been estimated using core and RC drill data and underground face chip data, have been performed to industry best practices, and conform to the requirements of CIM (2014).

## 15 MINERAL RESERVE ESTIMATES

### 15.1 Reporting Standard

The reserves were compiled with reference to the NI 43-101 and JORC. This section summarises the main considerations in relation to preparation of reserves and provides references to the sections of the study where more detailed discussions of particular aspects are covered. The basis for the estimation of Mineral Reserves is metal prices of NZ\$1,714 per oz (US\$1,200 per ounce) for gold.

### 15.2 Reporting Date

Mineral Reserves for Waihi open pit and underground are reported as at June 30, 2015.

### 15.3 Qualified Person

Information relating to Mineral Reserves, Mine Planning, Project Infrastructure, Capital and Operating Costs, and Economic Analysis in this document was prepared by or under the supervision of Trevor Maton. Trevor Maton is a Chartered Professional Member of the Australasian Institute of Mining and Metallurgy and is the Qualified Person for those topics. Mr Maton is a full time employee of Waihi Gold Company Limited and has sufficient experience that is relevant to the style of mineralisation and type of deposit under consideration and to the activity being undertaken to qualify as a Qualified Person as defined by NI 43-101 and is employed at the Waihi operation.

### 15.4 Mineral Reserves

The combined Mineral Reserves for Waihi Open Pit and Underground are summarised in Table 15-1:

**Table 15-1: Mineral Reserves, Trevor Maton, MAusIMM (CP)**

Source <sup>e</sup>	Reserve Class	Tonnes (Mt)	Au (g/t)	Ag(g/t)	Contained Au (Moz)	Contained Ag (Moz)
Open Pit	Proved	0.155	3.05	30.50	0.015	0.152
	Probable	0.656	2.90	29.10	0.061	0.614
Underground	Proved	0.172	10.40	17.00	0.058	0.094
	Probable	0.529	10.20	18.20	0.173	0.310
Stockpile	Proved	-	-	-	-	-
	Probable	0.009	7.70	15.40	0.002	0.004
Total Proved		0.327	6.92	23.40	0.073	0.246
Total Probable		1.194	6.17	24.16	0.237	0.927
Total (June 30, 2015)		1.521	6.33	23.99	0.310	1.173

Notes to Accompany Mineral Reserve Table:

- Mineral Reserves are reported on a 100% basis;
- Mineral Reserves are reported to a gold price of NZD\$1,714/oz;

- Tonnages include allowances for losses resulting from mining methods. Tonnages are rounded to the nearest 1,000 tonnes;
- Ounces are estimates of metal contained in the Mineral Reserves and do not include allowances for processing losses. Ounces are rounded to the nearest thousand ounces;
- Rounding of tonnes as required by reporting guidelines may result in apparent summation differences between tonnes, grade and contained metal content;
- Tonnage and grade measurements are in metric units. Gold ounces are reported as troy ounces.

The change in Mineral Reserves reported at June 30, 2015 compared with those previously reported at December 31, 2014 is reported in Table 15-2.

**Table 15-2: Mineral Reserves, Jun 2015 Reserve Estimates vs. Dec 2014 Reserve Estimates**

Reserve Area	Tonnes (Mt)	Au (g/t)	Ag(g/t)	Contained Au (Moz)	Contained Ag (Moz)
<b>December 31, 2014 Reserve</b>					
Open Pit	1.131	2.78	27.78	0.101	1.010
Underground	0.884	9.09	18.18	0.258	0.517
Stockpile	0.026	3.27	32.66	0.003	0.027
<b>Total (Dec 31, 2014)</b>	<b>2.041</b>	<b>5.52</b>	<b>23.68</b>	<b>0.362</b>	<b>1.554</b>
<b>Changes to Reserve, Dec 14 vs. Jun 15</b>					
Open Pit	(0.320)	2.39	23.74	(0.025)	(0.244)
Underground	(0.183)	4.64	19.21	(0.027)	(0.113)
Stockpile	(0.017)	0.92	42.63	(0.001)	(0.023)
<b>Total (Dec 31, 2014)</b>	<b>(0.520)</b>	<b>3.14</b>	<b>22.77</b>	<b>(0.052)</b>	<b>(0.381)</b>
<b>June 30, 2015 Reserve</b>					
Open Pit	0.811	2.93	29.37	0.076	0.766
Underground	0.701	10.25	17.91	0.231	0.404
Stockpile	0.009	7.70	13.82	0.002	0.004
<b>Total (Jun 30,, 2015)</b>	<b>1.521</b>	<b>6.33</b>	<b>23.99</b>	<b>0.310</b>	<b>1.173</b>

Changes between the June 30, 2015 Reserve and the December 31, 2014 Reserve estimate primarily reflect the depletion of ore from the Martha pit and the Correnso underground mine and resource updates in areas of grade control drilling.

Inputs to the calculation of cut-off grades for the Waihi Gold open pit and underground mine include mining costs, metallurgical recoveries, treatment and refining costs, general and administration costs, royalties, and commodity prices.

Open pit mining was undertaken by a contractor from 1997 to 2015 under a schedule of rates, and production rates and costs are therefore well understood.

Long hole bench stoping with rock backfill is the current mining method for extraction of underground Mineral Reserves. Stope dilution has been estimated based on expected geotechnical conditions, stope spans and industry experience for similar mining operations. Recovery of ore requires the use of remote loaders, and allowances have been made for loss of Mineral Reserves and also for dilution from back fill.

Recovery of gold at Waihi Gold is achieved through the use of a CIP plant and a conventional SABC grinding circuit. The plant has an established skilled workforce and management team in place. Recent costs and processing recoveries support the reporting of the stated Mineral Reserves.

The technical and economic viability of the reported Mineral Reserves is supported by studies which meet the definition of a Feasibility Study. All permits and consents are in place for the extraction of the Mineral Reserve.

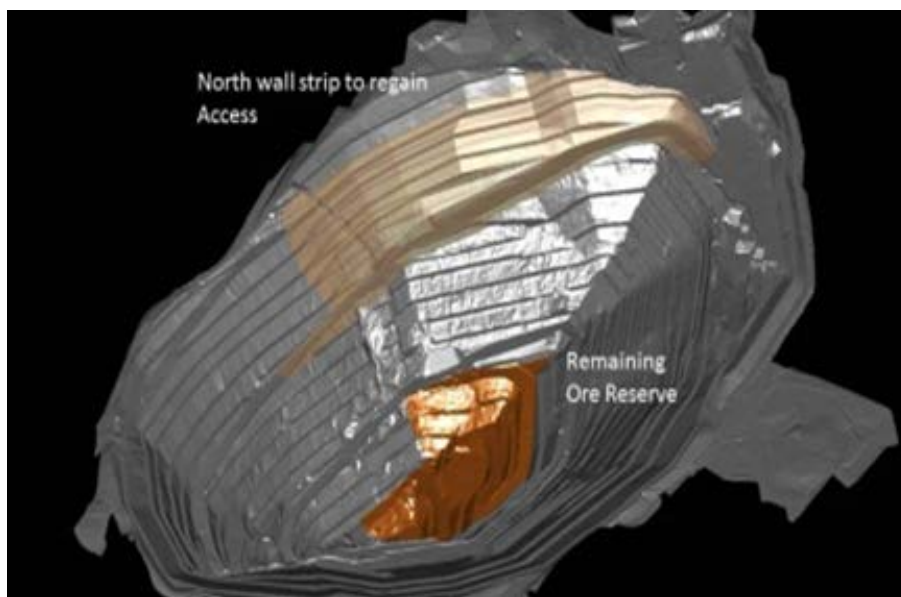
## 15.5 Open Pit

### 15.5.1 Open Pit Reserve

Open pit mining and ore processing at Waihi has been in continuous operation since 1988. The method for conversion of Mineral Resource to Mineral Reserve involved a 2010 pit optimisation study using the "Whittle" Lerch-Grossman algorithm to determine the economic limits of the Mineral Reserve. Mining of this layback was commenced in 2010.

A localised failure of the north wall that undercut the main access ramp suspended open pit mining operations in April 2015. A mining study has been initiated to identify methods to recover the remaining Mineral Reserve, but still requires additional geotechnical monitoring and analysis to confirm the appropriateness of the methods.

**Figure 15-1: Open Pit Mineral Reserve Limits and Stability Cutback**



### 15.5.2 Cut-off Grade

The cut-off grade used to determine Mineral Reserves for the Open Pit was 0.5 g/t Au.

### 15.5.3 Pit Slopes and Geotechnical

A detailed geotechnical study was completed for Waihi Gold by PSM in 2010 based on geotechnical drilling, structural pit mapping and geotechnical modelling. Geotechnical domains were re-defined based

on this analysis. The design criteria used to support calculation of Mineral Reserves are reported in the table below.

**Table 15-3: Pit Slope Design Criteria to Support Mineral Reserve Calculations**

SECTOR		PIT WALL DIP DIRECTION					
		SOUTHEAST TOWARDS 330°		EAST TOWARDS 270°		NORTHEAST TOWARDS 195°	
Bench		Face Slope	Inter-Ramp	Face Slope	Inter-Ramp	Face Slope	Inter-Ramp
	>1135					30°	
1135	1120	30°	35°			35°	30°
1120	1104	30°		37°	37°	40°	
1104	1090	30°		37°		30°	
1090	1070	37°		37°		40°	
1070	1050	45°		37°		55°	44°
1050	1030	45°		37°	60°		
1030	1010	45°		37°	65°		
1010	990	45°		65°			
990	970	55°	47°			65°	50°
970	950	55°				65°	
950	930	55				70°	
930	910	60°				70°	
910	890	60°				70°	

The open pit geotechnical conditions are impacted by the presence of extensive historic mine workings, particularly on the south and east walls of the pit. Caving initiated during historic mining has resulted in zones of poor quality rock mass within and outside of the pit slope limits. There has been ongoing large scale block movement over the last seventy years and this large scale block movement will continue into the caved zones in the future beyond the life of the open pit.

The east wall of the open pit lies directly above one of the most significant caved zones, the “Milking Cow”. Mining operating procedures have been enhanced to account for this zone which has the potential to contain large and numerous voids.

Geotechnical monitoring has continued following the localised failure of the north wall that undercut the main access ramp and suspended operations in April 2015.

**15.5.4 Mining Dilution and Ore Loss**

No mining losses were applied. It is considered that the resource estimation technique applied to the broad ore zones provides an adequate estimate of the run of mine (ROM) tonnes and grades. Reconciliation data from mining the Martha open pit supports this approach.

There are no Inferred Mineral Resources included in the open pit economic evaluation. The studies have demonstrated that the open pit operation is technically and economically viable without the inclusion of inferred Mineral Resources.

All fixed infrastructure required for the chosen mining method to extract the open pit Mineral Reserve is in place.

**15.6 Underground**

**15.6.1 Underground Reserve**

Underground mining and ore processing at Waihi has been in continuous operation since 2004.



The study work undertaken for Correnso underground mine meets Feasibility Study level standard. Mining studies have been conducted for mine design, mine planning, ventilation, cut-off grade, detailed cost estimation and economic evaluation. The site has had a 10 year operating experience with mineral resource reconciliation and metallurgical recovery performance of the underground resources. Actual costs for underground mining, ore processing, general and administration and selling costs are known.

A mine plan has been developed which is technically achievable and economically viable. All Modifying Factors have been considered.

Permits and Consents have already been granted for the Correnso underground project and all planned mining methods are in accordance with the licence, permit and consent conditions, principally related to placement of backfill, blast vibration limits, method of working and hydrogeological controls.

### 15.6.2 Cut-off Grades

The following cut-off grades have been used to determine the Underground Mineral Reserve:

- Ore development and stoping beyond designed limits 4.3g/t Au,
- Ore development beyond stope limits 4.2g/t Au,
- Incremental stopes (ore development in place) 3.9g/t Au,
- Incremental ore development 2.5g/t Au.
- The cut-off grades are determined from a mining cost of NZ\$110/ore tonne and processing cost of NZ\$45/ore tonne and include all general and administrative charges.

### 15.6.3 Geotechnical Design Parameters

The following geotechnical parameters have been used within the Correnso Underground mine design:

- Development ground support regimes similar to those employed at Trio and Favona with bolting and mesh required in all areas, fibrecreting as required in poorer ground areas and cable bolting of drive intersections and wider excavations
- Minimum 1:1 pillar separating development openings
- 15m vertical level spacing provides a good basis for stable stoping and manageable blast vibration.
- Stope dilution 0.5m to 1.0m on each wall.
- Ore drive stripping to be no wider than 7.0m on a 15.0m level spacing with no ore drive stripping a preferable option.

### 15.6.4 Mining Dilution and Ore Loss

The mining recovery factors applied for Correnso underground are summarized in the table below. Over-break is included in the capital and operating lateral waste development dimensions so that no additional over-break is assigned. No over-break is assumed for operating lateral ore development as the over-break tonnes are generally ore which are included in the stope tonnes. Assuming zero over-break in the ore drives removes the risk of either double counting or under calling ore tonnes and metal.

Stopes were designed with 0.4m dilution on both the footwall and the hangingwall which when applied with the stope recovery factors reconciles with performance of stopes in both Favona and Trio.

Tonnage recovery factors shown in the table below for stoping include in-situ ore plus dilution material. Metal recovery factors take into account the difficulties associated with recovering all ore from a stope, particularly under remote control operations. Additionally, it allows for the potential loss of metal due to excess dilution burying ore and limiting recovering of all of the ore.

**Table 15-4: Underground Mining Recovery Factors**

Activity	Tonnage recovered	Metal recovered
Lateral Development — Capital Waste	100%	-
Lateral Development — Operating Waste	100%	-
Lateral Development — Operating Ore	100%	100%
Vertical Development — Capital Waste	100%	-
15m high Long hole Stope (includes 5% fill dilution at zero grade)	105%	90%

No Inferred Resource metal has been included in the Mineral Reserve. Each individual design item was interrogated to report against each Mineral Resource category, and the average grade of each design item reassessed only allowing contribution of metal from Measured and Indicated Mineral Resource categories. As such, any Inferred Resource material was effectively included as diluting material at zero grade.

## 15.7 Comments on Section 15

The QPs are of the opinion that the Mineral Reserves for the Project conform to the requirements of CIM (2014).

## 16 MINING METHODS

### 16.1 Martha Open Pit

The method for conversion of Mineral Resource to Mineral Reserve involved a 2010 pit optimisation study using the "Whittle" Lerch-Grossman algorithm to determine the economic limits of the Mineral Reserve. Mining of the current layback was commenced in 2010.

A localised failure of the north wall occurred in April 2015 which undercut the main access ramp. Operations were suspended in April 2015 and the mining contract terminated in June 2015. Studies are in progress to regain access to the bottom of the pit. It is planned to undertake a wall strip in the north east to regain access to the ramp below the failure to allow full recovery of the remaining Mineral Reserve. Whilst input parameters to the design have been based on local site experience, geotechnical studies have not been completed to demonstrate that the planned north east wall strip to regain access has adequate Factors of Safety.

The open pit mining process at Martha is determined largely by the land use consents granted to the Company. Ore and waste is mined by conventional drill, blast, load and haul methods from the open pit. Waste and ore is categorised into hard and soft material. Waste is further categorised into potentially acid forming or non-acid forming rock. Ore sampling is conducted in-pit by RC drilling. Ore blocks are blocked out on the basis of this sampling and take into account the capacities of the equipment to selectively mine these blocks.

Soft material is ripped by D9 dozer whereas hard material is blasted. Strict controls on blast vibration determine the blast hole spacing and the maximum allowable charge weight per delay. Generally ore is blasted in 5metre vertical intervals (two flitches), but blast vibration limitations may require blast holes to be drilled at 2.5metre vertical intervals. Electronic detonators are used in all holes to ensure detonation of charges occur as per the design sequence. The Company monitors each blast vibration for conformance.

All ore and waste is loaded via 190 tonne backhoe excavators into 85 tonne rear dump trucks and trucked via a 1 in 10 ramp and generally direct tipped to a Jaw Crusher or Stamler Breaker station. Small quantities of ore and waste are stockpiled close to the jaw crusher. The presence of historic workings in the open pit requires probe drilling to identify voids or weak pillars which create both a safety hazard and an operating constraint. Underground voids are either banded off or marked with hazard tape. Excavators and trucks must operate around the void working in towards the void. This process can at times influence the bench extraction sequence. All ore and waste is crushed. Ore is conveyed 1.5 km to the process plant and placed in a 40,000t stockpile. A surge (Polishing Pond) stockpile (up to 1.2MT) is available close to the water treatment plant for excess ore.

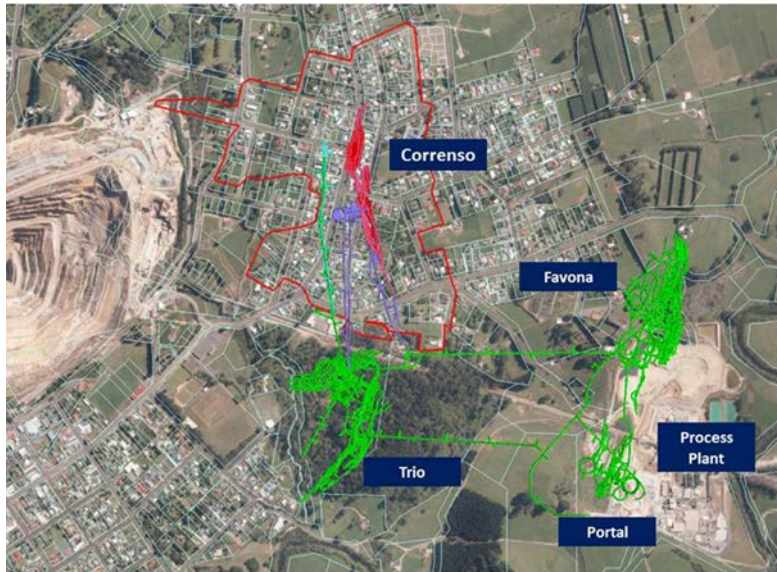
The minimum mining width has been set at 3 metres wide, determined by the observed width of many of the small narrow veins that are being mined. Equipment has been sized to suit these design parameters. The selective mining unit developed for the geological block model is a bench height of 2.5metres, and east west dimension of 3metres and north south dimension of 10metres reflecting the drill spacing and the main trend of the mineralised veins in an east westerly direction.

Reverse Circulation grade control drilling has been used since 2006 and is drilled to an approximate 10m x 5m pattern with 1.5m down hole sample lengths. Drill holes are currently inclined to the north but this will be continually reviewed in the light of routine pit mapping.

The ore zones are broad on each mining bench, and the overall dilution edge effects are minimal, with the result that there is little difference between the overall in situ and diluted tonnes and grade. The Mineral Resource block model has a block dimension which is larger than the optimum selective mining unit (SMU) for the equipment currently operating at Waihi Gold. When estimating open pit Mineral Reserves there is no requirement for additional mining dilution subsequent to the geological modelling stage. Waihi Gold will continue to monitor dilution assumptions during on-going operations.

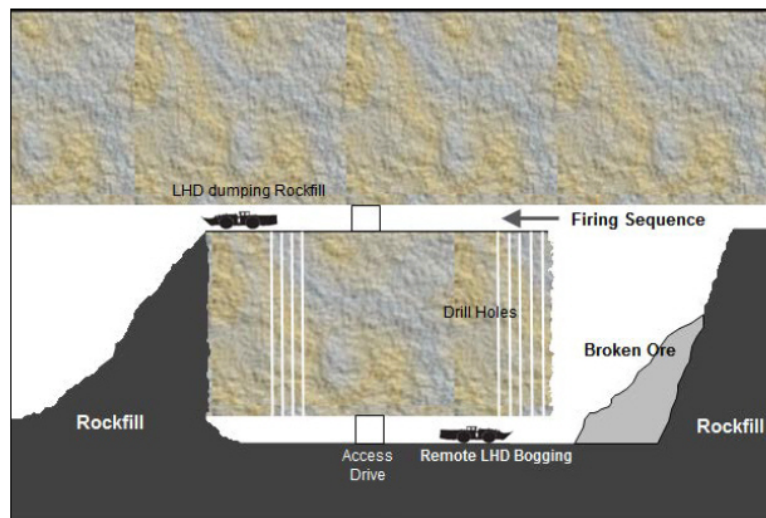
## 16.2 Correnso Underground Mining

Correnso is accessed via the existing Favona Mine and Trio Mine, the portal is close to the Process Plant, refer Figure 16-1.



**Figure 16-1: Location of Correnso Mineral Reserve**

Mining options available for Correnso were limited because of the permit conditions, blasting and backfill constraints and AVOCA mining was selected as the preferred mining method. Correnso has been designed with a 15m level spacing, floor to floor primarily to limit blast vibration but this also assists hanging wall and footwall stability, refer Figure 16-2.

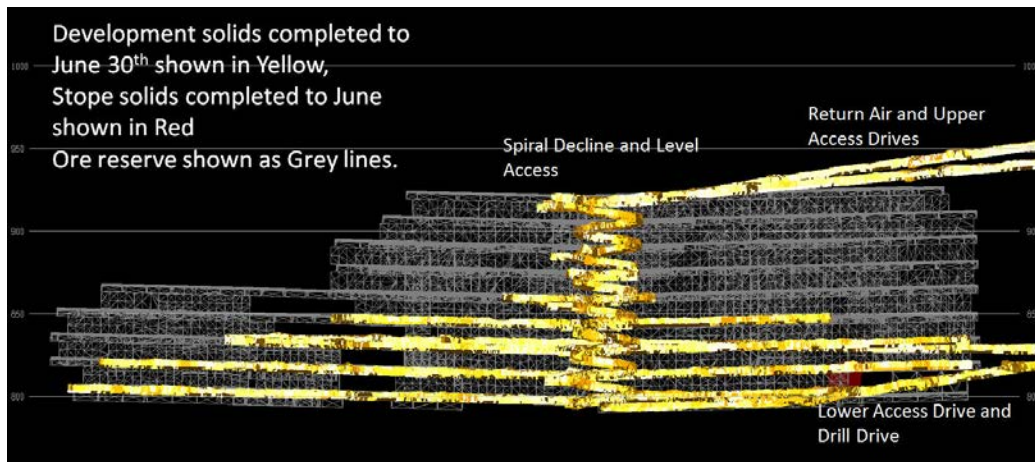


**Figure 16-2: Modified AVOCA Mining Method**

Access to the Correnso underground is via a decline from previously mined areas, and also serves as a fresh air intake. Two primary exhaust raises and a single fresh air raise has been raise bored to surface and equipped. The portal is located close to the processing plant. The mine layout for Correnso can be summarized as follows:

- Primary accesses via the existing lower trio access drive, the 844 exploration drive and from the Trio 953 level.

- Exhaust ventilation development from the 972 and running parallel with the 953 access exhausting levels via a dedicated return air raise adjacent to the spiral decline.
- Ore and level waste development at 15m Level Spacing.
- Ventilation rise adjacent to the spiral decline.
- Ore passes and waste passes to all levels throughout the mine.



**Figure 16-3: Long Section of Correnso Mineral Reserve**

Conventional cross cut accesses are designed for Avoca stoping levels. Ore and waste passes are planned to assist with efficient materials handling. Exhaust ventilation is provided from the 972 Trio development to the existing Union Hill ventilation rise. The status of development of the Correnso mine as at June 30, 2015 is shown in Figure 16-3. Mining is located approximately 200metres below residential housing and the mining reserve is approximately 120metres high by 600metres long.

The Permit and mining method requires all stopes and selected development to be backfilled. Mine waste and supplement from Waste Rock Embankment would be used. The open contractor has supplied to Waihi Gold costing to move the material from the Waste Rock Embankment to the portal waste stockpile, estimated at \$7.32/tonne.

Consulting Group, Mining One in their review of backfill for the Correnso project concluded:

- The proposed loose rock fill backfill option for the Correnso Orebody is consistent with the current mining practices across the Waihi Gold Operations. The backfill option provides the most economical backfill solution, whilst limiting the potential for stope collapse and surface subsidence.
- It is recommended that a testing program is implemented to provide greater understanding of the mechanical properties of the proposed backfill material.
- Small voids are an inevitable consequence of using loose rock fill. The voids created by loose rock fill are likely to affect local stope stability only. Providing adequate loose rock fill is placed immediately following stope development, the bulking of any failed rock is likely to arrest propagation of the failure in close proximity to the stope.

### 16.2.1 Hydrogeology

The Correnso Underground is fully dewatered and no further dewatering is required for the extraction of the Reserve. Work is underway to advance options for the design of additional pumping, to allow the conversion of further Mineral Resources to Mineral Reserves.

GWS Limited Consulting (GWS) have modelled the groundwater system in Waihi since the late 1980's. Calibration of the model is undertaken at six monthly intervals and discussed in the annual settlement and dewatering monitoring report submitted to the Regulators. GWS report that a shallow groundwater system associated with volcanic ash, alluvium and completely weathered rhyolite tephra is present at shallow

depth. Monitoring data shows that it is unaffected by mine dewatering except immediately adjacent to the Martha Pit. Shallow groundwater levels are controlled principally by rainfall infiltration, low surface soil permeability and natural and assisted drainage to surface water systems.

GWS report that the higher volumes of water in the deeper aquifer are contained primarily in the quartz vein, the historic underground workings and infiltrated through the open pit which is more permeable than the surrounding andesite country rock. This system has been drained from geological intersections in the Martha Pit as well as vertical pumping bores located within the pit and pumping from the underground mine. Current water levels are maintained by the pumping system within the underground mine.

### 16.2.2 Correnso Geotechnical Model

The geotechnical model for stoping assessments was based on empirical modelling using Q ratings for the rock mass quality and applying the Mathews method to determine stable spans. Geotechnical modelling was impacted by mine design where level spacing was set by blast vibration limits and modelling had to ensure stable pillars were left.

Geotechnical assessments indicate that rock mass conditions within the ore zone and immediately adjacent to the ore zones is generally of good to very good quality with the exception of the northern portion of the Correnso West Vein. In general, rock mass conditions are expected to be poorer in the Correnso West vein when compared to the Correnso East vein. The following ground support was recommended for Correnso development. In general the ground conditions at Correnso are expected to be better than seen at Favona and similar to Trio. Stopping assessments indicate that rock mass conditions within the ore zone and immediately adjacent to the ore zones is generally of good to very good quality with the exception of the northern portion of the West Vein. In general, rock mass conditions will be poorer in the Correnso West vein when compared to the Correnso East vein. It is expected that stable stope strike spans of 15m for Correnso West and 30m for Correnso East vein can be routinely achieved in the northern third of the ore body. Stable stope strike spans of 20m for Correnso West and 40m for Correnso East vein can be routinely achieved in the central and southern portion of the veins in areas where Modified Avoca is utilised.

Caving and surface subsidence potential has been assessed for development and stoping with the risk being low if recommendations for ground support, allowable spans, and management techniques are followed.

Numerical modelling was undertaken to assess the global effects of mining including global mine stability, risk due to chimney failure of individual stopes, and the effects on ground surface subsidence. The numerical modelling concluded that the likely effects on ground surface stability due to mining to be negligible.

### 16.2.3 Mine Scheduling

Correnso mine production criteria was calculated from benchmarked rates adjusted for permit conditions and used to develop the mine plan. Benchmark rates are based on Trio and Favona capabilities. Table 16-1 lists the productivity rates and activity durations used in the mine development and production schedule.

**Table 16-1: Underground Mining Rates**

Activity	Rate
Critical Access and Ventilation Development	20m / week max
High Priority Level Waste Development	20m / week max
General Rate Level Waste Development	15m / week
High Priority Ore Drive Development	15m / week
General Rate Ore Drive Development	9m / week
Stope Production – peak individual stope	850t / day
Stope Production – total mine peak Reduced Correnso case	1,170 t / day
Stope Production – total mine peak Full Correnso case	1,350 t / day

Standard Backfilling Rate	850 t / day
Longhole drilling rate per rig	160 m / day

Total jumbo advance is capped at 600 metres per month to suit the 3 jumbos used for the project. This figure was regularly exceeded in the Trio project. Analysis of blasting constraints demonstrates that this amount of firing is possible even whilst in full stope production. The maximum heading advance rate of 20m per week per heading is a reduced rate due to the permitted blasting time constraints.

Checks were made to ensure development and stopes were sequenced correctly with bottom up development, development completed on the level prior to stoping commencing and adequate separation between the stoping fronts on the various levels. Checks were also made to ensure stoping, drilling and backfilling activities on a single level could be carried out independently of each other.

Ore drive development is scheduled at a maximum of 165 metres per month per jumbo with the peak monthly forecast development rate being 495 metres per month when three jumbos are operating.

#### 16.2.4 Staffing

Currently staff at the underground mine comprises Mine Manager, Contract manager, Mine Foreman and Shift Foreman (5), Mining Engineers (6), Geologists, Geotechnical engineers (2), surveyors (3) and support staff and this staffing level is estimated to continue into the Correnso operation. Operating personnel (mining and maintenance) is provided by an Australian mining contractor (approximately 100).

#### 16.2.5 Stockpiling and Waste Dump

Some stockpiling of material will be required to enable waste production to be scheduled in accordance with backfill requirements and maintain consistent ore feed through the process facility. For the Correnso Underground mine, existing stockpile areas near the Favona portal will be used for the temporary storage of ore and waste rock removed, and for the crushed rock and aggregate (from a local quarry) for backfilling.

A shortage of backfill material exists for the Correnso mine and this will be sourced from the Waste Development Site.

Most ore from the underground mine will be processed relatively quickly with the run of mine (ROM) material stockpiled in the ROM stockpile located near the conveyor in the processing area. This stockpile has a 100,000 tonne capacity.

#### 16.2.6 Equipment and Haulage

The Correnso mining equipment fleet size has largely been determined (for key mobile equipment items) in the cost model based on the physical schedule and productivity and utilization assumptions.

The equipment fleet on site is as follows:

- Lateral Development face drilling and bolt installation with 2 Boom Jumbo
- Loading using CAT 1700 or 2900 underground loaders
- Trucking utilizing 50 tonne underground trucks.
- Solo 5V long hole drill rigs capable of drilling in the diameter range of 51 to 76mm and up to 25m hole length.
- Ancillary equipment (explosive charge vehicles, shotcreting equipment, integrated tool carries, grader) similar to that currently used on site
- Normet ANFO and Shotcreting support vehicles
- Graders

### 16.2.7 Maintenance

Comprehensive maintenance tracking and reporting systems, in addition to preventive maintenance (PM) programs are established. Site maintenance facilities are considered adequate to support the current and forecast LOM fleet and exist in centralized facilities on surface and a service bay underground. PMs are routinely performed as per the manufacturer's recommendations. Major overhauls and rebuilds are done onsite with existing personnel with the infrequent assistance from contracted personnel. The LOM equipment replacement/rebuild schedule is appropriate to the mine plan.

### 16.2.8 Blast Vibration

Vibration modelling has been completed for Correnso by John Heilig and Partners. The Waihi Correnso permit specifically required that:

- There shall be no more than three blast events per day, from Monday to Saturday and between 0700 and 2000.
- No blasting shall be undertaken at night (2000 to 0700 the following day), on Sundays or on public holidays.
- The peak particle velocity (vector sum) shall be no more than:
  - For development blasts: 5mm/s for 95% of the monitored events; 2mm/s on average.
  - For production blasts: 5mm/s for 95% of the monitored events; 3mm/s on average.
- Compliance with the 95-percentile limit shall be determined separately for development blast events and for production blast events,
- Production blasts shall have a total duration of not more than 9 seconds;
- Development blasts shall have a total duration of not more than 12 seconds;
- A combination of production and development blasts shall have a duration of not more than 12 seconds.
- No blast event shall have a duration of more than 18 seconds.

Modelling of the likely scale of blasting has been based upon vibration relationships developed from the underground blasting at Waihi over the last six years. When mining the lower levels (more than 300m below surface), blasting can use simplified stoping blasting procedures (i.e. single deck of column per blast hole). The upper sections of the mine (220m to 300m below surface) will be blasted with conventional stoping practices using several discrete columns of explosive within a single blast hole to control vibration levels. The blast vibration (95% less than), charge weight and distance relationship at Correnso is governed by the relationship:

$$PPV_{\text{Underground Design}} = 2230 \left( \frac{d}{\sqrt{w}} \right)^{-1.49}$$

Where *PPV* is blast vibration mm/s, *d* is distance in meters and *w* is explosive weight in kg.

Mine scheduling was based on the assumption that the blasting windows for the Correnso project would be:

- during a one hour window at 7am, 1pm and 7pm,
- no blasting, including development, occurring at night, and
- blasting will not occur on Sundays or public holidays.

### 16.3 Ventilation

Network analysis has been conducted using VentSim software. The analysis verified that designs and planning are adequate. The Correnso exhaust ventilation circuit will see the main accesses connected to



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the existing Trio exhaust ventilation circuit. Fresh air sources for Correnso will be via the lower trio and 844 drill drive accesses. No dedicated fresh air rises are planned at this point in time. Secondary ventilation will be via conventional fan and vent bag means.

#### **16.4 Compressed Air and Service Water**

Compressed air and water services for Correnso are from an extension of the Favona/Trio system. Two rated at a capacity of 1000cfm @ 8.5 Bar each are provided for the Project.

## 17 RECOVERY METHODS

The metallurgical process at Waihi is well-tested and proven technology, having been in operation for 27 continuous years.

### 17.1 Actual Plant Performance

Mill Production statistics for the 2014 year are detailed in Figure 17-1 and Figure 17-2.

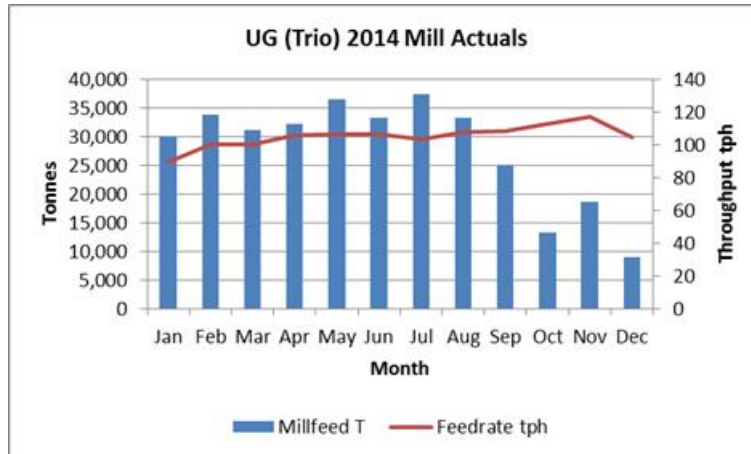


Figure 17-1: Underground mill feed tonnes and throughput actual 2014

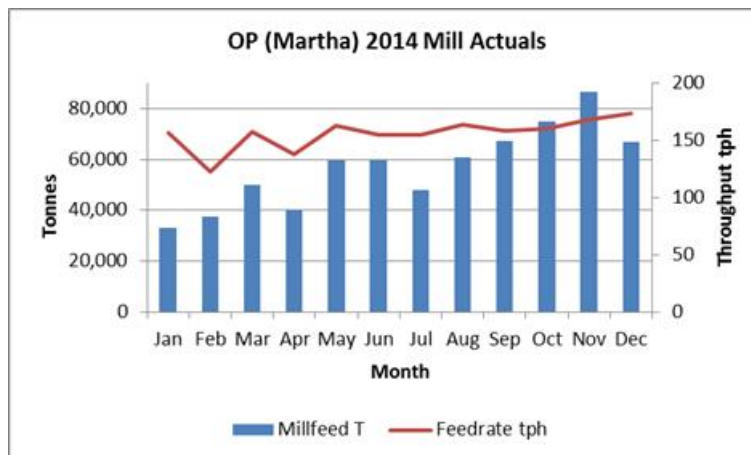


Figure 17-2: Open pit mill feed tonnes and throughput actual 2014

### 17.2 Metallurgical Accounting

Metallurgical accounting at Waihi is primarily based on the tonnage of wet ore processed through the comminution circuit, as totalised on the Conveyor 5 (CV5) weightometer and gold receipts from the Mint. Wet tonnes are converted to dry tonnes by using a moisture factor, the moisture factor is derived from samples taken from CV5, and a moisture factor is generated and applied to each 12 hour shift of processing. Gold production is based on gold receipts from the Mint and the changes to the gold stocks in circuit. Gold production is reported monthly and for each ore type. Gold stock takes are taken monthly and at the change of ore campaigns.

Samples are taken at strategic points in the processing stream to measure gold concentrations in those streams to determine plant efficiencies on a day to day basis. All information is entered into a data base which then performs the Metallurgical accounting.

### 17.3 Ore Processing

Ore processing consists of five stages: comminution, leaching/adsorption, elution, electro-winning and smelting as shown in.

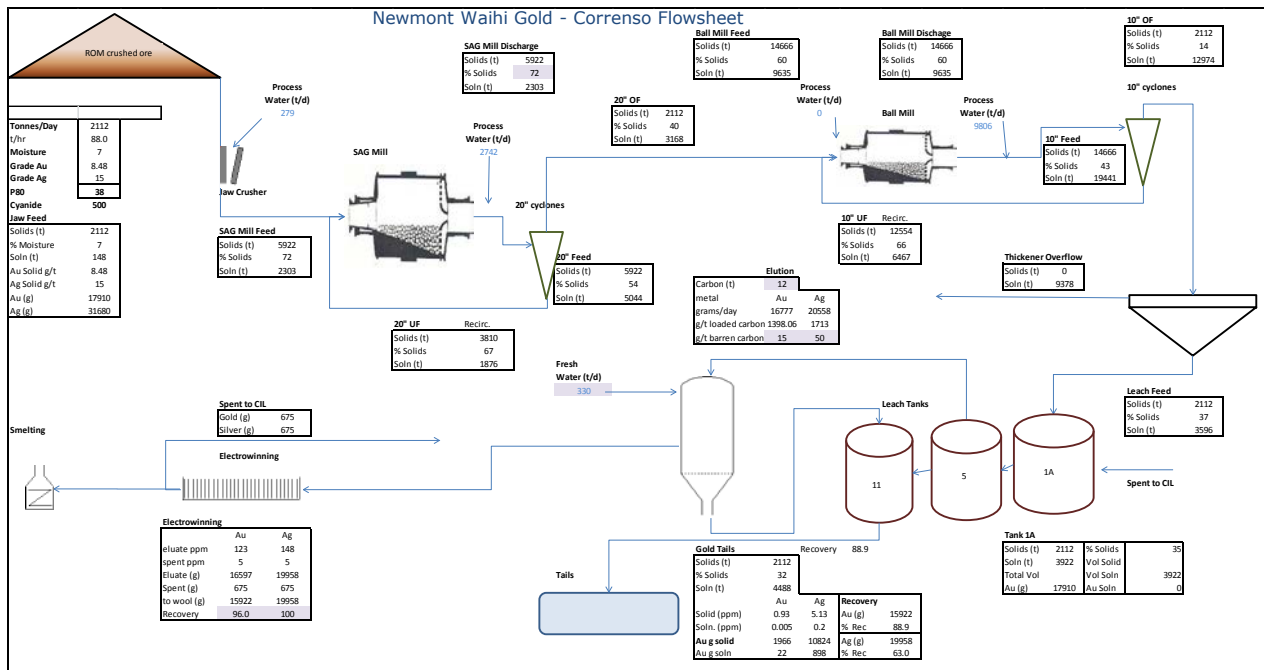


Figure 17-3: Process Flow Sheet

### 17.4 Comminution

Underground stockpile ore is reclaimed at 80 tonnes per hour by front end loader and fed onto a static grizzly with an aperture of 150 mm. The final conveyor from the ore handling circuit transports the ore into the grinding circuit, which is enclosed in a steel clad building for sound protection.

Prior to entry into the feed chute of the SAG mill, the ROM ore is further reduced in feed size via a jaw crusher to a P80 of 110 – 130 mm. The SAG mill make up ball size is 125 mm and the mill operates typically with a 10% ball load. The SAG mill draws between 2100-2150 kW of power when operating at 15 rpm or 77% of the critical speed.

The SAG mill discharge is sized using a trommel attached to the SAG. The +12mm oversize material is conveyed to a HP100 cone crusher with a closed side setting of 9mm and is recycled back to the SAG mill. The cone crusher has a power draw of approximately 30 kW. The undersize slurry from the SAG trommel is pumped to two 500 mm diameter inclined Weir Warman Cavex cyclones. The cyclone underflow reports to the SAG mill feed chute. The cyclone overflow gravitates to the ball mill discharge hopper, whereby the slurry is pumped to a cyclone distributor, which consists of fourteen 250 mm diameter Weir Warman Cavex cyclones. The cyclone underflow reports back to the ball mill for further grinding and the cyclone overflow reports to the pre-leach thickener.

### 17.5 Leaching and Adsorption

The pre-leach thickener increases slurry density from approximately 15% solids to approximately 37 to 40% solids prior to the leach/adsorption circuit, which comprises six leach and six CIP adsorption tanks. The leaching tanks capacity are 700 m3 and the adsorption tanks have 300 m3, providing a total residence leach/adsorption time of 24 hours for Martha ore and 48 hours for Correnso ore. Wedge wire cylindrical inter-stage screens with mechanical wipers are installed in each adsorption tank. The interstage screens retain carbon in the tank but let the slurry pass through to the next stage. A bleed stream is pumped from an adsorption tank to the previous tank in the circuit, the carbon contained in the bleed stream is retained

in the previous adsorption tank in the circuit, this provides counter current flow whereby the slurry flows from adsorption tank 1 to 6 while the carbon flows from adsorption tank 6 to 1. This allows for maximum carbon loading in adsorption tank 1 and maximum scavenging of gold solution in adsorption tank 6. From adsorption tank 6 the slurry passes over a carbon safety screen to collect any carbon that may have leaked from the adsorption circuit, the barren tailings slurry is then pumped to the tailings storage facility.

Cyanide is delivered and mixed on site, via a sparging system to a concentration of 21 % wt./vol. The cyanide is dosed into the first leach tank and the concentration is maintained at 280 ppm for Martha and 240 ppm for Correnso. Oxygen is added to the first leach tank by a shear reactor to enhance the leach kinetics and reduce cyanide consumption.

## **17.6 Elution, Electrowinning and Smelting**

Loaded carbon from the adsorption circuit is fed into an elution column where the carbon is washed at high temperature and pressure to remove the gold and silver from the carbon and into a pregnant eluate. The pregnant eluate is then passed through electrowinning cells where gold and silver is electroplated onto stainless steel cathodes. Following elution the barren carbon is reactivated and recycled to the adsorption tanks.

The cathodes are periodically harvested and rinsed to yield a gold and silver bearing sludge which is dried, mixed with fluxes and put into a furnace at 1200°C. Once the sludge is molten it is poured as bars of doré (alloy of gold and silver) ready for shipment to the Mint.

## **17.7 Other**

The Waihi processing plant has a SCADA control system. Equipment protection and P&ID control loops to optimise the control of the major streams/processing parameters within each process circuit are actively in use within the process plant.

The Processing Plant has the capacity to treat either 1.25 million tonnes of Martha ore or 800,000 tonnes of Correnso ore per annum.

## 18 PROJECT INFRASTRUCTURE

### 18.1 Mine Layout

Correnso Underground and the Correnso Extensions will use the existing process facilities, tailings storage facilities, water treatment facilities and other site infrastructure established at the Martha Mine in 1988 and upgraded in the late 1990's.

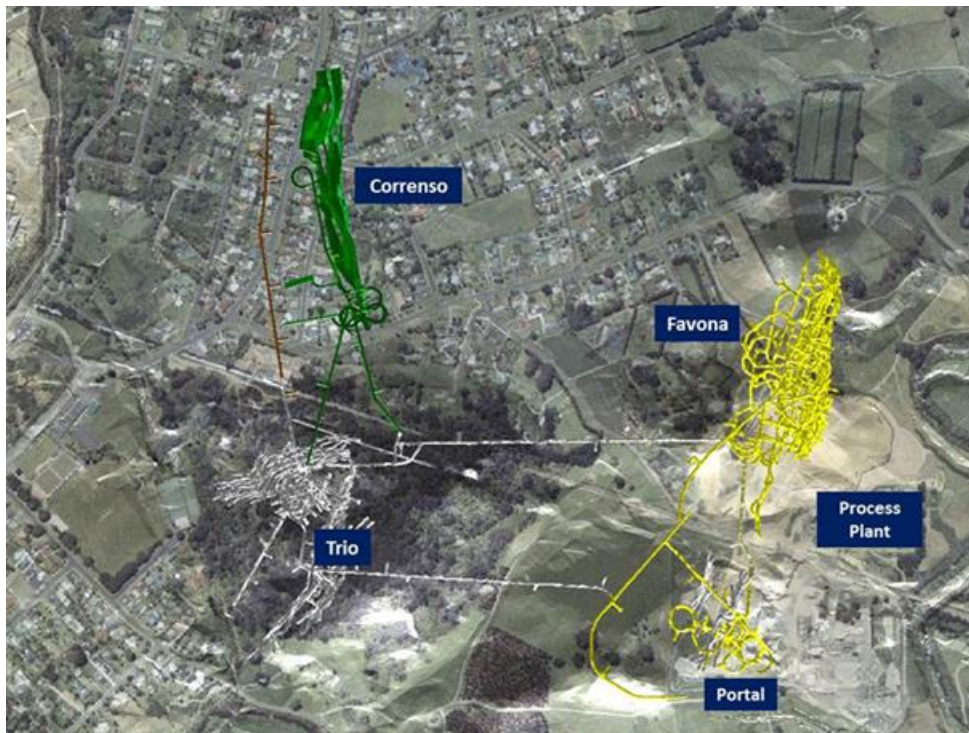


Figure 18-1: Location of mine infrastructure relative to Waihi Township

### 18.2 Waste Disposal Facilities

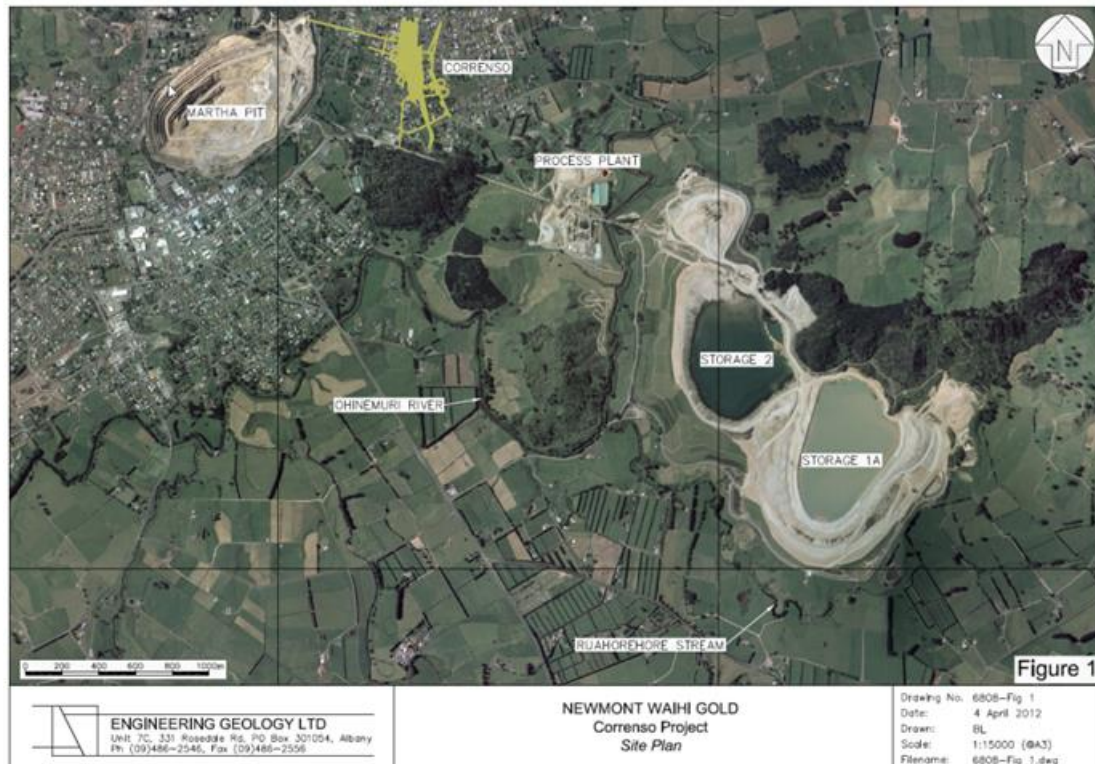
All waste produced from the underground mine is classified as potentially acid forming and is returned underground as stope backfill.

Waste from the open pit is conveyed 2.0km to the waste development load-out site where it is either directly loaded into 100t trucks and transported a further 1km to the tailings dam or stockpiled for future use. At the waste development site, the waste is selectively placed in accordance with a quality control program to form a dam for the tailings impoundment. All waste is compacted in accordance with strict design specifications.

Approximately 0.3Mm<sup>3</sup> of PAF waste rock requires disposal, as of 30 June 2015, from the current life of mine project and sufficient room remains in the embankment forming Storage 1A.

### 18.3 Tailings Storage Facilities

Waihi Gold has two tailings storage facilities (TSFs) known as Storage 2 and 1A. Both are located south-east of the Martha Pit as shown in Figure 18-2. The TSFs are formed by embankments that abut elevated ground to the east of Storage 2 and north of Storage 1A.



**Figure 18-2: Location of tailings storage facilities**

Storage 2 has a finished crest elevation of RL156 and the planned crest of Storage 1A is RL177.25. The embankments have both been constructed from overburden material obtained from mining Martha Pit. Storage 2 was constructed first and provided tailings storage from 1989 to May 2000. Storage 1A has since provided tailings storage. Storage 1A is permitted by the Mining Licence and has a Building Consent allowing it to be constructed to RL177.25.

The remaining tailings capacity after production from Martha open pit and Correnso Underground is estimated at 2.27Mm<sup>3</sup> after allowing for water from an extreme rainfall event (1.2m associated with 72 hour probable maximum precipitation (PMP) event) and 1m freeboard. This would be available for storage of tailings associated with the Correnso Extensions Mineral Resource.

## 18.4 Stockpiles

The batching of ore and waste through the crusher conveyor system will require material to be hauled to stockpiles. This will occur when an excavator is excavating materials not being conveyed at the time or when maintenance or modification works are being undertaken on the conveyor crusher system. The maximum stockpile capacity at the Martha Pit is up to 200,000 tonnes depending on the number of stockpiles. A large stockpile facility for ore has been constructed adjacent to the Mill. This facility is termed the Polishing Pond Stockpile and has a capacity to hold up to 1.2 Million tonnes of ore. A cost to stockpile and a reclaim cost are incurred with material placed on this stockpile as it relocates ore conveyed to the mill away from the mill by approximately 700metres.

## 18.5 Power and Electrical

The peak and average power demands for Correnso are anticipated to be in the vicinity of 3.0 MW and approximately 2.1 MW respectively.

Two additional underground substations (1.5MW capacity each) and associated HV power reticulation have been installed for the project. Main permanent HV feeds for the project will be via extensions from the Trio installations.

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LV power will be provided from the existing LV reticulation systems within the Trio mine.

## **18.6 Communications**

Technologies currently installed at Correnso Underground include:

- Person to Person Communications: For primary person to person communications a leaky feeder system is installed. This is proven technology which consists of hand held and vehicle mounted radios transmitting via leaky feeder cable reticulated through the mine on the “backs” of development.
- Proximity detection (equipment to equipment and equipment to person) is essential for the safety of personnel working underground.

Electronic tagging and tracking using specific cap lamps is planned for Correnso. It provides a reliable and accurate system for determining who is in the mine and where they are located. The cap lamp units are also used for proximity detection. The system would also be used for evacuation by sending messages to all personnel underground. This system requires the fibre optic backbone to operate.

## **18.7 Comments on Infrastructure**

In the opinion of the QP, the existing infrastructure is appropriate to support the current life-of-mine plan to 2017.

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## **19 MARKET STUDIES AND CONTRACTS**

### **19.1 Market Studies**

The mine has been operational continuously for the last 27 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.

### **19.2 Commodity Price Projections**

Metal price assumptions are provided by OceanaGold Corporation. Prices used for the June 30, 2015 Mineral Reserve estimates:

Gold: NZ\$1,714.00/oz

Exchange Rate NZ\$: \$US\$ 0.70

The metal price assumptions provided by OceanaGold Corporation for the June 30, 2015 Mineral Resource estimates:

Gold NZ\$1,714.00/oz

Exchange Rate NZ\$: \$US\$ 0.70

### **19.3 Contracts**

OceanaGold has agreements at typical industry benchmark terms for metal payables and refining charges for doré produced from the Waihi operations. Gold and silver bearing doré is shipped to an Australian refinery for further processing under a toll refining agreement.

Contracts are in place covering underground mining, transportation and refining of bullion, and the purchase and delivery of fuel, electricity supply, explosives and other commodities. These agreements conform to industry norms.

### **19.4 Comments on Market Studies and Contracts**

In the opinion of the QPs:

- OceanaGold is able to market the doré products produced from the Project.
- The terms contained within the sales contracts are typical and consistent with standard industry practice, and are similar to contracts for the supply of doré elsewhere in the world.
- Metal prices are set by OceanaGold Corporation management and are appropriate to the commodity and mine life projections.



## 20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

### 20.1 Environmental

#### 20.1.1 Baseline Studies

Environmental data has been collected over the last 25 years of Waihi operations and baseline data was collected prior to the start of operations and reported in the original mining licence application. Data is routinely collected for noise levels, blast vibration, air quality, and surface and ground water discharge quality from various sources, ground settlement and ground water levels. This data is reported to various regulatory bodies as required by the Company's various consents and permits. External independent experts are engaged by Waihi Gold to assist in the preparation and review of these reports. The reports are then reviewed and approved by various regulators who utilise independent expert reviewers to assist them.

#### 20.1.2 Environmental Design Criteria

Project environment design criteria is focused on limiting noise, blast vibration, ground differential settlement, air quality and water quality to as a minimum comply with the permit conditions. Key environmental permit limits are:

- Noise limits at the nearest privately owned residence is 55dB (L10) measured at the boundary during daytime hours and 40dB (L10) during night time. Noise from the Martha Mine and the Trio (and Correnso) Underground Mines is required to be measured cumulatively along with all operations within the processing plant, waste and tailings area, and the conveyor and associated activities.
- Blast vibration conditions require that there shall be no more than three blast events per day, from Monday to Saturday and between 0700 and 2000, and no blasting shall be undertaken at night (2000 to 0700 the following day), on Sundays or on public holidays. In addition the peak particle velocity (vector sum) shall be no more than:
  - For development blasts;
    - 5mm/s for 95% of the monitored events.
    - 2mm/s on average.
  - For production blasts;
    - 5mm/s for 95% of the monitored events.
    - 3mm/s on average.

Compliance with the 95% and average limits shall be measured over a six-month rolling period and determined separately for development blast events and for production blast events,

- Air quality: Dust arising from operations shall not exceed the following levels more than twice a year:
  - Dust deposition: 5 grams per square meter per month;
  - Total particulate matter concentration: 100 micrograms per cubic meter;
  - Particulate matter of less than 10 microns: 55 micrograms per cubic meter.
- Lighting: any lighting installed in the project area shall not exceed 8lux at the boundary of the site.
- Water quality - The discharges authorized by the permits shall not cause a significant adverse environmental effect on the receiving water, or on users of that resource, or in the case of surface water, on aquatic biota.
- Differential ground settlement when measured between two permanent survey markers is to be less than 1 in 1000 so as to ensure no damage to structures by a wide margin.
- Storage of hazardous materials is limited to approved currently quantities for diesel, ammonium nitrate, packaged explosives and detonators.

## 20.2 Social License

### 20.2.1 Stakeholder Engagement

The company has established various stakeholder engagement structures for the representation of stakeholders and project affected people including Iwi, Resident Groups, Community based organizations and local government. Stakeholder engagement has been summarized in Section 20.11.4 of this report and detail of the engagement is provided in the various Assessment of Environmental Effect documents for the project.

The operation has established complaints and grievance systems / procedures for the on-going management of all project grievances.

The permits are prescriptive in terms of stakeholder engagement with the Community. Consultation is an on-going component of the existing operation. From a community perspective impacts to be managed, associated with the Correnso project, include:

- effects on property values
- and negative effects on the local community, and
- reputational risk related to mining activity in close proximity to homes.

The permit is prescriptive in terms of prescribing minimum requirements for stakeholder engagement with the Community, including the following:

- Clause 62: Following the first exercise of this consent, the consent holder shall hold a consultation meeting open to the public. The meeting shall be called quarterly during the first year of mining activities provided for under this consent, and six-monthly thereafter. The meeting shall be chaired by an independent chairman.
- Clause 65: Upon the first exercise of this consent, and at six-monthly intervals thereafter, the consent holder shall invite representatives of those tangata whenua who have a particular interest in the Waihi area, of the Hauraki District Council and of the Waikato Regional Council to attend a meeting. The costs associated with the venue for the meeting, and any associated catering costs, will be met by the consent holder.
- Clause 78: At least 1 month prior to exercising this consent, the consent holder shall appoint a person (the "Liaison Officer"), and any replacement person subject to the approval of the Hauraki District Council and the Waikato Regional Council (the "Councils"), to liaise between the consent holder, the community and the Councils.
- Clause 79: The Liaison Officer shall also be active in informing the Waihi community regarding any new proposed underground mining beyond the Correnso, Grace/Empire and Daybreak orebodies.

### 20.2.2 Polling and Project Announcement

The Correnso project was announced to the public on Monday, 15 August 2011. Community engagement has actively continued since the announcement managed by Waihi Gold.

Prior to the public announcement of the Correnso project, Phoenix Research Ltd, were engaged to conduct surveys within the Waihi town ship and surrounding areas on public opinion with respect to gold mining and also research into the demographics of the area. Key results from the Phoenix Research public opinion survey including the following:

- Nearly everyone (98%) mentioned benefits of mining in Waihi in general.
- The benefits people most often associate with the current mining operation include employment and work opportunities, more money in the community, tourist attraction.
- The disadvantages people most often associate with the current mining operation are noise, dust, damage to the environment, vibration, safety issues, eyesore, and houses difficult to sell.

Ideas Shop, a public relations consultancy was engaged to provide a strategy and support for going public announcement and external stakeholders. The strategy provided to achieve the task was focused in four main areas.

- Disaggregation and profiling of all local audiences, with a particular focus on East Waihi.
- Segmented communication from multiple channels, hard copy, media, face-to-face, location-based communications.
- Policy of “no surprises” for Waihi Gold staff/ contractors and Waihi residents.
- Effective risk management.

### 20.2.3 Property and Community Investment Policy

A Property and Community Investment Policy package (PCIP) for affected residents was announced in conjunction with the announcement of the Correnso project. The PCIP comprised a range of initiatives, including residential property purchases, top-up and betterment payments, all of which were voluntary initiatives. Funding of US\$14M to support this program was approved by the Company.

The overall objective of the property programme component of the PCIP was to pre-empt any negative impact the announcement of the Correnso project might have on the property market within Waihi East. The PCIP comprised a range of initiatives including:

- Purchase 10 properties that were on the market as of 23/08/11
- Significant Purchase Fund: independent panel given fixed budget for property purchases.
- Top Up: available for all properties within the Project Area for duration of project.
- Waihi East Betterment Fund – fixed annual budget for community improvements with demonstrable impact on property prices.
- Waihi East Education Fund – offer to support school, kindergarten and day-care centres in order to sustain school roles.

As a result of discussions in the course of the consenting process, including mediation in the Environment Court, significant portions of the PCIP were incorporated into permit conditions. Included in these conditions were conditions 46 and 47 of the principal Land Use resource consent requiring ex gratia payments to house owners above development works and offers to purchase housing above stopes.

## 20.3 Community Consultation

Waihi Gold has undertaken community consultation since the start of operations and the role of the Community Liaison Person is established in the Mining License and subsequent permits. Since this date, consultation has been undertaken with the following parties:

- Land owners and occupiers in the immediate vicinity and neighbouring the permit area
- The rest of Waihi
- Iwi groups - Ngati Hako, Ngati Tamatera, Ngati Maru, Ngati Koi (refer Section 20.11)
- Government departments - Ministry of Education, Ministry of Energy and Resources, Ministry for Economic Development
- Waikato Regional Council and Hauraki District Council
- NGO's Community groups and interested parties including the Waihi East Ratepayers Groups (WERG), Distressed Residents' Action Team (DRAT), Waihi Community Vision and Waihi Vision Trust, Grey Power, Waihi Probus, Waihi Lions.

Consultation has taken the form of neighbourhood and community meetings, mail outs of information brochures and questionnaires, local medial articles, a dedicated web-site linking to results of technical monitoring, home visits and individual meetings.

## 20.4 Environmental Assessment

Environmental studies conducted as part of the Correnso project are extensive and have been required to support the permit application for Waihi Correnso. Environmental assessment was carried out on a larger Waihi Correnso project which included potential additions from the Daybreak and Empire Grace deposits. The environmental effects based reports are all independently reviewed by consultants employed by the regulators (permit issuers).

Studies include, air quality, water quality and ecology, noise, blast vibration effects, traffic, potential for subsidence, ground settlement in response to dewatering, property values, dewatering and geochemistry of tailings, waste and groundwater. These are discussed briefly below.

## 20.5 Air Quality

For the purposes of permitting, a CAF plant and a ventilation shaft were assumed to be required. The Correnso Mineral Reserve does not assume this infrastructure.

Kevin Rolfe was engaged by Waihi Gold to undertake an assessment of the air quality implications. The Rolfe report identifies the potential sources of emissions as being:

- Emissions from the proposed vent shaft located within the SFA;
- Above ground vehicle movements;
- Stockpiling of ore and waste rock;
- Ore and rock crushing, screening and conveying;
- Manufacturing of CAF and the handling of backfill rock and aggregate;

Rolfe's report concludes that the effects can be managed to comply with the conditions of existing discharge permits, which have proven to be effective in avoiding or mitigating effects on the Waihi environment. The main conclusions and recommendation from the report are:

An assessment of discharges from the Correnso vent shaft finds the effects of discharges will be insignificant. The predicted concentration of contaminants from the vent shaft discharge is less than accepted standards by a wide margin - between 18 – 2,000 times.

All above ground activities associated with Correnso are located within the Martha Extended Project, the Favona, or the Trio project areas and therefore no additional consent for discharges to air is required. The location of the CAF batching plant at the Favona portal stockpile is covered by the current permits issued for the Favona Underground Mine.

Stockpiling associated with the Correnso is not expected to be an air quality issue, but any dust issues that may arise will need to be addressed in a proactive way.

Operation of the processing plant for the ore from the Waihi Correnso will be similar to that for the Favona and Trio Underground Mines and the Martha Mine, and so the air quality significance of those activities will continue to be in full compliance with Discharge Permit 971281.

## 20.6 Noise

For the purposes of permitting, a CAF plant and a ventilation shaft were assumed to be required. The Correnso Mineral Reserve does not require this infrastructure.

Hegley Acoustic Consultants were commissioned to undertake noise studies in support of the Correnso permit application and to review the potential effects of truck movements, fill plant operation and ventilation fan noise on the environment. Hegley's report noted that the following activities have the potential to generate noise at Correnso:

- Construction and operation of the vent shaft behind the Grey Street noise bund in the existing SFA of the Martha pit;

- Operation of the CAF batching plant to be located in the current stockpile area near the Favona portal; and
- The use of existing stockpile areas for the temporary storage of ore, waste rock and the crushed rock and aggregate to be used for backfilling.

The noise condition proposed for the Waihi Correnso Project Area is based on conditions adopted for the Trio Project and set out in the Environment Court Consent Order dated 27<sup>th</sup> July 2011.

Hegley Associates concluded:

- Construction and operation of the proposed ventilation shaft can be completed within the more restrictive 40dBA night time noise limit of the Operative Hauraki District Plan and existing consent requirements. This ensures that relevant day time noise limits will be met with a large factor of safety at all times.
- Stockpiling the waste rock in the processing plant and stockpile area will continue as at present and there will be no change in the noise generated, which has been demonstrated in practice to be in full compliance with consent limits.
- The operation of the cemented aggregate fill batch plant will not increase the existing noise generated by activities in the processing and stockpile area. Hegley concluded that the proposed work can be undertaken 24 hours of the day without causing any noise nuisance for the residential neighbours.

## 20.7 Blast Vibration

For the purposes of permitting, a larger mine including Indicated, Inferred and Mineral Inventory was assessed (approximately 2.5MT). Heilig & Partners were commissioned to undertake blast vibration studies in support of the Correnso permit application to review the potential effects of blasting activities on the environment and residents amenity.

The Hauraki District Plan has a vibration limit of 5mm/s for impulsive vibration. Compliance with the 5mm/s value ensures there is no superficial damage or structural damage to the Waihi properties, as it is significantly less than the vibration levels necessary to cause damage.

Modelling of the likely scale of blasting has been based upon vibration relationships developed from underground blasting at Waihi over the last six years and has been corroborated by trial blasting of exploration holes in October 2012. The analyses showed that both a technically and economically feasible scale of mining can be achieved. The mine scheduling analyses indicated that:

- A reduction in the blasting windows for Correnso is possible with blasting occurring only during a one hour window at 7am, 1pm and 7pm with no blasting, including development, occurring at night. Blasting will not occur on Sundays or public holidays.
- To maintain the planned production and advance rates, comply with the 5mm/s criterion, exclude night time blasting and limit the number of firing windows, it is however necessary that the current restriction on the duration of a production blasts to not more than 6 seconds is removed for this consent.

The effects of blasting the Correnso orebody were presented as a series of contours ranging between 1mm/s and 5mm/s. The contours show the maximum extent of vibration over the entire mine life and indicate that properties further than 270 meters (in plan) from mine are not expected to receive greater than 3mm/s of vibration. Properties further than 850 meters are unlikely to perceive any vibration.

Heilig recommended, in addition to the 5mm/s limit, Waihi Gold proposes additional constraints to those imposed on the Favona and Trio Underground Mines being the reduction in blast windows from the currently consented number of four per day to three per day for the Waihi Correnso Project, along with the elimination of the night time blasting window. As set out in the Heilig report these changes result in a significant reduction in the total number of events, a key contributor to vibration effects, compared to existing operations.

Heilig concluded that the vibration effects of proposed blasting activities associated with the Waihi Correnso Project can be controlled to an acceptable level.

## 20.8 Geochemistry

URS New Zealand LTD (URS) conducted a geochemical study of ore, tailings and waste rock expected to be recovered from Correnso and assess the potential influence these materials may have on the environment.

URS conducted analytical and leach (static and kinetic) tests on ore and waste material from Correnso drill core and concluded:

- Correnso ore has elevated concentrations of trace elements, and increased sulphur content (relative to either Favona or Martha ore) and has the potential to be acid generating. Elevated concentrations of trace elements will be reflected in tailings decant water quality, however URS anticipates this can be appropriately managed through the existing water treatment processes.
- The potential for significant changes in seepage quality as a result of Correnso tailings is considered to be low for the foreseeable future due to the long seepage times and attenuation is expected to mitigate elevated trace elements to some degree.
- To ensure geochemical security of PAF waste rock and reduce potential effects on water quality, the implementation of an appropriate management strategy is required. A range of recognised methods for the management of mine waste have been effectively employed where necessary in the management of Martha, Favona and Trio waste rock. Martha waste rock has been successfully managed for over 20 years. URS envisages that the appropriate management of waste rock sourced from Correnso will be similar to existing management practices.
- Mixed groundwater discharged from areas backfilled with waste rock or cement aggregate fill will be approximately equivalent in composition to the adopted background groundwater quality, with only minor increases in the concentration of the metalloids selenium and antimony.
- Groundwater is predicted to flow from the connected underground workings (Favona, Trio and Correnso) and report to Rivers and the Martha Lake (that will form on cessation of mine dewatering). URS predicts a significant degree of attenuation and dilution of groundwater discharging from the backfilled area of the mine such that URS considers it unlikely concentrations of contaminants will be discernible from the current background groundwater quality.

## 20.9 Traffic

For the purposes of permitting, cemented aggregate fill was required to backfill the voids and quarried rock was imported into the mine site to manufacture the fill. The Correnso Mineral Reserve does not require cemented aggregate fill.

Traffic Design Group Ltd was commissioned to assess the transportation effects of a proposal to transport aggregate from an existing quarry adjacent to McLeans Road to Correnso, via its Baxter Road access. TDG make the following conclusions and recommendations:

- The existing local authority roads are expected to safely and efficiently accommodate the additional truck traffic.
- The intersections of Crean Road / SH2 and Baxter Road / SH2 would be at risk of adverse safety effects from the proposal with the existing layouts. It is therefore recommended that the intersections be upgraded with the provision of right turn bays for access into each of the side roads.

- Overall, TDG concludes that the proposed aggregate transport can be safely and efficiently accommodated within the local transport environment with less than minor effects on the safe and efficient operation of the road network.

## **20.10 Environmental Management System**

All operations are conducted under the existing Environmental Management System (EMS). Potential environmental risks included in the current risk register include issues such as:

- Surface Water and Groundwater protection from TSF seepage;
- Controlled discharge of excess water into the Ohinemuri River;
- Hydrocarbon management;
- Waste management;
- Biodiversity management (including fauna, weed, clearing management)
- Uncontrolled release of process/tailings water;
- Uncontrolled release of hazardous chemicals; and
- Air quality impacts from dust and greenhouse gas emissions.

The above risks are tracked and managed through specific Management Programs. Environmental Management Plans (EMPs) and related documentation specific to management areas also contribute to day-to-day management of specific environmental aspects.

## **20.11 Socio-economic and Cultural Characteristics**

### **20.11.1 Socio-economic Characteristics**

The direct and indirect impacts of Waihi Gold operations account for approximately 25% of the town's economy. Other significant employers are the retail and hospitality sectors, and there are also several small, specialised engineering and manufacturing businesses located in the town. Key aspects of the demographics include an ageing population, and a noticeable dip in the proportion of people in the 20-30 year-old bracket. The latter is attributed to many young people seeking employment or further study opportunities elsewhere. The community also features a high proportion of people on invalid or sickness benefits, and scores relatively highly on socio-economic deprivation scales. This suggests a community that could be vulnerable to significant changes in the town's economy.

### **20.11.2 Cultural Characteristics**

Ngati Tamatera, Ngati Maru, Ngati Hako and Ngati Koi have been consulted in relation to the Correnso Underground Mine. This consultation was taken into account and shaped the final conditions of the principal Land Use consent, which included mediation in the Environment Court with iwi representatives of iwi.

The company recognizes through its Iwi Cultural Policy and Protocol 2005, the special relationship that local Iwi have with Pukewa (Martha Hill), the Ohinemuri River and Motukeho (Black Hill) and that this relationship is important to their spiritual, cultural and social wellbeing. It recognizes that Pukewa, Motukeho, the Ohinemuri River and other waterways are highly valued taonga (treasure) of Ngati Tamatera and other iwi.

### **20.11.3 Local Service Industry**

A local service industry has established itself over the last twenty years to support the Waihi Gold mine comprising engineering, cleaning, maintenance, rental, tire and consumable suppliers, security, labour hire and other services. More technically advanced services are available from the regional centres in terms of heavy engineering, large equipment hire and other specialized services. Most suppliers are privately run

and not affiliated with Waihi Gold. It would be expected that these services would continue to support the Correnso project and it would be unlikely the project would see an increase in these services.

#### **20.11.4 Stakeholders and Communication**

Waihi Gold has a comprehensive procedure to ensure that appropriate communication and consultation regarding mining operations, project development and exploration is carried out with identified stakeholders and other interested parties in a timely and consistent manner

#### **20.11.5 Community Health, Education and Services**

Community health, education and services are well established in Waihi with four primary schools, one secondary school, medical centres and various community health centres present. Most establishments are government funded. It is highly unlikely that the Correnso project will require an increase in services in any of these areas or impose any additional stress on the existing services in these areas.

### **20.12 Indigenous Considerations**

Consultation has been undertaken with Indigenous groups and evidence has been given by Mikaere as part of the Correnso consent application into the cultural issues associated with the project.

Consent condition 64 requires Waihi Gold to ensure that a Cultural Awareness Programme is provided to all of the consent holder's staff and full time contractors working at the Waihi operations as soon as practicable after commencement of the consent. The Programme shall be prepared and delivered by tangata whenua who have a particular interest in the Waihi area in conjunction with the consent holder.

### **20.13 Project Closure and Reclamation**

Rehabilitation proposals and concept plans were developed well before the commencement of construction for open pit mining in 1987, and those plans are revised annually. In preparing these plans, the advice and skill of a large range of experts, including soil scientists, hydrologists, engineers, aquatic biology and water quality specialists has been sought. Where possible, Waihi Gold progressively rehabilitates areas of disturbed land.

#### **20.13.1 Closure Strategy**

Closure of the Correnso Mine will involve the removal of the underground infrastructure. Backfilling of the stopes will occur as a part of stoping and is required by the consents. The shafts will be backfilled and the portal will be plugged or otherwise blocked off (as already required by the Favona resource consents). Rehabilitation of other facilities such as the processing mill, water treatment plant and tailings storage facilities is already provided for under the Martha Mining Licence and resource consents.

Re-flooding of the Correnso workings will occur naturally from groundwater recharge once dewatering required for underground mining has ceased, and will also occur as part of the consented pit lake formation which is provided for under the current Rehabilitation and Closure Plan. River and treated water may be used to supplement the natural groundwater inflows and accelerate re-flooding. The closure works for Correnso will be included in the existing rehabilitation and closure plan required by the regional resource consents, and in the quantum of the rehabilitation bond which is maintained in favour of both WRC and HDC. Closure works are specifically covered in this application along with any incremental bond requirements related to Correnso.



## 21 CAPITAL AND OPERATING COSTS

### 21.1 Capital Costs

Capital costs for the Waihi Correnso project comprise mainly capital mine development and installation of fixed underground equipment such as pump stations and substations. Other capital costs include the Property and Community Investment Program, plant and administration sustaining capital. As of June 30, 2015, Correnso capital works are largely completed.

The capital costs are based on the development of the underground operation, sustaining capital and expenditure for project development is outlined in Table 21-1. The range of accuracy for the capital cost estimate is +/- 15%.

**Table 21-1: Capital Costs Initial and Sustaining**

Summary Capital Expenditure Schedule		2015	2016	2017
Administration	NZ\$M	1	0	—
Geology	NZ\$M	3	—	—
Open Pit	NZ\$M	0	0	—
Process / WTP	NZ\$M	1	1	1
Underground	NZ\$M	18	1	—
Other	NZ\$M	—	—	—
<b>Total Capital Expenditures</b>	<b>NZ\$M</b>	<b>\$23</b>	<b>\$2</b>	<b>\$1</b>

#### 21.1.1 Basis of Estimate

The capital cost estimate is based on a combination of equipment supplier quotations, supplier pricing, OceanaGold price assumptions and benchmarking from similar sized operations. Capital cost estimates for the underground mine are based on quotations from suppliers. A provision for freight has been included.

Capital costs for the Correnso project related to underground comprise mainly capital mine development, fixed underground equipment and some surface installation. Other capital costs include the Property and Community Investment Policy, tailings storage facility construction and plant administration sustaining capital.

The underground mining development capital cost was estimated based on development metres measured from mining plans multiplied by mining development costs estimated within the cost model.

Consumable costs were sourced directly from site suppliers who provided unit rates for almost all consumables. Where consumables were not currently in use at site cost estimates were obtained from suppliers directly.

Equipment costs were also sourced from a number of areas:

- Quotes from suppliers were obtained by SRK Consultants as part of their equipment study.
- Costs for fixed underground equipment were based on recent site purchases, supplier's quotes or experience from other projects.

A small number of costs were estimated based on costs from other operating sites.

#### 21.1.2 Exclusions

No escalation was assumed at the study stage as many of the supplier's quotes were recent and valid at the time of the study. Escalation is employed in the financial model and business plan.

#### 21.1.3 Capital Costs Underground Mine

Mining costs are largely underground mine development and fixed underground infrastructure. The underground development costs were estimated from first principles in a Mining Cost Estimation workbook

using labour rates, consumable unit costs, equipment maintenance and hire and other costs and adjusted for the split of operating activity and capital activity for drill blast load and haul including overheads. Fixed underground equipment costs were estimated mainly from recent supplier / manufacturers quotes and estimates.

Included within the mining capital are the Property and Community Investment costs. These costs provide for the ex-gratia payments to residents located above mine development, the purchase of residential properties above stopes and purchase of properties recommended by the Investment Review Panel as set down in the Permit.

## 21.2 Operating Costs

### 21.2.1 Introduction

A detailed cost model provides the basis for the estimate of open pit mining, underground, processing and other operating costs. The cost model was developed using first principles derived from supplier quotations, benchmark data from other similar operations and site budgets.

Separate cost models were developed for mining and processing and these build up costs from first principles using physical inputs as drivers and unit rates sourced from site and supplier. The cost structure is based on fixed costs and variable / driver derived costs and was used to estimate operating costs.

- Operating costs for mining include lateral ore and waste development, stoping costs, backfilling costs, mine services and mine overheads.
- Operating costs associated with Process Plant includes including water treatment and tailings disposal, ore stockpiling, SAG and Ball mill crushing and grinding, operating and maintenance , reagent mixing, thickening , leach and adsorption, and gold room all flocculants and reagent chemical, plant maintenance and reallocated electrical costs associated with operating the water treatment plant, polishing pond and reverse osmosis plant. It includes compliance costs but excludes management and labour.
- G&A operating costs include General Site Management (including all staff costs), Health and Safety, Emergency response, Human Resources, Supply Chain Management, Environment, External Affairs and Community Relations, Town Services, Finance and Administration. Costs are fixed and projected forward from prior years values including efficiencies realized.
- Closure and rehabilitation costs have been included in the model but as Correnso incurs very little rehabilitation costs, rehabilitation has a small positive value as closure and reclamation is deferred.

The cost estimate is considered to be +/- 15%. This level of accuracy is attributed to the site operating history over a range of conditions. Table 21-2 and Table 21-3 show the annual operating costs.

**Table 21-2: Operating Costs Excluding Open Cut**

Summary Operating Expenditure Schedule		2015	2016	2017
Total Open Pit Mining Costs	NZ\$M	17	3	-
Total Underground Mining Costs	NZ\$M	51	50	-
Total Processing Costs	NZ\$M	28	22	-
Total G&A	NZ\$M	11	11	-
Total Other Expenses	NZ\$M	4	4	-

**Table 21-3: Operating Costs Including Open Cut**

Summary Operating Expenditure Schedule		2015	2016	2017
Total Open Pit Mining Costs	NZ\$M	19	28	11
Total Underground Mining Costs	NZ\$M	51	50	-
Total Processing Costs	NZ\$M	28	25	10
Total G&A	NZ\$M	11	11	5
Total Other Expenses	NZ\$M	4	4	3

## 21.2.2 Underground Operating Costs

Operating costs include lateral ore and waste development, stoping costs, backfilling costs, mine services and mine overheads. Deferred mine development is broken out of the operating costs based on a ratio of capital and lateral development. A break-down of the underground mining costs are provided in Table 21-4

**Table 21-4: Underground Operating Costs**

Underground Mining Cost Schedule		2015	2016	2017
Supervision/Admin	NZ\$M	13	13	
Geology	NZ\$M	4	4	
Survey	NZ\$M	0	0	
Utilities	NZ\$M	0	0	
Jumbo Drill	NZ\$M	5	2	
Simba Drilling	NZ\$M	1	2	
Longhole Drill	NZ\$M	0	0	
Blasting	NZ\$M	4	3	
Load	NZ\$M	5	7	
Primary Haul	NZ\$M	7	7	
Cables	NZ\$M	1	0	
Mine Services	NZ\$M	3	3	
Support Services	NZ\$M	3	2	
Ground Support	NZ\$M	6	2	
Roadworks/Earthworks	NZ\$M	0	0	
Other	NZ\$M	0	3	
<b>Total Underground Mining Costs</b>	<b>NZ\$M</b>	<b>\$51</b>	<b>\$50</b>	

Underground mining costs are estimated at NZ\$119/tonne ore.

## 21.2.3 Open Pit Operating Costs

Open pit operations were suspended in April 2015. Studies are in progress to regain access to the bottom of the pit following the localised failure of the wall. It is planned to undertake a wall strip in the north east to regain access to the ramp below the failure to allow full recovery of the remaining Mineral Reserve. Operating costs include ore and waste mining, conveying, mine services and mine overheads.

**Table 21-5: Open Pit Operating Costs**

Open Pit Mining Cost Schedule		2015	2016	2017
Admin	NZ\$M	2	0	0
Blasting	NZ\$M	3	7	1
Dewater	NZ\$M	0	0	0
Drill Ground Support	NZ\$M	1	1	0
Facilities	NZ\$M	1	3	1
Geology	NZ\$M	1	0	0
Hauling	NZ\$M	1	4	1
Loading	NZ\$M	1	3	2
Power	NZ\$M	0	1	1
Road Work	NZ\$M	0	0	0
Survey	NZ\$M	0	0	0
Waste Dump Management	NZ\$M	8	8	3
<b>Total Open Pit Mining Costs</b>	<b>NZ\$M</b>	<b>\$19</b>	<b>\$28</b>	<b>\$11</b>

## 21.2.4 Process Operating Costs

Process plant and metallurgy costs are shown below in Table 21-6 for the Underground Reserve and in Table 21-7 for Open Pit and Underground Reserve. Costs include water treatment and TSF operation. Labour and other resources are shared between process, tailings reticulation and water treatment.

**Table 21-6: Process Operating Costs (Underground Only)**

Processing Cost Schedule		2015	2016	2017
Supervision/Admin	NZ\$M	\$7	\$6	
Ore Rehandle	NZ\$M	2	1	
Secondary	NZ\$M	0	0	
Ball	NZ\$M	1	1	
SAG	NZ\$M	9	7	
Reagent Mixing	NZ\$M	1	0	
Thickening	NZ\$M	0	0	
Leaching (Mill)	NZ\$M	4	2	
Adsorption	NZ\$M	0	0	
Desorption	NZ\$M	1	1	
Tailings	NZ\$M	1	0	
Water Treatment Heap Leaching	NZ\$M	2	2	
Refining / Smelting	NZ\$M	0	0	
Metallurgical Lab	NZ\$M	1	1	
<b>Total Processing Costs</b>	<b>NZ\$M</b>	<b>\$28</b>	<b>\$22</b>	

Processing costs are estimated at NZ\$44/tonne ore.

**Table 21-7: Process Operating Costs (Underground and Open Pit)**

Processing Cost Schedule		2015	2016	2017
Supervision/Admin	NZ\$M	\$7	\$7	\$3
Ore Rehandle	NZ\$M	2	1	0
Secondary	NZ\$M	0	0	0
Ball	NZ\$M	1	4	1
SAG	NZ\$M	9	6	3
Reagent Mixing	NZ\$M	1	0	0
Thickening	NZ\$M	0	0	0
Leaching (Mill)	NZ\$M	4	3	1
Adsorption	NZ\$M	0	0	0
Desorption	NZ\$M	1	1	1
Tailings	NZ\$M	1	0	0
Water Treatment Heap Leaching	NZ\$M	2	2	1
Refining / Smelting	NZ\$M	0	0	0
Metallurgical Lab	NZ\$M	1	1	0
<b>Total Processing Costs</b>	<b>NZ\$M</b>	<b>\$28</b>	<b>\$25</b>	<b>\$10</b>

Processing costs are estimated at NZ\$32/tonne ore.

## 21.2.5 General and Administrative Operating Costs

**General and Administration costs refer to site wide operational costs rather than costs directly associated with operational departments. These costs have been sourced directly from the 2014 Waihi life of mine plan, and reported in**

Table 21-8 and Table 21-9.

Table 21-8: G&amp;A Costs Forecast

Summary G&A Schedule		2015	2016	2017
Site Leadership	NZ\$M	\$3.0	\$3.3	\$1.9
Health & Safety	NZ\$M	\$0.9	\$0.9	\$0.5
Security	NZ\$M	\$0.8	\$0.8	\$0.4
Site General Services	NZ\$M	\$0.4	\$0.4	\$0.3
Accounting	NZ\$M	\$0.9	\$0.9	\$0.5
Risk Management	NZ\$M	\$0.4	\$0.4	\$0.3
Global Supply Management	NZ\$M	\$0.3	\$0.3	\$0.2
Information Technology	NZ\$M	\$0.1	\$0.1	\$0.1
Human Resources	NZ\$M	\$0.8	\$0.6	\$0.4
Environmental	NZ\$M	\$2.9	\$2.8	\$1.6
<b>Total G&amp;A</b>	<b>NZ\$M</b>	<b>\$10.6</b>	<b>\$10.7</b>	<b>\$6.2</b>

Table 21-9: Other Costs Forecast

Other Project/Country Specific Expense, Royalties, Fees, etc.		2015	2016	2017
Community Infrastructure	NZ\$M	\$0.5	\$0.5	\$0.3
Waihi-Community Relations	NZ\$M	\$1.5	\$1.4	\$0.8
Pastoral	NZ\$M	\$0.1	\$0.0	\$0.0
AEP Property	NZ\$M	\$0.9	\$1.0	\$0.4
Donations	NZ\$M	\$0.2	\$0.2	\$0.1
Property Policy Expense	NZ\$M	\$0.3	\$0.3	\$0.1
Redundancy Costs	NZ\$M	—	—	—
Closure and Reclamation	NZ\$M	\$0.3	\$0.6	\$1.5
<b>Total Other Expenses</b>	<b>NZ\$M</b>	<b>\$3.6</b>	<b>\$3.9</b>	<b>\$3.2</b>

General and administrative costs are estimated at NZ\$21/tonne ore milled.

## **22 ECONOMIC ANALYSIS**

### **22.1 Summary**

Given that pit operations have been suspended pending geotechnical evaluation, economic analysis has been performed separately for the open pit reserve and the underground reserve. No inferred material is included in the economic analysis.

As at June 30, 2015, development capital for Correnso has been spent with only minor capital development required for Correnso. Sustaining capital is estimated at NZ\$26M.

Total life of mine operating costs for underground mining, open pit mining, ore processing and general and administration is estimated to be NZ\$ 260million.

Results from the economic analysis for Correnso is a post-tax free cash flow of US\$74 million and a post-tax NPV of US \$78 million based on US\$1200 gold price and 0.7 exchange rate including full closure and rehabilitation costs.

The economic analysis shows that the open pit reserve adds US\$43M of post-tax cash flow and post-tax NPV of US\$40M.

### **22.2 Methods, Assumptions and Basis**

This section summarises the results of the economic evaluation of the Waihi Study. The date of valuation is June 30, 2015.

Mineral Reserve Estimates in Section 15 of this Technical Report are reported at September 30, 2014.

Assumptions used in the study have been considered by the board of OceanaGold as appropriate and used across the group for evaluation purposes. They are based on review of forecasts in the markets as well as the historical prices.

Table 22-1 presents the principal assumptions and inputs used in this economic evaluation.

### **22.3 Production Schedule**

Processing recovery assumptions remain as per year-end reserve reporting despite current year positive performance, refer Figure 13-5.

The mine plan reported in this Technical Report has 1,713 million ounces of gold and 199 kilo-tonnes of copper contained. The valuation date is from 1 January 2015 which reports different contained metal to the Mineral Reserves, September 30, 2014, reported in Sections 15. Only Mineral Reserves are included in the economic evaluation, Inferred Resources have been omitted.

There is no silver included in valuation even though the operation is consistently generating silver revenue. NI 43-101 statutory guidance does not permit the reporting of revenue derived from mineralisation which is not included in the Measured and Indicated resource. OceanaGold has completed a programme of assaying and resource modelling of the contained silver and expects to include silver in year-end reporting.

Processing recovery assumptions remain as per year-end reserve reporting despite current year's positive performance, refer Figure 13-5.

The economic evaluation mine plan inputs are reported in Table 22-1 and Table 22-2.

Table 22-1: Mine Plan Physicals Excluding Open Pit

	Units	LOM Total	2015PF	2016	2017	2018
Initial Ore Stockpiles	ktonnes	5				
Total Ore Mined	ktonnes	854	267	429	158	—
Total Waste Mined	ktonnes	—	—	—	—	—
Total Material Mined	ktonnes	854	267	429	158	—
Project Strip Ratio	waste : ore	—	—	—	—	—
Total Ore Tons Processed	ktonnes	854	267	429	158	—
Processed Ore Gold Grade	g/t	8.99	8.26	9.09	9.96	—
Processed Ore Silver Grade	g/t	14.49	12.79	13.71	19.47	—
Processed Ore Copper Grade	%	—	—	—	—	—
Processed Ore Spare 1 Grade	%	—	—	—	—	—
Processed Ore Spare 2 Grade	%	—	—	—	—	—
Contained Gold, Processed	kozs	247	71	125	51	—
Contained Silver, Processed	kozs	398	110	189	99	—
Contained Copper, Processed	klbs	—	—	—	—	—
Contained Spare 1 Processed	klbs	—	—	—	—	—
Contained Spare 2 Processed	klbs	—	—	—	—	—
Average Recovery, Gold	% recovery	87.2%	87.0%	87.3%	87.5%	—
Average Recovery, Silver	% recovery	63.0%	63.0%	63.0%	63.0%	—
Average Recovery, Copper	% recovery	—	—	—	—	—
Average Recovery, Spare 1	% recovery	—	—	—	—	—
Average Recovery, Spare 2	% recovery	—	—	—	—	—
Recovered Gold	kozs	215	62	109	44	—
Recovered Silver	kozs	251	69	119	62	—
Recovered Copper	klbs	—	—	—	—	—
Recovered Spare 1	klbs	—	—	—	—	—
Recovered Spare 2	klbs	—	—	—	—	—
Payable Gold	kozs	215	62	109	44	—
Payable Silver	kozs	251	69	119	62	—
Payable Copper	klbs	—	—	—	—	—
Payable Spare 1	klbs	—	—	—	—	—
Payable Spare 2	klbs	—	—	—	—	—

Table 22-2: Mine Plan Physicals Including Open Pit

	Units	LOM Total	2015PF	2016	2017	2018
Initial Ore Stockpiles	ktonnes	5				
Total Ore Mined	ktonnes	1,512	267	854	391	—
Total Waste Mined	ktonnes	—	—	—	—	—
Total Material Mined	ktonnes	1,512	267	854	391	—
Project Strip Ratio	waste : ore	—	—	—	—	—
Total Ore Tons Processed	ktonnes	1,512	267	819	426	—
Processed Ore Gold Grade	g/t	6.31	10.20	6.79	2.95	—
Processed Ore Silver Grade	g/t	21.81	12.79	20.75	29.50	—
Processed Ore Copper Grade	%	—	—	—	—	—
Processed Ore Spare 1 Grade	%	—	—	—	—	—
Processed Ore Spare 2 Grade	%	—	—	—	—	—
Contained Gold, Processed	kozs	307	88	179	40	—
Contained Silver, Processed	kozs	1,060	110	546	405	—
Contained Copper, Processed	klbs	—	—	—	—	—
Contained Spare 1 Processed	klbs	—	—	—	—	—
Contained Spare 2 Processed	klbs	—	—	—	—	—
Average Recovery, Gold	% recovery	88.3%	87.5%	88.1%	90.5%	—
Average Recovery, Silver	% recovery	63.0%	63.0%	63.0%	63.0%	—
Average Recovery, Copper	% recovery	—	—	—	—	—
Average Recovery, Spare 1	% recovery	—	—	—	—	—
Average Recovery, Spare 2	% recovery	—	—	—	—	—
Recovered Gold	kozs	271	77	157	37	—
Recovered Silver	kozs	668	69	344	255	—
Recovered Copper	klbs	—	—	—	—	—
Recovered Spare 1	klbs	—	—	—	—	—
Recovered Spare 2	klbs	—	—	—	—	—
Payable Gold	kozs	271	77	157	37	—
Payable Silver	kozs	668	69	344	255	—
Payable Copper	klbs	—	—	—	—	—
Payable Spare 1	klbs	—	—	—	—	—
Payable Spare 2	klbs	—	—	—	—	—

## 22.4 Cash Flows

The financial model develops cash flows based on:

- mining schedules, processing stockpiles and mine feed to process plant,
- application of driver and non-driver costs to mining, processing and G&A,
- application of capital costs, closure costs, exploration and employee severance costs, and
- calculation of cash flows including provision of royalties, working capital and depreciation and taxation.

Project indicators of NPV, IRR, MIRR, AISC and cumulative FCF are the key economic indicators. The reserves have been developed using the costs described in Section 21 of this report and other inputs.

### 22.4.1 Underground Mining

Key economic metrics for the Correnso Project in US Dollars are shown below in Table 22-3.

**Table 22-3: Correnso Financial Metrics**

Free Cash flow		\$US Million	\$74
NPV	7.0%	\$US Million	\$78
Operating Metrics			
Mine Life		Years	3.0
Average Mining Rate		MTPA	0.5
Average Processing Rate		MTPA	0.5
Strip Ratio		waste : ore	-
Mining Cost / Ton		US\$ / t	\$80.45
Processing Cost / Ton		US\$ / t	\$37.71
G&A Cost / Ton		US\$ / t	\$18.18
Metal Sales			
LOM Au Sales	Payable metal	kozs	258
Costs Associated w/ Sales			
Total Production Cost / Equivalent oz	Co-Product	\$US / oz	\$615
Total Cost / Equivalent oz	Co-Product	\$US / oz	\$539
LOM CAS / oz Au	Co-Product	\$US / oz	\$562

### 22.4.2 Underground and Surface Mining

Key economic metrics for the Martha and Correnso Project are shown below in Table 22-3.

**Table 22-4: Correnso and Martha Financial Metrics**

Free Cash flow		\$US Million	\$117
NPV	7.0%	\$US Million	\$118
Operating Metrics			
Mine Life		Years	3.0
Average Mining Rate		MTPA	0.9
Average Processing Rate		MTPA	0.8
Strip Ratio		waste : ore	-
Mining Cost / Ton		US\$ / t	\$53.71
Processing Cost / Ton		US\$ / t	\$22.24
G&A Cost / Ton		US\$ / t	\$9.83
Metal Sales			
LOM Au Sales	Payable metal	kozs	310
Costs Associated w/ Sales			
Total Production Cost / Equivalent oz	Co-Product	\$US / oz	\$500
Total Cost / Equivalent oz	Co-Product	\$US / oz	\$466
LOM CAS / oz Au	Co-Product	\$US / oz	\$489



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## **22.5 Royalties and Other Fees**

A royalty of 2.5% is payable to Coeur d'Alene Mines of Idaho and Viking Mining, New Zealand. The Coeur Viking royalty results from the 1998 agreement to transfer exploration rights to Waihi Gold for a lump sum payment and a royalty payment based on the spot price of Gold / Silver. The agreement extends over east Waihi to the north of Barry Road (including the Correnso project area).

Waihi Correnso falls within the Favona Mining Permit 41 808 (MP 41 808) area which is governed by the 1996 Minerals Programme for Crown-owned minerals, including gold and silver. The Favona Mining Permit provides for a royalty to be payable to the Crown calculated as the higher of:

- (a) an ad valorem royalty of one per cent royalty on net sales revenue from gold and silver, or
- (b) five per cent royalty on accounting profits.

Included within the economic evaluation is a "Contingent Payment" of US\$5Million to Newmont in accordance with the Sale and Purchase Agreement between OceanaGold and Newmont. This payment would not be incurred if the open pit design / method is different to that proposed by Newmont or if ore is not extracted within the period of 2 years from the October 2015.

## **22.6 Salvage Value**

Salvage value has been excluded from the economic evaluation.

## **22.7 Taxation**

The New Zealand tax rate of 28% has been used for all tax intent and purposes excluding royalties. For tax purposes, capital expenditures are depreciated from 2015 to 2017 on a straight line basis. The straight-line depreciation approach used in this model is a good approximation of the depreciation that could be claimed for tax purposes.

## **22.8 Financing Costs**

No financing costs have been applied to the economic analysis.

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## **23 ADJACENT PROPERTIES**

There are no adjacent properties that are relevant to this Report.

## 24 OTHER RELEVANT DATA AND INFORMATION

### 24.1 Risks

Risk workshops were conducted at Waihi in April 2014. Risk assessments show key project risks lie in defining the geological resource confidence and grade over-estimation and compliance with permit conditions. Mitigation plans have been developed to address key risks. The key risks and mitigation measures identified are shown in Table 24-1:

**Table 24-1: Project High and Extreme Risks Ratings**

Key Risks Correnso	Status / Mitigation
Grade / tonnage underestimation	<ul style="list-style-type: none"> <li>• Exploration drive for Correnso allows underground resource drilling.</li> <li>• Grade control drilling from dedicated access ahead of mining.</li> <li>• Drill spacing studies.</li> </ul>
Compliance with permit conditions	<ul style="list-style-type: none"> <li>• Blast trials undertaken and additional piezometers installed</li> <li>• Numerical modelling conducted</li> <li>• History of operations, compliance and specialized resources available.</li> <li>• Consents granted with tight but workable constraints</li> </ul>

A separate S&ER risk assessment was conducted in October 2013 to review the probable and potential worst case costs to compensate homeowners for impacts to livelihoods, real or perceived, that could be required to develop the Correnso deposit. High risk assessment and a mitigation program were identified for:

“Third party property group engaged to manage all property purchases and associated face to face contact with residents fails to do so in a timely and considerate fashion resulting in negative community perception of the program”. This was successfully implemented during early 2015.

## **25 INTERPRETATION AND CONCLUSIONS**

Following review of the data available on the Waihi Project, the QPs have reached the following interpretations and conclusions.

### **25.1 Mineral Tenure, Surface Rights, Royalties, Environment, Social and Permits**

- Mining tenure held by Oceana Waihi Gold in the areas for which Mineral Resources and Mineral Reserves are estimated is valid;
- Oceana Waihi Gold holds sufficient surface rights to support mining operations over the planned life-of-mine that was developed based on the Mineral Reserves;
- Permits held by Oceana Waihi Gold for the Project are sufficient to ensure that mining activities are conducted within the regulatory framework required by New Zealand law;
- Sufficient tailings storage facilities have been planned for;
- Oceana Waihi Gold has sufficiently addressed the environmental impact of the operation, and subsequent closure and remediation requirements that Mineral Resources and Mineral Reserves can be declared, and that the mine plan is appropriate and achievable. Closure provisions are appropriately considered. Monitoring programs are in place;
- The existing infrastructure, availability of staff, the existing power, water, and communications facilities, the methods whereby goods are transported to the mine, and any planned modifications or supporting studies are sufficiently well-established, or the requirements to establish such, are well understood by Waihi Gold, and can support the declaration of Mineral Resources and Mineral Reserves and the current mine plan;
- The mine currently holds the appropriate social licenses to operate;
- Oceana Waihi Gold has developed a communities' relations plan to identify and ensure an understanding of the needs of the surrounding communities and to determine appropriate programs for filling those needs. The company monitors socio-economic trends, community perceptions and mining impacts.

### **25.2 Geology and Mineralization**

- The geological understanding of the setting, lithologies, and structural and alteration controls on mineralization is sufficient to support estimation of Mineral Resources and Mineral Reserves. The geological knowledge of the area is also considered sufficiently acceptable to reliably inform mine planning;
- The mineralization style and setting is well understood and can support declaration of Mineral Resources and Mineral Reserves. The deposit displays classic features that are typical of volcanic-hosted epithermal Au deposits. The QPs consider the model and interpreted deposit genesis to be appropriate to support exploration activities.

### **25.3 Exploration, Drilling, and Data Analysis**

- Exploration activities since 1986 comprised surface reconnaissance exploration, geological and structural mapping, geochemical sampling, airborne, ground and down-hole geophysical surveys, surface and underground drilling, engineering studies and mine development;
- The exploration programs completed to date are appropriate to the style of the deposit and prospects. The research work supports the genetic interpretation of the Waihi vein deposits.

- Underground drilling of the Correnso deposit for resource conversion and drilling of associated vein systems (Daybreak and Empire) totals 325 holes for 56,453 metres of predominantly diamond drill core.
- The majority of surface drill holes were drilled by triple tube wireline diamond methods. Surface holes are collared using large-diameter PQ core, both as a means of improving core recovery and to provide greater opportunity to case off and reduce diameter when drilling through broken ground and historic stopes. Drill hole diameter is usually reduced to HQ at the base of the post mineral stratigraphy. RC drilling is mostly confined to the immediate pit vicinity, or isolated first pass exploration drill holes.
- The quantity and quality of the lithological, geotechnical, collar and down hole survey data collected in the exploration, delineation, underground, and grade control drill programs are sufficient to support Mineral Resource and Mineral Reserve estimation;
- Sampling methods are acceptable, meet industry-standard practice, and are acceptable for Mineral Resource and Mineral Reserve estimation and mine planning purposes;
- The quality of the analytical data is reliable and sample preparation, analysis, and security are performed in accordance with industry standards;
- There have been limited data verification programs undertaken by third-party consultants.

## **25.4 Metallurgical Testwork**

- Metallurgical test work and associated analytical procedures were appropriate to the mineralization type, appropriate to establish the optimal processing routes, and were performed using samples that are typical of the mineralization styles found within the Project;
- Samples selected for testing were representative of the various types and styles of mineralization. Samples were selected from a range of depths within the deposit. Sufficient samples were taken so that tests were performed on sufficient sample mass. As mining progresses deeper and/or new mining zones are identified, additional variability tests are undertaken as required;
- Testwork results have been confirmed by production data;
- Mill process recovery factors are based on production data, and are considered appropriate to support Mineral Resource and Mineral Reserve estimation, and mine planning.

## **25.5 Mineral Resource and Mineral Reserve Estimates**

- Mineral Resources and Mineral Reserves for the Project, which have been estimated using core drill data, have been performed to industry best practices, and conform to the requirements of CIM (2014). The Mineral Reserves are acceptable to support mine planning;
- Reviews of the environmental, permitting, legal, title, taxation, socio-economic, and marketing factors and constraints for the Project support the declaration of Mineral Reserves using the set of assumptions outlined;
- Factors which may affect the estimates include: commodity price assumptions; metallurgical recovery assumptions; changes to the geotechnical and hydrogeological parameters used for stope and open pit mine design; dilution assumptions; changes to capital and operating cost estimates.

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## 25.6 Life-of-Mine Plan

- Underground mine plans are appropriately developed to maximize mining efficiencies, based on the current knowledge of geotechnical, hydrological, mining and processing information on the Project;
- A localised failure of the north wall of the open pit occurred in April 2015 which undercut the main access ramp. Studies are in progress to regain access to the bottom of the pit. It is planned to undertake a wall strip in the north east to regain access to the ramp below the failure to allow full recovery of the remaining Mineral Reserve. Whilst input parameters to the design have been based on local site experience, geotechnical studies have not been completed to demonstrate that the planned north east wall strip to regain access has adequate Factors of Safety
- Production forecasts are achievable with the current equipment and plant, replacements have been acceptably scheduled;
- The Mineral Reserves are currently estimated to be 0.31 million ounces gold, supporting a mine life of 2 years with currently drilled additional resources projected to provide a further year;
- The current process facilities are appropriate to the mineralization styles in the underground operations and the existing process facilities will support the current life-of-mine plan;
- Infrastructure required to support mining activities is sufficient for the current LOM.

## 25.7 Conclusions

In the opinion of the QPs, Mineral Resources and Mineral Reserves have been appropriately estimated for the Waihi Gold Mine. Mining and milling operations are performing as expected. This indicates the data supporting the Mineral Resource and Mineral Reserve estimates were appropriately collected, evaluated and estimated.

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## **26 RECOMMENDATIONS**

The QPs have reviewed the information on the Waihi Gold Mine and have no meaningful recommendations to make for further work.

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## APPENDIX B - TECHNICAL GLOSSARY AND ABBREVIATIONS

Technical Glossary and Abbreviations	
<b>AAS</b>	atomic absorption spectroscopy
<b>AEP</b>	Annual Exceedance Probability
<b>AEPEP</b>	Annual Environmental Protection and Enhancement Programmes
<b>Ag</b>	silver
<b>AMC</b>	AMC Consultants Pty Ltd
<b>Analabs</b>	Analabs Proprietary Limited
<b>ANCOLD</b>	means the Australian National Committee on Large Dams Inc., which is an Australian based non-government, non-profit association of professional practitioners and corporations with a professional interest in dams. ANCOLD is a member of the International Commission on Large Dams (ICOLD) and publishes internationally recognised guidelines for the sustainable development and management of dams and water resources.
<b>APMI</b>	Australasian Philippines Mining Incorporated
<b>Arimco MC</b>	Arimco Mining Corporation
<b>ASX</b>	Australian Securities Exchange
<b>ATV</b>	Acoustic Televiewer
<b>Au</b>	gold
<b>AU\$</b>	Australian dollar
<b>AuEq.</b>	gold equivalent
<b>Barangay</b>	is the smallest administrative division in the Philippines and is the native Filipino term for a village, district or ward.
<b>bcm</b>	bank cubic metre(s)
<b>BFA</b>	bench face angles
<b>BIR</b>	Bureau of International Revenue
<b>block model</b>	is a computer based representation of a deposit in which geological zones are defined and filled with blocks which are assigned estimated values of grade and other attributes. The purpose of the block model is to associate grades with the volume model.
<b>bulk density</b>	is the dry in-situ tonnage factor used to convert volumes to tonnage.
<b>CAAP</b>	Civil Aviation Authority of the Philippines
<b>CAMC</b>	Climax-Arimco Mining Corporation
<b>CIL</b>	carbon in leach
<b>CIM</b>	the Canadian Institute of Mining, Metallurgy and Petroleum
<b>CIM Standards</b>	are the CIM Definition Standards for Mineral Resources and Mineral Reserves adopted by the CIM Council on 27 <sup>th</sup> December, 2010, for the reporting of Mineral Resource, Mineral Reserve and mining studies used in Canada. The Mineral Resource, Mineral Reserve, and Mining Study definitions are incorporated, by reference, into NI 43-101, and form the basis for the reporting of reserves and resources in this Technical Report. With triple listings on the TSX, ASX and NZX, OceanaGold also reports in accordance with the JORC Code and where necessary reconciles its reporting to ensure compliance with both the CIM Standards and the JORC Code.
<b>CIP</b>	carbon in pulp
<b>Climax</b>	Climax Mining Limited and, as the context requires, its related bodies corporate
<b>CLRF</b>	Contingent Liabilities and Rehabilitation Fund
<b>cm</b>	centimetre(s)
<b>CSR</b>	corporate social responsibility
<b>Cu</b>	copper
<b>cut-off grade</b>	is the lowest grade value that is included in a Mineral Resource statement, being the lowest grade, or quality, of mineralised material that has reasonable prospects for eventual economic extraction.
<b>CWC</b>	Credible Worst Case
<b>Cyprus</b>	Cyprus Philippines Corporation
<b>Delta</b>	Delta Earthmoving, Inc
<b>DENR</b>	is the Department for the Environment and Natural Resources. The DENR is the Philippines government agency primarily responsible for implementing the government's environmental policy and for regulating the exploration, development, utilization and conservation of the Philippine's natural resources.
<b>DH</b>	drill hole
<b>diamond drilling</b>	is a rotary drilling technique using diamond set or impregnated bits, to cut a solid, continuous core sample of the rock.
<b>DWP</b>	Development and Utilization Work Program

<b>E</b>	East
<b>ECC</b>	means an Environmental Compliance Certificate, issued by the DENR, certifying compliance with the EISS.
<b>EIS</b>	Environmental Impact Study
<b>EISS</b>	means the Environmental Impact Statement System, established under the Mining Act for classifying projects in terms of their potential impact on the environment. A project that is classified as environmentally critical or located in an environmentally critical area requires an ECC from the DENR, certifying that the operator will not cause a significant negative environmental impact and has complied with all of the requirements of the EISS.
<b>EMB</b>	means the Philippine Environmental Management Bureau, established within the Department of Environment and Natural Resources, as the Philippines national authority responsible for pollution prevention and control, and environmental impact assessment.
<b>EOM</b>	end of month
<b>EOY</b>	end of year
<b>EPCM</b>	Engineering, Procurement and Construction Management
<b>EPEP</b>	means the Environmental Program and Enhancement Program for the Didipio operation submitted under the conditions of the ECC.
<b>EPRMP</b>	Environmental Performance Report and Management Plan
<b>ERA</b>	mean the Environmental Risk Assessment conducted under the conditions of the ECC.
<b>ESE</b>	East South East
<b>ESIA</b>	Environmental and Social Impact Assessment
<b>ETF</b>	means the Environmental Trust Fund established for the Didipio operation under the conditions of the ECC.
<b>FAR</b>	fresh air rise
<b>Fe</b>	iron
<b>FMRDF</b>	Final Mine Rehabilitation and Decommissioning Fund
<b>FMRDP</b>	means the Final Mine Rehabilitation/Decommissioning Plan which is still being reviewed by the Mine Rehabilitation Fund Committee
<b>FTAA</b>	Financial or Technical Assistance Agreement
<b>FTD</b>	Flow through drain
<b>g</b>	gram(s)
<b>G&amp;A</b>	general and administration
<b>GHD</b>	GHD (Australia) Pty Ltd
<b>g/t</b>	grams per metric tonne
<b>GTA</b>	graphite tube atomization
<b>H&amp;S</b>	Hellman and Schofield
<b>ha</b>	hectare(s)
<b>HDPE</b>	high density polyethylene
<b>Hg</b>	mercury
<b>HLUR</b>	Housing and Land Use Regulatory Board
<b>HQ</b>	is a reference to the ~ 96 mm diameter of drill rods used to recover diamond drill core
<b>ICC</b>	means Indigenous Cultural Communities under the Indigenous People's Rights Act, Republic Act No. 8371.
<b>Implementing Rules and Regulations</b>	means DENR Administrative Order No. 2010- 21, 28 <sup>th</sup> June, 2010, issuing Revised Implementing Rules and Regulations of Republic Act No. 7942, Otherwise Known as the "Philippine Mining Act of 1995"
<b>Indicated Mineral Resource</b>	as defined under the CIM Standards is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.
<b>Inferred Mineral Resource</b>	as defined under the CIM Standards is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.
<b>IP</b>	means Indigenous Peoples under the Indigenous People's Rights Act, Republic Act No. 8371.
<b>IRA</b>	inter-ramp angles
<b>JK</b>	JK Tech Proprietary Limited
<b>JORC Code</b>	means the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves which became effective 20 <sup>th</sup> December, 2012 and mandatory from 1 <sup>st</sup> December, 2013. The JORC Code is the accepted reporting standard for the ASX and the NZX.

<b>kg</b>	kilogram(s)
<b>km</b>	kilometre(s)
<b>km<sup>2</sup></b>	square kilometre(s)
<b>koz</b>	thousand troy ounces
<b>kt</b>	thousand metric tonnes
<b>kV</b>	kilovolts
<b>kWh</b>	kilowatt hour(s)
<b>kWh/t</b>	kilowatt-hours per tonne
<b>lb</b>	pound(s)
<b>LG</b>	Lerch Grossman
<b>LHOS</b>	long hole open stoping
<b>LoM</b>	Life of Mine
<b>µm</b>	micron or micrometre
<b>m</b>	metre(s)
<b>M</b>	million(s)
<b>m<sup>3</sup></b>	cubic metre(s)
<b>m<sup>3</sup>/h</b>	cubic metres per hour
<b>m/s</b>	metres per second
<b>Ma</b>	million years
<b>MCE</b>	Maximum Credible Earthquake
<b>MDE</b>	Maximum Design Earthquake
<b>Measured Mineral Resource</b>	as defined under the CIM Standards is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.
<b>Metso</b>	Metso Technology PTSTI Pty Ltd
<b>MGB</b>	means the Mines and Geosciences Bureau, established under the DENR to administer the Mining Act.
<b>Mineral Reserve</b>	as defined under the CIM Standards is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined. The term "Mineral Reserve", when used in this Technical Report, is consistent with "Ore Reserve" as defined by the JORC Code.
<b>Mineral Resource</b>	as defined under the CIM Standards is a concentration or occurrence of diamonds, natural solid inorganic material or natural solid fossilized organic material including base and precious metals, coal and industrial minerals in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.
<b>mineralisation</b>	means the concentration of minerals in a body of rock.
<b>Mining Act</b>	means Republic Act No. 7942, also known as the Philippine Mining Act 1995, which governs the granting of rights to explore and mine for minerals in the Philippines.
<b>mm</b>	millimetre(s)
<b>MMT</b>	Multipartite Monitoring Team
<b>Moz</b>	million troy ounces
<b>MRF</b>	Mine Rehabilitation Fund
<b>MRFC</b>	means Mine Rehabilitation Fund Committee established to administer the EPEP and FMRDP and comprising representatives of the DENR, local authorities, community representatives and a representative of OGPI
<b>mRL</b>	metres above sea level. Note: for technical reasons all mRL coordinates described in this Technical Report have had 2000m added, ie: 2000m represents sea level.
<b>MSO</b>	Mineable Stope Optimiser software developed by Alford Mining Systems.
<b>Mt</b>	million metric tonnes
<b>MTF</b>	Monitoring Trust Fund
<b>Mtpa</b>	million tonnes per annum
<b>multiple indicator kriging</b>	is a grade estimation technique
<b>MW</b>	megawatt(s)

<b>MWT</b>	Mine Waste and Tailing Fees
<b>N</b>	North
<b>NAPP</b>	negative acid producing potential
<b>NATA</b>	National Association of Testing Authorities, the body which accredits laboratories and inspection bodies within Australia
<b>National Internal Revenue Code</b>	means the Tax Code of the Philippines or Republic Act No. 9337, as amended.
<b>NCIP</b>	means the National Commission on Indigenous Peoples, which is responsible for identifying and delineating ancestral domains/lands in the Philippines with the consent of the ICC/IP concerned.
<b>NE</b>	Northeast
<b>NI 43-101</b>	National Instrument 43-101 – Standards of Disclosure for Mineral Projects of the Canadian Securities Administrators.
<b>NNE</b>	North North East
<b>NPV</b>	net present value
<b>NQ</b>	is a reference to the ~ 76 mm diameter drill rods used to recover diamond drill core.
<b>NW</b>	Northwest
<b>NWRB</b>	means the National Water Resources Board, which grants authorities for taking water from and discharging to rivers and waterways in the Philippines in accordance with the Water Code.
<b>NMV</b>	means Net Metal Value
<b>NSR</b>	net smelter return
<b>NUVELCO</b>	Nueva Vizcaya Electric Cooperative
<b>NZX</b>	means NZX Limited, the New Zealand Stock Exchange.
<b>OBE</b>	Operating Basis Earthquake
<b>OceanaGold</b>	means OceanaGold Corporation and/or any of its subsidiaries.
<b>OCEANAGOLD or OGC</b>	means OceanaGold Corporation
<b>OGPEC</b>	means OceanaGold (Philippines) Exploration Corporation (previously Arimco Mining Corporation, then Climax Arimco Mining Corporation)
<b>OGPI</b>	means OceanaGold (Philippines), Inc (previously Australasian Philippines Mining, Inc)
<b>OHPL</b>	Overhead Power Line
<b>ordinary kriging</b>	is a grade estimation technique.
<b>OREAS</b>	certified gold and copper reference standards produced by Australian-based company Ore Research and Exploration and used internationally in the assay of samples.
<b>Orica</b>	Orica Philippines Inc.
<b>oz</b>	troy ounce (31.103477 grams)
<b>Pb</b>	lead
<b>PCE</b>	Pollution Control Equipment
<b>PDMF</b>	Partial Declaration of Mining Feasibility
<b>PIMA</b>	Portable Infrared Mineral Analyser
<b>PHP</b>	Philippine Peso
<b>polygonal method</b>	is a grade estimation technique.
<b>PPA</b>	Philippines Port Authority
<b>ppb</b>	parts per billion
<b>ppm</b>	parts per million
<b>PQ</b>	is a diamond drill tube size equivalent to 85 mm inside diameter.
<b>Preliminary Feasibility Study</b>	as defined under the CIM Standards is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on mining, processing, metallurgical, economic, marketing, legal, environmental, social and governmental considerations and the evaluation of any other relevant factors which are sufficient for a Qualified Person, acting reasonably, to determine if all or part of the Mineral Resource may be classified as a Mineral Reserve. The CIM Standards require the completion of a Preliminary Feasibility Study as the minimum prerequisite for the conversion of Mineral Resources to Mineral Reserves.
<b>Probable Mineral Reserve</b>	as defined under the CIM Standards is the economically mineable part of an Indicated Mineral Resource and, in some circumstances, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. The term "Probable Mineral Reserve", when used in this Technical Report, is consistent with "Probable Ore Reserve" as defined by the JORC Code.

<b>Proven Mineral Reserve</b>	as defined under the CIM Standards is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified. The term "Proven Mineral Reserve", when used in this Technical Report, is consistent with "Proved Ore Reserve" as defined by the JORC Code.
<b>PSE</b>	Pollution Source Equipment
<b>pXRF</b>	portable X-ray fluorescence
<b>Q1</b>	Quarter beginning 1 January and ending 31 March
<b>Q2</b>	Quarter beginning 1 April and ending 30 June
<b>Q3</b>	Quarter beginning 1 July and ending 30 September
<b>Q4</b>	Quarter beginning 1 October and ending 31 December
<b>QA/QC</b>	quality assurance / quality control
<b>Qualified Person or QP</b>	as defined under the CIM Standards means an individual who is an engineer or geoscientist with at least five years of experience in mineral exploration, mine development or operation or mineral project assessment, or any combination of these; has experience relevant to the subject matter of the mineral project and the Technical Report; and is a member or licensee in good standing of a professional association.
<b>QQ</b>	Quantile-Quantile
<b>PLI</b>	Point Load Index
<b>RAB</b>	rotary air blast
<b>RAR</b>	return air rise
<b>RC</b>	reverse circulation
<b>RCF</b>	Rehabilitation Cash Fund
<b>Revised Forestry Code</b>	means Presidential Decree No. 705, enacted in 1975, which regulates the location, prospecting, exploration, utilization or exploitation of mineral resources in the Philippines, within forest concession areas. Licences, leases and timber permits, permitting mining operations within forest concession areas, are granted by the Director of the Bureau of Forestry.
<b>RL</b>	relative level. Note: for technical reasons all mRL coordinates described in this Technical Report have had 2000m added, ie: 2000m represents sea level.
<b>RMI</b>	Risk Management Intercontinental Pty Ltd
<b>ROM</b>	run of mine
<b>RQD</b>	the Rock Quality Designation index of rock quality
<b>S</b>	South
<b>SABC</b>	SAG mill / Ball mill / pebble crusher
<b>SAG</b>	semi-autogenous grinding
<b>SCSR</b>	self-contained self-rescuer
<b>SDMP</b>	means the Social Development and Management Program prescribed by the Mining Act and its implementing rules and regulations and approved by the MGB.
<b>SE</b>	Southeast
<b>SG</b>	specific gravity
<b>SGS</b>	SGS Philippines Inc.
<b>Shell</b>	Philippines Shell Petroleum Corporation
<b>SMU</b>	selective mining unit
<b>SSM</b>	small scale mining or miners
<b>STDEV</b>	standard deviation
<b>SW</b>	Southwest
<b>SWMP</b>	Surface Water Management Plan
<b>t</b>	metric tonne (1,000 kilograms)
<b>TEM</b>	technical economic model
<b>t/m<sup>3</sup></b>	tonnes per cubic metre
<b>tpa</b>	tonnes per annum
<b>tpd</b>	tonnes per day
<b>tpm</b>	tonnes per month
<b>Trafigura</b>	Trafigura Pte Ltd
<b>TSF</b>	tailings storage facility
<b>TSP</b>	the total suspended particulate
<b>TSS</b>	total suspended solids

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<b>TSX</b>	Toronto Stock Exchange
<b>UCS</b>	Uniaxial Compressive Strength
<b>US\$</b>	United States dollars
<b>UTM</b>	Universal Transverse Mercator
<b>UTS</b>	Uniaxial Tensile Strength
<b>VCRC</b>	Victoria Consolidated Resources Corporation
<b>Water Code</b>	means Presidential Decree No. 1067, enacted in 1976, which regulates the taking of water from and discharges to rivers and waterways in the Philippines.
<b>WRD</b>	waste rock dump
<b>W</b>	West
<b>wt</b>	weight
<b>XRF</b>	x-ray fluorescence
<b>Zn</b>	Zinc
<b>3D</b>	three-dimensional
<b>@</b>	at
<b>%</b>	percent
<b>°</b>	degrees
<b>°C</b>	degrees Celsius