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**Technical Report and Preliminary Economic Assessment for the
Island Gold Lower Zones (according to National Instrument 43-101
and Form 43-101F1)**

Project Location:

Finan Township (Ontario, Canada)
(NTS : 42C/08)
(UTM : 690,414E, 5,352,731N)
(NAD 83, Zone : 16)

Prepared for:

Richmont Mines Inc.
161, avenue Principale
Rouyn-Noranda, Quebec J9X 4P6

Prepared by:

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Effective Date: October 8, 2015
Signature Date: December 11, 2015

CERTIFICATE OF AUTHOR – SYLVIE POIRIER

I, Sylvie Poirier, Eng. P. Eng., (OIQ No. 112196; PEO No. 100156918) do hereby certify that:

1. I am a Consulting Engineer of: InnovExplo, 560, 3^e Avenue, Val-d'Or, Québec, Canada, J9P 1S4.
2. I graduated with a Bachelor's degree in mining Engineering from École Polytechnique (Montréal, Québec) in 1994.
3. I am a member of the *Ordre des Ingénieurs du Québec* (OIQ, No. 112196), the Professional Engineers of Ontario (PEO No. 100156918), and the Canadian Institute of Mines (145365).
4. I have worked as an engineer for a total of twenty (20) years since graduating from university. My mining expertise was acquired while working for Lafarge Canada and for Placer Dome and McWatters at the Sigma mine, as well as for Natural Resources Canada on a special research initiative program on narrow-vein mining. I have been a consulting engineer for InnovExplo Inc since September 2008.
5. I have read the definition of "qualified person" set out in Regulation 43-101 /NI 43-101 and certify that by reason of my education, affiliation with a professional association (as defined in Regulation 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of Regulation 43-101.
6. I am responsible for supervising the assembling of the report and author of sections of 22; co-author of sections 1, 2, 3, 16, 18, 21 and 24 to 27. of the report titled "Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)" (the "Technical Report"), effective date of October 8, 2015 and signature date of December 11, 2015, prepared for Richmond Mines Inc.
7. I had prior involvement with the Project that is the subject of the Technical Report.
8. I visited the Island Gold Project on April 9 and 10, 2015.
9. I am not aware of any material fact or material change with respect to the subject matter of the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.
10. I am independent of the issuer applying all of the tests in Section 1.5 of Regulation 43-101 (National Instrument 43-101).
11. I have read Regulation 43-101 respecting standards of disclosure for mineral projects and Form 43-101F1, and the sections of the Technical Report for which I was responsible have been prepared in accordance with that regulation and form.

Signed on this 11^h day of December, 2015

(Original signed and sealed)

Sylvie Poirier, Eng., P. Eng.
InnovExplo Inc.

CERTIFICATE OF AUTHOR – DANIEL ADAM

I, Daniel ADAM, P.Geo., Ph.D., as an author of this report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” prepared for Richmond Mines Inc. and dated December 11, 2015, do hereby certify that:

1. I am a Professional Geologist employed as Vice President, Exploration by Richmond Mines Inc., located at 161, Principale Avenue, Rouyn-Noranda, QC J9X 4P6.
2. I received a Ph.D. in Geology from the University of Nancy I (Nancy, France) in 1987.
3. I am a registered member of the *Ordre des Géologues du Québec* (OGQ licence No. 229) and a practicing member of the Association of Professional Geoscientists of Ontario (APGO No. 1837). I have worked as a geologist for a total of 26 years since my graduation. I have worked mainly in exploration and in the mining industries for companies where I had increasing levels of responsibilities.
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
5. I visited the Island Gold Project several times last year.
6. I am the author of sections of 4 to 12, 14, 15, 19, 20 and 23 and co-author of sections 1, 2, 3 and 24 to 27 of the NI 43-101 report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” dated October 8, 2015.
7. I have no personal knowledge, as of the date of this certificate, of any material fact or change, which is not reflected in this report.
8. I have been an employee of Richmond Mines Inc. since March 2008, first as Senior Geologist, then as Exploration Manager and later as Vice President Exploration.
9. I have prepared this Technical Report in compliance with National Instrument 43-101 and in conformity with generally accepted Canadian mining industry practices. As of the date of the 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.
10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated this 11th day of December 2015

(Signed & Sealed) “Daniel Adam”

(Original signed and sealed)

Daniel Adam, P.Geo., Ph.D.

CERTIFICATE OF AUTHOR – JEAN BASTIEN

I, Jean Bastien P.Eng, MBA., as an author of this report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” prepared for Richmond Mines Inc. and dated December 11, 2015, do hereby certify that:

1. I am a Professional Engineer employed as General-Manager by Richmond Mines Inc., located at 161, Principale Avenue, Rouyn-Noranda, QC J9X 4P6.
2. I received a Baccalaureate in mining Engineer in 1983 from *Université Laval* (Québec City, Québec) and a Master in business analysis from *Université du Québec en Abitibi-Témiscamingue* (Rouyn-Noranda, Quebec) in 2009.
3. I am a registered member of *the Ordre des Ingénieurs du Québec* (OIQ licence No. 39570) and member of Professional Engineers Of Ontario (PEO licence No. 100219259) I have worked as an Engineer for a total of 32 years since my graduation. I have worked in the mining industries for different companies with increasing levels of responsibilities.
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
5. I worked at the Island Gold mine for the last two years.
6. I am a co-author of sections 1,2, 3, 16, 18, 21 and 24 to 27 of the NI 43-101 report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” dated October 8, 2015.
7. I have no personal knowledge, as of the date of this certificate, of any material fact or change, which is not reflected in this report.
8. I have been an employee of Richmond Mines Inc. since July 2010, first as Superintendent technical services and as General Manager.
9. I have prepared this Technical Report in compliance with National Instrument 43-101 and in conformity with generally accepted Canadian mining industry practices. As of the date of the 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.
10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated this 11th day of December 2015

(Signed & Sealed) “Jean Bastien”

(Original signed and sealed)

Jean Bastien, P. Eng., MBA

CERTIFICATE OF AUTHOR – MATHIEU BELISLE

I, Mathieu BÉLISLE, ing., P. Eng., as an author of this report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” prepared for Richmond Mines Inc. and dated December 11, 2015, do hereby certify that:

1. I am a senior metallurgist with Soutex Inc. with a business address at 357 Jackson, Québec, QC, G1N 4C4
2. I am a graduate of *Université Laval* (Québec City, Québec), with a Bachelor's degree in Material and Metallurgical Engineering (B.Ing., 2002).
3. I am a registered member of the *Ordre des Ingénieurs du Québec* (OIQ licence No. 128549) and a registered member of the Association of Professional Engineer of Ontario (PEO licence No. 100210246). I have worked as a mineral processing engineer for a total of 13 years since my graduation. I have worked in engineering consultation and in the mining industries.
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
5. I visited the Island Gold Project several times last year.
6. I am the author of sections 13 and 17 and co-author of sections 1, 21 and 25 to 27 of the NI 43-101 report entitled “Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)” dated October 8, 2015.
7. I have no personal knowledge, as of the date of this certificate, of any material fact or change, which is not reflected in this report.
8. I have been an employee of Soutex Inc. since January 2009, as senior metallurgist.
9. I have prepared this Technical Report in compliance with National Instrument 43-101 and in conformity with generally accepted Canadian mining industry practices. As of the date of the 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.
10. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them for regulatory purposes, including electronic publication in the public company files on their websites accessible by the public.

Dated this 11st day of December 2015

(Signed & Sealed) “Mathieu Bélisle”

(Original signed and sealed)

Mathieu Bélisle, Eng., P. Eng.

SIGNATURE PAGE – INNOVEXPLO

Technical Report and Preliminary Economic Assessment for the Island Gold Lower Zones (according to National Instrument 43-101 and Form 43-101F1)

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**Technical Report and Preliminary Economic Assessment for the
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1. SUMMARY

The objective of InnovExplo's mandate was to complete a Preliminary Economic Assessment (the "PEA") and Technical Report (the "Report") for Richmond's Island Gold mine in compliance with National Instrument 43-101 and Form 43-101F1.

The PEA focused on the Island Gold Lower Zones, specifically the mineral resources of the C Zone between levels 450m and 860m. This potentially mineable mineral resource constitutes a large portion of the lower zones in the Island Gold mine (known as *Lower Island Gold*), for which resource inventories were prepared by Richmond.

InnovExplo considers the present PEA to be reliable and thorough, based on quality data, reasonable hypotheses and parameters compliant with NI 43-101 and CIM standards regarding mineral resource estimates.

1.1. Description and Location

The Island Gold mine is located 83 km northeast of Wawa, Ontario. It is part of the Island Gold Project, which is divided into nine parts (properties) comprising 219 patented, leased and staked claims covering 7,772 ha, mainly within the townships of Finan and Jacobson.

Richmont holds 100% of all mining titles relating to its Island Gold Project, with the exception of a few claims where the rights are shared with Argonaut Gold Inc. The properties of the Island Gold Project are subject to the payment of royalties and financial contractual obligations.

Access to the Island Gold mine and its environs (herein the "Project" or the "property") is via four-season road from Highway 519, just west of Dubreuilville, which is located approximately 35 km east of the junction between highways 17 and 519. It takes approximately one hour to drive from Wawa to the mine site.

Since beginning commercial production in October 2007, Richmond's 100%-owned Island Gold Mine has produced more than 337,000 ounces of gold.

1.2. Geological setting and mineralization

The Island Gold Project is located in the Michipicoten Greenstone Belt, which is part of the Wawa Subprovince within the Archean Superior Province. The Island Gold Project is stratigraphically positioned in the upper portion of the Wawa Assemblage, composed of intermediate to felsic volcanic rocks capped by pyrite-bearing iron formations.

Gold mineralization is controlled by the Goudreau Lake Deformation Zone (GLDZ). Gold occurs in narrow, subparallel quartz veins in areas of intense sericitization and silicification. Five (5) major zones have been identified along the GLDZ: the Island Zone, the Lochalsh Zone, the North Shear/Shore Zone, the 21 Zone and the Goudreau Zone. A continuous 900-m-long mineralized structure marked by alteration and gold values of 1 g/t or more is indicated in drill core from the Lochalsh Zone to the Island Zone.

The Island Gold Lower Zones at the Island Gold mine concerns six (6) mineralized zones (G, G1, B, C, D and E1E) in the deepest part of the deposit, of which the C Zone is the most important, showing very good continuity with consistent gold grades. The six zones have been identified within an east-west alteration corridor 100 to 150 m thick that extends between -450 m and -1,000 m of vertical depth, and over a lateral strike length of 900 to 1,000 m spanning the Lochalsh, Island Gold and Extension 1 sectors. The dip of the mineralization is generally subvertical to the south, except between levels 400m and 500m where it becomes less steep.

1.3. Deposit Types

Gold mineralization in the Goudreau-Lochalsh area is found in several different rock types and geologic settings. All of the past-producing mines and numerous other gold occurrences exhibit a close spatial association with felsic to intermediate intrusive rocks, and all are located along the GLDZ.

The GLDZ is subdivided into four structural domains (Southern, Northern, Eastern and Western) based on the style of deformation, lineation patterns, and the orientation and sense of shear displacement on sets of shear zones. Most gold deposits along this zone are associated with quartz veining and/or shear zones. Sage and Heather (1991) have grouped these shear zones into six main shear or high strain zone categories with the following azimuths: 070°, 020° to 035°, 130° to 140°, 080° to 090°, 110° to 115°, and 350° to 010°.

1.4. Exploration and Data Verification

In 2015, Richmond continued its drilling program in order to improve the quality of resources, increase the amount of resources and convert resources to reserve categories both in the upper part and lower parts of the Island Gold mine. At the end of the third quarter of 2015, a total of 61,601 m of diamond drilling were completed, 59,779 m from underground drilling and 1,822 m from surface exploration drilling.

All drill core logging is completed by qualified personnel using software developed by Gemcom and called DDH Logger. The data entered in the software follows a pre-established structure with consistent codification of lithologies and structures observed creating uniformity in the geological description.

The drill hole database is managed using Gemcom's GEMS Logger software. There is one main database for all the Island Gold mine drill holes. As of December 31, 2014, the database contained 2,805 holes totaling 542,769 m from surface and underground diamond drilling

Since the beginning of operations at the Island Gold mine, a QA/QC program was initiated to verify and confirm the results obtained either by production sampling (mucks, chip sampling, etc) or by diamond drilling. This verification is essential to determine the validity of the data used for resource and reserve calculations.

The assays supporting the Island Gold Mineral Resource and reserves estimate are based on sample preparation and analytical protocols that meet standard industry practice.

After compiling and interpreting the QA/QC data, the assay results from laboratories used to calculate the Mineral Resource and Reserve Estimate of December 31, 2014, are considered acceptable and within normal tolerance limits.

An external reserve and resource audit was completed in January 2014 by M. Robert de l'Étoile from RPA and based on a desktop review of the Lower Island Gold Mineral Resource, RPA was of the opinion that the Mineral Resource Estimate was reasonable, has been adequately prepared using standard industry practices, and conforms to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM definitions) as incorporated into National Instrument 43-101 (NI 43-101)

The author of this section considers that the Island Gold mine drill hole database is suitable for use in the mineral reserve and resource estimation studies.

1.5. Mineral Resource Estimate

The parameters used for the geological and structural interpretation of the Island Gold mine, as well as for the mineral inventory estimate, are based on the best estimation of the Island Gold technical department at the time of the estimation. Technical parameters for the resources were provided by the head office of Richmond or the technical department of the Island Gold mine.

The following parameters were used for the Mineral Reserve and Resource estimation of December 31, 2014:

- Exchange rate (CAD/USD) : 1.0833
- Price of gold (US\$) : \$1,200.00
- High value capping limit (Upper Zones) : 75.0 g/t Au
- High value capping limit (Lower Zones) : 95 g/t Au for C & B zones, 40 g/t for other zones
- Low value cut-off limit (Stope) : 3.75 g/t Au
- Low value cut-off limit (Development) : 1.5 g/t Au
- Stope dilution : 18%
- Development dilution : 30%
- Dilution grade : 0.5 g/t
- % Ore recovery – Stope (included) : 95%
- % Gold recovery – Mill (excluded) : 95%
- Ore specific gravity : 2.82 t/m³ (2.80 t/m³ for Lower Island Gold resources)
- Minimum mining width : 2.0 m

GEMS software, version 6.7, was used to prepare the resource estimation. The resource estimates were calculated following two distinct methods. GEMS software was used to create block models for all zones in all sectors, except for the E1E-Ext3 Zone. At the extremity of the study area, where less diamond drilling information was available, the E1E-Ext3 resources were calculated using a polygonal method, but a grade correction was applied to decrease the grade by 26%. This correction was based on historical reconciliation data between production and milling at the Island Gold mine.

The Mineral Resource and Reserve Estimate of December 31, 2014 is based on more than 37,000 composites, taken from 5,258 underground development faces, 2,116 underground diamond drill holes and 230 surface diamond drill holes. Also, diamond drill holes will generally intersect more than one zone and therefore generate more composites.

Several mineralized zones that are parallel to the C Zone have also been recognized and interpreted, and a resource estimation has also been completed on these zones. They are now included in the Total Island Gold Mineral Resource.

The Measured and Indicated resources of the Island Gold mine, as of December 31, 2014, were estimated to be 733,500 tonnes at 9.29 g/t Au for 219,050 ounces, and the Inferred resources were estimated to be 3,547,500 tonnes at 8.79 g/t Au for 1,002,750 ounces. (See Table below)

Island Gold Global Mineral Resource Estimate as of December 31, 2014 (Table 14.6)

Category	Tonnes	Grade (g/t Au)	Grams	Ounces
Measured Resources	35,500	4.77	169,000	5,450
Indicated Resources	698,000	9.52	6,644,000	213,600
Measured & Indicated Resources	733,500	9.29	6,813,000	219,050
Inferred Resources	3,547,500	8.79	31,189,500	1,002,750

Measured and Indicated mineral resources of 438,000 tonnes grading 10.95 g/t for 154,200 ounces of gold have been established for the lower zones of the Island Gold mine ("Lower Island Gold"; Table below). The Inferred mineral resources totalled 3,178,000 tonnes grading 9.00 g/t for 919,950 ounces of gold in the lower zones of the Island Gold mine, mostly in the C Zone (Table below).

**Lower Island Gold Global Mineral Resource Estimate as of December 31, 2014
(Table 14.5)**

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Island Sector - Lower C and D Zones (Measured)	9,500	3.33	32,000	1,000
Island Sector - Lower C and D Zones (Indicated)	419,500	11.19	4,696,000	151,000
Extension 1 Sector - Lower E1E, C & D Zones (Indicated)	9,000	7.72	68,500	2,200
Total Measured and Indicated	438,000	10.95	4,796,500	154,200
Total Inferred	3,178,000	9.00	28,614,000	919,950

Several factors may affect the mineral resource estimate. The estimation of mineral resources is a complex and subjective process, and the accuracy of any such estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in the geological interpretation. Metal price, the exchange rate between US and Canadian dollars, geological continuity, mining method, hydrogeological constraints and geotechnical factors may materially impact the mineral resource estimate.

Mineral Resources presented are exclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

1.6. Mineral Reserve

Mineral reserve calculations estimate the volume and grade of ore that can be mined and processed at potential profit. The conversion of mineral resources into mineral reserves is based on economic parameters detailed in section 14. Only mineral resources that would have been classified in the measured and indicated categories were used in the economic calculations of estimated reserves as of December 31, 2014.

The economic viability of the resources converted into reserves was determined by the technical department of the Island Gold mine, specifically the engineering department. Ore dilution, recovery rates and mining costs used in the resource and reserve calculations represent Richmond's best estimates as of December 31, 2014.

The total Island Gold Proven and Probable reserves as of December 31, 2014, stand at 895,000 tonnes at a grade of 6.39 g/t Au for 183,750 ounces.

The tables below summarize the estimated proven and probable reserves. The data below represent diluted ore with an estimated 95% ore recovery, except for the Goudreau GP5 and GP2 zones (30% dilution and 50% ore recovery). It does not take into account the milling recovery.

Island Gold Mine Proven Reserves as of December 31, 2014 (Table 25.1)

Category	tonnes	Grade (g/t Au)	Grams	Ounces
Proven Reserves	258,500	6.36	1,644,000	52,850
Probable Reserves	636,500	6.40	4,070,000	130,900
Proven and Probable Reserves	895,000	6.39	5,714,000	183,750

The ore reserves presented here are in large part estimates, and production of the anticipated tonnages and grades may not be achieved or the indicated level of recovery may not be realized. There are numerous uncertainties inherent in estimating Proven and Probable reserves, including many factors beyond Richmond's control. The estimation of reserves is a complex and subjective process, and the accuracy of any such estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in the engineering and geological interpretation. Reserve estimates may require revision based on various factors such as actual production experience, exploration results, gold price fluctuations, drilling results, metallurgical testing, production costs or recovery rates. These factors may render the Proven and Probable reserves unprofitable to develop.

1.7. Mining

The PEA considered an 800 tpd mining operation using the current material handling method based on 30t trucks. The potentially mineable mineral resource defined for the PEA constitutes the resources in the most continuous portion of the deposit between the 450m and 860m levels, as of December 31, 2014. For the purpose of this PEA, the following were excluded: resources above the 450m level, and isolated resource blocks or parallel zones outside the main area of interest (the C Zone). No reserves were considered.

Prior to the PEA, InnovExplo assessed the maximum daily output and conducted a trade-off study on material handling and manpower transportation systems for the Island Gold mine. The results of this pre-PEA work support the selection of the production scenario and material handling option for the mining plan elaborated for the PEA. The results also demonstrate it would be possible to sustain a maximum daily tonnage of 1150 tpd for the potentially mineable mineral resource once mining in the third horizon has started. However, this would imply a new material handling system as well as some significant changes to the mill in order to accommodate the higher output.

Based on the results and on discussions held with the client, it was decided to retain two daily tonnages for subsequent detailed analysis. The 800 tpd scenario was developed as a base case for a short- to intermediate-term mining plan, and the 1150 tpd scenario was to be further investigated as a potential future mining plan.

The rationale for retaining and studying both tonnage options was the following:

- Richmond already has a provincial permit to produce at a rate of 900 tpd. Above that level, a new permit will be needed.
- It is possible with additional capital to increase mill capacity to 1200 tpd.

- Considering that a large portion of the tonnage in the evaluation consists of Inferred resources, there is a concern that definition drilling may not keep pace with a production rate above 1150 tpd.
- Preliminary economical calculations show that ventilation costs, OPEX and CAPEX, would increase considerably at a mining rate above 1200 tpd.
- Maximum orebody extraction rate is based on the specific location of resources considered in this study. If resources are there in tonnage but the location changes, this could greatly impact scheduling; hence, another reason to be careful when dealing with the theoretical maximum capacity value.

For the purpose of this PEA, all mineral reserves were considered at the Measured and Indicated resource level. Furthermore, the PEA only considers resources within the main continuous structure, the C Zone C, between the 450m and 860m levels.

To prepare for the mining plan, stope shapes were created using the solids prepared by Richmond for their reserve and resource estimation. InnovExplo created stopes 22 m high, 25 m long, with a width matching that of the mineralization. The resulting tonnage in the potentially mineable mineral resource is reported in the following table.

Resources considered in the PEA mining plan (Table 16.3)

Category	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)	Resource classification (%)
Measured and Indicated	626,059	9.94	200,075	33
Inferred	1,245,199	11.04	441,976	67

Several mining methods have been contemplated since mining activities commenced at Island Gold. Of all the methods examined, cut-and-fill and long-hole mining were tested, and longitudinal long-hole retreat mining was selected as the preferred method. The ore width, vertical dip, good ground quality, productivity factors, cost, and availability of equipment and personnel were some of the major parameters involved in the decision.

A design consisting of two ramps driven from level 740m down to 860m was elaborated and retained in the PEA mining plan. Each level can be served by a single access connecting to a ramp, or by multiple accesses. This design provides two accesses for each level between 740m and 860m. This configuration allows to two production domains on each level. There are also ventilation gains by having two ramps.

The resulting production schedule is presented in the following table and includes tonnage from stopes and development. Years 2015 and 2016 are considered a transition period. During this period, a portion of the production comes from mining zones that were not part of the PEA. The proposed mining plan gives a mine life of seven (7) years.

Yearly tonnages for development and production (Table 16.7)

	Transition Period		Island Gold Lower Zones Production Period						
	2015	2016	2017	2018	2019	2020	2021	2022	Total
Stope tonnage (t)	59,401	188,609	211,030	269,134	288,748	306,821	298,277	267,328	1,889,348
Grade (g/t)	5.98	6.94	7.03	9.10	10.33	9.20	8.70	7.08	8.41
Development tonnage (t)	44,486	69,010	85,760						199,256
Grade (g/t)	9.59	11.34	8.70						9.81
Total tonnage mill (t)	103,888	257,619	296,790	269,134	288,748	306,821	298,277	267,328	2,088,604
Grade (g/t)	7.53	8.12	7.51	9.10	10.33	9.20	8.70	7.08	8.55
Tonnage ratio (develop./stop e)	0.75	0.37	0.41						
Ounces produced	24267	64894	69195	76008	92513	87574	80557	58732	553,740

1.8. Environment

From exploration through operations and closure one of Richmond's goals at the Island Gold mine is to prevent pollution, safeguard the environment, educate employees and communities about the company's environmental programs and commitments, and apply best management practices to prevent or mitigate any potential environmental impacts.

The Island Gold mine has a permit to operate at a production rate of 900 tpd. The mine operates under several environmental permits issued by government agencies, the main ones relating to water and air.

A Waste Management Plan is in place for the site, to deal with a variety of waste, including hazardous waste and excess materials. Tailings management was augmented in 2015 with construction work at the Primary Pond that will allow an additional six (6) years of tailings deposition.

A comprehensive environmental monitoring program is in place at the Island Gold mine that includes inspections, sampling schedules, data management and reporting. Key performance indicators are tracked, and any deviations from targets are addressed and corrected. Both internal (management) and external reporting (government agencies) is ongoing.

The community closest to the mine is the Town of Dubreuilville. In addition to employment benefits, the Island Gold mine has engaged in partnerships with the town.

Also, in addition to initial discussions with the Batchewana First Nation, Richmond is actively working and engaging with the primary First Nation community i.e. Michipicoten First Nation, and to a lesser extent Missanabie Cree First Nation.

Compliance with permitting conditions and best management practices are critical aspects to the success of the Island Gold mine. Given that water is one of the main issues covered by the permits, additional improvements to the water management system are recommended, the main one being a diversion system around the Primary Pond, which is estimated to cost \$2.1 M.

Overall, the mine's management system related to environment, permitting and community relations is robust, and is also comparable to industry peers. As part of Richmond's sustainability initiatives, the Island Gold mine aims to continuously improve its environmental and social performance.

1.9. Metallurgy

Mineralogical and metallurgical characterization studies were performed in 2013 by Unité de recherche et de service en technologie minérale (URSTM), a research unit affiliated with the Université du Québec en Abitibi-Témiscamingue (UQAT). Kremzar Mill has been processing ore from the Island Gold Mine since October 2007, and more than 320,000 ounces have been recovered. Since the beginning of 2015, Kremzar Mill has processed a proportion of the ore from the lower zone development.

The mill is composed of a two-stage crushing circuit followed by a two-stage grinding circuit. The mill uses cyanide leaching and a carbon-in-pulp (CIP) process to recover gold.

The ore from the coarse ore bin is crushed by a jaw crusher followed by a secondary crushing stage performed by a cone crusher. From the fine ore bin, crushed material is then sent to a ball mill operated in closed circuit with cyclones and a regrind mill. Gold is leached in a leaching circuit and extracted in a CIP circuit. The loaded carbon is washed with nitric acid solution to remove scale before being sent through a carbon regeneration kiln. Gold is removed from the loaded carbon by elution (stripping) followed by electrowinning. The stripped carbon is regenerated in reactivation kilns before being returned to the process. Fine carbon is constantly removed and recovered from the process to avoid gold loss, while fresh carbon is continuously added to the process. The high-grade electrowinning concentrate is sent to a bullion furnace for smelting of doré.

Following the review of the current situation at the Island Gold concentrator, some improvement opportunities were identified that could optimize mill operations and availability, and stabilize a potential higher throughput of 900 tpd. The major projects are described below.

1.10. Capital and Operating Costs

The reader is cautioned that this PEA is preliminary in nature. The PEA includes Inferred Mineral Resources that are too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA scenarios or forecasts will be realized.

During the transition period, estimated capital costs specifically associated with the development of the Island Gold Lower Zones were identified as project capital. Following that two-year period, all capital costs are considered sustaining capital.

Most of the costs associated with capital expenses or sustaining were provided by Richmond. InnovExplo was involved with Capital Costs related to development work.

1.10.1. Project capital

The project capital costs represent capital expenses that occur during the transition period and are specifically associated to the development of the Island Lower Zones. Project capital includes development, mobile equipment, mine building and offices, tailings dam expansion and underground construction.

The estimated project capital costs are presented in the following table and represent a total of \$62.2 M.

PEA project capital cost (Table 21.1)

Project capital (C\$)	2015	2016	Total
Development	11,749,948	20,436,681	32,186,630
Mine mobile equipment	1,052,556	10,850,000	11,902,556
Mine building office	2,000,000		2,000,000
Tailings dam	9,900,000		9,900,000
Underground construction	754,839	5,500,000	6,254,839
Total	25,457,343	36,786,681	62,244,025

1.10.2. Sustaining capital

The sustaining capital is broken down as per the subcategories presented in the following table. The total sustaining capital costs are expected to be \$40.5 M for the 2017–2022 period, with the majority of the capital expenditures occurring in the first three years.

PEA sustaining capital (Table 21.2)

Sustaining capital (C\$)	2017	2018	2019	2020	2021	2022	Total
Development	8,870,446	0	0	0	0	0	8,870,446
Mine (other than development)	9,750,000	5,800,000	4,300,000	1,500,000	800,000	0	22,150,000
Surface (mine building offices)	3,400,000	1,000,000	1,000,000	1,000,000	0	0	6,400,000
Tailings	2,141,000	188,000	188,000	188,000	188,000	188,000	3,081,000
Total	24,161,446	6,988,000	5,488,000	2,688,000	988,000	188,000	40,501,446

The operating costs were adjusted to account for the impact of mining at greater depth. Specifically, the most affected costs relate to material handling, reductions in available wrench time, equipment operation and energy.

Wrench and cycle times vary significantly as mining gets deeper, and this has been accounted for.

Based on Richmond's accounting structure, a model was made using Excel software to evaluate the operating costs associated with the resources evaluated in this PEA, pending on decision on exactly where development and production work will be done.

Operating costs were estimated relative to the known reference cost of mining on the 450m level. Many unit costs are not fixed since wrench time is reduced and cycle time is longer with deeper mining. For Richmond, mining below the 450m level using the current material handling and manpower transportation system translates into higher operating costs.

Operating costs were evaluated by integrating the proposed mining plan. After the transition period, operating costs relate only to Island Gold Lower Zones. The following tables present the operating cost distribution for years 2017 to 2022, and the total cost and average unit cost for that period. The resulting average operating unit cost (Opex) is 148.36\$/t.

Operating cost distribution (Table 21.3)

Financial	2017	2018	2019	2020	2021	2022
Total OPEX (C\$)	\$45,968,845	\$41,572,861	\$44,300,512	\$45,752,730	\$43,249,683	\$35,392,239
Mining	\$23,974,796	\$19,305,202	\$20,713,363	\$21,916,669	\$20,158,889	\$17,829,525
Milling	\$9,365,538	\$8,781,708	\$9,195,760	\$9,577,302	\$9,396,919	\$8,743,583
G&A	\$9,307,172	\$9,837,560	\$9,950,787	\$10,055,196	\$9,827,134	\$6,000,000
Royalties at 3% avg	\$3,321,339	\$3,648,391	\$4,440,602	\$4,203,563	\$3,866,742	\$2,819,131
Cash operating cost (\$/t)	\$155	\$154	\$153	\$149	\$145	\$132
Cash costs (\$/oz)	\$664	\$547	\$479	\$522	\$537	\$603

Total and unit operating costs (Table 21.4)

Operating cost	Total 2017 to 2022 (\$)	Average unit cost (\$/t)
Mining	123,898,444	71.73
Milling	55,060,809	31.88
G&A	54,977,849	31.83
Royalties at 3% avg	22,299,768	12.91
Total	256,236,870	148.35

Costs obtained from the financial analysis should be taken with caution. In this PEA, the hypothesis is that no other resources will be mined except those in the defined resource area (the “potentially mineable mineral resource”). For this reason, approximately 30 months after the start of the PEA mining plan, all development will have been completed, and at that point, all mineralized material is assumed to come only from stoping activities at a lower cost. If Richmond’s exploration plans are successful and the reality is that some development would be needed to mine these future discoveries, making costs higher for a number of years to come. It is only during last few years of the mine life that all mineralized material will come only from stoping.

1.11. Opportunity and Risks

InnovExplo identified all important internal risks, potential impacts and possible risk mitigation measures that could affect the economic outcome of the project. This excludes the external risks that apply to all mining projects (e.g., changes in metal prices, exchange rates, availability of investment capital, change in government regulations, etc.). Significant opportunities that could improve the economics and timing of the project are also identified. Further information and evaluation is required before these opportunities can be included in the project economics.

1.11.1. Opportunities

Higher tonnage output

Higher daily output has a good impact on operating costs by diluting the fixed portion of the costs over a bigger tonnage. Mill capacity is currently at 900 tpd. InnovExplo sees a potential opportunity to boost output to 1150 tpd as soon as the Indicated resource tonnage is sufficient. The preliminary rough calculation for a new large ramp from the 450m level to the mill that can accommodate 45 t trucks is an interesting option due to the relatively fast implementation time, favourable capital compared to a full-service/length shaft, good operating costs and flexibility. This material handling system could easily support a 1150 tpd throughput.

Automation

The Island Gold mine is located in a remote area. There is a local manpower pool from Dubreuilville, but a significant fraction of the manpower (44%) needs transportation and room and board, which is paid by Richmond. In the event that additional resources are defined, InnovExplo sees automation as an opportunity to increase the productivity per man-shift by developing automation and by using energy- and productivity-efficient machines underground. It would be on a case-by-

case basis as remote sites do not have the same manpower costs as mines near towns like Timmins, Sudbury or Val-d'Or. Automation in mines is becoming attractive and affordable as the technology is maturing. As one example, trucks could be partly automated using the "leader-follower" technology. This technology is based on a "leader" truck driven by a human being and "follower" robotic truck doing the same moves as the leader. This technology would be suitable for Richmond since it does not require any complex network infrastructure like ultra-fast communication systems along the pathway.

Using condition-specific unit costs for resource to reserve conversion

The methodology used on cost study involving wrench and cycle times specific to locations and personnel and material handling set-up should be considered for future reserve evaluations. Unit costs are not equal, and if a given resource is well positioned with respect to access points, a greater percentage can be turned into reserves than if it was too deep or far away from main access points. For a mine like Richmond, where resources are spread laterally and vertically, it can have a significant impact. A division by zone for unit cost calculations, like what was done in this technical report, is a good way to obtain accurate cost forecasts.

Compressed air management

The compressed air capacity at 8,000 scfm is relatively high considering the use of electric hydraulic jumbos and the absence of a shotcrete machine or down-the-hole drilling equipment. Compressed air is a very advantageous and relatively safe way of transferring energy in underground mines, but it is one of the less efficient. InnovExplo recommends a survey of the underground compressed air consumers (machines and piping/leaks) to see if there is a match between production and "useful" demand. Leaks, if present, need to be tamed. Also, compressors generate a lot of heat and this heat in winter time could be used to heat buildings or even mine ventilation air, depending on distance and other factors. Monitoring of consumption through flow meters or power meters is recommended to detect costly leaks. Water in the compressed air also increases friction losses and corrosion. Air receivers on surface with automatic purges could be an asset. An economic analysis on compressed air piping could also be done if it is suspected that friction losses are too high due to pipe diameters.

Modelling truck and equipment interactions

In this study, cycle times for trucks were calculated using simple tools, which is acceptable for a PEA-level evaluation. Optimization gains should be sought given the considerable cost of trucking ore and waste. Stochastic software, such as Arena®, is available, as are specialists in cycle simulations, such as Simica (Sudbury, Ont.). Modelling and time studies could reveal system inefficiencies that translate into higher costs and lower production. InnovExplo sees an opportunity to evaluate and improve the Island Gold "traffic" management system knowing that more trucks will circulate simultaneously if ore comes mainly from Island Gold Lower Zones (below the 450m level).

Ventilation

From time to time, there will be many diesel-fueled vehicles and equipment running at the same time below the 450m level, and this could place a burden on the ventilation distribution. In order to minimize ventilation requirements without temporarily preventing access to some of the equipment, InnovExplo recommends the following:

- 30t trucks reaching the end of their useful life should be replaced with units equipped with ventilation reduction (VR) packages. New diesel emission technologies (US EPA tier III and IV) will lead to lower airflow requirements. This type of technology does not represent a huge cost and benefits are significant.
- The PEA mining plan calls for a double-ramp system almost all the way down. Connections, either temporary or permanent, are present on some levels between the ramps (levels 620m, then 770m). They are important for reducing air friction losses. One inter-ramp link needs to be present at all times.
- Ventilation raises/manways of sufficient free surface are present where there is no double-ramp access. Ladders, landings and compartments create shock losses, and the raises have to be big enough to minimize the energy needed to push the air. An economic study is suggested to determine the optimal manway size based on electricity and excavation costs.
- Waste from development must be used locally as much as possible for backfill, thus reducing the trucking distance. A waste stope/storage located close to the producing sector could be a solution. Knowing that Island Gold will likely be short of waste backfill, the extra tonnes generated during excavation operations would be welcome.

Processing

Since 2013, preliminary analyses have shown that mill throughput could be increased to 1200 tpd with some circuit preliminary identified bottlenecks. The main preliminary bottlenecks are:

- Crushing circuit capacity: reduction ratio too high at the primary crusher;
- Grinding circuit capacity: global power draw available;
- Thickening capacity: due to the type of feed well; and
- Gold recovery capacity: from elution circuit.

The following necessary modifications have already been identified:

- Rearrange the crusher circuit including an additional cone crusher;
- Replace the crusher circuit screen;
- Increase the fine ore bin storage capacity;
- Replace the thickener feed well and feed dilution system; and
- Replace the slurry pumps.

However some modifications must be analyzed in a future study to identify the best option between the following:

- Adding grinding capacity vs. reducing gold recovery by a higher product size;
- Adding a new gravity circuit vs. upgrading the current elution circuit.

The modifications above to increase mill capacity to 1200 tpd should be achieved with an investment of less than C\$15 M. Further study is required to confirm the preliminary assumptions and the preliminary cost estimation.

1.11.2. Risk

Resources

Several factors may affect the Mineral Resource Estimate, including metal prices, the exchange rate between US and Canadian dollars, unusual or unexpected geological or geotechnical formations or seismic activity, ore grades lower than expected, physical or metallurgical characteristics of ore that are less amenable than expected to mining or processing, faulty data on which engineering assumptions are made, or dilution increases.

Shortage of waste backfill

Island Gold will likely be short of dry waste backfill. Development waste normally stockpiled on surface to be used at a later time for backfill was used to raise the tailings dam. The impact of that shortage has not been evaluated but should be kept in mind.

Replacement of Inferred resources in the C Zone by parallel lenses

In the PEA mining plan, assumptions were made for replacement tonnes coming from the C Zone, which historically has shown a high (85%) conversion ratio between inferred to indicated and measured resources. Those replacement tonnes will have to come from parallel lenses. InnovExplo did not include extra development costs to replace any of the tonnes in the C Zone by tonnes from other lenses. Therefore, in order to be “even” money-wise, replacement tonnes will have to be of a high enough grade to pay for extra development. It is also possible that parallel lenses will add more tonnes. This would allow a longer life or a higher daily tonnage while diluting some capital costs even further.

Timing

In the pre-PEA study, InnovExplo showed through relative NPV calculations that implementation time is important. For gold mines like Island Gold, where gold is present in quartz veins, the conversion of inferred resources to measured resources takes more time and energy compared to massive sulfide mines. It is problematic for major infrastructure investments since management must wait for resources to be better defined. Often, by the time information is available, many tonnes have already been mined and cannot benefit from the advantage related to the investment, or cannot participate in the payback of the investment.

A scenario that would help increase hauling capacity is to develop ramps from level 450m to the mill. This option has the advantage of being fast to implement and would

represent a relatively low capital. This option would eliminate the need for Volvo surface trucks that are responsible for an OPEX re-handling fee of \$2/t. This option would put the operation in a good position if additional resources are found below level 860m.

Dewatering system

As development progresses laterally and deeper, there is a possibility of more infiltration water. InnovExplo recommends regularly updating the general pumping arrangement diagram for the underground mine. It is recommended that the diagram show pump specifications, particularly capacity, and other important data like peak and low (seasonal variations/down pours) pumping duties. Pumps need to be able to respond to seasonal peaks and be able to catch up in a decent time after a power shutdown. Volumes of the main sumps are also needed, with levels, to have an idea of the retention capacity. If it is the intention to raise daily output in the future, drilling, dust control and other activities could generate more service water.

Hauling system

The current set-up, with partly loaded 30t trucks, is not efficient and will not put the mine in a good position if resources are added below the 860m level. Operating costs will be high because of lower wrench times and longer cycle times.

1.12. Recommendation

Recommendation are made by the PEA's QPs to advance further the development of the Island Gold Lower Zones.

Richmont is already actively developing the Island Gold Lower Zones. The major ongoing exploration program may provide additional resources above that zone and also laterally. The results could have an impact on the mining plan and recommendations herein.

Consequently, the recommendations outlined below are based on the known resources for the Island Gold Lower Zones that were studied by this PEA. These recommendations are intended to ensure the continued development of the Island Gold Lower Zones according to the proposed mining plan within the forecasted operating parameters.

1.12.1. Geology

It is recommended to complete the planned definition and delineation drilling in the PEA area by the end of 2015 in order to update the Mineral Reserve and Resource Estimates in the first quarter of 2016.

1.12.2. Mining

In order to provide sufficient stope availability at the production stage, the following work is recommended:

- Continue to develop the main ramp system to an ultimate depth of 860m by the end of 2016.

- Complete capital expenditures on underground infrastructure and equipment by the end of 2016.

Given that significant savings can be realized by increasing daily tonnage and having a highly efficient material handling system, an economic analysis of worker transportation and material handling systems is recommended based on the preliminary information that will be obtained in the first half of 2016 from the ongoing exploration program. Time being a key economic factor, it will be important to react quickly on positive results from the diamond drilling program to gain the full benefits of a new material handling system with low operating costs. The assessment thus far has shown that certain options outperform the status quo as long as some tonnage is added and implementation time is short. With that in mind, a feasibility study is recommended to prove accuracy-level design and costing of selected material handling systems. The mill expansion from 900 to 1200 tpd should also be costed with the same level of accuracy.

1.12.3. Processing

Following the review of the current situation at the Island Gold concentrator, some improvement opportunities were identified that could optimize mill operations and availability, and also stabilize a potential higher throughput of 900 tpd. The major projects are as follows:

- Increase the number of cyclones in the operation to stabilize the separation performance, reduce the cyclone wear and improve efficiency;
- Upgrade some slurry pumps to maintain the throughput and availability;
- Upgrade the reclaim and process water distribution network to stabilize the distribution flow rate and reliability;
- Replace the current permanent magnets on CV-01 and CV-04 at the crushing circuit by self-cleaning magnets to increase circuit availability and reduce the risk of major failure on major crushing equipment;
- Replace the lime preparation and distribution to stabilize the pH level with reduction of lime consumption;
- Add a scale prevention/reduction chemical agent distribution system at the reclaim and process water to reduce scale built-up in the piping and pumps and to stabilize the equipment performance and maintain availability;
- Upgrade the refinery with additional area in drying sector with new sludge filtration and drying systems. This new area will include a new gold room and security system;
- Upgrade the electrical motor control center (MCC) to increase the reliability of the electric distribution, for health and safety reasons and to reach the operational availability target.

The recommended work should bring mill availability to 93% as presented in the following table.

Mill availability improvement work (Table 26.1)

Projects	Total
Self-cleaning magnets	385 400 \$
Cyclone arrangement modifications	162 000 \$
Slurry pumps	255 200 \$
Process water circuit modifications	146 900 \$
Reagents	712 000 \$
Refinery upgrade	655 600 \$
Electrical upgrade	980 000 \$
Total	3 297 100 \$

1.12.4. Infrastructure

Under sustaining capital, the improvements to be done in 2016 and 2017 are to the warehousing facilities, welding shop and garage.

In terms of electrical requirements, the MCC at the mill needs to be changed in 2016. The 13.8 kV power line needs to be available underground to avoid too much voltage drop and to accept additional consumers. Ventilation-on-demand and/or ventilation control should be studied to find out if there would be any payback.

For underground construction, a service area for mechanical work and a fuel station are needed on level 620m. Three refuges are also needed to follow development and production. Ventilation walls and ventilation airlocks need to be built to control ventilation and allow for circulation in the ventilation network.

Permanent pumping stations should be planned and built on levels 425m and 740m to support future operations and exploration.

A review of long-term building maintenance needs may also be required depending on the expected mine life, which could change if the exploration program yields positive results.

Power distribution will also need to be supported by a detailed study on increasing the mill capacity to 1200 tpd. Moreover, it should be kept in mind that the design and costing of different material handling systems for underground ore handling may also have a significant impact on electrical power.

1.12.5. Environment

Even though Richmond's environmental and social management programs are robust, the company must continue to manage the environmental and social aspects of all project components, looking for opportunities to continuously improve performance, with relevant costs being part of OPEX.

Water management is one of the main issues addressed by permits from government agencies and presents the highest risk to operations if not optimized. Additional improvements to water management systems are therefore

recommended, the main one being a diversion system around the Primary Pond of the Tailings Management Facility, which is estimated to cost \$2.1 M; this should be part of CAPEX.

1.12.6. Recommended Budget to continue development of the Island Gold Lower Zones

To complete the proposed work program and advance the Island Gold Lower Zones to production, InnovExplo and its collaborators estimate that a budget of approximately \$65.8 M is required, as presented in the table below.

Budget to continue the development of the Island Gold Lower Zones (Table 26.2)

Item	Cost
Geology	
Complete planned definition and delineation drilling in the PEA	Already engaged
Mining	
Detailed engineering to increase production to 1150tpd	\$300,000
Development – Project Capital	\$32,186,630
Mobile Equipment – Project Capital	\$11,902,556
Underground Construction – Project Capital	\$6,254,839
Mineral Processing	
900 tpd mill optimization and upgrade (availability)*	\$ 3,297,100
Surface Infrastructure	
Mine Buildings – Project Capital	\$2,000,000
Environment	
Primary Pond – Project Capital	\$9,900,000
Total	\$65,841,125

2. INTRODUCTION

At the request of Richmond Mines Inc. (“Richmont” or the “issuer”), InnovExplo was retained to produce a Preliminary Economic Assessment (the “PEA”) and Technical Report (the “Report”) for the Island Gold Lower Zones (the “Project”), in compliance with National Instrument 43-101 (“NI 43-101”) and Form 43-101F1.

This report is addressed to Richmond Mines Inc., a Canadian gold producer. The common shares of Richmont are listed and posted for trading on the Toronto Stock Exchange (TSX) and the NYSE MKT under the symbol “RIC”.

InnovExplo is an independent mining and exploration consulting firm based in Val-d’Or (Quebec).

Richmont began its exploration activities in northwestern Quebec in 1984. Richmont holds all shares of Camflo Mill Inc., a corporation incorporated under the Canada Business Corporations Act, all shares of Patricia Mining Corporation (“Patricia Mining”), a corporation continued under the Ontario Business Corporation Act, and all shares of Louvem Mines Inc. (“Louvem”), a corporation incorporated under the Companies Act (Quebec), now governed by the Business Corporations Act (Quebec).

Richmont currently operates two gold mines: the Beaufor mine in Quebec and the Island Gold mine in Ontario. The Island Gold mine is located approximately 83 km northeast of Wawa, Ontario, in the Sault Ste. Marie Mining Division. The nearest town is Dubreuilville, Ontario, approximately 10 km northwest of the Island Gold mine.

2.1. Terms of Reference

The issuer requested a PEA for the Island Gold Lower Zones. This project pertains to resources in the C Zone between levels 450m and 860m. Specific objectives of the PEA were to:

- Establish a realistic and sustainable output capacity for the potential mineable mineral resource using the same mining method.
- Determine resources potentially amenable to mining.
- Elaborate a mining plan for these resources
- Estimate capital and operating costs related to the mine plan.
- Recommend additional work to advance the Project to the next stage.
- Produce a technical report compliant with Form 43-101F1.

2.2. Principal Sources of Information

InnovExplo's PEA was based on published material as well as the data, professional opinions and unpublished material submitted by Richmond or requested by InnovExplo or other participating consultants to complete the study. Cost estimation data were also obtained from service providers, suppliers and material handling distributors/fabricators.

Authors also consulted other information sources, such as the Mining Claims Information database for the status of mining titles and the Geology Ontario online warehouse for assessment work, both available via the Ministry of Northern Development and Mines website, as well as technical reports, annual information forms, annual reports, management's discussion and analysis reports, and press releases published by Richmond on the SEDAR website.

InnovExplo and the other participating consultants conducted a review and appraisal of the information used to prepare this PEA, including its conclusions and recommendations, and they are of the opinion that such information is valid and appropriate considering the nature and level of the study (PEA) and the purpose for which the report is prepared. The authors have fully researched and documented the conclusions and recommendations made in the report.

Other sources of information used in this report are listed in the references or elsewhere in the text of the report.

The consultants do not have nor have they previously had any material interest in Richmond Mines Inc. or related entities. The relationship with Richmond is solely a professional association between the client and the independent consultants. This Report was prepared in return for fees based upon agreed commercial rates, and the payment of these fees is in no way contingent on the results of this report.

2.3. Qualified Persons and Inspection on the Project

The qualified persons (QPs) responsible for the preparation of this Technical Report are:

- Sylvie Poirier, P.Eng. (OIQ No.112196, PEO No.100156918), of InnovExplo;
- Daniel Adam, P.Geo., PhD (OGQ No. 229, APGO No. 1837), of Richmond;
- Jean Bastien, P.Eng., MBA (OIQ No. 39570, PEO No. 100219259) of Richmond; and
- Mathieu Belisle, P.Eng. (OIQ No. 128549, PEO No. 100210246) of Soutex.

In addition to the principal authors and QPs, the other people involved in the preparation of this report were:

- Jean Garant, Eng., M.Sc. (InnovExplo);
- Serge Morin, Sr. Tech. (InnovExplo);
- François Girard, Eng. (InnovExplo);
- Justin Roy, EIT. (Richmond Mines);
- Raynald Vincent, P.Eng. M.G.P. (Richmond);
- Line Dorval, CPA, CGA (Richmond); and
- Vincent Ramcharan, M.Eng., P.Eng.

The list below presents the sections for which each qualified person (as set out in NI 43-101) was mainly responsible:

Sylvie Poirier: supervised the assembly of the report; author of sections of 22; co-author of sections 1, 2, 3, 16, 18, 21, 24 and 25 to 27.

Daniel Adam: author of sections of 4 to 12, 14, 15, 19, 20 and 23; co-author of sections 1, 2, 3, and 24 to 27

Jean Bastien: co-author of sections 1, 2, 3, 16, 18, 21, and 24 to 27.

Mathieu Belisle: author of sections 13 and 17; co-author of sections 1, 21 and 25 to 27

The following QPs visited the Island Gold mine for the purposes of the PEA:

- Sylvie Poirier of InnovExplo visited the mine on April 9 and 10, 2015, accompanied by Jean Garant of InnovExplo.
- Mathieu Belsile, P.Eng., of Soutex, worked regularly as Interim Mill Superintendent at the Island Gold mine from April 2015 to December 2015

2.4. Note Regarding the 2015 Preliminary Economic Assessment

Preliminary Economic Assessment (PEA) means a study, other than a Preliminary Feasibility Study or Feasibility Study, which includes an economic analysis of the potential viability of mineral resources. PEA is defined only in NI 43 101, not in the CIM definition standards. A PEA is preliminary in nature; it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. A PEA uses the concept of “mineral resources within a conceptual mining plan” or “mineral resources within a PEA design plan”. If an issuer can qualify mineral reserves or make a production decision based on the PEA, it may be misleading to call it a PEA. A mineral reserve is the economically mineable part of a measured or indicated mineral resource demonstrated by at least a Preliminary Feasibility Study. The results of a Feasibility Study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of a project.

2.5. Units and Currencies

All currency amounts are stated in Canadian Dollars (\$, C\$) or US dollars (\$US). Quantities are stated in metric units, as per standard Canadian and international practice, including metric tons (tonnes, t) and kilograms (kg) for weight, kilometres (km) or metres (m) for distance, hectares (ha) for area, and grams (g) or grams per metric ton (g/t) for gold grades. Wherever applicable, imperial units have been converted to the International System of Units (SI units) for consistency. A list of abbreviations used in this report is provided in Appendix I.

3. RELIANCE ON OTHER EXPERTS

InnovExplo and Soutex were contracted by the issuer to collaborate on the preparation of a PEA and Technical Report for the Island Gold Lower Zones. All authors are qualified persons as defined by NI 43-101, however only the InnovExplo and Soutex authors also meet the requirements for independent persons.

Some of the geological and/or technical reports for projects in the vicinity of the Island Gold mine were prepared before the implementation of NI 43-101. The authors of such reports appear to have been qualified, and the information prepared according to standards that were acceptable to the exploration community at the time. In some cases, however, the data are incomplete and do not fully meet the current requirements of NI 43-101. The authors have no known reason to believe that any of the information used to prepare this report is invalid or contains misrepresentations.

The authors relied on reports and opinions as outlined below for information that is not within the authors' fields of expertise.

The following persons from Richmond provided InnovExplo with information and data:

- Vincent Ramcharan, independent consultant, provided information related to the environmental aspect of the study and the tailings.
- Line Dorval, Accounting Analyst and Special Projects, provided information related to financial statistics, unit costs, equipment, manpower and other information related to the Island Gold accounting structure, as well as budget figures.

The authors believe the information used to prepare this report and to formulate its conclusions and recommendations is valid and appropriate considering the preliminary level of this economic assessment.

The authors, by virtue of their technical review of this PEA, affirm that the work and recommendations presented in the report are in accordance with NI 43-101 and CIM technical standards.

4. PROPERTY DESCRIPTION AND LOCATION

4.1. Location

The Island Gold mine is located approximately 83 km northeast of Wawa, Ontario, in the Sault Ste. Marie Mining Division, at longitude 84° 27' W, latitude 48° 18.5' N (Figure 4.1). Dubreuilville is the closest town to the Project, approximately 10 km to the northwest.



Figure 4.1 – Geographic location of the Island Gold Project and mine

4.2. Description of Mining Titles

The Island Gold property is divided into nine parts and consists of 219 patented, leased and staked claims totalling 7,772 ha, located mainly within the Finan and Jacobson townships. These claims are grouped into nine (9) different properties: Kremzar, Lochalsh, Goudreau, Goudreau Lake, Edwards, Salo, Ego, Argonaut and Island Gold (Table 4.1 and Figure 4.2). A list of the mining titles is provided in Appendix II. The Island, Lochalsh and Goudreau zones are located on the Lochalsh and Goudreau properties. The mining patents and leases have been legally surveyed. The surface rights are held by the Crown. All the claims are registered under the name of Richmond Mines and all are in good standing. Mining titles on the Island Gold Project, as well as on adjacent properties, grant Richmond Mines the following rights:

- Claims Exploration for mineral substances: Rights to subsurface only. Work required for renewal of right.
- Mining Leases are for a 20-year period: No obligation or work requirement. Payment of annual fee.

- Surface rights limited to mining activities: Possibility to renew for additional periods of 10 years.
- Patents For life: No obligation or work requirement. Payment of annual fee. Surface rights limited to mining activities.
- Patents For life: No obligation or work requirement. Payment of annual fee. Surface rights limited to mining activities.

Table 4.1 – Richmond Mines Properties - Island Gold Mine Area

Property	Number of claims	Area (ha)	Description / Expiry date	Richmont Mines Ownership (%)
Kremzar	21	383	Patented Claims: taxes are paid every year, 2 Mining Leases: 02/28/2022 to 06/30/2030	100
Lochalsh	33	349	Patented Claims: taxes are paid every year Mining Leases: 06/30/2030 to 03/31/2033 Part of 1 mining lease Claims: 02/06/2017 to 02/06/2018	100 100 below 100m
Goudreau	65	988	58 Patented Claims: 6 Patented Claims: Part of 1 Patented Claim: taxes are paid every year 1 Claim: 08/20/2018	100 100 below 400m 100 below 100m
Goudreau Lake	4	58	4 Patented Claims: taxes are paid every year	100
Island Gold	41	5,119	Claims: 07/14/2016 to 07/14/2019	100
Edwards	43	703	Patented Claims: taxes are paid every year Claims: 04/05/2017 to 08/28/2019	100
Ego	3	64	Claims: 06/05/2016	100
Salo	3	40	Claims: 06/08/2017 to 12/28/2018	100
Argonaut	6	72	3 Patented Claims: 1 mining lease: 04/30/2030 2 claims: 02/05/2018 to 04/18/2018 taxes are paid every year	100 below 400m 100 100

The mineralized zones, including the reserves and resources of the Island Zone and underground infrastructure, are located on mining leases 991853, 991854 and 991852 and patented claim 2075 of the Lochalsh property. The ramp and waste pad are on patented claims 1776 and 1710 of the Goudreau property. The reserves and resources of Lochalsh are located on mining leases 825288 and 825287 of the Lochalsh property. The Goudreau resources are located on patented claim 3817 of the Goudreau property. The deep C Zone estimated mineral resources at the Island Gold mine are principally located on the Lochalsh mining lease 825288 and on Goudreau Lake patented claims 2491 and 2666.

4.3. Ownership of Mineral Rights

All the mining titles of the properties are held by Richmond following different acquisition agreements described in the following section.

All mining titles on the Island Gold Project, with the exception of four (4) patented claims of the Goudreau property (2490, 2491, 2666 and 2667), were jointly held by Richmond (55%) and Patricia Mining Corp. (45%). Since the acquisition of Patricia Mining on December 16, 2008, Richmond holds 100% of all mining titles relating to the Island Gold property, except for the already mentioned four (4) claims for which Richmond owns 69%, and the remaining 31% is held by a third party. Following the acquisition, the mining rights owned by Patricia Mining (45%) were transferred to Richmond in February and March 2009.

4.4. Agreement Summaries

4.4.1. History

During the 1980s and early 1990s, Canamax Resources Inc. held the Project claims until Canada Tungsten Inc. ("Canada Tungsten") acquired them through a merger. The patented and leased claims were acquired by Patricia Mining from Canada Tungsten in April 1996, and were subdivided into the Kremzar, Lochalsh and Goudreau properties. Canada Tungsten merged with Aur Resources Inc. ("Aur") at the end of 1996. By 1996, Patricia Mining owned 100% of the Kremzar and Lochalsh properties and had a 53.4% joint venture interest in the Goudreau Property. Pursuant to the purchase agreements for the Lochalsh and Goudreau properties, Patricia Mining agreed to indemnify Aur against any liabilities arising from the mine closure, rehabilitation, decommissioning and reclamation of the properties, including liabilities arising pursuant to the closure plan.

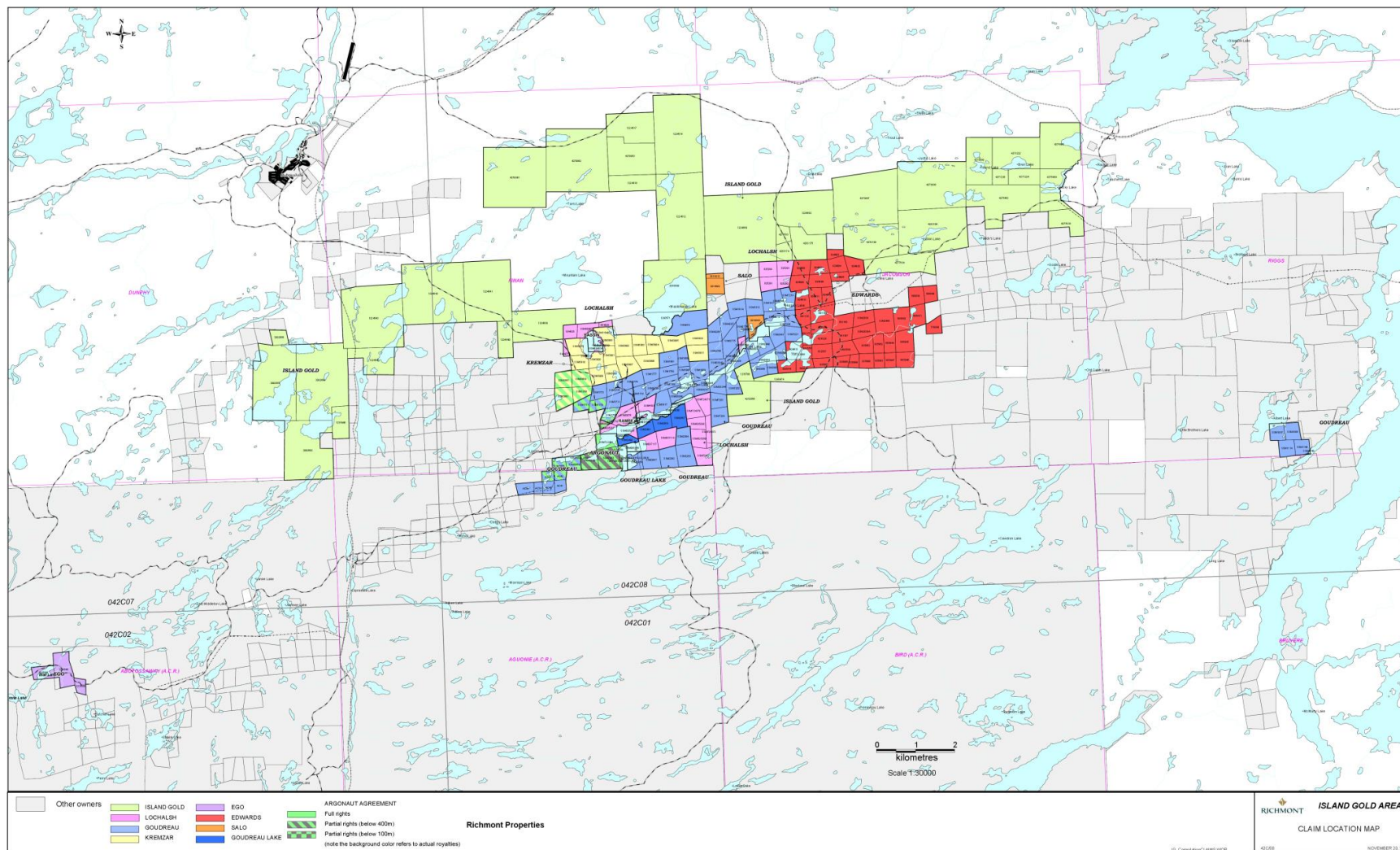


Figure 4.2 – Claim map – Island Gold Mine Area

4.4.2. Richmond–Patricia Mining Joint Venture

Richmont entered into an agreement with Patricia Mining on August 28, 2003. Under the agreement, Richmont completed a private placement investment of C\$1.0 million in common shares of Patricia Mining at C\$0.50 per share, and obtained an option to acquire a 55% interest in the Island Gold property by investing up to C\$10 million or by bringing the project into commercial production. This initial investment was used to partly finance a C\$3 million exploration program on the Island Gold property. On December 3, 2004, Richmont decided to invest up to an additional C\$10 million in order to acquire a 55% interest in the project. Richmont became the project operator as of January 1, 2005. The Corporation acquired its 55% interest during the course of the fourth quarter of 2005, after having fulfilled its obligation to invest C\$10 million toward the project's development.

In January 2006, Richmont and Patricia Mining announced the purchase of the remaining joint venture interest of Algoma Steel Inc. ("Algoma") in the Goudreau property near Dubreuilville, Ontario, for C\$100,000. The property remains subject to a 15% net profit interest ("NPI") royalty as per the original joint venture agreement between Algoma and Patricia Mining.

On December 16, 2008, Richmont acquired all of the common shares of Patricia Mining that it did not already own pursuant to a plan of arrangement under the Business Corporations Act (Ontario). Following this transaction, Richmont's ownership interest of the Island Gold Mine increased to 100%.

4.4.3. Other Agreements

On May 9, 2012, Richmont acquired Red Pine Exploration's remaining 25% interest in the Edwards property, bringing the Corporation's ownership to 100%, and on June 13, 2012, the Corporation acquired the Salo property, which includes three (3) claims to the east of the Island Gold mine.

On October 16, 2013, Richmont entered into a land and mining rights agreement with Argonaut Gold Inc. ("Argonaut"), owner of the Magino Gold Project adjacent to the Island Gold mine. The agreement enables Richmont to extend the western boundary of its Island Gold Lower Zones by a distance of approximately 585 m, thus increasing the project's exploration potential towards the west. Mining rights below a depth of 400 m were also secured on several claims to the south of the Island Gold Lower Zones, thus adding to the project's exploration potential at depth. As part of the agreement, Richmont will acquire Claim SSM 722481 in its entirety, which immediately abuts Island Gold's Lochalsh Zone, where reserves and resources currently exist and where mining is currently taking place. In exchange, Argonaut will receive exploration and mining rights from surface to a maximum depth of 400 m on certain Richmont claims that border the Magino Gold Project, providing it with greater flexibility in its project development. Under the terms of the agreement, Richmont will receive a net payment of C\$2.0 million in cash from Argonaut upon completion of the land transactions. This Agreement was slightly modified in June 2014. Under the revised terms, Argonaut will receive one claim in its entirety and surface and mining rights down to a depth of 400 m on six (6) claims. It will also receive surface rights on two claims down to a depth of 100 m. Richmont will receive two additional claims for a total of three (3), and mining rights below a depth of 400

m on three (3) claims. As previously reported, under the terms of the Agreement, Richmond will receive a net payment of C\$2.0 million in cash from Argonaut upon completion of the land transactions, which are now expected to take place in 2015.

On August 5, 2014, Richmond announced that it had signed a definitive agreement to acquire the outstanding 31% ownership of four (4) patented claims on the Island Gold Mine property, thereby increasing its ownership of these claims to 100% from 69% previously. The 31% ownership held by the third party will be acquired by Richmond in return for a 3% Net Smelter Return (“NSR”) royalty that is payable on 100% of the mineral production from the four claims (see press release of August 5, 2014).

On August 6, 2014, Richmond announced it had closed the previously detailed transaction consolidating its ownership of the Island Gold Mine property. Richmond acquired the remaining 31% interest of the four (4) claims of Goudreau property (claims 2490, 2491, 2666 and 2667, now called the Goudreau Lake property) and now owns 100% interest in all claims.

4.5. Mineral Royalties

Island Gold Project properties held by Richmond are subject to the payment of royalties and financial contractual obligations.

The Kremzar property is subject to a 4% NSR payable to Algoma, which becomes payable to Algoma pursuant to the Algoma Royalty Agreement.

The Kremzar property is also subject to a 3% NSR payable to Teck, which is payable until such time as the Algoma NSR becomes payable. In the event that the Algoma NSR becomes payable and is reduced below 4%, Teck will be entitled to receive an NSR equal to 50% of the amount by which the Algoma royalty is reduced, payable on the same terms as the Algoma NSR.

The Lochalsh property is subject to a 3% NSR payable to Teck. The Island Main and Lochalsh zones, as well as a part of the Island Gold Lower Zones mineral resources, are located on this property.

The Goudreau property is subject to a 2% NSR payable to Teck and a 15% net profit interest (“NPI”) royalty payable to Algoma.

The Goudreau Lake property is subject to a 3% NSR royalty payable to Host’s Gold Incorporated. They are also subject to a 1.38% NSR royalty payable to Teck and a 10.38% NPI royalty in favour of Algoma Steel.

The Salo property is subject to an NSR royalty of 2% in favour of M.A. Tremblay, J. Robert, R. Salo and P. Robert.

Red Pine Exploration owns a 2% NSR on the Edwards property.

There is a 10% NPI payable to Cavendish on four (4) claims of the Argonaut property

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES AND PHYSIOGRAPHY

5.1. Access

Access to the Island Gold mine and its environs (herein the “Project” or the “property”) is via four-season road from Highway 519, just west of Dubreuilville, which is located approximately 35 km east of the junction between highways 17 and 519. It takes approximately one hour to drive from Wawa to the mine site.

5.2. Climate

The Project is located within the Lake Superior Regional climatic zone, moderated by the influence of Lake Superior. The average day time temperature is 2 °C, with a range of 31 °C to -41 °C. Annual precipitation is normally 669 mm of rain and 278 cm of snow. Winter winds are from the northwest to north, and southwest to westerly winds prevail during the summer.

5.3. Local Resources

Wawa has a population of approximately 3,500. Dubreuilville, originally a forestry community, has a population of approximately 900. The Island Gold mine is also within a few kilometres of railway lines operated by Canadian National Railways and Algoma Railways. Sidings for each of these railway lines are located in the villages of Goudreau and Lochalsh.

A power substation connected to the provincial power grid, water supply, gravel roads, offices, maintenance buildings and living accommodations are all available within the mine area. Power is supplied by Algoma Power Inc. (formerly Great Lakes Power Corporation).

Richmont also offers living accommodations and flexible schedules to its employees. Training is offered in order to maintain a local qualified workforce.

5.4. Surface Infrastructure

The Island Gold infrastructure includes a primary tailings pond, secondary settling pond, Kremzar Mill (a carbon-in-pulp mill), Lochalsh ramp and portal, mine access road, and hydro-electric power lines, all of which are located on the property. An office, core logging and storage facility, and a mine dry are located on the previously producing Kremzar mine site. When the Kremzar carbon-in-pulp mill was constructed in 1988, it was capable of handling 650 tpd. Since then, its milling capacity was increased to 850 tpd in 2010 and finally 900 tpd in October 2015. Miller Lake, which is located west of the Kremzar mine, is a fully permitted tailings area. The tailings and waste rock have been tested and are not acid generating. All permits for mining and milling operations have been maintained.

5.5. Physiography

The mine area is within the Precambrian Shield adjacent to Lake Superior, in an area of low rolling hills that trend in an east-west direction. Rivers, streams and lakes have a northeast trend reflecting glacial and some regional structural trends. The local topography consists of low ridges and hills surrounded by flat areas of glacial material, swamps and lakes. Property relief is low, from a high point of 488 masl

near the Miller and Maskinonge lakes, to a topographic low point of 381 masl near Goudreau Creek. The Project area has been partially logged.

6. HISTORY

Part of the information in this section is from the Genivar 43-101 technical report for the Island Gold mine.

6.1. Kremzar Mine

Patrice Kremzar first discovered gold on the claim group hosting the Kremzar mine in 1925. By the early 1930s, some 13 gold occurrences had been identified, primarily within quartz veins and lenses associated with shear zones. In 1983, Canamax and Kremzar Gold Mines Ltd, a subsidiary of Algoma, entered into a joint venture to explore the property. Subsequently, Canamax discovered the Kremzar Zone to the north of the Goudreau Lake Deformation Zone (GLDZ). At this location gold occurs with pyrite in a zone of intense silicification. The zone trends approximately east-west and dips to the south. During 1985 and 1986, a ramp was driven to intersect the gold-bearing zone, and in 1988 a mill was constructed on the property. Mining began during the fourth quarter of 1988 and continued until late 1990. A total of 1,455,580 g (46,798 oz) of gold was produced from 306,603 tonnes of ore during the operating period. The average head grade of the ore was calculated at 4.77 g/t Au. Closure of the mine was due to lower than expected mill head grades, reportedly resulting from excessive dilution caused by the bulk mining method in use. With the exception of some limited trenching and sampling by Patricia Mining Corp. ("Patricia Mining") since 1997 on the Kremzar mine property, very little was done at the property between 1997 and now.

6.2. Island Gold Exploration History

Algoma began assessing the Goudreau area for sulphur and iron at the turn of the century. The Emily Bay occurrence, an auriferous sulphide-oxide iron formation, was trenched and 38 holes drilled in the 1940s. Algoma discovered gold mineralization within the Goudreau Iron Range in 1953 and 1954, with samples yielding grades averaging 3.0 g/t Au, or better, in places. The volumes and grades encountered at that time were not economic at prevailing gold prices, and no further work was conducted. The iron formations are Michipicoten-type stratiform, and are relatively continuous in shape and grade. Amax Minerals Exploration (Amax), the predecessor of Canamax, initiated exploration on the property area in 1974.

During the period 1974 to 1976, AEM surveying, prospecting, mapping, sampling and diamond drilling (comprising 12 drill holes) was completed. Continued exploration from 1976 to 1979 included an additional 10 drill holes. Canamax, a subsidiary of Amax, took over exploration in the area from Amax and began exploring the Wawa Greenstone Belt in 1978.

In 1983, Canamax and Algoma formed a joint venture to evaluate the mineral potential of Algoma's 117 patented claims covering the Goudreau Iron Range. In 1983, Canamax explored the known gold occurrence in the Morrison No. 1 Iron Formation, located north of the Goudreau Zone. Two other gold zones, the Pine Zone Iron Formation (Pine Zone) and the Breccia Zone, were discovered in Jacobson Township. The zones are associated with a major structural break referred to as the Breccia Zone Fault or the Pine Zone Fault. Canamax completed 21 holes on the Pine Zone and a reserve estimate, which outlined a small tonnage of

subeconomic gold mineralization. In 1983, Canamax began to acquire claims through staking and purchase in southern Finan Township.

During 1987 and 1988, exploration drill programs concentrated on the Morrison No. 1 area. Multiple alteration zones containing gold mineralization along a 500-m strike length were found within the GLDZ structure. In late 1988, Canamax drilled four (4) holes to the south and southeast of Spring Lake in Aguonie Township. Weak alteration zones were intersected along this section of the GLDZ. Gold was found in sericitized felsic volcanic rocks, in narrow quartz veins in mafic volcanics, and in sulphide-carbonate iron formation. Drilling indicates that the GLDZ has a width of about 180 m in this area. The claims in this area were allowed to revert back to Algoma.

In 1985, drilling by Canamax about 2 km south of the Kremzar mine intersected a series of subparallel lenses containing gold mineralization within deformed rocks of the GLDZ. Detailed diamond drilling through 1987 and 1988 was used to define the higher-grade lenses, known as the Lochalsh, Island Gold, Shore and Goudreau Lake zones. The Island Gold Zone is now referred to as the Island Zone.

During 1989 and 1990, a ramp 1,280 m long was driven into the Island Zone beneath Goudreau Lake from an adit on the north shore. Drifts and raises totalling 382 m were developed on two levels at depths of 125 m and 140 m. A 400-m drift was established north of the zone to provide stations for underground diamond drilling. Systematic chip and muck sampling was carried out on both levels. A bulk sample of 4,167 tonnes was extracted from the underground workings and processed at the Kremzar Mill. The bulk sample head grade was reported to be approximately 6.5 g/t Au.

From April 1996 to September 1997, Patricia Mining completed 15,545 m of diamond drilling in 42 holes on the Island and Lochalsh zones. In November 1996, Pearson, Hofman and Associates Ltd (PHA) reviewed the exploration program proposed by Patricia Mining and recommended a program of surface exploration drilling. The drilling program was designed to explore for mineralization in the 500-m gap between the Lochalsh and Island zones. In 1997, trenching was completed in 15 areas on the claim holdings, concentrating on the Kremzar property. The trenching program aimed to expand previously trenched gold showings in an effort to identify targets that may warrant follow-up exploration.

In November 1997, Patricia Mining retained RPA to undertake a review of the work completed by Patricia Mining, to estimate the mineral resources contained in the Island Zone, Lochalsh Zone, and other mineralized zones, and to prepare an independent report. In July 1999, RPA was retained by Patricia Mining to prepare an update to the RPA report issued in 1997. The purpose of the latter was to comment upon the work completed by Patricia Mining on its land holdings in the Wawa area in the time following the first RPA report.

From May 2000 to April 2001, Patricia Mining completed mechanical stripping, washing, geologic mapping, channel sampling, diamond drilling, line cutting, and magnetics and IP geophysics on several auriferous zones identified on the Island Gold Project. Trenches were excavated over Zone 8, Zone 3, Zone 2, Northwest

Extension, Pine Zone, Breccia Zone and Portal Zone. Two BQ diamond drill holes were completed to test the new interpretation that the North Shear was a major northeast-trending mineralized structure. As a result of these holes, a 20.5 line-km exploration grid was cut over the North Shear, and JVX completed magnetic and IP geophysical surveys. Holes PL-17, 21, 22, 24, 30, 00-06, 00-10 and PI-03 were re-logged in February 2001.

From April to June of 2001, a geological mapping, diamond drilling, drill core re-logging and sampling program was completed to assist in determining the extent of the North Shear and possible low grade bulk tonnage resources in the GLDZ. Geological mapping was completed over the exploration grid cut in late 2000. Five NQ drill holes totalling 1,027 m were completed over the North Shear target. These holes confirmed that the North Shear was a major mineralized structure parallel to the Island Zone and Lochalsh Zone. Re-logging of drill core stored at the Kremzar mine site also continued.

In February 2002, drill core re-logging and sampling was completed on 8,054 m in 24 drill holes previously drilled by Patricia Mining. The program was designed to expand upon previous information gained from work in 2001 and to assist in estimating potential bulk mineable resources. In March 2002, RPA was retained by Patricia Mining to prepare an addendum report to the RPA report issued in December 2000.

In 2004, Patricia Mining performed an underground exploration program on the Island Zone at a cost of \$3.0 million. The exploration work consisted of underground development, underground definition drilling and surface drilling. At the end of 2004, Richmond completed seven (7) holes to evaluate the deep extension of the Island Zone and also decided to invest up to \$10 million in order to acquire a 55% interest in the project. Approximately 1,100 tonnes of material was brought to surface and placed next to the portal in separate stockpiles of waste rock, low-grade ore and high-grade ore. Geological mapping was done in the new development in the level 140m sill drift. Each face and slash was mapped based on alteration codes and quartz vein terminology used in the 2004 underground drilling. A surface winter drilling program comprising ten (10) holes totalling 6,119 m of core drilling was also completed during the year. The surface program tested the North Shear and Shore zones, as well as the depth extensions of the Island and Lochalsh zones.

From 2005 to 2008 inclusively, most of the exploration work completed in the Island Gold mine area was performed underground except for 25 surface diamond drill holes (PRS-01 to PRS-25) drilled in 2006. A total of 423 diamond drill holes were completed from 2005 to 2008, representing 56,312 m. These diamond drill holes targeted mainly the E1E (Island and Ext-1) and CD zones. A minimal portion targeted the North Shear Zone and E1E Ext-2 sectors, and the western extension of the known zones between Island Gold E1E and C/D packages and the Lochalsh Zone.

During 2009, underground drilling at the Island Gold mine consisted of 212 drill holes totalling 26,914 m. approximately half these metres were exploration holes in the Lochalsh, Goudreau and Extension 2 zones. The drilling confirmed the presence and continuity of the targeted zones. A surface diamond drilling program was implemented in conjunction with the underground drilling. The goal of this program

was to primarily test the near surface eastern and western extensions of the known zones in the vicinity of the Island Gold mine. Other potential areas, such as Zone 21 and Magino-type gold mineralization immediately east of the property boundary, were also tested.

In 2010, Richmond continued its underground exploration program via drilling and drifting in order to improve the quality of the resources, convert resources to reserve categories and to increase the resource base. A total of 225 drill holes over 36,533 m of delineation drilling and exploration drilling were completed underground at the Island Gold mine. Exploration holes in the Lochalsh, Goudreau, Extension 2 and Extension 3 sectors represented 24,423 of those metres. The 2010 drilling confirmed the presence and continuity of the targeted zones. In the Lochalsh sector, it permitted a better understanding and evaluation of the area. The exploration drilling into the Extension 2, Extension 3, Goudreau and Lochalsh sectors confirmed the location of the known resources. In some cases the quality of the estimated resources improved (for example, from inferred to indicated) and permitted the conversion of a portion of the resources into probable reserves. Also during the year, a surface diamond drilling program was conducted. The goal of this program was primarily to test the known zones in the vicinity of the Island Gold mine along eastern and western extensions and at depth. The 2011 surface exploration drill program was completed in late December. The program consisted of 49 holes and totalled 30,015 m. The drilling on the projected eastern (Extension 3 area) and western (Lochalsh area) extensions of the mine structure horizons was successful in identifying the continuity of similar alteration, mineralization and shearing found in the Island Gold Deposit. Also mineralized intersections, representing the extensions of the known zones, were intercepted at depths up to 800 m below surface.

In 2012, Richmond continued its underground diamond drilling program to improve the quality of the resources, convert resources to reserve categories, and to increase overall resources. During 2012, 320 holes totaling 42,131 m of delineation and exploration drilling were completed underground at the Island Gold mine. Exploration holes in the Island Deep and Extension 2 sectors represented 3,083 of these metres. The 2012 drilling program confirmed the presence and continuity of the targeted zones. The definition drilling into the Extension 1 and Extension 2 sectors permitted the conversion of probable reserves to proven reserves. In the Lochalsh sector, it permitted a better understanding and evaluation of the area. Drilling into the Extension 1, Extension 2, Goudreau and the Lochalsh sectors confirmed the location of the known resources, and in some cases increased the quality of the estimated resources (for example, inferred to indicated) and permitted the conversion of a portion of the resources into probable reserves.

Also, in 2012, a surface diamond drilling program was conducted to primarily test the known zones in the vicinity of the Island Gold mine along eastern and western extensions and at depth. The 2012 surface exploration drill program consisted of 76 holes totaling 40,077 m. The drilling on the projected eastern (Extension 2 area) and western (Lochalsh area) extensions of the mine structure horizons was successful in identifying the continuance of similar alteration, mineralization and shearing found in the Island Gold deposit. Also, mineralized intersections, representing the extension of the known zones, were intercepted at depths up to 1,000 m below surface.

In 2013, Richmond continued its exploration drilling program in order to improve the quality of the reserves, increase the resources and convert resources to reserve categories in the upper part of the mine and to increase the resources in the lower part (Island Gold Deep). During the year, a total of 37,707 m of definition-delineation drilling, and 62,210 m of exploration drilling (Island Gold Deep) were completed over 443 holes.

In 2014, about 360 holes for approximately 41,300 m were drilled, excluding some service holes. A total of 38,800 m of underground diamond drilling were completed at the Island Gold mine. Definition-delineation drilling in the upper sectors of the mine and in Extension 1 succeeded in renewing the mine's mineral reserves. Exploration holes to the east, below Extension 1, confirm the presence and continuity of the mineralized zones at depth in this area. A surface exploration drill program consisting of three (3) holes totaling 2,523 m was completed to test the projected eastern extension of the mine's mineralized zones into the Extension 2 area. The first hole was stopped because of too much deviation, the second hole intersected mineralized zones at a vertical depth of more than 1,200 m, confirming the continuity of the mineralized system at depth with a gold value of 19.87 g/t Au over an estimated true width of 3.93 m.

6.3. Historical and Recent Geophysical Surveys

Geophysical surveying within the project area includes regional-scale airborne magnetic surveying, a ground magnetic and spectral induced polarization (IP) survey, and a seismic survey. The airborne magnetic survey consists of data collected in 1983 and 1986 using the Aerodat system. The ground magnetic and spectral IP surveys were carried out by JVX Ltd in January 2000. The surveys were focused on the area between 14,000 E and 15,500 E, and 4,600 N and 5,200 N, and were designed to delineate sulphide zones related to gold mineralization. The ground magnetic survey outlined three northwest-trending structures, two of which are known to be diabase dikes and one that coincides with an IP zone (Webster, 2001). The magnetics also indicate a distinct magnetic high that trends along the south side of Goudreau Lake and coincides very closely with the intercalated phyrichloritic flows located south of the Webb Lake Granodiorite. The spectral and resistivity IP survey outlined nine anomalous zones, which were interpreted to represent six exploration targets from RPA (2002).

Seismic surveying was carried out by Geophysicon Geophysical Consultants of Calgary, Alberta, over Goudreau Lake during the winter of 1989. The main purpose of the survey was to obtain detailed information on the depth to bedrock prior to proceeding with underground development at the Island Zone. The depth to bedrock profile data from this report had been digitized into Gemcom.

In 2010, an Aeroquest helicopter magnetometer gradiometer/VLF survey was done over the Richmond property. This survey has been combined and compiled with three previous ones by JVX Ltd (2011) to better understand the geophysical expression and setting of the gold mines, prospects and occurrences.

In 2012, Spectral IP/resistivity and magnetic surveys were done on three grids on Richmond's Island Gold property (JVX Ltd, 2012).

6.4. Historical and Existing Island Gold Mine Mineral Resource Estimates

A number of resource and reserve estimates have been prepared over the years for the gold zones within the Island Gold mine area. The more recent and relevant ones for the Island and Lochalsh zones are summarized below. Neither Richmond nor the authors of this report have reviewed the historical estimates in sufficient detail to comment on their reliability. A number of earlier resource estimates from the late 1980s and early 1990s are not discussed because more drilling has been carried out since that time.

6.4.1. 2002 Kallio resource estimate

The 2002, the Kallio resource estimate covered a large area that included the Island, Lochalsh, Goudreau, North Shear and Centre zones (Kallio, 2002). The Kallio estimate was the first estimate reported on SEDAR in a NI 43-101 technical report. The Island Zone portion of the Kallio estimate can no longer be considered current because of the significant amount of drilling and underground work that has been carried out since then.

The 2002 Kallio estimate used a block model based on an open pit mining concept and 5 m x 5 m x 5 m blocks. Inferred resources of 20,610,000 tonnes at 2.35 g/t Au were estimated using a 0.75 g/t Au cut-off, 4,210,000 tonnes at 6.00 g/t Au using a 3.0 g/t Au cut-off, and a total of 2,034,000 tonnes at 8.30 g/t Au using a 5.0 g/t Au cut-off.

These “resources” are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context. Richmond did not review the database, key assumptions, parameters or methods used by Kallio for this mineral resource estimation.

6.4.2. RPA resource estimate

In 2004, RPA assisted by Hubacheck Consulting Geologists (HCG) completed the geological interpretation for the Island Zone. An approximate 4.0 g/t Au cut-off grade in conjunction with a 1.0-m minimum horizontal thickness were used to define composite control intervals. Some minor exceptions were made to preserve zone continuity.

A 6.0 g/t Au cut-off grade was used to define resource outlines on the longitudinal sections. At the 6.0 g/t Au cut-off grade, RPA estimated that the Indicated mineral resources of the Island Zone totalled 272,000 tonnes at an average grade of 12.3 g/t Au for 108,000 ounces of gold, cutting all high assays to 75 g/t Au. RPA estimated that the Inferred mineral resources totaled 275,000 tonnes at an average cut grade of 13.1 g/t Au for 116,000 ounces of gold.

These “resources” are historical in nature and should not be relied upon. In 2004, they were conform to NI 43-101 criteria and to CIM Standards and Definitions at this time. Since 2004, more drilling has been added and more geological information are available. Additionally, assumption used to determine cut-off grades are likely to have change since 2004. Consequently, these “resources” cannot be considered as current. They are included in this section for illustrative purposes only and should not be disclosed out of context.

6.4.3. Genivar resource estimate

In 2006, 2007 and 2008, Genivar assisted by HCG personnel completed the geological interpretation for the Island Zone. The estimations were calculated using Promine software (vein block module). The technical parameters were provided to Genivar by Richmond.

In May 2007, Genivar estimated the total reserves and resources for the Island Gold mine as follows: total reserves of 1,013,854 tonnes at 8.55 g/t Au, total Measured and Indicated resources of 454,705 tonnes at 10.26 g/t Au, and total Inferred resources of 610,728 tonnes at 9.96 g/t Au. A true thickness of 1.5 m was used for the Goudreau, Lochalsh and Island Gold Inferred resources, whereas 2.0 m was used for the Measured and Indicated resources of the Island Gold main zone. A cut-off grade of 5.0 g/t Au was used for the estimates.

These “resources” are historical in nature and should not be relied upon. In 2007, they were conform to NI 43-101 criteria and to CIM Standards and Definitions at this time. Since 2007, more drilling has been added and more geological information are available. Additionally, assumption used to determine cut-off grades are likely to have change since 2007. Consequently, these “resources” cannot be considered as current. They are included in this section for illustrative purposes only and should not be disclosed out of context.

The update provided by Genivar, using data received up to December 31, 2008, returned an estimate of 1,031,187 tonnes at 8.72 g/t Au for the total reserves. The total Measured and Indicated resources were estimated at 422,197 tonnes at 10.77 g/t Au, while the total Inferred resources were of 676,608 tonnes at 9.65 g/t Au. The same cut-off of 5.0 g/t Au was used for these calculations.

These “resources” are historical in nature and should not be relied upon. In 2008, they were conform to NI 43-101 criteria and to CIM Standards and Definitions at this time. Since 2008, more drilling has been added and more geological information are available. Additionally, assumption used to determine cut-off grades are likely to have change since 2008. Consequently, these “resources” cannot be considered as current. They are included in this section for illustrative purposes only and should not be disclosed out of context.

6.4.4. Mineral resource and reserve estimate – Island Gold Geology Department

Since December 2009, mineral resource and reserve estimations have been conducted by the Geological Department of the Island Gold mine and Richmond's Exploration Department located in Rouyn-Noranda, Quebec. The data and results are verified by Daniel Adam, P.Geo., PhD, Vice President Exploration for Richmond. The parameters used for the geological and structural interpretation of the project, as well as for the mineral inventory estimate, are based on the best estimation of the Island Gold Technical Department at the time of the calculations. Technical parameters for the reserves are provided by Richmond's head office or the Technical department of the Island Gold mine.

As of December 31, 2012 the estimated Island Gold Mine Proven and Probable mineral reserves were 785,221 tonnes at 5.60 g/t Au for 141,456 ounces of gold.

The estimated Measured and Indicated resources were 502,910 tonnes at 6.86 g/t Au for 110,958 ounces of gold, and the Inferred resources were estimated at 279,569 tonnes at 6.20 g/t Au for 55,744 ounces of gold.

These “resources” are historical in nature and should not be relied upon. In 2012, they were conform to NI 43-101 criteria and to CIM Standards and Definitions at this time. Since 2012, more drilling has been added and more geological information are available. Additionally, assumption used to determine cut-off grades are likely to have change since 2012. Consequently, these “resources” cannot be considered as current. They are included in this section for illustrative purposes only and should not be disclosed out of context.

As of December 31, 2013, estimated Proven and Probable reserves were 733,347 tonnes at 6.09 g/t Au for 143,506 ounces. With the Island Gold Deep resources, total estimated Measured and Indicated resources were 739,700 tonnes at 9.81 g/t Au for 233,330 ounces, and total Inferred resources were estimated at 3,558,972 tonnes at 9.07 g/t Au for 1,037,327 ounces.

These “resources” are historical in nature and should not be relied upon. In 2013, they were conform to NI 43-101 criteria and to CIM Standards and Definitions at this time. Since 2013, more drilling has been added and more geological information are available. Additionally, assumption used to determine cut-off grades are likely to have change since 2013. Consequently, these “resources” cannot be considered as current. They are included in this section for illustrative purposes only and should not be disclosed out of context.

7. GEOLOGICAL SETTING

Parts of the information in this section are from the Genivar 43-101 Technical report for the Island Gold mine.

7.1. Regional Geology

The Island Gold Project is part of the Michipicoten Greenstone Belt, which is part of the Wawa Subprovince and the Archean Superior Province. The Michipicoten Greenstone Belt is approximately 140 km long and up to 45 km wide. The belt comprises three volcanic cycles. The age of the rocks are (from oldest to youngest): 2,889 Ma for the Hawk Assemblage (cycle 1); 2,750 Ma for the Wawa Assemblage (cycle 2); and 2,700 Ma for the Catfish Assemblage (cycle 3). Shearing along the contacts has often obscured the original relationship between the assemblages. Regionally, the upper Wawa Assemblage of intermediate to felsic volcanics consists of tuff, quartz-feldspar crystal tuff, lapilli tuff, oligomictic and polymictic breccia, and rare spherulitic flows. Overlying this is the lower Catfish Assemblage, comprising massive and pillowed magnesium- and iron-rich tholeiitic flows. The Project is stratigraphically positioned in the upper portion of the Wawa Assemblage (Cycle 2) capped by pyrite-bearing iron formation outcropping in the Morrison and Pine zones. Structurally, the Project is in a synclinal structure paralleling the Goudreau anticline (fold axis occurs 1 km south of Goudreau Lake). Tight to isoclinal folds and local attenuation or boudinage of units along fold limbs appear to occur regionally. Fold axes are subparallel to the regional foliation at 070° to 095°. A geological map is presented on Figure 7.1.

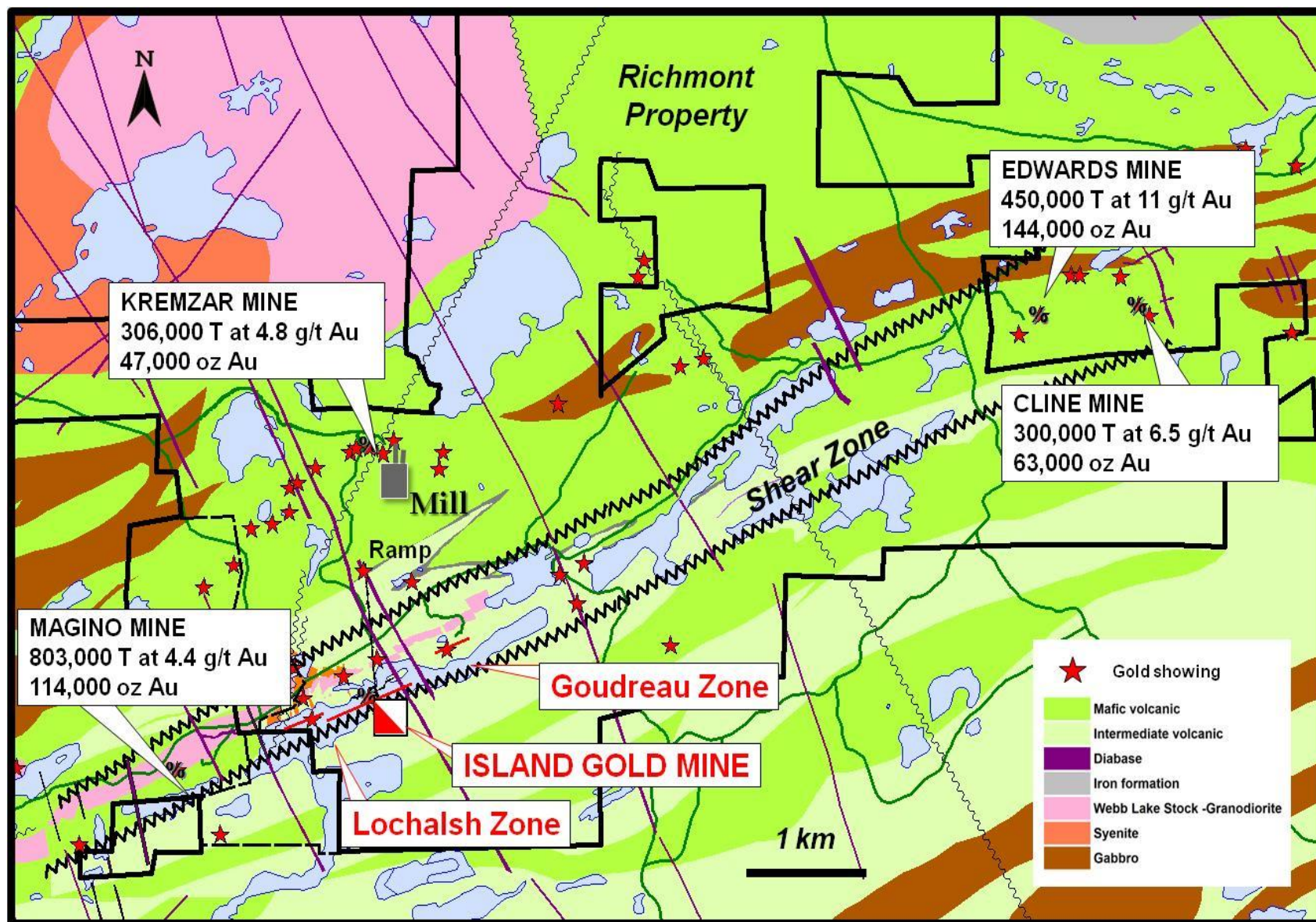


Figure 7.1 – Geological map of the Island Gold Project

7.2. Island Gold Mine Geology

7.2.1. General Overview

The Goudreau Iron Range, a pyrite-rich iron formation, occurs between the Wawa and Catfish assemblages (Sage and Heather, 1991). A northeasterly-trending, 30-km long and 4.5-km wide structurally deformed zone, called the Goudreau Lake Deformation Zone (GLDZ), occurs between the two assemblages in the Project area (Figure 7.1). East-northeast striking, steeply dipping, subparallel zones of gold mineralization are present within the quartz sericite-pyrite-carbonate alteration of the GLDZ. North-trending diabase dikes cut across all stratigraphy. Regional mapping supported by detailed core logging observations has outlined iron formation marker beds and correlative lithologies that appear to be a conformable monoclinal volcano-stratigraphic sequence, facing and younging to the north in the Project area.

The GLDZ has been explored between Goudreau Station and east of the former Cline mine, along a 20 km strike. It is a low-angle strike-slip fault zone with sinistral movement cutting stratigraphy at a shallow angle. East of the Project, the GLDZ hosts the past producing Edwards and Cline mines in the Jacobson Township and the past-producing Magino mine to the west.

Including its subsidiary splays, the GLDZ is believed to be the main control on gold mineralization for the Project area. Mineralization occurs along the strike length of the GLDZ, covering over 5 km within the Project area. Locally, complex structures influence the orientation and character of the gold mineralized zones. The mineralized zones appear to have been deformed, indicated by tightly folded veins visible in the drill core and underground development. The Kremzar mineralization is controlled by a subsidiary structure approximately 1,200 m north of the GLDZ. The mineralized zone trends approximately east-west and dips southwards. Within the GLDZ mineralization, ore shoots plunge to the east or west. A relationship has not been determined between the folds and the plunge of ore shoots. Intermediate to mafic metavolcanics, primarily massive and pillowed flows, occur to the north and west of the Richmond Project. These mafic flows face north and are overlain by the Herman Lake nepheline-syenite intrusive complex to the west. To the north is the Maskinonge Lake granodiorite stock. The Webb Lake Stock lies to the southwest in the Magino mine area. Around the periphery of the Project are felsic intrusions, one to several kilometres in size. Mafic volcanics occur in the northern portion of the Project on the Kremzar Property.

The southern part of the Project area consists of felsic to intermediate pyroclastic-phyric flows, crystal and/or ash tuffs, locally lapilli tuffs with coarser block and ash debris flows in the upper part of the Cycle 2 volcanics. Narrow quartz-feldspar porphyry dikes and minor mafic volcanic rocks are present within the felsic sequence. Between the felsic tuffs of the GLDZ and the Cycle 3 mafic volcanic rocks to the north, lies the Goudreau Iron Range, a pyritic iron formation. All of these units generally have a 070° to 090° strike and a subvertical dip.

7.2.2. Island Zone Geology

While strength of alteration, degree of strain, sulphide content and increasing amounts of quartz veining provide a guide to outlining the zones of higher potential for economic gold mineralization, the mapping of greyish translucent quartz veining

is the key to locating higher grade gold values within the Island Zone alteration envelope. These veins possess a limited lateral extent, probably due to the effect of extensional strain and boudinage. Significant, but lower gold values are associated with silicification or banded silica-pyrite flooding which occur along the same trends as the greyish translucent veins. Shallow south-dipping, late non-mineralized milky quartz carbonate veins tend to be restricted to the higher strain zones, and appear to be controlled by subhorizontal kinking of the main subvertical strain fabric. These veins often cut across the greyish translucent veins to form ladder structures, in which some of the greyish vein material is replaced by milky white quartz-carbonate material. These types of structures are relatively common in Archean lode gold deposits and indicate high pore pressure build-up in a high stress environment, which subsequently fails in a brittle fashion to form one or two sets of gash-type veins. It does not appear that significant gold has been mobilized into these types of structures. The two dominant foliation directions observed in the 140 sill drift have azimuths of 060° and 075° with vertical to steeply south dipping foliations. Alteration and quartz veining follow both trend directions, although the main, laterally persistent trend is along the 075° foliation.

Thickening and localized displacements of mineralization may have occurred along the 060° structures. On section 15,100E, drill holes traversed a volcano-stratigraphic succession consisting, from north to south, of a thick assemblage of felsic feldspar porphyritic flows intercalated with a more tuffaceous unit varying in thickness from 20 m to 45 m. The feldspar porphyritic flows contain 10% to 15% feldspar phenocrysts and often exhibit blue quartz phenocrysts. Thin beds of interflow lapilli, porphyritic and ash tuffs commonly occur within the porphyritic flows and can be correlated along strike and down dip. From sections 15,140E to 15,170E, the phytic flow assemblage appears to become progressively more dominant with fewer lapilli ash tuffs intercalated with thicker phytic flows. The porphyritic flow sequence overlies crystal lapilli-ash tuffs intercalated with chlorite-silica-sericite-pyrite banded tuffs. Thin banded iron units are intercalated with magnetite-rich matrix supported agglomerate debris flows. Two gold-bearing alteration envelopes (Island Zone) are stratabound between the porphyritic flow sequence to the north and a chloritic tuffaceous and heterogeneous volcanic sequence to the south. No reliable geological information is available farther south.

8. MINERAL DEPOSIT TYPES

The following description on regional deposit types is from Kallio (2002). Gold mineralization in the Goudreau-Lochalsh area is found in several different rock types and geologic settings. Deposits may be hosted by one or several rock types. All of the past-producing mines and numerous other gold occurrences exhibit a close spatial association with felsic to intermediate intrusive rocks. The only rock types that are not known to host gold are the diabase dikes and two granitoid intrusions, namely the Herman Lake Nepheline Syenite Stock and the Maskinonge Lake Granite Stock. The majority of known gold occurrences in the area including the Magino mine, the Edwards mine and the Cline mine are located along the GLDZ. The GLDZ is subdivided into four structural domains (Southern, Northern, Eastern and Western) based on the style of deformation, lineation patterns, and the orientation and sense of shear displacement on sets of shear zones. Most gold deposits along this zone are associated with quartz veining and/or shear zones. Sage and Heather (1991) have grouped these shear zones into six main shear or high strain zone categories with the following azimuths: 070°, 020° to 035°, 130° to 140°, 080° to 090°, 110° to 115°, 350° to 010°.

The 070° orientation is most characteristic of the Southern Domain, while the others are more characteristic of the Eastern, Western and Northern Domains. In several cases, all six high strain zone orientations are present at a gold occurrence and, quite often, the high strain zones of different orientations are found splaying off of each other, but not crosscutting, suggesting a close relationship between them. In locations where multiple high strain zone orientations present, only one or two will usually host significant gold and one will usually be more dominant. Sites where high strain zones of differing orientations intersect often create favourable sites for deposition of high-grade gold mineralization. Typical alteration surrounding the deposits includes variable amounts of carbonatization, (Fe-carbonate \pm calcite), silicification, sulphidization, biotitization, sericitization, feldspathization and chloritization. Deposits hosted by mafic host rocks are generally altered to biotite, Fe-carbonate, pyrrhotite \pm pyrite, quartz and minor K-feldspar. Deposits hosted by rocks of felsic composition are generally altered to quartz-sericite with pyrite \pm pyrrhotite. More detailed models for gold deposition within the Island-Lochalsh zones are discussed in Yule (1989) and Heather and Arias (1992). According to Yule (1989), gold along the GLDZ between the Magino mine and the Island Zone is hosted by high-grade quartz veins that trend at 070° and 085°. The veins along the 070° trend are roughly parallel with the overall deformation zone and are considered to have formed along planes of strike slip movement. The veins along the 085° trend are oblique to the deformation zone and considered to have formed as dilated zones between parallel sets of shears. The report by Heather and Arias (1992) also suggests that gold is contained within 070°-trending structures, but that the most significant gold-bearing veins are oriented at 050°/-70°N and 085°/-65°N. The 050°-trending veins are approximately parallel to northeast/southwest-trending flexures being interpreted for the west-central part of the study area.

8.1. Mineralization and Alteration

Some information contained in this section is taken from the 2004 Roscoe Postle Associates Inc. (RPA) technical report on the Island Gold Project. RPA prepared the

report (*Technical Report on the Island Zone Mineral Resource Estimate, Wawa, Ontario*) for Patricia Mining.

The GLDZ hosts the Island, Lochalsh, Goudreau, North Shear, and Shore zones in the Project area (Figure 7.1). Other past-producers associated with the GLDZ are the Magino mine to the southwest, the Edwards mine to the northeast and the Cline mine to the northeast. Within the GLDZ are a series of parallel shear zones, up to 25 m wide by several hundred metres long, with dips ranging from -70° to -90° . Moderate to high strain intensity are present within the shear zones containing pervasive alteration occurring in the form of iron carbonate, silica and calcite. The strongest strain deformation appears to be primarily controlled by competency contrasts between less competent, thinly bedded tuffs and more competent massive bedded phryic flows. Within areas of intense sericitization and silicification with 2% to 5% pyrite are narrow, subparallel quartz veins carrying gold mineralization. Gold is found primarily in quartz stringers and veins 1 to 5 cm wide. Visible gold (VG) forms clouds of fine gold droplets up to 3 mm in diameter.

At the Island Zone (formerly the Island Gold Zone), six zones referred to as E1E, E2, D1, D, C and B are defined and characterized by the presence of alteration halos ranging from 0.5 to over 8 m in thickness, comprising intense silica alteration, albite alteration and quartz-carbonate veins.

Two dominant envelopes are defined, namely the C/D envelope and the E/E1 envelope, which includes the D1 Zone. In the Project area, the GLDZ has two main strands separated by about 150 m of country rock. The northern GLDZ strand contains the Magino felsite within the Webb Lake Sill. This felsic intrusive stock extends as a sill eastward to Bearpaw Lake, 5 km to the east. It hosts the Magino mine and North Shear zones and is likely the controlling structure influencing the Shore and Goudreau zones, which flank the southern contact. The Webb Lake Sill varies from a massive equigranular texture containing quartz and feldspar phenocrysts to highly sheared, sericitic quartz-eye schist. The massive units have up to 15% colourless and opalescent blue quartz. Biotite and chlorite rarely exceed 10% of the rock composition. It has been termed quartz-feldspar porphyry, granodiorite, diorite and trondhjemite. The southern GLDZ strand hosts the Island, Lochalsh and Goudreau zones. It comprises intermediate to felsic tuffs and agglomerates, overlain by up to 30 m of glacial overburden under the waters of Goudreau Lake. Quartz-feldspar crystal and lapilli tuffs, from light buff to dark grey and dark green, vary from intensely foliated and sheared, to massive. Thin bedded to laminated tuff units are often interbedded with agglomerate units. Agglomerate fragments are identical to the tuff units surrounded by a dark chloritic matrix, often containing magnetite. Fragments average 10 to 15 cm across and range up to 50 cm.

The Goudreau Iron Range is a tightly folded sequence of east-west-trending synformal and antiformal structures. It dips northwards and has a shallow plunge to the east. The iron formation appears to pinch out by the eastern end of Pine Lake and is truncated to the west by the McVeigh Creek Fault at Goudreau. The unfolded strike length is approximately 18 km. Low grade gold has been found within the Goudreau Iron Range at the Morrison No. 1 Zone.

The GLDZ hosts five (5) gold zones with similar geological characteristics in the project area:

- Island Zone;
- Lochalsh Zone;
- North Shear and Shore zones;
- 21 Zone;
- Goudreau Zone.

A continuous 900-m-long mineralized structure marked by alteration and gold values of 1 g/t or more is indicated in the drill core from the Lochalsh Zone to the Island Zone. Within this broad mineralized structure, lenses (containing quartz veins) of higher grade mineralization are present. These include several lenses at the Island Zone, the Lochalsh Zone, and the area between them. The lenses are generally narrow (0.5 to 2 m), with variable strike lengths ranging from 10 m x 20 m to 55 m x 65 m, with an average of 25 m x 45 m, and are dominantly eastward although they have variable subvertical plunges. High gold values located outside of the main alteration envelopes can be difficult to correlate in areas with wider spaced drilling.

8.2. Main Gold zones (Genivar 2007)

8.2.1. Island Zone

Five zones, named from south to north, C, D, D1, E and E1, were used to estimate the Island Zone mineral resources and reserves. Underlying the phyrlic flows, which are relatively unaltered and exhibit weak strain deformation, the E1E Zone alteration envelope ranges from 6 to 8 m thick. The upper contact of the zone is usually sharply bounded, characterized by pervasive silicification, albitization and quartz carbonate-tourmaline veining destroying the primary rock fabric. Gold mineralization is associated with laminated silica-sericite-pyrite banding with grey-white quartz veinlets parallel to the foliation. Visible gold is observed as specks or clouds in the ribboned banded veinlets and stringer veins which also show a crenulated (sigmoidal) folding habit with core angles of 20°. Pervasive silicification, sericitization and recrystallized pyrite correlate with strong strain deformation where sigmoidal (S-type) shear fabrics are observed.

The D1 Zone appears to be an alteration envelope spatially occurring between the C/D and E1E alteration envelopes. Crenulated to discontinuous veins and veinlets subparallel to the shearing are commonly observed.

The C/D alteration envelope is similar in character to the E1E Zone envelope with moderate to strong strain deformation defining the north contact (stratigraphic hanging wall – D Zone) and the south contact (stratigraphic footwall – C Zone). The envelope varies from 4 to 8 m thick. Discrete alteration zones are characterized by a progressive change from moderately sericitized, carbonatized, pyritized host lithotypes to pervasive silicification and pyritization of host lithotypes with the primary fabric unrecognizable. Pyrite content can range from 2 to 10% where a ribbon-banded fabric containing fine-grained and coarse-grained cubes or aggregates is observed. Strong strain deformation in the C/D envelope develops S-type shear fabrics, crenulated and boudinaged structures of quartz veins that can be locally brecciated. Intense deformation is also observed with the development of mylonitic and ribbon-banded fabrics (widths of 1 mm to 10 cm) in the C/D and E1E alteration envelopes.

Four types of quartz veining have been observed and are described as follows:

- Opalescent, greyish white veining or flooding; well-defined ribbon-banded fabric to diffuse margins (1 to 50 cm); pyritized stringers commonly containing with VG in clouds with recrystallized pyrite; boudinaged and parallel to foliation.
- Greyish, white veining with well-defined margins; sulphide-poor; mm to cm-scale with VG observed as specks or clouds; veins angled 15° to 20° from foliation.
- Milky white veining \pm chlorite and calcite; trace chalcopryrite, pyrrhotite, pyrite; cm-scale to m-scale; stringers and flat tension veins are common.
- Quartz-chlorite-calcite-tourmaline stringer veins; trace chalcopryrite, pyrrhotite, pyrite, arsenopyrite, and molybdenite. In addition to the C, D, and E1E zones, subzones have been identified which appear to be spatially controlled in their relative distribution with respect to the two main alteration trends.

The zones have a near vertical dip varying from -80° north to -75° south, but most commonly at -80° south. The width of the C/D and E1E alteration envelopes and the less altered intervening material is approximately 50 m in the Island zone above the 450m level.

The relationship between the different zones is complex. An anastomosing pattern has been interpreted and well documented by the sill development. The C and D zones merge together and the merge is called the C/D Zone; the E1 and E zones also merge together and the merge is called E1E. At depth, D1 merges with the E1E Zone.

8.2.2. Lochalsh Zone

The Lochalsh Zone has a 450-m strike length between a depth of 100 m and 300 m below the surface. The geology of the Lochalsh Zone is the same as the geology of the Island Zone. Mineralization and alteration are very similar to that of the Island Zone. The two main subzones at the Lochalsh Zone were named O and Q by Canamax, and appear to correspond to the B, C, D and E1E zones at the Island Zone.

In 1996 and 1997, Patricia Mining did most of its drilling between the Island and Lochalsh zones. In this intermediate area, the alteration zone, as well as the grades and thickness of the subzones, appears to be generally weaker than the Lochalsh Zone and Island Zone. Some deep holes drilled by Patricia Mining indicate the probable down dip extension of the zones on section 14,650E at 500 m below surface (47.5 g/t Au over 1.55 m in PL-16 at 614 m and 9.1 g/t Au over 1.95 m in PL-17 at 684 m). The drilling program of 2006 showed that a good continuity exists for subzones called L-B, L-C/D, L-E, L-E1 L-E2 and L-Middle. It confirms Richmond's preliminary interpretation and shows both good grade and thickness for these zones compared to the previous holes performed.

8.2.3. Goudreau Zone

The discovery hole on the Morrison No.1 group of claims intersected gold mineralization of 17.7 g/t Au over 7 m, 42.5 g/t Au over 1 m and 6.8 g/t Au over 2 m

in 1987. This zone became known as the Goudreau Zone. Multiple alteration zones, containing high-grade gold in quartz veining or silicification, were intersected over a strike length of 500 m. Gold is also present in some of the host rock between the lenses. These altered shear zones occur at the contact with the granodiorite (Magino felsite) and country rock within the GLDZ. Abundant fracturing and shearing is present.

The 2006 drilling program failed to prove the previous geological model. A new model was then created, which is a giant CS fabric composed of vertical subparallel shears between which are shear zones at an angle.

These shear zones do not show the same characteristics as the Island Zone. The shears are more brittle in nature and the alteration is more chloritic. More pyrrhotite and chalcopyrite are also observed. Many quartz veins show the presence of tourmaline like in the north shear. Most of the high gold values correspond to the free gold intercept and are independent of the amount of sulphide.

New developments and definition drilling results brought a new interpretation in 2012 for the Goudreau Zone. The main change was the new interpreted GP5 Zone, a flat, gently east-dipping, high-grade zone located between two subvertical east-west mineralized zones. The main gold mineralization seems to be associated with a decimetric gold-bearing quartz vein having a general strike NNE-SSW and an average dip of 30° to the east. This vein was later deformed with folding and east-west shearing.

Underground drilling and development work in this area from 2013 to 2015 confirms this interpretation for the GP5 zone and a similar zone, the GP2, is also interpreted at depth to the east. Sub vertical mineralized zones similar to the main Island zones are also found in the Goudreau area: G2, G3, G5, G6, G7 and G9.

8.2.4. North Shear Zone

The North Shear Zone has been recognized as a major structure as a result of work carried out by Patricia Mining in 1999, 2001 and 2002. This work confirmed the continuity of the main structure westward to 14,350E (at the intersection of the Secondary Pond Fault) and eastward through the Island Gold Ramp to 14,800E. The North Shear structure is marked by a persistent brittle shearing deformation consisting of en-echelon quartz-tourmaline stringer veining and stockworks containing visible gold, minor pyrite, and trace chalcopyrite. Rocks within the zone are often highly strained, crenulated, silicified and sericitized. The quartz-tourmaline veining occurs within the central to northern portions of the Webb Lake Granodiorite Sill trending subparallel and locally crossing formational contacts that dip approximately -80° to the north.

In 2004, Patricia Mining's surface diamond drilling program (holes PR-04-01, 2, 3, 4, 5, 6, 7 and 9) intersected the North Shear Zone over a strike length of 1,100 m from section 14,200E to section 15,300E, piercing the down-dip extension of the zone up to 350 m below surface. The North Shear Zone is generally located along the northern contact of and passing into the Webb Lake Granodiorite Sill, and is characterized by brittle shearing deformation extending along strike for approximately 1 km. The gold mineralization is hosted in chlorite-quartz-tourmaline

stringer and stockwork veining up to 25 m wide, accompanied by silicification, sericitization and pyritization of the felsic flows, and granodiorite host rocks. This pervasive shear structure dips from -75° to -80° to the north. In 2005, the 140m level vent drift development perpendicularly cut across the North Shear. The shear was observed dipping 65° to 70° north and seemed to follow the contact between the Webb Lake Granodiorite Sill and a massive feldspar porphyry unit. The shear exhibited moderate to strong schistosity subparallel to the contacts. As previously observed by Patricia Mining personnel, the deformation extended within the granodiorite. At the level of the vent drift, only strong chlorite and carbonate alteration is present. A massive milky quartz vein containing coarse pyrite and tourmaline was observed. Grab samples yielded only anomalous assays.

Three other well-defined shear zones were cut by the vent drift. The northernmost shear yielded significant values. The east drift wall yielded 55.62 g/t Au over 2.3 m uncut, and the east wall 9.52 g/t Au over 1.8 m. The highest gold values were associated with grey opalescent veining and quartz flooding with visible gold. These three shear zones are recognizable due to strong deformation with silica and sericite alteration. The pyrite content ranges from 2 to 10%. These shear zones systematically dip northward. Between the shear zones, and easily recognizable at the back of the drift, a system of en-echelon quartz-tourmaline veins are present.

A second zone was intercepted north of the exploration drift at the 4750 and 4850 northing.

These zones were collectively called Island North and are probably the east extension of the north and vent drift intersection.

8.2.5. Shore Zone

The Webb Lake Granodiorite Sill is spatially associated with the Shore Zone, which is interpreted to flank the southern contact of the sill from section 14,600E to section 15,300E. Highly altered and sericitized felsic tuffs with quartz-feldspar porphyry comprise the host lithology. The felsic tuffs are highly deformed and the bedding is crenulated. The Shore Zone ranges up to 7 m thick. Mapping of the Island Zone decline indicates a zone with shear foliation dipping 60° northward. Gold is present in opalescent grey quartz lenses in the highly sericitized zones. Visible gold occurs as patches of finely dispersed clouds of fine-grained gold. Assays range from 2.5 g/t Au over 0.62 m to 47.3 g/t Au over 5 m. The Shore Zone is also referred to as the Center Zone (Kallio and AMEC, 2002). In 2005, the 140m level vent drift development cut across the Shore Zone and a few shear zones inside the Webb Lake Granodiorite Sill. The Shore Zone recognized in the vent drift did not correspond to the previous description of the zone. This occurrence is located south of the sill, spatially at the same previously recognized emplacement. The zone dips 72° to 85° north, following the contact between the Webb Lake Granodiorite Sill and a massive feldspar porphyry unit. The zone is marked by a siliceous felsic tuff with few feldspar porphyries. The schistosity is weak. The dominant alteration is silicification and the zone shows trace to 15% pyrite. This zone is more likely a distal pyritic iron formation rather than a shear zone. The assays yielded only anomalous gold values. Considering the discrepancy between the previous description and the present, it is uncertain that mapping of the drift recognized the same structure.

8.2.6. Zone 21

In April 1997, a series of visible gold-bearing, white quartz veins were discovered in Patricia Mining drill hole 061-02-21 at a vertical depth of 250 m. The intersection averaged 52.2 g/t Au over 19 m with erratically distributed values and visible gold. The veins exhibit a low core angle and may trend northeast. This hole is located some 300 m north of the Lochalsh Zone. The very high-grade results of hole 061-02-21 were followed up by additional drilling nearby, which did not define the structure of the high-grade veins.

8.3. Other Gold Zones (Genivar 2007)

A number of other gold zones and occurrences are located in the Project area. These are described below.

8.3.1. Kremzar mine property

The Kremzar mineralization occurs 1,200 m to the north of the GLDZ on a northwest-trending fault splay structure that dips at -75° to the southwest. The Kremzar Zone has a 120° strike, -70° dip to the southwest and plunges steeply east. It is surrounded by a strong biotite and silica alteration halo that consists of very fine-grained, dark brown biotite, 2% to 5% disseminated pyrite (locally 20%), 1- to 3-m-wide pyritic, cherty bands and sinuous lenses, and broad silicification. Cherty bands are parallel, break from and merge with the major alteration system, and carry significant gold. They are present on the footwall and hanging wall, as well as metres away from the system. In addition to the Kremzar mine itself, 14 other zones have been found on the Kremzar Property, of which three have been explored in some detail. Drilling on the New Zone, also known as the Alpha Zone, shows mineralization extending beyond the Kremzar Zone along strike and with depth.

Trenching and 16 drill holes (total of 12,641 m) on the No. 2 Zone located gold mineralization in quartz veins and sulphides. The geology of the area comprises mafic volcanics with a porphyry dike.

Six (6) drill holes (total of 550 m) and trenching indicated that the geology and mineralization of the No. 3 Zone is similar to the No. 2 Zone. Biotite, chlorite, carbonates and pyrrhotite are part of the mineralized Rusty Zone in altered mafic intrusive rocks, revealed by stripping, mapping and channel sampling. Five (5) drill holes totalling 528 m were drilled on the No. 1 Zone by Canamax.

8.3.2. Portal Zone (Genivar 2007)

In the collar of the Island Gold ramp a series of east-west-striking quartz-ankerite veins were encountered, and this area was named the Portal Zone. Locally, these veins assayed up to 20 g/t Au over 1 m, and averaged 4.0 g/t Au over 11 m. A series of four (4) short holes totaling 1,227 m were drilled along strike to the east and west of the ramp portal without extending the zone.

Little additional effort was put into this area and the ramp continued on to the target at the Island Zone. Investigation of this showing by Patricia Mining demonstrated that the veins are possibly controlled by a southeast-trending shear zone and that drilling by Canamax in all likelihood could have missed the structure.

8.3.3. Portage Showing

Surface geology comprises sericite altered felsic tuffs at the Bearpaw Lake portage. Altered quartz veins are visible in old trenches. Gold values in the range of 2.3 g/t Au were obtained from grab samples. Two holes were drilled to the north and northeast of Bearpaw Lake in Jacobson Township. Weak alteration structures and fewer zones were encountered in these holes. No gold mineralization was encountered. Pine Lake Zone Hole 061-02-23, east of north Bearpaw Lake, intersected 95.9 g/t Au over 1.4 m; hole 061-03-24, north of Pine Lake in Jacobson Township, intersected 9.9 g/t Au over 0.6 m; and hole 061-02-66 intersected 1.7 g/t Au over 0.7 m. All three drill holes are located 1 to 1.5 km to the east of Goudreau Lake.

8.3.4. Pine Zone and Breccia Zone

The Bearpaw Group of claims contains two gold zones: the Pine Zone Iron Formation and the Breccia Zone, located east of Bearpaw Lake in Jacobson Township. Both zones are associated with a major fault structure-trending at 320°, the Breccia Zone Fault. West of the fault, the regional lithology strikes at 070°, to the east the strike is 090°. Geology and airborne magnetic anomalies indicate a sinistral horizontal displacement of approximately 1,000 m.

Dark green chloritic mafic volcanics, massive to pillowed flow units, overlie the Goudreau Iron Range, which is underlain by felsic tuffs and agglomerates.

The Pine Zone sulphide-oxide iron formation contains significant gold near the Breccia Fault in Jacobson Township. Geology comprises a pyrite-bearing iron formation, the Goudreau Iron Range, and felsic and mafic rocks. Trenching and drilling of 21 holes defined a small tonnage of subeconomic gold mineralization. Drilling through the Breccia Fault did not intersect any significant gold values. The Pine Zone is similar to the Breccia Zone to the west.

The Breccia Zone Fault in Jacobson Township cuts the stratigraphy at right angles and extends over several kilometres. One drill hole tested the Breccia Zone associated with the Breccia Zone Fault. Narrow quartz veins in the fault breccia at Bearpaw Lake yielded 6.0 g/t Au over 1 m. Mafic, felsic and iron formation rocks are found in this area.

8.3.5. Morrison No. 1 Zone

The Goudreau Iron Range, sulphide-oxide iron formation, contains gold in the Morrison No. 1 Zone over narrow widths. Of four holes totalling 375 m drilled by Canamax, the best gold value was 18.7 g/t Au over 1 m. In 1954, Algoma drilled a hole yielding 2.7 g/t Au over 30.5 m.

8.3.6. Morrison Cabin Trench

Gold mineralization is present in tensional quartz-tourmaline veins on a contact between mafic volcanic rocks and a porphyry dike located on the north contact of the Webb Lake Sill along strike of the North Shear Zone. Old trenches were reopened during Patricia Mining's 1997 surface trenching program (Tracanelli, H., 1997). Surface stripping adjacent to the trench revealed important structural relationships that may control the distribution of Lochalsh, Island and Goudreau gold-bearing systems hosted in the GLDZ.

A narrow banded iron formation (BIF) unit is exposed on the north contact of the Webb Lake granodiorite sill and has undergone complete replacement to epidote and garnet. This unit appears to be facies-equivalent with an auriferous iron formation debris flow facies intersected in drill holes P-17, PR-04-3 and 10. This auriferous BIF unit may be a precursor chemical sediment marker bed capping the last major pulse of felsic magmatic subvolcanic intrusive activity (Webb Lake Stock) in the upper Cycle 2 metavolcanic cycle, before the onset of the Helen Iron Formation event.

8.4. Island Gold Lower Mineralized Zones (Richmont 2013)

Six mineralized zones (G, G1, B, C, D and E1E), the C Zone being the main one, have now been identified within an east-west alteration corridor 100 to 150 m thick that extends between -450 m and -1,000 m of vertical depth, and over a lateral strike length of 900 to 1,000 m spanning between the Lochalsh, Island and Extension 1 sectors (Figure 8.1).

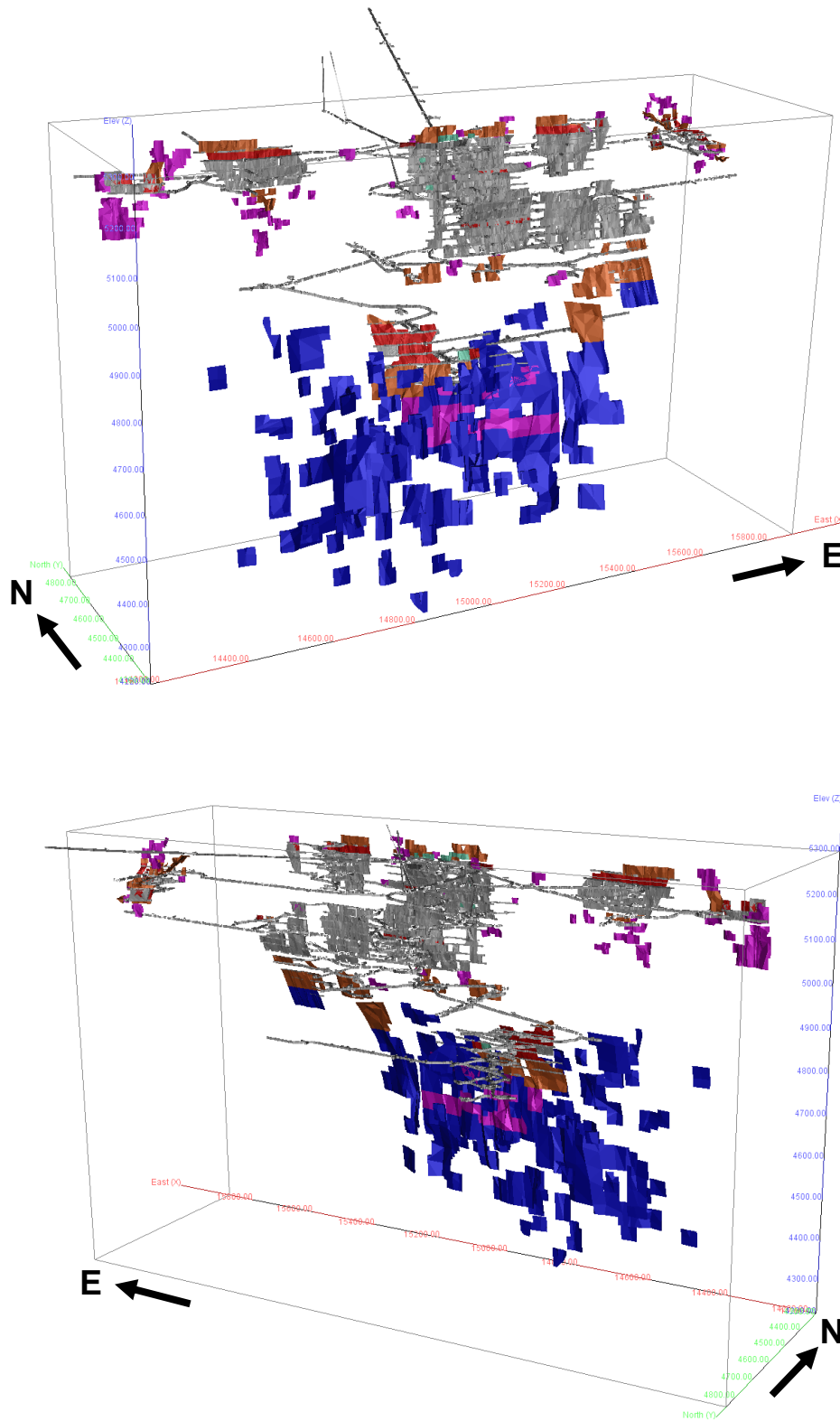


Figure 8.1 – 3Dviews of island gold lower zone mineral resources in blue with existing island gold mine infrastructure

These mineralized gold zones are similar to the actual mined zones at the Island Gold mine. They consist of altered zones (API, Alteration Package Island) in intermediate volcanic rocks with disseminated pyrite, which contains grey quartz veins with often visible gold. Generally, the altered zones contains only a few grams of gold; the majority of the gold content of the mineralized intersects is contained in the quartz veins.

Six (6) zones have been identified inside this east-west corridor 100 to 150 m thick, but only the C Zone shows very good continuity with consistent gold grades.

The C Zone is subvertical, at depths between 450 m and 1,000 m, and appears to be an extension of the areas currently being mined. In the Extension 2 area, an intercept of 19.87 g/t Au over an estimated true width of 3.93 m at a depth of 1,200 m shows that gold mineralization continues deeper. There is an inflection to the south of the mineralized zones, which can be seen in the upper part of the C Zone (Figure 8.2). Up to now, it is not yet clear if this inflection is related to a fault zone, a shear zone or simply a fold.

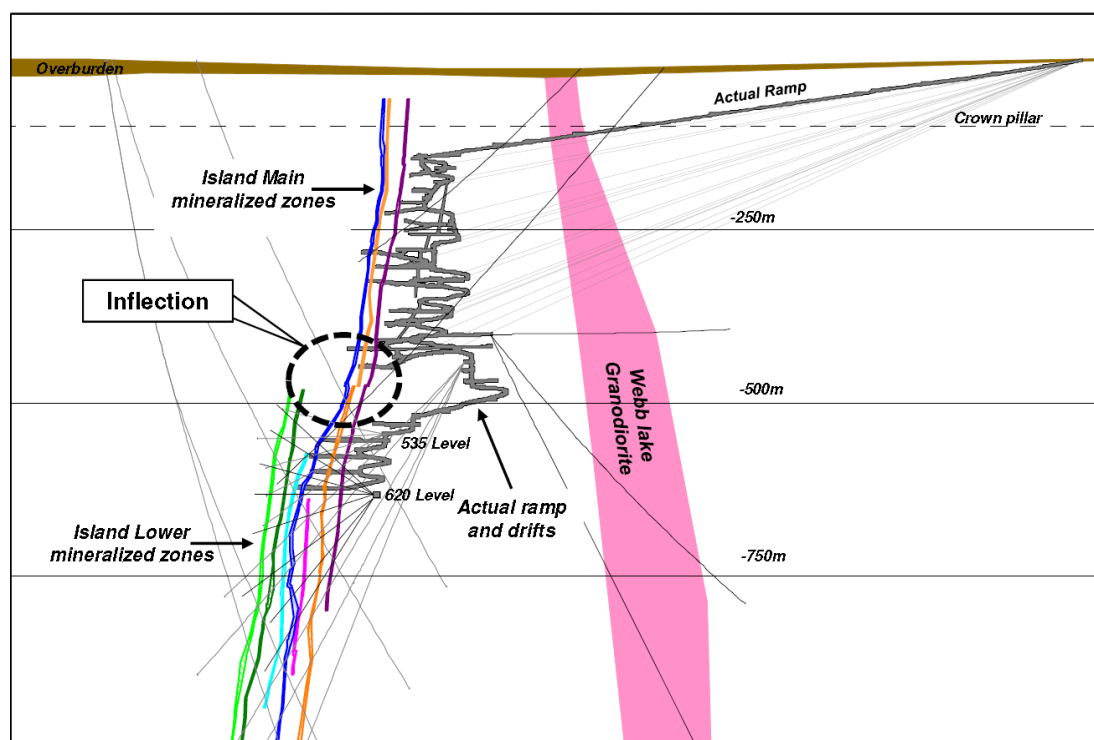


Figure 8.2 – General section showing the southward inflection of the Island Gold main mineralized zone

The C Zone resource has higher average widths and grades than what is currently being mined closer to surface, and remains open laterally and at depth. The average true width of the new C Zone at depth is estimated to be 4.5 m, compared to an average of 2.7 m above the 400m level (current mining operations).

9. EXPLORATION

No exploration work other than drilling was conducted by Richmond.

10. DRILLING

10.1. Drill Core Logging

All drill core logging is completed by qualified personnel using software developed by Gemcom and called DDH Logger. The data entered in the software follows a pre-established structure with consistent codification of lithologies and structures observed creating uniformity in the geological description.

The drill hole database is managed using Gemcom's GEMS Logger software. There is one main database for all the Island Gold mine drill holes. As of December 31, 2014, the database contained 2,805 holes totaling 542,769 m from surface and underground diamond drilling that were drilled within the mine area (i.e.:13,800 to 16,500E and 4,000 to 5,250N) since the early 1980's. Most of the surface holes were drilled between 1985 and 1990 in programs coordinated by Canamax. The remainder were drilled in later programs managed by Patricia Mining and lastly by Richmond.

A total of 375 holes representing 166,243 m have been drilled from surface and 2,074 holes totaling 337,726 m were drilled from the underground infrastructures of the Island Gold mine. Most of this drilling has been concentrated in the south-central portion of the study area and designed to collect information for the Island, Extension 1, Extension 2, Lochalsh and Goudreau zones. Only a limited number of holes have been targeted to directly intersect the North Shear Zone. Most of the surface drill holes have been drilled from north to south at the exception of the Island Gold Lower Zones drilling from south to north.

10.2. Methodology and Planning

The majority of the drill holes are planned on cross-sections in order to intersect the zones as much perpendicular as possible.

An optimal 20 m x 20m drill hole spacing is the aim for the delineation-definition drilling, and it can be reduced to 10 m x 15 m in geologically complex areas like Goudreau.

A 50 m x 100m spacing is used as a first phase of exploration drilling in new sectors. Diamond drill holes are planned to intersect all the known zones and then end 20 to 30 m past these zones on a horizontal plane.

10.3. Geology and Analysis

A detailed description of the drill cores is carried out by experienced and qualified personnel (graduate geologist) who are supervised by members of the PEO (Professional Engineers of Ontario) or APGO (Association Professional Geologist of Ontario) or the OGQ (Ordre des Géologues du Québec), according to a pre-established model at the Island Gold Project. A computerized log is prepared for each drill hole with the following basic information:

- collar location
- main and secondary units

- texture and structure
- mineralization and alteration: mineralogy, thickness, type
- sample location

The length and location of the sample is controlled by the geology: (*i.e.*, geological unit, alteration package, mineralized zone and deformation zone). For the exploration holes, the sampled intervals of the drill holes are sawed in order to preserve a sample of core-witness at the site. Since 2014, as several holes are drilled from the same drill bays for definition and delineation drilling, two holes over five are sawed, one is kept as reference and the other is used as duplicates samples. For the three other holes, the entire core of mineralized zones is sent to the laboratory and the remaining core is discarded.

Once the sample results are returned from the laboratories, the results are plotted on sections and plans at the appropriate scale. Geological unit names and symbols follow an in-house legend loosely based on the legend developed by the Minister of Natural Resources of Quebec (MB 96-28). The horizontal thickness and true thickness are computed with the Gemcom software. Only the true thickness and grade of the calculated composites are plotted on the Vertical longitudinal sections.

10.4. Cementing of Drill Holes

In accordance with the Ontario mining regulations, after the drill holes are completed and surveyed, they are partially filled using a grout cement mixture. A contractor completes the cementing of the borehole. The drill hole cementation is registered in the database of the DDH Logger system and identified on the front page of every drill hole log.

10.5. Surface Collar Surveying

Collars of all the surface drill holes of the Island Gold Lower Zones program have been surveyed with the exception of 5 holes. The surveying was done by a registered surveying contractor or by Richmond employees using a GPS with base. Drill hole coordinates are recorded in the local grid system of the Island Gold mine, which has a 22° rotation with the geographic north.

10.6. Underground Collar Surveying

Most of the underground diamond drill holes completed since 2005, with all the drill holes completed since the 2009, were surveyed. For the underground drill holes, the establishment of the back and foresights are marked using surveying instruments. The contractor sets the diamond drill onto the collar and aligns the drill along a string tied taut between the front and back sight pads. The plunge of the drill is fixed using an inclinometer. Once holes are completed, the surveying department returns to the collar location of the hole and directly measures the final coordinates, azimuth and plunge. This survey data are incorporated into the drill hole database.

10.7. Down-Hole Surveying

Since 2009, underground and surface programs use a 3-m hexagonal core barrel with a 10-in or 18-in stabilizing shell. Single shot Flexit directional testing was done 10m from the collar (or casing) and every subsequent 30m along with an additional

Flexit multi shot survey upon completion of the hole. Down hole surveys can be carried out either with a Flexit or a Reflex instrument.

The instrument's azimuth readings were corrected for the magnetic declination on the Project and a rotation was applied to convert the azimuth into the Island Gold mine grid.

In 2013, the deviation of a series of holes drilled into the Island Deep C Zone between the two dykes has been measured with a gyroscope. Those holes have passed through one dyke whose the magnetism disrupted the Flexit survey.

10.8. 2015 Drilling program

In 2015, Richmond continued its drilling program in order to improve the quality of resources, increase the amount of resources and convert resources to reserve categories both in the upper part and lower parts of the Island Gold mine. At the end of the third quarter of 2015, a total of 61,601 m of diamond drilling were completed, 59,779 m from underground drilling and 1,822 m from surface exploration drilling (Table 10.1).

Table 10.1 – 2015 Diamond Drilling Summary

TYPE OF DIAMOND DRILLING	Metres drilled
Definition	12,082 m
Delineation (transform inferred resources to indicated)	35,856 m
U/G Exploration	11,841 m
Surface Exploration drilling	1,822 m
TOTAL	61,601 m

In September 2015, Richmond announced a program of deep directional drilling in an area down plunge to the east of the main deposit which holds significant potential for a high grade extension after a single hole from surface last year intersected 19.87 g/t Au over 3.93 m, 200 m to the east and 280 m below the known deposit at a depth of 1,200 m.

A 23,000-m surface drilling program was designed to test this area with approximately 30 drill targets in the area surrounding the 1,200-m-deep high-grade drill intersection. The decision was made to use directional drilling for these deep holes as it will reduce costs by allowing multiple pierce points from three deep pilot holes, and will also allow more accurate targeting. Three drills were set up on surface on surface in October and the three pilot holes from which approximately 10 legs will be done to test different drill targets are in progress. The planned array of 30 holes will test an area along the favourable shear zone covering approximately 500 m laterally and 640 m vertically, between depths of 860 m to 1,500 m (Figure 10.1).

In September 2015, Richmond also announced that it will complete its previously announced surface exploration drilling program. The remaining 17,000 m of this

program will consist of approximately 30 to 35 holes and will focus on the six (6) key areas detailed in Figure 10.2.

- Western Shear Extension: This area extends from the western edge of the current Island Gold resource, to the west for a distance of approximately 1 km, to the claim boundary with Argonaut. A few holes have previously tested this zone from surface and underground, encountering positive results. One hole, recently completed from underground assayed 21.16 g/t Au (17.33 g/t Au cut at 75 g/t) over 4.78 m (core length, true width not yet known) at a vertical depth of 674 m. The current program will continue the drill testing of this potential from underground and from surface. The proximity to the mine workings would likely facilitate development of this area from the existing underground infrastructure, if an economic resource can be identified.

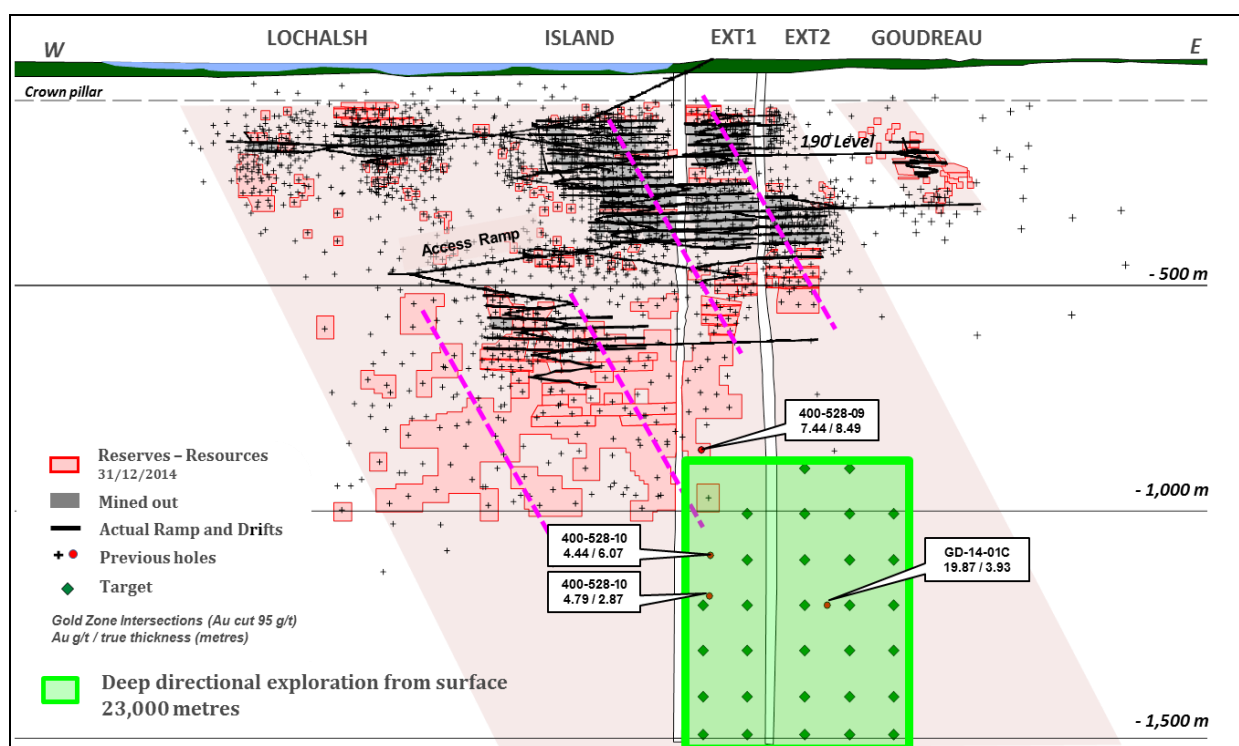


Figure 10.1 – Island Gold mine – Deep directional surface drilling program

- Eastern Shear Extension: The Island Gold Project includes a 5-km strike length of the favourable Goudreau Shear Zone to the east of the Island Gold mine. The targets along the shear include:
 - One target area is located only 600 m east of the current workings. A few drill holes testing this near-surface area from surface in 2010 intersected positive results. If successful, this area could likely be developed from the existing mine workings.

- Further to the east along the shear, approximately 1.5 km from the current mine is a target where a 2010 drill hole intersected encouraging gold mineralization.
- The past producing Edwards and Cline mines lie approximately 5 km east of the Island Gold mine. The exploration team believe there is potential for the Edwards' gold zones to trend across the Island Gold Project.
- **21 Zone:** Located less than 1 km northwest of the mine, historical drill results have been favourable and warrant follow-up drill testing during the current program.
- **Alpha & X Zones of the Kremzar mine area:** High grade zones were drilled proximal to the Kremzar mine but were not pursued as the mine was closed soon after. These zones, as well as with the deep extension of the Kremzar main zone, warrant drill testing due to the grades and the proximity to Richmond's current operations.
- **ML-12-04 Zone:** Located approximately 2 km northeast of the mine, a shallow hole by Richmond in 2012 intersected 19.2 g/t Au over 4.2 m (not true width as the hole was at low angle with the structure) associated with a zone of strong shearing that warrants follow up drilling.
- **22 Zone:** Located 3 km northeast of the mine, a 4 km long geophysical anomaly has associated anomalous gold identified from limited historic drilling, trenching and grab samples.

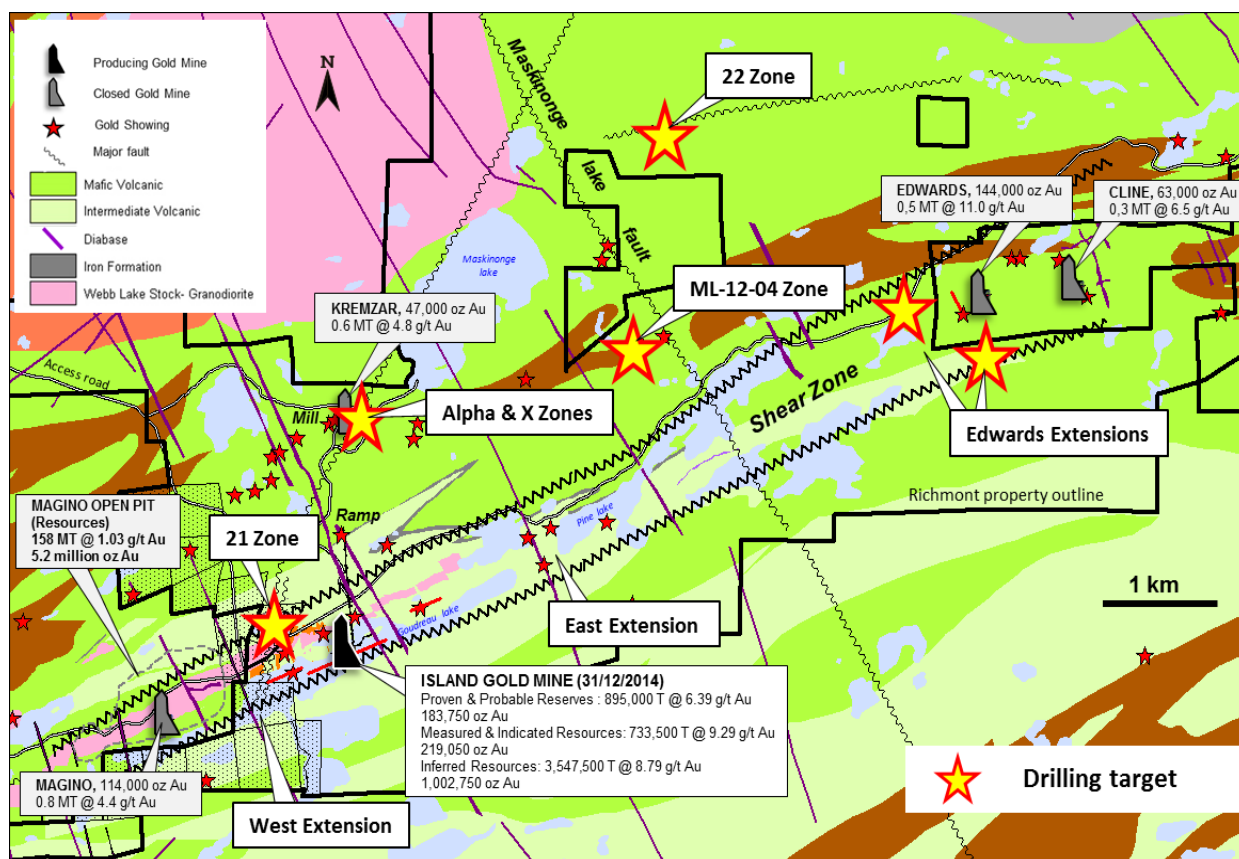


Figure 10.2 – Island Gold mine – Planned surface exploration program

Up to now, results of the 2015 underground definition and delineation drilling program within the area of the PEA have confirmed the presence and continuity of mineralized zones and were as predicted by the Mineral Resource and Reserve Estimate of December 31, 2014. Results of the underground development done in the upper part of this same area in 2015 were also used to support this estimation (see Section 24).

11. SAMPLE PREPARATION, ANALYSES AND SECURITY

Sampling of gold mineralization within the study area has included surface and underground diamond drilling, chips, mucks and test holes. Diamond drilling and chip sampling are the initial methods of collecting a continuous series of samples through zones of mineralization on a regular pattern. Mineral Resource and Reserve as of December 31, 2014, are supported by diamond drill holes samples and chip sampling. Muck samples represent pieces of rock collected after the blast, they are used to estimate the grade during mining and development for large volume of broken ore. Test hole are samples that have been collected from the sludge of small drill holes done with a jack-leg drill. Muck sample and test holes results were not used in the mineral resource and reserve estimates for Island Gold. Muck samples are only used to reconcile underground production and results from mill to the reserves.

All diamond drilling samples were sent to Laboratoire Expert ("LabExpert") located in Rouyn-Noranda, Quebec, or Actlabs Laboratory located in Geraldton, Ontario. Some samples were also sent to Wesdome Laboratory in Wawa, Ontario, in order to expedite results; they were re-assayed later in a commercial laboratory. Production samples, represented by chip, mucks test-holes and definition core, were sent to the Wesdome Laboratory in Wawa, Ontario.

11.1. Core Sample Collection

11.1.1. Drill core sampling

Intervals of core to be sampled for analysis are marked by the geologist. Sampling is done over the mineralized section along regular intervals. The sample lengths vary between 0.3 m to 1.0 m. When present, lithological boundaries, such as geological units or alteration, limit the sample intervals. Core recovery is excellent and approaches one hundred percent. Very minor, isolated, centimetre scale, fault gouge and blocky core can be identified but do not impact the reliability of the analytical results from samples of this drill core.

Sample positions are identified on the core by the geologist while logging and sample tags are placed under the core in the core boxes at the end of each sample.

The core is cut into two halves by the core shack technician using an electrical core saw equipped with a diamond tipped blade. One half of the core is placed into sample plastic bag for assaying and the remaining half core is returned to the core box for future reference. For some definition and delineation drill holes, entire core is placed in the sample plastic bag. One tag is placed into the sample bag, while the second tag is placed into the core box at the appropriate location. Once all designated samples have been accumulated, they are transported to the receiving facilities of the designated laboratory. During 2014, the samples were sent to LabExpert located in Rouyn-Noranda, Quebec, to Activation Laboratories Ltd located in Geraldton, Ontario, and also to Wesdome Laboratories in Wawa, Ontario.

11.1.2. Core size

The majority of the underground diamond drill holes were either NQ or BQ size with a small proportion being AQTK size. The surface drilling was either BQ or NQ size, surface diamond drill holes for the Island Gold Lower Zones were all of NQ size.

Also, in 2014, underground diamond drill holes of the Island Gold Lower Zones were drilled in NQ-size in order to limit the deviation and to get a larger sample.

11.1.3. Core storage

The recent drilling programs were carefully sawed in half (longitudinally, in order to obtain a representative sample), and the witness portions of the drill core were stored and catalogued for future reference purposes in the core library located at the Island Gold mine site. The core is stored outdoors in covered racks or as separate cross-piles on the mine site.

11.2. Panel Sample Collection

The panel (or chip) sampling method generally consists of taking horizontal representative samples, from 0.3 to 1.0 m long, of the geology (units or alteration) that is exposed either in the face or in the adjacent walls. At Island Gold, systematically in primary cross cut, chip sample are taken on both walls. For the sill, the same method is applied. The geological technician or the geologist takes a 2 kg sample which is chipped with a hammer for a zone of 1.5 m vertically by 0.3 to 1.0 m horizontally. Each geological unit is sampled proportionally to its importance in order to obtain a representative sample. Samples could vary in weight from around 1.5 kg to 2 kg (or more). The sampler notes the location and the geology of each panel in a sample notebook. Sample numbers and results are numerically entered using a Promine module in AutoCAD Software and subsequently transferred into GEMS Software.

11.3. Laboratory Procedures

Richmont requested 30 g fire assays with either a gravimetric or AA finish. The cutoff for gravimetric versus AA finish were established at 3.0 g/t Au. These methods and the routine sample preparation are described in the following section.

11.3.1. Actlabs procedures (see Appendix III)

Activation Laboratories Ltd is based in Geraldton (Ontario), it is accredited ISO 9001:2000 and has its Certificate of Laboratory Proficiency (PTPMAL).

11.3.1.1. Sample preparation at Actlabs

The routine sample preparation at Actlabs Laboratories includes:

- Dry samples if required;
- Crush total sample to ½ inch (Jaw Crusher);
- Split approximately 350 g using a Jones riffle;
- The remaining reject is placed in a plastic bag, and packed in cartons with sample numbers listed on the outside;
- Pulverize the 350 g sample;

- Homogenize the pulp, it is then ready for assay. Sample preparation quality is assured by regular inspection, maintenance of crushing equipment, training and supervision of staff to ensure that proper technique is utilized. Actlabs prepare and analyse second pulps from stored rejects. The resulting data is compared with original results to verify sample sequence and also that repeatability is within acceptable limits. To ensure that there is no dilution or concentration of various minerals, dust loss is kept at a minimum. For the critical pulverizing step, Actlabs have equipped their pulverizers with automatic draft shut off damper to eliminate sample pulp loss. To prevent cross contamination, Actlabs use compressed air jets to clean the equipment between samples. The rolls crusher is cleaned using a wire brush combined with air jets, this system does a thorough cleaning. Also barren abrasive material is crushed between batches as an extra precaution.

11.3.1.2. Gold by fire assay at Actlabs

Both gold assay and geochemical gold analysis begin with a fusion using a flux mixture of litharge (PbO_2), sodium carbonate, borax, silica, fluorspar with further oxidants (nitre) or reductants (flour) added as required. The relative concentrations of the fluxing materials are adjusted to suit the type of sample being analyzed. An aliquot of silver is added as a final collection agent. The resultant lead button containing the precious metals is reduced to PbO_2 and absorbed into a cupel in a cupellation furnace. The precious metals collected in the silver aliquot are now ready for either geochemical analysis using an atomic absorption spectrometer or a gravimetric assay finish. The geochemical method involves dissolving the precious metal and analyzing by atomic absorption. Gravimetric assays are completed by dissolving the silver of the doré bead in nitric acid and leaving the gold to be weighed on a micro balance.

Quality control consists of using in-house or CANMET standards, blanks and by re-assaying at least 10% of all samples. The supervisor may also have additional pulps prepared from stored reject and assayed. All data is evaluated by the fire assay supervisor and additional checks may be run on anomalous values. All values obtained are reported.

11.3.2. LabExpert procedures (see Appendix III)

LabExpert is a commercial laboratory located in Rouyn-Noranda, Quebec.

11.3.2.1. Sample preparation at LabExpert

Upon receipt, samples are placed in numerical order and compared with the client packing list to verify receipt of all samples. If the client does not provide a packing list with the shipment, one will be prepared by the person unpacking the samples. If the samples received do not correspond to the client list, the client will be notified.

Samples are dried if necessary and then reduced to $\frac{1}{4}$ inch with a jaw crusher. The jaw crusher is cleaned with compressed air between samples and barren material between sample batches. The sample is then reduced to 90% -10 mesh with a rolls crusher. The rolls crusher is cleaned between samples with a wire brush and compressed air and barren material between sample batches. The first sample of each sample batch is screened at 10 mesh to determine that 90% passes 10 mesh.

Should 90% not pass, the rolls crusher is adjusted and another test is done. Screen test results are recorded in the log book provided for this purpose. The sample is then riffled using a Jones type riffle to approximately 300gm. Excess material is stored for the client as a crusher reject. The 300-g portion is pulverized to 90% -200 mesh in a ring and puck type pulverizer, the pulverizer is cleaned between samples with compressed air and silica sand between batches. The first sample of each batch is screened at 200 mesh to determine that 90% passes 200 mesh. Should 90% not pass, the pulverizing time is increased and another test is done. Screen test results are recorded in the log book provided for this purpose.

11.3.2.2. Gold by fire assay at LabExpert (atomic absorption)

A 29.166 g sample is weighed into a crucible that has been previously charged with approximately 130 g of flux. The sample is then mixed and 1mg of silver nitrate is added. The sample is then fused at 1800 °F for approximately 45 minutes. The sample is then poured in a conical mold and allowed to cool, after cooling, the slag is broken off and the lead button weighing 25 to 30 g is recovered. This lead button is cupelled at 1600 °F until all the lead is oxidized. After cooling, the doré bead is placed in a 12 x 75 mm test tube. Then, 0.2 ml of 1:1 nitric acid is added and allowed to react in a water bath for 30 minutes; following this, 0.3 ml of concentrated hydrochloric acid is added and allowed to react in the water bath for 30 minutes. The sample is then removed from the water bath and 4.5 ml of distilled water is added. The sample is thoroughly mixed and allowed to settle, and the gold is determined by atomic absorption.

Each furnace batch comprises 28 samples that include a reagent blank and gold standard. Crucibles are not reused until the result of the sample that was previously in each crucible has been obtained. Crucibles that have had gold values of 200 ppb are discarded. The lower detection limit is 5 ppb and samples assaying over 1000 ppb are checked gravimetrically.

11.3.2.3. Gold by fire assay at LabExpert (gravimetric)

A 29.166 g sample is weighed into a crucible that has been previously charged with approximately 130 g of flux. The sample is then mixed and 2 mg of silver nitrate is added. The sample is then fused at 1800 °F for approximately 45 minutes. The sample is then poured in a conical mold and allowed to cool, after cooling, the slag is broken off and the lead button weighing 25 to 30 g is recovered. This lead button is then cupelled at 1600 °F until all the lead is oxidized. After cooling, the doré bead is flattened with a hammer and placed in a porcelain parting cup. The cup is filled with 1:7 nitric acid and heated to dissolve the silver. When the reaction appears to be finished, a drop of concentrated nitric acid is added and the sample is observed to ensure there is no further action. The gold bead is then washed several times with hot distilled water, dried, annealed, cooled and weighed.

Each furnace batch comprises 28 samples that include a reagent blank and gold standard. Crucibles are not reused until the result of the sample that was previously in each crucible has been obtained. Crucibles that have had gold values of 3.00 g/t are discarded. The lower detection limit is 0.03 g/t and there is no upper limit. All values over 3.00 g/t are verified before reporting.

11.4. Security

In 2005, the core logging facility and core storage area were established on the Kremzar mine and milling site. A trailer was installed onsite as a core logging facility. A separate room was installed for core sawing and sample packing. The core is stored outdoors in covered racks or as separate cross-piles. In 2012, a new core logging facility was built near the old one.

A security gate and personnel control access to the mine access road at all times. Individual sample bags are sealed with tape. The samples are placed in large Fabrene bags identified and sealed before being placed on pallets. Shipping of production samples is done by pick-up by Island Gold staff to the Wesdome Laboratory in Wawa. The core samples are delivered to Actlabs or LabExpert via transport companies.

11.5. Quality Control and Quality Assurance

Since the beginning of operations at the Island Gold mine, a QA/QC program was initiated to verify and confirm the results obtained either by production sampling (mucks, chip sampling, etc) or by diamond drilling. This verification is essential to determine the validity of the data used for resource and reserve calculations.

11.5.1. 2014 Laboratory Quality Control and Quality Assurance Programs

During the past year (2014), analytical laboratories used by the Island Gold mine applied an internal QA/QC program. Duplicates were re-assayed for each batch of samples processed. Blanks and certified reference material (standards) were also inserted with each sample batch assayed. After compiling and interpreting of the QA/QC data it was considered that the assay results from laboratories, used to calculate the reserves and resources as of December 31, 2014, were acceptable and within normal tolerance limits. The statistical analysis for each laboratory is presented below (Table 11.1). Individual graphic representation is given in Appendix IV.

The QA/QC programs for the Island Gold Lower Zones were conducted in conjunction with the standard Richmond program.

Table 11.1 – QA/QC internal laboratory summary

WESDOME INTERNAL CERTIFIED REFERENCE CHART SUMMARY								
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation	Comments
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good	
OxG98	1.017	3.51	good	6.89	improvement needed	0	good	
OxG104-core	0.925	0.42	very good	7.36	improvement needed	0	good	
OxG104-chip	0.925	3.94	good	6.88	improvement needed	0	good	
OxH112	1.271	0.05	excellent	6.17	improvement needed	0	good	
OxP91	14.82	0.72	excellent	2.13	good	0	good	
OxP116	14.92	0.66	excellent	2.98	good	0	good	
average		1.55		5.40				
ACTLABS INTERNAL CERTIFIED REFERENCE CHART SUMMARY								
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation	Comments
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good	
OxD108	0.414	2.17	good	3.73	very good	0	good	
OxK110	3.602	1.81	good	4.25	industry typical	0	good	
OxN92	7.643	2.02	good	2.99	good	0	good	
SF57	0.835	2.89	very good	4.6	industry typical	0	good	
average		2.22		3.89				
LAB EXPERT INTERNAL CERTIFIED REFERENCE CHART SUMMARY								
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation	Comments
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good	
OxG104	0.925	0.2	excellent	1.17	excellent	0	good	
SE68	0.599	1.12	excellent	1.44	excellent	0	good	
SG66	1.086	0.3	excellent	0.8	excellent	0	good	
average		0.54		1.14				

11.5.2. Wesdome internal QA/QC

The Wesdome Laboratory engages in an internal QA/QC verification of their results. A blank and a certified standard are inserted with every batch of samples being assayed. The proportion of inserted standards (lab checks) and blanks is given in Table 11.2. Five (5) standards were used by Wesdome for the year, totalling 598 samples done for chip analyses and 35 standards for core analyses. The accuracy for the standards averaged 1.55%, which is the percentage difference between all the lab standard results and the assigned value. This is considered good. The results ranged from 0.05% for OxH112 to 3.94% for OxG104–chip. The precision evaluation indicated that 66% of the standards left room for improvement being >5% for the Relative Standard Deviation (RSD) as expressed by the standard deviation of the results as a percentage of the average of these results. However, standards OxP91 and OxP116 showed good precision. All standards except ‘OxG104–core’ had a number of resultant outliers but none contained any gross outliers that would suggest an analytical problem or an error in the identification of standard material. Therefore the 2014 QA/QC results of the Wesdome lab are acceptable but some precision improvement is needed. Wesdome inserted 361 blanks which returned values less than the AA detection limit.

Table 11.2 – QA/QC internal statistics – Wesdome Laboratory

Sample Type	Total samples	% standards	% blanks
Drill core	1,892	1.8%	3.3%
Chips	4,010	14.9%	7.3%
Mucks	8,036	0.005%	0.01%
Test Hole	1,628	0%	0%

The number of standards and blank insertion percentages for chip samples are quite good, and the industry typical range would be 2.5% to 10% at advanced project stages. Standard and blank insertion rates for drill core are low for advanced work stages.

11.5.3. Actlabs internal QA/QC

Actlabs Laboratory engages in an internal QA/QC verification of their results. A certified standard is inserted with every batch of samples being assayed. The proportion of inserted standards (lab checks) is given in Table 11.2 below. The percentage is within acceptable parameters. It should be noted that Actlabs was used as a secondary lab used mostly for over flow core samples and low volumes of QA/QC pulp and reject cross check samples. Four internal standards totaling 245 samples or 9.9% of total number of samples were analyzed by Actlabs during the year. The accuracy evaluation of the Actlabs internal standard program averaged a 2.22% for the 4 standards which is the difference between all results and the accepted standard value. This is considered good and acceptable. The precision evaluation averaged a 3.89% RSD and ranged from industry typical to good and therefore of acceptable level of performance. Blank material inserts used by Actlabs totaled 203 or 7.9% of total samples analyzed and assayed below the detection limit of .0025 g/t and therefore no problem with cross contamination was noted in the company's analytical procedure from the internal program at least.

Table 11.3 – below shows statistical data for the Actlabs laboratory.

Sample Type	Total samples	% standards of duplicates	% blanks
Drill core	2,538	9.6%	7.9%

11.5.4. Actlabs original vs. duplicate values

A total of 16 pulp sample duplicates or were analyzed by Actlabs. Duplicate assaying by Actlabs includes duplicates done at the sample preparation taking a 30g pulp aliquot from the original 250 g pulp sample every 30 samples. Coarse duplicate are done every 50 samples in which an additional 250 g split off the original reject material. In addition Richmond has requested all samples which exceed 3 g/t in the initial AA finish are run again with a gravimetric finish.

As can be seen in Figure 11.1 below a very high correlation co-efficient was obtained between original and duplicate pulps analyzed by Actlabs. Actlabs achieved correlation co-efficient of .9985 however only a limited database of 16 samples were available which makes the results less statistically valid. Therefore the crushing and pulverization procedures during analysis are indicated to be good.

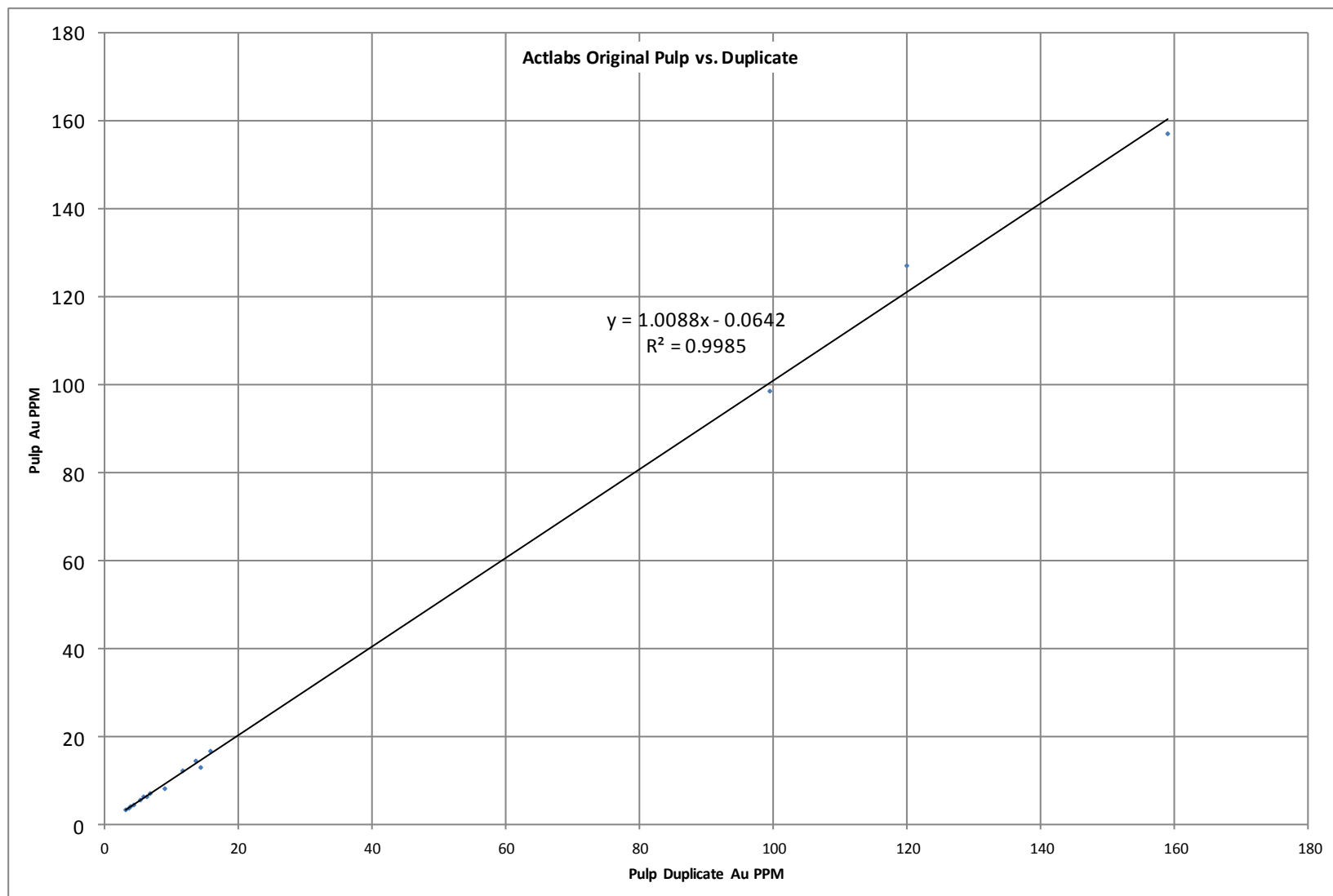


Figure 11.1 – Actlabs pulp vs. duplicate

11.5.5. LabExpert internal QA/QC

LabExpert laboratory engages in an internal QA/QC verification of their results similar to the previous labs used by Richmond. An certified standard is also inserted with every batch of samples being assayed. The proportion of inserted standards (lab checks) is given in Table 12.5 below. It should be noted that only core samples were sent to the LabExpert laboratory in 2014 along with low volumes of pulp and reject cross check batches. LabExpert used 3 standards totalling 251 samples during 2014 which is 10% of the total samples analyzed. The accuracy for the standards averaged 0.34% which is the percentage difference between all the lab standard results and the assigned value. This is considered excellent. The level of precision is also excellent averaging 1.14% for the RSD. The accuracy of the internal standards that LabExpert runs is rated as above the typical industry average. It is determined that the accuracy and precision are within acceptable parameters. LabExpert did not use any blanks samples during the 2014 program.

Table 11.4 below shows some statistical data for the LabExpert laboratory.

Table 11.4 – QA/QC internal statistics – LabExpert

Sample Type	Total samples	%standards	% blanks
Drill core	24,652	10.2%	0%

The standard insertion rate is at the top range of a typical industry level, but no blanks were run during the year's analyses, which should be corrected to between 2.5 and 10%.

11.5.6. LabExpert original vs. duplicate values

LabExpert runs pulp duplicates every twelve (12) samples taking an additional 30 g aliquot from the original pulp. A total of 767 pulp sample duplicates were analyzed by LabExpert, or approximately 3% of the total volume of samples (24,629) analyzed for 2014. The original pulp analysis for LabExpert verses duplicate values yields a very high co-efficient of correlation of 0.9954 which demonstrates an excellent degree of repeatability of pulp sample material. This indicates, in part, a good sample homogeneity derived from the crushing and pulverization steps.

As seen in graph of Figure 11.2 the LabExpert original pulps and duplicate pulps analysis have an extremely high correlation co-efficient indicating in part that crushing and pulverization during the analytical methods are creating a very homogeneous pulp medium.

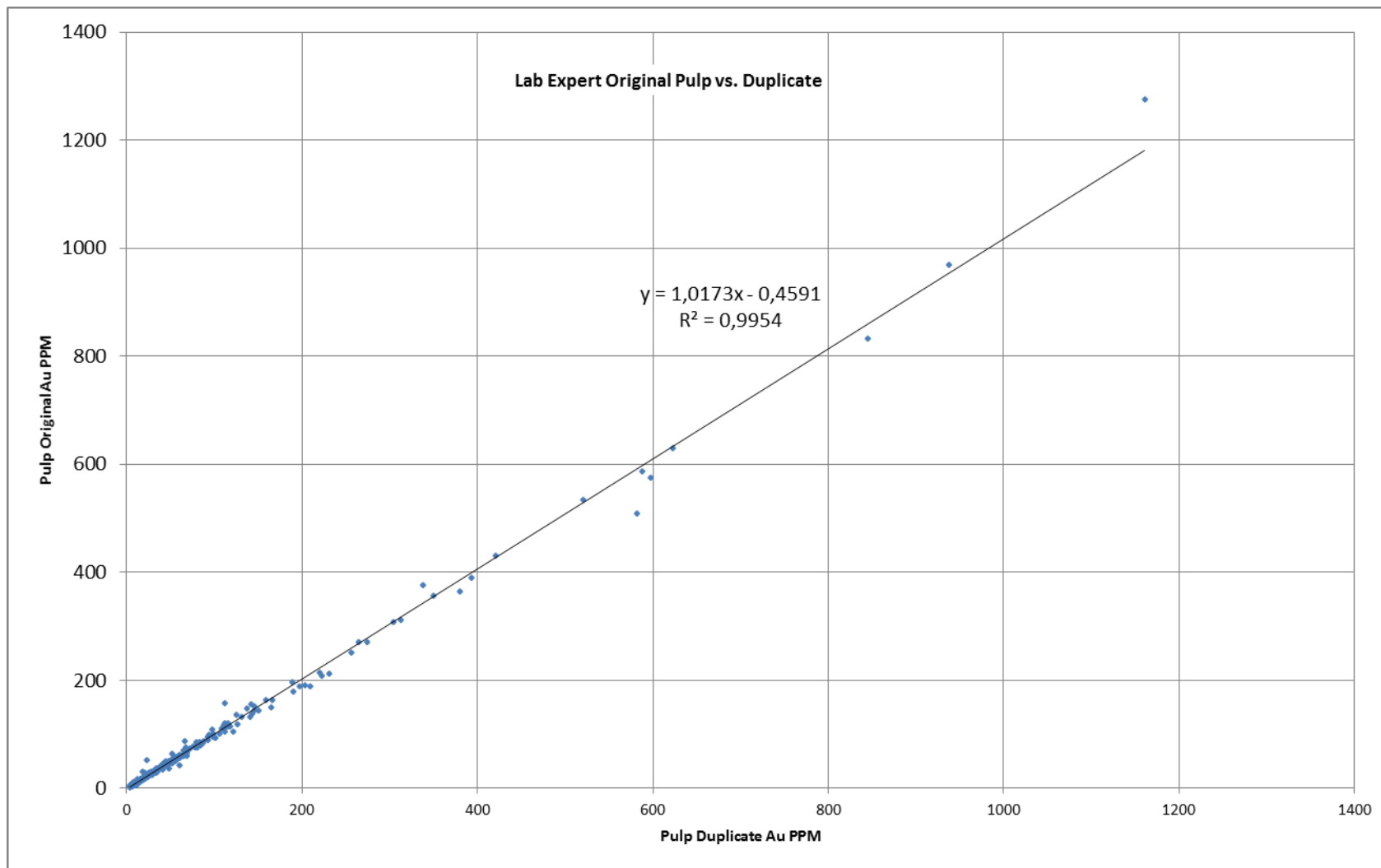


Figure 11.2 – LabExpert Internal QA/QC – Pulps vs. Duplicates

11.6. 2014 Richmond Island Gold Internal Quality Control and Quality Assurance Program

The Island Gold geological department has established its own internal QA/QC program to verify the laboratories. A certified reference material (standards from RockLabs) is inserted with each sample shipment (made up of 25 drill hole samples). An in-house blank material (barren dyke core material) is also inserted with the shipments, generally after a sample containing visible gold.

11.6.1. Accuracy and precision – Certified reference standard results

The accuracy of a geochemical analytical value is measured relative to a predetermined Certified Reference Standard. Standards consisting of pulverized rock of known gold content were placed within the sample stream batches routinely during the surface and underground drill campaign on the deep C zone at a rate of 1 standard per 25 samples by Richmond geologists. The reference standards used were from RockLabs which has been providing certified reference material for the gold mining industry since 1997. A summary of the main standards used during the drill campaign between 2014 and present are listed in Table 11.5 below.

Table 11.5 – 2014 list of standards used by Richmond

External Standard RockLabs	Mean Grade g/t	95% Confidence Interval g/t (+/-)
HiSiIP1	12.05	0.13
OxQ90	24.88	0.18
SN74	8.981	0.065
SN75	8.671	0.054
SK62	4.075	0.045
SL61	5.931	0.057
SP59	18.12	0.12
SQ83	30.64	0.22
SH69	1.146	0.011
SK78	4.134	0.04

The grades of the reference material range from 1.146 g/t to 30.64 g/t as to reflect the ranges anticipated in the majority of Island deep C zone samples and in most cases similar matrices. Individual plots for standard reference material values obtained by the respective laboratories were created relative to the accepted mean grade for the respective standard. Individual graphs are presented in Appendices IV. A summary of results from the graphical data is presented in the following sections.

Table 11.6 – Richmond's standard summary

LABORATOIRE EXPERT CERTIFIED REFERENCE CHART SUMMARY							
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good
HiSiIP1	12.05	0.3	very good	0.99	good	0	good
OxQ90	24.88	0.21	very good	0.97	good	0	good
SN74	8.981	2.65	good	1.07	good	0	good
SN75	8.671	0.18	very good	1.23	good	0	good
SL61	5.931	0.46	very good	0.54	good	0	good
SP59	18.12	0.27	very good	0.83	good	0	good
SQ83	30.64	0.33	very good	1.05	good	0	good
average		0.63		0.95			
WESDOME CERTIFIED REFERENCE CHART SUMMARY							
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good
SH69	1.146	0.61	very good	6.55	improvement needed	0	good
SK78	4.134	2.04	good	2.74	good	0	good
SQ83	30.64	1.08	good	1.43	good	0	good
average		1.24		3.57			
ACTLABS CERTIFIED REFERENCE CHART SUMMARY							
Standard	Au	Accuracy	Accuracy Evaluation	Precision	Precision Evaluation	Gross Outliers	Out of Control Evaluation
Rocklabs CRM	ppm	% diff. of avg. value vs accepted grade		robust relative standard dev. %	<3% good	% all results	<1% good
HiSiIP1	12.05	2.72	good	3.59	typical	0	good
OxQ90	24.88	2.5	good	1.37	good	0	good
SH69	1.146	3.18	good	3.92	typical	0	good
SP59	18.12	1.7	good	5.25	need improvement	0	good
SL61	5.931	3.5	good	3.78	typical	0	good
average		2.72		3.582			

11.6.1.1. LabExpert certified reference standards

During the course of 2014 seven certified reference standards totalling 1045 standards (Table 11.7) were inserted into the sample stream by Richmond and analyzed by LabExpert. The insertion rate for standards is good and between the typical industrial rate of 2.5%- 10%. However the insertion rate for blanks is low at only 1% for advanced projects. The analysis by LabExpert demonstrates a very good degree of accuracy throughout the range of standards (Appendix IV). The accuracy evaluation of LabExpert averaged a difference of only 0.63% between average lab analyzed value and the RockLabs accepted mean value. This is considered very accurate.

Precision is the measurement of reproducibility or how variable the analytical procedure of the lab may be. The standard reference graphs on the RockLabs plotting template present a precision co-efficient measured by the standard deviation of in-control results expressed by a percentage of the average of these results. LabExpert attained an average precision of 0.95% and a range between 0.54 and 1.23%. The level of precision rates as 'good' or <3% with industry typical results in the range of 3–5%. Again LabExpert precision is acceptable.

Table 11.7 – LabExpert QA/QC stats

Lab ID	SAMPLE TYPE	TOTAL SAMPLE	STANDARDS	% Standards	BLANKS	%Blanks	LAB DUPLICATES	% Lab Duplicates
Laboratoire Expert	Drill Core	24629.00	1045.00	4.24%	247.00	1.00%	767.00	3.11%

'Out of control' results were automatically screened out prior to accuracy and precision calculations by the RockLabs calculation template to prevent skewing of averages and standard deviations. An 'out of control' result is a term used when a normal procedure is not adhered and the result typical lies outside 3 standard deviations of the processing limits a spurious result or gross outlier on the graph. LabExpert scored 'good' in this category generally having no 'out-of-control' results.

LabExpert has scored well in accuracy and precision evaluations and although it is not an ISO accredited lab it is considered to have provided acceptable results for the resource estimate that has been undertaken.

11.6.1.2. Actlabs certified reference standards

A total of 88 standards were analyzed by Actlabs during 2014. The Actlabs sample volume was low and for all data sets the respective reference standard contained less than 20 results (Table 11.8). Therefore results are not considered statistically valid for a definitive comment on the accuracy or precision of this lab. However the standard insertion rate of 4% is within acceptable parameters but the blank insertion rate is low for an advanced project and should be between 2.5% and 10%. An examination of the five (5) reference standards used in the Actlabs plots indicates an accuracy averaging a 2.72 % difference between Actlabs measured values and the accepted mean grade of the RockLabs standards. This is considered acceptable.

The precision of Act Labs is classified between 'typical and good' with an average precision of only 3.35% expressed as a percentage of the average of standards deviation of all in control samples. Industry typical results are in the 3-5% range. This performance is considered acceptable as well.

There were no gross outliers in the sample results with <1% considered 'good' and 1-5% considered as industry typical.

Since the sample populations of standards analysis were very low additional sample numbers are needed for a valid statistical assessment to assess Actlabs performance. Previously in 2013 Actlabs performed very well at all levels.

Table 11.8 – Actlabs QA/QC Stats

Lab ID	SAMPLE TYPE	TOTAL SAMPLE	STANDARDS	% Standards	BLANKS	%Blanks	LAB DUPLICATES	% Lab Duplicates
Actlabs	Drill Core	2160	88	4.07%	13	0.60%	17	0.79%

11.6.1.3. Wesdome certified reference standard results

A total of 70 standards were analyzed by Wesdome during the 2014 drill campaign (Table 11.9). The insertion rates for both standards and blanks are within acceptable parameters. Three standards analyzed by Wesdome during 2014 demonstrate a good degree of accuracy averaging 1.24% difference between the Wesdome analyzed value and the accepted mean grade of the RockLabs standard. Analysis accuracy for standard SH69 is very good at 0.6% and for the standard SK78 was 2%. Results for standard SQ83 was 1.08% within the accepted mean average of the standard based on only 13 samples.

Precision averaged 3.5% which is rated as industry typical with precision ranging between 1.43% and 6.55%. The exception is analysis results of SH69 being 6.69% being worse than industry typical. As before the lower sample number of 18 analyses may affect the validity of this result.

Although sample numbers are limited and Wesdome is not an ISO accredited laboratory accuracy evaluation is good and precision is industry typical. A larger sample population would be required to better assess the accuracy and precision of Wesdome labs.

Table 11.9 – Wesdome QA/QC stats

Lab ID	SAMPLE TYPE	TOTAL SAMPLE	STANDARDS	% Standards	BLANKS	%Blanks	LAB DUPLICATES	% Lab Duplicates
Wesdome	Drill Core	1773	70	3.95%	41	2.31%	nil	n/a

11.6.2. Field blank standards

Field blank standards were used during the deep Island drill campaign 2014 to monitor any possible contamination during the analytical process. Field blank material is typically derived from a local barren source rock. The field blank standard material used by Richmond is derived from a mine property Matachewan diabase dyke. The blank samples have been taken from diamond drill holes which transected the dyke and were pristine with no mineralization, fracturing or veining. Drill core samples were then washed and bagged for use. Intermittent batch samplings indicates a similar level of gold <5 ppb. The blank material is therefore considered suitable. Generally blanks are inserted after core samples in which visible gold has been identified.

11.6.2.1. LabExpert field blank analysis

LabExpert tested 247 field blanks inserted by Richmond. Values ranged from <5 ppb to 0.678 g/t with an average of .027 ppm and a standard deviation of .075 ppm (Figure 11.3). A failure rate of 8.9% occurred with field blanks assaying over the 10x detection limit. Due to the higher than desired average values and the variability of the results (average=.027 ppm, SD=.075 ppm) as well as the 10% failure rate of result > 10x the detection limit a cross contamination problem would be suspected. In the sample stream the blank samples are inserted mainly after core samples with visible gold grains. The barren diabase field blank material is stated previously is appropriate for blank reference material. During the pulverization process at LabExpert the ring crusher is cleaned with both compressed air and undergoes a cycle of sand cleaning as well. Since the diabase material has been previously characterized as having a gold content of below the AA detection limit it can be deduced that the procedure for preventing cross contamination of samples at LabExpert is not completely successful and requires some improvement.

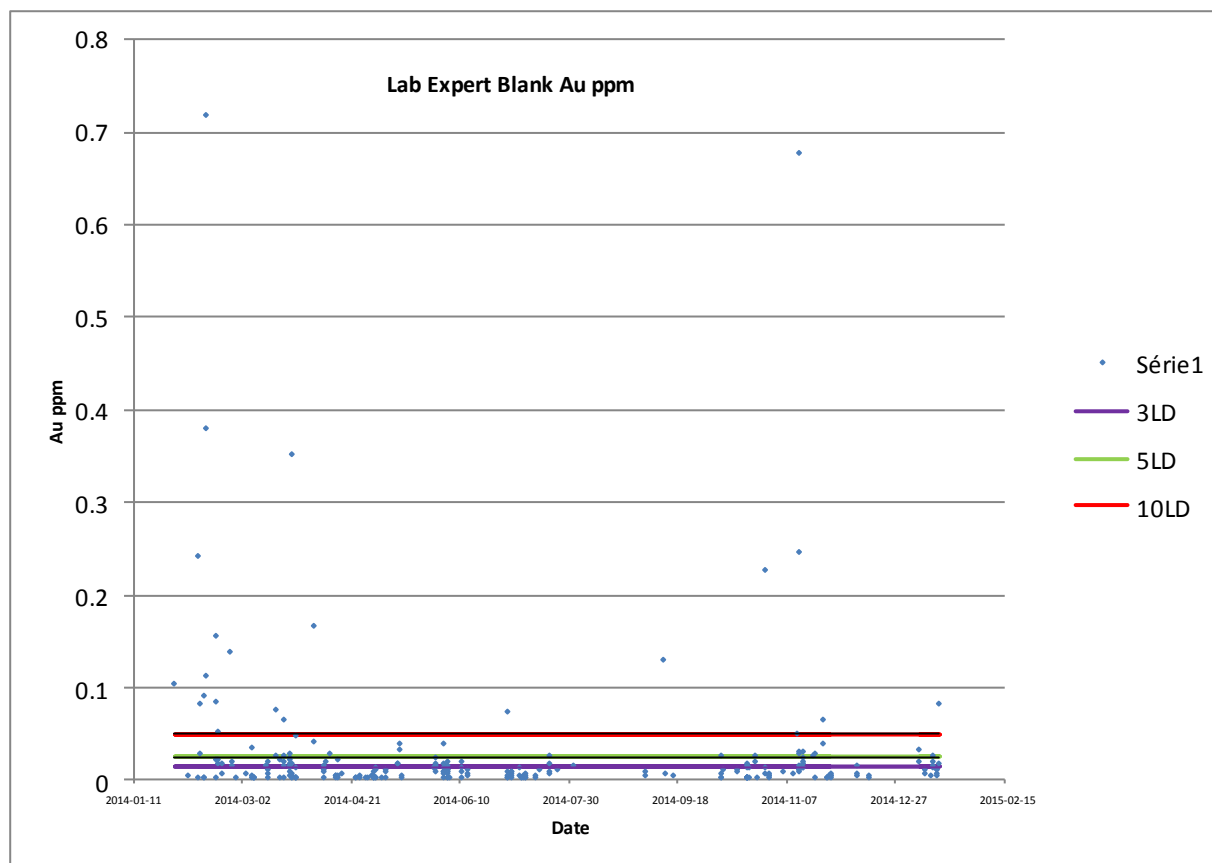


Figure 11.3 – LabExpert blanks

11.6.2.2. Wesdome field blanks

Wesdome tested a total of 41 blanks inserted by Richmond. Field blank values ranged from under detection limit to 0.28 ppm. The assay values of the blanks averaged .075 ppm with a standard deviation of .076 ppm (Figure 114). 34% of field blanks tested by Wesdome were over the 10x detection limit. A much higher gold assay values for blank material suggests a cross contamination problem at the analytical level is the likely problem. Since blank samples are inserted after samples containing visible gold and high gold values Wesdome needs improvement in cleaning ring crushers between samples.

Although only 41 blanks were sent to the lab and tested by Wesdome the analytical procedure problems of contamination is still valid especially when the failure rate is 34%.

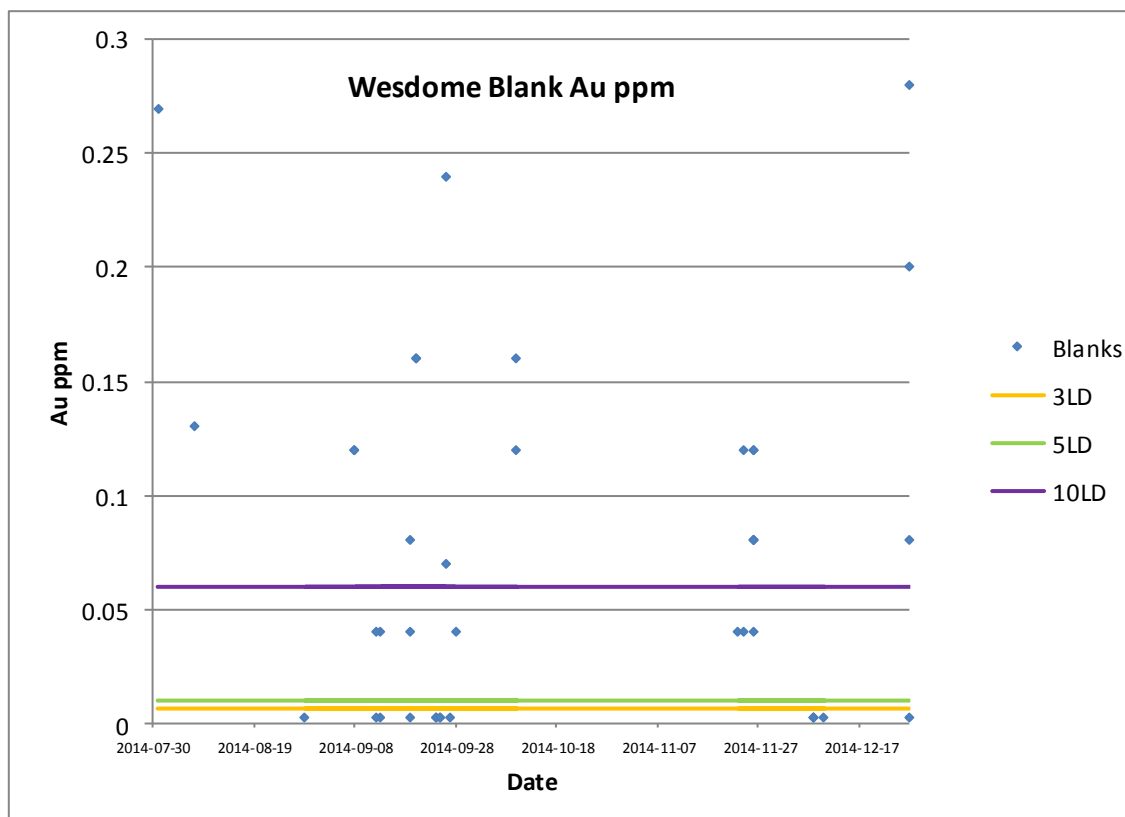


Figure 11.4 – Wesdome Blanks

11.6.2.3. Evaluation of potential contamination

The field blanks assayed at LabExpert and Wesdome both demonstrate a problem of higher than desired blank gold assay values. LabExpert had almost 9% over the 10x detection limit and Wesdome scored over 35% exceeding the 10x detection limit. Actlabs only tested 13 blanks which averaged 0.011 ppm with a SD of 0.014 ppm however low sample numbers preclude a statistical valid assessment of cross contamination at that laboratory. There were no cases however where the contamination or spurious assay values above the cut-off limit for the ore reserve. Both laboratories have standard ringier crusher cleaning between sample pulverization with compressed air and sand. The source of diabase for part of the Island Gold Lower Zones drilling campaign is from drill core which is cleaned and bagged for use and has been demonstrated as an appropriate barren rock type below 5 ppb in the intermittent sampling batches.

It is suggested that despite the measures taken by the laboratories to clean machinery between samples that the efforts should be either improved or more closely scrutinized since the blank material is commonly inserted into the sample stream by Richmond after any visible gold bearing sample. However improvements can be made for field blanks characterization by Richmond which would include a more regular grade testing of material in 2015 to establish an acceptable mean grade and deviation for individual field blank batches and closer contact with laboratories when failures arise. The laboratory internal blank QA/QC all passed with

no lab internal blanks above detection limit but a lab blank is a pulp inserted into the sample stream directly and not rock medium that must be crushed and pulverized.

11.6.3. Laboratory cross checking

LabExpert and Wesdome laboratories underwent pulp and reject sample cross checking done by a second laboratory (Table 11.10). LabExpert resampling by Actlabs totalled 90 pulps and 186 rejects. Wesdome resampling totalled 76 pulps and 26 rejects.

Table 11.10 – Laboratory cross checking

Lab ID	GOLD ZONE SAMPLES	Pulp CROSS CHECKS	% Pulp Cross Checks	REJECTS CROSS CHECKS	% Reject Cross Checks	CORE DUPLICATES	%Core Duplicates
Laboratoire Expert	2966.00	90.00	3.03%	186.00	6.27%	314.00	10.59%
Wesdome	366	76	20.77%	26	7.10%	nil	n/a

11.6.3.1. LabExpert original sample vs. Actlabs cross checks

Cross checking between LabExpert and Actlabs was carried out with a batch of 90 pulp samples which constituted 3% of the 2966 samples taken within mineralized gold zones. The results show that there is excellent correlation between the two labs with an R2 co-efficient of 0.9941 as seen in graph of Figure 11.5.

Cross checking between LabExpert and Actlabs was also done on 186 reject samples which constitutes 6% of the 2966 samples taken within mineralized gold zones. The results indicate again a very good correlation co-efficient between the two labs with an R squared value of 0.9833 as seen in Figure 11.6.

The high degree of correlation between LabExpert, an non ISO-accredited lab, and Actlabs, an ISO-accredited lab, indicates LabExpert performs gold analyses with a high level of reliability and quality.

LabExpert does participate in a CANMET round robin sampling program twice a year. The sampling program is mandatory for labs with accreditation and voluntary for those not accredited. LabExpert however does voluntarily participate and has always successfully passed the CANMET program for gold, platinum and palladium.

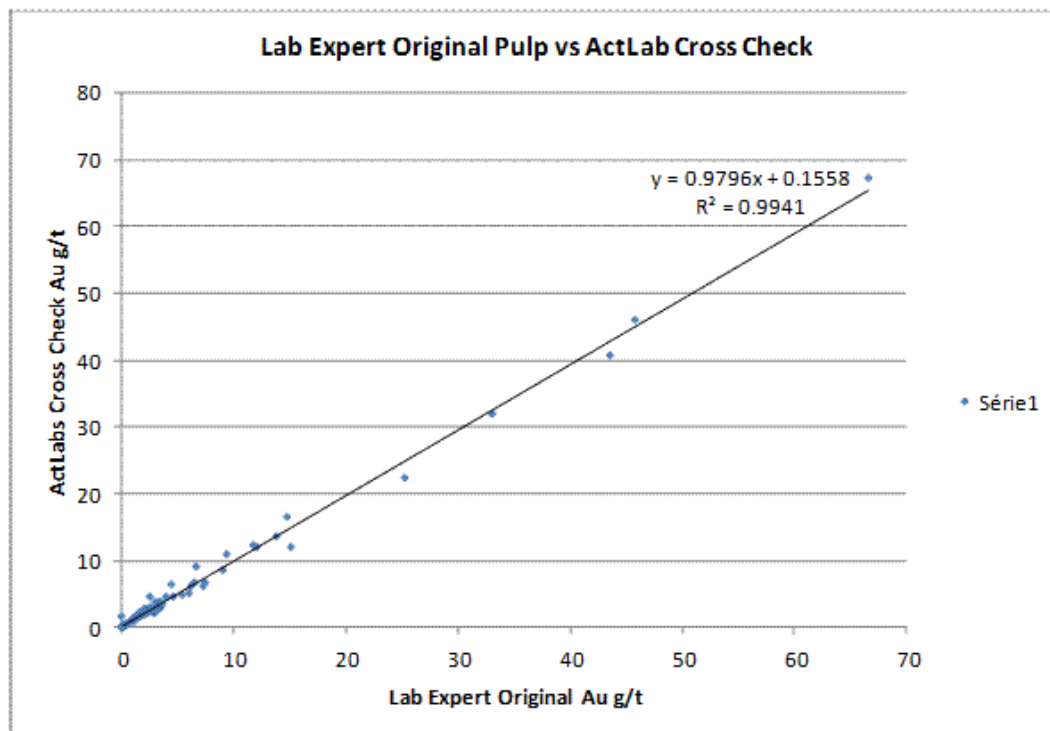


Figure 11.5 – LabExpert vs. Actlabs Pulp Cross Checks

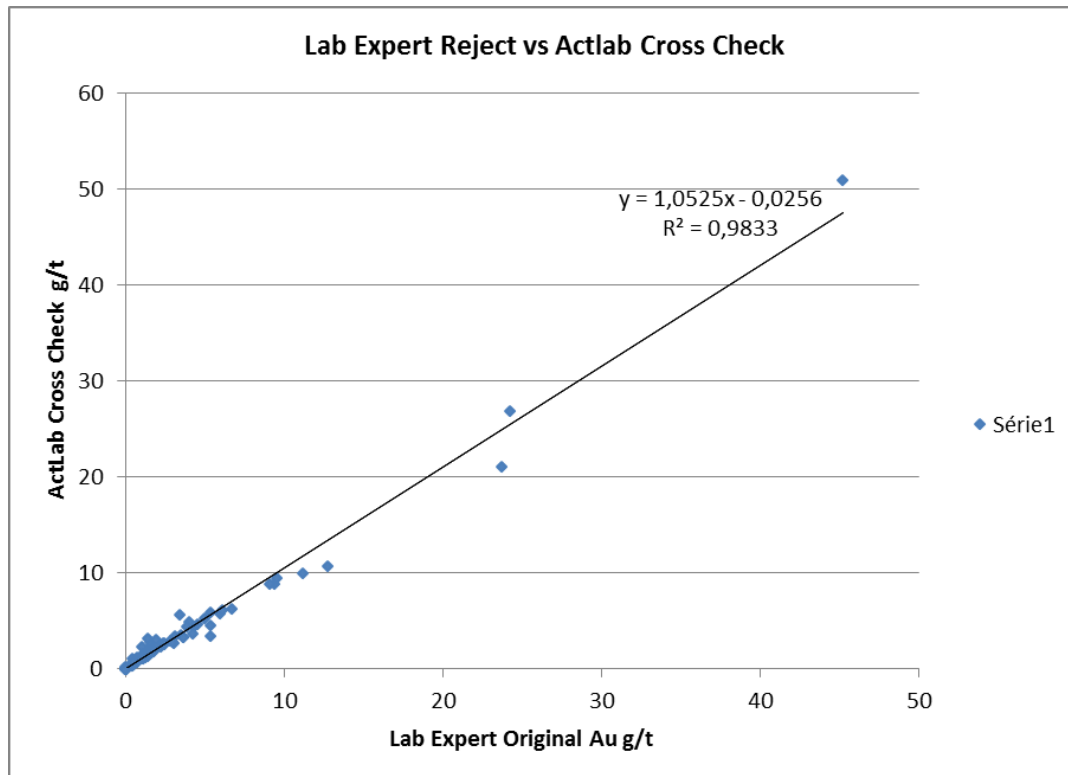


Figure 11.6 – LabExpert vs. Actlabs Reject Cross Checks

11.6.3.2. Wesdome original samples vs. Actlabs cross checks

A total of 76 Wesdome pulps were sent to Actlabs for rechecking which constituted 20% of the 366 samples within the mineralized gold zones. The results demonstrate a very high correlation coefficient with an R squared of 0.9985 as seen in the graph of Figure 11.7.

A total of 26 Wesdome rejects were cross checked by Actlabs which is approximately 7% of the 366 samples taken within the mineralized gold zones. A good coefficient of correlation with an R2 of 0.9684 was achieved as seen in the plot of Figure 11.8.

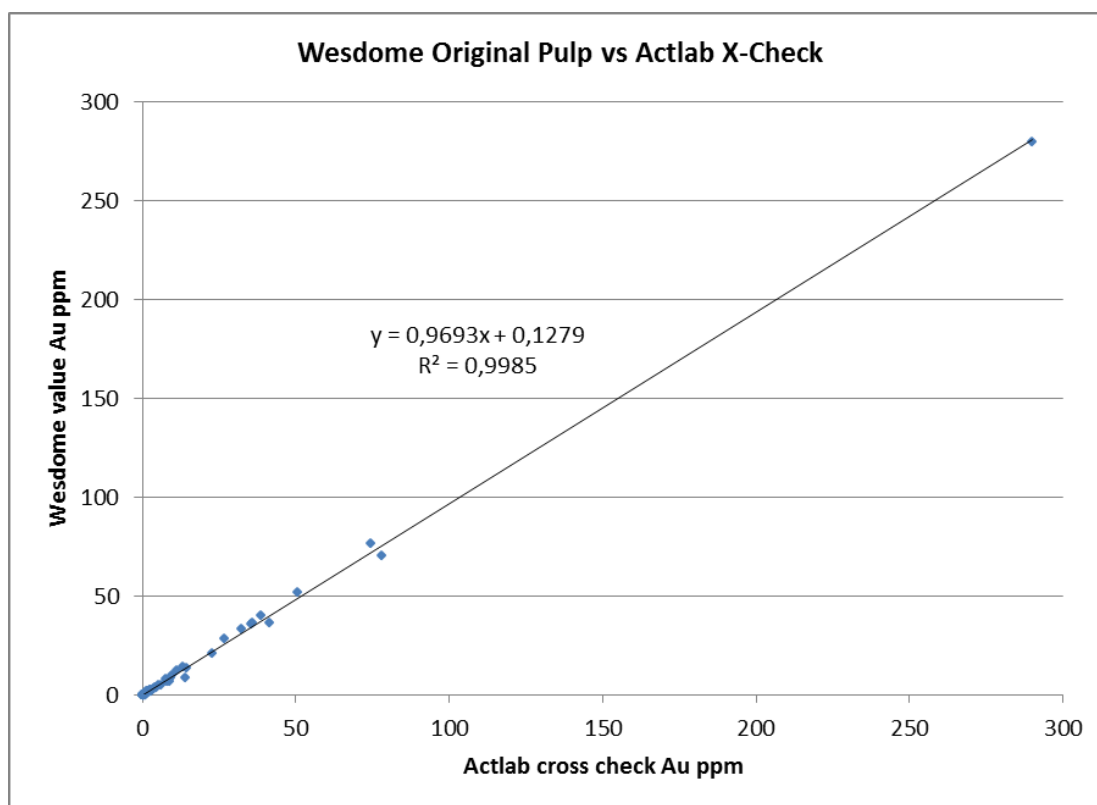


Figure 11.7 – Wesdome vs. Actlabs Pulp Cross Checks

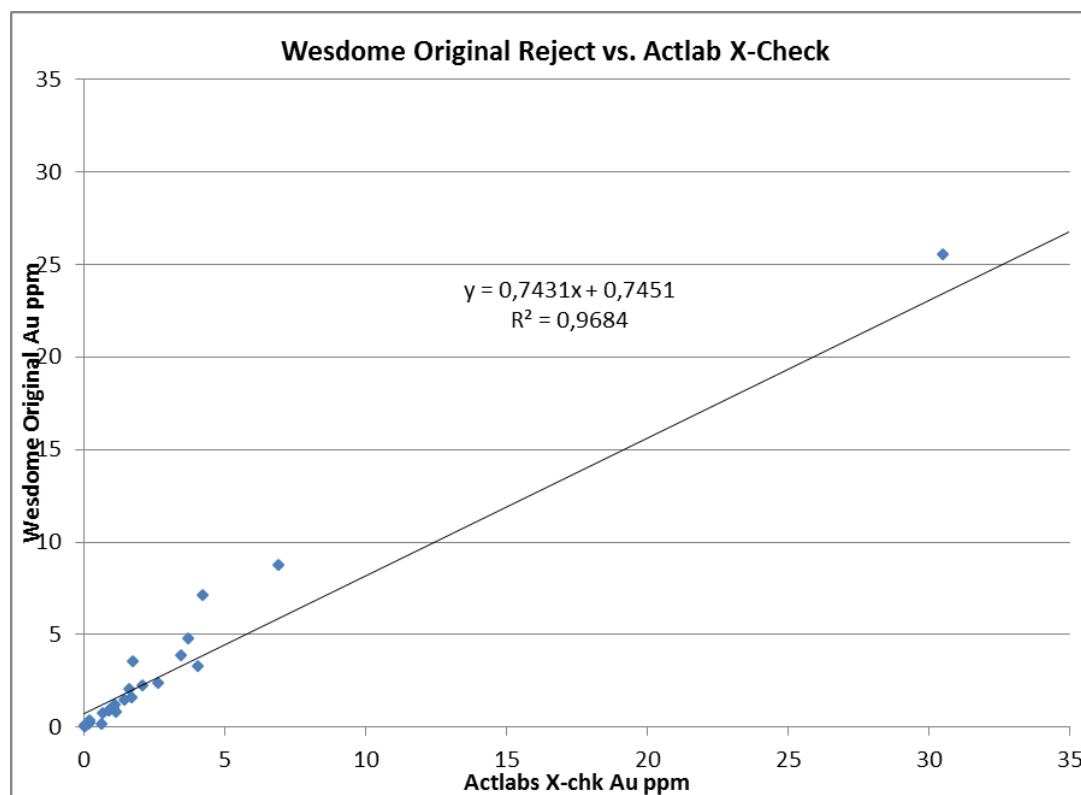


Figure 11.8 – Wesdome vs. Actlabs Reject Cross Checks

11.6.4. Duplicate sample of core and face chips

11.6.4.1. Core duplicate samples

A total of 229 core samples were split with both sides being analyzed. The correlation result yielded in this scatter plot is an R^2 of 0.85 (Figure 11.9) which appears good. However there are noticeable large departures from the linear trend including multiple sample sets such as the following: 9.6 g/t vs. 88.0 g/t, 30.8 g/t vs. 57.0 g/t, 84.0 g/t vs. 28.5 g/t, 45.7 g/t vs. 3.9 g/t, 0.139 g/t vs. 12.5 g/t. This demonstrates moderate variability within some of the original core sample material which was not exhibited in pulp duplicate results. The primary or natural inhomogeneity of the rock sample is apparent as to cause a mild to moderate intermittent nugget effect. An alternate method of determining an estimation of precision is to calculate the '**Absolute Relative Difference**':

$$ARD = \frac{|(dup - parent)|}{(dup + parent)/2}$$

The average of the ARD values in the set of 229 samples is 46.4% which is a better method to validate the real precision of the core duplicate results. So the difference of the parent-duplicate values divided by the average of the duplicate-parent couplets as a percentage indicate a average variability of over 46%. This may suggest a mild to moderate nugget effect in the primary rock medium. It also indicates that the crushing and grinding process have been more than adequate to cover this initial inhomogeneity of source rock due to the accurate and precise performance of labs in standard QC and lab cross checks.

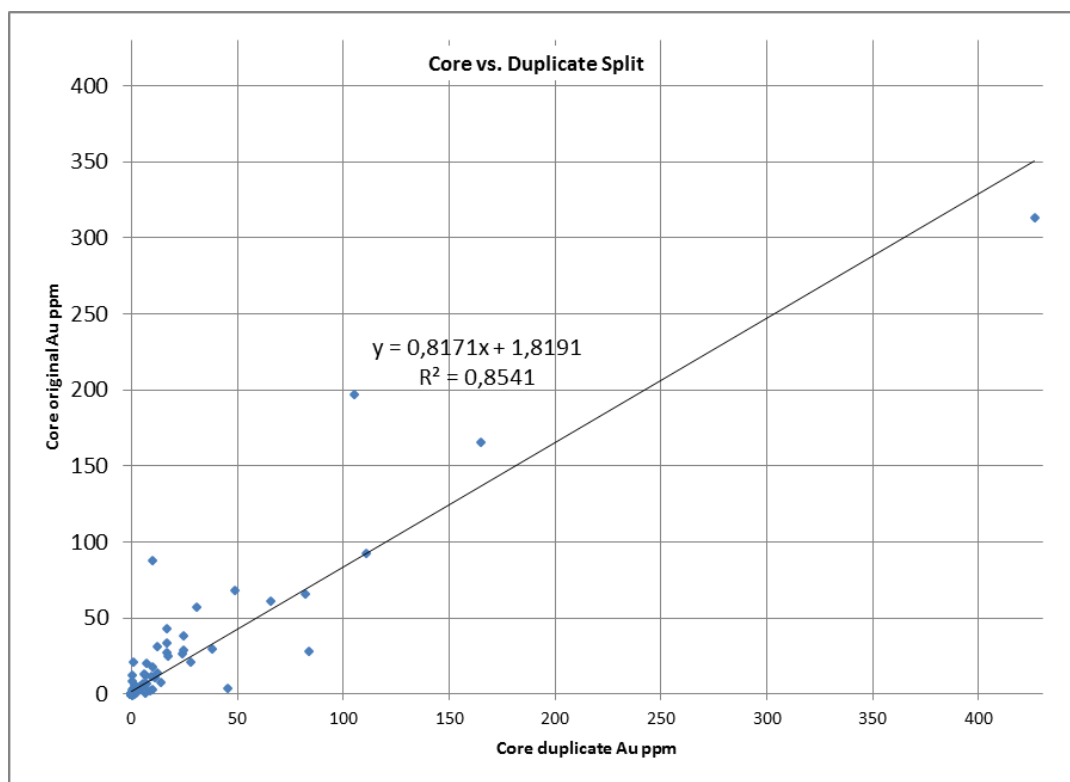


Figure 11.9 – Duplicate samples of core

11.6.4.2. Chip duplicates samples

In 2014, a total 161 duplicate samples were taken across underground development headings from Lochalsh to Extension 2. The results of the program revealed a poor correlation between the original and duplicate face samplings with a result of 0.46 R² (Figure 11.10). The poor correlation is partially attributed to the heterogeneity inherent in a gold bearing rock type or nugget effect in conjunction with face sampling methods in which sampling can occur within a larger area up to a square meter and therefore much coarser in interval and more random than the corresponding core sampling for the same interval.

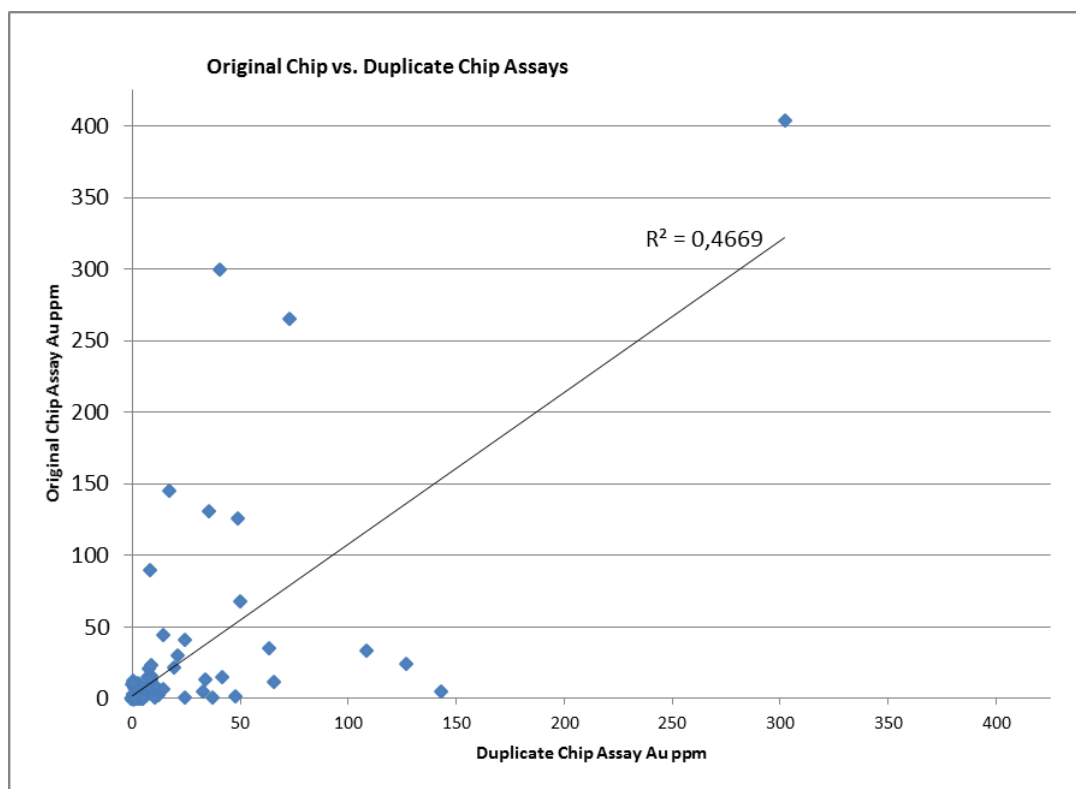


Figure 11.10 – Duplicate samples of face sampling

11.6.5. Underground muck tracking

Internal tracking of the broken material underground, either ore or waste, was done from the mine to the mill using a simple “washer tracking system”. Pre-identified steel washers are inserted in underground remucks, to determine if any errors are made during haulage. If a washer inserted in waste is recovered at the mill, it can be assumed some waste was put on the ore pile during haulage and vice versa. This simple system is efficient in flagging any muck haulage problems before they become too serious.

Almost no washers were inserted in 2014, but Richmond intends to use this control again in 2015.

11.7. Summary and Comments

Accuracy and precision levels of LabExpert, the primary laboratory used at Island Gold, is evaluated as very good demonstrated by performance in the Island Gold certified reference standard program. The sub 1% accuracy levels from the accepted mean value of the certified reference standards give strong validity to the assay results used in the reserve/resource calculations. Wesdome and Actlabs also were at or better than the typical industry levels as well. Improvement is needed in selecting matrix matched standards with the assay core samples.

Accuracy and precision levels of Actlabs and LabExpert for their internal programs were good and acceptable as well. The precision of the internal standards for

Wesdome needed improvement in 4 of the 6 standards used although accuracy was remained acceptable. The only suggestion is that the internal lab standards be matrix matched with Island Gold mine ore samples. In many casing CRM was oxide based rather than sulphide.

Duplicate pulp rechecks by LabExpert exhibited a high degree of correlation indicating that the crushing and pulverization steps produced a very homogenous sample medium. This is a critical stage in the analytical process. Wesdome and Actlabs also performed well in this regard.

LabExpert pulp and reject samples cross checked by Actlabs displayed a very high correlation coefficients well over an R^2 of 0.9. Wesdome pulps and reject similarly cross checked by Actlabs yielded a similar strong correlation. This excellent repeatability gives strong validity to the assay results. Improvement in these areas could be the reduction of reject grain size to 90% -10 mesh and increase in pulp sample mass from 30 to 50 g.

Field blank program demonstrated a failure rate of 9% for LabExpert indicating a cross contamination issue and suggesting some room for improvement at the analytical stage particularly when cleaning the ring crusher after each sample preparation. The blank failure rate of Wesdome was 34% indicating a serious problem with cross contamination between sample preparations. To control this problem the lab should be notified upon blank failure.

The core duplicate results when displayed on a typical scatter plot yield what appears to be a moderate good coefficient correlation R^2 factor of 0.85. However when assessed by the Absolute Relative Difference method the ARD of all 229 samples indicate an average variability of 46%. This suggests that the primary rock sample may have intermittent problems with a mild to moderate nugget effect. It also indicates as previously discussed the crushing and pulverization steps have been conducted well and the produced good homogeneity which may have masked any apparent nugget effect of possible sample core inhomogeneity.

It is suggested that the Howarth and Thompson (1978) method of validation be adopted to better evaluate the analysis of duplicate samples.

After compiling and interpreting the QA/QC data, the assay results from laboratories used to calculate the Mineral Resource and Reserve Estimate of December 31, 2014, are considered acceptable and within normal tolerance limits.

12. DATA VERIFICATION

The sample intervals, sample numbers, and other information on the sample tags are manually entered into the database by Island Gold mine personnel. The assays are digitally transferred into the database by an in-house program developed by Richmond. The Gemcom database is valid and acceptable for supporting resource estimation work. This database contains all of the information related to drill holes, drift sampling, assay results and the laboratory certification. The assay results are transferred via e-mail and then are put into the database, which had no modifications done to it and was used in its entirety.

The data used for the reserve and resource estimate was deemed acceptable. Some checks against the original data were performed and modifications were completed if needed before any estimates were calculated.

A verification of and corrections to the Island Gold database were done prior to the Mineral Resource and Reserve Estimate of December 31, 2014.

An external reserve and resource audit was completed in January 2014 by M. Robert de l'Étoile from RPA and based on a desktop review of the Lower Island Gold Mineral Resource, RPA was of the opinion that the Mineral Resource Estimate was reasonable, has been adequately prepared using standard industry practices, and conforms to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM definitions) as incorporated into National Instrument 43-101 (NI 43-101).

The author of this section considers that the Island Gold mine drill hole database is suitable for use in the mineral reserve and resource estimation studies.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

Mineralogical and metallurgical characterization studies were performed in 2013 by *Unité de recherche et de service en technologie minérale* (URSTM), a research unit affiliated with the *Université du Québec en Abitibi-Témiscamingue* (UQAT). One (1) set of samples from four (4) different drill cores were selected and shipped to URSTM. The drill cores were representative of the mineral deposit analyzed in this PEA. An average gold grade was determined for each core sample. The samples were combined in a composite for the metallurgical testwork. The drill hole numbers were:

- 400-514-16A;
- GD-11-15;
- GD-497-01W1; and
- 425-487-02.

The composite was analyzed for mineral content using ICP chemical analysis. A Bond Work Index test was conducted on the composite. The free gold evaluation of the material was assessed to determine the free gold content and gold concentration. The gold recovery was achieved by gravity and cyanidation on the whole composite.

13.1. Head Assays

The variability tests from the four (4) samples are summarized in Table 1. The composite head analysis by ICP was conducted by Laboratoire Expert (Table 13.2).

Table 13.1 – Drill Hole Head Assay

Drill Hole	Au (g/t)
400-514-16A	17,24
GD-11-15	40,49
GD-497-01W1	46,68
425-487-02	3,93

Table 13.2 – ICP analysis on composite head sample (Laboratoire Expert)

Code	Zone	Ag ppm	As ppm	Ca	Co ppm	Cu ppm	Fe	Hg ppm	Ni ppm	Pb ppm	S	Sb ppm	Zn ppm
S-24	Island Gold composite sample	1,3	99	2,7%	16	74	3,4%	0,026	26	2	2,1%	< 10	47

13.2. Grinding

Comminution testwork determines the ore characteristics and energy consumption required to break the rock. The composite was tested at *Cégep de l'Abitibi-Témiscamingue* for the Bond Ball Mill Work Index.

13.2.1. Bond Ball Mill Test

The Bond Index expresses the material's resistance to ball milling grinding. A high index value means the material is more difficult to grind. The Bond mill work index result was 12.6 kWh per metric ton using a standard test procedure.

13.2.2. Free Gold Content Evaluation

A gravimetric concentration evaluation was carried out in two (2) steps using a Knelson concentrator, followed by a cleaning stage using a Mozley table. The experimental procedure for free gold evaluation is presented in Figure 13.1.

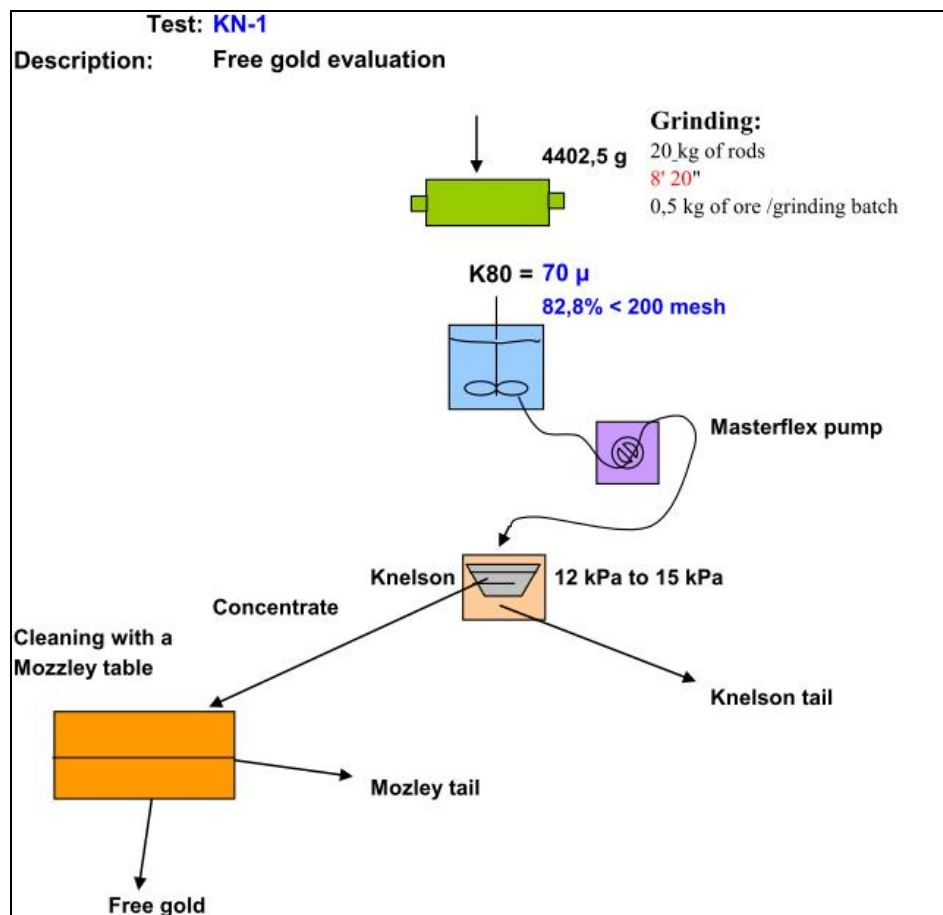


Figure 13.1 – Free gold evaluation protocol

The free gold content of the composite is estimated at 54.8%. The coarsest gold particle was measured at 693 µm, but the majority of the free gold is in the finer size (<25 µm).

13.2.3. Cyanidation

The standard method of recovering gold is through cyanidation, where gold is dissolved by cyanide solution and further concentrated by either precipitation through the addition of zinc dust or by adsorption through activated carbon. Gold leaching was investigated at URSTM on the composite samples at different grinds with a 24-hr residence time (Table 13.3); the leaching performance went up to 99% at the finest grind (36 microns), and down to 96.8% in the coarser grind.

Table 13.3 – Cyanidation test results

Description	Test	Cyan. duration (h)	K80 (µm)	% < 200 mesh	NaCN		Ca(OH) ₂		Au		
					ppm NaCN (end of test)	kg NaCN/ mt of ore	pH final	kg Ca(OH) ₂ / mt of ore	Rec. Au	final tail g Au/mt	Calc. Feed g Au/mt
Cyanidation test at different grinds	CN-IG-1	24,0	101 µ	68,2%	639	0,11	11,2	1,60	96,8%	0,84	26,62
	CN-IG-2	24,0	70 µ	82,5%	653	0,17	11,2	1,76	97,9%	0,58	27,31
	CN-IG-3	24,0	49 µ	82,5%	731	0,17	11,4	1,86	98,4%	0,42	25,16
	CN-IG-4	24,0	36 µ	98,7%	757	0,24	11,4	2,34	99,0%	0,29	28,97
Average calc. feed:											27,02 g Au/mt

13.2.4. Production Data

Kremzar Mill has been processing ore from the Island Gold Mine since October 2007, and more than 320,000 ounces have been recovered. Since the beginning of 2015, Kremzar Mill has processed a proportion of the ore from the lower zone development. The development material was mixed with the mining production in a significant proportion, up to 43% for the third quarter of 2015. Figure 13.2 summarizes the proportion of development material in the mill feed for 2015.

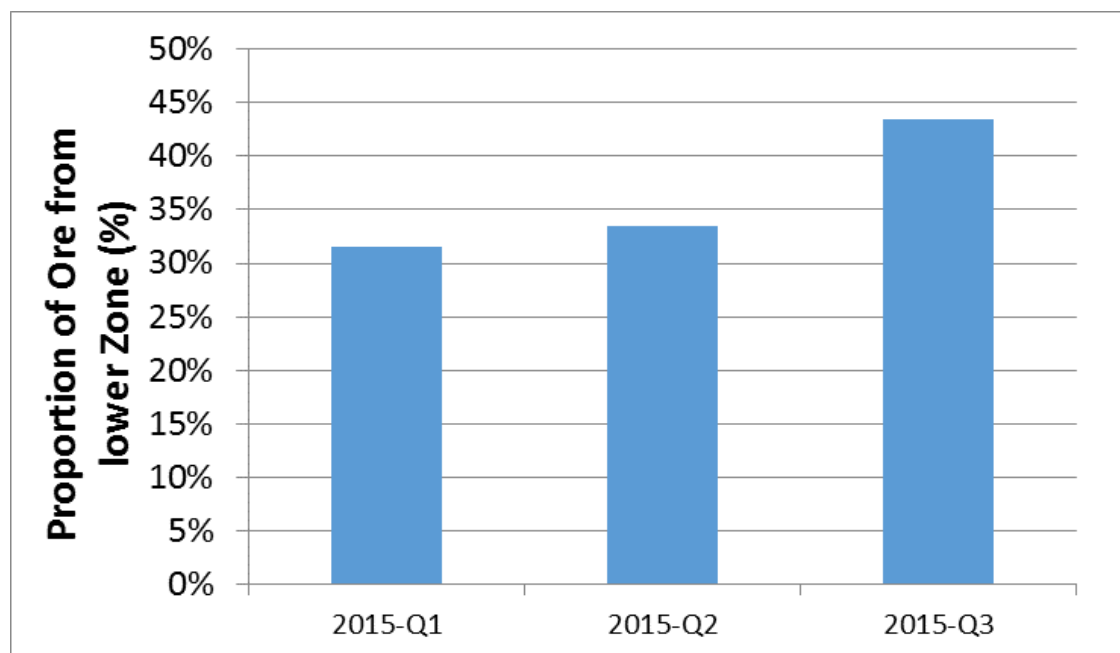


Figure 13.2 – Proportion of Ore Processed at the Mill from Lower Zone Development

The average Kremzar Mill feed grade was 5.9 g/t for 2014, and 7.2 g/t for the first three quarters of 2015. During this period, the recovery was at or higher than the 96% targeted recovery. Gold recovery has not been affected by the proportion of development ore processed from the lower zone since the beginning of 2015.

Average production head assays by quarter are presented in Figure 13.3, and gold recoveries for the same period are presented in Figure 13.4.

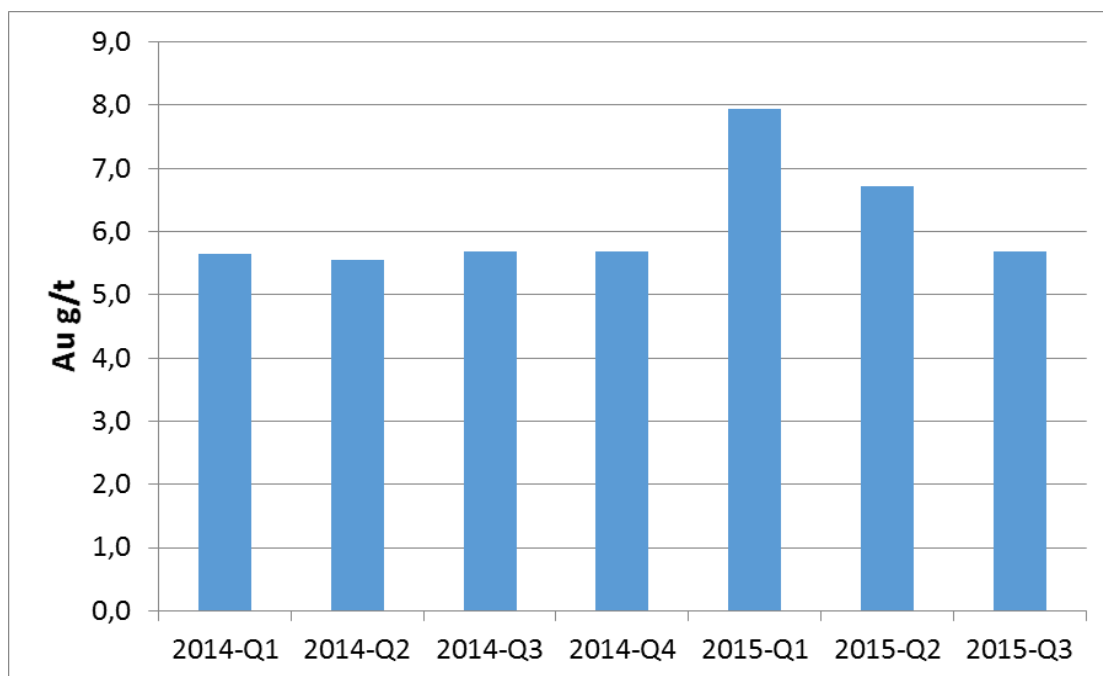


Figure 13.3 – Kremzar Mill head assays 2014–2015

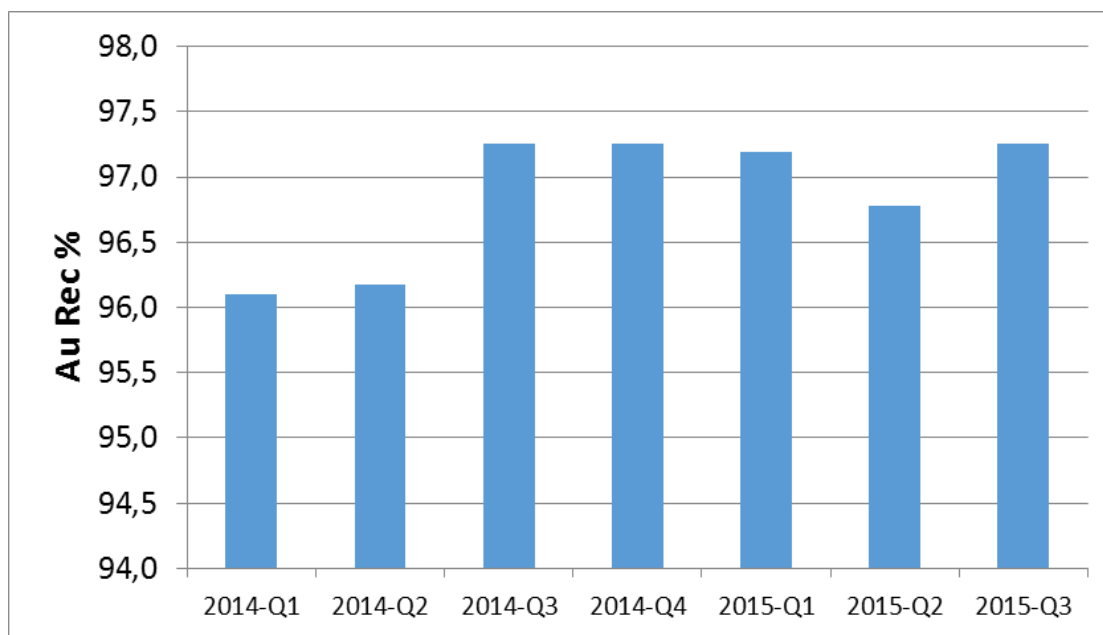


Figure 13.4 – Gold recoveries 2014–2015

14. MINERAL RESOURCES ESTIMATES

14.1. Introduction

The PEA calculations are based on the estimation of the Mineral Reserves and Resources defined as of December 31, 2014. This estimation was carried out by the geological staff of the Island Gold mine in collaboration with Richmond's exploration department Rouyn under the supervision of Raynald Vincent, P.Eng., Chief Geologist. The data and results were reviewed by Daniel Adam, P.Geo., Vice President Exploration for Richmond.

Mineral resources were grouped according to the classification established by the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") and adopted by the CIM Council. The source data and parameters used for the estimation of the mineral resources correspond to acquired knowledge, best estimations and the situation as of December 31, 2014. For calculation purposes, it includes results available as of December 31, 2014 for the Island Gold mine.

Richmond's technical staff produced an interpretation according to local conventions used at Island Gold as follows:

- C, D, D1 and E1E for the Island and Lochalsh zones;
- GD2, GP2, GD3, GP5, GD6, GD7 and GD9 for the Goudreau zones; and
- B, C, D, D1, E1E, G and G1 for the lower Island Gold zones (also known as Lower Island Gold).

The zones are clearly defined on longitudinal sections. A series of these longitudinal sections are presented in Appendix V at the end of this report to illustrate the Mineral Resource and Reserve blocks.

Before defining the mineral resources, a global resource evaluation was performed to identify mineralized zones that meet technical parameters. This global resource evaluation was completed for all the zones, and the same technical parameters were used.

The Mineral Resources presented here are exclusive of Mineral Reserves. The economic viability of these Mineral Resources has not been demonstrated. Reserves are presented in section 15 of this report.

14.2. Mineral Resource and Reserve Classification, Categories and Definition

The CIM guidelines for resource classification include the following definitions which are relevant to the classification of the Island Gold mineral resources:

- A Mineral Resource is a concentration or occurrence of natural, solid, inorganic or fossilized organic material 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.
- A Measured Mineral Resource 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.

- An Indicated Mineral Resource 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.
- An Inferred Mineral Resource 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.

The following definitions detail the nomenclature of the Mineral Resource Estimate as of December 31, 2014:

- Indicated resources: A maximum drill hole spacing of 20 to 25 m center to center is required to have a good control on vein continuity especially if no development was done above or below the ore block. Economic feasibility was not done on these resource blocks or it was negative. This last parameter differentiates these blocks from the probable reserve blocks.
- Inferred resources: These blocks are represented mainly by isolated drill holes, or areas where the drill spacing is too large, with zones interpreted to be the continuity of the known mineralized zones. Economic feasibility was not done on these resource blocks. The influence given around one hole to define the inferred resource block depends on the thickness and the geological continuity of the zone; it varies from 10 to 30 m.

14.3. Methodology

GEMS software, version 6.7, was used to prepare the resource estimation. The resource estimates were calculated following two distinct methods. GEMS software was used to create block models for all zones in all sectors, except for the E1E-Ext3 Zone. At the extremity of the study area, where less diamond drilling information was available, the E1E-Ext3 resources were calculated using a polygonal method, but a grade correction was applied to decreased the grade by 26%. This correction was based on historical reconciliation data between production and milling at the Island Gold mine.

Regardless of the methods used, mineralized intersections were established by the geological department for each drill hole and underground development face. The diamond drill hole intersections were determined following an interpretation on vertical cross-sections and horizontal plans while the development intersections were interpreted using face mapping and the assay results of each development face. Once an individual mineralized intersection is determined, each one is tagged in the database according to their individual zone name.

14.3.1. Polygonal method

Individual pierce points were generated on longitudinal sections for the E1E-Ext3 Zone. This longitudinal is a representation of an average plane through the mineralized zone.

For the E1E-Ext3 Zone, an azimuth of 91° and a dip of 80° (south) were used for the calculations.

For the polygonal method, polygon construction is completed on longitudinal sections. An influence area of 20 m was determined and used for the diamond drill hole data and development composites. When all polygons are generated, a combination is created using development and drill hole pierce points.

After the ore block limits are determined and the grade and tonnes of each reserve block are calculated, the specific dilution and ore recovery are factored into the final reserve estimate. A 10.0 g/t capping is applied to the undiluted mineralized ore block, and an 8.3 g/t capping is applied to the undiluted development ore blocks during the resource estimation. These capping limits are based on the reconciliation of historical Island Gold production data and the mill data, and are specific to the mine.

Resource estimates are given in-situ without dilution or ore recovery being factored into the calculation.

14.3.2. Block modelling – Upper Island Gold

After interpretation, 3D solids were created in GEMS software, 1-m composites were generated inside the solids built for resource estimation. Assays used in the compositing process were capped at 75 g/t Au. A rock code, based on the associated zone, was assigned to each composite. Composites were extracted to a point area table for statistical analysis and grade interpolation, composite less than 0.30 m were discarded.

In order to determine search ellipsoid parameters and to define variability over distance between holes, variography was carried out by Belize Solutions Inc. in 2010 (Appendix VI). Gold zones in the Extension 1 and Lochalsh sectors used the same ellipsoid parameters. In the Extension 2 sector, rotational parameters around the axes were slightly changed to better fit the mineralized zone in that area. Cell size used in the block modelling was 5 m (east-west) by 5 m (elevation) by 2 m (north-south). Cell blocks had to be 50% or more within the 3D solid to be included in the grade estimates.

Block grade interpolation was carried out using ordinary kriging or ID2. A minimum of two (2) composites and a maximum of 16 composites were used to interpolate grades within each block. The search radius used during the estimations varies according to the zones. All block model parameter data for the block model are found in Appendix VII.

14.3.3. Block modelling – Lower Island Gold

The C Zone, as well as the other parallel zones defined at depth, are typical of the Island Gold mine mineralization, exhibiting decimetre-sized grey quartz veins often containing visible gold inside several metres wide altered zones with disseminated pyrite.

The current mineral resource estimation of the lower Island Gold zones (*Lower Island Gold*) was completed for an area extending over 1,000 m laterally and at depth from 400–450 m to 1,100 m, below the area currently being mined. A total of 465 surface and underground drill holes were used to model the mineralized zones with 3D wireframes using a minimum true thickness of 2 m; composites less than 0.75 m were discarded.

Mineral resources were estimated by 3D block modelling (block dimension of 10 m x 10 m x 4 m) with GEMS software using 2-m composites except for the Extension 2 Sector where 1-m composites have been used and those less than 0.3 m were discarded. For the Extension 2 sector, the block model dimension was 5 m x 5 m x 2 m.

Grade estimation was done by Ordinary Kriging for the Extension 1, Extension 2, C and B zones, using parameters that have been defined with a variographic study done on the C Zone (Appendix VI). Parameters used for the kriging of the different zones are given in Appendix VII.

The capping grade for each of the Lower Island Gold zones are given in Table 14.1, and charts are found in Appendix VIII. A high grade assay capping value of 95 g/t Au was used for the C Zone following a statistical analysis of this zone.

Table 14.1 – Capping grade for the Lower Island Gold zones

Zone	Data type	Capping value (g/t)
G1	DDH	40
G	DDH	40
B	DDH	70
C	DDH	95
C	FACE	47
D	DDH	31
D1	DDH	31
E1E	DDH	31

For all the other zones, grade estimation was done using an inverse squared distance weighted interpolation. A minimum of 2 composites and a maximum of 20 composites (within an ellipsoidal search ellipse of 60 m x 60 m x 40 m) were used for the interpolation. A high grade assay capping value of 40 g/t Au was used for the G and G1 zones and 31 g/t Au for the D, D1 and E1E gold zones.

A density of 2.80 t/m³ was used for the tonnage calculation of all the lower zones except for Extension 2 where we used 2.82 t/m³, which is based on one URSTM laboratory measurement completed on a composite sample of four C Zone core intercepts (a density of 2.82 t/m³ is presently used at the Island Gold mine).

Mineral Resources were estimated using a minimum average grade of 3.75 g/t Au inside the modelled mineralized zone. This cut-off is based on a gold price of US\$1,200 per ounce, and a CAD/USD exchange rate of 1.0833. Mineral resource areas were cut into the C Zone wireframe using an extrapolation of approximately 30 m from drill hole intercepts, an extrapolation of about 20 m has been used for the other zones. All the blocks inside the clipped wireframes are accounted for in the mineral resource estimation. Inside the mineral resource areas, drill hole spacing average is approximately 50 m although there are areas with a larger spacing as well as areas with a tighter spacing.

Considering the present drill hole spacing, about 20% of the Lower Island Gold resources have been categorized as Indicated.

14.4. Data and Parameters

The Mineral Resource and Reserve Estimate of December 31, 2014 is based on more than 37,000 composites, taken from 5,258 underground development faces, 2,116 underground diamond drill holes and 230 surface diamond drill holes. Also, diamond drill holes will generally intersect more than one zone and therefore generate more composites.

A total of 54,372 assays were used to define the composites.

14.4.1. Diamond drill hole database

The diamond drill core was logged by qualified personnel using GEMS Logger software. This software is Access based and an extension/module compatible with GEMS software. The current resource estimate is based on both historical and current drill hole assays present in the Island Gold diamond drill hole database.

14.4.2. Other available data

Core logs and assay certificates are generally in digital and paper format. The original paper copies of geological reports, drill logs and assay certificates are stored at the Island Gold mine site.

14.4.3. Parameters

The following parameters were used for the Mineral Reserve and Resource estimation of December 31, 2014:

- Exchange rate (CAD/USD) : 1.0833
- Price of gold (US\$) : \$1,200.00
- High value capping limit (Upper Zones) : 75.0 g/t Au
- High value capping limit (Lower Zones) : 95 g/t Au for C & B zones, 40 g/t for other zones
- Low value cut-off limit (Stope) : 3.75 g/t Au
- Low value cut-off limit (Development) : 1.5 g/t Au
- Stope dilution : 18%
- Development dilution : 30%
- Dilution grade : 0.5 g/t
- % Ore recovery – Stope (included) : 95%
- % Gold recovery – Mill (excluded) : 95%
- Ore specific gravity : 2.82 t/m³ (2.80 t/m³ for Lower Island Gold resources)
- Minimum mining width : 2.0 m

The exchange rate and the price of gold were determined by the Richmond head office. Other parameters were determined by the Island Gold technical department based on criteria such as mining method, operating costs and historical mining results obtained at the mine.

Stope dilution varies according to the planned stope widths. The specific dilution for each mining block is determined by the Island Gold engineering department. For the reserve estimation, an average stope dilution of 18% is used. The development dilution is estimated at 30%. This dilution and stope ore recovery are based on historical results obtained in previous developments and stopes excavated since 2006.

All diamond drill hole intercepts and development faces were calculated at a 2.0m minimum width. Grade of the adjacent material was used when assayed, or a value of zero was applied when not assayed.

The specific gravity database used for the current estimate is based on the historical specific gravity determined by Swastika Laboratories giving an average of 2.82 t/m³. For the Lower Island Gold Resources, a density of 2.80 t/m³ was used for the tonnage calculation of all the zones.

Parameters for the Lower Island Gold Resources are described in section 14.3.3.

14.5. Mineral Resource Estimate

Mineral Resources that are listed here are exclusive of Mineral Reserves, and the economic viability of these Mineral Resources has not been demonstrated. Figure 14.1 shows the Island Gold mineral resources plotted on a longitudinal section of the mine.

14.5.1. Island Gold Total Mineral Resource

The Measured and Indicated resources of the Island Gold mine were estimated at 733,500 tonnes grading 9.29 g/t Au for 219,050 ounces, and the Inferred resources were estimated at 3,547,500 tonnes grading 8.79 g/t Au for 1,002,750 ounces. All

resource blocks determined to be economically viable were converted to reserves and are not included in the Mineral Resource Estimate of December 31, 2014.

Results are presented undiluted and in-situ. This Mineral Resource Estimate is an estimate of the Island, Goudreau and Lochalsh zones only. It does not include any of the possible resources in the other mineralized zones, such as the North Shear or Shore zones.

The resources were based on parameters detailed in section 14.3 and were evaluated from drill hole and chip composite results using GEMS 6.7 software. All calculations were done in metric units (metres, tonnes and g/t Au).

Tables 14.2 to 14.4 summarize the calculated resources. Individual results by resource block are given in Appendix IX.

Table 14.2 – Island Gold Measured Resource Estimate as of December 31, 2014

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Island Sector – E1E and E2 Zone	5,945	6.06	36,042	1,159
Island Sector – Upper D1 Zone	11,636	4.26	49,553	1,593
Island Sector – Upper C and D Zones	8,399	6.19	51,991	1,672
Island Sector – Lower C and D Zones	9,421	3.33	31,389	1,009
Total	35,401	4.77	168,975	5,433

Table 14.3 – Island Gold Indicated Resource Estimate as of December 31, 2014

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Lochalsh Sector – E2 Zone	28,447	6.57	186,798	6,006
Lochalsh Sector – E1E Zone	80,389	6.53	524,771	16,872
Lochalsh Sector – D Zone	16,715	8.08	135,006	4,341
Lochalsh Sector – C Zone	19,898	6.75	134,364	4,320
Island Sector – E1E and E2 Zone	27,970	6.89	192,768	6,198
Island Sector – Upper C and D Zones	10,350	6.58	68,105	2,190
Island Sector – Lower C and D Zones	419,709	11.19	4,696,352	150,991
Island Sector – Upper D1 Zone	3,647	5.60	20,428	657
Extension 1 Upper – E1E, C and D Zones	9,781	3.95	38,589	1,241
Extension 1 Lower – E1E, C and D Zones	8,847	7.72	68,295	2,196
Extension 2 Upper – E1E, C and D Zones	6,772	9.79	66,267	2,131
Extension 3 Sector – E1E, C and D Zones	15,466	7.14	110,429	3,550
Goudreau Sector – GD2 Zone	13,112	8.48	111,250	3,577
Goudreau Sector – GD3 Zone	15,829	7.34	116,120	3,733
Goudreau Sector – GD6 Zone	12,374	10.00	123,738	3,978
Goudreau Sector – GD7 Zone	8,588	5.92	50,872	1,636
Total	697,894	9.52	6,644,153	213,614

Table 14.4 – Island Gold Inferred Resource Estimate as of December 31, 2014

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Lochalsh Sector – E2 Zone	37,708	7.62	287,479	9,243
Lochalsh Sector – E1E Zone	79,773	7.25	578,090	18,586
Lochalsh Sector – D Zone	38,532	7.31	281,672	9,056
Lochalsh Sector – C Zone	44,077	6.71	295,560	9,502
Island Sector – Lower B Zone	306,623	7.18	2,200,506	70,748
Island Sector – Upper C and D Zones	35,147	6.65	233,723	7,514
Island Sector – Lower C and D Zones	1,840,674	10.00	18,411,490	591,943
Island Sector – Upper D1 Zone	18,908	5.33	100,803	3,241
Island Sector – Lower D1 Zone	36,473	4.88	177,849	5,718
Island Sector – Upper E1E and E2 Zones	46,524	5.49	255,339	8,209
Island Sector – Lower E1E and E2 Zones	63,300	7.05	446,254	14,347
Island Sector – Lower G and G1 Zones	555,906	7.47	4,153,009	133,522
Extension 1 Sector – Upper E1E, C and D Zones	2,006	4.75	9,530	306
Extension 1 Sector – Lower E1E, C and D Zones	325,673	8.84	2,880,378	92,606
Extension 2 Sector – Upper E1E, C and D Zones	4,452	4.30	19,148	616
Extension 2 Sector – Lower E1E, C and D Zones	49,729	6.93	344,492	11,076
Extension 3 Sector – E1E, C and D Zones	7,098	8.01	56,854	1,828
Goudreau Sector – GD2 Zone	7,390	6.56	48,493	1,559
Goudreau Sector – GD3 Zone	11,565	7.42	85,832	2,760
Goudreau Sector – GD7 Zone	16,026	7.60	121,794	3,916
Goudreau Sector – GD9 Zone	8,727	10.00	87,274	2,806
Goudreau Sector – GP2 Zone	11,380	10.00	113,800	3,659
Total	3,547,693	8.79	31,189,370	1,002,761

14.5.2. Details of the Lower Island Gold Mineral Resource

Drilling completed in 2014 enabled Richmond to confirm the C Zone Inferred resource at depth and convert part of it to the Indicated category, specifically in western upper part of the C Zone and in the Extension 1 sector, between the two diabase dykes (Fig. 14.1). Several mineralized zones that are parallel to the C Zone have also been recognized and interpreted, and a resource estimation has also been completed on these zones. They are now included in the Total Island Gold Mineral Resource.

Measured and Indicated mineral resources of 438,000 tonnes grading 10.95 g/t for 154,200 ounces of gold have been established for the lower zones of the Island Gold mine (“Lower Island Gold”; Table 14.5). The Inferred mineral resources totalled 3,178,000 tonnes grading 9.00 g/t for 919,950 ounces of gold in the lower zones of the Island Gold mine, mostly in the C Zone (Table 14.6). Individual results by resource block are given in Appendix IX.

Table 14.5 – Lower Island Gold Measured & Indicated Resource Estimate as of December 31, 2014

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Island Sector – Lower C and D Zones (Measured)	9,421	3.33	31,839	1,009
Island Sector – Lower C and D Zones (Indicated)	419,709	11.19	4,696,352	150,991
Extension 1 Sector – Lower E1E, C & D Zones (Indicated)	8,847	7.72	68,295	2,196
Total	437,977	10.95	4,796,036	154,196

Table 14.6 – Lower Island Gold Inferred Resource Estimate as of December 31, 2014

Zone	tonnes	Grade (g/t Au)	Grams	Ounces
Island Sector – Lower B Zone	306,623	7.18	2,200,506	70,748
Island Sector – Lower C and D Zones	1,840,674	10.00	18,411,490	591,943
Island Sector – Lower D1 Zone	36,473	4.88	177,849	5,718
Island Sector – Lower E1E and E2 Zones	63,300	7.05	446,254	14,347
Island Sector – Lower G and G1 Zones	555,906	7.47	4,153,009	133,522
Total	3,178,379	9.00	28,613,978	919,960

14.5.3. Island Gold Global Mineral Resource

The Island Gold Global Mineral Resource is summarized in Table 14.7.

Table 14.7 – Island Gold Global Mineral Resource Estimate as of December 31, 2014

Category	Tonnes	Grade (g/t Au)	Grams	Ounces
Measured Resources	35,500	4.77	169,000	5,450
Indicated Resources	698,000	9.52	6,644,000	213,600
Measured & Indicated Resources	733,500	9.29	6,813,000	219,050
Inferred Resources	3,547,500	8.79	31,189,500	1,002,750

Mineral Resources presented are exclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Several factors may affect the Mineral Resource Estimate. The estimation of mineral resources is a complex and subjective process and the accuracy of any such estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in the geological interpretation. Metal price, the CAD/USD exchange rate, geological continuity, mining method, hydrogeological constraints and geotechnical factors may materially impact the Mineral Resource estimate.

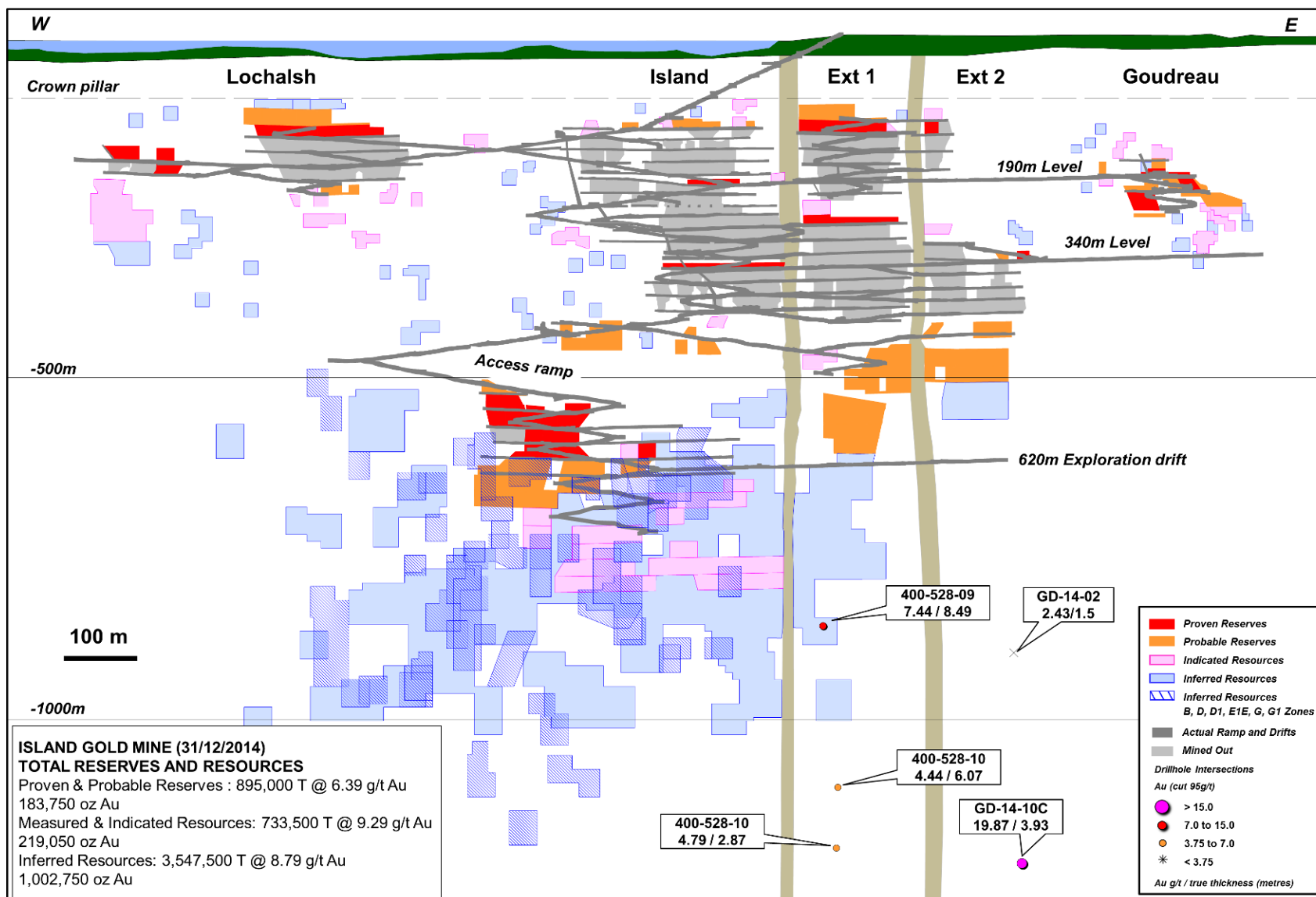


Figure 14.1 – Island Gold mine longitudinal section with location of Mineral Resources and Reserves as of December 31, 2014

15. MINERAL RESERVE ESTIMATES

The data and results were verified by Daniel Adam, P.Geo., PhD, Vice President Exploration for Richmond, and the reserve blocks were reviewed by the Island Gold mine engineering department, overseen by Daniel Vachon, Chief Engineer.

Mineral reserve calculations estimate the volume and grade of ore which can be mined and processed at a potential profit. The global resource was reviewed by the engineering department, with assistance from the geological staff, to define the reserve blocks that could be economically extracted with a mining plan. The conversion of mineral resources into mineral reserves is based on the economic parameters detailed in section 14. Only mineral resources that would have been classified in the measured and indicated categories were used in the economic calculations to estimate reserves as of December 31, 2014.

The methodology to define tonnage and grade for the reserve blocks is the same as that for the resource blocks (see section 14).

The economic viability of the resources converted into reserves was determined by the technical department of Island Gold mine, specifically the engineering department. Ore dilution, recovery rates and mining costs used in the resource and reserve calculations represent Richmond's best estimates as of December 31, 2014. These factors and parameters are revised each year in order to take into consideration the realities encountered in the mining operation, and are updated according to the experience gained and the changes in the economic situation. Individual results by reserve block are given for each mineralized zone in Appendix X. Longitudinal sections with all the resource and reserve blocks for each mineralized zone are provided in Appendix V.

The following definitions detail the nomenclature of the reserves estimated as of December 31, 2014:

- Proven reserves: Ore development was completed above, below or on both levels of the ore block. If only one level was developed a minimum drill spacing of 20 m is necessary to confirm vein continuity. Economic feasibility was estimated by the engineering department of the Island Gold mine to validate the block as reserves.
- Probable reserves: No development was done above or below. Since the information from the ore development is lacking, a maximum drill hole spacing of 20 m center to center is necessary to validate vein continuity inside the ore block. Economic feasibility was estimated by the engineering department of the Island Gold mine to validate the block as reserves.

Figure 14.1 shows the Island Gold mineral reserves plotted on a longitudinal section of the mine.

Total Island Gold Proven and Probable reserves as of December 31, 2014, stand at **895,000 tonnes at a grade of 6.39 g/t Au for 183,750 ounces.**

Tables 15.1 and 15.2 summarize the calculated proven and probable reserves. The data represents diluted ore (18% at a grade of 0.5 g/t) with an estimated 95% ore recovery, except for the Goudreau GP5 and GP2 zones (30% dilution and 50% ore recovery). The calculations do not take into account the milling recovery.

Table 15.1 – Island Gold mine – Proven Reserves as of December 31, 2014.

Zone	tonnes	Grade (g/t Au)	Grams	Ounces
Island Zone E1E	11,826	6.26	73,999	2,379
Island Zone C (Lower)	85,851	6.57	564,132	18,137
Island Zone D	8,196	5.05	41,380	1,330
Extension 1 (E1E Zone)	44,841	5.86	262,889	8,452
Extension 2 (Upper E1E Zone)	3,904	6.74	26,322	846
Lochalsh – E1E Zone	48,805	5.85	285,590	9,182
Goudreau – GD2 Zone	7,924	8.28	65,586	2,109
Goudreau – GD3 Zone	13,584	6.73	91,471	2,941
Goudreau – GD6 Zone	4,192	7.89	33,076	1,063
Goudreau – GD7 Zone	25,315	7.39	187,057	6,014
Broken tonnes (UG and surface)	4,271	2.43	12,798	411
Total	258,708	6.36	1,644,299	52,865

Table 15.2 – Island Gold Mine Probable Reserve Estimate as of December 31, 2014

Zone	tonnes	Grade (g/t Au)	Grams	Ounces
Island Zone E1E	48,97	5.14	250,694	8,060
Island Zone C Upper	23,616	4.92	116,197	3,736
Island Zone C Lower	107,991	7.85	847,728	27,255
Island Zone D	23,768	6.24	148,377	4,770
Extension 1 (C Zone)	106,892	5.91	631,710	20,310
Extension 1 (E1E Zone)	16,018	7.89	126,310	4,061
Extension 2 (Upper E1E Zone)	1,357	3.84	5,204	167
Extension 2 (Lower E1E Zone)	62,408	7.41	462,329	14,864
Development Island, EXT1 & EXT2	94,967	5.74	545,252	17,530
Lochalsh – E1E Zone	33,044	6.47	213,800	6,874
Lochalsh – E2 Zone	13,143	5.06	66,566	2,140
Lochalsh – C Zone	10,251	5.23	53,634	1,724
Development Lochalsh	21,056	4.46	93,848	3,017
Goudreau – GD2 Zone	18,333	8.28	151,860	4,882
Goudreau – GD3 Zone	6,384	6.84	43,675	1,404

Zone	tonnes	Grade (g/t Au)	Grams	Ounces
Goudreau – GD6 Zone	13,853	7.82	108,269	3,481
Goudreau – GD7 Zone	14,972	3.91	58,559	1,883
Goudreau – GP2 Zone	3,996	7.81	31,201	1,003
Goudreau – GP5 Zone	15,306	7.51	115,000	3,697
Total	636,151	6.40	4,070,213	130,861

The ore reserves presented here are in large part estimates, and production of the anticipated tonnages and grades may not be achieved or the indicated level of recovery may not be realized. There are numerous uncertainties inherent in estimating Proven and Probable reserves, including many factors beyond Richmond's control. The estimation of reserves is a complex and subjective process, and the accuracy of any such estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in the engineering and geological interpretation. Reserve estimates may require revision based on various factors such as actual production experience, exploration results, gold price fluctuations, drilling results, metallurgical testing, production costs or recovery rates. These factors may render the Proven and Probable reserves unprofitable to develop.

Also, the grade of ore mined may differ from that indicated by drilling results, and this variation may have an adverse impact on production results. In addition, the reliability of estimates of future production might also be affected by factors such as weather, strikes and environmental occurrences.

16. MINING METHODS

16.1. Caution to the Reader

The reader is cautioned that this PEA is preliminary in nature. The PEA includes Inferred Mineral Resources that are too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA scenarios or forecasts will be realized.

16.2. Introduction

The main objectives of this PEA were to:

- Establish a realistic and sustainable output capacity for the potential mineable mineral resource using the same mining method.
- Determine resources potentially amenable to mining.
- Elaborate a mining plan for these resources
- Estimate capital and operating costs related to the mine plan.
- Recommend additional work to advance the Project to the next stage.

The PEA mining plan has an output capacity of 800 tpd using the current material handling method with 30t trucks, supported by the results of a study of the maximum orebody sustainable extraction rate and an economic assessment of material handling systems (see section 24 for details). The potentially mineable resource is contained in a continuous portion of the deposit between levels 450m and 860m. It was defined using the company's resource and reserve statement as of December 31, 2014 (see sections 14 and 15 for details). For the purpose of this PEA, the following resources were excluded: those above the 450m level, those below the 860m level, and those within parallel structures or isolated resource blocks outside the main structure (the C Zone).

The PEA mineral resource area is shown on a longitudinal section of the Island Gold mine in Figure 16.1.

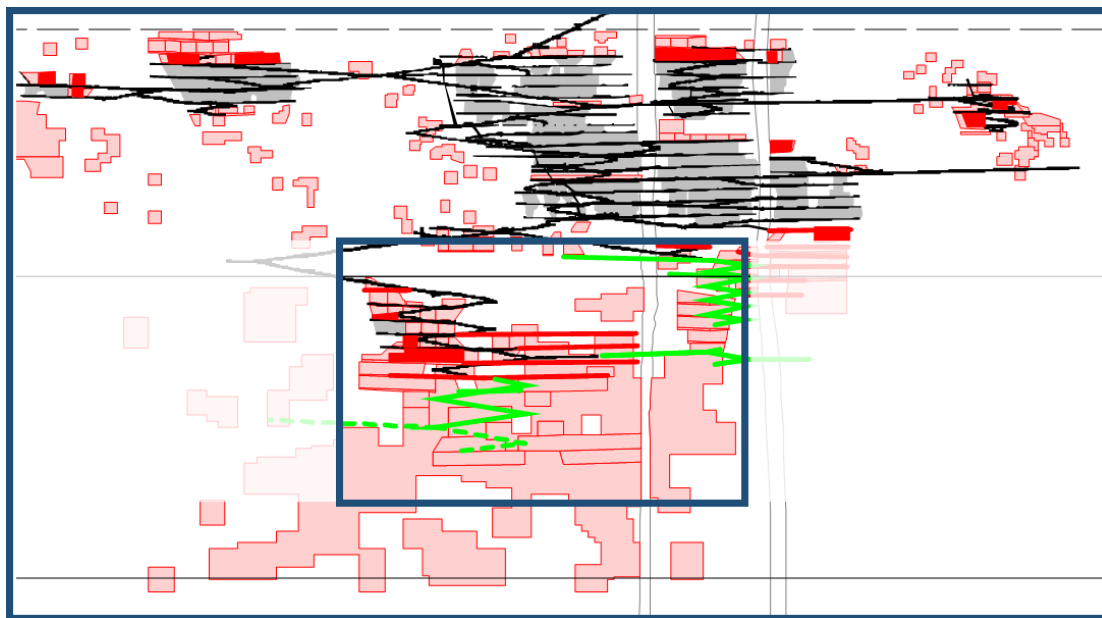


Figure 16.1 – Longitudinal section through the Island Gold mine showing the PEA mineral resource area (box)

16.3. Geotechnical

No geotechnical studies were conducted for the purposes of this PEA. Stope dimensions were kept within the same range currently in effect at the mine.

Determination of stope dimensions

John G. Henning, Ph.D., P.Eng., conducted a study to establish stope dimensions. The results were presented in a report issued in March 2007. The methodology was *empirical estimation of stope dimensions*, which uses the *stability graph* method according to the following steps:

- Estimate the N value;
- Plot the values onto the standard stability graph to obtain the initial design estimates of the hydraulic radius; and
- Calculate the strike length for the given stope height.

This method yielded estimates of the hanging wall dimensions. In the case of the Island Gold mine, the floor-to-floor height is in the range of 22 to 25 m. The hydraulic radius (HR) is dependent on the true width of the lens, but a value of 6 m was used (Table 16.1).

Table 16.1 – Estimated hanging-wall dimensions

Estimated hanging-wall dimensions					
		HR (m)	H = 15m (floor to floor)	H = 23m (floor to floor)	H = 33m (floor to floor)
		Strike Length			
Low range	Stable	4	17m	12m	10m
	Transition to unstable	6	60m	25m	19m
Typical	Stable	7	200m	36m	24m
	Transition to unstable	10	> 200m	150m	51m
Lower Mid- range	Stable	5	30m	18m	14m
	Transition to unstable	8			

Conservative maximum strike length design (based on anticipated low range N')

Optimistic strike length design (based on anticipated typical N')

Realistic (less-conservative) maximum strike length design (based on anticipated N' occurring between Low Range and Typical)

Backfilling

Backfilling would still be necessary for two main reasons: the first is related to stope stability, the other is to avoid leaving horizontal pillars. The recommended backfill is rock fill with no cement for most of the horizons.

Surface pillar

The mineralized zones of the Island Gold mine lie directly beneath Goudreau Lake. The surface pillar study, also carried out by Henning, was presented in a report dated September 2006. The conclusions and recommendations were as follows:

- The proposed use of cut-and-fill mining methods combined with a favourable rock mass setting will minimize the risk of crown pillar instability;
- The suggested minimum crown pillar for a stope with a 3-m span or less is 30 m;
- The suggested minimum crown pillar for a stope with a 4-m span is 40 m;
- The gently undulating bedrock surface interpreted by the seismic refraction surveys likely underestimates the true topography;
- Additional details of the bedrock topography over the ore zones will be determined through surface diamond drilling;
- Probe holes should be drilled in advance of lateral development of the uppermost sill drift;
- At the base of the crown pillar, it is essential that all exposed rock surfaces be reinforced with permanent ground support, in the form of full column resin-grouted rebar and screening; and
- If the back cannot be reinforced, it should not be mined.

16.4. Hydrogeology

The mine is already in production, and thus far, there have been no adverse ground conditions related to pressurized water or minerals that lose strength when exposed to water.

16.5. Potentially Mineable Mineral Resource

The mineral resource and mineral reserve block models prepared by Richmond were used for the PEA. The block models included solid shapes that were created at a cut-off of 3.75 g/t. The resource and reserve estimates reported in sections 14 and 15 are summarized in Table 16.2.

Table 16.2 – Summary of mineral reserves and resources (as at December 31, 2014)

Category	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)
Proven and Probable Reserves (above -400 m)	463,000	6.04	90,000
Proven and Probable Reserves (below -400 m)	431,500	6.76	93,750
Total Proven and Probable Reserves	895,000	6.39	183,750
Measured and Indicated Resources (above -400m)	295,500	6.83	64,850
Measured and Indicated Resources (below -400m)	438,000	10.95	154,200
Total Measured and Indicated Resources	733,500	9.29	219,050
Inferred Resources (above -400m)	369,500	6.97	82,800
Inferred Resources (below -400m)	3,178,000	9.00	919,950
Total Inferred Resources	3,547,500	8.79	1,002,750

- (1) Resources are exclusive of Reserves and do not have demonstrated economic viability at this time.
(2) Established on December 31, 2014, using a gold price of US\$1200 and a CAD/USD exchange rate of 1.0833
(3) Underground resources were established for the C Zone and six other lateral zones below a vertical depth of -400 m.

Table 16.3 provides a summary of the reserve and resource estimates below the -400 m elevation, as of December 31, 2014.

Table 16.3 - Summary of mineral reserves and resources below the -400 m elevation (as of December 31, 2014)

Category	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)	Resource classification (%)
Proven and Probable Reserves	431,500	6.76	93,750	11
Indicated	438,000	10.95	154,198	11
Inferred	3,178,000	9.00	919,950	78

For the purpose of this PEA, all mineral reserves were considered to be in the Measured and Indicated Resource category. Furthermore, the PEA only considers resources within the main continuous structure, the C Zone, between the 450m and 860m levels. More specifically, all mineral resources above the 450m level, below the 860m level, and within parallel structures or isolated resource blocks outside the main structure were excluded.

To prepare the mining plan, stope shapes were created using solids prepared by Richmond for their reserve and resource estimation. InnovExplo created stopes 22 m high and 25 m long with a width matching that of the mineralization. The resulting stopes are illustrated in Figure 16.2, and the resulting tonnage considered as a Potentially Mineable Mineral Resource is reported in Table 16.4.

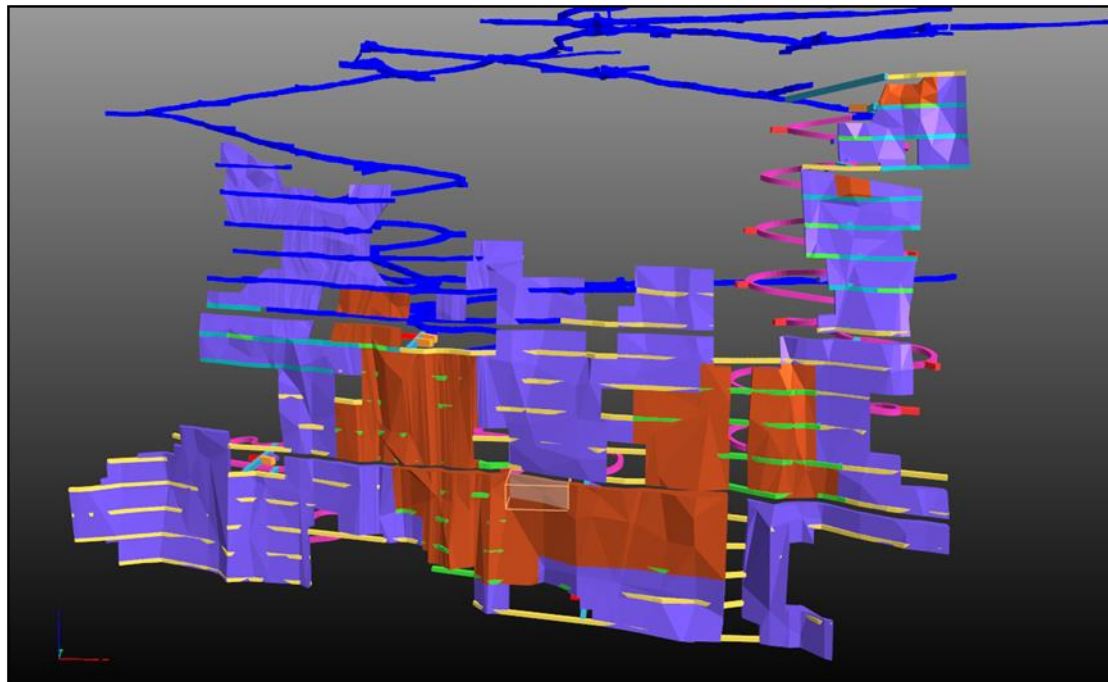


Figure 16.2 – Longitudinal view of the stopes included in the mining plan.

Table 16.4 – Resources considered in the mining plan

Category	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)	Resource classification (%)
Measured and Indicated	626,059	9.94	200,075	33
Inferred	1,245,199	11.04	441,976	67

The final mining plan developed in this PEA includes fully diluted and recovered mineralized material, and is presented in Table 16.5. Based on historical data for the Island Gold mine, a dilution factor of 18% and a mining recovery rate of 95% were applied to stope tonnage. Development tonnage grading more than 3.75 g/t was integrated into the mining plan. The resulting tonnage amounts to 2.09 Mt at 8.5 g/t Au.

Table 16.5 – Preliminary mining plan production quantities

	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)
Long Hole	1,890,000	8.41	511,033
Development	200,000	9.81	63,080
Total	2,090,000	8.55	574,517

16.6. Primary and Secondary Underground Access

The main access for personnel and material at the Island Gold mine is via a spiral shape ramp leading to the Lochalsh portal at surface. The main ramp, in lower sections of the mine, splits in two at elevation -410m in order to access the Island Gold Lower Zones sector and the Extension 1 sector on the east side. At the time of writing, the main ramp was developed to elevation 620m on the Island Gold side and to elevation 450m on the Extension 1 side. The PEA mine design consists of two (2) ramps driven from level 740m down to 860m in the Island Gold Lower Zones sector.

Ramps are driven with a flat-back profile, with nominal dimensions of 4.5 x 4.5m and a grade of 14%. Roadbed is added to obtain a rolling surface suited for ore handling by truck and other mobile diesel equipment. Assuming that the final (net) dimension of the ramp is 4.5 x 4.5m throughout the 450m to 860m sector, it would be possible to use 45t mine trucks, fully loaded. At the time of writing, 45t trucks cannot be used because an ore transfer would be required at the older and smaller portion of the ramp in the upper part of mine; partially loaded 30t trucks are the biggest trucks that can go through that small ramp section. The low-back area starts near the 425 pumping station and continues up to surface.

Ramps are developed in a spiral shape to allow access to all levels, which are spaced vertically every 22 to 25 m (floor to floor).

Egresses and manways

The manway starts from surface, not far from the main fresh air ventilation raise, and reaches level 150m where there is a short drift before reaching the next manway stretch. The stretch of manway from surface to level 150m is in fresh air and part of the dual-entrance heated mine fresh air system. From the 150m level, there is a cascade of manways and short ventilation drifts down to level 410m. From that point, there are two possible directions: one way east toward the Extension 1 sector, and the other west toward the Island Lower Zones ramp.

In the Island Lower Zones ramp, on elevation 425, there is the 425 ventilation access drift that connects to a manway going down. At the time of study, this manway, also in fresh air, had reached the 610m level. On the east side, in a symmetric manner, there is a planned manway that will follow ramp development down.

As part of the mining plan, a manway is needed on the Island Lower Zones side down to the ramp split on 720. From there, priority is to drive both ramps down in parallel and to make a permanent connection on the 770m level to provide a second egress mode instead of a traditional manway system, and to make an energy-efficient inter-ramp connection for ventilation purposes. Manways from the 770m level down to 860m are needed as egress unless a permanent inter-ramp connection is established on that bottom level.

Figure 16.3 shows the ventilation network as of June 8, 2015. The manway pathway in the Island Gold Lower Zones sector is a fresh air egress shown in green.

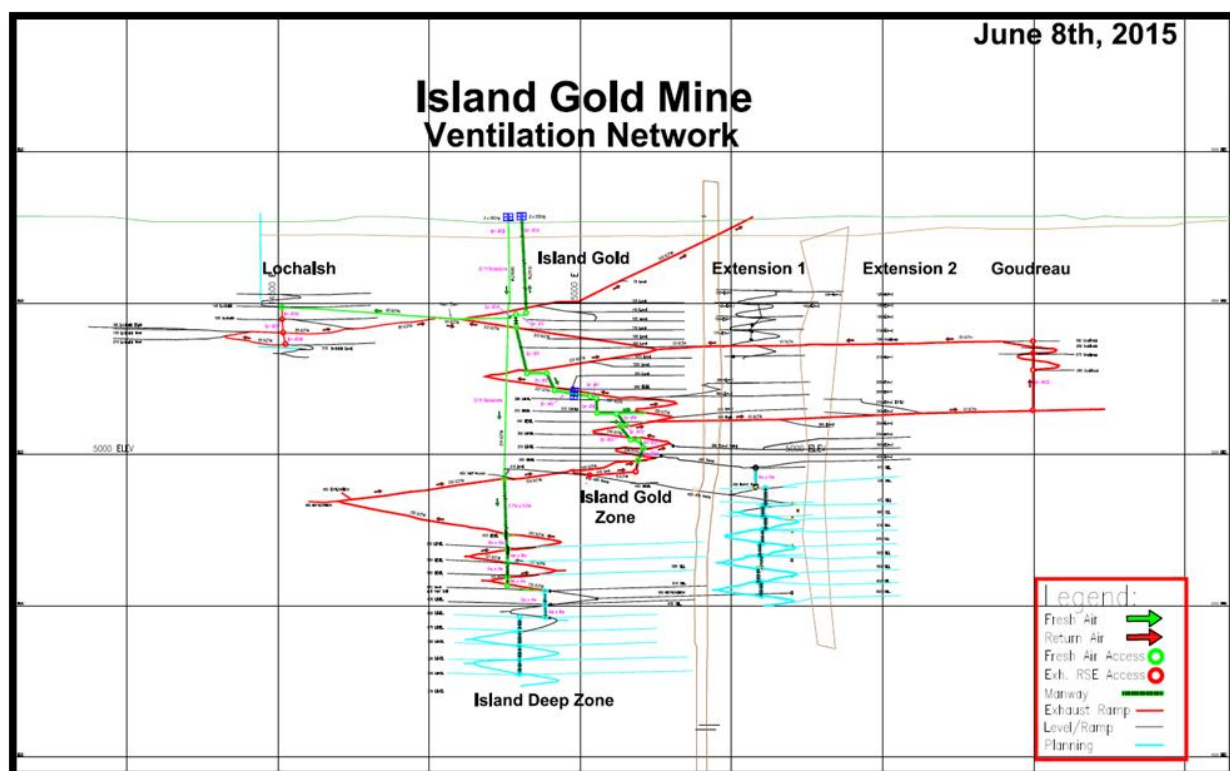


Figure 16.3 – Ventilation network as of June 8, 2015, looking north

Figure 16.4 shows the revised ventilation network for the purpose of this PEA, with egress manways. Fresh air goes down mainly from the west side and foul air goes up through the east side ramp. Manways are represented in blue, and most are in fresh air.

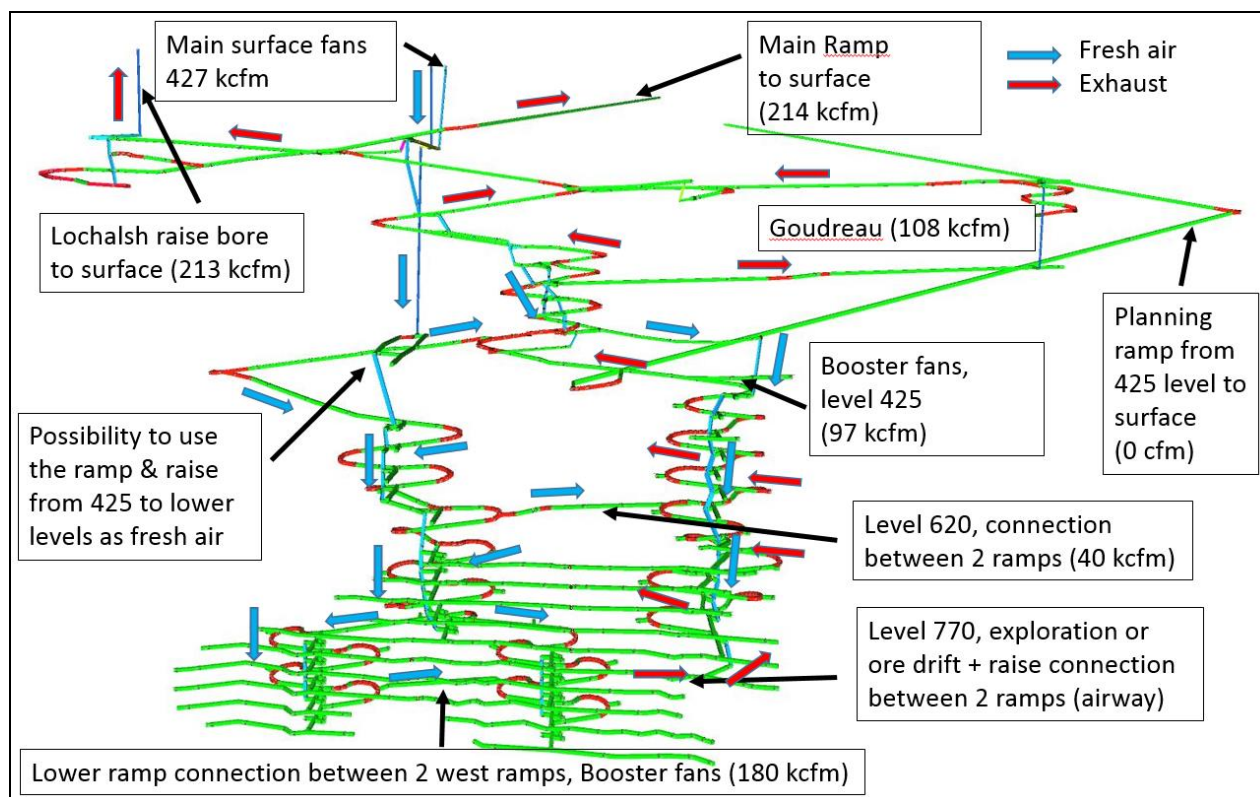


Figure 16.4 – Ventilation network and location of egresses (manways), as revised for the PEA

16.7. Underground Mining Method

Of all the methods tested since mining activities commenced at the Island Gold mine, the longitudinal long-hole retreat mining is the preferred method. The ore width, vertical dip, good ground quality, productivity factors, costs, and availability of equipment and personnel were some of the major parameters involved in the decision.

In the proposed mining plan, sills are planned on levels 860 m, 740 m and 635 m. No significant changes in the geological shape are expected in the area studied in this PEA. Therefore, the current mining method remains adequate for the evaluated mine expansion.

Long hole mining consists of drilling a series of vertical holes downward into mineralization from one level to another. The mineralization is then blasted in vertical slices, and the broken material ends up in the bottom sill and is extracted using LHDs. For every sill and sublevel horizontal slice, a primary slot opened by drop

raise method is excavated at each extremity of the level, and blasting of a first stope 18 to 22 m length along strike is achieved using a longitudinal retreating process. All the broken mineralized material is extracted before another slice is blasted to ensure maximum recovery of the mineralized material should any unplanned caving occur. Once the stope is completed, waste rock is dumped in the empty stope as non-cemented rock fill. To be able to blast the second stope of the same level, a void must first be created by pulling out some of the backfill of the first fully-backfilled stope. The second stope is then blasted, mucked and backfilled. The process is repeated until all sublevels are mined out. This mining method is often referred to as the *Modified Avoca Mining Method*. Some part of the mucking and backfilling steps are performed with remotely operated LHDs for safety reasons.

Stope size along strike is mainly dictated by a maximum hydraulic radius factor of 6.0.

Figures 16.5 and 16.6 illustrate the concept of the mining method.

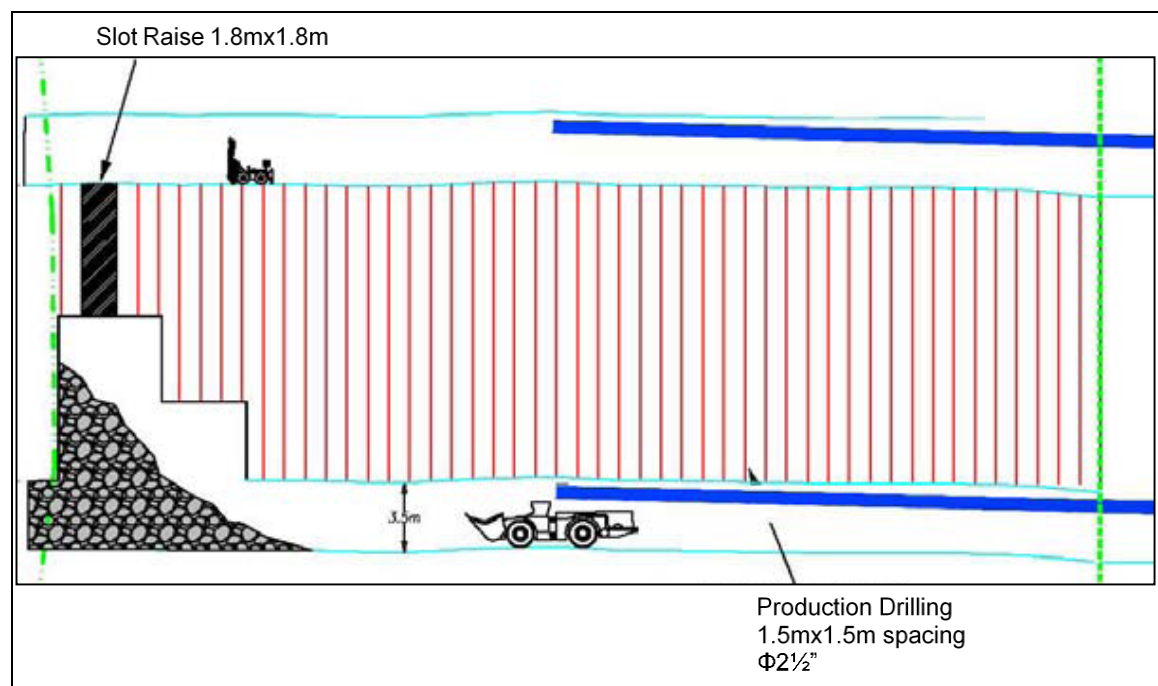


Figure 16.5 – Longitudinal view of the mining method showing drilling, blasting and mucking activities.

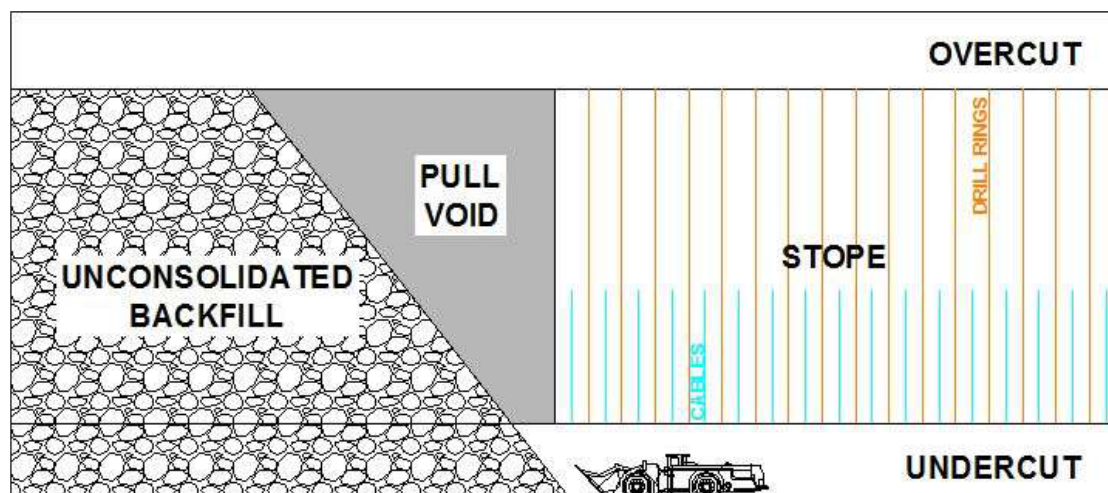


Figure 16.6 – Longitudinal view of the mining method showing backfill and void creation activities.

16.7.1. Mining domain concept

A mining domain is an independent production sector, starting on a sill and going up to reach the last level before the next sill. Within the domain, the mining method is retreating. For most of the domain, only one stope can be mined at a time. If there are multiple accesses on a sill to reach more than one domain, the upper levels associated with that sill will have to be designed symmetrically. Mucking or backfilling two stopes at the same time in the same domain would incur a loss of efficiency that may outpace the benefits.

Figure 16.7 shows a plan view of a sill with two domains. In the middle, one stope has to be backfilled before the adjacent one can be opened to avoid having a double stope opened at the same time, creating structural stability issues. The more domains that are available, the greater the flexibility of the mining plan and the potential for increasing daily output.

A domain is always associated with two sides or wings. While drilling or cable installation is going on in one wing, mucking or backfilling is taking place on the other side. This method works as long as the duration of the tasks is similar. A tight schedule management program is mandatory in cases where timing is a sensitive factor.

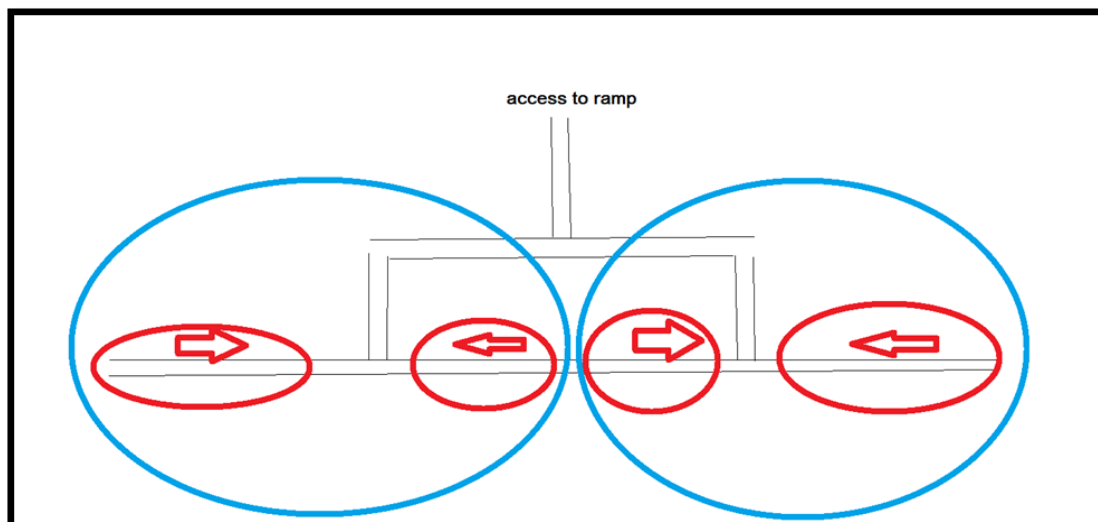


Figure 16.7 – Illustration of the mining domain concept

The PEA mine design generates a total of six (6) domains (Fig. 16.9). Sills are horizontal boundaries between domains.

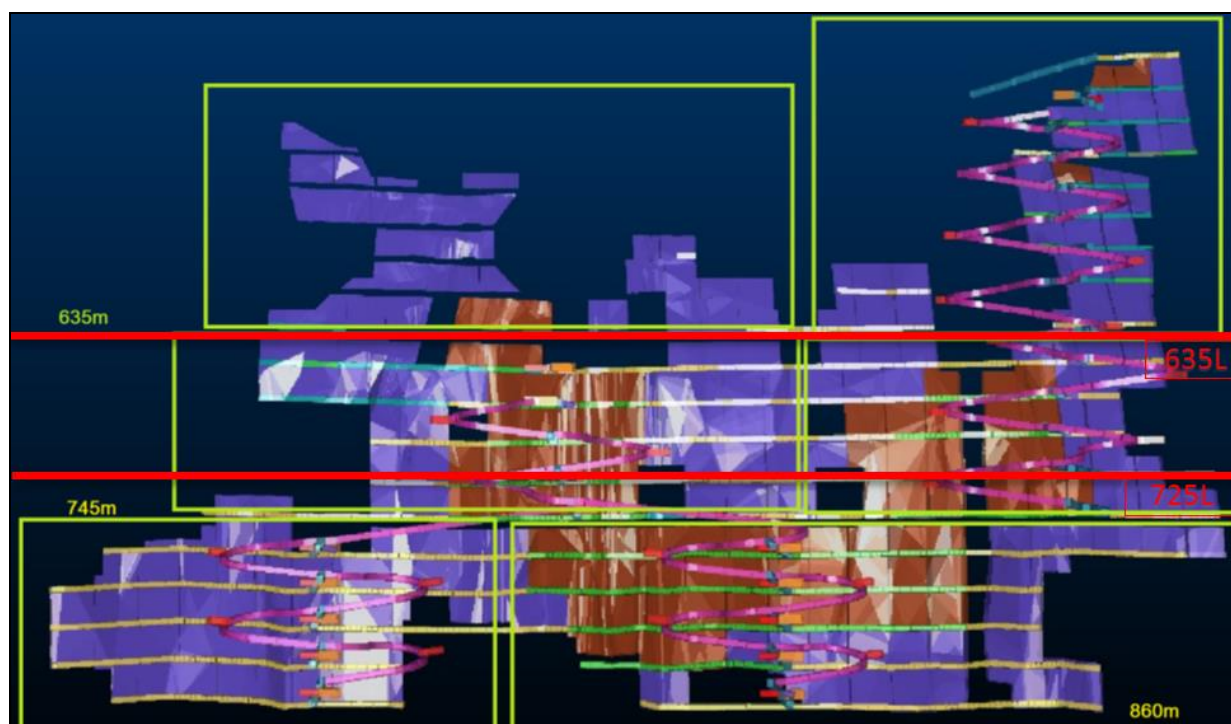


Figure 16.8 – Longitudinal sections illustrating available domains.

16.7.2. Mine Development

Based on the potentially mineable mineral resource defined for this PEA, InnovExplo designed a ramp, accesses and sill drifts to efficiently extract the available tonnage.

The first design consisted of a single ramp similar to the one designed by Richmond. According to the planning achieved using EPS (Enhanced Production Schedule), a Studio 5D[®] tool discussed in section 22, the single-ramp plan was not suitable for an output of 800 tpd. It did not allow sustainable tonnage for the full production period. The plan did not provide sufficient flexibility or domains for simultaneous production on a single horizon, especially in the lower part. For these reasons, this plan was not retained.

In order to see what would happen to the maximum orebody extraction rate if the number of extraction domains was increased, a second design was elaborated with two ramps driven from level 740 down to 860m, and this design was retained for the PEA. Each level can be served by a single access connecting to the ramp or by multiple accesses. This design provides two (2) accesses for each level between 740m and 860m. This configuration allows two (2) production domains on each level. There are also ventilation gains by having two ramps.

The mine development plan of this PEA is similar to what has been done at the mine. Before any stope mining can be accomplished, development in mineralized material is completed on levels. All sill development headings are controlled by the geology department.

Sill development is done using two different sizes. Excavation size is dependent on the width of the orebody and position related to the access drift. In narrow zones, the dimensions are 3.5m H x 3m W. If the mineralized zone is wider than 4m, drifts are excavated with dimensions of 4.5m H x 4.5m W. Dimensions are dictated by the size of LHD used (2.7m³ and 4.6 m³ LHDs). The appropriate sill drift size is very important to keep dilution to a minimum. Sill development starts at the access drift and progresses to the limits of mineralization. Therefore, if a wide stope is encountered after a narrow one it will be developed using a small drift. In Figure 16.2, stopes that are excavated using the bigger drifts are illustrated in orange, and the remainder are illustrated in blue.

The dip of the orebody in the study area is almost vertical. The ramp follows the dip of the orebody. Accesses are developed on each level as well as service excavations. Service excavations typically consist of a small level sump, an electrical sub-station room, and a waste stockpile and ore loading bay. Diamond drill bays are usually excavated along the ramp pathway to allow for definition, delineation and exploration drilling.

Figure 16.9, extracted from a ventilation survey, shows a typical level with all its excavations (sump, electrical room, broken material and backfill bays, and manway access).

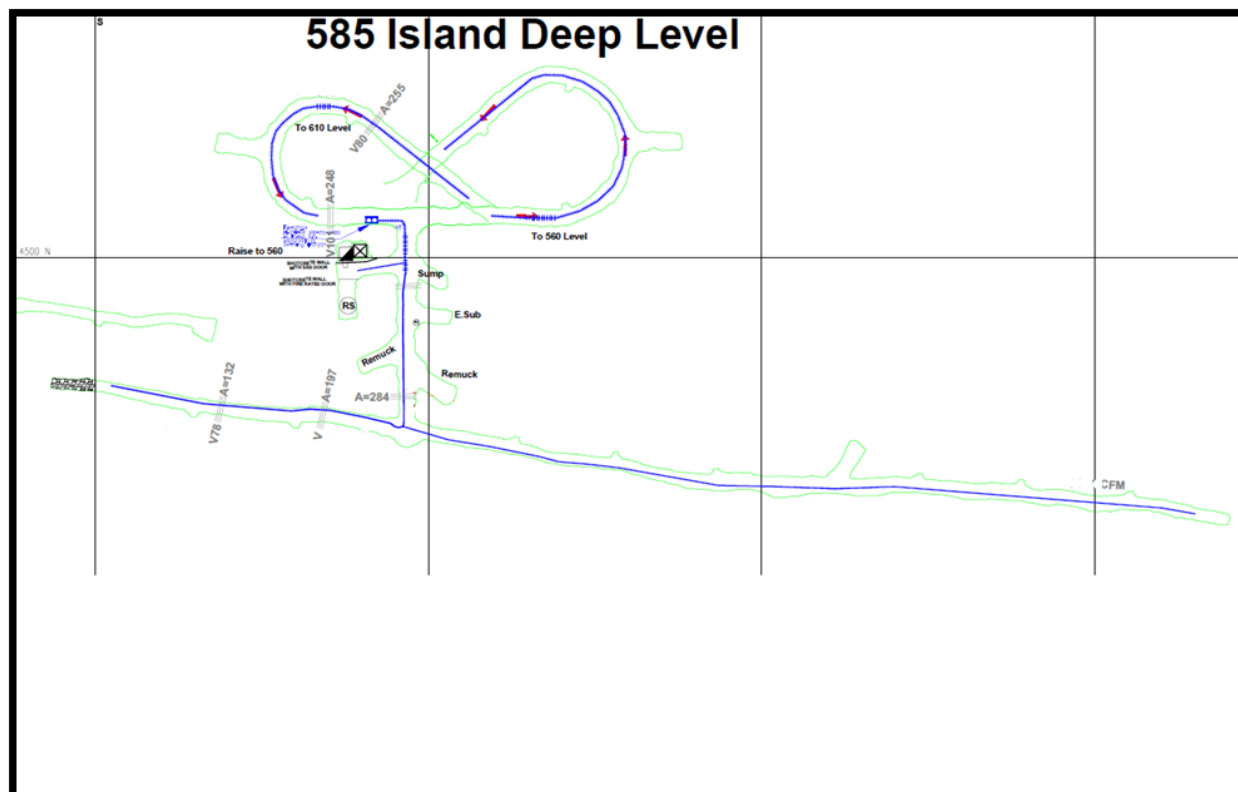


Figure 16.9 – Typical level with excavations.

16.8. Ground support

Currently, there is no known indication of any structural features present between 450m and 860m that would change the ground support or dilution parameters. Although greater depth will affect stress conditions, the effects are not expected to be significant based on the experience of current mining and development activities.

16.8.1. Development ground support

Although development will progress to greater depths, no excessive costs for ground support in ramps and accesses are anticipated down to the 860m level. The reason for this is that ramp dimensions, at 4.5 x 4.5m, are still small enough for standard ground support. If stress levels change, and this translates into high levels of ground deformation, cables bolts or Super Swellex®-type long-range anchors could be used at intersections. A dome-shaped back could also be adopted if needed.

The ground support pattern shown in Figure 16.10 is currently used at the mine for the ramp and large access drifts, and was considered adequate for the purpose of this PEA.

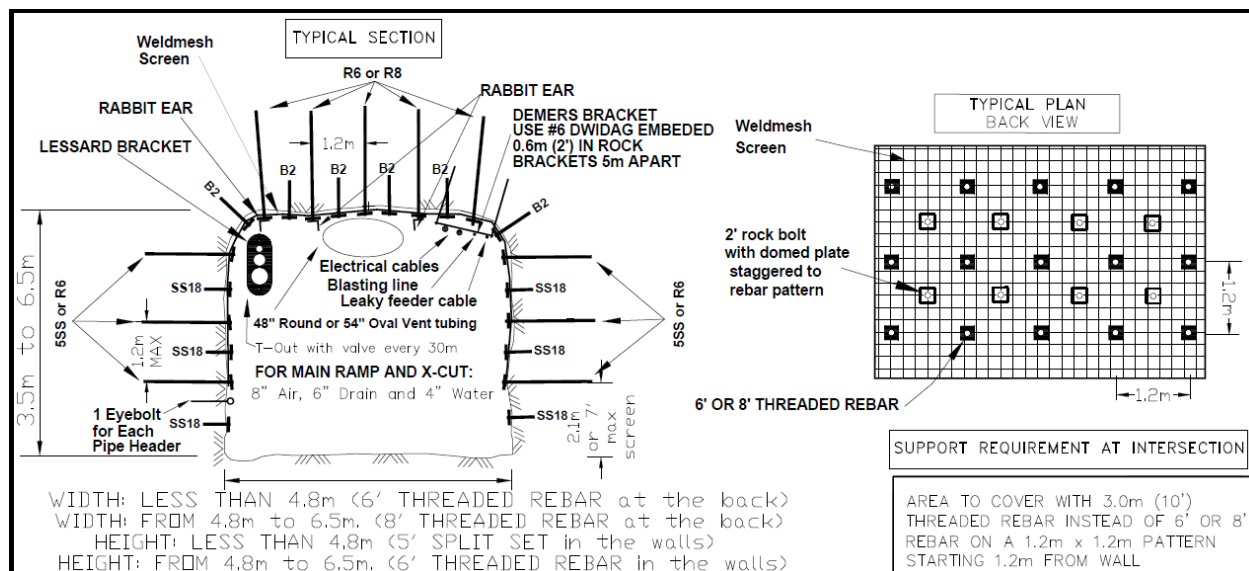


Figure 16.10 – Typical ground support pattern for the Island Gold mine

In the mineralized zone, development will be done using current ground support standards.

16.8.2. Stope ground support

Stope ground support is used to control dilution. Dilution may come from local structural failure or from inadequate drilling and blasting practices. Dilution control can be achieved, to a certain extent, using long-range ground support. Richmond is currently using cable bolts to limit stope wall dilution at the Island Gold mine, and this method has given good results. Cable bolts are used at the undercut and overcut. Cables 6 and 8 m long are used. Figure 16.11 show a typical dilution control with cable bolts.

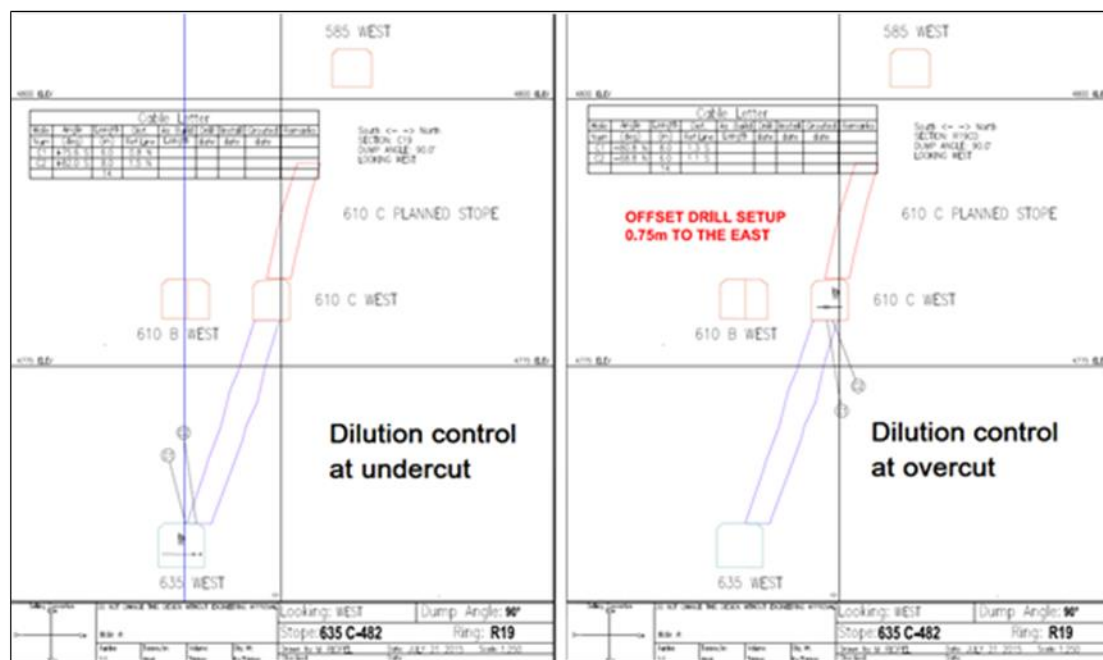


Figure 16.11 – Typical cable bolt support in a stope

Rockfill is also an important application of ground support for stope stability and overall sector stability. Currently no stope is left open for more than 25 m along strike. In the event that locally excessive wall dilution is observed, the 25-m span dimension could be reduced.

16.9. Production and development schedule

The production and development schedule was completed using EPS[®] software, part of CAE Mining Studio 5D[®]. EPS is a mine production scheduling and forecasting tool. It allows users to interactively update schedules, production parameters and dependencies of the mining activities. Once dependencies have been assigned to the tasks, EPS can automatically generate a schedule. In addition, the EPS schedule is linked with 3D graphical data to provide dynamic animations of the schedule.

In order to organize the data to import into EPS, each stope and each segment of production drift were tagged in the computer model based on the width of the stope. Tagging was necessary for selecting production parameters based on drift and equipment size.

Figure 16.2 shows the location of the stopes that can be mined with 4.6m³ LHD and those with 2.7m³ LHD.

The first runs were done with the single-ramp scenario. The modelled and manually calculated preliminary cycle times both demonstrate that the main limiting factor for higher production capacity was the low number of active stopes available. In order to achieve higher productivity, runs were completed with the double-ramp scenario and this scenario was retained for the PEA.

16.9.1. Development schedule

For development, the mining plan calls for three crews with Jumbos and one team with a scissor-lift, jacklegs and stoppers for small drifts. Development priorities were optimized in EPS to try to smooth the tonnage distribution output in order to avoid high or low production peaks. In general, the following priorities were given:

- Priority 1 – Jumbo A in the main ramp and Jumbo B in the east ramp.
- Priority 2 – Jumbo C developing all level entrances and level drifts as long as they are wider than 4 m, and scissor-lifts with workers using jack legs and stoppers developing drifts 3 m wide (also by definition in the orebody).
- As soon as Jumbo A passes by a sill, the sill and level development related to it immediately becomes the priority for Jumbo C.
- When Jumbo A and B complete the ramp development, the next priority becomes the sill and then the levels on that sill going upward.

The mining plan includes all development required to access and mine the mineralized material considered in the PEA. Table 16.6 provides the yearly quantities extracted from the EPS planning software. By late 2017, all development work will have been completed.

Table 16.6 – Island Lower Zones PEA mine development quantities

	2015	2016	2017	Total
Development CAPEX				
Horizontal (metres)	2,213	3,814	1,569	7,596
Vertical (metres)	152	304	228	684
Development OPEX				
Horizontal (metres)	1,541	2,468	2,919	6,928
Vertical (metres)	0	701	871	1,572
Total development	3,906	7,287	5,587	16,780
Horizontal (metres)	3,754	6,282	4,488	14,524
Vertical (metres)	152	1,005	1,009	2,256

Table 16.7 provides the breakdown of horizontal development per type. There is roughly a 50/50 split between ramp development and remaining horizontal development activities.

Table 16.7 – Island Lower Zones PEA horizontal development breakdown by category

	Expressed in % of all meters	
Total horizontal metres	14,524	100%
Ramp development (4.5m x 4.5m)	7,626	53%
Jackleg development: (3.5m x 3m)	2,932	20%
Jumbo lateral development	3,839	26%
Extra development (vent accesses etc.)	127	1%

Figures 16.12 to 16.15 show EPS screen captures illustrating the yearly progression of horizontal development. The first visual 3D representation in Figure 16.12 shows the advancement as of June 1, 2015, only a few weeks after simulation start-up. Development already present at the effective date of May 11, 2015, is shown in deep blue.

The images illustrate that some stopes are taken during the development phase, and that development work is completed in 2017.

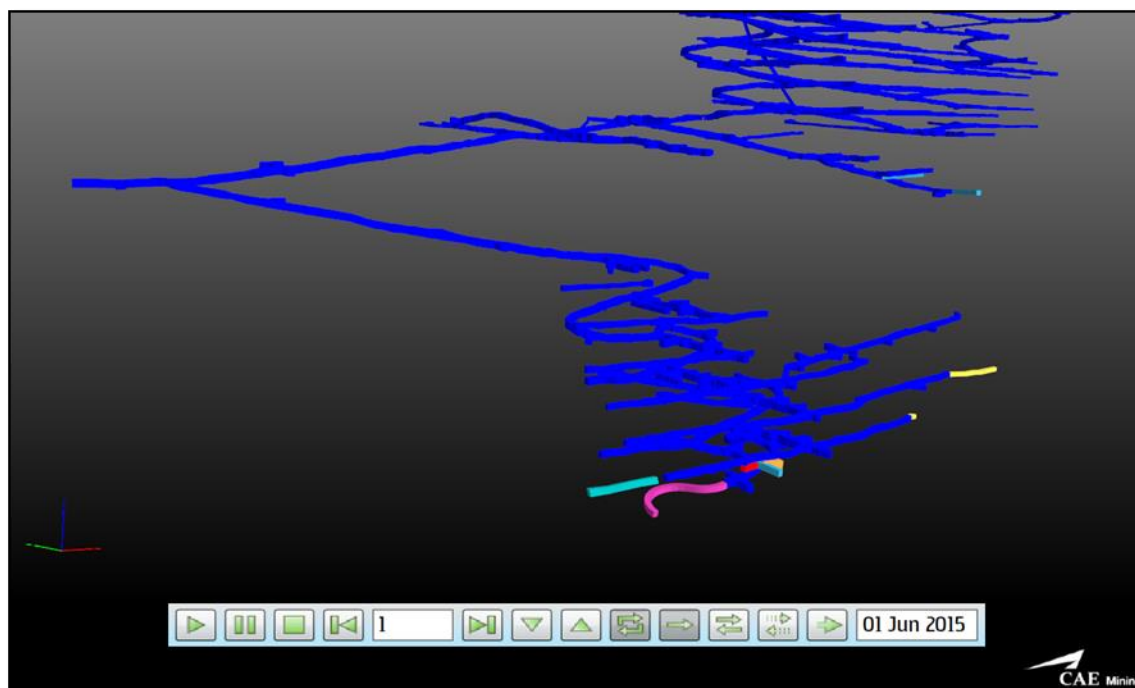


Figure 16.12 – Planned development as of June 1, 2015

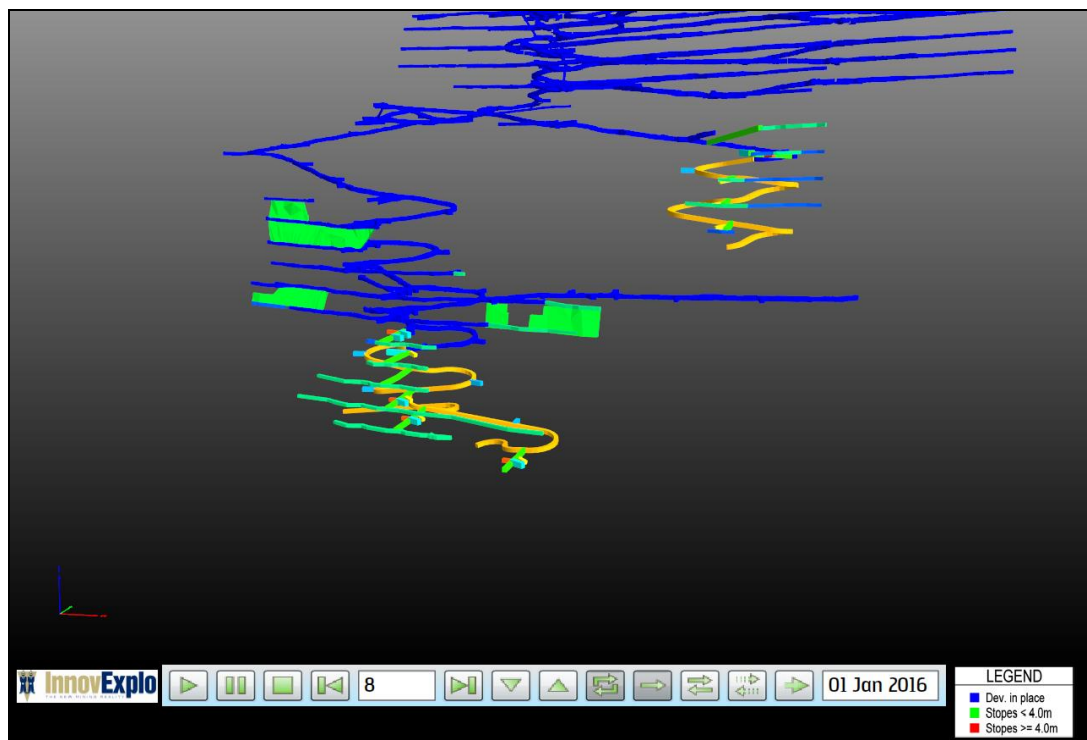


Figure 16.13 – Planned development as of January 1, 2016

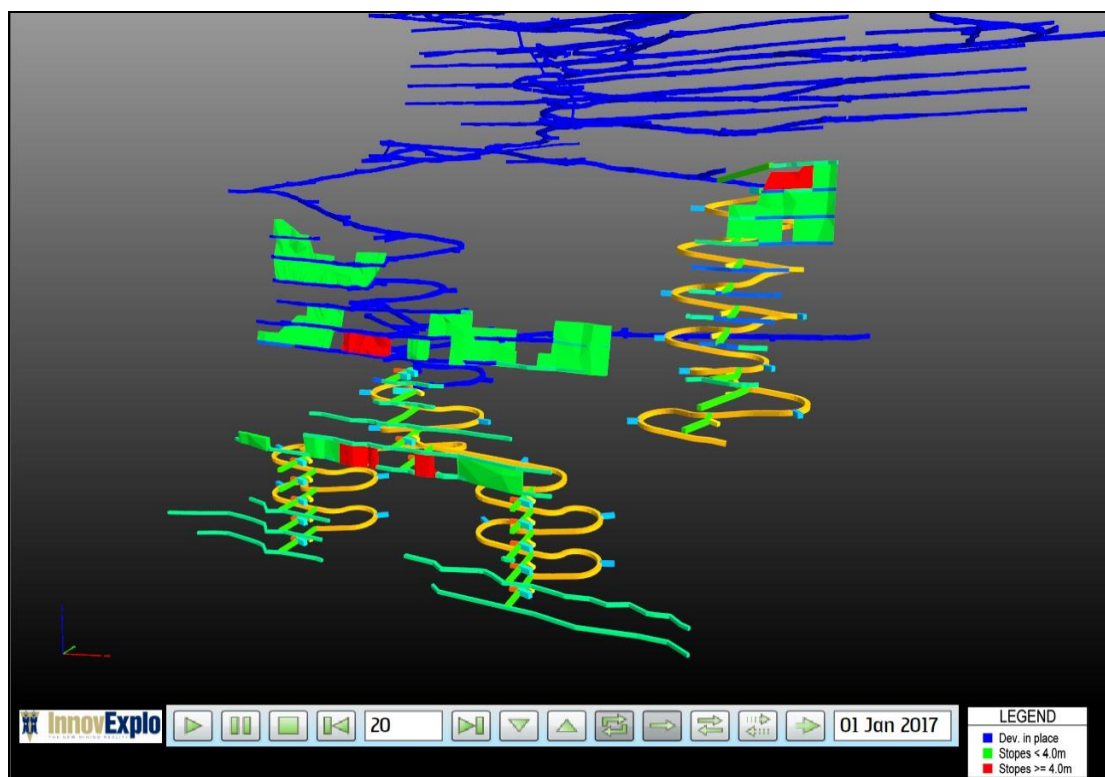


Figure 16.14 – Planned development as of January 1, 2017

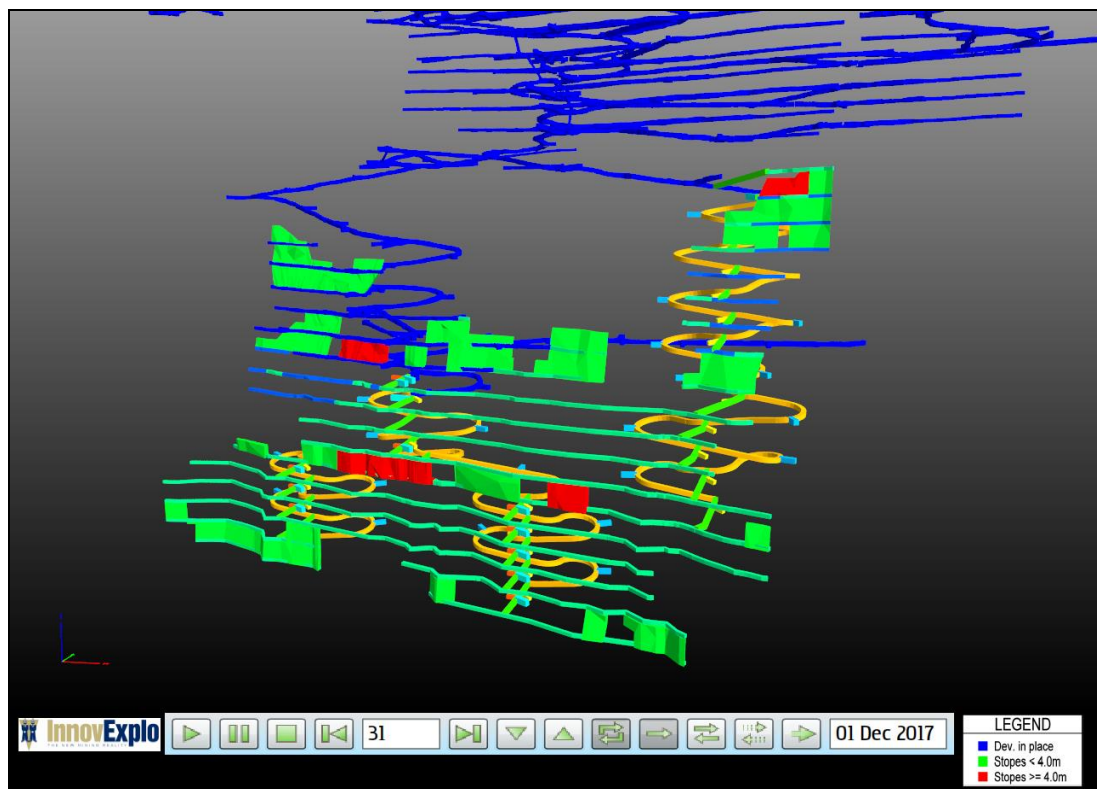


Figure 16.15 – Planned development as of December 1, 2017

16.9.2. Underground Production Schedule

The parameters considered for stope unit activity rates takes into account the differences in production related to stope widths. When the stopes are wider than 4 m, performances are higher when using 4.6m³ LHDs instead of 2.7 m³ units. The performances used in the simulations are the following:

Production rates when drift is 3 m wide

Backfilling: 450 tpd

Mucking: 420 tpd

Pull for void creation: 450 tpd (*same rate as backfilling*)

Fixed delay: total of 6 days for loading and blasting, remote mucking pad installation, waste bumper installation, CMS scanning and processing, and normal system delays.

Production rates when drift is 4 m wide

Backfilling: 877 tpd

Mucking: 580 tpd

Pull for void creation: 877 tpd (*same rate as backfilling*)

Fixed delay: total of 6 days for loading and blasting, remote mucking pad installation, waste bumper installation, CMS scanning and processing, and normal system delays.

EPS is powerful planning software; nevertheless, even though the average daily tonnage was set at 800 tpd and maintained, peaks and lows occur on a monthly basis (Figure 16.16).

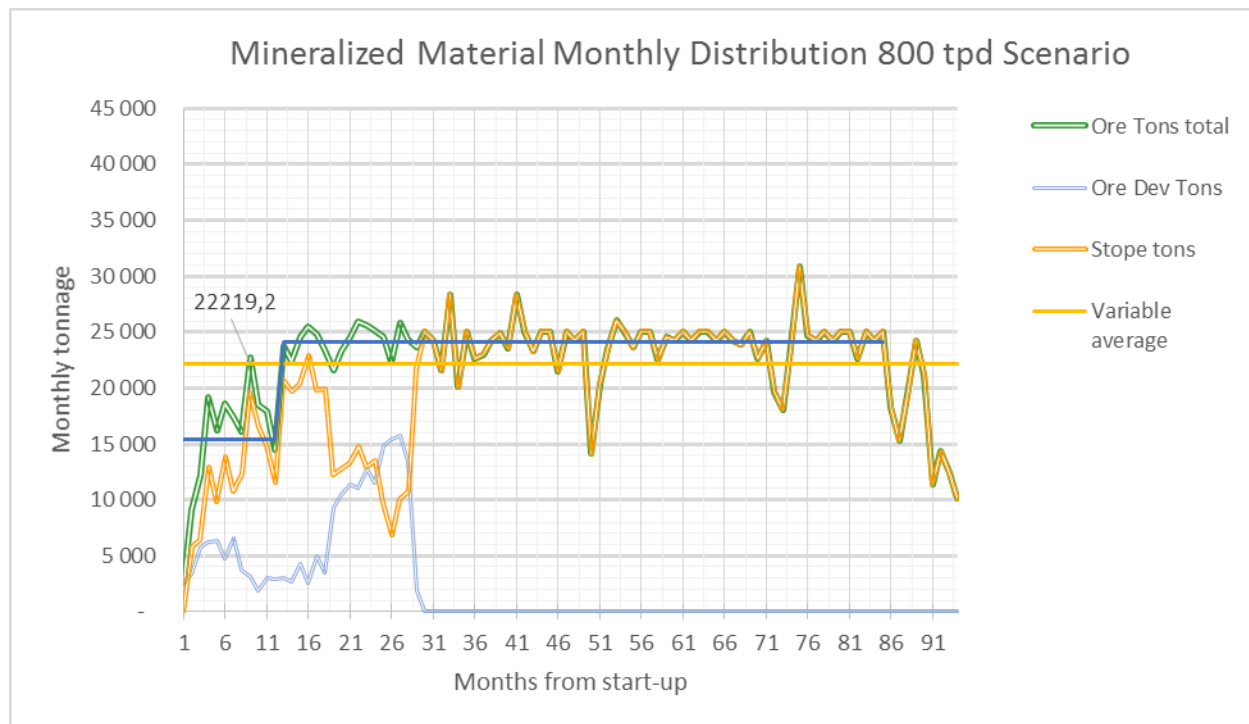


Figure 16.16 – Illustration of the EPS production schedule.

The resulting production schedule is presented in Table 16.8 and includes tonnage from stopes and development. Years 2015 and 2016 are considered a transition period. During this period, a portion of the production comes from mining zones that were not part of the PEA. The mining plan sustains an average production of 800 tpd. The average daily tonnage is fully provided by the resources included in this PEA between years 2017 and 2022.

Table 16.8 – Yearly tonnages for development and production

	Transition Period		Island Gold Lower Zones Production Period						
	2015	2016	2017	2018	2019	2020	2021	2022	Total
Stope tonnage (t)	59,401	188,609	211,030	269,134	288,748	306,821	298,277	267,328	1,889,348
Grade (g/t)	5.98	6.94	7.03	9.10	10.33	9.20	8.70	7.08	8.41
Development tonnage (t)	44,486	69,010	85,760						199,256
Grade (g/t)	9.59	11.34	8.70						9.81
Total tonnage mill (t)	103,888	257,619	296,790	269,134	288,748	306,821	298,277	267,328	2,088,604
Grade (g/t)	7.53	8.12	7.51	9.10	10.33	9.20	8.70	7.08	8.55
Tonnage ratio (develop./stope)	0.75	0.37	0.41						
Ounces produced	24267	64894	69195	76008	92513	87574	80557	58732	553,740

16.10. Ventilation

Main ventilation fans and propane air heaters are located near main ventilation raises. The heating system is composed of four (4) propane burners and total heating power is 43 MBtu. Main surface fans are:

- 2 units, Joy, 54", 200 hp;
- 2 units, Hurley, 60", 350 hp.

Ventilation studies were performed to determine the impact on the ventilation equipment (fans and controls) and network of mining the potentially mineable mineral resource.

The first step was to model the existing ventilation network. A ventilation audit was done on site by InnovExplo. Modelling was done using Ventsim® 2015 Release 4.0 software to reflect current airflows, pressure losses and main fan power requirements.

The PEA development and mining sequence was then incorporated into the balanced model of the existing ventilation network.

Figure 16.17 shows the graphical representation of a Ventsim simulation corresponding to a key phase of the ventilation network deployment in time. In order

to establish downward air flow in the west ramp and upward airflow in the far-east ramp, a high-flow/ medium-pressure booster fan will need to be installed in a permanent connection between main ramps well below the 720m level. Ultimately, air pathways would connect to the far-east ramp on level 770m. No changes were made to surface fans, but booster fans will need to be present in the Island Lower Zones sector to create the desired airflow direction. If there is ever development below level 860m, then a permanent connection between the two main ramps on that elevation (860m) is recommended.

Manways (the structures with ladders and landings) in conventional blasted raises have high friction factors and booster fans are needed to reduce the static pressure of the main surface fans. Before the stoping cuts accesses between same-level west and east domains, multiple temporary connections are present between ramps below the 720m level. This was not taken into consideration in the ventilation model given the PEA-level of this study.

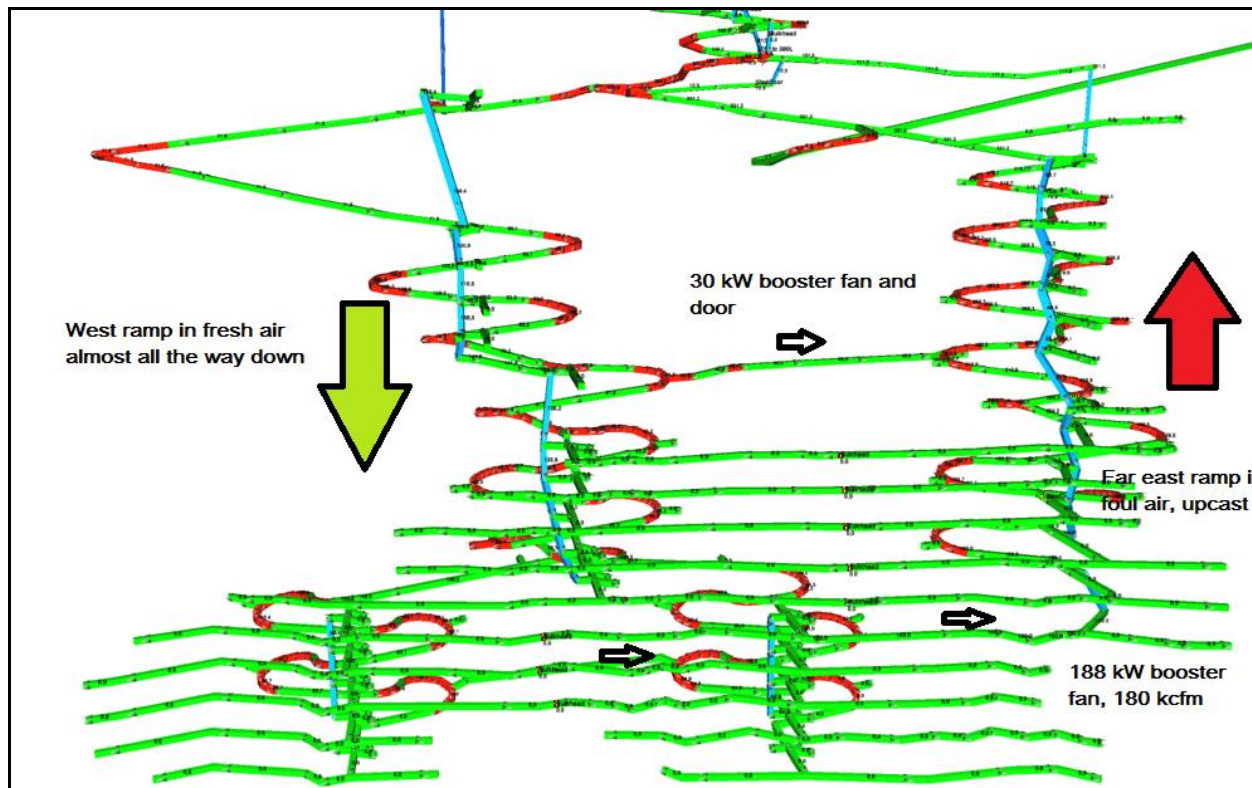


Figure 16.17 – Ventilation network with booster fans

Overall, the ventilation strategy associated with this PEA is to push fresh air down via the west ramp from level 425m plus one manway or vent raise system, while the other ramp is in foul air. That system reduces static friction losses.

Based on this PEA-level study, InnovExplo considers that the existing surface infrastructure and ventilation equipment are sufficient to satisfy ventilation requirements.

The modelling demonstrates that surface fans and upper mine airways are sufficient in number, size and power to provide the required peak 430 kcfm airflow.

16.11. Backfill

Backfill requirements were evaluated for this study in light of a potential shortage. Table 16.9 shows the numbers expressed in thousands of metric tons (kt).

Table 16.9 – Backfill requirements (kt)

Backfill	2015	2016	2017	2018	2019	2020	2021	2022	Total
Inventory on surface at beginning of year	200								
Waste rock produced in equivalent kt of ore (waste tonnes x 1.35 for swell factor)	572	477	79	0	0	0	0	0	1128
Stope and mineralized development– PEA and short term mining plan merged for 2015 and 2016	274	297	312	278	299	307	299	267	2333
Stockpile or shortfall in equivalent ore kt	498	180	-233	-278	-299	-307	-299	-267	-1005

Some backfill stored on surface was used to raise the tailings dam; consequently, Island Gold will likely be short of traditional backfill based on PEA-level calculations. Shortage is expected to be in the range of 740 kt of waste, which is equivalent to 1,000 kt of ore when you consider the swelling factor of 1.35 associated with blasting.

The best backfill for this Avoca mining method is one that will let water pass through and has a high angle of repose to minimize the amount of material for the pull. Development waste rock is quite good in that regard. It is also hard, thus resisting some crushing action from the walls that may move. No study was done on alternate sources of backfill.

16.12. Mine dewatering

Island Gold reports an average daily water inflow of 2,300 m³. Pumps have a capacity to handle 3,360 m³/day. During spring melt, pumps are working at full capacity. The pumping arrangement is a complex cascading system. Maximum head between lifts is 65 m. Main electric pumps have power ratings between 30 to 100 hp. Figure 16.18 shows the current and planned pumping system on a longitudinal section.

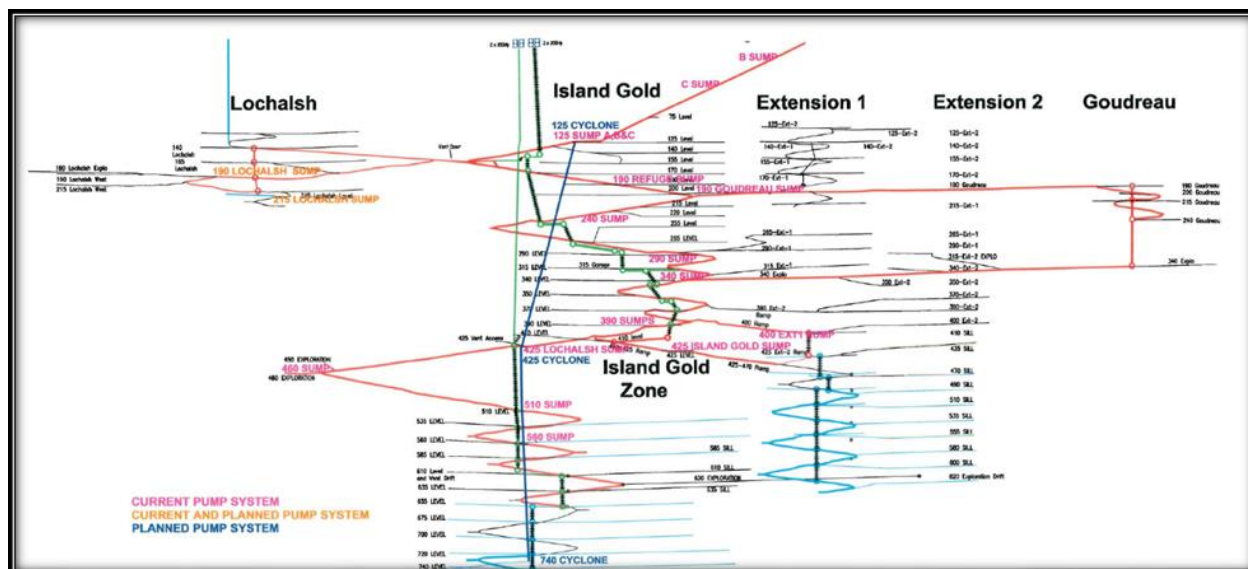


Figure 16.18 – Current and planned pumping system.

16.13. Mine equipment

Island Gold's mine fleet includes equipment at various stages of their useful life. The PEA considers the current equipment fleet sufficient for the proposed mining plan.

The list of Island Gold underground equipment owned by Richmond, which was considered in the PEA, is presented in Table 16.10. The table provides the number of units in the fleet and also the average number of units taking into account equipment downtime due to maintenance or mechanical breakdown. Mechanical availability statistics from Richmond were used for this study.

Table 16.10 – Island Gold U/G Diesel Mine Equipment list

Equipment type	Number in fleet	Available mechanically at all time
27t and 30t u/g mine trucks	9	7.3
LHD 6 cu yd class	9	5.9
LHD 3.5 cu yd class	4	3.0
LHD 1-2 yd class	4	3.7
Jumbo	3	2.3
Scissor-lifts	5	4.6
Toyota man carriers	9	8.3
Boom trucks	3	1.8
Lube truck	1	1.0
Kubota tractors and Minemaster	5	3.9
Grader	1	

Richmont is relying on underground contractors for development, ramp and level maintenance, and for production drilling and cable bolt drilling. Contractors provide their own equipment, like LHDs, trucks, scissor lift, utility trucks, pick-ups and production drill rigs, on an “as needed basis”. Richmont also has some surface equipment for road maintenance, snow removal and ore rehandling. Since this PEA does not introduce any changes to the surface equipment fleet, they are not listed.

In order to estimate truck requirements, productivity cycles were modelled for trucking. The worst case scenario considered a production of 800 tpd coming exclusively from the 860m level (the lowest extraction level). For that scenario, 5.5 trucks would be required to transport the mineralized material to surface. Extracting ore from the lower sill requires backfill. Once on surface, the trucks will be tramming waste rock from the surface stockpile if none is available nearby underground. Overall, the truck presence in the ramp network will be acceptable. There is also the double ramp system for the lower part that will help reduce traffic interactions.

16.14. Mine personnel

There are nearly 250 active workers at the Island Gold mine, including students that belong to the hourly worker category. Hourly workers represent 66% of total manpower.

Tables 16.11 and 16.12 provide the list of hourly and staff workers, respectively, corresponding to the early-2015 payroll. Section 21 of this report provides a detailed analysis of the manpower component of the capital and operating costs.

Table 16.11 – List of hourly personnel

Number		
Department	Job title	Total
ELECTRICAL	ELECTRIC - CERTIFIED	3
	ELECTRICAL APPRENTICE	1
	ELECTRICIAN	2
	INSTRUMENTATION TECHNICIAN	1
	LEAD MAINTENANCE ELECTRIC	1
Total ELECTRICAL		8
GEOLOGY	CORE SPLITTER	2
Total GEOLOGY		2
MECHANICAL	DRILL DOCTOR - ALIMAK	1
	MECHANIC	6
	MECHANIC - CERTIFIED	12
	MECHANIC LEADER	1
	MECHANICAL APPRENTICE	1
	MILLWRIGHT	1
	UNDERGROUND LABOUR	1
	WELDER - CERTIFIED	2
Total MECHANICAL		25
MILL	CRUSHER OPERATOR	4
	EQUIPMENT OPERATOR	4
	GRINDING OPERATOR	4
	MECHANIC - CERTIFIED	1
	MILL LABOUR	5
	MILLWRIGHT	4
	SOLUTION OPERATOR	4
Total MILL		26
MINE	CABLE BOLTER	2
	CONSTRUCTION MINER	4
	CONSTRUCTION MINER HELPER	5
	GRADER OPERATOR/SERVICE MAN	1
	JUMBO MAN	11
	LEAD MINER	2
	LONG HOLE BLASTER	4
	REMOTE SCOOP OPERATOR	13
	SENIOR MINER	34
	SERVICE MAN	5
	TRUCK DRIVER / MINER	16
Total MINE		97
SURFACE	CARPENTER APPRENTICE	1
	EQUIPMENT OPERATOR	1
	JUNIOR OPERATOR	1
	SURFACE LABOURER	1
	TIMBERMAN	1
Total SURFACE		5
Total GENERAL		163

Table 16.12 – Staff

Department	Employee class	Job title	Total
ADMINISTRATION	MANAGEMENT STAFF	ASSISTANT GENERAL MANAGER	1
		COORDINATOR, HEALTH AND SAFETY	1
		DIRECTOR BUSINESS, PERFORMANCE, MANAGEMENT	1
		GENERAL MANAGER	1
		MANAGER ADM SERVICES	1
		SUPERINTENDENT, HEALTH AND SAFETY	1
		SUPERINTENDENT HUMAN RESOURCES	2
		SUPERINTENDENT LOGISTIC AND PURCHASING	1
		SUPERVISOR, WAREHOUSE	1
	Total MANAGEMENT STAFF		12
	STAFF	ADMINISTRATIVE ASSISTANT, HR	2
		CLERK, SHIPPING / RECEIVING	1
		CLERK, WAREHOUSE	2
		COORDINATOR, IT	1
		COORDINATOR, WAREHOUSE	2
		OCCUPATIONAL HEALTH NURSE	1
		TECHNICIAN, ENVIRONMENT	1
		TRAINER	1
		WAREHOUSE RUNNER	1
	Total STAFF		12
Total ADMINISTRATION			24
ENGINEERING	MANAGEMENT STAFF	CHIEF ENGINEER	1
		SUPERINTENDANT, PROJECT S AND PLANNING	1
		SUPERINTENDENT TECHNICAL SERVICES	1
	Total MANAGEMENT STAFF		3
	STAFF	COORDINATOR, LONG HOLE	1
		ENGINEER PROJECT	1
		ENGINEERING DEPT. - STUDENT	1
		ENGINEERING TEAM LEADER	2
		JUNIOR ENGINEER	2
		MINE PLANNER, LONG HOLE	1
		MINING TECH / SURVEYOR	2
		SENIOR MINE TECHNICIAN	1
		TECHNICIAN, MINE	1
		TECHNICIAN, VENTILATION	1
	Total STAFF		13
			16
GEOLOGY	MANAGEMENT STAFF	CHIEF GEOLOGIST	1
	Total MANAGEMENT STAFF		1
	STAFF	GEOLOGIST	4
		LEADER CORE SPLITTER	1
		SENIOR EXPLORATION GEOLOGIST	2
		SENIOR PRODUCTION GEOLOGIST	3
		SURVEYOR / GEOLOGICAL TEC	1

Department	Employee class	Job title	Total
	Total STAFF		11
Total GEOLOGY			12
MECHANICAL	MANAGEMENT STAFF	MAINTENANCE SUPERINTENDANT	1
	Total MANAGEMENT STAFF		1
	STAFF	CLERK, WAREHOUSE	1
		PLANNER, MECHANIC	2
		RELIABILITY ENGINEER	1
		SENIOR SUPERVISOR	1
		SUPERVISOR, MOBILE MAINTENANCE	2
	Total STAFF		7
Total MECHANICAL			8
MILL	MANAGEMENT STAFF	ASSISTANT MILL SUPERINTENDENT	1
		SUPERINTENDENT, MILL	1
	Total MANAGEMENT STAFF		2
	STAFF	SUPERVISOR, MILL	2
		SUPERVISOR, MILL MAINTENANCE	1
		TECHNICIAN, MILL	1
	Total STAFF		4
Total MILL			6
MINE	MANAGEMENT STAFF	SENIOR SUPERVISOR, MINE	2
		SUPERINTENDENT, MINE	1
	Total MANAGEMENT STAFF		3
	STAFF	SUPERVISOR, MINE	9
	Total STAFF		9
Total MINE			12
SURFACE	MANAGEMENT STAFF	SUPERINTENDENT, ENVIRONMENT	1
	Total MANAGEMENT STAFF		1
	STAFF	SURFACE PROJECTS COORDINATOR	1
		TECHNICIAN, ENVIRONMENT	1
	Total STAFF		2
Total SURFACE			3
Total GENERAL			79

16.15. Underground services and infrastructure

Two refuge stations are planned for the Island Gold Lower Zones : one on the 620m level (service area), another on the 675m level, and the third near the 800m level.

On the 620m level, there is a planned service area that will be accessible from the 620m exploration drift. A complete shop is planned. A warehouse, shop office, welding bay, tire bay, wash bay, small equipment service bay and big equipment service bay are planned.

16.15.1. Piping

Drinking water is delivered in jugs. Mine service water and drainage water lines are located in the ramp.

16.15.2. Electrical distribution

One of the two main substations on surface is located close to the Lochalsh ramp portal. It is a recently replaced 44,000 to 5,000 volts 7.5 MVA ONAN type. Another transformer, a 10 MVA ONAF type, feeds one compressor and, via an overhead line, the main vent raise and two 4/0 cables going in two parts of the mine.

The other compressors are fed by a 5kV line coming from the mill's high voltage transformer.

The first part of the underground mine distribution is the upper mine going to level 435m, and the second cable from level 435m to 675m and down. Island Gold has a 4 MW demand on this transformer. Island Gold is currently building and installing a 44 kV to 13.8 kV – 10 MVA, and running an air guard cable through a 125 mm bore hole from the surface to level 400m and from level 400m to 620m of the mine. Substation engineering is done at 50%, and all the 13.8 kV cable will be delivered in November 2015. The first part of the bore hole to level 400m is being drilled.

Only one electrical power cable runs from the Lochalsh portal to the electrical substation going to levels 125m and 190m. Nearly all the remaining feeder cables go through bore holes.

Island Gold's standard for inter-level energy distribution is based on five (5) bore holes for 5 kV, 600 volts, grounding and communication.

The majority of the substations are 5kV to 600 volts – 1MVA. The new substations are double taps, 13.8 kV and 5kV primary to 600 volts secondary at 1 MVA. Substations are usually installed every 75 m vertically, and upper and lower levels powered by these substations are fed by 600V cables through bore holes.

16.15.3. Compressed air distribution

Compressors are located on surface, in the Lochalsh portal and ramp sector.

Six (6) air compressors, electrically driven and totalling 8000 scfm, are present. A back-up 750 scfm diesel powered compressor is also available for emergencies. Compressed air is used underground for using jack legs and stopers, for pressurizing refuges, for production and cable bolting drill rig, and for diaphragm pumps. The mill has a 150 kW 1000 scfm Ingersoll Rand Compressor for the lixiviation process, service air and instrumentation. New steel pipes for compressed air distribution u/g below 620m level and 490m level are 8" in diameter to lower the pressure losses. Old lines are 6" in diameter.

16.15.4. Fuel and other services

Richmont's Island Gold mine is a simple small-tonnage operation. There is no underground crusher, and since the backfill system is dry, there is no complex paste-fill or cement distribution line. Shotcrete is currently not used on a regular basis. Fuel is delivered by truck. There could be some savings by having an underground fuel bay below the 450m level. If a new ramp is driven from the mill sector, or a shaft, a fuel line could be installed to remove the fuel tanker truck. InnovExplo does not recommend installing a fuel line in a small spiral ramp. A fuel line in a diamond drill hole is possible, but this is complex and costly.

17. RECOVERY METHODS

The Island Gold Mine ore is processed at Kremzar mill. The Mill is composed of a two (2) stage crushing section followed by a two (2) stage grinding section. The mill uses cyanide leaching and a carbon in pulp process to recover gold. Some improvements were made to the plant in recent years, replacement of crushers, cyclone replacement and piping and pumping upgrade. A brief description of the current process flowsheet is outlined in this section.

17.1. Process Flowsheet

The simplified process flowsheet for the Island Gold Mill is presented in Figure 17.1.

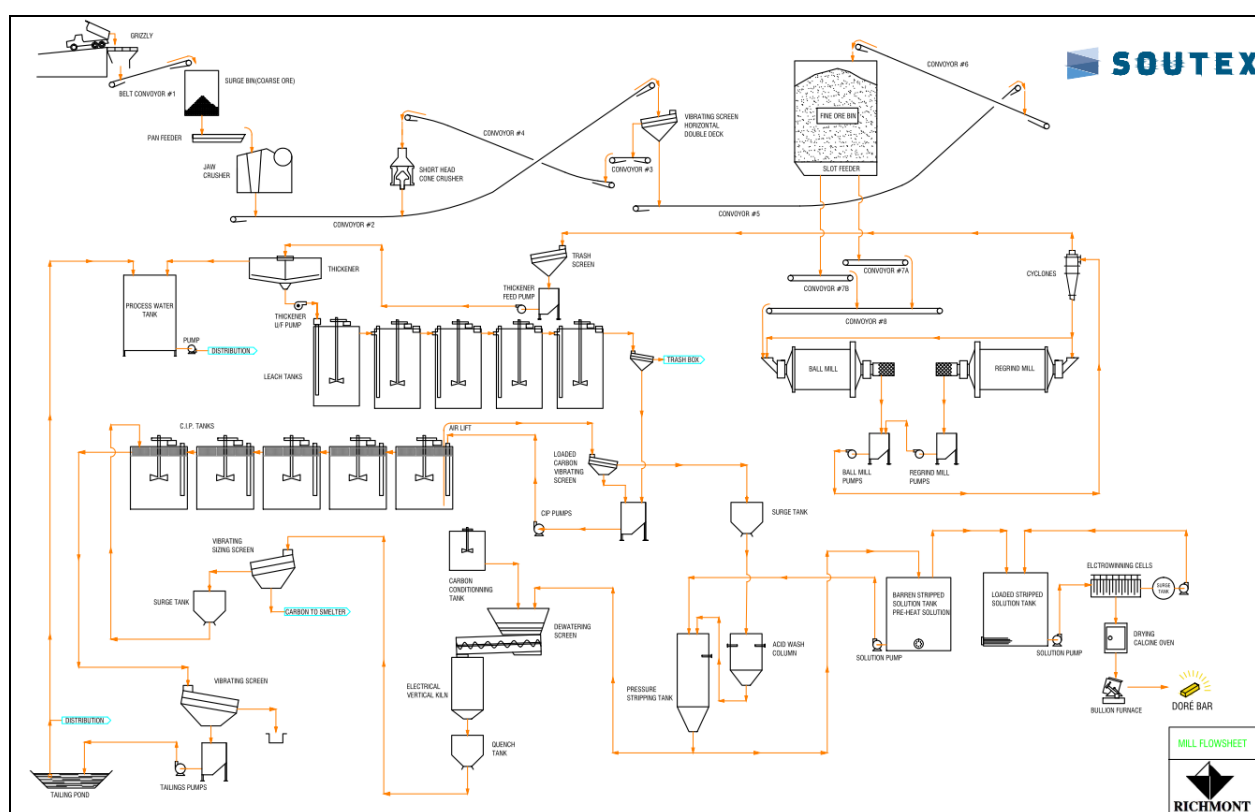


Figure 17.1 – Simplified Flowsheet

17.2. Process Flowsheet Summary

The ore from the stockpile is crushed by a jaw crusher followed by a secondary cone crusher. The crushed material is then sent to a ball mill operated in closed circuit with cyclones with a regrind mill. Gold is leached in a leaching circuit and extracted in a carbon-in-pulp (CIP) circuit. The loaded carbon is washed with nitric acid solution to remove scale before being sent through a carbon regeneration kiln. Gold is removed from the loaded carbon by elution (stripping) followed by electro winning. The stripped carbon is regenerated in reactivation kilns before being returned to the process. Fine carbon is constantly removed and recovered from the process to avoid

gold loss, while fresh carbon is continuously added to the process. The high grade electro winning concentrate is sent to a bullion furnace for smelting of doré.

17.3. Process Description

17.3.1. Crushing

The ore from the mine is stockpiled, a haul truck transports ore from the stockpile to a grizzly. A primary conveyor (CV-01) conveys the material to the coarse ore bin. A vibrating feeder feeds the coarse ore to the jaw crusher, the crusher discharge falls onto the screen feed conveyor (CV-02). The crushed ore is screened and the oversize goes to the cone crusher to be reduced and goes back to the screen feed conveyor (CV-02). The undersize of the screen is conveyed to the fine ore bin by conveyors (CV-05/06).

17.3.2. Grinding Circuit

The crushed ore is sent to the primary ball mill where it discharges to the primary ball mill discharge pump box. The pulp is pumped to the cyclone to be classified; the underflow is split between the primary ball mill and the regrind ball mill. The regrind discharge is sent to the primary ball mill discharge pump box. The cyclone overflow is sent to a static trash screen and pumped to the thickener. Cyanide is added to the primary ball mill discharge pump box to start the leaching reaction in the grinding circuit.

17.3.3. Thickening, Leaching, Cip

The pulp from the thickener underflow is pumped to the leaching tanks train where five (5) leaching tanks are supplied with compressed air. The pulp is directed to a vibrating trash screen prior to the CIP circuit where carbon is added to CIP tanks to absorb the gold in solution.

17.3.4. Tailings

The tailings from the CIP circuit are collected in a pump box and pumped to the tailings pond. Water from the tailings pond is pumped back to the plant to be reused as reclaim, gland seal and process water.

17.3.5. Acid Wash, Elution & Regeneration

When the gold adsorbed on carbon reaches the right level, the carbon is recovered by screening. The screened carbon is directed to the stripping vessel to be eluted transferring the gold in the pregnant solution from the carbon surface. The pregnant solution is directed to the electrowinning cells and the carbon is directed to a rotary kiln to be regenerated.

17.3.6. Electrowinning

The pregnant solution from the elution process is pumped to the electrowinning cells to precipitate the gold in a gold sludge. The gold sludge is decanted, dried, melted and poured into gold bar.

17.3.7. Reagents

17.3.7.1. Cyanide

The liquid cyanide solution is delivered by truck to the cyanide distribution tank. The cyanide is pumped in a close circuit at two (2) different points:

- Ball mill discharge pump box;
- Barren Solution tank.

The cyanide not used flows back to the cyanide tank. Cyanide is used to activate the leaching reaction.

17.3.7.2. Flocculent

Flocculent is used to help with the sedimentation of the solids in the thickener. The preparation station consists of a wetting unit, a mixing tank and a distribution tank.

17.3.7.3. Lime

Quicklime lime, delivered in bulk bags, is discharged in a hopper and fed with a screw conveyor to the mix tank to be prepared in milk of lime. The milk lime is pumped to a lime distribution tank to be distributed to the ball mill discharge pump box to maintain the pH at the right level to avoid HCN gas creation.

17.3.8. Utilities (Water and Air)

17.3.8.1. Water Networks

There are four (4) water networks that serve the various water users in the plant:

- Process water;
- Fresh water;
- Reclaim water;
- Gland seal water.

The process water network is used for most of the applications in the process. The process water comes from various sources:

- Fresh water from Maskinonge Lake;
- Reclaimed water from the tailings pond;
- Process water from the thickener overflow and Kremzar mine.

17.4. Concentrator Design

17.4.1. Design Criteria

The existing Kremzar Mill facility will be used for mineralized resources considered in the PEA. Table 17.1 presents the main design criteria

Table 17.1 – Concentrator Design Criteria

Parameter	Unit	Value
Plant - General		
Throughput - annual rate	t/y	328 500
Throughput - daily rate	t/d	900
Operating time	d/y	365
Operating time - crushing plant	h/d	16,0
Operating time - concentrator	h/d	24,0
Crushing plant - availability	%	67%
Concentrator availability	%	93%
Ore Characteristics		
Moisture	% w/w	2%
Specific gravity	t/m ³	2,8
Gold grade	g/t	8,5
Targeted recovery	%	96%
Bulk density	t/m ³	1,8
Grinding circuit target size	µm	65

17.4.2. Equipment List

The major process equipment is listed in Table 17.2.

Table 17.2 – Process Equipment List

Equipment Name	Description
Grizzly	Opening 16 X 12
Jaw Crusher	CLEMRO 18x54
Double Deck Vibrating Screen	5' x 10', 3/4" top screen, 7/16" bottom screen
Secondary Cone Crusher	HP200, Short Head, Coarse
Fine Ore Bin	500 t live capacity
Ball Mill	9'Øx11', 500 HP
Regrind Mill	9'Øx11', 500 HP
Cyclones	2 cyclone of 15'Ø
Trash Screen 1	Static 3'x6', 5mm Ø opening
Thickener	Ø : 60 ft
Leach Tank 1	24'Øx26'
Leach Tank 2	24'Øx26'
Leach Tank 3	24'Øx26'
Leach Tank 4	24'Øx26'
Leach Tank 5	24'Øx26'
Trash Screen 2	3'x6', 28 mesh
CIP Tank 1	14'Øx15'
CIP Tank 2	14'Øx15'

Equipment Name	Description
CIP Tank 3	14'Øx15'
CIP Tank 4	14'Øx15'
CIP Tank 5	14'Øx15'
Carbon Safety Screen	3'x6', 28 mesh
Loaded Carbon Screen	3'x6', 28 mesh
Carbon Dewatering Screen	Circular Screen, 30'
Carbon Conditioning Tank	2,4 m ³
Carbon Sizing Screen	2'x4', 20 mesh
Barren Stripped Solution Tank Pre-Heat Solution	12'Øx20'
Loaded Stripped Solution Tank	12'Øx20'
Electrowinning Cell 1	50 ft ³
Electrowinning Cell 2	50 ft ³

18. PROJECT INFRASTRUCTURE

18.1. Summary

The Island Gold mine is an established producer in a mining district that has been historically active over the years with the former Kremzar, Magino, Edwards and Cline mines. The nearest town is Dubreuilville, approximately 17 km from the mine using forestry roads. Dubreuilville is located at the end of Highway 519, heading east off the Trans-Canada Highway.

The population of Dubreuilville is about 900 people, and the main available services are an elementary school, a health centre, a hotel, a restaurant and bar, a grocery store, a Canada Post outlet, the town hall, a hardware store, a gas station, a municipal library and an arena.

Workers live in a camp close to Dubreuilville where they have individual rooms, recreational services and a cafeteria.

18.2. Site infrastructure

Figure 18.1 shows an aerial view of the Kremzar mill sector. The engineering offices, mine dry, core logging and storage facilities, warehouse, surface garages, various shops and storage units are located in that sector. The old Kremzar mine portal can be seen in the centre of the picture. This shallow portal and ramp is only used to go below the underground ore bin. A grizzly is present on top of the 800-t capacity bin. A steep conveyor under the bin brings ore to the crusher section adjacent to the mill. An ore surface stockpile is located nearby.

The mill is a carbon-in-pulp milling facility. Crushing is done exclusively on surface near the mill. The mill capacity was recently raised to 900 tpd. A primary tailings pond and a secondary settling pond are present.

Figure 18.2 shows an aerial view of the different sectors of the Island Gold mine.



Figure 18.1 – Aerial view of the Kremzar mill sector

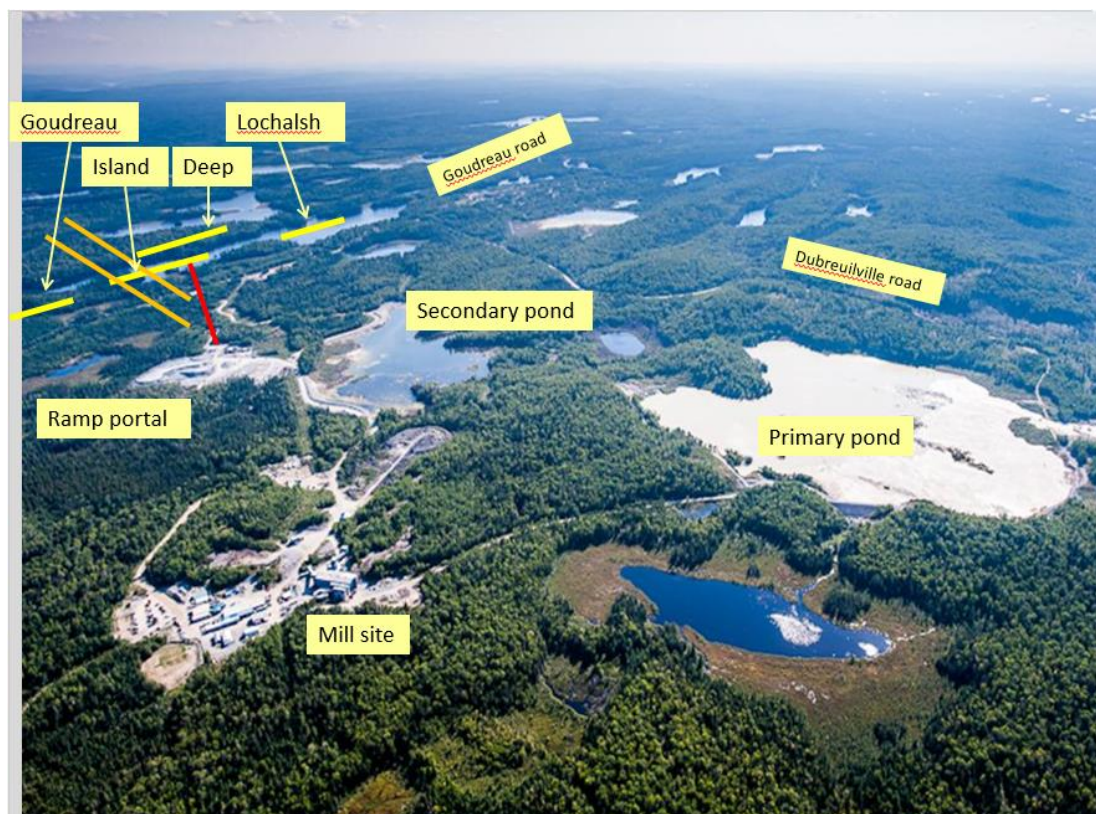


Figure 18.2 – Aerial view of the Island Gold mine

18.3. Roads, Shipping and Logistics

The Island Gold site is accessible by vehicle. The approximate travel time from Sault Ste. Marie is 3.5 hours, and 1 hour from Wawa. Airport service is available at Wawa. Charter plane flights from Rouyn-Noranda are also provided for some workers.

Being a gold mine, logistics are related to manpower and consumables. The doré does not incur a big transportation cost, unlike the case for massive sulfide ore concentrates.

18.4. Buildings

Almost all buildings needed for the current production and development work studied in this technical report are already present. Some additional sustaining capital was included to ensure the same surface infrastructure will be efficient for the duration considered (i.e., until 2022).

On surface, an office trailer and a dry trailer will be added at the end of 2015 to accommodate employees and the contractor during the peak period, and two 48-room bunkhouses will also be installed at the end of 2015. An emergency response building needs to be set up as soon as possible at the beginning of 2016.

A new surface garage needs to be added as part of the mechanical shop and warehouse improvements. Construction is planned for 2017.

All other buildings needed for the current production and development work studied in this technical report are already present. Some additional sustaining capital was included to ensure the same surface infrastructure will be efficient for the duration considered (i.e., until 2022).

18.5. Surface Water Management

The Island Gold Mine water is tied into the existing pipeline that runs from the Lochalsh ramp to the treatment ponds on the Kremzar site. Water quantity (discharge and intake) at Island Gold mine is monitored by various flow meters installed around the mine site. Water discharge and intake flow measurements are recorded and kept in such a manner to maintain compliance with the applicable regulations.

18.6. Tailing Management Facility

The Tailings Management Facility (TMF) represents the main water retention structures on the Project. It consists of two ponds, the Primary Pond (PP) and the Secondary Pond (SP), in addition to water transfer systems via a siphon system. (refer to Figure 18.2 – Site Plan). The PP (built in the former Miller Lake basin) occupies an area of 109 ha and the SP an area of 22 ha. The TMF is operated in accordance with Environmental Compliance Approval (ECA) No. 0440-9YLHG7 issued September 9, 2015, by the Ministry of the Environment Climate Change (MOECC). Annual inspections have been conducted by geotechnical specialists (AMEC Foster Wheeler), confirming overall good performance of the dykes. Refer to section 20.3 for more details.

19. MARKET STUDIES AND CONTRACTS

19.1. Market Studies

No market studies were undertaken to support this PEA. The sole mineral considered for revenue within the PEA is gold doré.

Gold sales are made directly to the financial institution and banks with revenue realized at that point.

19.2. Metal Pricing

Revenues were calculated using US\$1200 and exchange rate of 0.75 \$ CDN/\$ US.

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

From exploration to operations to closure, one of the goals at the Island Gold mine is to prevent pollution, safeguard the environment, educate employees and communities about the mine's environmental programs and commitments, and apply best management practices to prevent or mitigate any potential environmental impacts. The operations at Island Gold use a range of materials and consumables that includes explosives, chemicals and fuels.

This section will provide a description of the environmental, permitting, social and community, and sustainability components relating to the Island Gold Mine and Island Gold Lower Zones projects, and it also covers mine closure and reclamation at Island Gold.

20.1. Existing Conditions

20.1.1. Past and current land use

The Goudreau area has a history of mining dating back to the discovery of gold in the early 1900s. Several small gold mines and open pit pyrite mines have been active in the area in the past. Between the late 1920s and early 1940s, the area was also subjected to intensive prospecting for gold. There had previously been tailings discharged into the surrounding lakes including Goudreau Lake, resulting in an alteration of water and sediment quality.

Current land use in the Island Gold mine area consists primarily of forestry operations, mining and exploration activities, and tourism and recreation. The project area is occupied and surrounded by forest lands, which have been extensively harvested and continue to be periodically harvested.

A number of former operations in the region are under exploration and it is expected that one or more operations could resume at some time in the future.

Recreational activity consists primarily of fishing, hunting, and snowmobiling. A hunting/fishing camp is located in the Lochalsh town site approximately 15 km north east of the project site, however there are no inhabitants.

There are no permanent residences located within the mine area. A number of private camps are located on the opposite side of Goudreau Lake. Finan Township, where the site is located, is not an organized municipality.

20.1.2. Topography and soils

The site is located within a physiographical region described as a bedrock-drift complex. Regional topography is bedrock-controlled and is characterized by a sequence of east-northeast trending rounded hills and ridges. The valleys and low-lying areas between ridges are generally characterized by the presence of interconnected wetlands, streams and lakes (such as Maskinonge Lake and Goudreau Lake). Site relief is generally low, with low to moderate surface slopes and elevation differentials typically in the range of 5 m to 10 m. The site's highest

elevations are encountered north of the primary pond area (approximately 470 masl) and the site's lowest elevation is at Goudreau Lake (381 masl).

Water depths in Goudreau Lake vary substantially. The deepest areas, up to 13 m, occur in the northern portion of the lake. Considerable areas of marginal swamp are associated with the lower portions of Goudreau Lake.

Overburden soils are relatively uniform with types generally being topsoil, sand and till. These overly bedrock at greater depths.

20.1.3. Climate

The Wawa area climate is humid continental. Temperature extremes are moderated and precipitation patterns are altered by its proximity to Lake Superior. The average annual temperature is 1.7 °C with average annual minimum and maximum temperatures of -14.8 °C and 14.9 °C recorded in January and August, respectively. Extreme temperatures of -50 °C and 33.2 °C were recorded at Environment Canada's Wawa A station (ID 6059D09).

Average total annual precipitation is estimated between 850 and 900 mm of which approximately 70% falls as rain and 30% as snow. On average, rainfall occurs on 105 days each year and snowfall on 80 days. Nearly half of the annual snowfall occurs in December and January, while maximum rainfall occurs from June to October. Snow is generally present on the ground from November to April.

20.1.4. Water

The Island Gold mine site is located within the Maskinonge Lake and Goudreau Lake sub-watersheds (total area of 48.2 km²), approximately 40 km south of the Arctic drainage divide. Both sub-watersheds are part of the Michipicoten-Magpie watershed and Lake Superior Drainage Basin. Surface water drainage at the site is bedrock-controlled, generally flowing from northeast to southwest within the valleys between the elongated hills and ridges.

The Maskinonge Lake catchment covers the northwest part of the Site. Drainage from the northeast part of the Site reports to this catchment, including drainage from the Kremzar mill site and the wetland area to the east of the primary pond. The water flows south then west through a meandering stream and wetland, eventually discharging to Bearpaw Lake and, ultimately, to Goudreau Lake. The Goudreau Lake catchment covers the entire site, including both the tailings management facility and Maskinonge Lake catchments, and drainage areas to the east of the site. The outflow of Goudreau Lake is to the south.

Final treated water from the mine flows into the upper portion of Goudreau Lake via Goudreau Creek, which flows into the Michipicoten River system, entering the Lake Superior near Wawa.

Water is taken from Maskinonge Lake to provide potable water for the mine and, makeup water for processing, and for other uses such as dust suppression. Water for mill use is reclaimed from the Primary Pond of the Tailings Management Facility. Water in the mine is currently reused, any excess is pumped, via a multi-stage

pumping systems (comprising sumps/pumps at various levels in the mine) to surface to the Secondary Pond. This will be modified for mine water to be conveyed to the Primary Pond by mid-December 2015.

A visual representation of the site's hydrologic system site is shown in Figure 20.1.

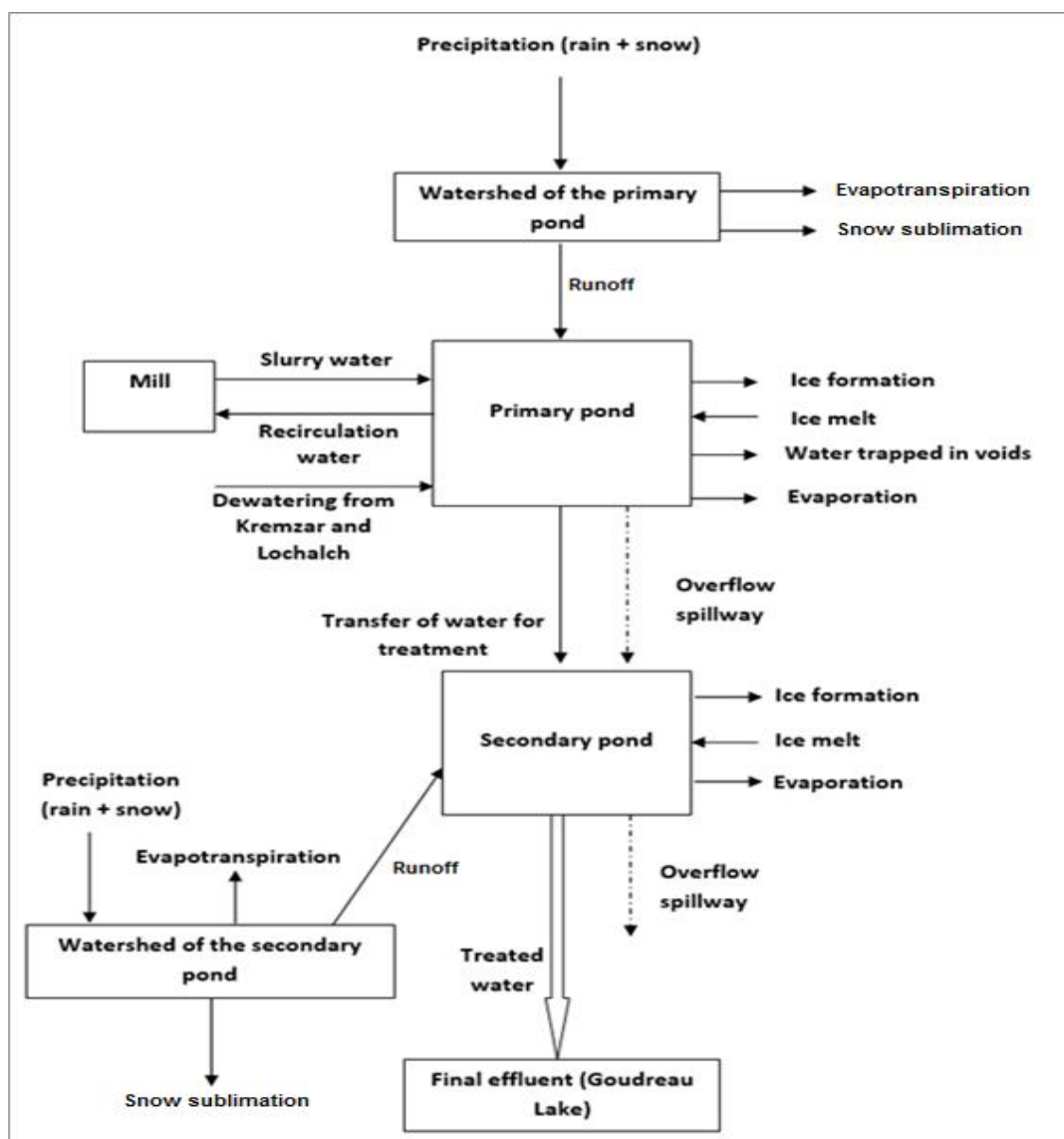


Figure 20.1 – Island Gold hydrologic system

Water balance studies have been conducted since the mine started operations, with the most recent completed in March 2015 by AMEC Foster Wheeler (AMECFW).

Water quality studies have been conducted since 1985; they show some alteration in water quality in Goudreau Lake as a result of the impact of two historical mining operations in the area. Historically, sampling at stations upstream of Goudreau Lake

(i.e., Maskinonge Lake, Miller Lake and Tailings Creek) showed lower background levels of pH, conductivity and alkalinity compared with Goudreau Lake stations. Additionally, the former Magino Gold mine discharged tailings directly to the west of the upper basin of Goudreau Lake during the middle to late 1930s. Sediments in this portion of the lake are composed of natural sediments and tailings. Despite these increased loadings, data has indicated that the water quality in the upper basin of Goudreau Lake was quite good.

Surface water quality monitoring has been conducted by Island Gold mine at two locations in Goudreau Lake (the receiving water body), and on Maskinonge Lake on a monthly basis. Both Maskinonge Lake and the upper basins of Goudreau Lake would be characterized as meeting provincial objectives. For the most part, metal concentrations were below their respective Provincial Water Quality Objectives (PWQO), with levels of many metals below the Method Detection Limit (MDL). Annual results have been comparable from 2007 to 2014.

In addition to the monitoring completed in conjunction with Environmental Compliance Approval (ECA) requirements, Environmental Effects Monitoring (EEM) studies started in 2005 and have continued since then, with the most recent phase currently in progress, these are scheduled to be completed in spring of 2016. Samples have been collected from Maskinonge Lake (reference 1), Pine Lake (reference 2) and Goudreau Lake (exposure), with the overall water quality in the three lakes being quite similar with the exception of the conductivity readings. The similarity of water conductivity readings in Goudreau Lake and Pine Lake support the hypothesis that Pine Lake was affected by past mining activities.

20.1.5. Groundwater

The site is located within a bedrock-drift complex physiographical region characterized by thin overburden or exposed bedrock in the highland areas and waterlogged wetlands in low-lying areas. There are no known or potential groundwater users within several kilometres of the Site. There is no current usage of groundwater resources on site. They will be used for post closure monitoring.

A hydrogeological study of the Island Gold mine site was conducted by Exp Services Inc. (Exp) in 2013. This included installation of ten (10) groundwater monitoring wells across the site. Depth to groundwater ranged from 1.32 to 11.7 m below ground surface (mbgs). Regional groundwater flow direction in both overburden and bedrock is southward toward Goudreau Lake.

A groundwater monitoring program has been in place since 2013 with regular monitoring of groundwater levels and quality. Samples of from the groundwater wells have been tested for various parameters including metals, cyanide, hydrocarbons, and anions, with no exceedances of provincial water quality guidelines.

20.1.6. Air

An Environmental Compliance Approval (ECA), No. 8549-9BPP7LV, issued with Limited Operational Flexibility (LOF), was granted to Richmond on September 21, 2015. This ECA amends the previous one issued in 2012. With the LOF, it now allows minor changes to equipment/infrastructure without having to amend the ECA.

The approval includes all emissions and addition of new or historically unapproved sources at the facility, including combustion equipment, crusher equipment, tanks, emission control equipment.

The ECA requires that the Richmond demonstrate compliance with Ontario Regulation 419/05, applicable MOECC Guidelines for Air and Noise, and other performance requirements as specified in their conditions. It permits modifications such as process changes, de-bottlenecking or addition of new equipment subject to limits on operational flexibility that include a production limit of 27,000 tonnes per month.

Of specific public interest, one condition included in the ECA requires that Richmond to make available, at all times, at the facility for inspection by members of the public, an emission summary table that documents the facility's compliance with Ontario Regulation 419/05.

Emission Summary and Dispersion Modelling (ESDM) reports have been prepared in accordance with Section 26 of Ontario Reg. 419/05 in 2009 and 2104 by Blue Heron Consultants and Golder Associates Ltd, respectively. These ESDM reports were prepared to support applications for the Air ECA. ESDM considers the potential contaminants from the various air emission sources at site, and is updated to include additions/deletions of equipment across the site. The potential contaminants included ammonia, carbon monoxide (CO), copper, lead, nickel, nitrogen oxides (NOx), sulphur dioxides (SOx) and total suspended particulates (TSP). All modelled potential contaminants were compared against MOECC criteria, with all below the respective limits

Ontario plans to release its Climate Change Strategy in early 2016, which will likely include a limit on Greenhouse Gas (GHG) emissions via its carbon Cap and Trade Program; a threshold of 25,000 tonnes CO₂/year has been identified. As part of Island Gold's GHG tracking, the most recent assessment for 2014 showed that the mine produced 7,104 tonnes CO₂/year (Golder, 2014). Therefore it may not be mandatory for the Island Gold mine to participate in the program, although Island Gold will continue to monitor these evolving regulations and will incorporate any changes as necessary.

20.1.7. Terrestrial plant and animal life

The area is largely composed of trembling aspen and white birch, balsam poplar, black spruce, white spruce, balsam fir, and jack pine.

Wildlife populations in the area are regionally typical with the presence of moose, wolves, foxes, black bears, beavers, otters, muskrats, mink, snowshoe hares, and red squirrels noted.

Habitats are generally favourable to moose as a result of past and ongoing forestry operations. Local moose populations are subject to considerable hunting pressure because of easy road access. Black bear are prominent in the mine area and are sighted regularly. The beaver, otter and mink that inhabit the local area are the focus of trapping activity.

Prior to clearing the trees around the site in 2015 for construction projects (roads, communication tower, parking lot, Dam Raise) , the Ministry of Natural Resources and Forestry (MNRF) requested that Richmond assess the potential for presence of Species At Risk (SAR) and their habitat, either for roosting, nesting or hibernation purposes. Blue Heron/Golder Associates completed the SAR screening survey in June 2015, with a desktop review to compile data from the area in order to assess the potential for SAR to utilize the habitat. Based on the desktop review, there was a potential for thirty-four (34) designated species to occur within the Wawa District. Seven (7) of these species have a moderate potential to inhabit the study area and twenty seven (27) species have a low potential to inhabit the site. Three of the species with moderate potential to occur on site have been listed as either endangered or threatened under both the Species at Risk Act (SARA) and the Endangered Species Act (ESA). These species include whip-poor-will, northern myotis and little brown myotis bats, with field surveys were conducted by Golder Associates Ltd/Blue Heron Consultants at the Island Gold mine site in June/July 2015. Northern myotis and little brown myotis were introduced onto the SAR list both federally and provincially in 2014.

Results for the Whip-poor-will surveys indicated these birds were not heard at the site during the time of the survey. Results from the acoustic bat surveys indicated the presence of the Little Brown Myotis, but no Northern Myotis were detected. Although the presence of the Little Brown Myotis was detected, biologists concluded it is unlikely these bats are using the habitat for roosting since their activity was very low (Golder Associates Ltd, 2015).

20.1.8. Fisheries

Fisheries resources around the mine site are primarily northern pike. Lake trout are restricted to Mountain Lake, where a self-sustaining population exists. Walleye has been introduced into both Pine and Goudreau Lakes. Goudreau Lake, which constitutes the receiving water body for the treated effluent discharge from the Secondary pond, supports northern pike, white suckers and various minnow species. Perch occur in Pine Lake. Maskinonge Lake supports a northern pike population.

Fish surveys have been conducted as part of the Environmental Effects Monitoring(EEM) studies, in Goudreau Lake (exposure area), Maskinonge Lake (reference area 1; without historic exposure) and Pine Lake (reference area 2; with historic exposure) Lakes. The most abundant species found in Goudreau Lake was the walleye, whereas the most abundant species in both Maskinonge and Pine Lakes was the white sucker. Following the walleye, the next most abundant species in Goudreau Lake were the white sucker and common shiner. The yellow perch was found to be the next most abundant species in Maskinonge Lake and the common shiner in Pine Lake.

20.2. Waste Management

Richmont's strategy is to reduce consumption, reuse any waste generated, and dispose final waste in a safe and responsible manner. A Waste Management Plan (WMP) has been developed and implemented for the site; it provides guidance to site and non-site personnel on the handling, processing and disposal of waste, including hazardous waste and excess materials, generated during the normal

operations of the facility. It also includes waste rock generated by mining activities to verify that it is not Metal Leaching/Acid Rock Drainage (ML/ARD).

It includes procedures for documentation, permits, waste audits, waste reduction work plans (WRWPs), and development of reduction and source separation programs in accordance with applicable regulations.

The WMP is consistent with the requirements of Reg. 347 (Waste Management), Reg. 207/96 (for burning of domestic waste), Reg. 240/00 (verification that ore/waste rock is non-Metal Leaching/Acid Rock Drainage), and Dubreuilville By-Law No. 2012-44 (domestic waste produced by the mine site and the camp).

20.2.1. Waste Rock

Mining development has adopted cut and fill and long hole stoping methods, with continuously backfilling reusing waste rock generated in the mine development. Excess waste rock is transported to surface, and stockpiled for use as future backfill and surface projects (e.g. dams at the TMF, roads etc.). Based on previous and existing data, ore and waste rock is not acid generating or metal leaching. There are ongoing testing programs to continuously assess potential for acid generation or metal leaching of both ore and waste rock.

20.3. Tailings Management

The tailings management facility (TMF) represents the main water retention structures on the mine site. It consists of two ponds, the Primary Pond (PP) and the Secondary Pond (SP), in addition to water transfer systems via a siphon system (see aerial view of site plan in Fig. 18.2). The PP (built in the former Miller Lake basin) occupies an area of 109 ha, and the SP an area of 22 ha. The TMF is operated in accordance with ECA No. 0440-9YLHG7 issued September 9, 2015, by the Ministry of the Environment and Climate Change (MOECC).

Tailings slurry is conveyed by a pressurized pipeline from the mill and spigotted around the inside perimeter of the PP. The surface of the tailings forms a sloped beach allowing for a pond to form at the lowest part. Water is pumped (reclaimed) from the PP to the mill. Both tailings and reclaim pipes are placed in an engineered ditch, with drainage to an emergency catchment area (with an area of 0.8 ha) at its lowest points and reinforced by construction of earthen berms to prohibit any unnatural drainage to Maskinonge Lake. The TMF also includes seepage collection and pump back systems at dyke Nos. 1 and 2 at PP; these were built to prevent any migration of seepage to Maskinonge Lake.

The initial TMF was constructed in 1988 under the direct supervision of engineers of Gibson and Associates. The PP was expanded in 2011 by raising, expanding and adding additional dams or dykes under the supervision of AMEC Environmental. The capacity of the PP of the TMF was further augmented in November 2015 to provide an extra six (6) years of tailings deposition by increasing the height of all existing dykes to an elevation of 424m, as well as by adding a new dyke in order to accommodate an additional storage capacity of up to 2.5 Mm³. The maximum operating elevation of the dams is 424.0 m, with the emergency spillway at an elevation of 422 m. The SP has a capacity of 0.4 Mm³.

The dams at the PP have been designed and constructed using the downstream construction method. The body of the dam consists of engineered granular fill, placed in controlled lifts and compacted. The embankment consists of a partially zoned construction, consisting of an exterior shell, an upstream membrane, a cut-off below grade, and filter systems. Annual inspections have been conducted by geotechnical specialists (AMEC Foster Wheeler), confirming overall good performance of the dykes.

Water treatment cycle duration is typically 40 days (10 days transfer from PP to SP, 20 days of final polishing at the SP, and 10 days discharge of treated water from the SP to the receiving environment in a series of streams, wetlands and ponds, eventually discharging into the central part of Goudreau Lake. The main parameters of concern are cyanide and total suspended solids (TSS), data from monitoring programs have shown that the foregoing treatment regime has been effective in reducing to reduce the levels of cyanide and TSS in the tailings, to levels well within compliance limits for treated effluent.

Water quality is routinely monitored in the PP and SP, and in Goudreau Lake (at the discharge point and downstream). A comprehensive water monitoring program has been implemented for the site, and includes seven (7) compliance sampling locations, and effluent limits as mandated by the MOECC. Limits have been established for Total Suspended Solids, Total Cyanide, Copper, Nickel, Lead, Zinc, Unionized Ammonia, Oil and Grease (monthly), Arsenic and pH. Effluent objectives have also been established for Iron, Phosphorus, Total Ammonia Nitrogen, and Oil and Grease (daily). Notwithstanding, Island Gold mine also conducts sampling and analyses for other parameters of concerns e.g. metals, anions, hydrocarbons.

Water discharge and takings are recorded and kept in such a manner to maintain compliance with the applicable regulations. Flow measurement devices have been installed to monitor discharge of treated water from the SP, and also volume of water transferred from the PP to the SP.

Under the previous 2012 ECA, discharge of treated water was seasonal, with the annual treatment and release window being from May 15 to December 31. However with the new ECA issued by MOECC in September 2015, Island Gold mine is now allowed to discharge treated water continuously, which will allow significant increased operational flexibility.

An Operations Manual (OM) has been prepared for the TMF, which includes operating procedures; inspection programs; repair and maintenance programs; contingency plans and procedures for dealing with potential spills, bypasses and any other abnormal situations and for notifying the MOECC; and complaint procedures for receiving and responding to public complaints. This will be updated to include changes arising from the Dam Raise Project 2015.

20.4. Permitting

All permitting activities identify and address the various municipal, provincial, and federal environmental and social requirements and standards applicable to the Island Gold Project. These include the statutory requirements, stakeholder interests, and environmental, social and economic aspects. Agencies include Environment

Canada (EC), Ministry of Environment and Climate Change (MOECC), Ministry of Natural Resources and Forestry (MNRF), and Ministry of Northern Development and Mines (MNDM)

Island Gold mine is permitted to be designed and operated at a production rate of 27,000 tonnes per month (at an average of 900 tpd) of gold-bearing ore.

Listed below are the major ECAs from MOECC that are applicable to the site:

- Air and Noise ECA No. 8549-9BPP7LV issued September 27, 2015. This now includes limited operational flexibility, which allows minor changes to equipment/infrastructure without having to amend the ECA.
- Septic System ECA No. 3989-8XUPS9 issued September 27, 2012. An application for an Amendment was submitted in August 2015 for the Sewage System Expansion Project, Richmond expects to receive approval in the first quarter of 2016.
- Industrial Sewage Works ECA No. 0440-9YLHG7 (for tailings management area) issued September 9, 2015 (previously treated discharge was seasonal, with the issuance of ECA; it is now continuous discharge, allowing increased operational flexibility).

Water taking is conducted within acceptable limits to protect fish habitat, as well as under the regulation of a Permit to Take Water (PTTW) from the Ontario Ministry of Environment and Climate Change (MOECC). Table 20.1 lists the PTTWs for the various locations.

Table 20.1 – List of permits to take water (PTTWs)

Permit Id	Location	Volume (litres/day)	Frequency	Expiry
3526-758PUD	Lochalsh	10,000,000	Annually	September 8, 2017
6138-9ABJ9Z	Kremzar	1,500,000	15th of each month	August 7, 2023
5140-82WM38	Maskinonge Lake	434,500	Annually	February 8, 2016
6551-8U3H95	Exploration Drills	280,000	Annually	December 20, 2021

An application was submitted in September 2015 to renew the PTTW for Maskinonge Lake, Richmond expects to receive the permit by mid-January 2016.

Other permits/conditions apply as listed below:

- Domestic waste (garbage) – Contracted and hauled to municipal landfill.
- Sewage sludge Waste – Contracted and hauled to municipal disposal/waste treatment.
- Hazardous Waste (oil contaminated materials, etc.) – hauled off site by certified waste disposal contracting firm.

- Used Bulk Oil – hauled off site by certified waste disposal contracting firm.
- Burn Pit (cardboard and wood wastes) – permit issued annually by the MNRF.
- Tree clearing - permit issued by MNRF on an as per cut basis.

Closure Plan – An Amendment to the 2013 Closure Plan was submitted in September 2015 to the Ministry of Northern Development and Mines, based on the changes arising from the Dam Raise Project 2015 at the Primary Pond of the Tailings Management Facility. The previous amendment to the closure plan had been submitted in 2013 and approval granted in 2014. Currently, the latest Amendment is in the process of review and comments; Richmond expects to receive approval in the first quarter of 2016.

Since 2009, there have been six (6) penalties and three (3) warnings issued to Island Gold mine relating to the discharge of the final treated water, with the fines paid to the government agencies, and relevant corrective actions taken.

20.5. Monitoring

A comprehensive environmental monitoring program is in place at Island Gold mine. It includes inspections, sampling schedules, data management and reporting. Also included in the program are sampling frequency, various parameters of concern (for field and laboratory analyses) and QA/QC procedures. Key performance indicators are tracked, and any deviations from targets are addressed and corrected.

Environmental audits (both internal and external) have been conducted over the years, with the last external audit done in 2013; corrections actions are being undertaken continuously.

Standard operating procedures (SOPs) have been developed for all environmental related activities.

An environmental training program is also in place. Training starts from employee general orientation through ongoing training/refresher topics to various environmental aspects

All programs and procedures are constantly reviewed and updated periodically.

20.6. Environmental Emergency Response

Island Gold's environmental programs are designed with the ultimate goal to prevent all environmental incidents. However, in the event of unplanned incidents, the mine maintains a high degree of emergency preparedness with appropriate plans, resources and training to minimize the impact on workers, operations and the community should an unplanned incident occur. A Spill Prevention and Control Plan (SPCP) is mandated under the regulatory requirements of Ontario Reg. 224/07 Spill Prevention and Contingency Plans, the primary purpose of which is to prevent and reduce the risk of spills of pollutants, and to prevent, eliminate or ameliorate any adverse effects that result from spills of pollutants.

A SPCP, as part of the environmental emergency response program, is in place for the overall Island Gold site. It outlines/mandates response to a leak or spill, and to limit effects to employees, the community and the environment.

It also includes roles and responsibilities of all employees, containment procedures, reporting aspects (both to internal management and external agencies), and follow-up/close-out procedures. Additional steps are taken to complete remediation and clean-up of a spill once the emergency containment has been completed.

20.7. Reporting

Aside from the monthly internal reports to Richmond's on-site and corporate management team, Table 20.2 lists the external reporting done by Island Gold mine, with applicable due dates and responsible agencies.

Table 20.2 – External Reporting

Report	Agency	Frequency	Deadline
Spill Prevention and Contingency Plan	MOECC	Annually	31-Jan
Annual Report	MOECC	Annually	31-Mar
Public Report	MOECC (kept at security gate)	Annually	15-Feb
Quarterly Report	MOECC	Quarterly	45 days after quarter
RISS	EC	Quarterly	45 days after quarter
MEWS	MOECC	Quarterly	45 days after quarter
HWIN	MOECC	Annually	15-Feb
PTTW Kremzar	MOECC	Monthly	15th of every month

20.8. Social and Community Considerations

20.8.1. Communities

Two communities within proximity to the Island Gold mine include the Township of Dubreuilville (closest to the mine) and the Municipality of Wawa in the Algoma District. Two other communities situated in the Algoma District include the Township of White River, which is 93 km north of Wawa, and the small community of Hawk Junction, which is approximately 30 km northeast of Wawa.

Dubreuilville is located 17 km from the mine site and has a population of approximately 900 permanent residents. The site is accessible from Dubreuilville by an all-weather road off Highway 519. The town contains accommodations for mine personnel. Dubreuilville is accessible by car or train. The town is on the Algoma Central Railway and is served by the train three days per week, year round.

Historically, forestry and mining have been major contributors to Dubreuilville's economy. In November 2007, Dubreuil Lumber Inc. filed for bankruptcy protection and ceased its logging operations. In 2008, the company was reduced to four

employees. The collapse of the forestry industry has dramatically impacted the town, leaving hundreds without work.

Statistics Canada data shows that Dubreuilville's population steadily decreased from 990 people in 1996 to 635 people in 2011. The median age of the total population in 2006 was 36.8 years and in 2011 it was 35.4 years.

Educational facilities include a Catholic elementary school and a public high school, both of which are francophone and have small class sizes. Students must travel to Wawa for English education. Daycare services are also offered. Residents have access to Contact North, which offers access to university and college courses through distance learning and online education.

The Dubreuilville Health Centre has two full-time registered nurses and receives six physician visits per month. The community also offers homecare, tele-health video consultations and mental health referrals. Dubreuilville provides community support services such as a food bank. The nearest hospital is the Lady Dunn Health Centre, approximately 75 km away by road in Wawa.

20.8.2. Industry

Current active mining or exploration in the area, other than the Island Gold mine, includes the Magino Gold Project owned by Argonaut Gold Inc. Previous operations include the Kremzar mine, the Edwards mine, and the Cline Lake Gold mine.

The Island Gold mine is located in the southeast corner of the timber management area controlled by Dubreuil Forest Products, of Dubreuilville. No operations are taking place in the project area at present and none are expected as the area has been extensively harvested. There is a local sawmill located in Dubreuilville which has been closed since 2008.

20.8.3. Recreation

Fishing has been closed on Goudreau Lake in recent years following the stocking of the lake with walleye by local conservation organizations, limiting fishing in the immediate project area to Pine Lake, which has reasonable public access. Maskinonge Lake is restricted by access through the project area. All three lakes support northern pike, white sucker and a variety of minnow species. Yellow perch also occur in Pine Lake, as well as walleye. Relatively easy access has resulted in intense fishing pressure by local residents, as well as the presence of some non-resident anglers who return to the area annually. Moose is the primary game animal and hunting pressure is considerable by both local residents of Dubreuilville and non-residents. A grouse population also attracts hunters. Black bear hunting is popular in the area with a local outfitter operating out of Dubreuilville.

The project area is adjacent to a snowmobile route, with lodging in Dubreuilville, resulting in increased traffic in the area during winter.

20.8.4. Community and Benefits

The Island Gold mine philosophy is to maximize local hiring of employees from the labour pool in the surrounding communities. This has increased the economic

stability of the local communities of Dubreuilville, Wawa, White River and Michipicoten First Nation who have been hit hard by the downturn of the forestry industry.

Currently there are 243 employees and approximately 200 contractors employed by Island Gold mine. At the start of 2008, there were 82 local employees and presently this has increased to 153 local employees most of whom were trained onsite for a new career in mining through the “basic underground hard-rock miner common-core program” offered through Island Gold mine’s partnership with Northern College. This ran for five years as part of Richmond’s efforts to be an ongoing good corporate citizen and combat the local shortage of skilled labour. Island Gold mine’s employees have augmented the local economy by living locally or supporting the local businesses while residing at work (equivalent to approx. 6 months per year).

Island Gold mine supports the local businesses and various non-profit organizations through its substantial local donations, purchase of materials, use of motels and many home and apartment rentals. Support is also reflected through company programs such as the health and wellness program which provides yearly funds to encourage employees to join a gym along with rental of local facilities such as the arena and school gym for employee activities or events.

Island Gold mine encourages employees to relocate to the local communities by offering a Moving and a House purchase program to employees to encourage them to move to the Township of Dubreuilville, Township of Wawa or White River.

Island Gold mine helps to alleviate the local Health care system by securing the services of a registered nurse to provide health care services and health and wellness programs onsite for our employees to promote a healthy life style. The services include health care, referrals to local doctors, awareness training, vaccination program (that includes hepatitis, twinRex and flu shots). Future plans are to acquire the equipment to conduct audio and pulmonary testing onsite as well as the possibility of applying for the certification to do blood work onsite.

The mine is in the process of donating money to the local hospital, Lady Dunn Center (in Wawa) which services the surrounding local communities.

Public consultation activities are ongoing. There have been several information sessions in Dubreuilville, to outline any proposed changes to the project. Feedback garnered from consultation activities have been incorporated into the decision making processes. Primary feedback has been related to employment opportunities at the mine for residents of Dubreuilville.

There have also been regular meetings with the Dubreuilville Town council (generally every 2 months) to discuss common interests such as the Town’s land fill, incentives to our employees to buy a house in Dubreuilville, possibility of permanent bunkhouse for Island Gold mine, etc. It was agreed that Richmond will provide a compactor to the town to assist in landfill management, and this was provided in April 2015.

Approval has been received to build a 98 unit bunkhouse complex within the community (adjacent to Green Lake). This is nearing completion. The permit is valid for three years until September 10, 2018. A monthly fee is paid to the town for rental of the land. A request for extension of the permit can be made; should Richmond be interested in doing so, the need for an extension will be evaluated prior to the expiry of the permit. The temporary zoning amendment was approved in February 2015 as a permanent zoning amendment as per Township of Dubreuilville for the land where the bunkhouse is located.

20.9. Aboriginal Relations

Consultations have been on-going with the following groups, who were identified as having an interest in the area of the Island Gold mine: Michipicoten First Nation, Missanabie Cree First Nation, and the Métis Nation of Ontario (MNO).

Michipicoten First Nation (MFN)

The Michipicoten First Nation is a member of the Ojibway community in Northern Ontario. Michipicoten First Nation is a community of approximately 1,055 members, 60 of whom live on the reserve (Chief Buckell, 2015). The 1850 Robinson-Superior Treaty recognized the traditional territory of the Michipicoten First Nation, and the site is located therein.

Traditionally, Michipicoten First Nation citizens have lived, hunted, and trapped throughout the area surrounding the Michipicoten River and harbour. For centuries, their ancestors lived a traditional way of life. Their lifestyle required travelling throughout the area at various times of the year for hunting and trapping.

There is a Memorandum of Understanding (MoU) signed and in effect with Richmond for the Island Gold mine. The MoU includes benefits related to contributions, employment and contracting opportunities.

Missanabie Cree First Nation (MCFN)

The traditional territory of the Missanabie Cree First Nation is situated in and around Missanabie Lake in the Treaty 9 area. The site is situated outside of this treaty area. There are 360 members of the First Nation, but because they do not have a reserve, they live in different communities in the area. A reserve is being constructed northeast of Wawa.

There are no agreements in place with MCFN; however, Richmond has been increasing communications and discussions with MCFN over the last years to arrive at a mutually beneficial agreement in the near future.

Métis Nation of Ontario

The Métis Nation of Ontario was established in 1993. They have a centralized registry of over 15,000 Métis citizens and have approximately 30 Chartered Community Councils across the province, which represent Métis citizens at the local level. Community councils nearest to the Project site include Chapleau, Terrace Bay, Thessalon and Thunder Bay. Membership numbers are not available. The Métis Nation of Ontario may have conducted harvesting activities in the area. There are no agreements in place with MNO.

20.9.1. Aboriginal engagement activities

Aboriginal Engagement initiatives for Island Gold mine was initiated in December 2003 by Patricia Mining Corp. and has been continued to date by Richmond. Richmond's Executive Management Team is actively engaged with all Aboriginal initiatives, including the President and the General Manager of Island Gold mine.

Consultations have been held over the years; the formats have been information sessions with community members held on the reserves, meetings onsite and offsite, and site visits.

There have also been engagement activities to outline any proposed changes to the project; e.g., the recent Dam Raise Project completed in November 2015.

Discussions have centered on the profit sharing, opportunities for employment, contracting, training, environmental effects of project.

In August 2015, Richmond was mandated by MNM that consultation shall also now include with Batchewana and Garden River First Nations. An initial meeting was held with Batchewana in October 2015 to discuss a path forward. There have not yet been any discussions with Garden River First Nation.

Richmond will continue working with all Aboriginal groups as Island Gold operations continue, to arrive at mutually beneficial arrangements.

20.10. Mine Closure and Reclamation

The Closure Plan presents the decommissioning strategy for the IG mine. It reflects the current and expected site conditions and defines a program which ensures the long-term chemical and physical stability of the site. The ultimate goal of the Closure Plan is to ensure that chemical and physical impacts to the site are minimized during operations, and that the site is returned as closely as possible to pre-development conditions at close-out. The Closure Plan has been developed using data collected during physical, chemical and biological studies of the site (treated effluent, surface water, ground water, ore/waste rock) and the surrounding environment during advanced exploration and production phases.

All closure activities are expected to be completed within five (5) years of close-out of activities. A summary of rehabilitation measures are listed below:

- Backfilling of underground drifts with waste rock;
- Installation of groundwater monitoring wells;
- Capping of shafts and vent raises;
- Contouring of remaining waste rock (if remaining);
- All mobile equipment brought to surface;
- All structures decommissioned or demolished;
- Removal and sale of equipment, tanks and materials of value (e.g. steel);
- Disposal of unsalvageable non-hazardous waste in the Dubreuilville landfill;
- Removal of fuels, chemicals, hydrocarbons and hazardous materials;
- Removal of mine pumps (allow underground to flood);
- Backfilling of portal entrances;

- Removal of tailings lines and siphons;
- Cover exposed tailings with waste rock;
- Certification of shaft and vent raise caps;
- Certification of backfilling;
- Scarification and revegetation of disturbed areas;
- Spillway construction to establish natural drainage;
- Secondary Pond breached, siphons removed, contoured;
- Scarification and revegetation of access roads; and
- Stability monitoring (physical, chemical and biological).

An amendment to the Closure Plan was submitted to the Ministry of Northern Development and Mines (MNDM) in April 2013 to amalgamate the Closure Plan (for Lochalsh and Kremzar) and include infrastructure associated with the Island Gold Lower Zones. Richmond received approval in June 2014. Based on the Dam Raise Project 2015, another Amendment to the 2013 Closure Plan was submitted in September 2015, along with the increase in Financial Assurance. The filing process of review and comments is ongoing; Richmond expects to receive approval in the first quarter of 2016.

The revised total closure cost estimate for the 2015 Closure Plan is \$1,683,942. Richmond has previously provided financial assurance \$1,577,127 to the Director, Mineral Development and Rehabilitation, MNDM. Richmond has submitted a certified cheque for the outstanding amount of \$106,815 to fulfill its financial commitments for the mine closure and reclamation.

Studies and work have been ongoing to meet the requirements associated with the 2013 closure plan that included a hydrogeological study and the installation of monitoring wells, with regular groundwater monitoring (refer to section 20.1.5). The majority of the ore is not expected to be acid generating according to acid base accounting results from testing carried out. Tailings samples were tested for acidic potential, results indicated that they will not generate acid. Testing for acid generation and metal leaching potential will continue throughout the mine life.

Closure planning is an iterative process which will be re-evaluated as the mine site development progresses since the initial plans are based on projected conditions which are expected to change in response to changes in site conditions, additional ore discoveries, mining/processing, advances in technology and new regulatory requirements. Richmond will continue to review and update the Island Gold Mine Closure Plan accordingly, to ensure that it remains current, relevant and optimized.

20.11. Sustainability

Richmont's sustainability initiatives at Island Gold mine are hinged around the company's principles to protect the health and safety of employees and contractors, as well as the environment and communities affected by the mining activities. With this approach, increased value is created for Richmont's shareholders by operating in a safe, socially and environmentally responsible manner while contributing to the prosperity of employees, their families and the communities in which Richmont operates.

Our employees are critical to Richmont's current and future success. Developing and nurturing talent and skills is also a key part of the company's sustainability strategy. Richmont is committed to local hiring and supporting local communities, both Aboriginal and local. An example was provided in section 20.8.4.

Richmont's role in contributing to the long-term sustainability of the communities and environment at Island Gold mine will also occur during the closure and rehabilitation stages. Upon cessation of operations, Richmont will close and rehabilitate Island Gold mine to ensure public safety and protection of the environment by eliminating unacceptable hazards, and restore the sites to a condition acceptable to regulators and communities (see section 20.10).

21. CAPITAL AND OPERATING COSTS ESTIMATE

21.1. Summary

This section details the capital and operating cost estimates specific to the mining of a potentially mineable mineral resource of 2.1 Mt located between the 450m and 860m levels.

Island Gold is an operating mine with ongoing mining and development activities. The basis for this PEA is that the identified potentially mineable mineral resource represents the continuity of the mine until 2022. Years 2015 and 2016 are considered a transition period between current mine activities and mining in the Island Gold Lower Zones.

21.2. Capital Costs

During the transition period, the capital costs specific to the development of the Island Gold Lower Zones are considered *project capital*. All capital costs following that two-year period are considered *sustaining capital*.

Most of the capital expenses were provided by Richmond. InnovExplo was involved with the estimation of capital costs related to development work.

21.2.1. Project Capital

Project capital costs represent the capital expenses that occur during the transition period related to the development of the Island Lower Zones. Project capital includes development, mobile equipment, mine building and offices, tailings dam expansion and underground construction.

The estimated 2015–2016 project capital costs amount to \$62.2 M (Table 21.1).

Table 21.1 – PEA project capital costs

Project capital (C\$)	2015	2016	Total
Development	11,749,948	20,436,681	32,186,630
Mine mobile equipment	1,052,556	10,850,000	11,902,556
Mine building office	2,000,000		2,000,000
Tailings dam	9,900,000		9,900,000
Underground construction	754,839	5,500,000	6,254,839
Total	25,457,343	36,786,681	62,244,025

21.2.2. Development

The project capital cost of \$32.2 M related to development work includes a total of 7,596 m of horizontal development and 684 m of vertical development. Development includes ramps, accesses to all levels, service and production bays, and manways.

21.2.2.1. Mine mobile equipment

For mobile equipment, the total cost of \$11.9 M includes several equipment, the main ones being :

- Haul trucks (2);
- 6 yards scoop (2);
- U/G Grader (1)

21.2.2.2. Mine building and office

A total of \$2 M in capital expenses was estimated for buildings and offices. It includes:

- Two 48-room bunkhouses to accommodate a total of 96 people at a time;
- An emergency response building;
- A new modular office building unit;
- A new modular dry building unit.

21.2.2.3. Tailings management facility

The main works at the Primary Pond of the TMF includes:

- Raising the four (4) existing dykes and adding one (1) dyke, with heights ranging from 3.5 to 5.7 m;
- Upgrades to the spillway and siphon system; and
- Construction of access roads around the perimeter.

21.2.2.4. Underground construction

The capital cost of \$6.25 M for underground construction includes:

- Electrical installations, including seven (7) underground sub-stations
- A communications system (leaky feeder)
- A portal transformer
- A transformer, holes for the cable, and cable to bring 13.8 kV underground

21.2.3. Sustaining Capital

The sustaining capital is broken down by sub-category as presented in Table 21.2. The total sustaining capital costs are expected to be \$40.5 M for the 2017–2022 period, with the majority of expenditures occurring in the first three years.

Table 21.2 – PEA sustaining capital

Sustaining capital (C\$)	2017	2018	2019	2020	2021	2022	Total
Development	8,870,446	0	0	0	0	0	8,870,446
Mine (other than development)	9,750,000	5,800,000	4,300,000	1,500,000	800,000	0	22,150,000
Surface (mine building offices)	3,400,000	1,000,000	1,000,000	1,000,000	0	0	6,400,000
Tailings	2,141,000	188,000	188,000	188,000	188,000	188,000	3,081,000
Total	24,161,446	6,988,000	5,488,000	2,688,000	988,000	188,000	40,501,446

21.2.3.1. Development

Sustaining capital expenses associated with 2017 horizontal development work (3446 m) and vertical development (871 m) represents a cost of 8,9 M\$.

21.2.3.2. Mine (other than development)

A sustaining capital expense of \$22.15 M is forecasted for the *Mine – Other than Development* sub-category. It includes mobile fleet renewal, underground construction, ventilation wall construction, electrical, materials and manpower.

21.2.3.3. Mechanical shop, warehouse

A sustaining capital expense of \$6.4 M is forecasted for the mechanical shop and warehouse. It covers moving the temporary bunkhouse (98 rooms) to a permanent location, adding a recreational room, repairing or replacing the apartment building and a new surface garage.

21.2.3.4. Tailings storage facility

For 2017, \$2.1 M is allocated for the construction of a diversion system around the Primary Pond. It will comprise ditches, culverts, etc. From years 2018 to 2022, an annual cost of \$188,000 is budgeted for maintenance of the diversion/drainage systems around the Primary Pond.

21.3. Operating Costs

The operating costs were adjusted to account for the impact of mining at greater depth. Specifically, the costs that are most affected relate to material handling, reduction in available wrench time, equipment operating costs and energy costs.

Wrench and cycle times vary significantly as mining gets deeper, and this has been accounted for.

Based on Richmond's accounting structure, a model was made using Excel software to evaluate the OPEX associated with the potential mineable mineral resource of 2.1 Mt located between the 450m and 860m.

Richmond's OPEX accounting structure consists of the following categories:

- Mine
- Mechanical
- Electrical
- Engineering
- Geology
- Administration (HR, accounting and procurement)
- Surface (buildings, bunkhouses, food, maintenance, apartments, charter planes, etc.)
- Corporate (finances, marketing)
- Mill operation
- Mill maintenance

For the purpose of this PEA, operating costs were grouped into four categories as presented in Table 21.3: *Mining, Milling, G&A and Royalties*. Corporate fees were not considered as part of the PEA estimation.

Operating costs were estimated relative to the known reference cost of mining on the 450m level. Many unit costs are not fixed since wrench time is reduced and cycle time is longer with deeper mining. For Richmond, mining below the 450m level using the current material handling and manpower transportation system translates into higher operating costs.

Operating costs were evaluated by integrating the proposed mining plan. After the transition period, operating costs are only related to Island Gold Lower Zones. Table 21.3 presents the operating cost distribution for years 2017 to 2022, and Table 21.4 provides the total cost and average unit cost for that period. The resulting average unit cost is \$148.36/t.

Table 21.3 – Operating cost distribution

Financial	2017	2018	2019	2020	2021	2022
Opex total costs (C\$)	\$45,968,845	\$41,572,861	\$44,300,512	\$45,752,730	\$43,249,683	\$35,392,239
Mining	\$23,974,796	\$19,305,202	\$20,713,363	\$21,916,669	\$20,158,889	\$17,829,525
Milling	\$9,365,538	\$8,781,708	\$9,195,760	\$9,577,302	\$9,396,919	\$8,743,583
G&A	\$9,307,172	\$9,837,560	\$9,950,787	\$10,055,196	\$9,827,134	\$6,000,000
Royalties at 3% avg	\$3,321,339	\$3,648,391	\$4,440,602	\$4,203,563	\$3,866,742	\$2,819,131
Cash operating cost (\$/t)	\$155	\$154	\$153	\$149	\$145	\$132
Cash costs (\$/oz)	\$664	\$547	\$479	\$522	\$537	\$603

Table 21.4 – Total and Unit operating costs

Operating cost	Total 2017 to 2022 (\$)	Average unit cost (\$/t)
Mining	123,898,444	71.73
Milling	55,060,809	31.88
G&A	54,977,849	31.83
Royalties at 3% avg	22,299,768	12.91
Total	256,236,870	148.35

21.3.1.1. General and Administration

General and Administration costs amount to \$31.83/t and include two departmental unit costs as described in Table 21.5. Those costs will be factored in by the gradual closure process, which will mainly happen in 2022. The budget model was developed for full production mode and assumes that all costs will remain in the same range until the last tonne is milled, which does not reflect reality.

- *Administration* includes human resources, accounting and procurement.
- *General* includes costs related to room and board, transportation fees, surface building maintenance, surface equipment maintenance, road maintenance, snow removal and security.

Table 21.5 – General and Administration Unit Costs

General and administration (G&A) cost	Average unit cost (\$/t)
Administration	10.40
General	21.43
Total	31.83

21.3.1.2. Mining

The resulting mining operating costs of \$71.73/t includes all expense related to the following accounts: *Mine*, *Mechanical*, *Electrical*, *Engineering* and *Geology* (see Table 21.6 for details).

Mine costs represent approximately half of total OPEX and include expenses related to production, development, operating costs, services and consumables.

The second half is composed of underground mobile equipment maintenance costs, electrical department costs, engineering and geology.

Table 21.6 – Mine operating cost

Mining operating cost	Average unit cost (\$/t)
Mine	35.60
Mechanical	20.82
Electrical	3.56
Engineering	4.72
Geology	7.03
Total	71.73

21.3.1.3. Mill – operating costs

The mill's operating cost is \$31.88/t. It can be broken down into two departmental unit costs, as presented in Table 21.7. Mill operation includes crushing, grinding, carbon-in-pulp process activities, and thickening for tailings disposal.

Table 21.7 – Mill operating cost

Mill operating cost	Average unit cost (\$/t)
Mill operations	18.97
Mill maintenance	12.91
Total	31.88

22. ECONOMIC ANALYSIS

Under NI 43-101 rules, producing issuers may exclude the information required for economic analysis on properties currently in production, unless the technical report includes a material expansion of current production. Richmond, being a producing issuer, is not required to include information under Item 22. There is currently no plan to expand the current Island Gold mine production of 800 tonnes per day (tpd).

23. ADJACENT PROPERTIES

Part of the information in this section is from Genivar's 43-101 technical report for the Island Gold Project.

23.1. Magino Mine

The first discovery of gold in the area was in 1918 by J. W. Webb on what is now referred to as the Magino deposit, located about 1 km to the southwest of the western Island Gold mine property boundary. The deposit is reported to be hosted in the Webb Lake Stock, a quartz porphyritic granodiorite, which intrudes mafic volcanic rocks. Both lithologies occur within the GLDZ and have been highly altered as a result of deformation associated with this structure. Gold is present within subparallel grey quartz veins and in silicified wall rocks of east-west striking shear zones in granodiorite within the GLDZ. According to public records, the Magino mine operated intermittently between 1933 and 1939 during which time 105,792 tonnes of ore at a grade of 2.57 g/t Au were mined producing approximately 8,700 ounces. The mine was closed from 1940 until 1988, when it was reopened by McNellen Resources Inc. and Muscocho Exploration Ltd. During the 1988 to 1992 period, a total of 696,413 tonnes of ore averaging 4.56 g/t Au was mined using bulk mining methods, producing 105,543 ounces of gold. Golden Goose Resources Inc. (Golden Goose) acquired the Magino mine property in 1996. In April 2004, Golden Goose filed a mineral resource estimate to verify the potential for a large tonnage low grade gold mineralization amenable to open pit mining.

This property was later acquired by Prodigy Gold (formed through a union between Golden Goose Resources and Kodiak Exploration), which did further exploration and defined the current open pit resource of 223 million tonnes averaging 0.87 g/t Au for 6.25 million ounces of gold. In 2012, Argonaut Gold acquired 100% of all issued and outstanding shares of Prodigy Gold. On December 2013, Argonaut announced pre-feasibility study results for the Magino project with after-tax IRR of 18% and total cash flow of US\$ 350 million. As of December 17, 2013, the probable reserves were 60.2 million tonnes at 0.9 g/t Au for 1.75 million ounces of gold.

23.2. Edwards Mine

The Edwards mine property is located to the northeast of the Island Gold mine property boundary. The property was originally staked in 1924 by Peter Edwards. In 1933 Gold Lands Syndicate optioned the property and sunk an inclined shaft to a depth of 105 ft. In 1935 Edwards Gold Mines Ltd acquired the property and deepened the shaft to 300 ft and erected a 75 short ton per day mill. During this period 1,573 short tons of ore were milled producing 435 ounces of gold (at a recovered grade of 0.31 oz/t). Between 1939 and 1960, the property laid dormant until it was staked by A. Paquette, followed by a number of other company options, until 1986, when it was acquired by Spirit Lake Explorations Ltd. In late 1996, River Gold Mines Ltd ("River Gold") agreed to purchase the two leasehold mining claims comprising the Edwards mine from VenCan Gold Corporation (formerly Spirit Lake Exploration Ltd). From 1996 to 2001, River Gold exploited three zones on which Vencan Gold had concentrated its drilling. River Gold ramped down to a depth of 300 m extracting 144,000 ounces of gold. The Edwards mine zones consist of a series of steeply dipping, subparallel, mineralized shoots hosted within deformed

rocks of the GLDZ. The zones vary in width from 1 to 5 m and are reported to extend at depth. River Gold mined the deposit as a low-tonnage, high-grade operation by. Ore was stockpiled on site and trucked to River Gold's mill located to the west of Wawa. In July 2001, River Gold closed the Edwards mine and put it on care and maintenance.

In July 2002, the Edwards mine was sold to Strike Minerals Inc. Strike Minerals has conducted in excess of 40,000 feet of drilling on the property that has delineated a number of parallel auriferous quartz vein systems in addition to the ones mined in early 2000.

In 2012, Strike Minerals dewatered the mine and did some development in the upper portion of the deposit. The deposit has been dewatered to the 140m level. Development of the cross-cut on the 60m level intersected the Edwards No. 1 and Edwards No. 5 zones, and Strike plans to continue development on the 60m level past the Rusty Weathered Zone to the Plowman No. 1 and No. 3 zones. On the 90m level, Strike Minerals plans to develop the cross-cut through the New North 2, New North 1, Edwards No. 1, Edwards No. 5, Rusty Weathered, Plowman No. 1 and Plowman No. 3 zones.

On March 19, 2013, Strike Minerals announced sampling results from the first lift on the Edwards No. 1 zone above the 60m level. The lift created approximately 225 tonnes of mineralized material. Muck samples at 8-ft intervals from the first lift returned an average grade of 38.98 g/t Au over a width of 1.5 m for a length of 24 m. Chip samples taken across the back after removal of the first lift returned a weighted average grade of 15.39 g/t Au over 1.5 m for a length of 24 m. Initial back sampling of the Edwards No. 1 zone on the 60m level returned a weighted average grade of 25.45 g/t Au over 1.5 m for a length of 21 m.

Strikes Minerals has stopped the work due to financial problems.

23.3. Cline Mine

The Cline mine is located about 2 km northeast of the eastern Island Gold mine property boundary, and lies to the northeast of the Edwards mine. The Cline mine zones comprise a series of steeply dipping quartz veins that are hosted by highly carbonated and silicified sheared granodiorite, felsic porphyry and intermediate volcanic rocks. Deformation is related to splays developing off the east-west-trending Edwards-Cline shear. The gold-bearing zone has been identified along a strike length of 150 m and to vertical depths exceeding 200 m. Gold bearing mineralization was discovered on the Cline property in 1918 and extensively explored during the 1920s via two openings. During this period, the No. 1 vertical shaft was sunk to a depth of approximately 45 m and the No. 2 inclined shaft to a depth of approximately 60 m. During the period 1936 to 1942, additional work on the Cline deposit included development and mining from the No. 4 shaft, sunk to a depth of approximately 360 m. During 1965–1966, a shallower shaft, No. 3, was sunk to a depth of approximately 35 m to complete further exploration. Production from the property is reported as 63,328 ounces of gold and 10,598 ounces of silver from 301,000 tonnes of ore.

Cline Mining Corp. repurchased the property in 1997 and optioned it to Win-Elrich who drilled eight (8) holes.

From 2005 until 2008, Cline Mining drilled 58 holes on the property. Derek McBride reviewed the historical data and the Cline drilling and wrote a NI43-101 report on this property in November 2009. About 200,000 short tons of historical resources at a grade of 0.22 oz/t are reported for the 88-60 Zone in this report.

No recent work has been reported by Cline Mining Corp., the current owner of the property.

24. OTHER RELEVANT DATA AND INFORMATION

24.1. Pre-PEA Trade-off Study

Although this PEA considers a scenario of 800 tpd using the current material handling system for the potentially mineable mineral resource between the 450m and 860m levels, other throughputs and material handling systems were also assessed.

Prior to the PEA mandate, InnovExplo assessed maximum daily output scenarios and conducted a trade-off study on material handling and manpower transportation systems for the Island Gold mine. The results of this pre-PEA work support the selected productivity and material handling option for the mining plan elaborated for this PEA.

24.1.1. Maximum Capacity Analysis

The first part of the scope of the trade-off study was to establish a sustainable and realistic maximal daily extraction rate without limitations due to mill or transportation constraints. It is called the *maximum orebody sustainable extraction rate*. The assessment is based on the potentially mineable resource tonnage available between the 450m and 860m levels.

The evaluation considered the same mining method currently being used, and assumed current equipment performance will remain the same. The mine's current dilution and mine recoveries also remain unchanged. No rock mechanics study has been conducted to determine the influence of mining at increased depth.

24.1.2. Mining Plan

24.1.2.1. Stope creation

The first step in preparing for the mining plan was to create stope shapes. Using the solids prepared by Richmond for their resource and reserve estimation, InnovExplo created stopes 22 m high and 25 m long, with widths that matched the width of mineralization.

Based on historical data for the Island Gold mine, the PEA assumes a dilution of 18% and a mining recovery rate of 95%.

The resulting potentially mineable resource amounted to 2.09 Mt at 8.5 g/t Au. Figure 24.1 illustrates the stopes and development of the PEA mining plan. Stopes that are excavated using the bigger drifts are illustrated in orange, and the remainder are illustrated in blue.

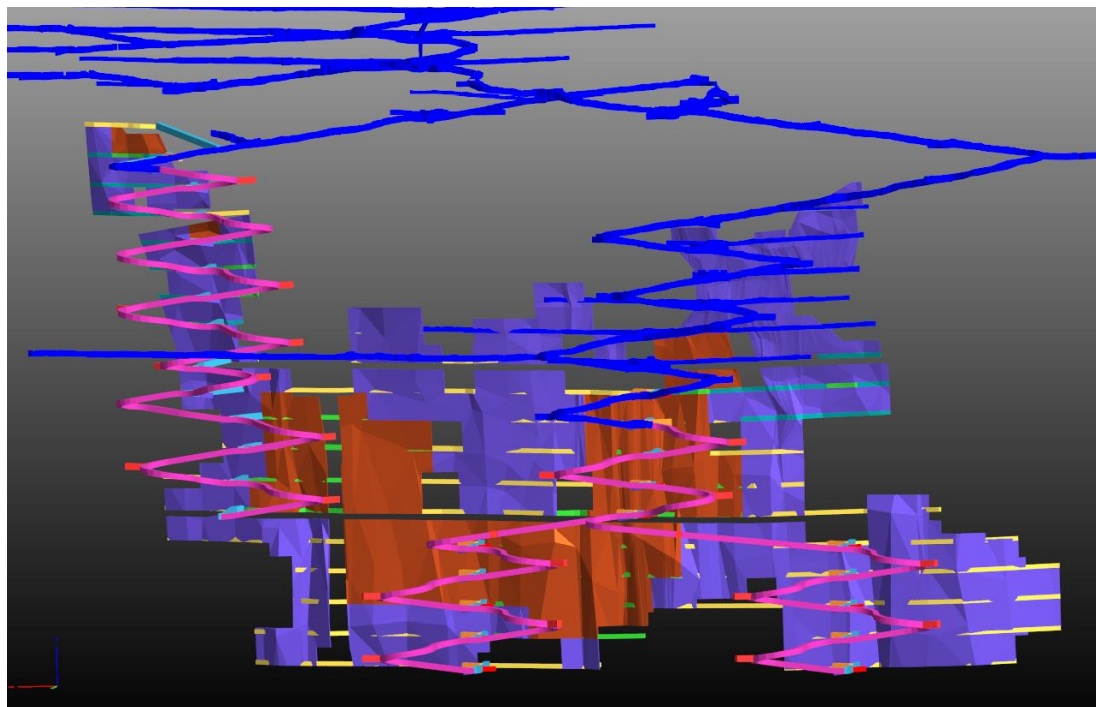


Figure 24.1 – Longitudinal view of the stopes and development included in the mining plan.

24.1.2.2. Development

Based on the potentially mineable resource defined for this PEA, InnovExplo designed ramps, accesses and sill drifts to efficiently extract the available tonnage.

The first design consisted of a single ramp similar to the one designed by Richmond. According to the planning achieved using EPS (Enhanced Production Schedule), a Studio 5D[®] tool discussed later in this section, the single-ramp plan was not suitable for an output of 800 tpd. It did not allow sustainable tonnage for the full production period. The plan did not provide sufficient flexibility or domains for simultaneous production on a single horizon, especially in the lower part. For these reasons, this plan was not retained.

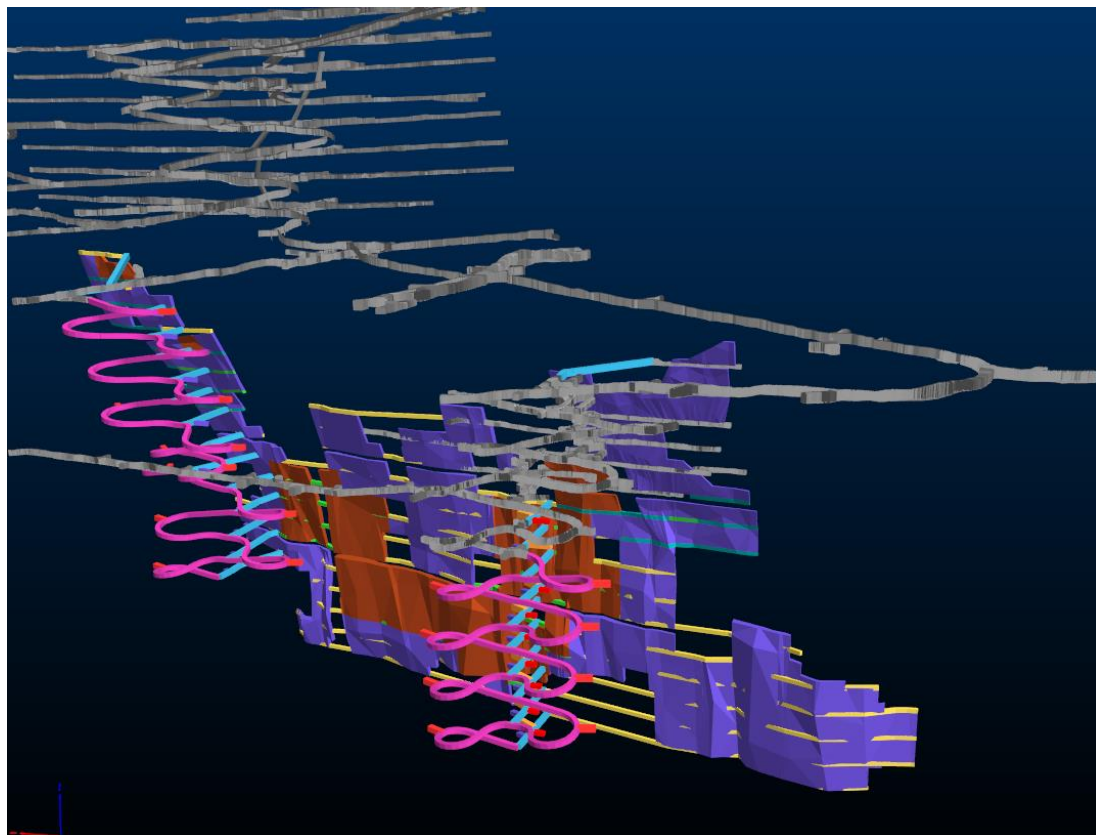


Figure 24.2 – Single-ramp design

In order to see what would happen to the maximum orebody extraction rate if the number of extraction domains was increased, a new design was elaborated consisting of two (2) ramps driven from level 740 down to 860. This scenario is presented in Figure 24.1.

24.1.2.3. The mining domain concept

A mining domain is an independent production sector, starting on a sill and going up to reach the last level before the next sill. Within the domain, the mining method is retreating (*Modified Avoca Method*). For most of the domain, only one stope can be mined at a time. If there are multiple accesses on a sill to reach more than one domain, the upper levels associated with that sill will have to be designed symmetrically. Mucking or backfilling two stopes at the same time in the same domain would incur a loss of efficiency that may outpace the benefits.

Figure 24.3 shows a plan view of a sill with two domains. In the middle, one stope has to be backfilled before the adjacent one can be opened to avoid having a double stope opened at the same time, creating structural stability issues. The more domains that are available, the greater the flexibility of the mine design and the potential for increasing daily output. It is important to note that this will incur an extra development cost that needs to be taken into account.

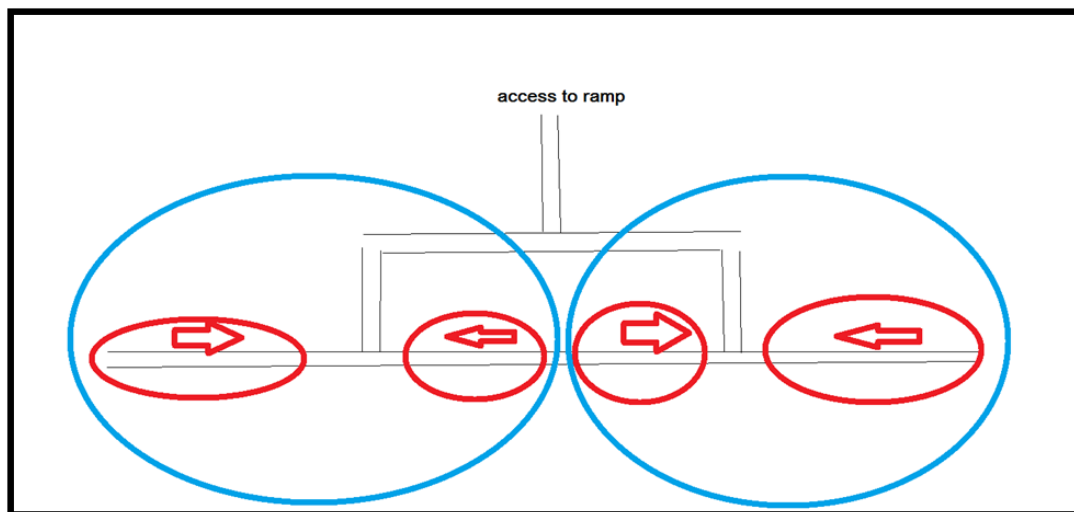


Figure 24.3 – Illustration of the mining domain concept

A domain is always associated with two sides or wings. While drilling or cable installation is going on in one wing, mucking or backfilling is taking place on the other side. This method works as long as the duration of the tasks is similar. A tight schedule management program is mandatory in cases where timing is a sensitive factor.

To illustrate the concept, Table 24.1 provides the cycle times for stopes wider than 4 m (representing around 6,500 t per stope).

Table 24.1 – Stope cycle times for stopes wider than 4 m.

West wing activities	Duration in days		East wing activities	Duration in days
Load and blast #1	2		Cable bolt drilling	10
Mucking blast #1	5.7		Cable bolt insertion and grouting	5
Load and blast #2	2		Production drilling	16
Mucking blast #2	5.6			
Backfilling	5.3			
Misc. installations	2			
Pull	1.6			
Total	24.2		Total	31

There is a difference in duration times between simultaneous activities occurring in opposite (twinned) wings, although the cable bolt drilling is done at the undercut while the production drilling is done at the overcut. If well managed, some production drilling could be done in parallel as long as there is no drilling over the head of the cable bolters. For a smooth operation within a domain, the extraction and preparation cycle times should be equal or as close as possible. If not, some delays will likely occur.

When the stope is narrow, 3 m or less, the cycle times for the two wings are closer (Table 24.2).

Table 24.2 – Stope cycle times for stopes less than 3 m wide.

West wing activities	Duration in days		East wing activities	Duration in days
Load and blast #1	2		Cable bolt drilling	10
Mucking blast #1	7.8		Cable bolt insertion and grouting	5
Load and blast #2	2		Production drilling	16
Mucking blast #2	7.8			
Backfilling	10.4			
Misc. installations	2			
Pull	3.1			
Total	35.1		Total	31

24.1.2.4. Enhanced Production Schedule (EPS) results

EPS is a mine production scheduling and forecasting tool that is part of the Studio 5D® mine planning software suite. It allows users to interactively update schedules, production parameters and dependencies of the mining activities. Once dependencies have been assigned to the tasks, EPS can automatically calculate the schedule from these dependencies. In addition, the EPS schedule is linked with 3D graphical data to provide dynamic animations of the schedule. EPS proved to be an excellent tool for estimating the maximum capacity of the deposit.

To organize the data to import into EPS, each stope and each segment of production drift were tagged in the computer model based on drift width and equipment size, those having less than 3 metres being mined with 2.7m³ (Figure 24.1 in purple) and the one wider than 3 metres being mined with 4.6m³ LHDs (Figure 24.1 in orange)

The first runs were done with the single-ramp scenario. The modelled and manually calculated preliminary cycle times demonstrate that the main limiting factor for increasing production capacity is the number of active stopes available. In order to achieve higher productivity, runs were completed with the double-ramp scenario. The double-ramp system yielded more production domains. Results are discussed below.

24.1.2.4.1. Development and production parameters

In EPS, each development and mining activity is broken down into unit segments, and these units are linked by dependencies.

Development parameters

For development, the mine design calls for three crews with Jumbos and one team with a scissor-lift, jacklegs and stopers for small drifts. Development priorities were optimized in EPS to try to smooth the tonnage distribution output in order to avoid high or low production peaks. In general, the following priorities were given:

- Priority 1 – Jumbo A in the main ramp and Jumbo B in the east ramp.
- Priority 2 – Jumbo C developing all level entrances and level drifts as long as they are wider than 4 m, and scissor-lifts with workers using jack legs and stopers developing 3-m-wide drifts (also by definition in the orebody).
- As soon as Jumbo A passes by a sill, the sill and level development related to it immediately becomes the priority for Jumbo C.
- When jumbos A and B complete the ramp development, the next priority becomes the sill and level development immediately above the sill, starting with the bottom sill.

Production parameters

The parameters considered for stope unit activity rates (task rates) account for the differences in production related to stope widths. When the stopes are wider than 4 m, performances are higher when using 4.6m³ LHDs instead of 2.7m³ units. The performances used in the simulations are the following:

Production rates when drift is 3 m wide:

- Backfilling: 450 tpd;
- Mucking: 420 tpd;
- Pull for void creation: 450 tpd (same rate as backfilling);
- Fixed delay: total of 6 days for loading and blasting, remote mucking pad installation, waste bumper installation, CMS scanning and processing, and normal system delays.

Production rates when drift is 4 m wide:

- Backfilling: 877 tpd;
- Mucking: 580 tpd;
- Pull for void creation: 877 tpd (same rate as backfilling);
- Fixed delay: total of 6 days for loading and blasting, remote mucking pad installation, waste bumper installation, CMS scanning and processing, and normal system delays.

24.1.2.4.2. Maximum capacity

Multiple simulations were performed to obtain a sustainable tonnage with limited production peaks and lows. The realistic and sustainable maximum output was found to be 1150 tpd.

Even though some simulations demonstrated that the deposit could allow for a higher average tonnage above the retained 1150 tpd, InnovExplo is of the opinion that the differences in high and low production peaks were too big to allow for sustainable production. In a production cycle, it is frequent to have available tonnage that is higher than the mucking capacity and vice versa. Most mines can temporarily accommodate a tonnage output peak that is one-quarter to one-third above nominal capacity; however, temporarily handling tonnage at a rate well above the nominal average output is usually not possible considering that equipment fleet size is based on nominal capacity.

24.1.2.4.3. Selected capacity

Based on the results obtained using EPS, and after holding discussions with the client, it was decided to retain two daily tonnages for subsequent and more detailed analysis. The 800 tpd scenario was taken as a base case for a short- to intermediate-term mining plan, and the 1150 tpd scenario was to be studied as a potential future mining plan.

The rationale for retaining and studying both tonnage options was the following:

- Richmond already has a provincial permit to produce at a rate of 900 tpd. Above that level, a new permit will be needed.
- It is possible with additional capital to increase mill capacity to 1200 tpd.
- Considering that a large portion of the tonnage in the evaluation consists of Inferred Resources, there is a concern that definition drilling may not keep pace with a production rate above 1150 tpd.
- Preliminary economical calculations show that ventilation costs, OPEX and CAPEX, would increase considerably at a mining rate above 1200 tpd.
- Maximum orebody extraction rate is based on the specific location of resources considered in this study. If resources are there in tonnage but the location changes, this could greatly impact scheduling; hence, another reason to be careful when dealing with the theoretical maximum capacity value.

800 tpd scenario

The chart in Figure 24.4 shows the simulation output at 800 tpd. Production (extraction) is done with two 4.6m³ LHD units and three 2.7m³ LHD units. This mobile equipment can be idle from time to time, but the whole fleet is needed to manage the production peaks. The amplitude of production lows and highs is within 200 tpd on average, except for a few months. Development is basically finished after 30 months from start-up, and total project duration is around 93 months.

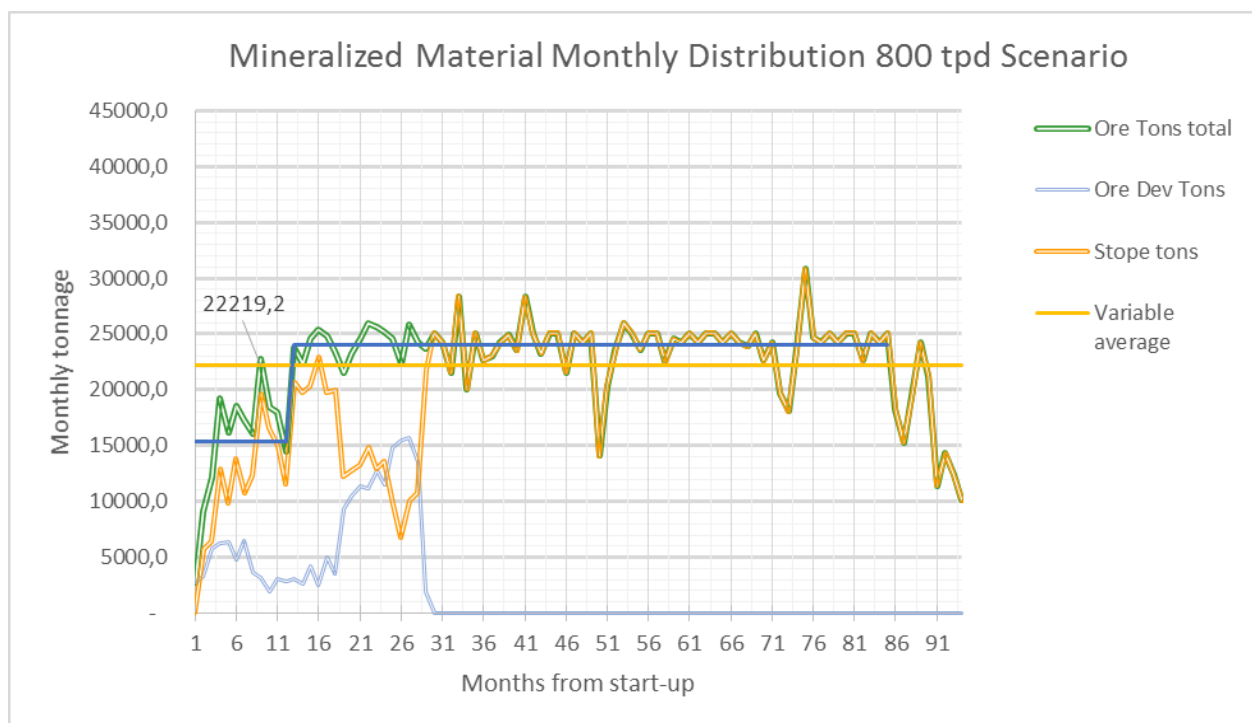


Figure 24.4 – Monthly distribution of the mineralized material for the 800 tpd scenario

1150 tpd scenario

The chart in Figure 24.5 shows the simulation output at 1150 tpd. Production (extraction) was possible with two 4.6m³ LHD units and four 2.7m³ LHD units. The amplitude of production highs and lows is within 200 tpd on average, except for one spike around the 28th month after start-up. Development is basically finished after 34 months from start-up, and total project duration is around 71 months.

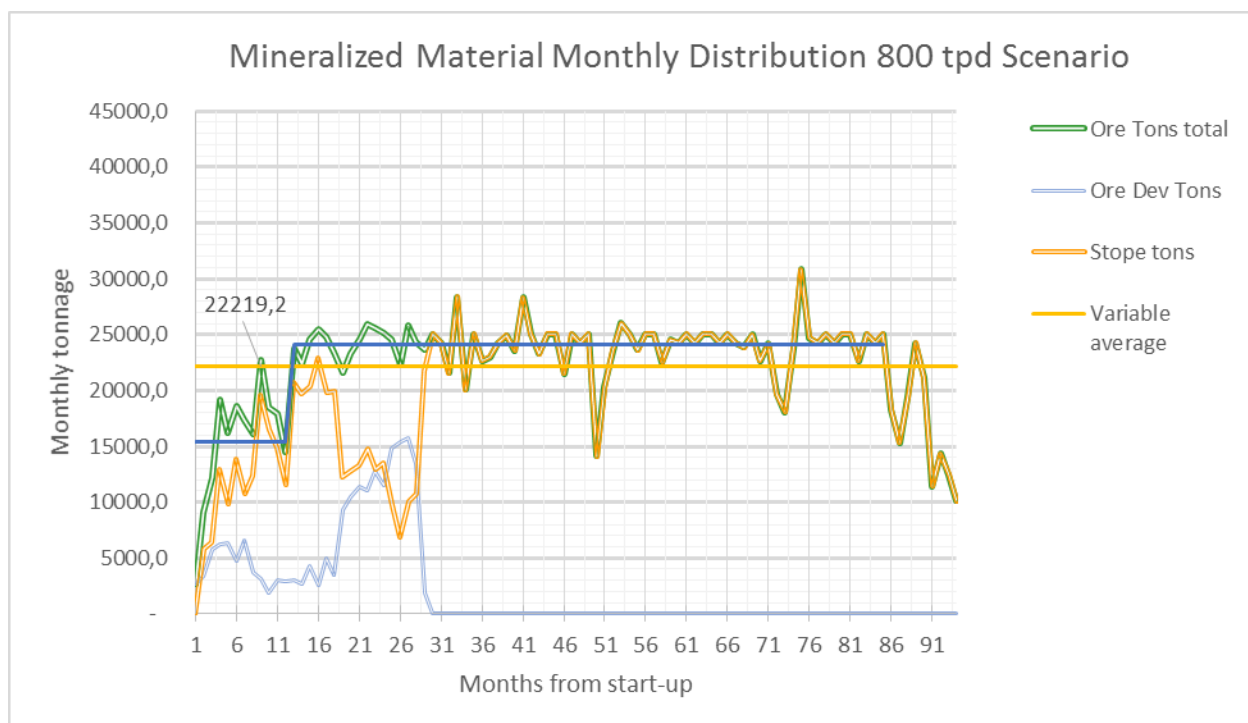


Figure 24.5 – Monthly distribution of the mineralized material for the 1150 tpd scenario

24.2. Material Handling Options – Brainstorming Phase

The second part of the scope was to identify the best material handling concepts for the deposit and associated infrastructure, taking into consideration the strategies, economics and schedules for all options identified. Manpower transportation was also included in the economic aspect of this trade off study.

Island Gold and InnovExplo personnel held a brainstorming session to identify all material handling and worker transportation options that warranted further study. In all, 20 options resulted from the brainstorming session (Table 24.3). These options can be grouped in five categories:

- Shafts;
- Winzes;
- Vertical Conveyor Systems;
- Horizontal Conveyor Systems; and
- Ramps (and trucks)

Table 24.3 – Material handling options generated during the brainstorming session

OPTION	DESCRIPTION
00	Status quo – 30t trucks partially loaded
0	Started the same as 00 but a few storage bays were created along the pathway to surface to minimize production impairment in case the ramp is blocked for a long time (e.g., equipment down). The two options were merged into Option 0 since not much difference.
1A	Full-service timbered shaft starting on surface and reaching a level close to centre of orebody mass
1B	Same as 1A but on guide ropes
2	Production-only shaft on guide ropes between surface and centre of orebody mass level
3A	Full-service timbered shaft starting on surface and reaching 450m level
3B	Like 3A but on guide ropes
4	Production only short shaft on guide ropes
5A	Vertical opening with bucket elevator
5B	Vertical opening with pocket belt conveyor or other belt-type vertical conveyor
6A	Full service timbered winze starting on level 140m and reaching a level close to centre of orebody mass
6B	Same as 6A but on guide ropes
7	Production-only winze between level 140m and a level close to centre of orebody mass
8A	New ramp between level 450m and Kremzar portal (near mill) with 60t trucks
8B	New ramp between level 450m and Kremzar portal (near mill) with 1.5m suspended belt conveyor
8C	New ramp between level 450m and Kremzar portal (near mill) with 1.0-m suspended belt conveyor (jaw crusher needed u/g)
9	Double ramp between level 450m and surface to minimize traffic delays
10A	Ramp between 450m level and surface with slashing on floor only to allow fully loaded 30t trucks to pass.
10B	Ramp between 450m level and surface with back and wall slashing to allow fully loaded 30t trucks to pass.
11	Powertrans® u/g haulage trucks with motorized trailer – 60t per trip

24.3. Material Handling Systems – Pugh Matrix

To limit the size of the material handling study, a Pugh Matrix was built to remove as many options as possible and focus on the best ones. Richmond and InnovExplo personnel were first asked to list selection criteria and assign weight to these criteria. Table 24.4 lists the criteria with their respective weights.

Table 24.4 – Pugh Matrix Selection Criteria

Pugh Matrix Selection Criteria	Weight
NPV	20%
Capital availability	5%
Potential for increasing daily output	10%
Independence from ongoing activities	10%
Plan's execution speed	10%
Maturity of selected technology	5%
Training for different duties	5%
Capacity to support Phase II (850m to 1500m levels)	35%

Based on the skewed weight distribution, it was clear that option selection would be influenced mainly by NPV and its capacity to support a next mining phase from below.

24.4. Retained Options

Supported by the Pugh Matrix results and after consulting the client, five options were retained. The justification for each of the selections is presented in the following table.

Table 24.5 – Justification of the five options retained for study

OPTION	JUSTIFICATION
00	Status quo – 30t trucks partially loaded. Other than adding a few extra 30t class trucks, this option is simple, low on capital and implement time is short.
1A	Full-service timbered shaft starting on surface and reaching a level close to the centre of orebody mass. This option is flexible if additional resources are discovered below the 860m level because the shaft can be deepened.
6A	Full-service timbered winze starting on the 140m level and reaching a level close to the centre of orebody mass. This option shares some of the good features of 1A but does not require the same surface installations, which reduces the capital. Winze can also be positioned closer to the orebody since it is not affected by swampy grounds at surface.
8B	A new ramp between the 450m level and the Kremzar portal area (near the mill) equipped with a 1.5-m suspended belt conveyor. The 1.5-m-wide suspended conveyor was selected because there is no need for a crusher, unlike the smaller size belt, and productivity is huge. Unlike using 60t trucks, a conveyor can accept an increase in daily tonnage if the appropriate belt speed and motor power are selected in advance or components are replaced.
9	Double ramp between level 450m and surface to minimize traffic delays. This option was analyzed by InnovExplo earlier in 2015, and it was therefore easy to include for reference purposes.

24.5. Tonnage Distribution by Level

A preliminary estimate of CAPEX and OPEX was run for all options resulting from the brainstorming session. A more detailed estimate was performed for the five retained options. The data were entered into a spreadsheet to facilitate the comparison. The following sections describe how the costs were estimated.

OPEX

In order to facilitate the rapid comparison between different options, only operating costs that can impact the material handling and personal transportation scenarios were considered. These costs are associated with ore and waste handling, wrench time, equipment operating cost and energy.

Tonnage distribution

In order to apply the proper unit costs associated with deeper elevations, it was necessary to quantify the distribution of the tonnage for each level knowing that as work progresses downward, costs go up. To limit the complexity of the calculations, the tonnages were merged into “*super horizons*” having the same centre of mass. These super horizons are not related to sill elevations; they are merely a way to divide the tonnage distribution into four geographic zones between the 450m and 860m levels.

Table 24.6 shows the distribution of tonnage among the four super horizons labelled 505m, 595m, 690m and 805m. It is important to note that half the resources are contained in the lowest super horizon and more than 80% in the bottom two super horizons. This has a big impact on the mine sequence and project economics.

Table 24.6 – Tonnage distribution by level and “super horizon”

Name	Mineralized material	Total tonnage	Total tonnes per vertical metre	Super horizon name	Total tonnage for super horizon
Level 450	Dev. and stope	1055	53	505	89591
Level 470	Dev. and stope	15997	800		
Level 490	Dev. and stope	17760	888		
Level 510	Dev. and stope	25753	1030		
Level 535	Dev. and stope	29026	1161		
Level 560	Dev. and stope	62004	2480	595	261056
Level 585	Dev. and stope	41203	1648		
Level 610	Dev. and stope	58542	2342		
Level 635	Dev. and stope	99307	4965		
Level 655	Dev. and stope	91422	4571		
Level 675	Dev. and stope	159095	6364	690	731346
Level 700	Dev. and stope	133847	5354		
Level 725	Dev. and stope	166979	8349		
Level 745	Dev. and stope	180003	7200		
Level 770	Dev. and stope	215667	10783		
Level 790	Dev. and stope	245059	12253	805	1006640
Level 815	Dev. and stope	228949	9159		
Level 840	Dev. and stope	187645	9382		
Level 860	Dev. and stope	129300	6465		
Total		2088633			2088633

24.6. Material Handling Operating Costs

The first estimated operating cost is the mineralized material handling cost per ton. Depending on the option, it consists of trucking, hoisting or conveying, and in some cases, a combination thereof.

Trucking is part of all five retained options since there is no ore pass system in any of the shaft and winze options.

Depending on the option, different truck capacities were considered. Options 0 and 9 use partially loaded 30t trucks (22t), option 8B uses fully loaded 30t trucks, and options 1A and 6A use 45t trucks.

For each option, trucking costs were estimated according to the location of the material. Specific material handling costs were also calculated for the shaft, winze and conveyor options.

The conveyor option, 8B, eliminated the need for Volvo surface trucks to move mineralized material from the portal to the mill site. In this case, a credit of \$2/t was applied to the OPEX estimate.

24.7. Wrench Time

Wrench time is an important consideration when forecasting costs by adding a level of accuracy to the estimate.

Wrench time is defined as the percentage of time that a skilled trade person spends actually performing physical work on an asset. Wrench time plays an important role in this study because travelling time varies with depth and the selected personnel transportation method, which is related to the material handling option.

24.7.1. Wrench time concept

Wrench time is the time where productive work is done or could be done. It is what is left when you remove the following:

- Travelling time to reach the specific workplace at the beginning and end of the shift; the amount of travelling time is highly dependent on the selected option;
- Surface time at the wicket at the beginning and end of the shift to receive instructions for the day;
- Lunchtime and breaks;
- Shower time;
- In the field, workplace inspection time (scaling, etc.);
- In the field, discussion time with the supervisor (usually one per shift);
- Inspections of mobile or production equipment and preparation time, including fuel and lube time.

24.8. Wrench time conversion

A number of assumptions were made in order to integrate the operating cost gain or loss related to wrench time and convert it to a dollar per tonne value.

First, it was determined that on each shift, a change in wrench time would be a factor for 26 workers because all underground workers are affected by longer travelling times, whereas the impact for truckers is already accounted for in the specific hauling cost per tonne calculations.

To find out how many of the 26 workers are affected for each option, we consulted Island Gold's list of underground worker categories. The list was used to determine the number of workers for each category that would be present on a normal shift. Some categories of workers only work day shifts, others only five days a week, and this had to be taken into account. The last step was to evaluate how many workers

for each category are really underground, knowing that some spend most of their time at surface.

Table 24.7 lists the wrench time-affected workers relative to the travelling distance for each of the studied options. Some workers were not considered because they do not work underground often. As an example, only one mechanic was considered in the wrench time calculations.

Table 24.7 – List of workers considered for wrench time (WT) calculations

Classification	Total number of workers in category	Average number of workers on a man-shift basis	Number of man-shifts affected by WT
Ground support			
Cable bolter	4	1	1
Construction			
Construction miner	4	1	1
Construction miner helper	2	0.5	0.5
Services and material handling			
Grader operator and Service man	12	3	3
Development			
Jumbo man	10	2.5	2.5
Senior miner	32	8	8
Production			
Long hole blaster	4	1	1
Remote scoop operator	12	3	3
Underground labour	1	0.25	0.25
Trades and maintenance			
Welder certified	2	0	0
Companion electrician	1	0.5	0.5
Electrician uncertified	3	1.5	1.5
Lead maintenance electrician	2	1	0
Mechanic	3	0.75	0
Mechanic certified	10	2.5	1
Mechanic leader	1	0.5	0
Mechanic maintenance 1	1	0.5	0
Geology and engineering			
Surveyor/Geology technician	1	0.25	0.25
Surveyor	2	0.5	0.5
Surveyor	1	0.25	0.25

Classification	Total number of workers in category	Average number of workers on a man-shift basis	Number of man-shifts affected by WT
Ventilation technician	1	0.25	0.25
Training			
Trainer	1	0.5	0
Others			
Diamond drillers - exploration contractors		2	2
TOTAL U/G per shift on avg.		31.25	26.5

For the cost estimation, \$50/hr was assumed for all workers affected by wrench time. Each material handling option studied has its own wrench time. The change in OPEX cost related to wrench time was compared to the current situation in which mining is done at a rate of 800 tpd and the deposit's centre of mass is located at the 450m level.

Therefore the wrench time for the current situation is the reference wrench time, and is referred to as WT_{ref} in this study.

The WT_{ref} was estimated to be 446.4 minutes for a 600-minute shift. This represents 74.4% effective working time. The factors entering in the WT_{ref} calculations are provided in Table 24.8.

Table 24.8 – Reference wrench time (WT_{ref}) estimates

	Time estimated (minutes)
Total time available per shift	600
Unproductive time common to all options	105
Unproductive time common to most options	10
Travelling time	38.6
Estimated WT_{ref}	446.4

The portion of non-productive time is dependent on the option, whereas the other factors are the same for all options. The unproductive time common to all options (105 minutes) includes the following:

- Wicket and safety huddle time: 15 min;
- Lunch, breaks, shower time: 45 min;
- In the field, workplace inspection and supervisor's visit: 15 min;
- Equipment prep and inspection, including fuel and lube time: 30 minutes

The unproductive time common to all options, except 8B (the conveyor option), is the surface travelling time between the dry and the Lochalsh portal; it is estimated to be 10 min.

In the WT_{ref} calculations, total underground travel time was estimated to be **38.6 min**. It considers the time to reach the workplace at the beginning of the shift, and the time to get back to surface at the end of the shift. It was estimated using an equivalent vertical travelling distance of 450 m and a travelling speed of 23.3 vertical metres per minute. This represents 166 linear metres per minute with a ramp at 14% grade and a maximum travelling speed of 15 km/h. This time is equivalent to an average travelling speed of 10 km/h, taking into account the stops to let workers out.

Table 24.9 shows the estimated wrench times per level for Option 0. Similar tables were created for each of the other options.

Table 24.9 – Wrench time calculation for Option 0 – Status Quo

		Dependant of scenario				Dependant of scenario		
	nominal shift duration	Frozen unproductive time	Travelling time from dry to surface u/g entrance at beginning of shift	Travelling time from surface u/g entrance to dry at end of shift	Total fixed non productive time	Travelling time from surface u/g entrance to workplace level (at ramp intersection)	Wrench time	Wrench time ratio
Time in minutes	600	105	5	5	115	69.1	415.9	69%
Option	Level							
0	505	105	5	5	115	43.2	441.8	74%
	595	105	5	5	115	50.9	434.1	72%
	690	105	5	5	115	59.0	426.0	71%
	805	105	5	5	115	68.9	416.1	69%
	840	105	5	5	115	71.9	413.1	69%
	910	105	5	5	115	77.8	407.2	68%
travelling speed in small size ramp is 167m/m	1000	105	5	5	115	85.5	399.5	67%
	1090	105	5	5	115	93.2	391.8	65%
	1180	105	5	5	115	100.9	384.1	64%
	1270	105	5	5	115	108.6	376.4	63%
	1360	105	5	5	115	116.3	368.7	61%
	1445	105	5	5	115	123.6	361.4	60%

Table 24.9 includes deeper levels that are only shown for the purpose of this exercise. Because the Pugh Matrix includes a parameter for the capacity of the system to handle mineralized material coming from below the 860m level, wrench times were calculated down to level 1445m to obtain an indication of how wrench time would change with depth.

As can be seen in Table 24.9, the 446 minutes of wrench time on a 10-hour shift when work is done on the 450m level (see Table 24.8) drops to 410 minutes when work is done on the 860m level, representing 36 minutes of productive time lost. Unless a change is made that can bring people to the work site faster, the result is that more workers would be required to maintain production; otherwise, output will decrease.

Table 24.9 also illustrates the impact of developing the deeper levels and using same worker transportation system.

Table 24.10 summarizes the wrench time below the 450m level for each option. For the shaft and winze option, the station is located on level 840m. In this option, 10 minutes are lost due to the travel time between the dry and the shaft house, thereby explaining why the difference compared to the new ramp is not as big as might be expected.

Table 24.10 – Summary of estimated wrench times (WT)

	Option			
	0	1A	6A	8
	Status Quo	Full shaft	Winze	Mill ramp
Level	WT in minutes	WT in minutes	WT in minutes	WT in minutes
505	442	429	426	458
595	434	434	431	453
690	426	440	436	448
805	416	446	443	443
840	413	448 – station level	445 – station level	441
910	407	444	441	438
1000	399	439	436	433
1090	392	434	431	428
1180	384	429	426	423
1270	376	424	420	418
1360	369	419	415	413
1445	361	414	410	408

24.9. Size of Mobile Equipment Fleet

The operating cost related to the mobile fleet is affected by variations in equipment requirements between scenarios. In order to estimate the impact, the equipment requirement was revised for each option, starting with the current list of the required

equipment to sustain the production rate at the Island Gold mine. Production trucks are considered in the hauling cost, so they are excluded from this gain or loss calculation. The same applies to the surface Volvo articulated trucks, which are used to move ore between the main portal and the mill site. Although the cost of extra mobile production support equipment was estimated, it does not significantly affect the OPEX evaluation.

24.10. OPEX Energy Costs

Mine ventilation heating costs (propane costs) were evaluated based on the mine's consumption in 2014. The consumption was 1,750,000 litres of propane at an average cost of \$0.57/litre. This represents a yearly cost of \$2,494 per kcfm.

24.11. Incremental OPEX

A discriminating tool was developed to introduce the concept of incremental OPEX. Incremental OPEX is related to underground production activities only, and is used to compare with the cost of mining on the 450m level. The resulting incremental OPEX for each option is presented in Tables 24.11 and 24.12. Option 8B, which consists of a ramp equipped with a conveyor connecting level 450m to the mill has the lowest operating incremental cost. A \$2/t credit is applied since the surface trucks assigned to ore re-handling are not needed with this option, thereby partly explaining why the ramp-and-conveyor OPEX is lower than the shaft or winze OPEX.

There is a difference in the incremental OPEX for each option for the 800 tpd and 1150 tpd scenarios since the equipment is different for 1150 tpd. At 1150 tpd, ventilation requirements are greater, motors are bigger, cage and skips are bigger or faster, and traffic interactions are higher. Incremental OPEX only relates to production activities and is not complete. It is, however, an efficient means to discriminate different scenarios for the same tonnage range. There is a gain related to fixed costs that is diluted over a bigger daily tonnage, which is not taken into account in the discriminating tool.

It is evident that for both tonnages, the ramp-and-conveyor option, 8B, has the lowest OPEX cost. The shaft and winze options would be in the same range if they were closer to the mill/dry sector like option 8B. Status quo has the worst OPEX in each production scenario, which is no surprise since the 30t trucks are only partially loaded. Option 9 fares slightly better than option 0, but the gain is modest since the reduction in traffic does not have a significant impact. Again, this is no surprise since 30t trucks are still used with that option.

Table 24.11 – Incremental OPEX cost for the five options at 800 tpd

800 tpd – Incremental OPEX cost (compared to mining on level 450m with the current system)		
Option #	Basic description	Incremental OPEX in \$/t
0	Same system	11.22
1A	Full-service long shaft	7.13
6A	Full-service winze	7.10
8B	Mill ramp with conveyor	4.56
9	Dual ramp near Lochalsh portal	7.66

Table 24.12 – Incremental OPEX cost for the five options at 1150 tpd

1150 tpd – Incremental OPEX cost (compared to mining on level 450m with the current system)		
Option	Basic description	Incremental OPEX in \$/t
0	Same system	13.92
1A	Full-service long shaft	9.40
6A	Full-service winze	9.36
8B	Mill ramp with conveyor	7.45
9	Dual ramp near Lochalsh portal	13.22

24.12. CAPEX

Capital costs were estimated for each option mainly using quotes from contractors and suppliers. They are presented in Table 24.13 for each tonnage output scenario. It should be noted that options 0 and 9 are not shown for 1150 tpd because the CAPEX is not practical.

Table 24.13 – Capital costs for the five options at 800 tpd and 1150 tpd

800 tpd – CAPEX			
Option	Basic description	Main CAPEX items	Total CAPEX (million \$)
0	Same system	2 x AD30 trucks added	2.51
1A	Full-service long shaft	Shaft and some relocation of buildings and associated infrastructure	54.65
6A	Full-service winze	Winze and associated infrastructure	36.93
8B	Mill ramp with conveyor	Ramp, conveyor and associated infrastructure	26.2
9	Dual ramp near Lochalsh portal	Ramp	15
1150 tpd – CAPEX			
Option	Basic description	Main CAPEX items	Total CAPEX (million \$)
0			n/a
1A	Full-service long shaft	Shaft and some relocation of buildings and associated infrastructure	69.65
6A	Full-service winze	Winze and associated infrastructure	51.93
8B	Mill ramp with conveyor	Ramp, conveyor and associated infrastructure	41.2
9			n/a

Table 24.14 summarizes the \$15M investment needed to bring mill capacity from the 900 tpd permitting threshold to 1200 tpd. Some modifications are mandatory and some recommended.

Table 24.14 – Main modifications required to increase mill capacity from 900 tpd to 1200 tpd

Sub-process	Mandatory tasks	Recommended modifications
Crushing	New cone crusher	
	New crusher circuit screen	
Ore storage	Bigger fine ore bin storage capacity	
Grinding		Replacement of regrind mill
CIP process		Addition of circular screens in CIP tanks
Thickener/tailings management	Replacement of thickener feed well	
	Replacement of thickener feed dilution system	
Other		Addition of a gravity circuit (centrifugal bowl, magnetic separator and shaking table)
Pumping	Replacement of slurry pumps	

24.13. Relative NPV for the Five Options

Given the PEA-level of the study, the NPV analysis assumes that revenues will be the same for all options. Therefore, only operating and capital costs were examined in order to assess the range for the different options.

The relative NPV results (NPV-R) for the 800 tpd daily output are shown in Table 24.15, and those for the 1150 tpd scenario in Table 24.15. Values for options 0 and 9 at 1150 tpd are only valid if it is technically possible to move mineralized material at that pace; however, in real life, this pace is not realistic due to traffic interactions and ventilation issues. For the NPV-R at 1150 tpd, a built-in credit for mining at a higher daily rate dilutes the fixed costs.

Table 24.15 – Relative NPV for the five options at a daily output of 800 tpd

Option	NPV-R (800 tpd)
00	-\$20,470,519
1A – shaft	-\$59,656,704
6A – winze	-\$43,926,720
8B – New 450-to-mill ramp with 1.5-m conveyor	-\$31,556,839
9 – Ramp doubled between 450m and surface	-\$30,810,298

Table 24.16 – Relative NPV for the five options at a daily output of 1150 tpd

Option	NPV-R (1150 tpd)
0 – status quo* – <u>not practical</u>	-\$25,869,775
1A – Shaft	-\$64,125,386
6A – Winze	-\$48,372,212
8B – New 450-to-mill ramp with 1.5-m conveyor	-\$36,817,372
9 – Ramp doubled between 450m and surface	-\$34,135,124

The interpretation of Table 24.15 (800 tpd) demonstrates that Option 0, the status quo, would be the best way to mine at 800 tpd. The next best option is 9, but this one would not help keep operating costs low if additional resources are found deep in the mine. The most “efficient” new handling system is the mill ramp and conveyor, but the NPV-R is not close to the status quo.

The interpretation of Table 24.16 (1150 tpd) demonstrates that Option 0, the status quo, would be the best way to mine at 1150 tpd, but this is not realistic since there would be too much traffic and the ventilation needs would be huge. This option must be discarded. Option 9 does not help with operating costs if additional resources are found below 860, so this option loses points in the Pugh Matrix, rendering it less favourable. Option 8B, the new mill ramp with a conveyor, is thus the best option.

In conclusion, the relative NPVs for material handling and tonnage provided in Tables 24.15 and 24.16 demonstrate that Option 0, the status quo (800 tpd with current ramp and 30t trucks), is the best case. There is an \$11/t incremental operating cost, but in terms of material handling, only two new trucks are needed for ore. If extra resources are found, there is likely sufficient economic justification to increase the tonnage extraction rate and invest in a material handling system that will lower the operating costs.

24.14. Best Material Handling Scenario

Based on the potentially mineable mineral resource included in the mining plan, InnovExplo recommended that a base case be prepared at 800 tpd with a double production ramp down to 860m from the 720m level. The three reasons for this are the flexibility afforded by the many opened domains, the ventilation considerations, and the better position to develop resources below the 860m level without overly affecting production. There is a potential for additional resources below 860m, and this is related to one of the Pugh Matrix selection criteria where the weight was set at 35%. InnovExplo foresees operational problems by having simultaneous development below 860m and production between 450m and 860m in a single-ramp environment.

The next best option compared to the status quo is to drive a new ramp between the 450m level and the mill sector, and to increase daily tonnage to 1150 tpd. The economics of this option is close to those of the base case. Diluting fixed costs over a bigger tonnage will pay for part of the ramp and mill capital investments.

A quick economic analysis was also done on a variant of option 8. The cost was estimated for a large 450-to-mill ramp without a conveyor. In this case, 45t trucks could be used instead of a conveyor until more resources would justify investing in a conveyor or other efficient system like a trolley, automated trucks, etc. The capital cost for the ramp (3,235 m at 14%) and some simple infrastructure, such as an underground ore bin, was estimated at \$16.6M.

The ramp directly reaching the mill sector has advantages over other options. An OPEX credit of \$2/t is applied because surface trucks currently being used to move ore from the Lochalsh portal to the mill sector will no longer be needed.

This ramp would also be available sooner than the shaft or winze. Implementation time is important in NPV calculations. The ramp would also provide a lot of waste rock for backfill, another important consideration since Richmond will likely be short of development-type waste rock for backfill. This option has only been evaluated at an order-of-magnitude level but should be considered in future studies since it is flexible and represents a step-by-step approach where capital can be spent incrementally in keeping with a gradual increase in resources.

24.15. Island Gold Mine Historical Gold Production

Table 24.17 below presents a compilation of production from the Island Gold mine (based on ounces sold) since 2007.

Table 24.17 – Island Gold Mine Historical Gold Production (Based On Ounces Sold)

Year	Tonnes (based oz sold)	Head grade g/t	Gold recovery %	Recovered grade g/t	Ounces sold
2007	35,202	6.84	94.36	6.45	7,302
2008	161,320	7.65	95.83	7.33	38,037
2009	211,773	6.04	94.52	5.71	38,879
2010	251,237	5.95	95.49	5.68	45,865
2011	261,731	6.10	95.91	5.85	49,196
2012	246,743	5.44	96.45	5.25	41,686
2013	244,631	4.64	96.09	4.46	35,113
2014	233,202	5.83	96.26	5.61	42,078
2015 until sept. 30th	174,425	7.14	97.01	6.93	38,859
Total	1,820,264	6.01	95.77	5.76	337,015

24.16. 2014 Production Reconciliation

All the 2014 production, stopes and development, has been reconciled with the December 31, 2013, ore reserves statement. Table 24.2 provides the tonnage-grade-ounces included in the reserves (including recovery and dilution) for all the stopes mined during the year, and the same data recalculated with the final stope

design and what was obtained with the production data adjusted to the mill results. For some of the stopes, there were no reserves at the beginning of 2014. For those, the solids were taken from the stope design and the grade interpolated from the block model dated December 31, 2013. Total stope production was 156,522 tonnes at 5.94 g/t for 29,912 ounces of gold

For the stopes mined in 2014 that had been included in the 2013 end-of-year reserves, production was 135,450 tonnes at 6.11 g/t Au for 26,592 ounces of gold versus reserves of 118,120 tonnes at 5.85 g/t for 22,214 ounces. There was 14.7% more tonnes with a grade 4% higher than estimated in the reserves, which is a good result; the total ounces of gold produced was 20% higher than anticipated in reserves (26,592 vs. 22,214 ounces). In general, in 2014, production showed better results than reserve estimation in the Extension 2 and Lochalsh sectors, but worse in Extension 1.

When the planned stopes are compared to the realized production for 2014, there was 14.7% more dilution than planned, and a slight 2% increase in grade and 17% more realized ounces. An average dilution of 19% was used for the reserve estimation of December 31, 2013; for the planned stopes, dilution was estimated stope by stope. Surveys with CMS were conducted in 2015 to better evaluate the dilution and the ore recovery obtained in the stopes.

For stopes that were not included in the reserve statement of December 31, 2013, production was 21,071 tonnes at 4.9 g/t for 3,320 ounces of gold. The realized tonnage was 8.8% higher than the planned tonnage, but the grade was 23% lower than the planned grade, which results in 16% lower gold production than expected (Table 24.18).

Table 24.18 – Island Gold Mine – 2014 Stope Reconciliation

Stopes included in 2014 reserves															
Stope (Reserve)	Reserves (as of Dec 31st, 2013)			Planning (Stope design)			Realised and adjusted (ME reconciles)			Variations					
	Diluted Tonnes	Diluted Grade	Diluted Ounces	Planned Diluted tonnes	Planned Diluted Grade	Planned Diluted Ounces	Adjusted Tonnes	Adjusted Grade (cut31)	Adjusted Ounces	Tonnes Adjusted Vs Reserves	Tonnes Adjusted Vs Planned	Ounces recovered Vs Reserves	Ounces recovered Vs Planned	Adjusted grade Vs Reserves	Adjusted grade Vs Planned
155-X2-541	2157	5.34	370	3842	5.31	656	7535	7.05	1708	349.3%	196.1%	461%	260%	132%	133%
170-X2-541	4073	8.48	1110	3836	7.63	941	4052	5.69	741	99.5%	105.6%	67%	79%	67%	75%
315-X2-541 (542PV)	3524	8.48	961	2809	8.47	765	3317	6.88	733	94.1%	118.1%	76%	96%	81%	81%
340-X2-541 (541-543PV)	4519	6.73	978	5622	6.71	1213	5460	8.55	1502	120.8%	97.1%	154%	124%	127%	127%
340-X2-546 (543-545PV)	2730	4.49	394	4185	6.08	818	5803	5.12	955	212.6%	138.7%	242%	117%	114%	84%
350-X2-543 (542PV)	10408	6.45	2158	13177	6.89	2919	13327	6.68	2862	128.0%	101.1%	133%	98%	104%	97%
350-X2-546 (544PV)	13661	6.35	2789	12867	5.51	2279	12508	6.71	2698	91.6%	97.2%	97%	118%	106%	122%
370-X2-543	9828	6.39	2019	9285	7.47	2230	11596	8.06	3004	118.0%	124.9%	149%	135%	126%	108%
215-E1E-501	2383	6.27	480	3363	5.35	578	4322	5.90	820	181.4%	128.5%		142%		110%
165-LC-E1E-445	2309	6.58	488	2156	6.71	465	4391	4.20	593	190.2%	203.7%	121%	127%	64%	63%
165-LC-E1E-449	3983	7.34	940	4174	6.89	925	6622	7.39	1573	166.2%	158.6%	167%	170%	101%	107%
165-LC-E1E-451	3827	4.26	524	3036	4.21	411	4474	6.58	946	116.9%	147.4%	180%	230%	154%	156%
165-LC-E1E-454	5085	5.74	938	2280	5.70	418	3118	5.20	522	61.3%	136.8%	56%	125%	91%	91%
165-LC-E1E-456	5154	3.99	661	5075	3.95	645	7284	4.62	1081	141.3%	143.5%	164%	168%	116%	117%
165-LC-E1E-459	6077	5.47	1069	5431	5.72	999	6517	5.84	1224	107.2%	120.0%	115%	123%	107%	102%
190-LC-E1E-450	2437	3.44	270	3081	3.72	368	1610	3.65	189	66.1%	52.3%	70%	51%	106%	98%
190-LC-E1E-453	5541	3.54	631	4335	3.68	513	4761	4.83	740	85.9%	109.8%	117%	144%	137%	131%
290-X1-524	3665	7.38	870	2282	7.86	577	2605	5.11	428	71.1%	114.2%	49%	74%	69%	65%
290-X1-526	5124	4.97	819	3680	4.93	583	3132	3.11	313	61.1%	85.1%	38%	54%	63%	63%
290-X1-529	6019	4.37	846	3917	4.33	545	5018	5.00	806	83.4%	128.1%	95%	148%	114%	115%
290-X1-531	6488	6.75	1408	6977	6.72	1507	6532	5.80	1217	100.7%	93.6%	86%	81%	86%	86%
290-X1-535	9128	5.08	1491	12664	5.78	2355	11464	5.25	1935	125.6%	90.5%	130%	82%	103%	91%
Total :	118120	5.85	22214	118074	5.98	22711	135450	6.11	26592	114.7%	114.7%	120%	117%	104%	102%
Stopes not included in 2014 reserves (Grade and tonnage estimated from block model of December 31st, 2013)															
Stope	(as of Dec 31st, 2013; Dil. 19%)			Planning (Stope design)			Realised and adjusted (ME reconciles)			Variations					
	Diluted Tonnes	Diluted Grade	Diluted Ounces	Planned Diluted tonnes	Planned Diluted Grade	Planned Diluted Ounces	Adjusted Tonnes	Adjusted Grade (cut31)	Adjusted Ounces	Tonnes Adjusted Vs Reserves	Tonnes Adjusted Vs Planned	Ounces recovered Vs Reserves	Ounces recovered Vs Planned	Adjusted grade Vs Reserves	Adjusted grade Vs Planned
140-E1E-504				1233	6.64	263	1095	7.72	272		88.8%		103%		116%
140-D1-490				3336	2.85	306	592	3.15	60		17.7%		20%		111%
200-E1E-504 (510PV)				1460	7.53	353	1250	4.44	178		85.6%		50%		59%
215-LC-E1E-423				3574	7.42	853	4052	5.91	770		113.4%		90%		80%
215-LC-E1E-426				2623	8.47	714	4465	5.44	781		170.2%		109%		64%
190-LC-E1E-455 (Ongoing Jan14)				980	3.72	117	2067	2.16	144		210.9%		123%		58%
585-C-578				3352	6.76	729	3574	6.78	779		106.6%		107%		100%
585-C-580				2800	6.72	605	3976	2.63	336		142.0%		56%		39%
Total :				19358	6.33	3940	21071	4.90	3320		108.8%		84%		77%

The same comparison was been done for the development, between the reserves and the production data reconciled with the mill results (Table 24.19). Total production from development was 62,857 tonnes at 6.27 g/t Au for 12, 675 ounces of gold.

The development realized within the reserves of December 31, 2013 amounted to 56,718 tonnes at 6.23 g/t Au for 11,355 ounces of gold versus reserves of 43,149 tonnes at 7.76 g/t Au for 10,763 ounces. There was about 30 % more ore development obtained than estimated in the reserves, mainly in the Goudreau and Lower Island Gold zones. Grade was 20% lower than anticipated, but the net result was a 5% higher gold production.

Also, development realized outside the 2014 reserves amounted to 6,139 tonnes at 6.69 g/t Au for 1,321 ounces of gold versus 5,031 tonnes at 6.95 g/t Au for 1,124 ounces. There was about 20% more development ore than estimated in the reserves, mainly in the Extension 1 and Extension 2 areas.

Table 24.19 – Island Gold Mine – 2014 Development Reconciliation

Grade reconciliation for development within 2014 Reserves									
Heading	Reserve 2014 (Diluted)			Realised (Month end reconcile)			Variation (Realised vs planned)		
	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
190-G2-E	243	3.62	28	286	2.89	27	118%	80%	94%
200-GD-SILL-E	76	14.92	37	91	0.70	2	120%	5%	6%
200-GD-SILL-W	285	9.21	84	305	6.70	66	107%	73%	78%
215-G2-E	2 372	4.59	350	2 124	35.84	2447	90%	781%	699%
215-G3-E	1 116	7.62	273	2 539	4.05	331	228%	53%	121%
215-G3-RAISE	112	25.27	91	106	12.77	44	95%	51%	48%
215-G6	282	32.21	292	647	17.64	367	229%	55%	126%
215-G7	1 616	8.43	438	2 940	8.73	825	182%	104%	188%
240-G7-E	62	3.8	8	473	6.23	95	760%	164%	1246%
240-G7-W	2 889	6.31	586	2 986	8.24	791	103%	131%	135%
190-LCW-RAISE	485	10.02	156	366	11.41	134	75%	114%	86%
190-LCW	2 941	9.8	927	3 554	3.16	361	121%	32%	39%
215-LCW	2 832	5.4	492	4 211	4.48	607	149%	83%	123%
125-IG-E1E-E	178	2.23	13	88	0.29	1	49%	13%	6%
125-IG-E1E-W	199	3.41	22	271	1.17	10	136%	34%	47%
410-IGE1E-XCUT	434	3.24	45	812	1.59	42	187%	49%	92%
425-IGD-E	1 151	4.57	169	1 716	2.38	131	149%	52%	78%
425-IGE1E-W	1 605	5.48	283	2 182	4.19	294	136%	76%	104%
535-IGC-E	1 573	4.91	248	1 570	4.81	243	100%	98%	98%
535-IGC-W	4 037	4.43	575	4 534	6.35	926	112%	143%	161%
560-IGC-E	838	6.28	169	849	5.24	143	101%	83%	85%
560-IGC-W	3 791	7.55	920	5 318	7.85	1343	140%	104%	146%
585-IGC-E	1 409	10.69	484	1 744	1.52	85	124%	14%	18%
585-IGC-W	3 176	11.33	1157	5 321	3.36	575	168%	30%	50%
610-IGC-E	3 541	7.77	885	3 263	1.93	202	92%	25%	23%
610-IGC-W	5 284	11.57	1966	7 639	4.49	1103	145%	39%	56%
610-IGB-W	621	3.28	66	784	6.46	163	126%	197%	249%
TOTAL	43 149	7.76	10763	56 718	6.23	11355	131%	80%	105%
Grade reconciliation for development outside of 2014 Reserves (Grade and tonnage estimated from block model of December 31st, 2013)									
Heading	Reserve 2014			Realised (Month end reconcile)			Variation		
	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces	Tonnes	Grade	Ounces
125-X1-E1E-E	1 272	2.15	88	1 400	5.72	257	110%	266%	293%
125-X1-E1E-W	1 075	6.46	223	1 095	6.50	229	102%	101%	103%
125-X2-E1E	775	9.95	248	1 128	4.32	157	146%	43%	63%
140-X2-E1E	1 014	9.26	302	1 409	12.78	579	139%	138%	192%
155-X2-E1E	895	9.16	264	1 107	2.78	99	124%	30%	38%
TOTAL	5 031	6.95	1 124	6 139	6.69	1 321	122%	96%	117%

24.17. 2015 Lower Zone Development Reconciliation

In 2015, development was carried out in the lower part of the mine, between the 560m and 655m levels, in the upper part of the C Zone reserve and resource area. The following table presents the reconciliation between the sectors where the development material was sent to the mill during the first three quarters of 2015 and the results of the same excavations estimated in the C zone block model of December 31, 2014 (considering a dilution of 30% at 0.5 g/t Au). In summary, the reconciled tonnage was 9% lower than expected, but the grade was 7% higher, resulting in a 98% recovery of the predicted ounces.

Table 24.20 – Island Gold Mine – 2015 lower development reconciliation with C zone block model of December 31, 2014

Development	Resource & Reserve C Zone block Model (as of Dec 31 st , 2014; Dil. 30% @ 0.5gpt)			Mined (reconciled)			Variations (Mined vs Reserves)		
	Diluted Tonnes	Diluted Grade	Diluted Ounces	Reconciled Tonnes	Reconciled Grade	Reconciled Ounces	Tonnes	Grade	Ounces
Lower Development Q1	17,229	5.5	3,024	13,831	6.1	2,714	80%	112%	90%
Lower Development Q2	22,520	7.1	5,129	23,937	7.1	5,502	106%	101%	107%
Lower Development Q3	31,009	5.6	5,572	26,613	6.1	5,192	86%	109%	93%
Lower Development 2015	70,758	6.0	13,726	64,381	6.5	13,408	91%	107%	98%

Note: as of September 30th, 2015

25. INTERPRETATION AND CONCLUSIONS

The objective of InnovExplo's mandate was to complete a Preliminary Economic Assessment (the "PEA") and Technical Report (the "Report") for Richmond's Island Gold mine in compliance with National Instrument 43-101 and Form 43-101F1.

The PEA focused on the Island Gold Lower Zones, specifically the mineral resources of the C Zone between levels 450m and 860m. This potentially mineable mineral resource constitutes a large portion of the lower zones in the Island Gold mine (known as *Lower Island Gold*), for which resource inventories were prepared by Richmond.

InnovExplo considers the present PEA to be reliable and thorough, based on quality data, reasonable hypotheses and parameters compliant with NI 43-101 and CIM standards regarding mineral resource estimates.

25.1. Description and Location

The Island Gold mine is located 83 km northeast of Wawa, Ontario. It is part of the Island Gold Project, which is divided into nine parts (properties) comprising 219 patented, leased and staked claims covering 7,772 ha, mainly within the townships of Finan and Jacobson.

Richmont holds 100% of all mining titles relating to its Island Gold Project, with the exception of a few claims where the rights are shared with Argonaut Gold Inc. The properties of the Island Gold Project are subject to the payment of different royalties and financial contractual obligations.

25.2. Geology

The Island Gold Project is located in the Michipicoten Greenstone Belt, which is part of the Wawa Subprovince within the Archean Superior Province. The Island Gold Project is stratigraphically positioned in the upper portion of the Wawa Assemblage, composed of intermediate to felsic volcanic rocks capped by pyrite-bearing iron formations.

Gold mineralization is controlled by the Goudreau Lake Deformation Zone (GLDZ). Gold occurs in narrow, subparallel quartz veins in areas of intense sericitization and silicification. Five (5) major zones have been identified along the GLDZ: the Island Zone, the Lochalsh Zone, the North Shear/Shore Zone, the 21 Zone and the Goudreau Zone. A continuous 900-m-long mineralized structure marked by alteration and gold values of 1 g/t or more is indicated in drill core from the Lochalsh Zone to the Island Zone.

The Island Gold Lower Zones at the Island Gold mine concerns six (6) mineralized zones (G, G1, B, C, D and E1E) in the deepest part of the deposit, of which the C Zone is the most important, showing very good continuity with consistent gold grades. The six zones have been identified within an east-west alteration corridor 100 to 150 m thick that extends between -450 m and -1,000 m of vertical depth, and over a lateral strike length of 900 to 1,000 m spanning the Lochalsh, Island Gold and

Extension 1 sectors. The dip of the mineralization is generally subvertical to the south, except between levels 400m and 500m where it becomes less steep.

25.3. Deposit Types

Gold mineralization in the Goudreau-Lochalsh area is found in several different rock types and geologic settings. All of the past-producing mines and numerous other gold occurrences exhibit a close spatial association with felsic to intermediate intrusive rocks, and all are located along the GLDZ.

The GLDZ is subdivided into four structural domains (Southern, Northern, Eastern and Western) based on the style of deformation, lineation patterns, and the orientation and sense of shear displacement on sets of shear zones. Most gold deposits along this zone are associated with quartz veining and/or shear zones. Sage and Heather (1991) have grouped these shear zones into six main shear or high strain zone categories with the following azimuths: 070°, 020° to 035°, 130° to 140°, 080° to 090°, 110° to 115°, and 350° to 010°.

25.4. Mineral Resource Estimate

The parameters used for the geological and structural interpretation of the Island Gold mine, as well as for the mineral inventory estimate, are based on the best estimation of the Island Gold technical department at the time of the estimation. Technical parameters for the resources were provided by the head office of Richmond or the technical department of the Island Gold mine.

The Measured and Indicated resources of the Island Gold mine, as of December 31, 2014, were estimated to be 733,500 tonnes at 9.29 g/t Au for 219,050 ounces, and the Inferred resources were estimated to be 3,547,500 tonnes at 8.79 g/t Au for 1,002,750 ounces (Table 14.7)

Island Gold Global Mineral Resource Estimate as of December 31, 2014 (Table 14.7)

Category	Tonnes	Grade (g/t Au)	Grams	Ounces
Measured Resources	35,500	4.77	169,000	5,450
Indicated Resources	698,000	9.52	6,644,000	213,600
Measured & Indicated Resources	733,500	9.29	6,813,000	219,050
Inferred Resources	3,547,500	8.79	31,189,500	1,002,750

For the lower part of the mine (below 450 m), known herein as Lower Island Gold, the Measured and Indicated mineral resources, as of December 31, 2014, amounted to 438,000 tonnes at 10.95 g/t for 154,200 ounces, and the Inferred mineral resources amounted to 3,178,000 tonnes at 9.00 g/t for 919,950 ounces, mostly in the C Zone (see Table below).

**Lower Island Gold Global Mineral Resource Estimate as of December 31, 2014
(Table 14.5)**

Zone	Tonnes	Grade (g/t Au)	Grams	Ounces
Island Sector - Lower C and D Zones (Measured)	9,500	3.33	32,000	1,000
Island Sector - Lower C and D Zones (Indicated)	419,500	11.19	4,696,000	151,000
Extension 1 Sector - Lower E1E, C & D Zones (Indicated)	9,000	7.72	68,500	2,200
Total Measured and Indicated	438,000	10.95	4,796,500	154,200
Total Inferred	3,178,000	9.00	28,614,000	919,950

Several factors may affect the mineral resource estimate. The estimation of mineral resources is a complex and subjective process, and the accuracy of any such estimate is a function of the quantity and quality of available data and of the assumptions made and judgments used in the geological interpretation. Metal price, the exchange rate between US and Canadian dollars, geological continuity, mining method, hydrogeological constraints and geotechnical factors may materially impact the mineral resource estimate.

Mineral Resources presented are exclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

25.5. Mineral Reserve

Mineral reserve calculations estimate the volume and grade of ore that can be mined and processed at potential profit. The conversion of mineral resources into mineral reserves is based on economic parameters detailed in section 14. Only mineral resources that would have been classified in the measured and indicated categories were used in the economic calculations of estimated reserves as of December 31, 2014.

The economic viability of the resources converted into reserves was determined by the technical department of the Island Gold mine, specifically the engineering department. Ore dilution, recovery rates and mining costs used in the resource and reserve calculations represent Richmond's best estimates as of December 31, 2014.

The total Island Gold Proven and Probable reserves as of December 31, 2014, stand at 895,000 tonnes at a grade of 6.39 g/t Au for 183,750 ounces.

The tables below summarize the estimated proven and probable reserves. The data below represent diluted ore with an estimated 95% ore recovery, except for the Goudreau GP5 and GP2 zones (30% dilution and 50% ore recovery). It does not take into account the milling recovery.

Table 25.1 – Island Gold Mine Proven Reserves as of December 31, 2014

Category	tonnes	Grade (g/t Au)	Grams	Ounces
Proven Reserves	258,500	6.36	1,644,000	52,850
Probable Reserves	636,500	6.40	4,070,000	130,900
Proven and Probable Reserves	895,000	6.39	5,714,000	183,750

25.6. Mining

The PEA considered an 800 tpd mining operation using the current material handling method based on 30t trucks. The potentially mineable mineral resource defined for the PEA constitutes the resources in the most continuous portion of the deposit between the 450m and 860m levels, as of December 31, 2014. For the purpose of this PEA, the following were excluded: resources above the 450m level, and isolated resource blocks or parallel zones outside the main area of interest (the C Zone). No reserves were considered.

Prior to the PEA, InnovExplo assessed the maximum daily output and conducted a trade-off study on material handling and manpower transportation systems for the Island Gold mine. The results of this pre-PEA work support the selection of the production scenario and material handling option for the mining plan elaborated for the PEA. The results also demonstrate it would be possible to sustain a maximum daily tonnage of 1150 tpd for the potentially mineable mineral resource once mining in the third horizon has started. However, this would imply a new material handling system as well as some significant changes to the mill in order to accommodate the higher output.

Based on the results and on discussions held with the client, it was decided to retain two daily tonnages for subsequent detailed analysis. The 800 tpd scenario was developed as a base case for a short- to intermediate-term mining plan, and the 1150 tpd scenario was to be further investigated as a potential future mining plan.

The rationale for retaining and studying both tonnage options was the following:

- Richmond already has a provincial permit to produce at a rate of 900 tpd. Above that level, a new permit will be needed.
- It is possible with additional capital to increase mill capacity to 1200 tpd.
- Considering that a large portion of the tonnage in the evaluation consists of Inferred resources, there is a concern that definition drilling may not keep pace with a production rate above 1150 tpd.
- Preliminary economical calculations show that ventilation costs, OPEX and CAPEX, would increase considerably at a mining rate above 1200 tpd.
- Maximum orebody extraction rate is based on the specific location of resources considered in this study. If resources are there in tonnage but the location changes, this could greatly impact scheduling; hence, another reason to be careful when dealing with the theoretical maximum capacity value.

For the purpose of this PEA, all mineral reserves were considered at the Measured and Indicated resource level. Furthermore, the PEA only considers resources within the main continuous structure, the C Zone C, between the 450m and 860m levels.

To prepare for the mining plan, stope shapes were created using the solids prepared by Richmond for their reserve and resource estimation. InnovExplo created stopes 22 m high, 25 m long, with a width matching that of the mineralization. The resulting tonnage in the potentially mineable mineral resource is reported in the following table.

Resources considered in the PEA mining plan (Table 16.3)

Category	Tonnes (t)	Grade (g/t Au)	Contained gold (oz)	Resource classification (%)
Measured and Indicated	626,059	9.94	200,075	33
Inferred	1,245,199	11.04	441,976	67

Several mining methods have been contemplated since mining activities commenced at Island Gold. Of all the methods examined, cut-and-fill and long-hole mining were tested, and longitudinal long-hole retreat mining was selected as the preferred method. The ore width, vertical dip, good ground quality, productivity factors, cost, and availability of equipment and personnel were some of the major parameters involved in the decision.

A design consisting of two ramps driven from level 740m down to 860m was elaborated and retained in the PEA mining plan. Each level can be served by a single access connecting to a ramp, or by multiple accesses. This design provides two accesses for each level between 740m and 860m. This configuration allows to two production domains on each level. There are also ventilation gains by having two ramps.

The resulting production schedule is presented in the following table and includes tonnage from stopes and development. Years 2015 and 2016 are considered a transition period. During this period, a portion of the production comes from mining zones that were not part of the PEA. The proposed mining plan gives a mine life of seven (7) years.

Yearly tonnages for development and production (Table 16.7)

	Transition Period		Island Gold Lower Zones Production Period						
	2015	2016	2017	2018	2019	2020	2021	2022	Total
Stope tonnage (t)	59,401	188,609	211,030	269,134	288,748	306,821	298,277	267,328	1,889,348
Grade (g/t)	5.98	6.94	7.03	9.10	10.33	9.20	8.70	7.08	8.41
Development tonnage (t)	44,486	69,010	85,760						199,256
Grade (g/t)	9.59	11.34	8.70						9.81
Total tonnage mill (t)	103,888	257,619	296,790	269,134	288,748	306,821	298,277	267,328	2,088,604
Grade (g/t)	7.53	8.12	7.51	9.10	10.33	9.20	8.70	7.08	8.55
Tonnage ratio (develop./stope)	0.75	0.37	0.41						
Ounces produced	24267	64894	69195	76008	92513	87574	80557	58732	553,740

25.7. Environment

One of Richmond's goals at the Island Gold mine is to prevent pollution, safeguard the environment, educate employees and communities about the company's environmental programs and commitments, and apply best management practices to prevent or mitigate any potential environmental impacts.

The Island Gold mine has a permit to operate at a production rate of 900 tpd. The mine operates under several environmental permits issued by government agencies, the main ones relating to water and air.

A Waste Management Plan is in place for the site, to deal with a variety of waste, including hazardous waste and excess materials. Tailings management was augmented in 2015 with construction work at the Primary Pond that will allow an additional six (6) years of tailings deposition.

A comprehensive environmental monitoring program is in place at the Island Gold mine that includes inspections, sampling schedules, data management and reporting. Key performance indicators are tracked, and any deviations from targets are addressed and corrected. Both internal (management) and external reporting (government agencies) is ongoing.

The community closest to the mine is the Town of Dubreuilville. In addition to employment benefits, the Island Gold mine has engaged in partnerships with the town.

In addition to initial discussions with the Batchewana First Nation, Richmond is actively working and engaging with the primary First Nation community i.e. Michipicoten First Nation, and to a lesser extent Missanabie Cree First Nation.

Compliance with permitting conditions and best management practices are critical aspects to the success of the Island Gold mine. Given that water is one of the main issues covered by the permits, additional improvements to the water management system are recommended, the main one being a diversion system around the Primary Pond, which is estimated to cost \$2.1 M.

Overall, the mine's management system related to environment, permitting and community relations is robust, and is also comparable to industry peers. As part of Richmond's sustainability initiatives, the Island Gold mine aims to continuously improve its environmental and social performance.

25.8. Metallurgy

Ore from the Island Gold mine is processed at Kremzar Mill. The mill is composed of a two-stage crushing circuit followed by a two-stage grinding circuit. The mill uses cyanide leaching and a carbon-in-pulp (CIP) process to recover gold.

The ore from the coarse ore bin is crushed by a jaw crusher followed by a secondary crushing stage performed by a cone crusher. From the fine ore bin, crushed material is then sent to a ball mill operated in closed circuit with cyclones and a regrind mill. Gold is leached in a leaching circuit and extracted in a CIP circuit. The loaded carbon is washed with nitric acid solution to remove scale before being sent through a carbon regeneration kiln. Gold is removed from the loaded carbon by elution (stripping) followed by electrowinning. The stripped carbon is regenerated in reactivation kilns before being returned to the process. Fine carbon is constantly removed and recovered from the process to avoid gold loss, while fresh carbon is continuously added to the process. The high-grade electrowinning concentrate is sent to a bullion furnace for smelting of doré.

25.9. Capital and Operating Costs

During the transition period, estimated capital costs specifically associated with the development of the Island Gold Lower Zones were identified as project capital. Following that two-year period, all capital costs are considered sustaining capital.

Most of the costs associated with capital expenses or sustaining were provided by Richmond. InnovExplo was involved with Capital Costs related to development work.

25.9.1. Project capital

The project capital costs represent capital expenses that occur during the transition period and are specifically associated to the development of the Island Lower Zones. Project capital includes development, mobile equipment, mine building and offices, tailings dam expansion and underground construction.

The estimated project capital costs are presented in the following table and represent a total of \$62.2 M.

PEA project capital cost (Table 21.1)

Project capital (C\$)	2015	2016	Total
Development	11,749,948	20,436,681	32,186,630
Mine mobile equipment	1,052,556	10,850,000	11,902,556
Mine building office	2,000,000		2,000,000
Tailings dam	9,900,000		9,900,000
Underground construction	754,839	5,500,000	6,254,839
Total	25,457,343	36,786,681	62,244,025

25.9.2. Sustaining capital

The sustaining capital is broken down as per the subcategories presented in Table 25.1. The total sustaining capital costs are expected to be \$40.5 M for the 2017–2022 period, with the majority of the capital expenditures occurring in the first three years.

PEA sustaining capital (Table 21.2)

Sustaining capital (C\$)	2017	2018	2019	2020	2021	2022	Total
Development	8,870,446	0	0	0	0	0	8,870,446
Mine (other than development)	9,750,000	5,800,000	4,300,000	1,500,000	800,000	0	22,150,000
Surface (mine building offices)	3,400,000	1,000,000	1,000,000	1,000,000	0	0	6,400,000
Tailings	2,141,000	188,000	188,000	188,000	188,000	188,000	3,081,000
Total	24,161,446	6,988,000	5,488,000	2,688,000	988,000	188,000	40,501,446

The operating costs were adjusted to account for the impact of mining at greater depth. Specifically, the most affected costs relate to material handling, reductions in available wrench time, equipment operation and energy.

Wrench and cycle times vary significantly as mining gets deeper, and this has been accounted for.

Based on Richmond's accounting structure, a model was made using Excel software to evaluate the operating costs associated with the resources evaluated in this PEA, pending on decision on exactly where development and production work will be done.

Operating costs were estimated relative to the known reference cost of mining on the 450m level. Many unit costs are not fixed since wrench time is reduced and cycle

time is longer with deeper mining. For Richmond, mining below the 450m level using the current material handling and manpower transportation system translates into higher operating costs.

Operating costs were evaluated by integrating the proposed mining plan. After the transition period, operating costs relate only to Island Gold Lower Zones. The following tables present the operating cost distribution for years 2017 to 2022, and the total cost and average unit cost for that period. The resulting average operating unit cost (Opex) is 148.36\$/t.

Operating cost distribution (Table 21.3)

Financial	2017	2018	2019	2020	2021	2022
Total OPEX (C\$)	\$45,968,845	\$41,572,861	\$44,300,512	\$45,752,730	\$43,249,683	\$35,392,239
Mining	\$23,974,796	\$19,305,202	\$20,713,363	\$21,916,669	\$20,158,889	\$17,829,525
Milling	\$9,365,538	\$8,781,708	\$9,195,760	\$9,577,302	\$9,396,919	\$8,743,583
G&A	\$9,307,172	\$9,837,560	\$9,950,787	\$10,055,196	\$9,827,134	\$6,000,000
Royalties at 3% avg	\$3,321,339	\$3,648,391	\$4,440,602	\$4,203,563	\$3,866,742	\$2,819,131
Cash operating cost (\$/t)	\$155	\$154	\$153	\$149	\$145	\$132
Cash costs (\$/oz)	\$664	\$547	\$479	\$522	\$537	\$603

Total unit operating costs (Table 21.4)

Operating cost	Total 2017 to 2022 (\$)	Average unit cost (\$/t)
Mining	123,898,444	71.73
Milling	55,060,809	31.88
G&A	54,977,849	31.83
Royalties at 3% avg	22,299,768	12.91
Total	256,236,870	148.35

Costs obtained from the financial analysis should be taken with caution. In this PEA, the hypothesis is that no other resources will be mined except those in the defined resource area (the “potentially mineable mineral resource”). For this reason, approximately 30 months after the start of the PEA mining plan, all development will have been completed, and at that point, all mineralized material is assumed to come only from stoping activities at a lower cost. If Richmond’s exploration plans are successful and the reality is that some development would be needed to mine these future discoveries, making costs higher for a number of years to come. It is only during last few years of the mine life that all mineralized material will come only from stoping.

25.10. Opportunity and Risks

InnovExplo identified all important internal risks, potential impacts and possible risk mitigation measures that could affect the economic outcome of the project. This excludes the external risks that apply to all mining projects (e.g., changes in metal

prices, exchange rates, availability of investment capital, change in government regulations, etc.). Significant opportunities that could improve the economics and the timing and permitting of the project are also identified. Further information and evaluation is required before these opportunities can be included in the project economics.

25.10.1. Opportunities

25.10.1.1. Mining

Higher tonnage output

Higher daily output has a good impact on operating costs by diluting the fixed portion of the costs over a bigger tonnage. Mill capacity is currently at 900 tpd. InnovExplo sees a potential opportunity to boost output to 1150 tpd as soon as the Indicated resource tonnage is sufficient. The preliminary rough calculation for a new large ramp from the 450m level to the mill that can accommodate 45 t trucks is an interesting option due to the relatively fast implementation time, favourable capital compared to a full-service/length shaft, good operating costs and flexibility. This material handling system could easily support a 1150 tpd throughput.

Automation

The Island Gold mine is located in a remote area. There is a local manpower pool from Dubreuilville, but a significant fraction of the manpower (44%) needs transportation and room and board, which is paid by Richmond. In the event that additional resources are defined, InnovExplo sees automation as an opportunity to increase the productivity per man-shift by developing automation and by using energy- and productivity-efficient machines underground. It would be on a case-by-case basis as remote sites do not have the same manpower costs as mines near towns like Timmins, Sudbury or Val-d'Or. Automation in mines is becoming attractive and affordable as the technology is maturing. As one example, trucks could be partly automated using the "leader-follower" technology. This technology is based on a "leader" truck driven by a human being and "follower" robotic truck doing the same moves as the leader. This technology would be suitable for Richmond since it does not require any complex network infrastructure like ultra-fast communication systems along the pathway.

Using condition-specific unit costs for resource to reserve conversion

The methodology used on cost study involving wrench and cycle times specific to locations and personnel and material handling set-up should be considered for future reserve evaluations. Unit costs are not equal, and if a given resource is well positioned with respect to access points, a greater percentage can be turned into reserves than if it was too deep or far away from main access points. For a mine like Richmond, where resources are spread laterally and vertically, it can have a significant impact. A division by zone for unit cost calculations, like what was done in this technical report, is a good way to obtain accurate cost forecasts.

Compressed air management

The compressed air capacity at 8,000 scfm is relatively high considering the use of electric hydraulic jumbos and the absence of a shotcrete machine or down-the-hole drilling equipment. Compressed air is a very advantageous and relatively safe way of

transferring energy in underground mines, but it is one of the less efficient. InnovExplo recommends a survey of the underground compressed air consumers (machines and piping/leaks) to see if there is a match between production and “useful” demand. Leaks, if present, need to be tamed. Also, compressors generate a lot of heat and this heat in winter time could be used to heat buildings or even mine ventilation air, depending on distance and other factors. Monitoring of consumption through flow meters or power meters is recommended to detect costly leaks. Water in the compressed air also increases friction losses and corrosion. Air receivers on surface with automatic purges could be an asset. An economic analysis on compressed air piping could also be done if it is suspected that friction losses are too high due to pipe diameters.

Modelling truck and equipment interactions

In this study, cycle times for trucks were calculated using simple tools, which is acceptable for a PEA-level evaluation. Optimization gains should be sought given the considerable cost of trucking ore and waste. Stochastic software, such as Arena®, is available, as are specialists in cycle simulations, such as Simica (Sudbury, Ont.). Modelling and time studies could reveal system inefficiencies that translate into higher costs and lower production. InnovExplo sees an opportunity to evaluate and improve the Island Gold “traffic” management system knowing that more trucks will circulate simultaneously if ore comes mainly from Island Gold Lower Zones (below the 450m level).

Ventilation

From time to time, there will be many diesel-fueled vehicles and equipment running at the same time below the 450m level, and this could place a burden on the ventilation distribution. In order to minimize ventilation requirements without temporarily preventing access to some of the equipment, InnovExplo recommends the following:

- 30t trucks reaching the end of their useful life should be replaced with units equipped with ventilation reduction (VR) packages. New diesel emission technologies (US EPA tier III and IV) will lead to lower airflow requirements. This type of technology does not representing a huge cost and benefits are significant.
- The PEA mining plan calls for a double-ramp system almost all the way down. Connections, either temporary or permanent, are present on some levels between the ramps (levels 620m, then 770m). They are important for reducing air friction losses. One inter-ramp link needs to present at all times.
- Ventilation raises/manways of sufficient free surface are present where there is no double-ramp access. Ladders, landings and compartments create shock losses, and the raises have to be big enough to minimize the energy needed to push the air. An economic study is suggested to determine the optimal manway size based on electricity and excavation costs.
- Waste from development must be used locally as much as possible for backfill, thus reducing the trucking distance. A waste stope/storage located close to the producing sector could be a solution. Knowing that Island Gold will likely be short of waste backfill, the extra tonnes generated during excavation operations would be welcome.

25.10.1.2. Processing

Since 2013, preliminary analyses have shown that mill throughput could be increased to 1200 tpd with some circuit preliminary identified bottlenecks. The main preliminary bottlenecks are:

- Crushing circuit capacity: reduction ratio too high at the primary crusher;
- Grinding circuit capacity: global power draw available;
- Thickening capacity: due to the type of feed well; and
- Gold recovery capacity: from elution circuit.

The following necessary modifications have already been identified:

- Rearrange the crusher circuit including an additional cone crusher;
- Replace the crusher circuit screen;
- Increase the fine ore bin storage capacity;
- Replace the thickener feed well and feed dilution system; and
- Replace the slurry pumps.

However some modifications must be analyzed in a future study to identify the best option between the following:

- Adding grinding capacity vs. reducing gold recovery by a higher product size;
- Adding a new gravity circuit vs. upgrading the current elution circuit.

The modifications above to increase mill capacity to 1200 tpd should be achieved with an investment of less than C\$15 M. Further study is required to confirm the preliminary assumptions and the preliminary cost estimation.

25.10.2. Risk

25.10.2.1. Resources

Several factors may affect the Mineral Resource Estimate, including metal prices, the exchange rate between US and Canadian dollars, unusual or unexpected geological or geotechnical formations or seismic activity, ore grades lower than expected, physical or metallurgical characteristics of ore that are less amenable than expected to mining or processing, faulty data on which engineering assumptions are made, or dilution increases.

25.10.2.2. Mining

Shortage of waste backfill

Island Gold will likely be short of dry waste backfill. Development waste normally stockpiled on surface to be used at a later time for backfill was used to raise the tailings dam. The impact of that shortage has not been evaluated but should be kept in mind.

Replacement of Inferred resources in the C Zone by parallel lenses

In the PEA mining plan, assumptions were made for replacement tonnes coming from the C Zone, which historically has shown a high (85%) conversion ratio between inferred to indicated and measured resources. Those replacement tonnes will have to come from parallel lenses. InnovExplo did not include extra development costs to replace any of the tonnes in the C Zone by tonnes from other lenses. Therefore, in order to be “even” money-wise, replacement tonnes will have to be of a high enough grade to pay for extra development. It is also possible that parallel lenses will add more tonnes. This would allow a longer life or a higher daily tonnage while diluting some capital costs even further.

Timing

In the pre-PEA study, InnovExplo showed through relative NPV calculations that implementation time is important. For gold mines like Island Gold, where gold is present in quartz veins, the conversion of inferred resources to measured resources takes more time and energy compared to massive sulfide mines. It is problematic for major infrastructure investments since management must wait for resources to be better defined. Often, by the time information is available, many tonnes have already been mined and cannot benefit from the advantage related to the investment, or cannot participate in the payback of the investment.

A scenario that would help increase hauling capacity is to develop ramps from level 450m to the mill. This option has the advantage of being fast to implement and would represent a relatively low capital. This option would eliminate the need for Volvo surface trucks that are responsible for an OPEX re-handling fee of \$2/t. This option would put the operation in a good position if additional resources are found below level 860m.

Dewatering system

As development progresses laterally and deeper, there is a possibility of more infiltration water. InnovExplo recommends regularly updating the general pumping arrangement diagram for the underground mine. It is recommended that the diagram show pump specifications, particularly capacity, and other important data like peak and low (seasonal variations/down pours) pumping duties. Pumps need to be able to respond to seasonal peaks and be able to catch up in a decent time after a power shutdown. Volumes of the main sumps are also needed, with levels, to have an idea of the retention capacity. If it is the intention to raise daily output in the future, drilling, dust control and other activities could generate more service water.

Hauling system

The current set-up, with partly loaded 30t trucks, is not efficient and will not put the mine in a good position if resources are added below the 860m level. Operating costs will be high because of lower wrench times and longer cycle times.

26. RECOMMENDATIONS

This section outlines the work required to advance the Island Gold Lower Zones as recommended by the PEA's QPs as defined by NI 43-101 standards.

Richmont is already actively developing the Island Gold Lower Zones. The major ongoing exploration program may provide additional resources above that zone and also laterally. The results could have an impact on the mining plan and recommendations herein.

Consequently, the recommendations outlined below are based on the known resources for the Island Gold Lower Zones that were studied by this PEA. These recommendations are intended to ensure the continued development of the Island Gold Lower Zones according to the proposed mining plan within the forecasted operating parameters.

26.1. Geology

It is recommended to complete the planned definition and delineation drilling in the PEA area by the end of 2015 in order to update the Mineral Reserve and Resource Estimates in the first quarter of 2016.

26.2. Mining

In order to provide sufficient stope availability at the production stage, the following work is recommended:

- Continue to develop the main ramp system to an ultimate depth of 860m by the end of 2016.
- Complete capital expenditures on underground infrastructure and equipment by the end of 2016.

Given that significant savings can be realized by increasing daily tonnage and having a highly efficient material handling system, an economic analysis of worker transportation and material handling systems is recommended based on the preliminary information that will be obtained in the first half of 2016 from the ongoing exploration program. Time being a key economic factor, it will be important to react quickly on positive results from the diamond drilling program to gain the full benefits of a new material handling system with low operating costs. The assessment thus far has shown that certain options outperform the status quo as long as some tonnage is added and implementation time is short. With that in mind, a feasibility study is recommended to prove accuracy-level design and costing of selected material handling systems. The mill expansion from 900 to 1200 tpd should also be costed with the same level of accuracy.

26.3. Processing

Following the review of the current situation at the Island Gold concentrator, some improvement opportunities were identified that could optimize mill operations and availability, and also stabilize a potential higher throughput of 900 tpd. The major projects are as follows:

- Increase the number of cyclones in the operation to stabilize the separation performance, reduce the cyclone wear and improve efficiency;
- Upgrade some slurry pumps to maintain the throughput and availability;
- Upgrade the reclaim and process water distribution network to stabilize the distribution flow rate and reliability;
- Replace the current permanent magnets on CV-01 and CV-04 at the crushing circuit by self-cleaning magnets to increase circuit availability and reduce the risk of major failure on major crushing equipment;
- Replace the lime preparation and distribution to stabilize the pH level with reduction of lime consumption;
- Add a scale prevention/reduction chemical agent distribution system at the reclaim and process water to reduce scale built-up in the piping and pumps and to stabilize the equipment performance and maintain availability;
- Upgrade the refinery with additional area in drying sector with new sludge filtration and drying systems. This new area will include a new gold room and security system;
- Upgrade the electrical motor control center (MCC) to increase the reliability of the electric distribution, for health and safety reasons and to reach the operational availability target.

The recommended work should bring mill availability to 93% as presented in Table 26.1.

Table 26.1 – Mill availability improvement work

Projects	Total
Self-cleaning magnets	385 400 \$
Cyclone arrangement modifications	162 000 \$
Slurry pumps	255 200 \$
Process water circuit modifications	146 900 \$
Reagents	712 000 \$
Refinery upgrade	655 600 \$
Electrical upgrade	980 000 \$
Total	3 297 100 \$

26.4. Infrastructure

Under sustaining capital, the improvements to be done in 2016 and 2017 are to the warehousing facilities, welding shop and garage.

In terms of electrical requirements, the MCC at the mill needs to be changed in 2016. The 13.8 kV power line needs to be available underground to avoid too much voltage drop and to accept additional consumers. Ventilation-on-demand and/or ventilation control should be studied to find out if there would be any payback.

For underground construction, a service area for mechanical work and a fuel station are needed on level 620m. Three refuges are also needed to follow development

and production. Ventilation walls and ventilation airlocks need to be built to control ventilation and allow for circulation in the ventilation network.

Permanent pumping stations should be planned and built on levels 425m and 740m to support future operations and exploration.

A review of long-term building maintenance needs may also be required depending on the expected mine life, which could change if the exploration program yields positive results.

Power distribution will also need to be supported by a detailed study on increasing the mill capacity to 1200 tpd. Moreover, it should be kept in mind that the design and costing of different material handling systems for underground ore handling may also have a significant impact on electrical power.

26.5. Environment

Even though Richmond's environmental and social management programs are robust, the company must continue to manage the environmental and social aspects of all project components, looking for opportunities to continuously improve performance, with relevant costs being part of OPEX.

Water management is one of the main issues addressed by permits from government agencies and presents the highest risk to operations if not optimized. Additional improvements to water management systems are therefore recommended, the main one being a diversion system around the Primary Pond of the Tailings Management Facility, which is estimated to cost \$2.1 M; this should be part of CAPEX.

26.6. Recommended Budget to continue development of the Island Gold Lower Zones

To complete the proposed work program and advance the Island Gold Lower Zones to production, InnovExplo and its collaborators estimate that a budget of approximately \$65.8 M is required, as presented in the table below.

Table 26.2– Budget to continue the development of the Island Gold Lower Zones

Item	Cost
Geology	
Complete planned definition and delineation drilling in the PEA	Already engaged
Mining	
Detailed engineering to increase production to 1150tpd	\$300,000
Development – Project Capital	\$32,186,630
Mobile Equipment – Project Capital	\$11,902,556
Underground Construction – Project Capital	\$6,254,839
Mineral Processing	
900 tpd mill optimization and upgrade (availability)*	\$ 3,297,100
Surface Infrastructure	
Mine Buildings – Project Capital	\$2,000,000
Environment	
Primary Pond – Project Capital	\$9,900,000
Total	\$65,841,125

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APPENDIX I – Units, Conversion Factors, Abbreviations

Units

Units in the Report are metric unless otherwise specified. Precious metal content is reported in grams of metal per metric ton (g/t Au or Ag), unless otherwise stated. Tonnage figures are dry metric tons (“tonnes”) unless otherwise stated. Ounces are troy ounces.

Abbreviations

°C, °F	degrees Celsius, Farenheit	oz, Moz	troy ounces, million troy ounces
ha	hectare	avdp	avoirdupois pound
g	gram	st	short ton
kg	kilogram	oz/t	ounces per short ton
mm	millimetre	t	metric ton (tonne)
cm	centimetre	Mt	million metric tons
m	metre	g/t	grams per metric ton
km	kilometre	tpd	metric tons per day
masl	metres above sea level	ppb	parts per billion
' or ft	feet	ppm	parts per million
(scfm) cfm	(standard) cubic feet per minute	cps	counts per second
m ³ /min	cubic metres per minute	hp	horsepower
Mbs	megabytes per second	Btu	British thermal units
\$ or C\$ or CAD	Canadian dollars	kV/kVA	kilovolts/kilovolt-amps
US\$ or USD	American dollars	MPa	mega pascals

Conversion factors for measurements

Imperial Unit	Multiplied by	Metric Unit
1 inch	25.4	mm
1 foot	0.305	m
1 acre	0.405	ha
1 ounce (troy)	31.103	g
1 pound (avdp)	0.454	kg
1 ton (short)	0.907	t
1 ounce (troy) / ton (short)	34.286	g/t

APPENDIX II – List of Mining Right

APPENDIX III – Laboratory Procedure – Sample preparation and analytical methods

APPENDIX IV – QA/QC Statistics and Figures

APPENDIX V – Longitudinales Sections (CD)

APPENDIX VI – Variography and Statistical review – Belzile Solutions

APPENDIX VII – Search Parameters and Variography

APPENDIX VIII – Charts for Grade Capping

APPENDIX IX – Detailed Resources Estimates – Individual Block

APPENDIX X – Detailed Reserves Estimates – Individual Block

APPENDIX XI – Signed Reserve and Resources Summary