TECHNICAL REPORT AND PRELIMINARY ECONOMIC ASSESSMENT ON THE GARRCON DEPOSIT- GARRISON GOLD PROPERTY

LARDER LAKE MINING DIVISION
GARRISON TOWNSHIP, ONTARIO, CANADA

for

NORTHERN GOLD MINING LIMITED

Report No. 948

A.C.A. Howe International Limited
Toronto, Ontario, Canada

Patrick Hannon, M.A.Sc., P.Eng.
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Effective Date: June 23, 2011
Signing Date: August 5, 2011

A.C.A. HOWE INTERNATIONAL LIMITED
Mining and Geological Consultants

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1 SUMMARY

This technical report ("the Report") has been prepared by A. C. A. Howe International Limited ("Howe") at the request of Mr. Martin Shefksy, President, Northern Gold Mining Inc. ("Northern Gold" or "the Company"). This report is specific to the standards dictated by National Instrument 43-101 and Form 43-101F1 (Standards of Disclosure for Mineral Projects) in respect to the Garrison Gold Property ("Property") and focuses on Howe's independent mineral resource estimate update and Preliminary Economic Assessment ("PEA") on the Garrcon Deposit within the Garrison Gold Property.

The Property is located in the Timmins-Kirkland Lake area of northeastern Ontario along the Highway 101 corridor east of the town of Matheson. Specifically it is located in Garrison Township, Larder Lake Mining Division, approximately 40 kilometres north of Kirkland Lake, 40 kilometres east of Matheson, and 100 kilometres east of Timmins, Ontario.

The Property is comprised of 43 patented mining claims covering an area of approximately 476.1 hectares (1176.5 acres). The claims that make up the Property have been historically grouped into four contiguous claim blocks known as the Newfield, Garrcon, Brydges and Linton.

The Property is located within the Archean Abitibi Subprovince of the Superior Province of the Canadian Shield. The Property overlies about 4 kilometres of the regionally significant Destor-Porcupine Fault Zone and a major splay, the Munro Fault Zone. The Property is underlain by Kidd-Munro Assemblage metavolcanic rocks which, in the absence of faults, are unconformably overlain by Timiskaming Assemblage clastic metasedimentary rocks, composed of conglomerate, wacke-sandstone, siltstone, argillite and schist. The Timiskaming Assemblage rocks are closely associated with the Destor-Porcupine Fault Zone from the Quebec border to Hislop Township a distance of approximately 65 kilometres (Berger, 2002) . Banded magnetite-hematite iron formation is complexly interbedded and structurally interleaved with clastic metasedimentary rocks. On the Property the Timiskaming Assemblage is fault bounded, on the north side by the Munro fault and on the south side by the Destor-Porcupine Fault Zone.

The Destor-Porcupine Fault Zone comprises a variably altered and deformed sequence of metavolcanic rocks that include komatiites and tholeiitic basalts. Significant gold deposits generally occur in clusters within and adjacent the Destor-Porcupine Fault Zone. Where clustering occurs, the gold deposits are associated with disseminated pyrite zones in sub-parallel auriferous structures over limited strike distances. An example of this clustering is the Holloway Mine and Holt-McDermott gold mines in Holloway Township, approximately 15 kilometres east of the Property. These two deposits occur along two separate gold-bearing structures which, as at the Garrison Property, are largely covered by overburden.

Gold mineralisation on the Property is similar to many of the deposits in the Timmins Gold Camp, where high-grade, gold-mineralized quartz veins and gold-bearing disseminated sulphide zones occur within and adjacent to shear zones, as steeply dipping ore shoots. On the

Property gold mineralisation occurs in quartz-pyrite vein stockworks within the intervening Timiskaming sedimentary rocks on the northern edge of the Destor-Porcupine Fault Zone (Garrcon Deposit comprising the Garrcon North, Shaft and South Zones) and also occurs in sulphide-rich bodies (pyrite-arsenopyrite) within the Destor-Porcupine Fault Zone (903 Zone) and Munro Fault Zone (Jonpol Deposit comprising the JD, JP, RP and East Zones).

Howe has reviewed the Garrcon deposit data provided by Northern Gold, including the drill hole database, has visited the site and has reviewed sampling procedures and security. Howe believes that the data presented by the Company are generally an accurate and reasonable representation of the Garrcon deposit mineralisation. Howe concludes that the database for the Garrcon deposit is of sufficient quality to provide the basis for the conclusions and recommendations reached in this Report.

The current sampling and analytical protocols are considered by Howe to be appropriate. The quality control and quality assurance (QA/QC) protocols of the Company are industry standard. Northern Gold's QA/QC results to date indicate that there are no major problems with the accuracy of the analyses. While there is no available QA/QC data for the historic exploration on the Property, it was conducted under the supervision of experienced geologists and Howe is of the opinion that the data is of sufficient quality to be used in a current NI 43-101 compliant resource estimate.

During January-to-June, 2011, ACA Howe International Limited ("Howe") carried out a resource estimate update for Northern Gold's Garrison Project, Garrcon Deposit. The resource estimate includes holes up to GAR-11-74, drilled during 2011.

The updated resource estimate was prepared by Doug Roy, M.A.Sc., P.Eng., Associate Mining Engineer with Howe. Geological interpretation was provided by Ian Trinder, M.Sc., P.Geo., Senior Geologist with Howe. Micromine software (Version 2010) was used to facilitate the resource estimating process. The resource estimate was prepared in accordance with CIM Standards on Mineral Resources and Reserves[1].

For resource estimation, Northern Gold provided several forms of digital data. Input files were created from the supplied data for import to Micromine resource modeling software.

Mineralised zones were outlined to enforce geological control during block modeling. Because of the larger scale and lower grade nature of the mineralisation, it was assumed that if developed the deposit would be mined using larger scale, surface mining methods.

Interpretations were accomplished by plotting and interpreting hard-copy cross-sections. Those interpretations were digitised and zone intercepts were determined.

The Garrcon zone is constrained to the south by Porcupine-Destor Fault which is delineated by ultramafic and chlorite talc schists. Similarly there appears to be a smaller more limited ultramafic body bounding (at least locally) the mineralisation to the north.

[1] CIM Standards in Mineral Resources and Reserves, Definitions and Guidelines, adopted December 11, 2005

Samples were regularised (normalized) over 1.0 metre intervals - the most common sample interval for samples within the mineralised zones. Statistics were calculated for regularised samples within the Garrcon mineralised zone. The mean value for all regularised samples was 0.44 g/tonne.

Experimental variograms were constructed. The omni-directional variogram produced excellent data to which an exponential model could readily be fit. The range was approximately fifty metres.

A block model was constructed with a block size of 10x10x10 metres. There were two sub-blocks in each direction for a geological resolution of 5x5x5 metres.

The chosen cut-off grade for mineralised zone interpretation was 0.1 g/tonne of gold. The chosen "block cut-off" [2] grade for defining mineral resources was 0.3 g/tonne. No top-cut grade was applied because, in the Co-author's (Doug Roy's) opinion, a top-cut would not affect the global estimate.

Resource classification parameters were chosen based on a combination of variography results and the Co-author's (Doug Roy's) judgement. Indicated Resources were outlined graphically cross-sections within areas where the intercept spacing was slightly less than the variogram range of 50 metres.

Because of the very good fit of the global semi-variogram model to the raw semi-variogram data, ordinary block kriging was considered to be an acceptable and appropriate method for estimating block grades in this deposit.

Grade estimation was carried out in three "runs." The first run had a maximum search radius of 50 metres and required samples from at least three holes. In subsequent runs, the parameters were relaxed.

Mineral resources were defined using a block cut-off grade of 0.3 g/tonne. The grand total for Indicated mineral resources is 24.9 million tonnes with an average gold grade of 0.9 g/tonne, containing 720,000 ounces gold. The grand total for Inferred mineral resources is 18.6 million tonnes with an average gold grade of 0.7 g/tonne, containing 430,000 ounces gold.

[2] The grade at which it is possible to mine and process and exposed block (*i.e.*: stripping not included).

Summary

Mineral Resource Category	Block Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated				
Less Than 150 m Deep	0.3	15,000,000	0.9	430,000
More than 150 m Deep	0.3	9,900,000	0.9	290,000
Total Indicated	**0.3**	**24,900,000**	**0.9**	**720,000**
Inferred				
Less Than 150 m Deep	0.3	5,600,000	0.8	140,000
More than 150 m Deep	0.3	13,000,000	0.7	290,000
Total Inferred	**0.3**	**18,600,000**	**0.7**	**430,000**

Notes:

1. Cut-off grade for mineralised zone interpretation was 0.1 g/tonne.
2. Block cut-off grade for defining Mineral Resources was 0.3 g/tonne.
3. No top-cut grade was used. In the author's opininion, the use of a top cut would not have significantly affected the results.
4. Gold price was $US 1200 per troy ounce.
5. Zones extended up to 100 metres down-dip from last intercept. Along strike, zones extended halfway to the next cross-section.
6. Minimum width was 5 metres, though in no place was the zone that narrow.
7. Non-diluted.
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
9. Resource estimate prepared by Doug Roy, M.A.Sc., P.Eng.
10. A specific gravity (bulk density) value of 2.73 was applied to all blocks (a representative value based on a limited number of measurements).
11. Ordinary block kriging ("OBK") was used for estimating block grades.
12. Indicated resources identified where sample intercept spacing was 50 metres or less (based on variography).
13. No Measured Mineral Resources or Mineral Reserves of any category were identified.
14. The volume/tonnage of historic Cominco shaft, drifts and crosscuts have not been deleted from the Howe mineral resource volume/ tonnage. Howe estimates the tonnage extracted from the resource area was less than 0.1% of the total inferred and indicated resource tonnage.

Work by the Company at the Garrcon deposit has expanded the work carried out by previous operators, provided further detail on the nature of the mineralised zones and permitted the completion of an updated NI 43-101 compliant Mineral Resource Estimate.

Northern Gold's exploration program to April 2011 has confirmed and delineated a significant gold resource. Using a cut-off grade of 0.1 g/tonne gold for mineralised zone interpretation, Howe outlined a mineralised zone that is nearly vertical, 800 metres long and 300 metres wide (on average) and has been intersected to depths of up to 500 metres.

Howe is unaware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues that may materially affect the mineral resource estimate.

Howe has reviewed the Garrcon Deposit at the level of a Preliminary Economic Assessment (PEA). The reader is cautioned that this PEA uses Indicated and Inferred Mineral Resources.

NI 43-101 Part 2, Section 2.3(1)(b) and Companion Policy 43-101CP, Part 2, Section 2.3(1) Restricted Disclosure, prohibits the disclosure of the results of an economic analysis that includes or is based on inferred mineral resources, an historical estimate, or an exploration target. However, under NI 43-101, Part 2, Section 2.3(3) and Companion Policy 43-101CP, Part 2 section 2.3(3), the use inferred mineral resources is allowed in a Preliminary Economic Assessment in order to inform investors of the potential of the property.

This 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. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

For the purposes of the Preliminary Economic Assessment (PEA), a pit was optimised using the following parameters.

Parameter	Value
Mining Cost, Ore or Waste (Drilling, Blasting, Loading & Hauling)	$2.34 per tonne
Rehab Cost	$0.25 per tonne Milled
Dilution	5%
Mining Recovery	95%
Gold Price	$US 1,200 per ounce
Processing Cost (CIL/CIP, Heap Leach)	$5.31 / $4.22, per tonne Processed
Processing Recovery	98%, 65%
Specific Gravity	2.73
Overall Slope Angle (rock, overburden / fault material)	45°, 30°

The pit optimisation results were as follows.

Pit Details	CIL/CIP	Heap Leach	Total
Gold Price ($US per Ounce)	$1,200		
Cut-off Grade (g/tonne):	0.30	0.15	
Non-Diluted Ore (tonnes)	33,000,000	18,300,000	51,300,000
Non-Diluted Ounces	960,000	120,000	1,080,000
Non-Diluted Grade (g/tonne)	0.90	0.20	0.65
Waste Tonnes	102,000,000		
Pit Depth (m)	300		
Footprint (Hectares)	43		
Stripping Ratio (t_{waste}:t_{ore})	2:1		

A mining schedule and economic model has been developed for the operation. The PEA indicates that the mining of the Garrcon gold deposit by open pit mining methods would be feasible today. This PEA has determined that, with the Mineral Resources outlined to date, a combination gravity-agitated leach plant and a heap leach facility would be economic with a base case net present value (5.0% discount rate) of $266 million and an internal rate of return of 47%.

PEA conditions included $1,200/troy ounce gold, a processing rate of about 11,300 tonnes per day and a heap leach facility processing about 2.3 million tonnes per year.

The project is most sensitive to grade and the price of gold and least sensitive to capital costs. The PEA has been completed using order of magnitude costs and rock quality values typical of northern Ontario. The project economics would be even better if the present price of gold ($1500 +) were used; however, at this stage the project is still 3 to 5 years from production and it is prudent to use a lower number. As the project advances, a gold price closer to the present price can be used.

Based on the mineral resource update and PEA, Howe concludes that the Garrcon Deposit and the Garrison Gold Property is a property of merit and warrants additional expenditures to be further developed.

Howe recommends that the following work be incorporated into Northern Gold's ongoing project development plans to further refine estimates of costs, recoveries, engineering and mine design to facilitate the development of a Pre-feasibility Study:

1. Continue the advanced exploration permitting currently in progress to be followed by the work necessary for operational permitting.

2. Expand the permitting process to include potential mill sites, heap leach pads and tailings management areas using claims recently acquired by Northern.

3. Continue and expand the current drilling program:
    a. Add additional drills to increase the rate at which resources are upgraded, delineated and discovered.
    b. Continue the infill drilling program to improve the quality of existing resources.
    c. Increase the infill drilling rate to speed up the upgrading of resources and the delineation of additional resources within the resource footprint as identified by Howe.
    d. Emphasis be placed on step out drilling beyond the current resource footprint to test meta-sediment outcrops and newly stripped meta-sediments hosting stockwork veining with anomalous gold mineralization.

4. Northern Gold should continue specific gravity measurements of representative samples. Sufficient samples should be tested to be representative of the various mineralized and non-mineralized rock types within the Garrcon Zone along its entire strike length, width and depth. The number of samples will depend on the statistical variance of the measurements.

5. Further mineral processing work should be carried out to support assumptions that were made in this report. The work that has been carried out thus far is quite preliminary. This work should be expanded by exploring various processing options, determining which options would best suit this particular deposit and optimising the most promising flowsheet. Should that flowsheet consider heap leaching, a bulk sample pilot trial should be carried out to determine the actual, realised processing recovery value as opposed to the laboratory-predicted value. Testwork should include:
    a. Sieve analysis vs. gold grade.
        i. For each stage of the rock breakage history, a sieve analysis and grade of gold should be determined. This should be completed for selected bulk sampling sites where at least several hundred tonnes can be blasted on surface. At each stage of crushing, the ore should be sieved and a gold grade determined for each size fraction...
    b. Flotation Test Program
        i. Test four different grinds from approximately 70% at -200 mesh to 95% at -200 mesh. In these tests use reagent X-523 for 10 minutes followed by a 10-minute float with frother and potassium amyl xanthate.
        ii. Take the best of the above conditions and repeat with reagent Aerofloat 208 replacing the X-523. Take the best of the above conditions and jig the flotation feed and remove the coarser gold prior to flotation.
        iii. Have all tests that are performed above assayed for gold, silver and sulphur.
        iv. Repeat the best test of above and have all flotation floats performed for five 3-minute intervals to establish the flotation rate for the various minerals.
        v. Repeat the best tests of above but clean, reclean and re-reclean the two flotation products, and have the final re-reclean concentrate assayed for copper, lead and zinc as well. Also, repeat the best test using reclaimed water from a previous float test.
    c. Bottle roll tests to give some indication of the leaching character of the rock.
    d. Column leaching tests should be completed to get some idea of percolation rates for the heaps.
    e. Determination of solution application rates and solution percolation rates, crushing and agglomeration testing.

6. Continue testing the deposit for any potential Acid Rock Drainage (ARD) and confirmation of the relatively high calcium content, which is expected to neutralize any ARD potential.

7. A study of the structural geology, a map of the jointing system and a report on the geotechnical properties of the potential pit should be completed. The geotechnical properties of the rock types at the Garrcon property (Uniaxial Compressive Strength (UCS), Tensile Strength, Young's modulus and Poisson's ratio) should be determined. A suite of samples representing different parts of the deposit and each rock type should be tested at a rock mechanics laboratory.

8. Additional land may be required around the deposit, to store waste rock and tailings facilities. More detailed site engineering is required to confirm the suitability and sufficiency of the current property area for final mine and processing facilities should they be constructed.

9. Approximately 10 kilometres of line will be required to bring 3 phase power to the site. A right of way for this line should be investigated and talks with Ontario Hydro should be initiated.

10. A hydrological study should be completed to determine the amount of water that must be pumped to keep the pit dry. Any water bearing fractures found should be mapped so that they can be grouted off if necessary. A water storage facility will have to be in place to supply mill water, heap leach water as well as fire-fighting water.

11. A rock penetration rate study should be undertaken in order to determine the penetration rate for down the hole hammer type blast hole drills. Drill manufacturers often offer this service. A variety of core or rock samples should be tested so that an accurate penetration rate can be determined.

12. Update of the Garrcon resource estimate to include the results of the ongoing 2011 drill program. The update should be completed after sufficient drilling has been completed along strike of the currently defined mineral resource.

In line with these recommendations, Northern Gold has proposed a budget totaling $10,330,000 for a work program for the last four months of 2011. The proposed program and budget as shown below will permit Northern Gold to complete 44,000 metres of diamond drilling and approximately 11,200 metres of RC drilling to upgrade and expand the resource in addition to EBS and Permitting, metallurgical and engineering studies some of which are budgeted to continue into the first six months of 2012 (as per table).

Howe considers Northern Gold's proposed budget reasonable and recommends that the Company proceed with the proposed work program.

Item #	Task / Exploration Element	Year	Cost
1	EBS, Public Consultation and Permitting (See Table 21-1)	2011 & 2012	$720,000
3	Continue and Expand Diamond Drilling Program*	2011 Sept-Dec	$6,564,000
4	Metallurgical Testwork	2011 & 2012	$1,500,000
5	Update Resource Estimate	Late 2011 or Early 2012	$50,000
6	Initate Pre-Feasibility & Feasibility Data Collection & Engineering	2011 Sept-Dec	$150,000
		Total	**$8,984,000**
	Approximate 15%	**Contingency**	**$1,346,000**
		Grand Total	**$10,330,000**
* Drill program (Sept to Dec 2011)			
2011	44,000m diamond drilling @ $125/m and 11,200m RC drilling @ $95/m		

2 INTRODUCTION

2.1 GENERAL

This technical report ("the Report") has been prepared by A. C. A. Howe International Limited ("Howe") at the request of Mr. Martin Shefksy, President, Northern Gold Mining Inc. ("Northern Gold" or "the Company"). This report is specific to the standards dictated by National Instrument 43-101 and Form 43-101F1 (Standards of Disclosure for Mineral Projects) in respect to the Garrison Gold Property ("Property") and focuses on Howe's independent mineral resource estimate update and Preliminary Economic Assessment ("PEA") on the Garrcon Deposit within the Property. The Property is situated in Garrison Township, Larder Lake Mining Division, Ontario, approximately 100 kilometres east of the city of Timmins.

Northern Gold is a junior resource company listed on the TSX Venture Exchange under the symbol "NGM". The corporate head office is located at Suite 800 20 Victoria St., Toronto, Ontario, M5C 2N8. The company's field office is located in the town of Kirkland Lake, Ontario, approximately 40 km south of the Property area.

The Company's current focus is the Garrison Gold Property on which it has acquired an undivided 100% interest in 35 claims from ValGold Resources Inc., an undivided 100% in seven claims from June Linton, and a further five sevenths interest in one claim from June Linton, Karen Wicket & Lynn Troke. Certain claims are subject to royalty payments as detailed in Section 4.3.

Howe is an international mining and geological consulting firm that has been serving the international mining community for over 30 years. Howe is well recognized by the major Canadian Stock Exchanges and provincial regulatory bodies and its personnel have worked on projects involving a wide variety of commodities and deposit types throughout the world. The firm's services are provided through offices in Toronto and Halifax, Canada; and London, England.

Neither Howe nor any of the Authors of the opinions expressed in this Report (nor family members nor associates) have business relationships with the Company or any associated company, nor with any other company mentioned in this Report which is likely to materially influence their impartiality or create the perception that the credibility of this Report could be compromised or biased in any way. The views expressed herein are genuinely held and deemed independent of the Companies.

Moreover, neither the Authors of this Report nor Howe (nor their family members nor associates) have any financial interest in the outcome of any transaction involving the property considered in this Report, other than the payment of normal professional fees for the work undertaken in its preparation (which are based upon hourly charge-out rates and reimbursement of expenses). The payment of such fees is not dependent upon the content or conclusions of either this Report, nor any consequences of any proposed transaction.

2.2 SCOPE AND CONDUCT

The purpose of the report is to complete an update of Howe's September 23, 2010 NI 43-101 compliant resource estimate and a PEA for the Company's Garrcon Deposit at its Garrison Township Gold Property (formerly known as the Jonpol Property). The Garrcon Deposit is a bulk tonnage resource encompassing the historically recognized, higher grade Shaft, South and North zones.

This Report was prepared and co-authored by Mr. Doug Roy, M.A.Sc., P.Eng., Mr. Patrick Hannon, M.A.Sc., P.Eng., Associate Consulting Engineers and Qualified Persons (QP) with Howe and Mr. Ian D. Trinder, M.Sc. (Geology), P.Geo., Senior Geologist and QP with Howe. Mr. Ian Flint, Ph.D., P.Eng., Associate Consulting Engineer with Howe prepared Sections 13, 17 and 20.2.2 under the supervision of Mr. Hannon. Mr. Roy is a mining engineer with over ten years experience in the mining industry. He has participated in numerous projects and resource estimates for precious metals and base metals projects and has authored or co-authored numerous OSC-2A and NI 43-101 resource reports. Mr. Hannon is a mining and geological engineer with over 35 years experience in the mining industry. He has also participated in numerous projects, resource estimates, feasibility estimates and valuations for precious metals deposits. He has authored numerous OSC 2A and NI 43-101 reports. Mr. Flint is a mineral processing engineer with over 20 years of mineral processing experience in areas of design, operations, and research. Mr. Trinder has over 20 years experience in the mining industry with a background in international precious and base metals mineral exploration including project evaluation and management.

The updated mineral resource estimate was prepared in accordance with CIM Standards on Mineral Resources and Reserves. Only mineral Resources were estimated – no Reserves were defined.

Mr. Trinder visited the Property site and Northern Gold's Kirkland Lake field office on January 19th to 22nd, 2011 as part of Howe's due diligence in the preparation of this technical report. During the property visit, Mr. Trinder met with Mr. Michael Gross, Northern Gold's Vice President Exploration and Mr. Greg Matheson, the Company's Project Geologist to examine the Property area and discuss the Company's exploration activities, methodologies, findings and interpretations. Mr. Trinder completed a thorough review of all recent drilling on the Property, acquired a complete digital database of all historic and current drilling on the Property, and reviewed and made copies of historic reports available for the Property. In addition, Mr. Trinder reviewed drilling and sampling methodology, quality assurance and quality control procedures, security, etc.

The effective date of this report is June 23, 2011; the updated mineral resource estimate is based on historical and Northern Gold 2009-2011 drill hole assay data available to Howe as of May 5, 2011. Only assay results from the Company's 2011 drill program up to GAR-11-74 are considered in the resource estimate, which was the limit of assay data available at the cut-off date for the mineral resource estimate. The resource database includes drill hole data (collar,

survey and lithology) for additional 2011 diamond drill holes through to GAR-11-91 (April 26, 2011). Only the Garrcon Deposit within the Property area is discussed in any detail in this report. Howe reserves the right, but will not be obligated to revise this Report and conclusions if additional information becomes known to Howe subsequent to the date of this Report.

Northern Gold reviewed draft copies of this Report for factual errors. Any changes made as a result of these reviews did not include alterations to the conclusions made. Therefore, the statement and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are not false and misleading at the date of this Report.

Northern Gold has accepted that the qualifications, expertise, experience, competence and professional reputation of Howe's Principals and Associate Geologists and Engineers are appropriate and relevant for the preparation of this Report. The Company has also accepted that Howe's Principals and Associates are members of professional bodies that are appropriate and relevant for the preparation of this Report.

Northern Gold has warranted that full disclosure of all material information in its possession or control at the time of writing has been made to Howe, and that it is complete, accurate, true and not misleading. The Company has also provided Howe with an indemnity in relation to the information provided by it, since Howe has relied on Northern Gold's information while preparing this Report. The Company has agreed that neither it nor its associates or affiliates will make any claim against Howe to recover any loss or damage suffered as a result of Howe's reliance upon that information in the preparation of this Report. Northern Gold has also indemnified Howe against any claim arising out of the assignment to prepare this Report, except where the claim arises out of any proven willful misconduct or negligence on the part of Howe. This indemnity is also applied to any consequential extension of work through queries, questions, public hearings or additional work required arising out of the engagement.

2.3 SOURCES OF INFORMATION

In preparing this updated resource estimate, Howe has relied on a digital database received from Northern Gold in Microsoft Excel spreadsheet format. Howe has also reviewed geological reports, maps, miscellaneous technical papers, company letters and memoranda, and other public and private information as listed in Section 27 (References) of this Report. Howe has assumed that all of the information and technical documents reviewed and listed in the "References" are accurate and complete in all material aspects. While Howe carefully reviewed all of this information, Howe has not conducted an independent investigation to verify its accuracy and completeness. Howe has only reviewed the land tenure in a preliminary fashion, and has not independently verified the legal status or ownership of the property or the underlying agreements. Howe has not investigated any environmental or social issues that could conceivably affect the Garrcon Deposit. Historical mineral resource figures contained in the Report, including any underlying assumptions, parameters and classifications, are quoted "as is" from the source. Howe confirms the estimated resource is in compliance with National Instrument 43-101 and Form 43-101F1 (Standards of Disclosure for Mineral

Projects) and the definitions and guidelines of the CIM Standards on Mineral Resources and Reserves.

In addition, Howe carried out discussions with Mr. Michael Gross, Northern Gold's Vice President Exploration and Mr. Greg Matheson, the Company's Project Geologist. Howe's extensive experience in mesothermal vein deposits was also drawn upon.

The Authors believe that the data presented by Northern Gold are a reasonable and accurate representation of the Garrison Gold Property's Garrcon Deposit.

2.4 UNITS AND CURRENCY

All units of measurement used in this report are metric unless otherwise stated. Historical tonnage figures are reported as originally published in "tons" (short tons). Base metal values are reported in percent (%) or parts per million (ppm). Historical gold and silver grades are reported in their original unit of oz Au/ton or oz Ag/ton (ounces per short ton), although metric equivalents are also given for clarity. Recent analyses are reported in g/t (grams per metric tonne), ppm or parts per billion (ppb). Distances are expressed as kilometres (km) and metres (m). The Canadian dollar is used throughout this Report unless otherwise stated. At the time of writing this report exchange rate for conversion of U.S. dollars to Canadian dollars was US$1.00: C$1.03.

Location coordinates are expressed in Universal Transverse Mercator (UTM) grid coordinates, Zone 17, using the 1983 North American Datum, (NAD83).

2.5 GLOSSARY

Angle of repose: The angle of repose or angle of rest is the maximum slope at which a heap of loose material will stand without sliding.

Bench [mining]: A bench may be defined as a ledge that forms a single level of operation above which mineral or waste materials are mined back to a bench face. The mineral bearing material or waste is removed in successive layers, each of which is a bench. Several benches may be in operation simultaneously in different parts of, and at different elevations in the open pit mine. The bench height is the vertical distance between the highest point of the bench, or the bench crest, and the toe of the bench (**Figure 2-1**, MEH[3])

Bench slope: The bench slope is the angle, measured in degrees, between the horizontal and an imaginary line joining the bench toe and crest.

Berm: A berm is a horizontal shelf or ledge within the ultimate pit wall slope. The berm interval, berm slope angle, and berm width are governed by the geotechnical configuration of the slope.

[3] MEH – Mining Engineering Handbook, Society for Mining, Metallurgy, and Exploration, Inc. 2nd printing: December 1996

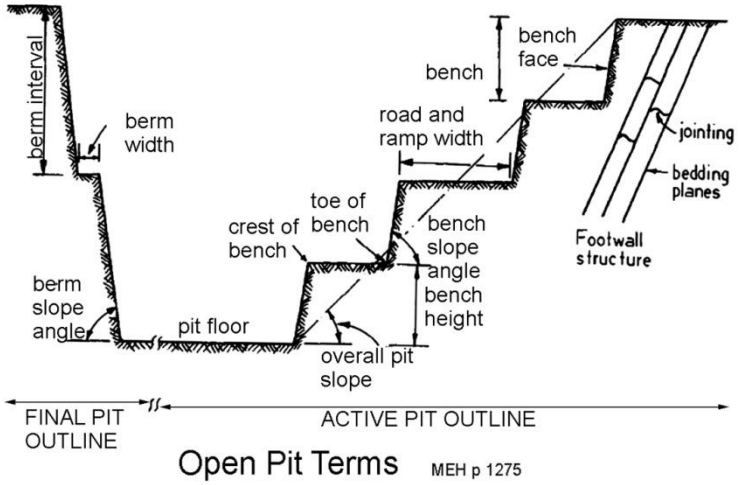


Figure 2-1: Open Pit Terms (MEH[4])

EBITDA: A measurement of a company's operating profitability. It is equal to earnings before interest, tax, depreciation and amortization (EBITDA) divided by total revenue. Because EBITDA excludes depreciation and amortization, EBITDA margin can provide an investor with a cleaner view of a company's core profitability. (Ref: http://www.investopedia.com/terms)

Haul Road: A haul road must be maintained into the pit for the duration of open pit mining. A spiral system is an arrangement whereby the haul road is arranged spirally along the perimeter walls of the pit so that the gradient of the road is more or less uniform from the top to the bottom of the pit. A zigzag or switchback system is an arrangement in which the road surmounts the steep grade of a pit wall by zigzagging, generally on the footwall side of the pit. The choice of spiral or zigzag is dependent upon several factors including the shape and size of the ore body, safety, truck economics and capabilities, and local pit slope stability.

Overall pit slope angle: The overall pit slope angle is the angle at which the wall of an open pit stands, as measured between the horizontal and an imaginary line joining the top bench crest with the bottom bench toe.

Pit limits: The pit limits are the vertical and lateral extent to which open pit mining may be economically conducted.

Preliminary Economic Assessment: A study, other than a pre-feasibility or feasibility study, that includes an economic analysis of the potential viability of mineral resources;
Companion Policy 43-101CP (4) "preliminary economic assessment" – The term "preliminary economic assessment", which can include a study commonly referred to as a scoping study, is defined in the Instrument. A preliminary economic assessment might be based on measured,

[4] MEH – Mining Engineering Handbook, Society for Mining, Metallurgy, and Exploration, Inc. 2nd printing: December 1996

indicated, or inferred mineral resources, or a combination of any of these. We consider these types of economic analyses to include disclosure of forecast mine production rates that might contain capital costs to develop and sustain the mining operation, operating costs, and projected cash flows.

Preliminary Feasibility (Pre-Feasibility) Study: "is a comprehensive study of the viability of a mineral project that has advanced to a stage where the mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, has been established and an effective method of mineral processing has been determined, and includes a financial analysis based on reasonable assumptions of technical, engineering, legal, operating, economic, social, and environmental factors and the evaluation of other relevant factors which are sufficient for a Qualified Person, acting reasonably, to determine if all or part of the Mineral Resource may be classified as a Mineral Reserve." The CIM Definition Standards requires the completion of a Preliminary Feasibility Study as the minimum prerequisite for the conversion of Mineral Resources to Mineral Reserves.

3 RELIANCE ON OTHER EXPERTS

Howe has relied upon the Ontario Ministry of Northern Development and Mines ("MNDM") for information on unpatented mining claim location and status. The MNDM disclaims any guarantee or warranty that their information is accurate, complete or reliable. Howe has relied upon the Company, its management and legal counsel for information related to underlying contracts and agreements pertaining to the historic acquisition of the patented and unpatented mining claims and their status. The Property description presented in this report is not intended to represent a legal, or any other opinion as to title.

Information on the Property presented in this Report is based on data derived from current and historic reports written by geologists and/or engineers, whose professional status may or may not be known in relation to the NI 43-101 definition of a Qualified Person. Howe has made every attempt to accurately convey the content of reports and files, but cannot guarantee either the accuracy or validity of the work contained. However, Howe believes that these reports were written with the objective of presenting the results of the work performed without any promotional or misleading intent. In this sense, the information presented should be considered reliable, unless otherwise stated, and may be used without any prejudice by Northern Gold.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 PROPERTY LOCATION

The Property is located in the Timmins-Kirkland Lake area of northeastern Ontario along the Highway 101 corridor east of the town of Matheson (Figure 4-1). Specifically it is located in Garrison Township, Larder Lake Mining Division, approximately 40 kilometres north of Kirkland Lake, 40 kilometres east of Matheson, and 100 kilometres east of Timmins, Ontario. The Property is situated within National Topographic System (NTS) map sheet 32/D12 at approximately latitude 48°30'58" North and longitude 79°57'11" West (UTM Zone 17N co-ordinates 578,115E and 5,374,030N, NAD83 Datum).

4.2 PROPERTY DESCRIPTION

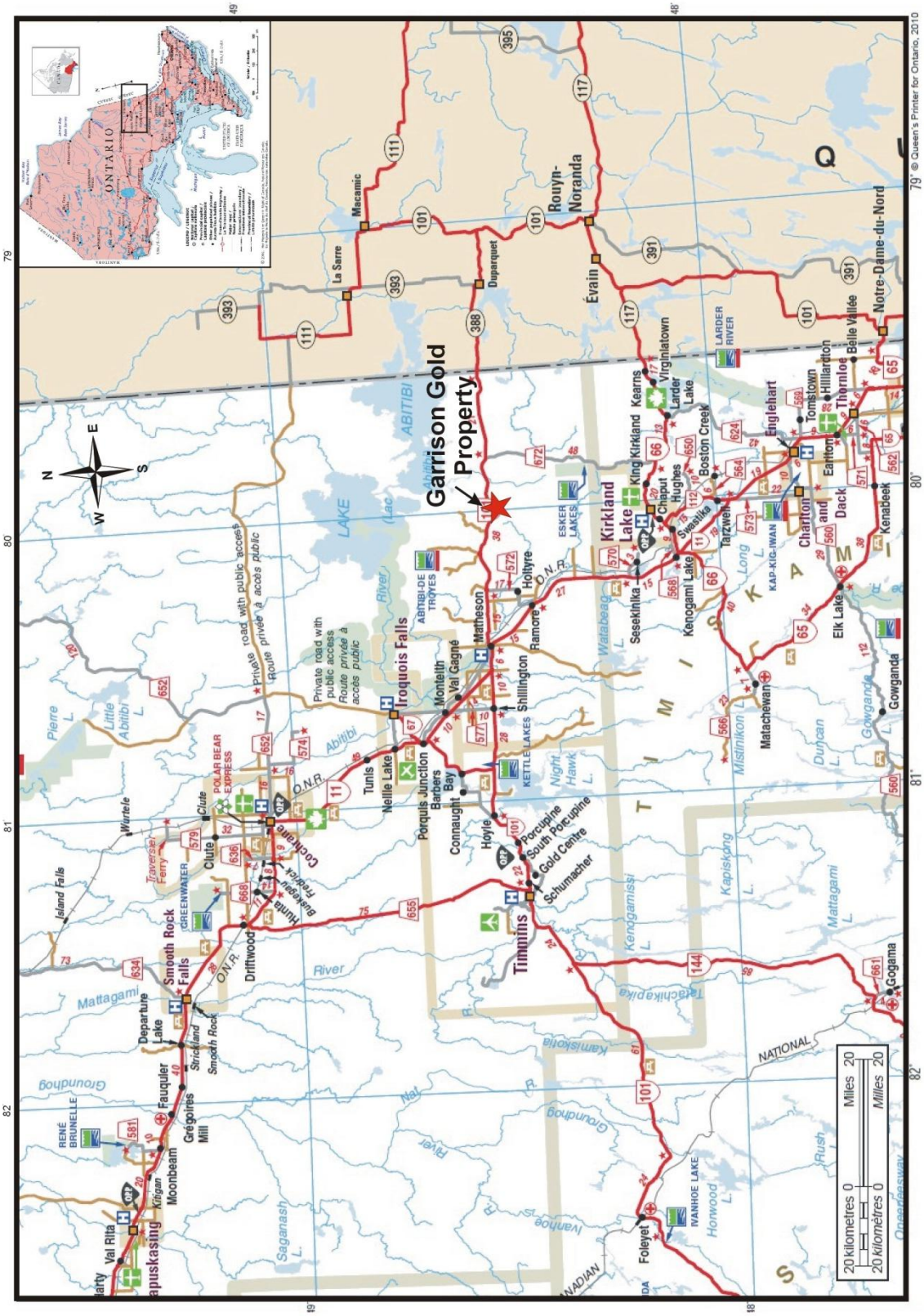
The Property is comprised of 43 patented mining claims covering an area of approximately 476.1 hectares (1176.5 acres) (Table 4-1; Figure 4-2). The claims that make up the Property have been historically grouped into four contiguous claim blocks known as the Newfield, Garrcon, Brydges and Linton Groups (Table 4-1; Figure 4-3).

Land surveyors established claim boundaries at the time the claims were patented. The cost of maintaining tenure of the patented claims is comprised of nominal fees (Provincial Land Tax and Provincial Mining Tax).

Table 4-1: List of patented mining claims comprising the Garrison Gold Property.

Claim Group	Claim Numbers (L)	No. Claims	Status	Holder	Percentage*
Newfield	26432 to 26437	6	Patented	Northern Gold Mining Inc.	100
	29734 to 29735	2	Patented	Northern Gold Mining Inc.	100
	39428 to 39429	2	Patented	Northern Gold Mining Inc.	100
	43702 to 43703	2	Patented	Northern Gold Mining Inc.	100
	44331 to 44332	2	Patented	Northern Gold Mining Inc.	100
Garrcon	26120 to 26122	3	Patented	Northern Gold Mining Inc.	100
	26341 to 26346	6	Patented	Northern Gold Mining Inc.	100
	38949 to 38951	3	Patented	Northern Gold Mining Inc.	100
Brydges	25803 to 25805	3	Patented	Northern Gold Mining Inc.	100
	25937 to 25942	6	Patented	Northern Gold Mining Inc.	100
Linton	26074 to 26076	3	Patented	Northern Gold Mining Inc.	100
	26116	1	Patented	Northern Gold Mining Inc.	100
	26384 to 26386	3	Patented	Northern Gold Mining Inc.	100
	30576	1	Patented	Northern Gold Mining Inc.	71.4
	TOTAL:	**43**			

* Northern Gold's percentage subject to completion of the terms of sales agreements detailed in Section 4.3



Map Source: Ontario Ministry of Transportation

Figure 4-1: Garrison Gold Property Location

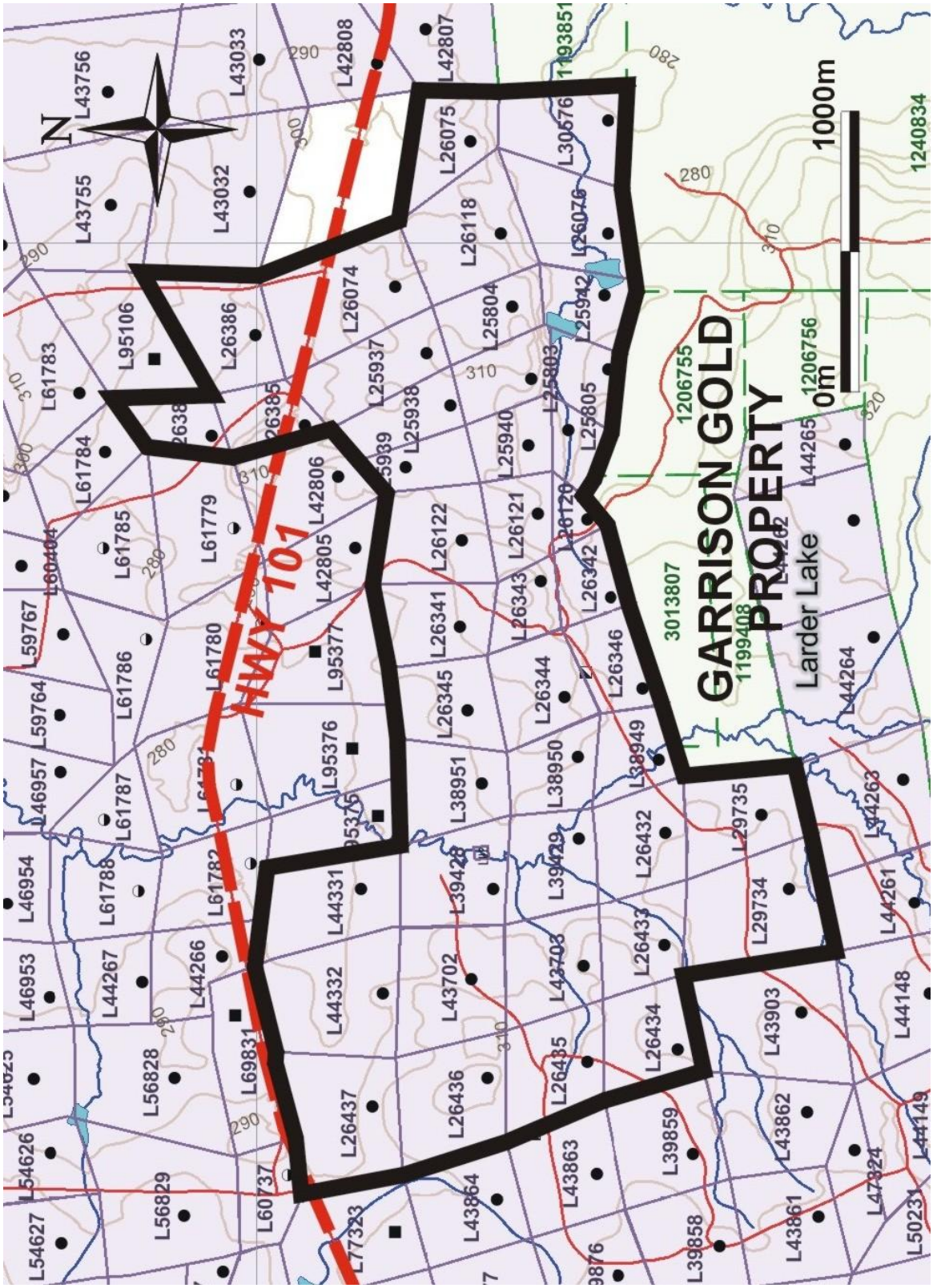


Figure 4-2: Property Claim Map

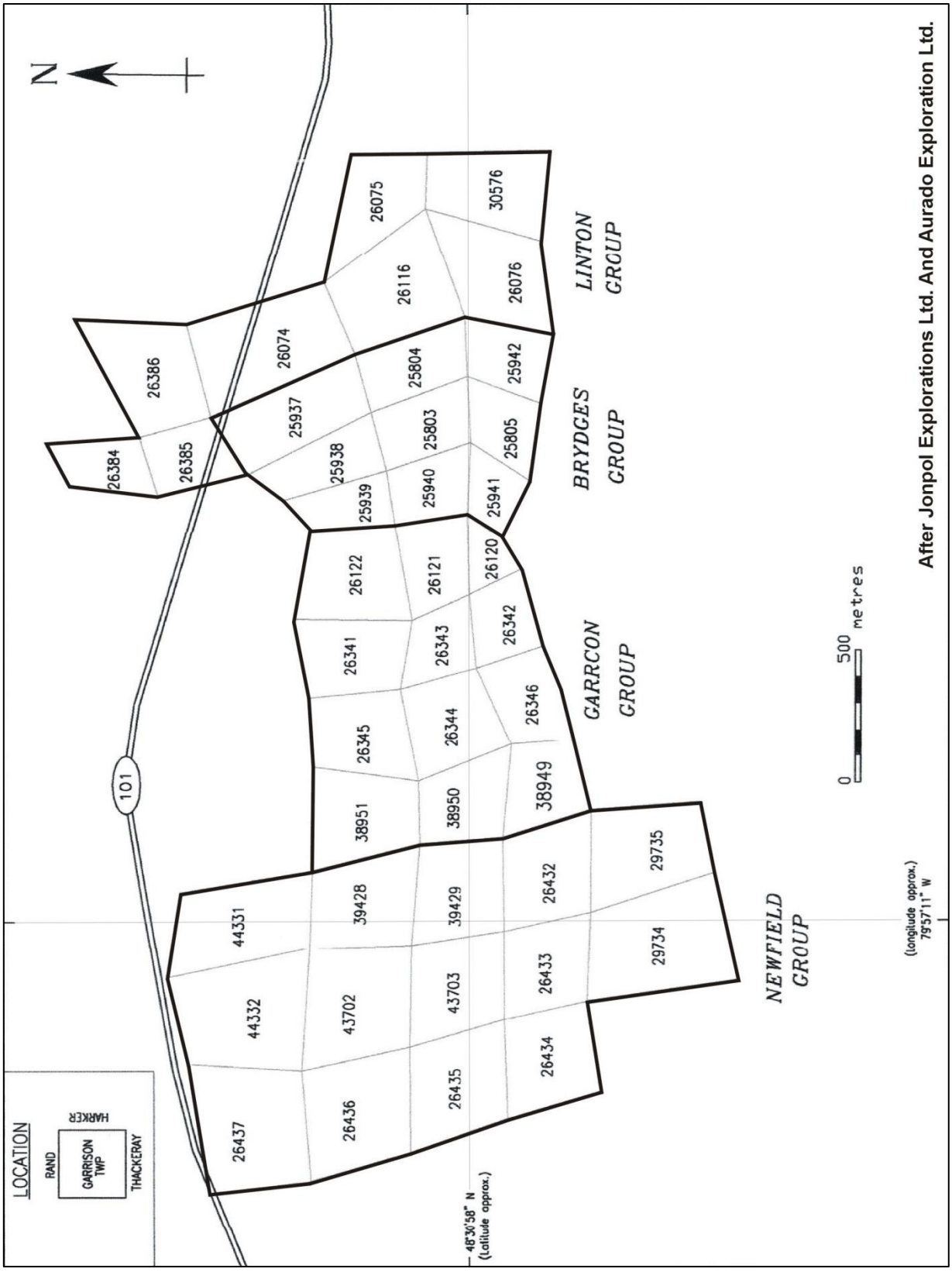


Figure 4-3: Property Claim Map with Historic Claim Group Outlines

4.3 PROPERTY, OTHER OBLIGATIONS

4.3.1 Newfield, Garrcon and Brydges Groups

On September 9, 2009 Northern Gold entered into an Option Agreement with ValGold Resources Ltd. (ValGold) covering 35 claims of the Garrison Gold Property owned 100% by ValGold Resources Inc. (Newfield, Garrcon and Brydges Groups). Under the terms of the agreement, Northern Gold could earn up to an undivided 80% interest in the Property in two phases.

Subsequently, under the terms of a sales agreement announced on April 7th 2011, Northern Gold purchased ValGold's 100% interest in the Garrison property with TSX Venture approval of the transaction granted on April 14, 2011.

In consideration for this sale, ValGold received on May 13th 2011:

- a cash payment of C$325,000 and a promissory note for an additional C$325,000 to be paid on or before August 13, 2011.
- 16 million common shares in Northern Gold ("Northern Gold Shares") giving ValGold aggregate holding of 17,437,500 common shares of Northern Gold, representing ownership of approximately 14.8% of the issued and outstanding shares of Northern Gold on a non-diluted basis.
- a 2% net smelter return royalty of which (i) half (i.e. 1%) can be acquired by Northern Gold for C$5 million paid to ValGold at any time upon the earlier of thirty-six months following the date of closing and the commencement of commercial production, and (ii) the remaining 1% can be acquired for a further payment of C$10 million at any time upon the earlier of seventy-two months following the date of closing and the commencement of commercial production.

For a period ending on the earlier of twenty-four months after closing or a change of control Northern Gold has a right to vote the Northern Gold Shares. In addition, Northern Gold has a right of first refusal to provide a buyer for any sale by ValGold in excess of 160,000 Northern Gold Shares in any calendar month.

Under the terms of the original Garrison Option and Joint Venture Agreement, Northern Gold had the right to earn up to an undivided 80% interest in the Property in two phases. Northern Gold could acquire a 50% undivided interest in the property by making exploration expenditures totaling $4,000,000 plus cash payments to ValGold totaling $1,000,000 over four years for a total expenditure of $5,000,000. The cash payments to ValGold totaling $1,000,000 over four years could be made either in cash or in Northern Gold stock at Northern Gold's option, using a 20 day value weighted average price, upon regulatory approval. Northern Gold was also to complete work on the property in the amount of $4,000,000 over four years, with $500,000 being spent on the property in the first year of the agreement and not less than $750,000 to be expended in each of the subsequent years. After earning the 50% interest,

Northern Gold could increase its interest to 80% percent by making additional cash payments totaling $1,000,000 over four years (again with all or part of the payments being made in Northern Gold stock equivalent, using a 20 day value weighted average price) and completing additional work on the property in the amount of $4,000,000 over four years.

At the time of closing the buy-out of the Garrison Option and Joint Venture Agreement, Northern Gold was in the second year of the option agreement and had made $400,000 in payments ($200,000 in cash and the issuance of 2.2 million in shares in satisfaction of the other $200,000 payment obligation) and had incurred over $3,000,000 in exploration expenditures.

In addition to the 2% net smelter return royalty held by Valgold, Cominco (now Teck Resources Limited) holds a net smelter return royalty (1.5% on ore above the 400-foot level and 2.0% on ore below the 400-foot level) on the Garrcon claim group (12 claims, L26120 to 22, L26341 to 46, and L38949 to 51), which cover both the Jonpol East Zone and the Garrcon Zone. The NSR agreement was made between previous property holder Jonpol Explorations Ltd. and Cominco, and has not been reviewed by Howe.

4.3.2 Linton Group

On April 12, 2011 Northern Gold announced that it reached a definitive agreement with June Linton, Lynn Troke and Karen Wickett to acquire a 96.4% interest in the Linton Claim Group consisting of eight patented mining claims contiguous to the eastern boundary of the historic Brydges Group. The acquisition of this strategic group of claims increases the size of the Garrison Gold Property to 476.1 hectares.

The claims are being purchased in two transactions. The first transaction consists of the purchase of a 100% interest in seven of the claims (26074 to 26076, 26116, and 26384 to 26386). They are being purchased for a cash payment of $91,000 plus 107,692 common shares of Northern Gold Mines Inc., and a 1% NSR, subject to closing and approval by the TSX Venture Exchange. TSX Venture approval of the first transaction was granted on April 25, 2011. The second transaction is the purchase of a five sevenths interest (71.4%) in the eighth claim (30576) for a cash consideration of $20,000 and a 1% NSR, to be apportioned to the vendors on a pro rata basis subject to closing and approval by the TSX Venture Exchange.

4.3.3 Other Underlying Agreements, Royalties or Encumbrances

Howe is unaware of any obligations, underlying agreements, royalties or encumbrances on the Property other than the above Agreements and the Cominco Royalty and is not aware of any environmental liabilities or public hazards associated with the Property. The exploration shaft and ramp that were established at the Jonpol Deposit during the 1980's and 1990's have been capped and meet current regulatory standards for closure. The portal to the Jonpol ramp has been blocked with coarse mine waste. In Ontario, work permits are not required to perform the work recommended in this Report.

The primary focus of Northern Gold's work and expenditures has been the Garrcon Deposit located in the south central portion of the Garrison Gold Property.

4.3.4 Additional Proximal Northern Gold Properties

On May 25, 2011, Northern Gold announced that it had entered into a definitive agreement to acquire a 100% interest in the Plato Claim Group from Plato Gold Corporation (Plato). The Agreement is subject to an underlying 2% Gross Metal Royalty on all metals produced from the property and is held by Géoconseils Jack Stoch Ltée (Géoconseils) in accordance with an Agreement between Géoconseils and Plato dated November 27th, 2007. The claims are being purchased for a cash payment of $72,000 and 175,000 common shares of Northern Gold. The 24 claims, covering 370.4 hectares, (915.3 acres), are strategically located in Garrison and Harker Townships approximately 1 kilometre southeast of the Linton Claim Group portion of Northern Gold's Garrison Gold Property (Figure 4-4).

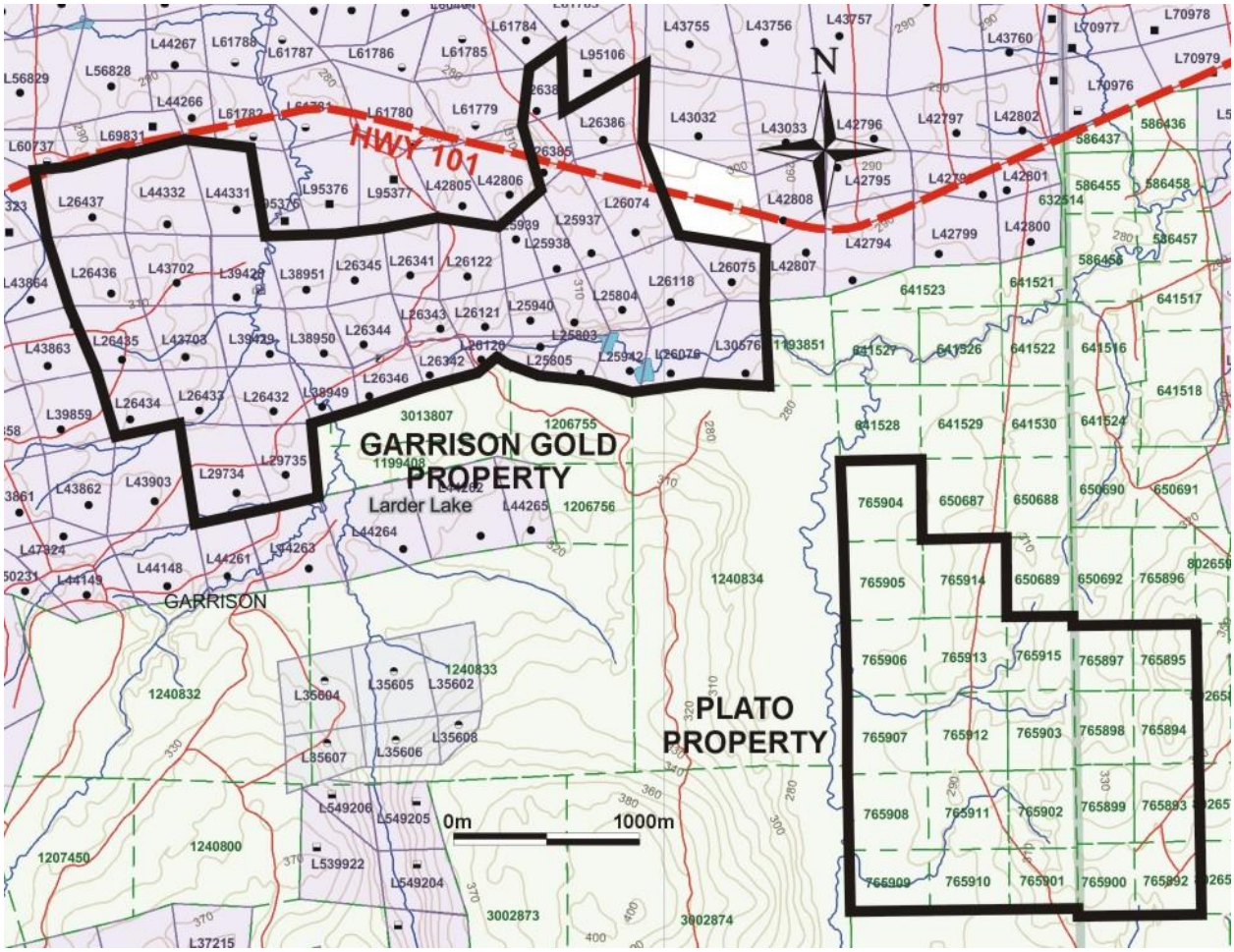


Figure 4-4: Location of Plato Claim Group

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

The Garrison Gold Property is located approximately 40 kilometres north of Kirkland Lake, 40 kilometres east of Matheson, and 100 kilometres east of Timmins, Ontario. Air access to the area is available via scheduled commercial flights to Timmins. Direct highway access to the area from Toronto is via Highways 400 and 11 north through North Bay to Matheson (approximately 560 km) then east from Matheson along Highway 101. Highway 101 traverses the north side of the Property and an 800 metre long gravel road, constructed in 1988, allows for 2-wheel drive access to the Property from the highway. Additional bush roads provide further access into the Property.

5.2 CLIMATE AND PHYSIOGRAPHY

There is low topographic relief in the immediate area of the Property. Property elevations range from 289 to 305 metres above sea level (ASL) with swamp and overburden covered areas between hummocks of clay rimmed outcrop. Jack pine and balsam grow on esker and sandy soil areas; wet areas are vegetated with spruce, cedar and tag alder. Bedrock exposure is generally poor (~10-20% exposure) and overburden is typically >5 metres thick.

The Property area experiences four distinct seasons. Daily average winter temperature in January is -17 degrees Celsius with an extreme daily minimum of -47 Celsius. Daily average summer temperature in July is +18 degrees Celsius with an extreme daily maximum of +39 degrees Celsius. The region has average annual precipitation of approximately 89 centimetres including approximately 59 centimetres of rain, largely during the months of April to October and up to 3 metres of winter snow accumulation, occurring largely between the months of November and April.

Mineral exploration can be conducted year-round. In lake covered or swampy areas, exploration activities such as geophysical surveys and diamond drilling are more easily conducted in the winter due to better accessibility after freeze-up.

5.3 LOCAL RESOURCES AND INFRASTRUCTURE

There are numerous operating gold and base metal mines in the area and the necessary infrastructure for mining and mineral exploration, including skilled labour, is available locally. The Property is located about 100 kilometres east of the City of Timmins, Ontario (2006 population: 42,997), a major mining centre with a skilled and educated work force, a commercial airport and rail service. Other population centres in the area include Matheson (2006 population: 2,619) and Kirkland Lake (2006 population: 8,248), an active mineral exploration and mining town with rail service.

Existing surface site infrastructure at the time of Howe's latest site visit consisted of the following:

- A graveled site access road from Highway 101 allowing 2 wheel-drive vehicle access;
- A security gatehouse;
- A renovated core shack (Plate 5-1) with logging room and attached core sampling room containing electric core saws and water storage tanks (Plate 5-2). The core shack also has additional storage areas for core and ATV's;
- A three room field office trailer;
- One diesel powered electric generator for core logging and core sampling rooms;
- Two decommissioned railway boxcars for storage of sample rejects and pulps;
- Core storage racks on gravel pad (Plate 5-3);
- Weather station.

A power transmission line of unknown capacity is located approximately 10 km southeast of the property along Highway 672 and water is readily available in the vicinity of the Property. The Property and adjacent Northern Gold Plato claim holdings may be of sufficient area for the establishment of potential mine infrastructure such as tailings and waste storage areas, heap leach pads and processing plant site. More detailed site engineering is required to confirm the suitability and sufficiency of the current property area for final mine and processing facilities should they be constructed.

Plate 5-1: Core logging/core sampling facility (January 21, 2011).

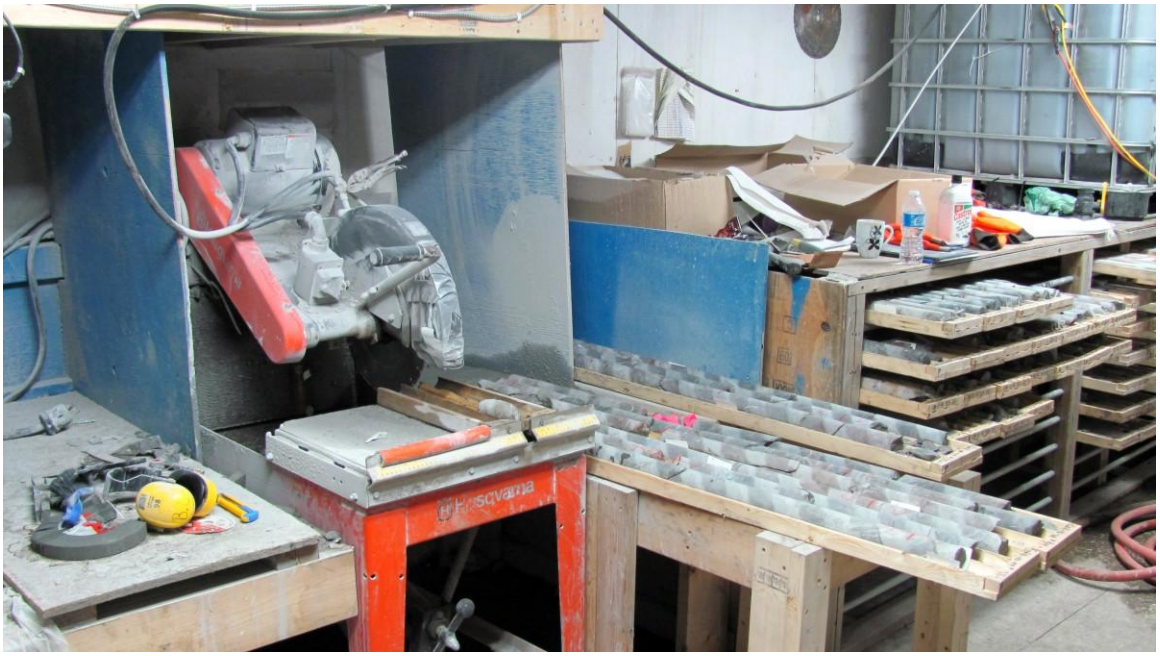


Plate 5-2: Core saw and sample preparation facility (January 2011).

Plate 5-3: Core storage racks with remodeled field office/logging and sample preparation facilities in background (September 2010).

6 PROPERTY HISTORY

Exploration conducted on the Property dates back to 1935 (Satterly, 1949). The majority of work has concentrated on the Jonpol Deposit area within the Property and this exploration history has been documented in Howe's 2008 technical report on the Garrison Gold Property for ValGold (George, 2008). Bath (1990) summarized the exploration and development from 1935 to 1989, for the area within and surrounding the present Property. Squair (2000) further summarized exploration conducted up to 1997.

As this Report focuses on the Garrcon Deposit, the Property history presented in this section shall concentrate on the immediate area of this zone within the Property. For the exploration history of the rest of the Property area, the reader is directed to the reports noted above.

The mining claims that make up the Property are patented and as a result very little of the exploration work carried out on the Property has been filed with the government and hence the data is not in the government assessment work files. Initial drilling on the Property occurred in the period 1935-1946 with additional drilling completed during 1983. None of this data has been included in the Northern Gold's current exploration drill hole database. The most important historic data relating to the Property is the exploration work completed since 1985 by Cominco / Jonpol Explorations Ltd. and by ValGold. Northern Gold's current drill hole database includes only holes drilled between 1986 and present.

6.1 GARRCON DEPOSIT EXPLORATION HISTORY

Exploration and development history from 1935 to 1989 has been extracted from Bath (1990) with metric equivalents inserted by Howe:

"1935: The Consolidated Mining and Smelting Company of Canada Ltd. optioned 9 claims from a Mr. McKenzie, sank a 256 foot (78 metre) deep inclined (to the south at 62 degrees) shaft, performed about 1,033 feet (315 metres) of lateral exploration work on the 120 and 240 foot (36.5 and 73 metre) levels, and hoisted about 7,612 tons (6,920 tonnes) of waste material. By year end, about 10,550 feet (3,216 metres) of underground and surface diamond drilling had been completed (Young 1937, Sinclair et al. 1937, Sinclair et al. 1938).

1936: Garrcon Mines Ltd. was incorporated in May with Consolidated Mining and Smelting controlling the company and acting as operator on the Garrcon Mines property. 1,745 feet (532 metres) of lateral underground exploration work and additional underground diamond drilling were completed (Sinclair et al. 1938).

1937: 4 feet (1.2 metres) of shaft sinking, 1,542 feet (470 metres) of lateral underground exploration work, 21 surface holes totaling 5,070 feet (1,545 metres), and 33 underground holes totaling about 5, 905 feet (1,800 metres) were diamond drilled. Before operations were suspended at year end, aggregate lateral underground

exploration work amounted to 636 feet (194 metres) on the 120 foot (36.5 metre) and 3,655 feet (1,114 metres) on the 240 foot (73 metre) levels (Sinclair et al. 1939), aggregate diamond drilling totaled 16,099 feet (4,907 metres) (of which 11,029 feet (3,362 metres) were drilled underground) and about 520 feet (158 metres) of trenching had been completed (Satterly 1949).

1941: Consolidated Mining and Smelting diamond drilled one 293 foot (89 metre) hole near the northeast corner of claim 38950.

1946: Consolidated Mining and Smelting completed a magnetic survey.

1949: By this time, Consolidated Mining and Smelting controlled in addition to the Garrcon property, 3 contiguous patented claims to the west (claim Nos. 39949-51). Before 1949, trenching and 4 holes totaling 2,110 feet (643 metres) were diamond drilled on these claims (Satterly 1949).

1983: Kerr Addison Mines Ltd. diamond drilled 10 holes on the 12 Consolidated Mining and Smelting/Garrcon Mines (by this time, optioned by Cominco Ltd.) claims (Jonpol Explorations Ltd. 1987 Annual Report).

1985: Jonpol Explorations Ltd. acquired the right to earn a 49% interest in the 12 Cominco/Garrcon Mines claims.

1986: Diamond drilling by Cominco was financed by Jonpol Explorations and delineated 2 additional auriferous zones (the North and South Zones). These were described (The Northern Miner, February 10, 1986) to be stratabound and not vein type. By July, Jonpol had earned a 49% interest in the property (The Northern Miner, July 21, 1986). By September, the South Zone was reported (The Northern Miner, September 29, 1986) to be hosted by altered sediment, to average 6 feet (1.8 metres) in width, and to have been traced by diamond drilling to the (vertical) 500 foot (152 metre) level along about l,300 feet (396 metres) of strike. The North Zone had by this time been traced along strike for about 200 feet (61 metres), to the (vertical) 500 foot (152 metre) level, averaged 10.7 feet (3.3 metres) in width, and was reported to be hosted by a wide shear.

1987: By midyear, drilling funded by Jonpol Explorations and supervised by Cominco had established reserves of 1.5 million tons (1.36 million tonnes) of material averaging 0.04 ounce of gold per ton (1.37 grams gold per tonne) above the 200 foot (61 metre) level near the shaft. The South Zone was indicated to average 0.15 ounce of gold per ton (5.14 grams gold per tonne) across 3.8 feet (1.2 metres) along l,400 feet (427 metres) of strike. The North Zone was reported to have been drill defined along 300 feet (91 metres) of strike. A new auriferous zone within the "Munro Shear" was reported to average 10 feet (3 metres) in width, to be drill defined along 250 feet (76 metres) of strike, with a mineralized drill core length of 36.9 feet (11.3 metres) averaging 0.30 (cut) ounce of gold per ton (10.28 grams gold per tonne - cut) intersected within it

(Jonpol Explorations Ltd. 1987 Annual Report). By July, Jonpol Explorations/Cominco were reported (The Northern Miner, July 27, 1987) to have spent $500,000 and that an additional $2 million was budgeted for additional exploration during the next 2 years.

1988: Jonpol Explorations announced in a news release dated February 2, 1988 that aggregate drill defined reserves were estimated to be 350,900 tons (319,000 tonnes) of material averaging 0.191 ounce of gold per ton (6.55 grams gold per tonne) above the (vertical) 500 foot (152 metre) level in three distinct zones. Later, Jonpol Explorations acquired a 100% interest in the property following Cominco's having diamond drilled 79 holes totaling about 70,168 feet (21,387 metres) since 1983 (A. D. Drummond, project engineer, Jonpol Explorations Ltd. , pers. comm. 1988). In July, Lac Minerals Ltd. obtained the right to acquire a 50% interest in the (Jonpol Explorations) properties (The Kirkland Lake Northern Daily News, July 7, 1988; The Northern Miner, July 11, 1988), and in November, Lac Minerals optioned the property (The Northern Miner, November 21, 1988)."

2005: ValGold Resources Inc. secured 100% ownership of the Property in June 2005 (subject to the Cominco NSR on the Garrcon claim group). Initial work consisted of data review and preliminary data compilation as part of the planning process for a diamond drilling program.

2006: ValGold completed 9 NQ diamond drill holes on the Garrcon zone totaling 3,348 metres.

2007: ValGold completed 3 BQ and 2 NQ diamond drill holes on the Garrcon zone totaling 2,361 metres.

2009: In September 2009 the Company entered into an Option Agreement with ValGold covering the Garrison Gold property (historic Newfield, Garrcon and Brydges claim blocks).

2009: Northern gold completed 11 NQ diamond drill holes on the Garrcon zone totaling 2,330 metres.

2010: Northern Gold completed 47 NQ diamond drill holes on the Garrcon zone totaling 11,250 metres (see Section 10). Additional exploration included ground magnetometer and VLF-EM surveys, surface stripping and sampling, and preliminary metallurgical testing.

2011: On April 7th 2011, Northern Gold announced that it had entered into a definitive agreement with ValGold to purchase ValGold's 100% interest in the Garrison property. TSX Venture approval of the transaction was granted on April 14, 2011.

6.2 GARRCON HISTORIC RESERVES AND RESOURCES

Various historical resource estimates on gold mineralisation in the Jonpol Mine and Garrcon Mine have been provided by various authors since the mid 1980's. ***These historical resources, which are summarized and reported by Bath (1990), and by Squair (2000) who referred to historical reports by DDH Geomanagement Ltd. (1989) and R.J. Bradshaw (1989), have not been reviewed by Howe, and are not in compliance with NI 43-101 "Standards of Disclosures for Mineral Deposits". Data and the basis for the calculation of these resources are not known to Howe and as such these resources should not be relied upon***.

By mid 1987, Jonpol Explorations Ltd. had established reserves of *1.5 million tons (1.36 million tonnes) of material averaging 0.04 ounce of gold per ton (1.37 grams gold per tonne) above the 200 foot (61 metre)* level and within the area of the Garrcon shaft.

In a news release dated February 2nd, 1988, Jonpol Explorations Ltd. announced aggregate drill defined reserves of *350,900 tons (319,000 tonnes) of material averaging 0.191 ounce of gold per ton (6.55 grams gold per tonne)* above the (vertical) 500 foot level and contained in three distinct zones (Table 6-1).

Table 6-1: Historical diamond drill defined reserves, Jonpol Explorations Ltd. (1988).

Mineralized Zone	Tonnage (tons)	Average Grade (opt)
Munro Zone	81,300	0.267
North Zone	166,800	0.161
Shaft Area (South Zone)	102,800	0.180
Weighted Average:	**350,900**	**0.191**

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGICAL SETTING

Garrison Township, situated in the Abitibi Greenstone Belt ("AGB"), is underlain by Neoarchean supracrustal rocks of the Abitibi Subprovince of the Canadian Shield. Supracrustal rocks are divided into tectonostratigraphic units called assemblages for descriptive purposes. The reader is referred to Jackson and Fyon (1991) for a full discussion of the Archean geology of the Superior Province and to Ayer et al. (2001) for a more recent interpretation of the AGB geology. Gold deposits are structurally controlled and are widely distributed within the AGB, but all of the large deposits occur within 2 km of the Porcupine-Destor Fault Zone, the Pipestone Fault Zone and the Cadillac-Larder Lake Shear Zone.

The most recent description of the regional geology of the area is by Berger (2002) in his geological synthesis of the Highway 101 area, east of Matheson. Berger (op cit p.xvii) has summarized the regional geological setting as follows (Table 7-1):

"The study area is underlain by Neoarchean supracrustal and intrusive rocks that are subdivided into 5 lithotectonic assemblages. The Kidd-Munro assemblage underlies the north part of the study area and is composed of a tholeiitic metavolcanic member and a calc-alkalic metavolcanic member. Ultramafic to mafic layered sills intrude the metavolcanic rocks. The Tisdale assemblage is composed of tholeiitic metavolcanic rocks and subordinate amounts of calc-alkalic metavolcanic rocks. The distribution of the assemblage is poorly constrained because of the Porcupine-Destor deformation zone and related splay faults transect the assemblage in several places. The Kinojevis assemblage underlies the south part of the study area and is composed of predominantly mafic tholeiitic metavolcanic rocks that are intercalated with thin units of tholeiitic rhyolite and calcalkalic metavolcanic rocks. The Porcupine assemblage underlies the northwest part of the study area and is composed of greywacke, argillite, and rare conglomerate that are intruded by small alkalic intrusions. The Timiskaming assemblage is composed of clastic and chemical metasedimentary rocks and rare alkalic metavolcanic rocks that are distributed within and near to the Porcupine-Destor deformation zone. Ultramafic to felsic alkalic intrusive rocks are also correlated with the Timiskaming assemblage and occur as dikes, small single-phase intrusions and large multi-phase intrusions throughout the area. Paleoproterozoic quartz-diabase dikes, Keweenawan-age olivine diabase dikes and Jurassic kimberlite dikes and diatremes intrude the Neoarchean rocks.

The Porcupine-Destor deformation zone is a crustal-scale structure that transects the study area and is characterized by south-side-up vertical movement. The fault zone and related northeast-striking splay faults such as the Ghostmount fault and McKenna fault, are the loci for gold mineralisation. Northeast-striking faults with dominant vertical displacement transect the Porcupine-Destor deformation zone. Two of these faults, the Hislop fault and Garrison fault, are major structural features that act as the boundaries to different

metallogenic segments. Gold mineralisation occurs in different structural settings, different styles, and different types of alteration patterns in each segment."

Gold is extracted from the St Andrew Goldfield Ltd.'s Holloway mine in Holloway Township, Brigus Gold's Black Fox mine in Hislop Township and St Andrew Goldfield Ltd.'s Hislop mine in Hislop Township (approximately 15 kilometres east, 32 kilometres west and 27 kilometres west of the Property respectively). In addition, St Andrew Goldfield Ltd.'s Holt mine in Holloway Township is in development (approximately 15 kilometres east of the Property). Several past-producing gold mines are located in Hislop and Garrison townships. Many gold prospects and occurrences are located throughout the study area and there is excellent potential for future discoveries. There is potential for platinum group elements mineralisation in the ultramafic to mafic layered, intrusions and the ultramafic phases of the alkalic intrusions (Berger, 2002). Diamonds occur in some of the kimberlite intrusions (Berger, 2002).

Table 7-1: Regional Table of Formations (Berger 2002)

PHANEROZOIC
CENOZOIC
QUATERNARY
HOLOCENE
Lake, stream and wetland deposits
PLEISTOCENE
Glacial, glaciofluvial and glaciolacustrine deposits, sand, gravel, and clay.
UNCONFORMITY
MESOZOIC
JURASSIC
Kimberlite dikes and diatremes
INTRUSIVE CONTACT
PRECAMBRIAN
PROTEROZOIC
Mafic intrusive rocks, Diabase dikes
INTRUSIVE CONTACT
ARCHEAN
NEOARCHEAN
Metamorphosed Alkalic Felsic and Intermediate Intrusive Rocks
Syenite, monzonite, quartz monzonite, granite, feldspar and quartz feldspar porphyry, intrusion breccia, pegmatitic syenite, schist, mylonite, albitite
INTRUSIVE CONTACT
Metamorphosed Alkalic Ultramafic and Mafic Intrusive Rocks
Hornblendite, pyroxenite, melasyenite, pegmatitic melasyenite, lamprophyre, gabbro and/or diorite
INTRUSIVE CONTACT
Metamorphosed Tholeiitic Ultramafic and Mafic Intrusive Rocks
Peridotite, pyroxenite, gabbro, gabbronorite, schist, diorite, pegmatitic gabbro
INTRUSIVE CONTACT
Mafic and Intermediate Alkalic Metavolcanic Rocks
Massive and porphyritic amphibole-biotite-bearing flows, flow breccias
Clastic and Chemical Metasedimentary Rocks: **Timiskaming Assemblage**
Greywacke, sandstone, arkose, siltstone, argillite, polymictic conglomerate, schist, chert, laminated magnetite-hematite iron formation.
UNCONFORMITY
Clastic and Chemical Metasedimentary Rocks: Turbidites: **Porcupine Assemblage**
Greywacke, siltstone, argillite, graphitic and pyritic mudstone, conglomerate, schist, chert
Felsic Metavolcanic Rocks: **Kidd-Munro Assemblage and Kamiskotia Assemblage**
Flows, tuffs, lapilli tuff, tuff breccia, schist
Mafic to Intermediate Metavolcanic Rocks: **Kidd-Munro, Tisdale and Kinojevis Assemblages**
Massive, flow-laminated and pillowed flows with flow top and pillow breccia, as well as amygdaloidal and variolitic varieties; tuff, lapilli tuff, schist, breccia, and feldspar porphyry
Mafic Metavolcanic Rocks: **Kidd-Munro, Tisdale and Kinojevis Assemblages**
Massive and pillowed flows with pillow and flow top breccia, as well as variolitic and amygdaloidal varieties; tuff and lapilli tuff, schist, leucoxene-bearing units, graphite breccia, dikes, hornfelsic greenstone
Ultramafic, Komatiitic, and Mafic Metavolcanic Rocks: **Kidd-Munro, Lower Tisdale and Stoughton-Roquemaure Assemblages**
Massive, spinifex and polysuture textured flows, schist and basaltic komatiite

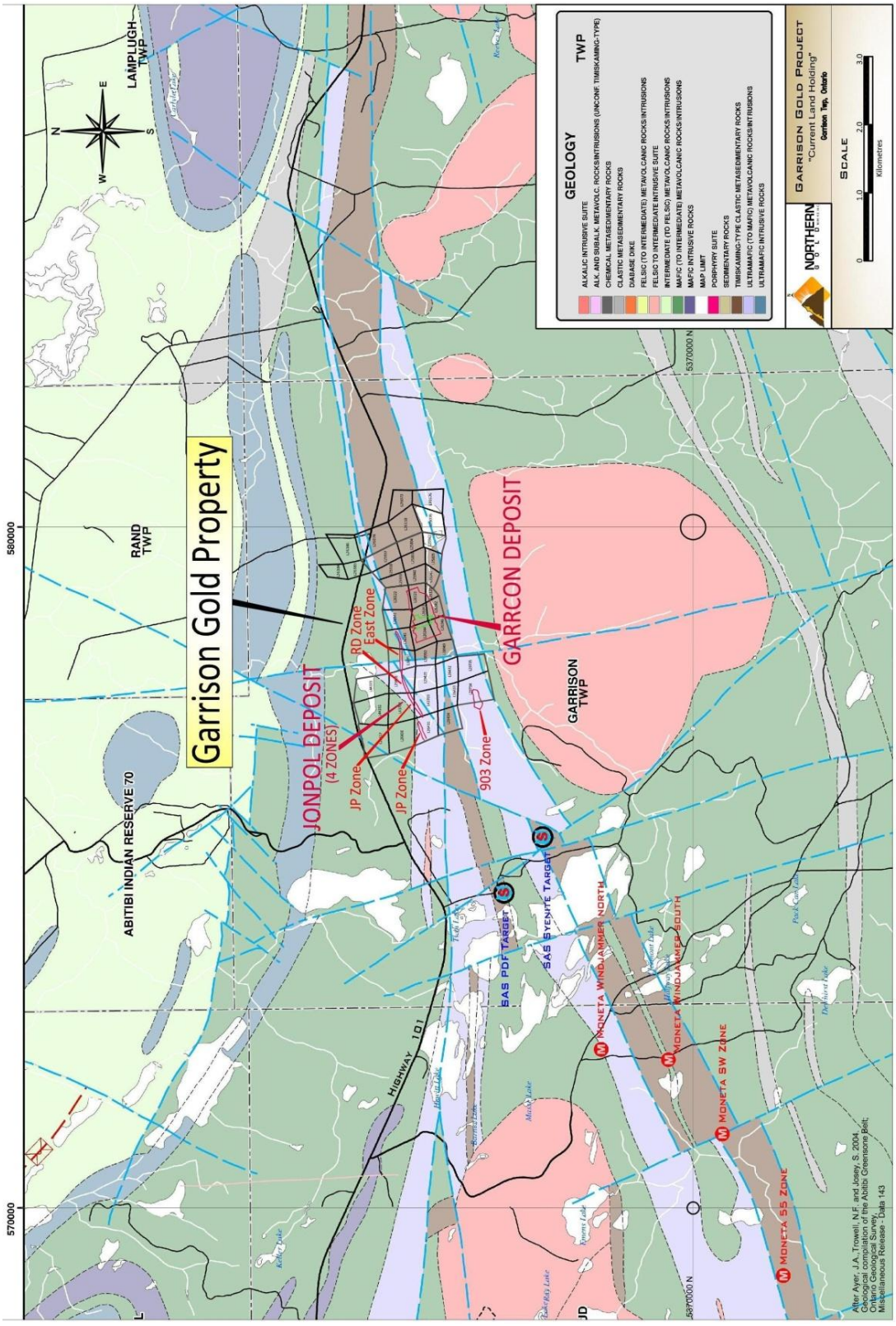


Figure 7-1: Regional Geology

7.2 Local Geological Setting

Satterly (1949) mapped Garrison Township for the Ontario Department of Mines and his mapping provides the best geological work relating to the geology of the Property. Berger (2002) made minor amendments to the geology and brought the nomenclature for the various volcanic-sedimentary units up-to-date in terms of the current understanding of the stratigraphy of the Abitibi Greenstone Belt.

Figure 7-2 presents a summary of the geology in the immediate area of the Property. The Property is underlain by rocks of the Kidd-Munro and Timiskaming Assemblages and about 4 kilometres of the regionally significant Destor-Porcupine Fault Zone and a major splay, the Munro Fault Zone. Both fault zones comprise a variably altered and deformed sequence of metavolcanic rocks that include komatiites and tholeiitic basalts. The map also shows the location of Highway 101, the Jonpol and Garrcon shafts, the Jonpol adit and ramp and the Property boundary.

The Kidd-Munro Assemblage is comprised of massive to pillowed, mafic (high magnesium and iron tholeiites) and ultramafic (komatiite) metavolcanic rocks. The metavolcanic flows strike in a general east-west direction and dip steeply to the south, however, outcrop is limited and there is probably significant local folding, particularly in the vicinity of the major fault zones that cross the property. No surface exposures of ultramafic (komatiite) metavolcanics have been identified, however, in drill core there are abundant occurrences of talc schists, talc-carbonate schists, and carbonate-mariposite schists that are indicative of the presence of ultramafic or high magnesium tholeiites in the metavolcanic sequence. It is a clear possibility that the Munro and Porcupine-Destor faults are focused within the ultramafic rock units because of their high ductility compared to the more brittle mafic volcanic, felsic volcanic and sedimentary assemblages. The Munro fault hosts the Jonpol Deposit.

Timiskaming Assemblage clastic metasedimentary rocks, composed of conglomerate, wacke-sandstone, siltstone, argillite and schist, are closely associated with the Porcupine-Destor deformation zone from the Quebec border to Hislop Township a distance of approximately 65 kilometres (Berger, 2002). Banded magnetite-hematite iron formation is complexly interbedded and structurally interleaved with clastic metasedimentary rocks. The Timiskaming Assemblage is younger than the Kidd-Munro Assemblage and in the absence of faults; the contact between the assemblages is an angular unconformity. On the Property the Timiskaming Assemblage is fault bounded, on the north side by the Munro fault and on the south side by the Porcupine-Destor fault. The sedimentary beds strike in a general east-west direction and dip steeply to the south. In general along the Munro fault zone the bedding tops are facing to the north, whereas to the south along the Porcupine-Destor fault zone the bedding tops are facing to the south. The Timiskaming sediments host the Garrcon Deposit immediately north of the Porcupine-Destor fault.

Immediately to the south of the Property is a large, metamorphosed, alkalic intrusive stock with a plan view diameter of 4 to 4.5 kilometres (Figure 7-1). The intrusive varies in composition from granite to monzonite.

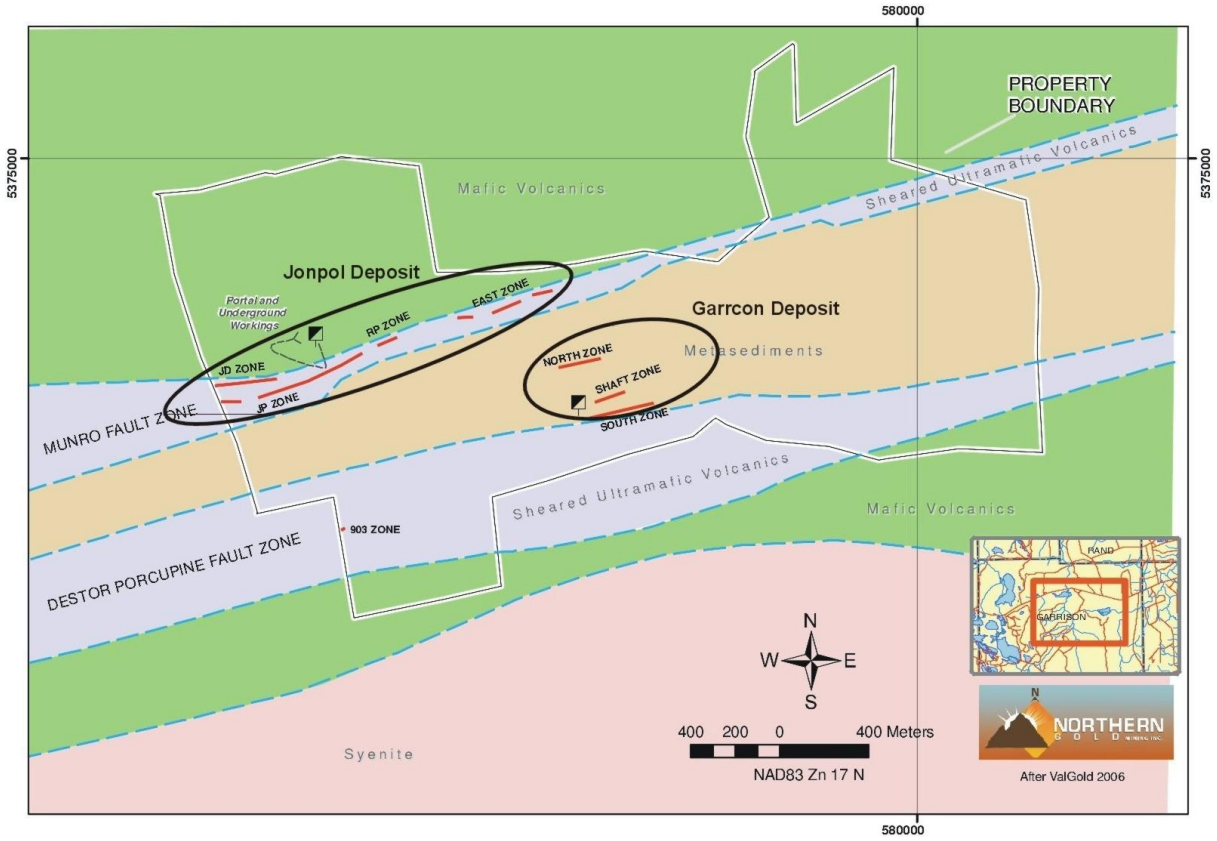


Figure 7-2: Property Geology

7.3 MINERALISATION

7.3.1 Garrcon Mineralised Zone

The Garrcon Zone exploration target located at UTM 5,373,700 metres north and 578,450 metres east on the Property includes the historic Shaft, South and North Zones. It occurs within the Timiskaming Assemblage adjacent to the Porcupine-Destor fault and is a zone of brecciated, silicified, metasediment with disseminated sulphides (pyrite and arsenopyrite) and irregular quartz veinlets. Preliminary metallurgical testwork indicates that the Garrcon mineralisation is non-refractory and is free milling (Section 13).

7.3.1.1 Host Rocks, Structures and Alteration

Sulphide-bearing gold mineralisation in the Garrcon North and Garrcon Shaft/South zones is hosted by Timiskaming-age sedimentary rock sequences that include greywacke, arkose and iron formation, occurring adjacent to the Destor-Porcupine Fault Zone (Figure 9-1). These sedimentary sequences have been hydrothermally altered and mineralized in distinct zones persisting to depth. Native gold grains and sulphide-bearing gold mineralisation occurs in quartz-carbonate vein stockworks. In this environment, gold may be encapsulated in sulphides or occur as native grains within crosscutting quartz veins. Principal minerals are native gold,

pyrite, magnetite, specularite arsenopyrite, and pyrrhotite with subordinate chalcopyrite, sphalerite and galena. Gangue minerals are vein quartz and carbonate (calcite, dolomite, and ankerite). Pervasive wall rock alteration is common adjacent to the veins, usually consisting of carbonatisation (ankerite or ferroan dolomite) and sulphides (pyrite, arsenopyrite, and pyrrhotite).

7.3.1.2 Length, Width, Depth and Continuity of Mineralisation

Development and mining at the Garrcon Shaft zone began in 1935 with the sinking of a 256 foot (78 metre) deep shaft by Consolidated Mining and Smelting Company of Canada Ltd. In 1986, diamond drilling by Cominco Ltd. delineated 2 new auriferous ore zones (the North and South zones) which were described as "stratabound". The South Zone was reported to be hosted by altered sedimentary rocks, with mineralisation averaging 6 feet (1.8 metres) in width, and traced by diamond drilling to 500 feet (152 metres) vertical along 1,300 feet (396 metres) of strike. The South Zone is described by Bath (1990) as striking 75°, dipping south at 50° and within about 70 feet (21 metres) of and/or within a regional scale, east-striking and steeply shear developed between clastic sedimentary rocks to the north and komatiitic rocks to the south. The North Zone was reported to be hosted in a shear zone, had been traced along strike for about 200 feet (61 metres) down to 500 feet (152 metres) in the vertical, and averaged 10.7 feet (3.3 metres) in width.

Howe's deposit model was developed with the aim of establishing a bulk tonnage resource estimate for the Company's Garrcon Deposit encompassing the known Shaft, South and North Zones and as such identifies a broad zone of mineralisation that extends over an east-west distance of 800 metres and remains open to the east. The mineralisation averages approximately 300 metres wide, with the narrowest width of 175 metres located on the more sparsely drilled eastern end of the zone, reaching a maximum width of 375 metres in the more densely drilled western portion of the zone. About half of the 800 metre east-west length of the zone is bounded by the Destor-Porcupine fault system on the south and the contact with mafic and ultramafic rocks on the north. Widths are still open on the remainder of the 800 metre strike length. Mineralisation included in the resource extends from surface across the entire zone to a depth of 125 metres on the more sparsely drilled eastern end and reaches a depth of up to 500 metres on the western half of the zone and remains open at depth.

7.3.2 Jonpol Deposit

The Jonpol Deposit (JD, JP, RP and East Zones) located at UTM 5,373,875 metres north and 577,325 metres east, was the primary exploration target on the Property in the 1980s and 1990s and is detailed in Howe's 2009 technical report (George, 2009). The Jonpol Deposit is a zone of gold mineralisation hosted in structurally controlled alteration zones within mafic to ultramafic (tholeiitic to komatiitic) rocks along the north contact of the Munro Fault which crosses the north-central part of the Property. The Jonpol gold mineralisation is generally associated with pervasive carbonate alteration with late stage silicification, sulphidisation (pyrite and arsenopyrite) and sericitisation, giving the altered rock a pale buff to pale purple-grey hue. Northern Gold reports that Lakefield testwork on behalf of previous operators indicated approximately 50% of the Jonpol mineralisation is refractory in nature.

8 DEPOSIT TYPES

8.1 EXPLORATION TARGETS

The Garrcon Zone exploration target on the Property includes the historic Shaft, South and North Zones. It occurs within the Timiskaming Assemblage adjacent to the Porcupine-Destor fault and is described as a zone of brecciated, silicified, sandstone with disseminated sulphides (predominantly pyrite) and irregular quartz veinlets. Preliminary metallurgical testwork indicates that the Garrcon mineralisation is non-refractory and is free milling (Section 13).

The Jonpol Deposit (JD, JP, RP and East Zones) was the primary exploration target on the Property in the 1980s and 1990s and is detailed in Howe's 2009 technical report (George, 2009). The Jonpol Deposit is a zone of gold mineralisation hosted in structurally controlled alteration zones within mafic to ultramafic (tholeiitic to komatiitic) rocks along the north contact of the Munro Fault which crosses the central part of the Property. The Jonpol gold mineralisation is generally associated with pervasive carbonate alteration with late stage silicification, sulphidisation (pyrite and arsenopyrite) and sericitisation, giving the altered rock a pale buff to pale purple-grey hue. Northern Gold reports that Lakefield testwork on behalf of previous operators indicated approximately 50% of the Jonpol mineralisation is refractory in nature.

8.2 DEPOSIT MODELS

Robert (1998) has provided an updated statement of the geological characteristics of Archean gold deposits (update of Robert 1996).

Robert has concluded that a close examination of the geological characteristics of Archean world-class gold deposits reveals a significant diversity in the nature and chemistry of the ore, hydrothermal alteration, and lithological or structural associations. Several geological styles of deposits can be distinguished:

- Quartz-carbonate veins in shear zones, faults and folds, and related extensional structures;
- Zones of stockwork veinlets and disseminated sulphides associated with small porphyry intrusions;
- Sulphide-rich veins and vein arrays;
- Gold-rich volcanogenic massive sulphide ("VMS") lenses in felsic volcanic rocks; and
- Rare carbonate-rich veins and siliceous replacements.

Geological relationships suggest that the porphyry-style, gold-rich VMS and possibly epithermal-style deposits have formed during the stages of construction (volcanic-plutonic activity) of the greenstone belts at depths of less than 5 kilometres, whereas orogenic deposits have formed during deformation at depths in excess of 5 kilometres.

These different styles of gold deposits commonly occur within the same districts or along the same fault zones, indicating that gold deposits within a given district formed at different crustal levels, at different times, and by different processes, and have been juxtaposed by successive episodes of burial, uplift, and deformation that have been focused in certain areas.

With specific reference to the southern Abitibi Greenstone Belt, where the Property is located, Robert notes that development begins with the accumulation of volcanic rocks in one or more cycles and the emplacement of coeval igneous intrusions. This represents the main phase of construction of volcanic plutonic edifices, which is partly accompanied by, but mostly followed by, turbidite (greywacke, shale and siltstone) sedimentation. This main phase of construction was followed by a first episode of deformation (D1) tilting, folding and overthrusting of supracrustal units, accompanied by diorite-tonalite intrusions. Subsequent uplift and erosion led to the deposition of alluvial-fluvial Timiskaming-type sedimentary rocks above an angular unconformity. This Timiskaming stage can be regarded as a renewed stage of volcano-plutonic construction as it was accompanied by the emplacement of high-level intrusives and volcanic rocks of alkalic composition. The Timiskaming stage was followed by the main period of deformation of the volcanic-plutonic edifices, beginning with regional D2 shortening across the belt and evolving into D3 transcurrent deformation.

Quartz-carbonate vein deposits consist of networks of quartz-carbonate veins in moderately to steeply dipping brittle-ductile shear zones and related extensional veins and vein arrays and breccia veins in relatively competent lithologic units. The deposits are spatially associated with major shear zones but have a tendency to be hosted by second and third order structures and splays. In the larger deposits, the vein networks have a surface footprint exceeding 1 kilometre of strike length and generally extend vertically to depths of 1 kilometre or more (McIntyre deepest levels were at approximately 2.5 kilometres below surface.

Robert (op cit) further noted that there is a strong association of world-class deposits with districts that contain a large proportion of mafic and ultramafic volcanic rocks.

In the Timmins gold camp, all of the above-mentioned styles of mineralisation can be found, and multiple styles can be found within a single mine, for example the Dome and Hollinger-McIntyre mines.

In quartz-carbonate vein deposits gold mineralisation occurs in both the veins and in adjacent altered wall rocks, with the bulk of the gold found in the veins. The mineralized veins consist of quartz and carbonate minerals, with subordinate amounts of pyrite, arsenopyrite, pyrrhotite, native gold, base metal sulphides, tourmaline, scheelite, talc, sericite and chlorite. Alteration envelopes, a few metres to tens of metres thick surround the veins, and may consist of reduced carbon, carbonatisation, potassium metasomatism, sodium metasomatism, sulphidisation and silicification (Card et al, 1988).

Carbonatisation is the most common and most extensive type of alteration in quartz vein deposits. This type of alteration involves the progressive replacement of Ca, Fe and Mg silicate minerals by carbonate species through the addition of carbon dioxide and is inwardly

zoned from calcite to ankerite and dolomite. Potassium metasomatism is found in close proximity to the veins as sericitisation of chlorite and plagioclase, the development of K-feldspar and biotite and the presence of fuchsite in ultramafic rocks. Sulphidation is restricted to the immediate wall rocks of the veins. Pyrite is the dominant sulphide with lesser amounts of pyrrhotite and arsenopyrite, but the volume of total sulphide minerals is generally less than 10%. Sodium metasomatism results in the formation of albite and paragonite. Silicification results in quartz flooding of the host rocks and an abundance of quartz veinlets and stockworks.

At the district and property scale, exploration for quartz-carbonate vein gold deposits focuses on broad transpressional shear zones located along lithologic boundaries. The gold mineralisation tends to occur within structures measuring hundreds to thousands of metres long that are subsidiary to major fault zones. At a more local scale mapping of alteration mineral assemblages can delineate favourable portions of shear zones. Even though the sulphide content of the quartz veins and the associated wall rock alteration is low, induced polarisation and resistivity geophysical methods result in a recognizable chargeability response, while the increased quartz content is recognized as an increase in resistivity. Carbonatisation causes destruction of magnetic minerals in mafic rocks, creating a negative magnetic feature coincident with alteration surrounding the lode deposits. In glaciated areas, geochemical surveys using heavy mineral concentrates derived from sampling till can be used to define areas of potential lode gold mineralisation. In addition, Mobile Metal Ion-type soil geochemical surveys have proven to be applicable in overburden covered areas.

9 EXPLORATION

The primary focus of Northern Gold's work and expenditures has been the Garrcon Deposit located in the south central portion of the Garrison Gold Property. Work programs implemented by Northern Gold since 2009 include geophysics, surface stripping/sampling, diamond drilling, asset and infrastructure rehabilitation, and environmental baseline studies.

This section outlines work completed by Northern Gold on the Property through May, 5, 2011, the cut-off date for the updated mineral resource estimate. As of this date, collar information was available for drill holes up to GAR-11-82 and GAR-11-90 to GAR-11-91 however other information (such as assay information) were not yet available/completed for some of the more recently drilled holes. In this report the updated mineral resource estimate and PEA includes new assay data from all 2010 drill holes except GAR-10-29 and 2011 drill holes GAR-11-49, GAR11-59 to GAR-11-63 and GAR11-70 to GAR-11-74. Assay data for GAR-11-64 to GAR-11-69 and GAR-11-75 onward were not yet available at the cut-off date for the mineral resource estimate. These remaining 2011 diamond drill holes will be reported in future technical reports when assay results are obtained and incorporated into future resource updates.

Mineral exploration activities including diamond drilling, core logging, sampling and assaying are ongoing at the Garrcon Deposit at the time of this report.

9.1 NORTHERN GOLD 2009 EXPLORATION

Exploration conducted by Northern gold is described in detail in Howe's 2010 technical report (Roy and Trinder, 2010). Work included:

- Satellite imagery; 25 square kilometer area over the entire Garrison Gold Property.
- Due diligence review of the ValGold data to identify errors and omissions.
- 11 NQ diamond drill holes on the Garrcon Deposit totaling 2,330 metres.

9.2 2010 SURFACE GRID AND GEOPHYSICS

Northern Gold contracted Kirkland Gems and Minerals, PO Box 834, Kirkland Lake, Ontario P2N 3K4, to chainsaw cut 40 line kilometres of grid on the Garrison Gold Property between February 9th and March 18th 2010. The grid covers the entire property and includes a baseline with an azimuth of 070°/250° True North. Twenty nine grid lines were cut perpendicular to the grid at 340°/160° True North and one tie line was cut parallel to the baseline (Figure 9-1). Grid lines were spaced at 100 metre intervals with stations picketed every 25 metres. Northern Gold's Civil Technician, Dave Eves subsequently completed a GPS survey of the grid lines.

The Company contracted Larder Geophysics, 14579 Government Rd., Larder Lake, Ontario P0K 1L0, to complete a ground magnetometer - VLF/EM survey over the entire 40 kilometres of grid. The survey was conducted with a GSM-19 v7 Overhauser magnetometer in walking mag/VLF mode. Readings were collected every second with the position extrapolated using the time to go 12.5m. VLF samples were taken at 12.5m sample intervals. A second GSM-19

was employed as a base station for diurnal correction. A total of 38.2125 line kilometers of magnetic and VLF EM surveying was conducted over a five day period between April 19th and April 28th, 2010. The survey consisted of 59838 magnetometer, and 3057 VLF EM readings.

The contoured Total Field magnetics plan map is presented in Figure 9-2. The zone of higher magnetic response sub-paralleling the baseline to the south corresponds to the Porcupine-Destor Fault. The large ovoid shaped area of extremely high magnetic response on the baseline corresponds to magnetite iron formation.

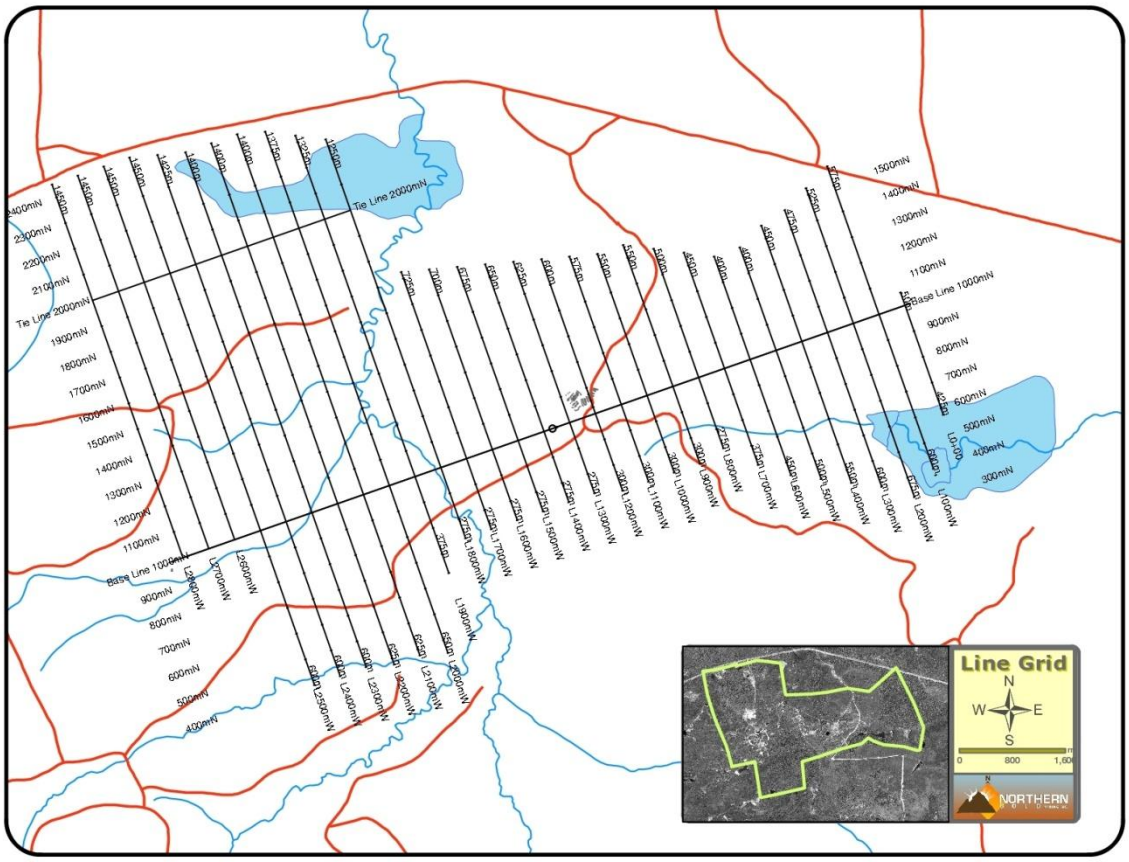


Figure 9-1: 2009 Exploration Grid Layout

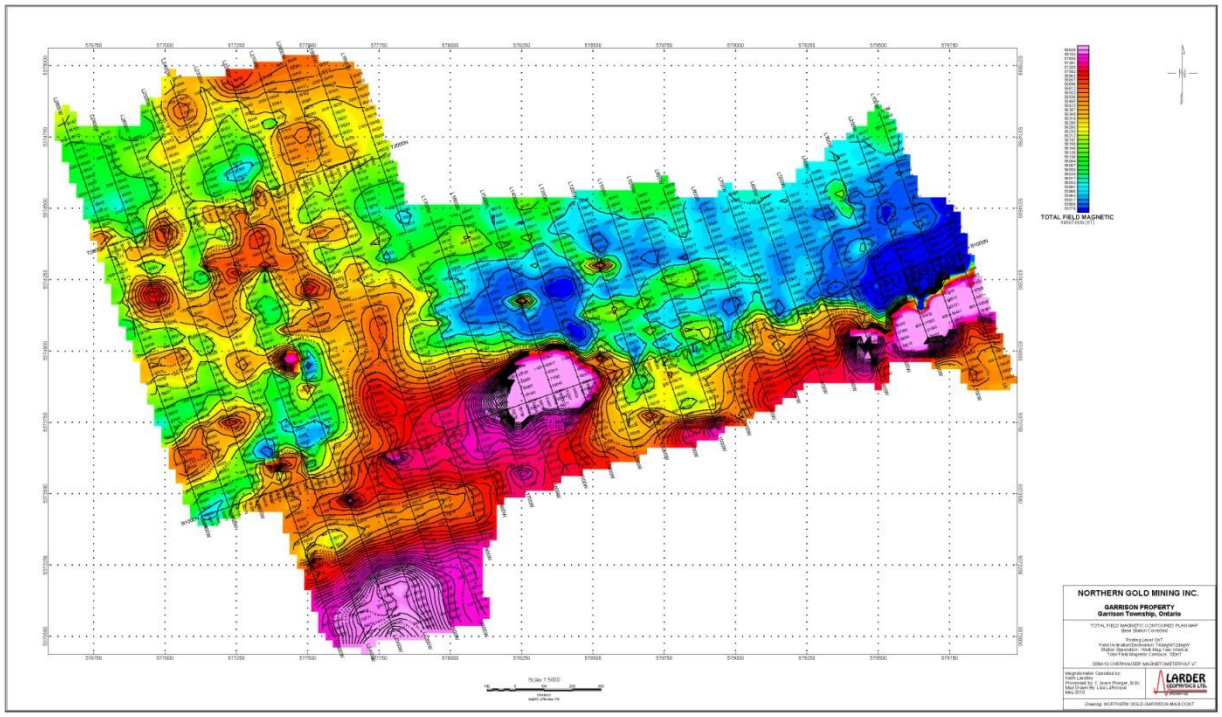


Figure 9-2: 2010 Contoured Total Field Magnetic Plan Map – Garrison Gold Property

9.3 2010 DRILL HOLE COLLAR SURVEY

On attempting to ground truth collar locations of historical Garrcon diamond drilling it was evident that there were inconsistencies in the data supplied by ValGold. Northern Gold identified location inaccuracies related to diamond drill holes drilled from the "Cominco Grid". Ground-truthing deemed collar locations for holes drilled from the historical "Newfield Grid" to be accurate. Between January 26th and May 30th 2010, Northern Gold's Civil Technician, Dave Eves utilized a differential global positioning system (DGPS) to identify multiple drill holes and historical grid lines on the "Cominco Grid" and reposition these holes and grid lines to fit the ground-truthed model. The overall repositioning resulted in a roughly 10 metre shift to the West for all "Cominco Grid" drill holes.

9.4 2010 REHABILITATION

In addition to property and core rehabilitation work conducted on the property in 2009 (Roy and Trinder, 2010), the following work was conducted in 2010:

New core storage pads were constructed and new core storage racks were purchased and set up at the core shack facility. The core shack building was expanded to provide additional short term drill core storage until logging and splitting are completed, improve the core splitting work area and provide covered cold storage for ATV's and snow machines.

9.5 2010 SURFACE STRIPPING / SAMPLING

Following receipt of high grade assays from grab samples collected on an outcropping quartz vein identified as the 1070 vein, prospecting found other quartz veins and evidence of earlier Cominco (?) work nearby. Consequently, a surface stripping program was initiated at the Garrison site on May 13th and conducted intermittently until July 3rd 2010. A total of four areas were stripped of overburden with an excavator and washed using a Wajax fire pump. The total surface area exposed in all four areas is roughly 5000 m^2. The areas stripped and washed are identified in Figure 9-3 as the light beige stippled areas.

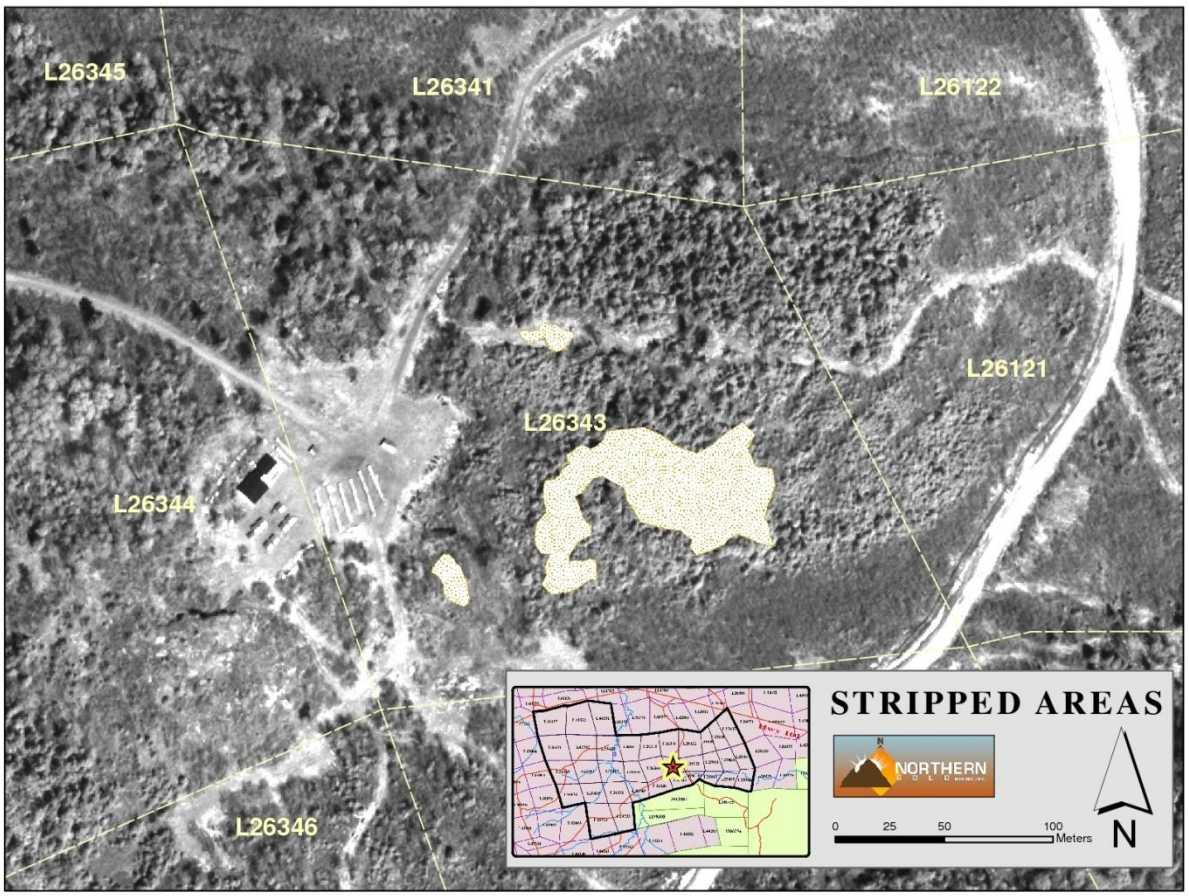


Figure 9-3: 2010 Garrcon Surface Stripping Locations

The largest of the three stripped areas focused on multiple high-grade veins found east of the core shack along the Garrcon Shaft Zone with visible gold frequently observed in the newly exposed quartz veins. The other two stripped areas were significantly smaller, focusing on small surface showings around drill hole collars from previous drilling by Northern or other operators.

Approximately 150 metres of channel samples were cut on the newly exposed outcrops with a self-propelled circular saw using a diamond cutting blade in July and August 2010 (Figure 9-4 and Figure 9-5). Samples were collected from the channels at a maximum of one metre intervals. Channels were cut with an approximate 4 centimetre width and 4 centimetre depth. Channels were cut in both north-south and east-west directions and tested both overall mineralized zones and specific veins/stringers. Channel samples returning greater than 0.3 and 0.5 g/tonne gold are highlighted in yellow and red in (Figure 9-4 and Figure 9-5). Detailed mapping and additional sampling on a more detailed east-west and north-south grid pattern is recommended at stripped area C and possibly area B and outcrop area D. Sampling on an orthogonal grid pattern will assist in confirming the spatial distribution of the gold mineralization.

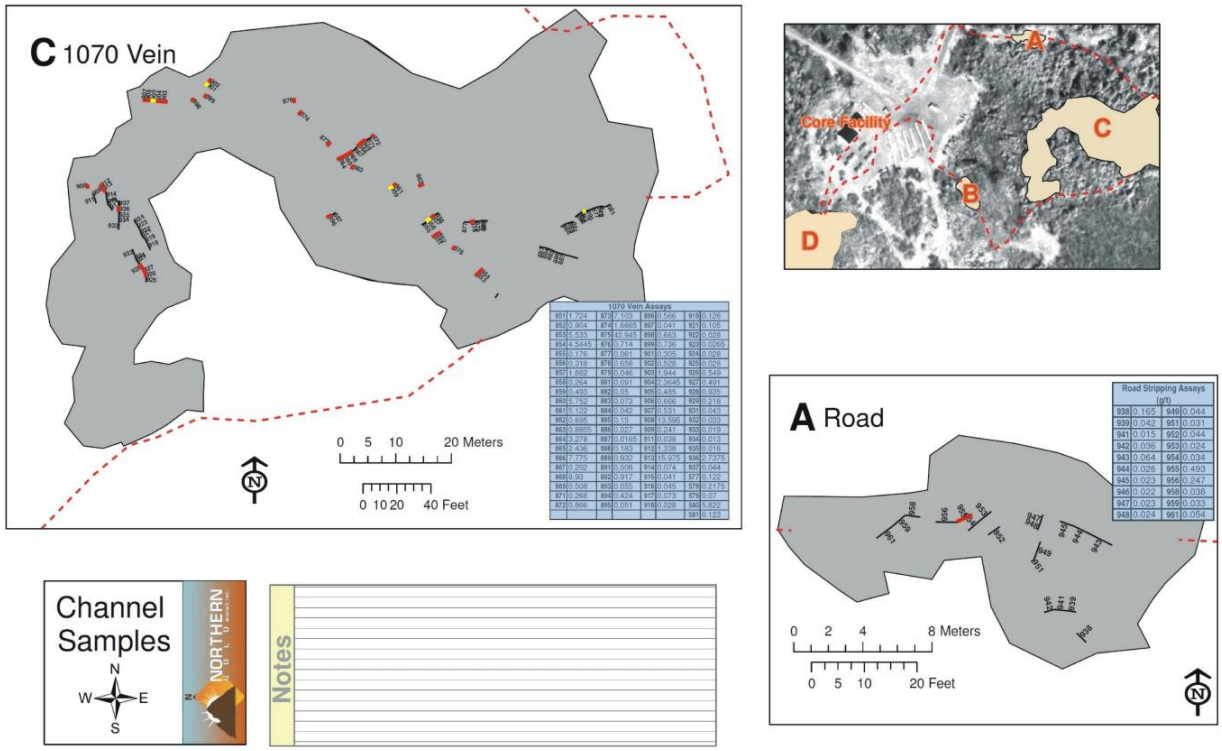


Figure 9-4: Distribution of Surface Channel Samples and +0.3 g/tonne Au Intervals (+0.3 and +0.5 g/tonne Au highlighted yellow and red respectively)

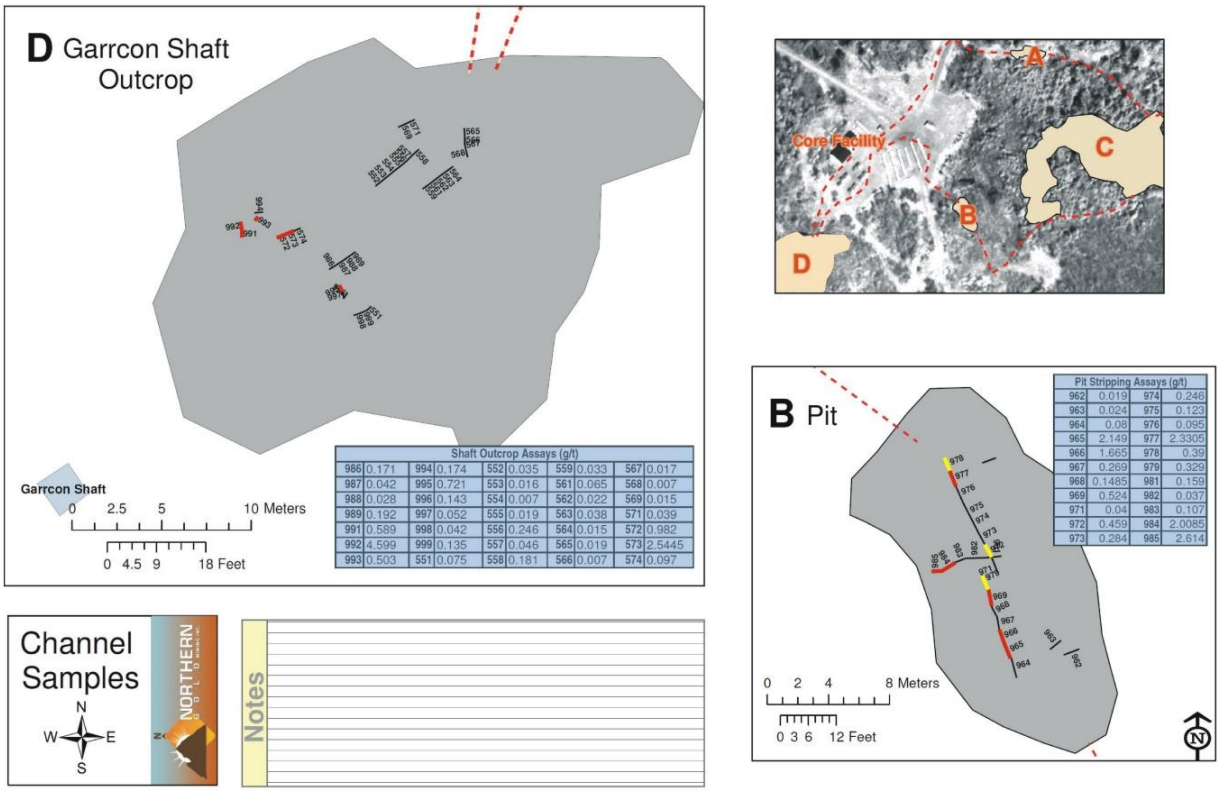


Figure 9-5: Distribution of Surface Channel Samples and +0.3 g/tonne Au Intervals (+0.3 and +0.5 g/tonne Au highlighted yellow and red respectively)

9.6 2010 – 2011 Environmental Baseline Study / Permitting

Northern Gold retained N.A.R. Environmental Consultants Inc. (NAR) of Sudbury, Ontario in 2010 to initiate environmental baseline studies on the Garrison property in anticipation of advanced exploration permitting and potential resource development. NAR's program to date is presented in Section 20 of this report.

9.7 2010 Metallurgical Testing

In late 2010, Northern Gold submitted two samples of Garrcon mineralization to SGS Mineral Services of Lakefield, Ontario for preliminary metallurgical testwork. Results of the testwork are presented in Section 13 of this report.

9.8 2010 Petrographic Study

Northern Gold submitted a fourteen drill core samples to Craig H.B. Leitch, Ph.D., P. Eng., 492 Isabella Point Road, Salt Spring Island, B.C. for petrographic study in late 2010.

Mr. Leitch was provided the samples without field names in order not to influence his interpretation. He therefore based his rock type classification on petrographic textures. Mr.

Leitch identified two mafic metavolcanic samples (PS-1 and 5), two intermediate crystal tuff samples (PS-6 and 7), seven felsic tuff to ash tuff samples (PS-4 and 8 to 13), two samples of possible hypabyssal intrusive porphyry (one felsic, PS-2, and one mafic, PS-14), and one sample of magnetite facies banded iron formation (BIF) (PS-3).

Albite-Kspar-dolomitic alteration or ankeritic carbonate-quartz-chlorite-sericite-pyrite-magnetite/hematite-rutile alteration is significant in most of the samples except PS-14, and is generally associated with intense, locally pervasive, stockworks of thin veinlets of quartz-carbonate ±albite-Kspar-chlorite-sulfides-magnetite/hematite, very minor chalcopyrite and possible trace sphalerite.

Gold was observed in two samples, PS-8 (included in, or along microfractures in, vein pyrite) and PS-11 (in Kspar or carbonate-chlorite-pyrite-hematite-local native gold stockwork veins). Gold was not observed in PS-13 which was reported to contain visible gold in the hand specimen.

9.9 2011 IP GEOPHYSICAL SURVEY

An induced polarization (IP) survey was conducted by Peter E. Walcott & Associates Limited of 608 - 1540 West 2nd Ave. Vancouver British Columbia, using a pulse type system. The principal components of the system are manufactured by Instrumentation GDD Inc. of Quebec and basically consist of three units, a GDD GRx16 Receiver and a GDD 5 KW Transmitter powered by a Honda 6.5 Kw Generator.

The survey was carried out using the "pole-dipole" method of surveying. In this method the current electrode, C_1, and the potential electrodes, P_1 through P_{n+1}, are moved in unison along the survey lines at a spacing of "a" (the dipole) apart, while the second current electrode, C_2, is kept constant at "infinity". The distance, "na" between C_1 and the nearest potential electrode generally controls the depth to be explored by the particular separation, "n", traverse.

Measurements – first to tenths separation – of apparent chargeability – the IP response parameter – and resistivity were made along the traverse lines with 25 and 50 metre dipole in various areas of the survey grid on 100 and 200 metre line spacing respectively.

Horizontal positions were recorded using a Garmin GPSMAP60CX. This handheld unit has an accuracy of plus or minus 3 metres in excellent conditions with degradation to plus or minus 15 metres in obstructed areas such as thick forest. Northings, eastings and GPS elevations were recorded every 100 metres along the lines, although the latter was not used.

Station elevations were recorded using a Brunton ADC Summit altimeter. This instrument measures elevations using barometric pressures to an accuracy of plus or minus 3 metres. Corrections for errors due to variations in atmospheric pressure were made by comparison to readings obtained on a similar instrument, held stationary at a base location at 2 minute intervals. Altimeter elevations were recorded every 50 metres.

A total of some 34 kilometres of IP surveying was completed over the property between February 15 and March 20, 2011.

The I.P. data are presented as individual pseudo section plots of apparent chargeability and resistivity at a scale of 1:5,000. Interpretation of the IP data is ongoing at the time of this report.

9.10 2011 SPECTROGRAPHIC CORE MAPPING

Northern Gold retained Photonic Knowledge Inc. of 481 Grande-Côte Rosemere, Québec in the spring of 2011 to conduct a test of its Core Mapper hyperspectral imaging system in two phases. The first phase was a 5,000 meter test scan of Garrcon core including the generation of a project specific spectral library. Phase 2 is dependant on the results of Phase 1 and will consist of a 25,000 meter test to scan an additional 20,000 meters of Garrcon core and 5,000 meters of Jonpol East Zone core.

The Core Mapper system collects spectral data between wavelengths of 400 and 1000 nanometres, simultaneously analyzing up to 5 boxes of drill core with resolution of up to 1 mm^2 per pixel and a field of view of 1.5 m^2. Up to 1,000 metres of NQ core may be processed per 12 hour shift. The hyperspectral data is then processed to generate:

- A high-definition RGB image (classic "photograph") of the core samples.
- A Spectral classification of elements based of a spectral library highlighting mineralogy, lithology and alteration.
- A linearized image of the spectral classification.
- A digital file with hyperspectral data for import into drilling logs and modeling software.

Photonic Knowledge generated a preliminary spectral library using core samples provided by Northern Gold and applied it to the initial test of 4,900 metres. At the time of this report, the spectral library is being refined by Photonic Knowledge for use as a lithologic library. Photonic collected additional core samples to develop a separate alteration-based spectral library. Hyperspectral (and visual) identification of various lithologies at Garrcon is complicated by the pervasive overprint alteration minerals, Northern Gold and Photonic Knowledge's current plan is to develop two spectral libraries, one to identify lithologies and the other alteration.

9.11 2010 AND 2011 DIAMOND DRILL PROGRAMS

Northern Gold's 2010 and ongoing 2011 diamond drill programs focused in-fill drilling and expanding the initial 2010 mineral resource estimate (Roy and Trinder, 2010) on the Garrcon Deposit. The drill programs are described in Section 10 of this Report.

10 DRILLING

10.1 HISTORICAL DRILLING ON GARRCON DEPOSIT

Initial drilling on the Garrcon Deposit occurred in the period 1935-1946 with additional drilling completed during 1983. None of this data is available in sufficient detail to be included in Northern Gold's current drill hole database. The most important historic data relating to Garrcon Deposit is the exploration work completed since 1985 by Cominco / Jonpol Explorations Ltd. and by ValGold Resources Inc.

The following surface diamond drill holes were completed by Cominco/Jonpol during the period 1985 to 1988 and by ValGold during 2006 and 2007. Northern Gold's current drill hole and resource database includes only holes drilled between 1985 and present (Appendix A).

Table 10-1: Historic Drilling included in Northern Gold's Drill Hole and Resource Database

Company	Year	# Drill Holes	Length (m)
Cominco/Jonpol	1985	5	619.2
Cominco/Jonpol	1986	14	2,696.5
Cominco/Jonpol	1986-1987	6	1,417.3
Cominco/Jonpol	1987	11	3,481.4
Cominco/Jonpol	1988	3	592.3
ValGold	2006	10	3,393.0
ValGold	2007	5	2,361.0
	Total	**54**	**14,560.7**

10.2 NORTHERN GOLD 2009 DRILL PROGRAM

Northern Gold's 2009 diamond drill program focused on verifying results by in-filling historic drilling of the Shaft, South and North zones at the Garrcon Deposit. Northern Gold personnel supervised the Program.

Northern Gold's 2009 Garrcon Deposit diamond drilling program commenced October 26, 2009 and was completed on December 11, 2009. The program consisted of 2,330 metres of NQ core (47.6 millimetres diameter) in 11 drill holes. All holes were completed to their planned depths except holes GAR-09-03 and GAR-09-07 which were lost when they encountered the historic Cominco underground workings. GAR-09-03 required an offset and restart as GAR-09-03A. In 2010, hole GAR-10-12 was offset 3 metres from GAR-09-07 and completed to planned depth.

Table 10-2: 2009 Garrcon Diamond Drill Program

HOLE ID	*Easting (UTM m)	*Northing (UTM m)	Elev (m-asl)	Azimuth	Dip	Length (m)	Start	Finish	Target Zone
GAR-09-01	578625.69	5373998.41	303.08	343.5	-40.5	177	10/27/2009	10/29/2009	Garrcon North Zone
GAR-09-02	578663.81	5373881.84	288.96	339.2	-44.6	350	10/29/2009	11/3/2009	Garrcon Shaft Zone / Garrcon North Zone
GAR-09-03	578592.92	5373945.58	298.62	159.8	-43.7	80	11/3/2009	11/4/2009	Garrcon Shaft Zone
GAR-09-03A	578597.71	5373937.13	297.34	154.3	-43.7	198	11/24/2009	11/27/2009	Garrcon Shaft Zone
GAR-09-04	578503.28	5373963.24	304.50	156.0	-42.6	291	11/4/2009	11/12/2009	Garrcon Shaft Zone
GAR-09-05	578530.59	5373968.35	304.07	162.5	-45.6	288	11/12/2009	11/17/2009	Garrcon Shaft Zone
GAR-09-06	578660.36	5373954.00	299.24	170.4	-45.3	189	11/17/2009	11/19/2009	Garrcon Shaft Zone
GAR-09-07	578652.64	5373974.63	302.21	165.9	-45.2	83	11/24/2009	11/25/2009	Garrcon Shaft Zone
GAR-09-08	578623.16	5373950.27	297.99	340.8	-45.3	237	11/28/2009	11/31/2009	Garrcon North Zone
GAR-09-09	578614.22	5374027.55	303.48	343.4	-45.4	150	11/31/2009	12/3/2009	Garrcon North Zone
GAR-09-10	578955.18	5374116.90	289.52	162.5	-45.0	290	12/8/2009	12/11/2009	Garrcon Shaft Zone

* North American Datum 1983

A detailed description of the 2009 Northern Gold drill program is presented in Howe's 2010 technical report and mineral resource estimate (Roy and Trinder, 2010).

10.3 2010 DIAMOND DRILLING

Northern Gold's 2010 diamond drill program at the Garrcon Deposit focused on infill drilling and some expansion of the east end of the resource where there were fewer holes (local grid sections -1050mE, -1100mE and -1130mE). Northern Gold personnel supervised the Program.

In 2010, Northern Gold contracted with Major Drilling International Group (Major) for a planned 10,000 metre diamond drilling program on the Garrcon Deposit. Major began drilling May 10, 2010 and as of December 16, 2010, 11,250 metres of NQ diamond drilling had been completed in 47 drill holes (GAR-10-11 to GAR-10-48 and GAR-10-50 to GAR-10-58, Table 10-3). Three holes failed in overburden and required restarts (Table 10-3).

Major used up to two VD5000 skid-mounted rigs which operated on two 12-hour shifts per day, five days per week. The drill contractor constructed drill access trails and drill pads. Drill water was supplied by pump and hose from a local surface water sources.

In this report the updated mineral resource estimate and PEA includes new assay data from all 2010 drill holes except GAR-10-29.

The Company had completed up to hole GAR-10-22 at the time of Howe's first property visit on July 12, 2010. The drill rig was onsite but the drilling program was on a three week break.

Table 10-3: 2010 Garrcon Diamond Drill Program

DDH ID	*Easting UTM m	*Northing UTM m	Elev DGPS m	Azimuth	Dip	Length m	Start	Finish	Rig ID	Comments
GAR-10-11	578670.99	5373929.01	295.81	161.6	-44.0	129	5/10/2010	5/12/2010	1416	Reflex survey
GAR-10-12	578648.29	5373970.62	302.22	155.3	-45.4	237	5/12/2010	5/14/2010	1416	Reflex survey
GAR-10-13	578580.97	5373988.15	304.20	346.6	-44.0	231	5/17/2010	5/20/2010	1416	Reflex survey
GAR-10-14	578479.55	5373955.29	304.67	162.6	-45.9	324	5/20/2010	5/28/2010	1416	Reflex survey
GAR-10-15	578590.77	5374020.43	304.29	339.9	-42.8	138	5/28/2010	6/1/2010	1416	Reflex survey
GAR-10-16	578640.94	5374014.25	304.74	162.2	-44.3	297	6/1/2010	6/7/2010	1416	Reflex survey
GAR-10-17	578535.57	5373932.61	306.78	166.2	-45.0	260	6/8/2010	6/11/2010	1416	Reflex survey
GAR-10-18	578573.07	5373990.71	304.14	162.0	-46.5	330	6/14/2010	6/17/2010	1416	Reflex survey
GAR-10-19	578704.55	5373992.25	309.44	179.2	-45.8	231	6/18/2010	6/22/2010	1416	Reflex survey
GAR-10-20	578793.78	5374012.52	306.07	241.9	-44.9	75	6/22/2010	6/24/2010	22	Reflex survey
GAR-10-20X**					-44.9	276	8/24/2010	8/31/2010	22	Reflex survey
GAR-10-21	578776.30	5374014.96	305.62	245.9	-44.7	51	6/24/2010	6/25/2010	22	Reflex survey
GAR-10-22	578760.14	5373937.58	290.69	160.0	-45.0	96	6/28/2010	6/29/2010	22	Reflex survey
GAR-10-23	578552.85	5373978.22	304.22	158.8	-44.8	336	7/19/2010	7/23/2010	22	Reflex survey
GAR-10-24	578526.18	5374017.96	303.83	349.1	-44.5	120	7/23/2010	7/26/2010	22	Reflex survey
GAR-10-25	578496.95	5373985.64	304.86	161.5	-44.0	354	7/27/2010	8/3/2010	22	Reflex survey
GAR-10-26	578505.04	5373932.63	304.44	156.6	-43.9	291	8/3/2010	8/10/2010	22	Reflex survey
GAR-10-27	578505.98	5373822.07	289.31	337.3	-48.5	177	8/10/2010	8/12/2010	22	Reflex survey
GAR-10-28	578552.15	5373880.99	293.41	164.9	-58.2	150	8/12/2010	8/16/2010	22	Reflex survey
GAR-10-29	578653.37	5373860.56	289.55	343.5	-44.8	351	8/17/2010	8/24/2010	22	Reflex survey
GAR-10-30	578689.55	5373970.86	302.10	342.2	-45.8	249	9/1/2010	9/7/2010	22	Reflex survey
GAR-10-31	578674.38	5374013.26	305.67	340.3	-45.6	192	9/8/2010	9/10/2010	21	Reflex survey
GAR-10-32	578719.82	5373891.33	289.48	341.3	-45.6	339	9/13/2010	9/20/2010	21	Reflex survey
GAR-10-33	578706.49	5373928.23	292.47	339.1	-43.4	300	9/20/2010	9/24/2010	21	Reflex survey
GAR-10-34	578658.25	5374058.05	304.81	340.0	-45.0	42	9/24/2010	9/27/2010	21	Failed in overburden
GAR-10-34B	578658.25	5374058.05	304.81	340.0	-45.0	43	9/28/2010	9/28/2010	21	Failed in overburden
GAR-10-34C	578658.25	5374058.05	304.81	338.2	-45.3	135	9/28/2010	9/29/2010	21	Reflex survey
GAR-10-35	578564.77	5374099.45	301.75	341.1	-43.3	66	9/30/2010	9/30/2010	21	Reflex survey
GAR-10-36	578735.22	5373856.00	288.65	340.9	-44.0	300	10/1/2010	10/7/2010	21	Reflex survey
GAR-10-37	578744.31	5373822.14	288.16	341.8	-43.8	300	10/7/2010	10/15/2010	21	Reflex survey
GAR-10-38	578611.53	5373892.61	292.12	160.0	-45.0	70	10/15/2010	10/18/2010	21	Failed in overburden
GAR-10-38A	578611.53	5373892.61	292.12	155.1	-62.9	126	10/18/2010	10/19/2010	21	Reflex survey
GAR-10-39	578600.49	5373850.00	289.62	342.6	-43.3	300	10/19/2010	10/25/2010	21	Reflex survey
GAR-10-40	578558.84	5373963.64	303.60	343.4	-44.8	225	10/25/2010	10/28/2010	21	Reflex survey
GAR-10-41	578572.50	5373991.40	304.07	160.4	-78.1	225	10/29/2010	11/1/2010	21	Reflex survey

DDH ID	*Easting UTM m	*Northing UTM m	Elev DGPS m	Azimuth	Dip	Length m	Start	Finish	Rig ID	Comments
GAR-10-42	578517.48	5374013.13	304.02	159.9	-45.0	300	11/3/2010	11/9/2010	21	Reflex survey
GAR-10-43	578611.26	5373897.81	292.47	339.8	-44.7	300	11/9/2010	11/16/2010	21	Reflex survey
GAR-10-44	578627.56	5373851.79	289.87	340.4	-43.3	330	11/16/2010	11/23/2010	21	Reflex survey
GAR-10-45	578528.20	5373910.68	302.08	348.2	-45.0	351	11/24/2010	11/29/2010	21	Reflex survey
GAR-10-46	578554.10	5373851.37	289.97	326.8	-44.9	300	11/29/2010	12/9/2010	21	Reflex survey
GAR-10-47	578405.43	5374123.97	295.80	160.0	-45.0	234	12/10/2010	12/13/2010	21	Reflex survey
GAR-10-48	578384.77	5374168.77	293.60	160.0	-45.0	249	12/13/2010	12/17/2010	21	Reflex survey
GAR-10-50	578758.43	5373933.27	290.62	335.3	-45.2	300	10/25/2010	11/3/2010	1437	Reflex survey
GAR-10-51	578742.88	5373970.58	294.79	343.9	-45.4	300	11/3/2010	11/10/2010	1437	Reflex survey
GAR-10-52	578727.43	5374033.41	309.06	2.1	-45.8	198	11/10/2010	11/15/2010	1437	Reflex survey
GAR-10-53	578638.53	5374106.66	302.81	338.5	-44.7	87	11/16/2010	11/17/2010	1437	Reflex survey
GAR-10-54	578594.94	5374096.69	302.30	341.6	-45.2	81	11/17/2010	11/19/2010	1437	Reflex survey
GAR-10-55	578791.02	5373978.99	292.44	336.4	-45.0	270	11/23/2010	11/28/2010	1437	Reflex survey
GAR-10-56	578810.08	5373936.11	288.41	340.0	-45.0	351	11/28/2010	12/9/2010	1437	Reflex survey
GAR-10-57	578780.28	5374020.80	306.22	340.9	-46.8	213	12/10/2010	12/13/2010	1437	Reflex survey
GAR-10-58	578766.25	5374061.98	310.34	340.0	-45.0	175	12/13/2010	12/16/2010	1437	Reflex survey
					Total	11,250	***			

* North American Datum 1983
**GAR-10-20X is the 276m extension of GAR-10-20 (75m) for a total hole depth of 351m
***Total excludes the failed holes (155m)

Upon completion of drill holes, drill hole collar coordinates and elevations were surveyed in UTM coordinates (NAD83) utilizing a Magellan Mobile Mapper CX DPGS with a horizontal accuracy of 0.3m. GPS coordinates of all collar locations were recorded and tied into the exploration grid. Northern Gold subsequently had all 2009 and 2010 drill holes resurveyed by Mazac Geoservices Inc. of 34, 9e Avenue Ouest, La Sarre, Quebec utilizing a Leica 1200 GPS system and Stabila electronic level.

The drill contractors completed down-hole directional surveys on all diamond drill holes at approximately 100 metre intervals using a Reflex EZ Shot single shot digital survey tool.

The drill casing was left in each hole and capped to permit future downhole geophysical testing and/or deepening of the holes.

Core was retrieved from the drill string using conventional wireline techniques. Core was removed from the core tube by drilling personnel and carefully placed in core boxes. Filled core boxes were removed from the drill site at shift change by drilling personnel and brought to Northern Gold's secure core logging and sampling facility at the Property. At the facility, the core was laid out on workbenches and cleaned prior to logging and sample interval marking.

The drill core was logged by a Northern Gold geologist who recorded a geotechnical log of core recovery and RQD measurements and a descriptive log including rock type (maintaining consistency with previous work), structure, alteration, and mineralisation (including presence of VG, quartz veining and its angle with the axis of the core). Drill core and sample information were input into a digital database using portable computer workstations at the workbenches. The geologist selected the sample intervals (as described in Section 10.5.1) and input the intervals into the drill hole database. The core was digitally photographed before sampling. The core sampling technician marked the sample cut line on the core prior to cutting.

Following core logging, the core was sampled as detailed in Section 10.5. At the completion of hole GAR-10-58, a total of approximately 10,512 core samples excluding standards, blanks and duplicates had been collected and sent to the laboratory for assay.

Digital assay files provided by Swastika Laboratory were merged with a "from" and "to" interval file created by Northern, with the sample number linking the two files. This methodology limits data entry errors to sample numbering, as well as the "from" and "to" specifications; assay data re-entry errors are therefore avoided. Sample numbering errors are identified during the merging process.

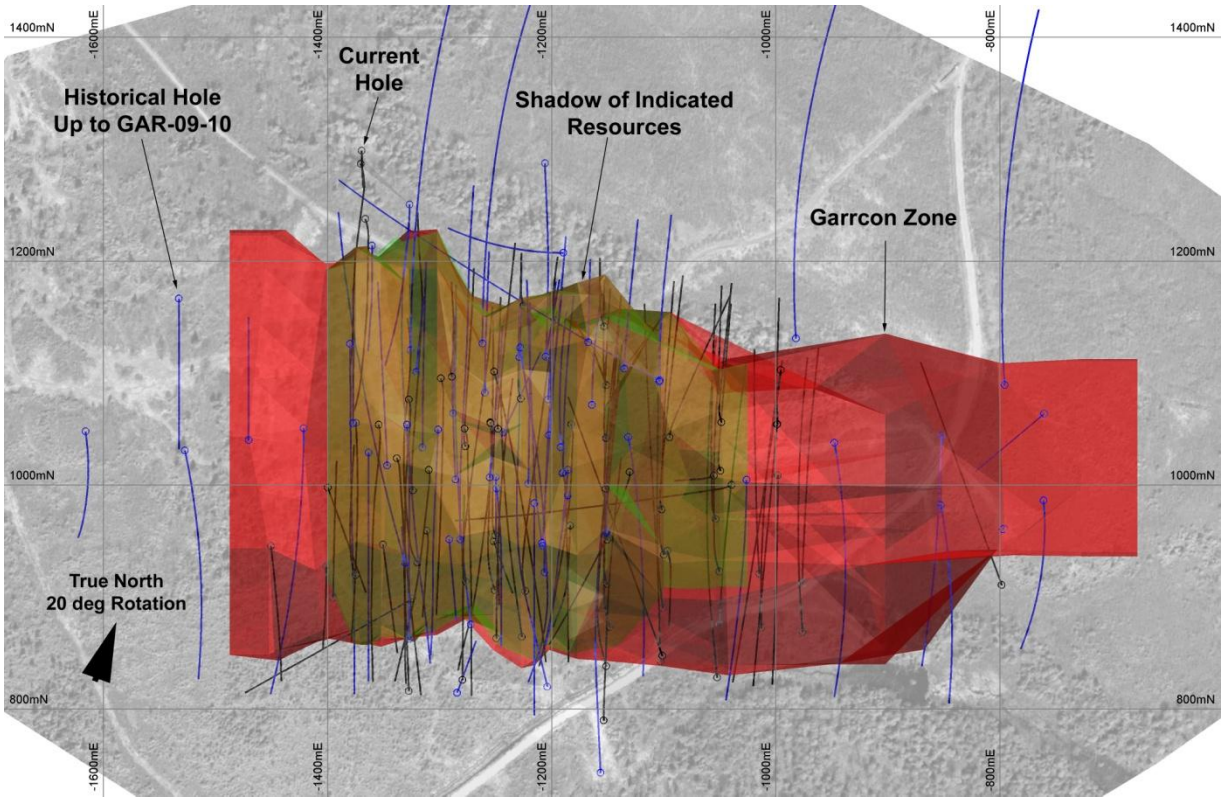


Figure 10-1: Northern Gold Diamond Drill Hole Plan

10.4 2011 DIAMOND DRILLING

Northern Gold's 2011 diamond drill program is a continuation of its 2010 program and is focused on infill and step-out drilling at the Garrcon Deposit. Northern Gold personnel are supervising the Program as in 2009 and 2010.

The drill contractor, Major Drilling International Group (Major), resumed drilling January 4, 2011 and as of the date of this report (June 23, 2011), 12,836 metres of NQ diamond drilling has been completed in 44 drill holes (GAR11-49 and GAR-11-59 to GAR-11-101 plus hole extensions GAR-11-37X, 11-39X, 11-50X, 11-70X, 11-74X, Table 10-3). One hole failed in overburden and required a restart (Table 10-3).

Major is using two VD5000 skid-mounted rigs which are operated on two 12-hour shifts per day, five days per week. The drill contractor constructs drill access trails and drill pads. Drill water was supplied by pump and hose from a local surface water sources.

As of May 5, 2011, the cut-off date for the updated mineral resource estimate, collar information was available for drill holes up to GAR-11-82 and GAR-11-90 to GAR-11-91 however other information (such as assays) were not yet available/completed for some of the more recently drilled holes. In this report, the updated mineral resource estimate and PEA includes new assay data from 2011 drill holes GAR-11-49, GAR11-59 to GAR-11-63 and GAR11-70 to GAR-11-74. Assay data for GAR-11-64 to GAR-11-69 and GAR-11-75 onward were not yet available at the cut-off date for the mineral resource estimate. These remaining 2011 diamond drill holes will be reported in future technical reports when assay results are obtained and incorporated into future resource updates. Drill holes GAR-11-75 to GAR-11-101 (completed as of the date of this report) are included in **Table 10-4** for information purposes only.

Major's two diamond drill rigs were working on holes GAR-11-61 and GAR-11-71A at the time of Howe's property visit on January 21, 2011.

Table 10-4: 2011 Ongoing Garrcon Diamond Drill Program (As of June 23, 2011)

DDH ID	*Easting UTM m	*Northing UTM m	Elev DGPS m	Azimuth True	Dip	Length m	Start	Finish	Drill Rig ID	Comments
GAR-11-37X**						100.00	4/16/2011	4/18/2011	21	No survey
GAR-11-39X**						57.00	2/9/2011	2/16/2011	1437	No survey
GAR-11-49	578381.58	5374180.09	293.57	166.5	-64.2	75.00	1/4/2011	1/4/2011	21	Gyro Survey
GAR-11-50X**						51.00	2/1/2011	2/2/2011	21	No survey
GAR-11-59	578758.58	5373775.70	287.49	342.1	-45.1	339.00	1/4/2011	1/10/2011	1437	Gyro Survey
GAR-11-60	578627.81	5373766.60	288.32	335.7	-55.5	300.00	1/11/2011	1/20/2011	1437	Gyro Survey
GAR-11-61	578643.42	5373811.90	288.98	337.2	-46.1	330.00	1/21/2011	2/1/2011	1437	Gyro Survey
GAR-11-62	578664.47	5373820.92	288.93	332.4	-46.7	399.00	2/1/2011	2/9/2011	1437	Gyro Survey
GAR-11-63	578560.13	5374035.03	303.83	145.1	-43.2	370.00	2/17/2011	2/24/2011	1437	Gyro Survey
GAR-11-64	578459.93	5373949.75	303.63	157.1	-43.8	277.00	3/1/2011	3/5/2011	1437	Assay not in Estimate
GAR-11-65	578561.02	5373819.39	288.99	340.0	-55.0	327.00	3/5/2011	3/15/2011	1437	Assay not in Estimate
GAR-11-66	578586.21	5373741.05	288.29	337.1	-57.3	313.00	3/16/2011	3/23/2011	1437	Assay not in Estimate
GAR-11-67	578519.76	5373855.99	290.80	151.6	-61.5	195.00	3/23/2011	3/31/2011	1437	Assay not in Estimate
GAR-11-68	578494.12	5373796.16	288.59	342.3	-47.9	175.00	4/1/2011	4/3/2011	1437	Assay not in Estimate
GAR-11-69	578478.87	5373820.61	289.25	158.5	-63.1	150.00	4/4/2011	4/14/2011	11	Assay not in Estimate
GAR-11-70	578773.85	5373888.20	288.13	332.1	-45.7	300.00	1/5/2011	1/9/2011	21	Gyro Survey
GAR-11-70X**						69.00	2/3/2011	2/5/2011	21	No survey
GAR-11-71	578788.00	5373848.00	300.00	340.0	-45.0	62.00	1/18/2011	1/20/2011	21	Failed in overburden
GAR-11-71A	578788.20	5373842.78	286.88	336.5	-46.4	351.00	1/21/2011	1/27/2011	21	Gyro Survey
GAR-11-72	578862.40	5373901.51	285.36	340.1	-46.1	348.00	2/5/2011	2/16/2011	21	Gyro Survey
GAR-11-73	578883.39	5373951.25	286.46	341.1	-45.5	312.00	2/17/2011	2/21/2011	21	Gyro Survey
GAR-11-74	578826.52	5373891.41	286.63	342.4	-50.7	318.00	1/9/2011	1/18/2011	21	Gyro Survey
GAR-11-74X**						21.00	4/15/2011	4/15/2011	21	Assay not in Estimate
GAR-11-75	578844.51	5373946.20	287.63	335.9	-47.9	291.00	2/21/2011	3/2/2011	21	Assay not in Estimate
GAR-11-76	578898.51	5373910.72	285.07	334.0	-46.4	348.00	3/2/2011	3/8/2011	21	Assay not in Estimate
GAR-11-77	578813.82	5374077.49	309.08	338.2	-45.0	162.00	3/8/2011	3/15/2011	21	Assay not in Estimate
GAR-11-78	578813.51	5374076.99	309.10	164.6	-45.1	336.00	3/15/2011	3/20/2011	21	Assay not in Estimate
GAR-11-79	578829.68	5374034.65	305.80	159.1	-45.0	264.00	3/21/2011	3/24/2011	21	Assay not in Estimate
GAR-11-80	578800.13	5374123.99	308.02	167.2	-44.4	399.00	3/29/2011	4/3/2011	21	Assay not in Estimate
GAR-11-81	578840.63	5373846.36	283.68	334.4	-44.4	432.00	4/4/2011	4/15/2011	21	Assay not in Estimate
GAR-11-82	579051.00	5374011.00	300.00	340.0	-45.0	258.00	4/18/2011	4/27/2011	21	Assay not in Estimate
GAR-11-83	579064.00	5373967.00	300.00	340.0	-45.0	420.00	4/27/2011	5/6/2011	21	Not in Estimate

DDH ID	*Easting UTM m	*Northing UTM m	Elev DGPS m	Azimuth True	Dip	Length m	Start	Finish	Drill Rig ID	Comments
GAR-11-84	579023.00	5374074.00	300.00	340.0	-45.0	171.00	5/9/2011	5/11/2011	21	Not in Estimate
GAR-11-85	578832.00	5374022.00	300.00	340.0	-70.0	306.00	5/11/2011	5/18/2011	21	Not in Estimate
GAR-11-86	578849.00	5373977.00	300.00	340.0	-65.0	354.00	5/18/2011	5/26/2011	21	Not in Estimate
GAR-11-87	578896.00	5373993.00	300.00	340.0	-65.0	363.00	5/26/2011	6/6/2011	21	Not in Estimate
GAR-11-88	578944.00	5374010.00	300.00	340.0	-65.0	350.00	6/6/2011	6/15/2011	21	Not in Estimate
GAR-11-89	578899.00	5373984.00	300.00	340.0	-60.0	354.00	6/15/2011	6/23/2011	21	Not in Estimate
GAR-11-90	578426.12	5373820.53	291.30	152.7	-61.4	222.00	4/14/2011	4/17/2011	11	Assay not in Estimate
GAR-11-91	578456.00	5373887.00	300.00	160.0	-60.0	219.00	4/17/2011	4/26/2011	11	Assay not in Estimate
GAR-11-92	578440.00	5373934.00	300.00	160.0	-60.0	165.00	4/26/2011	4/28/2011	11	Not in Estimate
GAR-11-93	578460.00	5374026.00	300.00	340.0	-45.0	177.00	4/28/2011	5/3/2011	11	Not in Estimate
GAR-11-94	578413.00	5374009.00	300.00	340.0	-45.0	201.00	5/4/2011	5/6/2011	11	Not in Estimate
GAR-11-95	578424.00	5373977.00	300.00	160.0	-60.0	147.00	5/9/2011	5/11/2011	11	Not in Estimate
GAR-11-96	578415.00	5373931.00	300.00	340.0	-45.0	327.00	5/11/2011	5/20/2011	11	Not in Estimate
GAR-11-97	578503.00	5374085.00	300.00	160.0	-45.0	480.00	5/20/2011	6/3/2011	11	Not in Estimate
GAR-11-98	578436.00	5373794.00	290.00	160.0	-60.0	175.00	6/3/2011	6/7/2011	11	Not in Estimate
GAR-11-99	578414.00	5373856.00	290.00	160.0	-60.0	327.00	6/7/2011	6/14/2011	11	Not in Estimate
GAR-11-100	578389.00	5373778.00	290.00	160.0	-60.0	159.00	6/14/2011	6/17/2011	11	Not in Estimate
GAR-11-101	578389.00	5373778.00	290.00	340.0	-45.0	252.00	6/17/2011	6/23/2011	11	Not in Estimate
					Total	12836	***			

* North American Datum 1983
**GAR-11-37X is the 100m extension of GAR-10-37 (300m) for a total hole depth of 400m
**GAR-11-39X is the 57m extension of GAR-10-39 (243m) for a total hole depth of 300m
**GAR-11-50X is the 51m extension of GAR-10-50 (300m) for a total hole depth of 351m
**GAR-11-70X is the 69m extension of GAR-11-70 (300m) for a total hole depth of 369m
**GAR-11-74X is the 21m extension of GAR-11-74 (318m) for a total hole depth of 339m
***Total excludes the failed hole (62m)

Upon completion of drill holes, Northern Gold temporarily surveys the drill hole collar coordinates and elevations in UTM coordinates (NAD83) utilizing a Magellan Mobile Mapper CX DPGS with a horizontal accuracy of 0.3m. GPS coordinates of all collar locations are recorded and tied into the exploration grid. Mazac, utilizing a Leica 1200 GPS system, completes a final survey of the new hole collars every one to two months when they are onsite to conduct downhole gyroscopic surveys.

Northern Gold has retained Mazac to complete gyroscopic downhole surveys of the completed drill holes in batches every one to two months. Because the holes are now surveyed after completion of the hole, two holes have not been surveyed due to damaged casing and two holes have been only partially surveyed due to downhole obstructions.

The drill casing is left in each hole and capped to permit future downhole geophysical testing and/or deepening of the holes.

Core is retrieved from the drill string using conventional wireline techniques. Core is removed from the core tube by drilling personnel and carefully placed in core boxes. Filled core boxes is removed from the drill site at shift change by drilling personnel and brought to Northern Gold's secure core logging and sampling facility at the Property. At the facility, the core is laid out on workbenches and cleaned prior to logging and sample interval marking.

The drill core is logged by a Northern Gold geologist who records a geotechnical log of core recovery and RQD measurements and a descriptive log including rock type (maintaining consistency with previous work), structure, alteration, and mineralisation (including presence of VG, quartz veining and its angle with the axis of the core). Drill core and sample information are input into a digital database using portable computer workstations at the workbenches. The geologist selects the sample intervals (as described in Section 10.5.1) and inputs the intervals into the drill hole database. The core is digitally photographed before sampling. The core sampling technician marks the sample cut line on the core prior to cutting.

Following core logging, the core is sampled as detailed in Section 10.5. At the completion of hole GAR-11-74, a total of approximately 4,203 core samples excluding standards, blanks and duplicates had been collected and sent for assay and a total of 2,917 results received from the assay labs as of May 5, 2011.

Digital assay files provided by the laboratory are merged with a "from" and "to" interval file created by Northern, with the sample number linking the two files. This methodology limits data entry errors to sample numbering, as well as the "from" and "to" specifications; assay data re-entry errors are therefore avoided. Sample numbering errors are identified during the merging process.

10.5 SAMPLING METHOD AND APPROACH

Historical (1985-1995) work on the Property was not reported in the manner currently required under NI 43-101, however, Howe is of the opinion that the geologists of the 1985-1995 era followed procedures related to the logging and sampling of drill core that would meet current NI 43-101 standards with exception of the insertion of QA/QC standards and blanks. However, written descriptions of the procedures were rarely recorded in technical reports at that time.

Sampling conducted by ValGold in its 2006-2007 drill programs have been described by Howe in its 2009 technical report (George, 2009). It is presumed by Howe that all historic sampling by Cominco / Jonpol in the 1985-1988 drill programs was completed in a manner consistent with accepted industry standard sampling and assaying techniques current at that time.

Based on a detailed review of the drilling and assay database of the Company's drilling and the historic drilling, Howe concludes that the historic sampling methods, core logging and assaying for the Property have met or were basically equivalent to standards currently required under NI 43-101.

The remainder of this section reviews the sampling methods used by the Company.

10.5.1 Northern Gold Sampling Methods

Diamond drill core is placed in labeled wooden trays and localized by depth blocks inserted by the drill contractor's personnel prior to removal of the core from the drill site. The drillers deliver the core boxes to the on-site facility at the end of each shift.

The core logging facility is located on the Property near the Garrcon Shaft and is located at the end of a gated road off of Highway 101. The facility has an office and an adjacent, secure core facility used for logging, sawing core and packing samples for shipment to the assay laboratory. The core facility has space for storage of core prior to logging.

Upon arrival at the core logging facility the core boxes are sequentially placed in a core rack. Spatial information related to each box of core is checked for accuracy and consistency at this point. Remedial actions are undertaken, if necessary, to correct deficiencies in the spatial information prior to entry into a database.

An experienced geologist logs the core and observations are entered into a drill log database prior to selecting samples for analyses. Selected portions of the core are marked and measured for sampling and are identified with one part of a three part assay tag, placed at the downhole end of the sample interval.

The core is sawn with a Husqvarna water-cooled masonry saw with 14-inch diamond blade and 230-volt 5hp motor. The core saw is located in a ventilated room separate from the core logging facility. Fresh water is used as a cooling/lubricating fluid; recycled water is not used.

The core is cut in half longitudinally, perpendicular to the foliation (50% split) with one half placed into plastic sample bags along with part two of the three part assay tag and sealed. The other half core is returned to the core box for archive and future verification and testing (if required). Each sample bag has the sample number written on the outside of the bag with black permanent marker corresponding to the sample tag placed inside. Information on the third part of the assay tag is entered into the database and the drill log, at which time accuracy and consistency are again reviewed and remedied, if necessary.

Core logging, sawing, sample bagging and sample shipment preparation is completed either by or under the onsite supervision of a Northern Gold geologist. Certified reference materials (standards), sample blanks and ½ core duplicate samples are inserted by Northern Gold into each sample batch submitted to the lab for the purpose of quality control (¼ core duplicates were submitted up to hole GAR-10-36, November 2010).

After sampling is completed, the archived core boxes are labeled and placed on core racks assembled in the yard of Northern Gold's field office on the Property.

Sample intervals vary from 0.3 metres to a maximum of 1.0 metre in length. The majority of samples are 1.0 metre in length but some are shortened for geological reasons. More than 99% of the drill core is submitted to a certified analysis laboratory for assaying. The core not submitted for analysis is collected (retained) for hand samples, petrographic samples and ARD analysis or for such other technical needs as they arise from time to time.

Sealed sample bags are placed in rice sacks and sealed. Northern Gold personnel maintain possession of the samples in the secure core shack until delivery to the laboratory. Sample batches are transported to the analytical laboratory in a timely fashion by Company personnel and transferred to the laboratory's chain of custody procedures and protocols. Samples are shipped direct from the site to the laboratory or via the Company's Kirkland Lake office. Northern Gold has a secure chain of custody to ensure the security and integrity of all samples submitted to the assay laboratory and appropriate Chain of Custody paperwork is maintained regardless of the shipping/transportation method. Laboratory pulps and rejects are backhauled to the Property and stored in a locked boxcar container.

10.5.2 Sampling or Recovery Factors

Core recovery is generally good in the Property area and Howe is confident that there are no sampling or recovery factors that would negatively impact the sampling procedures.

10.5.3 Sample Quality, Representativeness, and Sample Bias

The sampling methods are to industry standards for mineralisation of this type. Howe is of the opinion that the sampling methods meet NI 43-101 standards.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

Sampling and assaying methods conducted by ValGold in its 2006-2007 drill programs have been described by Howe in its 2009 technical report (George, 2009). It is presumed by Howe that all historic sampling by Cominco / Jonpol in the 1985-1988 drill programs was completed in a manner consistent with accepted industry standard sampling and assaying techniques current at that time.

Northern Gold's sample preparation and analyses for the 2009 drill program and holes GAR-10-11 and part of GAR-10-12 for the 2010 drill program were conducted by Swastika Laboratories Limited, Swastika, Ontario, P0K 1T0. Swastika Laboratories Limited participates in the Proficiency Testing Program for Mineral Analysis Laboratories (PTP-MAL), a testing program conducted bi-annually by the Standards Council of Canada. Swastika is the holder of a Certificate of Laboratory Proficiency.

Swastika Labs continued as Northern Gold's primary analysis laboratory until June 2010, at which time Swastika Laboratory informed the Company that turn-a-round for the Company's assays would increase because the laboratory had committed to providing priority service to another client that had committed to a significant sample volume. In the interest of maintaining better assay turn-a-round times, the Company decided to seek alternate analytical services.

As an immediate, though short term solution, the Company sent samples to Polymet Resources Inc. (Certified ISO 9001:2008) of Cobalt, Ontario (drill holes GAR-10-12 (part) to GAR-10-14).

Northern evaluated six analytical laboratories and selected Laboratoire Expert Inc. (Expert Labs) of 127 Boulevard Industriel, Rouyn-Noranda, Québec as its principal laboratory and SGS Canada Inc. Mineral Services of 1883 Leslie Street, Toronto Ontario as its secondary laboratory. Expert Labs is an accredited laboratory (PTP-MAL – Accredited by Standards Council of Canada – in accordance with ISO/IEC 43-1). SGS-Toronto is a reputable, ISO/IEC17025 accredited laboratory qualified for the material analysed. Both labs utilize industry standard quality control procedures.

As discussed in Howe's 2010 report (Roy and Trinder, 2010), a comparison of Swastika and Polymet check samples showed a significant scatter and generally poor gold analytical precision for pulps, Howe has attributed this to the analytical detection limit and methods utilised at the Polymet laboratory. In addition, normal check sampling of primary Polymet analyses at Expert and SGS on samples from GAR-10-12 to GAR-10-14 returned differences between the check assays and the original Polymet results (Polymet was consistently lower, and in some cases, much lower) leading to the suspicion that the Polymet lab was under-reporting gold at the lower grades. Northern Gold submitted all pulps from the Polymet samples to both Expert Labs and SGS Mineral Services for re-assay. Upon comparison of the

results from the three labs, Northern Gold, in consultation with Howe, elected to delete the Polymet assays from its assay database and average the Expert and SGS analytical results.

It is the opinion of Howe that all potential gold mineralized zones in the Company's drill core have been sampled and that the sample preparation, security and analytical procedures implemented have been adequate for the exploration conducted to date by Northern Gold. Northern Gold has implemented a quality assurance and quality control (QA/QC) protocol as detailed in Section 11.5.

No aspect of the sample preparation subsequent to delivery to the laboratory was conducted by an employee, officer, director or associate of the Company.

11.1 SWASTIKA LABS 2009-2010

11.1.1 Sample Preparation

Sample preparation consisted of conventional drying in ovens if required; crushing; splitting and; pulverizing. After drying, the sample was passed through a jaw crusher producing material of approximately -1/2 inch, with further size reduction to -10 mesh by a roller mill. A 300 gm sample was riffle split from the -10 mesh sample and pulverised to >90% -200 mesh using a ring and puck pulveriser. Silica sand was used to clean the equipment between each sample to prevent cross contamination. Prepared sample pulps were matted to ensure homogeneity prior to analysis. The homogeneous sample was then sent to the fire assay laboratory.

11.1.2 Analytical Procedures

All samples were analysed for gold by fire assay. A homogenized 30 gram charge of the sample is mixed with a lead based flux fused for one hour and fifteen minutes. Each sample has a silver solution added to it prior to fusion that allows each sample to produce a precious metal bead after cupellation. The fusing process results in lead buttons that contain all of the precious metals from the sample as well as the silver that was added. The button is then placed in a cupelling furnace where all of the lead is absorbed by the cupel and a silver bead, which contains any gold from the sample, is left in the cupel. The cupel is removed from the furnace and allowed to cool. Once the cupel has cooled sufficiently, the silver bead is placed in an appropriately labeled test tube and digested using aqua regia. The samples are bulked up with 1.0 ml of distilled de-ionized water and 1.0 ml of 1% digested lanthanum solution. The samples are allowed to cool and are mixed to ensure proper homogeneity of the solution. Once the samples have settled they are analysed for gold using atomic absorption spectroscopy. The atomic absorption spectroscopy unit is calibrated using appropriate certified standards in an air-acetylene flame. All gold assays that are greater than 1 g/tonne are automatically re-assayed by fire assay with a gravimetric finish for better accuracy & reproducibility.

Swastika re-assays every 10th pulp (on average) as a check on laboratory precision, and at their discretion frequently assays a second pulp.

11.2 EXPERT LABS 2010-2011

11.2.1 Sample Preparation

Sample preparation – the total sample is dried if necessary and crushed to 90% -10 mesh. A 300 gram subsample is split out using a Jones type riffle splitter. The 300 gram subsample portion is pulverized to 90% -200 mesh in a ring and puck pulveriser and used as the sample source for assaying.

The crusher reject material is stored until Northern is satisfied that assay results are acceptable, after which Northern instructs the laboratory to return the rejects to the Property or one of Northern Gold's designated personnel picks up the rejects and returns them the Property where they are placed in secure and dry storage for historic reference.

11.2.1 Analytical Procedures

All samples are assayed using the lead fire assay procedure with an AA geochemical finish. The detection limit is 0.005 g/tonne. All samples that assay higher than 1.0 g/tonne are re-assayed using a gravimetric finish to improve accuracy of the higher grade samples. The detection limit is 0.03 g/tonne.

Beginning in July 2010, Northern implemented the metallic screen lead fire assay analysis procedure for all sample intervals where visible gold or metallic minerals identified as visible gold are seen. Expert Labs metallic screen procedure is as follows:

- The entire sample is dried if necessary, crushed and pulverized.
- The pulverized material is screened by hand on a 100 mesh screen.
- The screen undersize is homogenized and lead fire assayed in triplicate (three individual 30g charges) using a gravimetric finish.
- The total screen oversize is lead fire assayed using a gravimetric finish.
- All assay results are combined using a weighted average calculation to determine an assay value for the entire sample.

As part of the Expert Lab's QA/QC protocol, the laboratory assays 10% of all samples submitted in duplicate. Additionally, the laboratory includes a reagent blank and a gold standard in each batch of 28 samples. All laboratory QA/QC results are reported to the Company.

Following completion of all assays, re-assays, analysis of results and upon instructions from Northern, the primary laboratory packages all remaining pulps, completes a submission document and ships the pulps to the secondary analysis laboratory, SGS-Toronto.

11.3 SGS MINERAL SERVICES 2010-2011

In November 2010, because assay turn-a-round times at Expert in September and October were normally exceeding 25 days, the Company began sending a portion of its primary

samples to SGS in Toronto. The resultant turn-a-round times for both Expert and SGS were better and the Company has continued splitting the primary assaying between the two laboratories. Expert continues, following fire assaying and acceptance by the Company of the results, to send all pulps to SGS for analysis by CN solubility for gold and for geochemical analysis of a 32 mineral suite as discussed in more detail below. Following receipt of fire assay results from SGS, the Company issues instructions to SGS for the shipment of selected pulps amounting to about 5% of the samples submitted to Expert for re-assay as a check on the accuracy and efficiency of SGS.

11.3.1 Sample Preparation

Primary core samples received at SGS are prepared using its sample preparation package PRP89, which consists of conventional drying if required, in 105^{o}C ovens; crushing; splitting and; pulverizing. After drying, the sample is passed through a primary oscillating jaw crusher producing material of 75% passing a 2mm screen. A 250-gram sub-sample is split from the crushed material using a stainless steel riffle splitter. This split is then ground to 85% passing 75 microns or better using a ring pulveriser.

11.3.2 Analytical Procedures

Primary core samples are prepared and assayed using the lead fire assay procedure with an ICP geochemical finish. The detection limit is 0.005 g/tonne. All samples that assay higher than 3.0 g/tonne are re-assayed using a gravimetric finish to improve accuracy of the higher grade samples (SGS' lower limit for reporting fire assay-gravimetric results is 3 g/tonne Au).

All sample pulps are assayed with the SGS BLE653 cold cyanide leach procedure with geochemical finish using a 30 gram sample.

All sample pulps are assayed for multi-elements using the SGS ICP40B analysis procedure. The ICP40B procedure uses four (4) acid digestion followed by ICP OES (inductively coupled plasma atomic emission spectroscopy) and reports results for 32 elements at a variety of concentration limits.

Based on lead fire assay results in the primary analysis laboratory, Northern selects approximately 5% of the samples submitted to Expert to be re-assayed by SGS as check samples using lead fire assay procedures that are the same as those used by Expert. These check assays are to check the accuracy and efficiency of Expert Laboratories. Check assaying is conducted as follows:

- All samples reported by Expert to have a grade of less than 3 g/tonne are lead fire assayed using the SGS FAI323 procedure which is a lead fire assay on a 30 gram sample with a ICP geochemical finish.
- All samples reported by Expert to have a grade greater than 3 g/tonne will be lead fire assayed using the SGS FAG303 procedure which has a gravimetric finish and uses a 30 gram sample.

SGS also has its own internal QA/QC protocols including standards, blanks and duplicates and the results of these analyses are also reported along with the results on Northern Gold's samples.

Following verification from Northern that the SGS results are acceptable, SGS packages all remaining unused pulps and ships them back to the Company at its Kirkland Lake office. Upon receipt, the pulps are kept in secure storage until the next work day when the pulps are transported back to the Garrison Gold Property, cataloged and placed in long term, dry and secure storage.

11.4 HISTORIC QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) PROGRAMS

Documentation is not available on any assay QA/QC program that may have been used by Cominco / Jonpol during their 1985-1988 drill programs however standards and blanks were not typically inserted by the exploration companies during this time period.

ValGold submitted blanks and standards representing approximately 1 blank or standard per 10 core samples during the period of its 2006-2007 drill program in 2005 to 2007. Howe (George, 2009) tabulated all of the blank and standard analyses and found no material deviations that would indicate any problems with the laboratory's accuracy and reproducibility.

11.5 NORTHERN GOLD QA/QC PROGRAMS

11.5.1 2009 Northern Gold QA/QC Programs

Northern Gold implemented QA/QC procedures for the 2009 drill program that included insertion of certified reference materials (standards), pulp and reject duplicates and sample blanks.

Howe reviewed and detailed the results of the 2009 QA/QC program in its 2010 technical report (Roy and Trinder, 2010). Northern Gold's 2009 QA/QC results indicated no major problems with the analyses with respect to accuracy, precision and contamination.

11.5.2 2010-2011 Northern Gold QA/QC Programs

11.5.2.1 Accuracy

To monitor accuracy, certified reference materials (CRM) or standards are inserted sequentially into the sample stream before shipment from the field at a rate of at least 1 in every 20 samples submitted.

Both high, medium and lower-grade gold standards are used in each sample shipment. The CRMs were obtained from Ore Research and Exploration Pty. Ltd. of Bayswater, Victoria, Australia (distributed by Analytical Solutions Inc. of Toronto, Ontario, Canada); and Rocklabs, Auckland, New Zealand (Table 11-1). The standards were received prepared

(pulverized to –200 mesh and blended) and either pre-packaged in 50 to 60 gram packets or in 2.5 kilogram containers from which Northern Gold weighs out 50 to 60 gram packets.

Table 11-1: QA/QC certified reference materials for 2010-2011 drilling program.

Standard	Au (ppm)	SD (ppm)	Supplier
OREAS 61Pa	4.46	0.13	Ore Research and Exploration
SF45	0.848	0.028	Rocklabs
SG40	0.976	0.022	Rocklabs
SJ39	2.641	0.083	Rocklabs
SJ53	2.637	0.048	Rocklabs
SL46	5.867	0.170	Rocklabs
SN50	8.685	0.180	Rocklabs

The SJ53 and SJ46 standards have been utilized throughout the 2010 and 2011 drill programs. Standards SF45 and SN50 were added to the sampling programs in November 2010 as a low grade and high grade standard respectively. Standards Oreas 61pa and SJ 39 were utilized intermittently during the 2010 program. Standard SG40 was added in the 2011 program as a replacement of SF45.

To check the accuracy of the laboratory, control limits (CL) are established at accepted mean ±3σ (standard deviation) and warning limits (WL) at accepted mean ±2σ. Any single standard analysis beyond the upper (UCL) and lower (LCL) control limits is considered a "failure". In addition, three successive standard analyses outside of the upper (UWL) and lower (LWL) warning limits on the same side of the mean could also constitute a failure. Successive warning results may indicate laboratory bias and possibly incorrect calibration of the laboratory equipment.

The results from the QA/QC standards were plotted versus time for each standard (Figure 11-1 to Figure 11-7). The upper and lower warning and control limits and mean Au value (Au-ppm) for the QC sample are shown on each chart.

Several instances of mislabeling and insertion of the wrong standard were recognized by Howe and these samples have been removed from the charts.

Most of the standards returned values within the accepted mean ±2SD (standard deviations). Howe recommends that the Company review any results falling outside the control limits. Expert Labs generally shows good results but there may be a slight bias to under-reporting of grade by the FA-AA method at grades greater than 2 g/tonne Au (Figure 11-5 to Figure 11-7). Expert's FA-Gravimetric method generally shows a very slight positive bias. Howe notes that while generally within acceptable levels, the number of failures and overall spread of analytical results for SGS analyzed standards is greater than that of the primary lab Expert. In particular, during the month of March 2011, SGS results showed a generally strong positive

bias with numerous warnings and several failures particularly at the higher grade standards (Figure 11-5 to Figure 11-7). This may reflect an incorrect calibration of the laboratory equipment. Howe recommends that Northern Gold conduct a review of these affected sample batches and implement remedial action, including re-assay, if warranted.

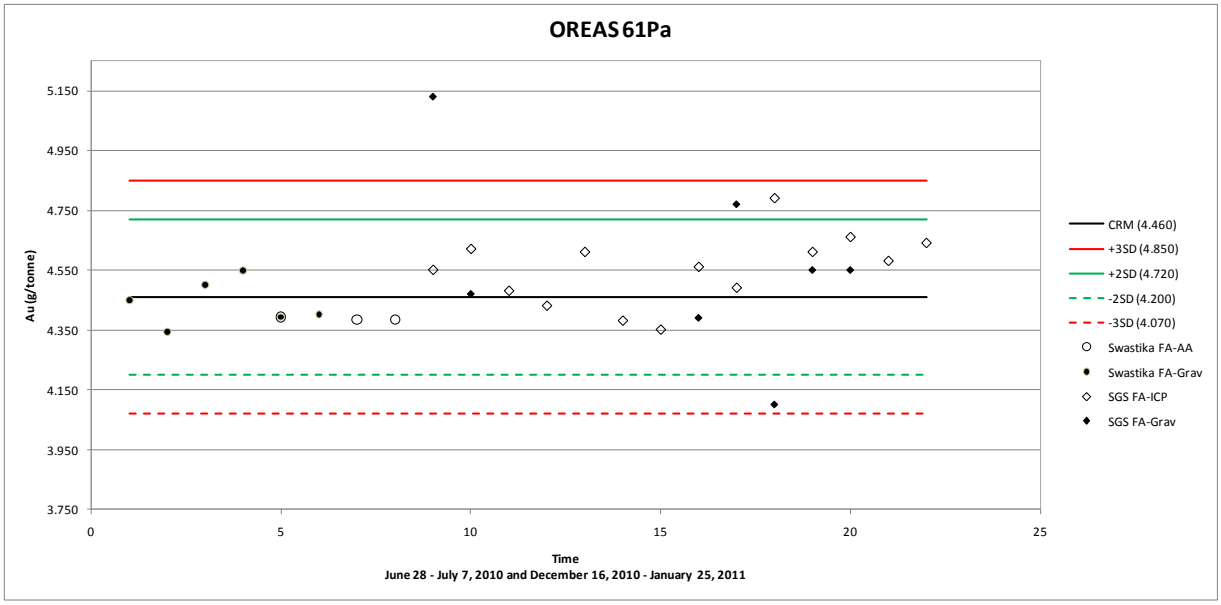


Figure 11-1: Standard OREAS 61Pa (4.460 g/tonne Au) results plotted against time

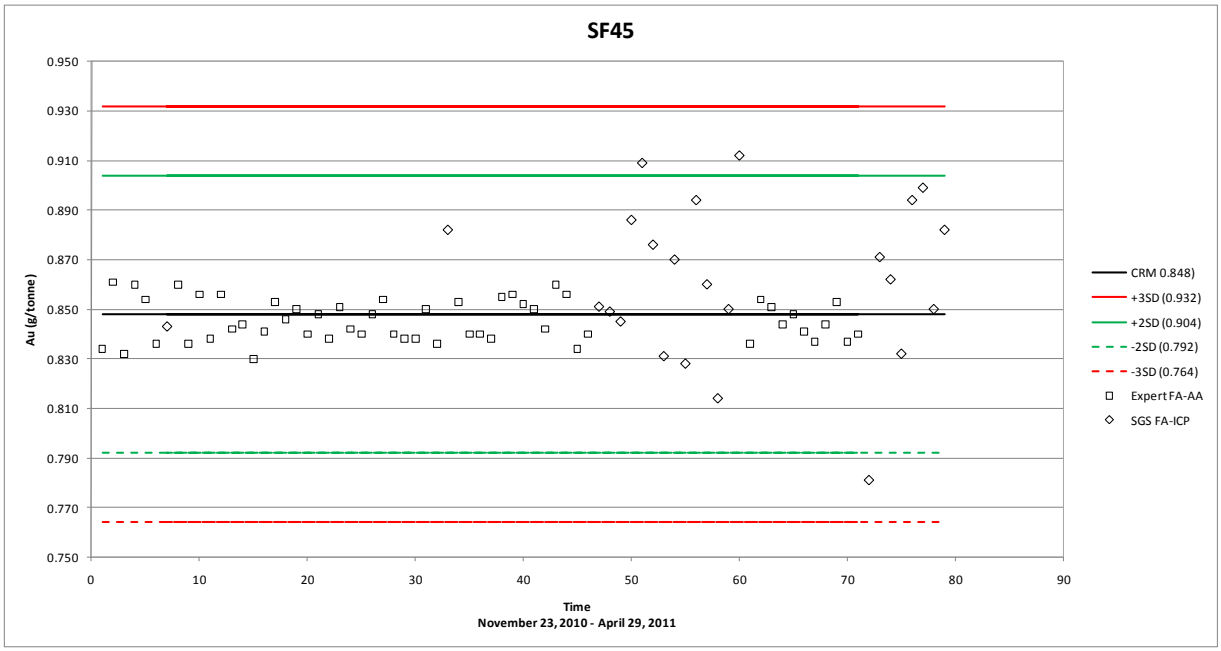


Figure 11-2: Standard SF45 (0.848 g/tonne Au) results plotted against time

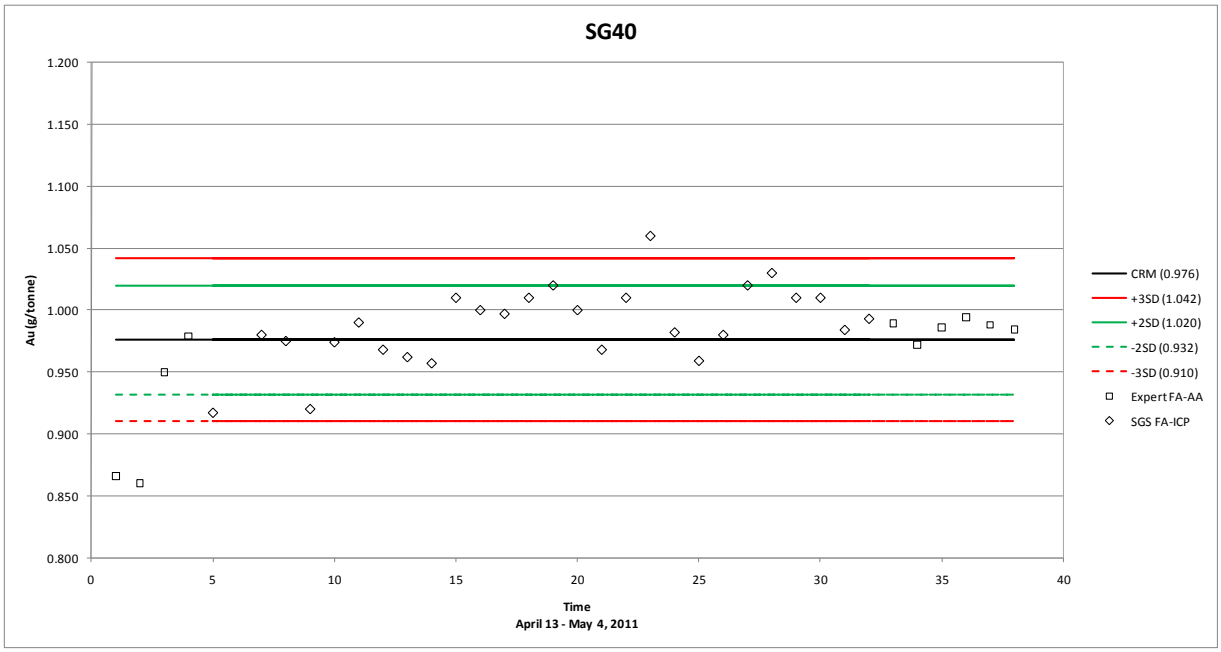


Figure 11-3: Standard SG40 (0.976 g/tonne Au) results plotted against time

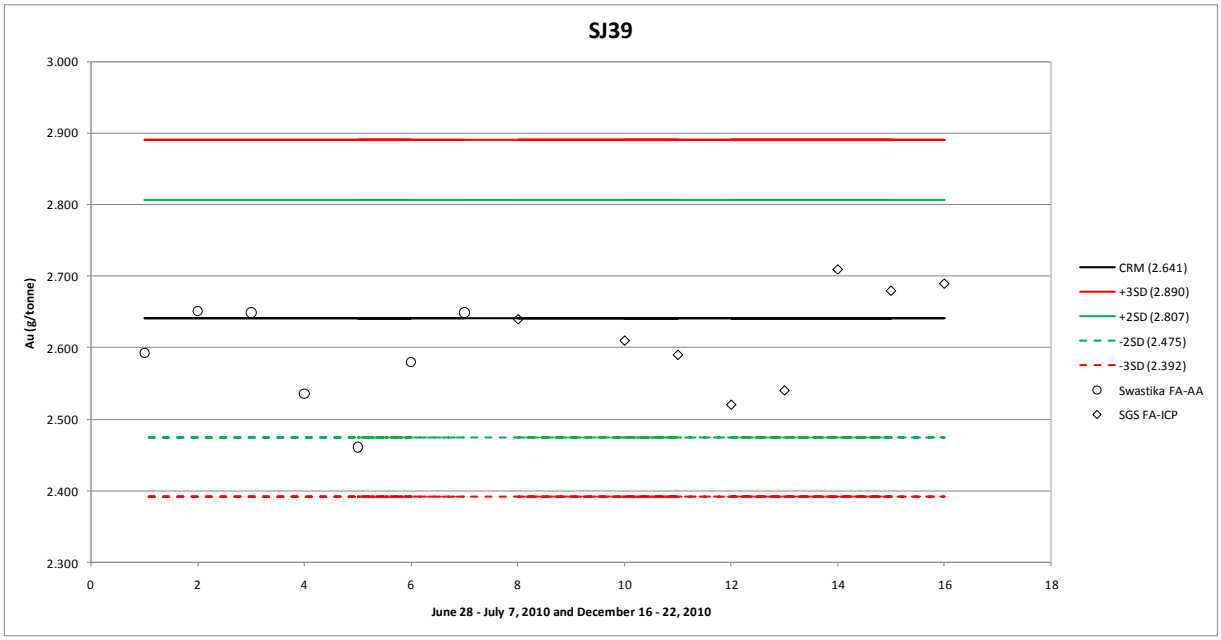


Figure 11-4: Standard SJ39 (2.641 g/tonne Au) results plotted against time

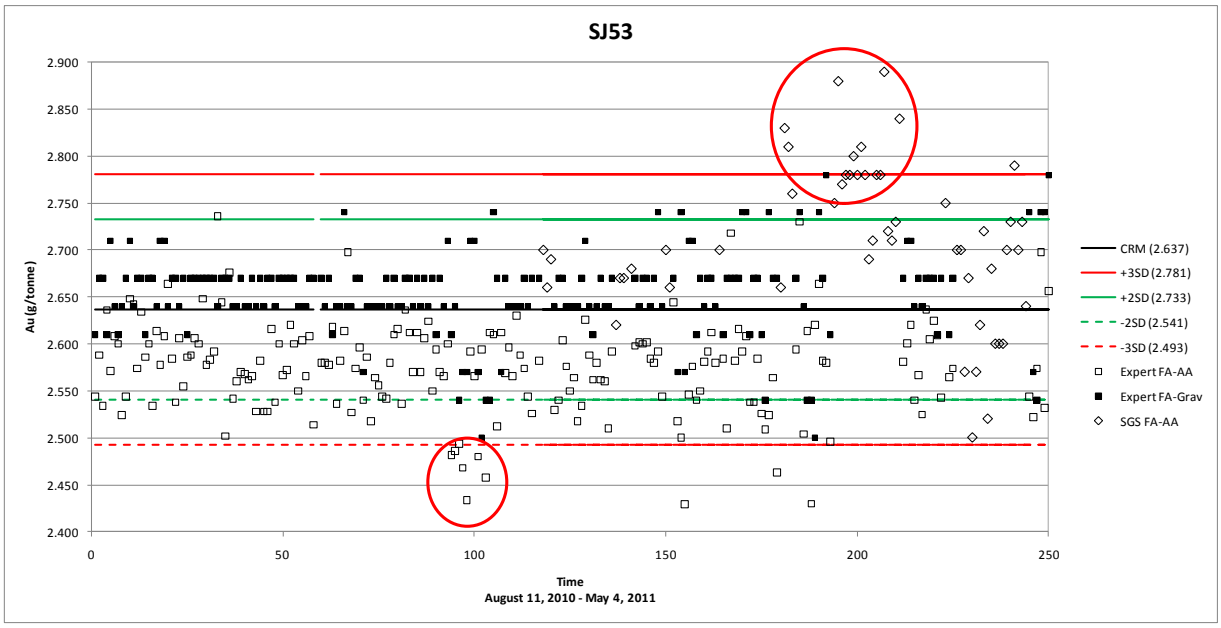


Figure 11-5: Standard SJ53 (2.637 g/tonne Au) results plotted against time

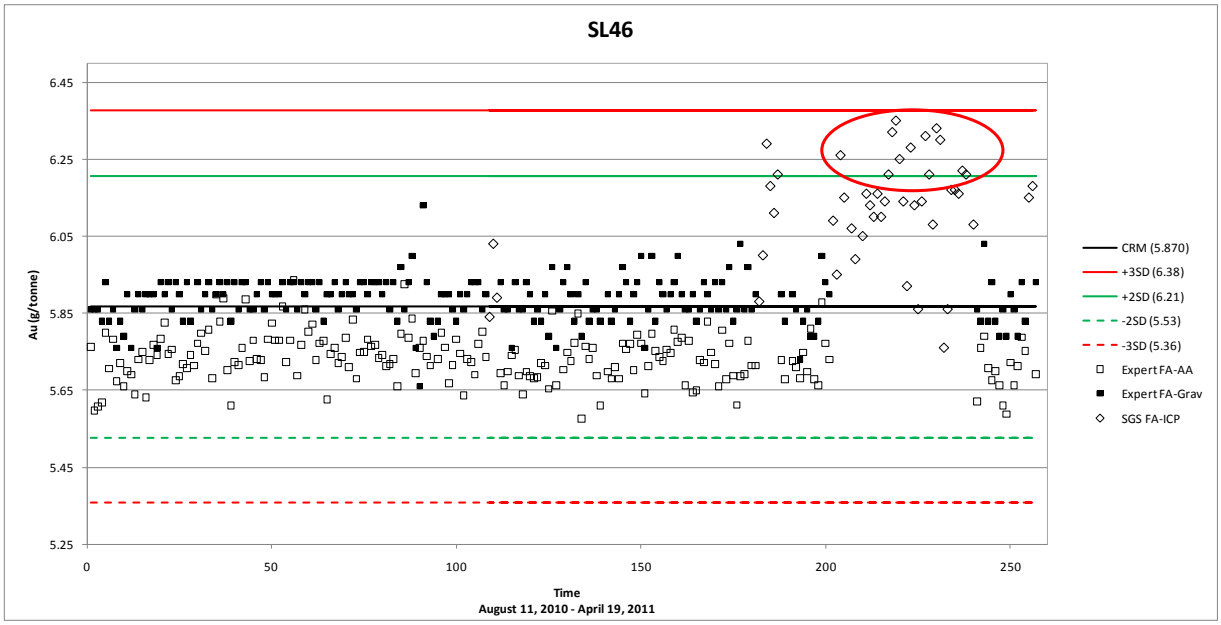


Figure 11-6: Standard SL46 (5.870 g/tonne Au) results plotted against time

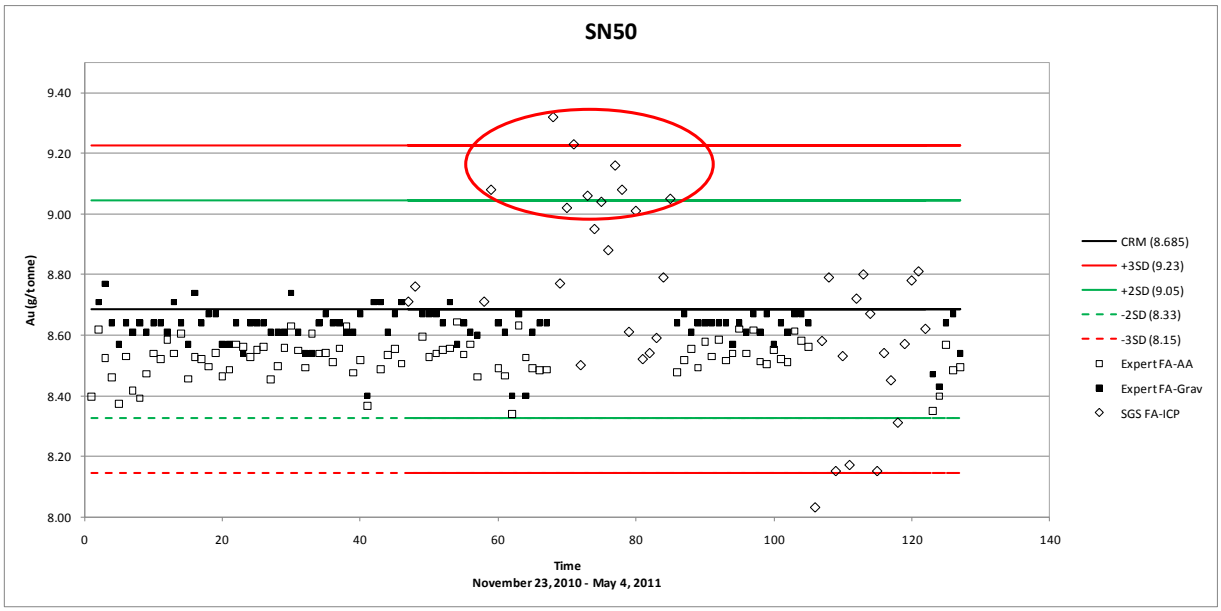


Figure 11-7: Standard SN50 (8.685 g/tonne Au) results plotted against time

11.5.2.2 Contamination

Two laboratory sample preparation processes that have significant potential for cross-contamination between samples are the jaw crushing and ring pulverizing stages. Contamination could also occur in the analytical side of the laboratory or from sample mislabeling.

Contamination is normally monitored through the routine insertion of coarse field blank material into the sample stream. As a rough guide, Howe suggests that blank samples should have analyses of less than 5x the detection limit. This, of course depends on how low the analytical detection limit is and the natural background concentration of the blank material.

Northern Gold inserted blanks approximately every 20th sample into the drill core sample batches before shipment. The Company utilizes commercial coarse marble aggregate for the blank material.

Howe suggests that the maximum acceptable value for the blank material be 25 ppb or 0.025 g/tonne gold. A blank sample that assayed greater than the maximum acceptable value should be considered a failure.

The results from the Blanks were plotted against time with the maximum acceptable value on the chart illustrated in Figure 11-8.

Most of the blanks inserted into the sample batches returned gold concentrations below the maximum acceptable value. Only one Swastika blank analysis and 3 SGS blank analyses returned results greater than the suggested maximum value. Howe recommends that the Company review the results of associated batches, particularly the SGS batches which

correspond to the March 2011 time period when SGS returned a significant number of warnings and failures for high standard values.

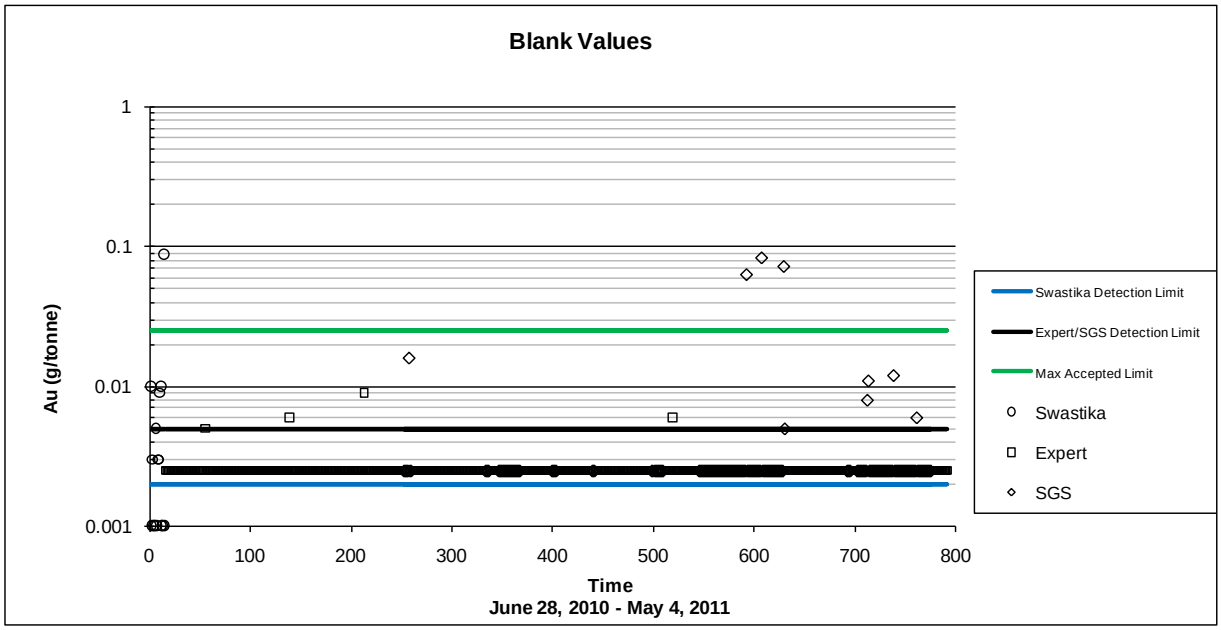


Figure 11-8: Blank sample analytical results plotted against time

11.5.2.3 Precision

Precision is often monitored by the insertion of duplicate samples at a rate of 1 in 20 samples submitted. The duplicates may be quarter/half core duplicates and/or preparation duplicates, split after the initial jaw-crushing phase to make two pulps. Northern Gold inserted both quarter core duplicates and preparation duplicates into the sample stream each at a rate of 1 in 40 samples such that there was a duplicate sample every 20 samples. In addition laboratories routinely analyse pulp duplicates, split after the pulverizing phase, as part of their internal quality control programs.

Core Duplicates

Generally, in a duplicate sampling program, quarter core duplicates are a compromise as a core duplicate. The best measure of precision is to analyse the other half of the core, leaving no remaining core. Precision indicated by quarter core duplicate is generally poorer than indicated by half core duplicates. In a duplicate sampling program, the core duplicate analyses account for the largest portion of total error in the entire process, and as such provide the best indication of the precision of any individual analyses.

In its 2009 drill program and 2010 drill program up to GAR-10-36 Northern Gold submitted quarter core duplicates. Beginning with hole GAR-10-37 the Company elected to utilize the entire archived half core in its core duplicate sampling program. The Company has submitted a total of approximately 377 core duplicate samples in the 2010 and 2011 programs to date.

Original analysis data vs. the quarter and half core duplicate analysis is plotted in Figure 11-9 and Figure 11-10. Any values that plot significantly away from the correlation line may indicate a potential nugget effect or, less likely sample preparation errors or analytical errors. Overall, the graph shows good correlation between the original samples and quarter core duplicates, however note that the majority of the samples have primary gold values less than 0.3 g/tonne. Howe recommends additional core duplicates be taken from higher grade mineralized intervals after the primary analyses have been completed.

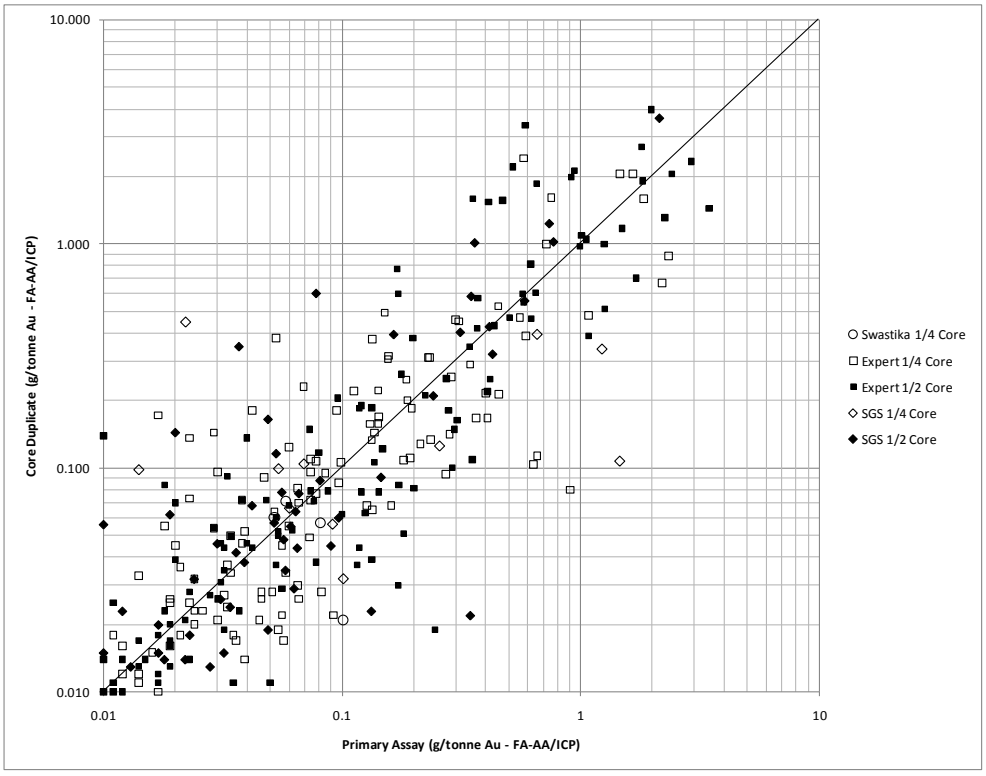


Figure 11-9: Plot of primary assays versus core duplicate assays (FA-AA)

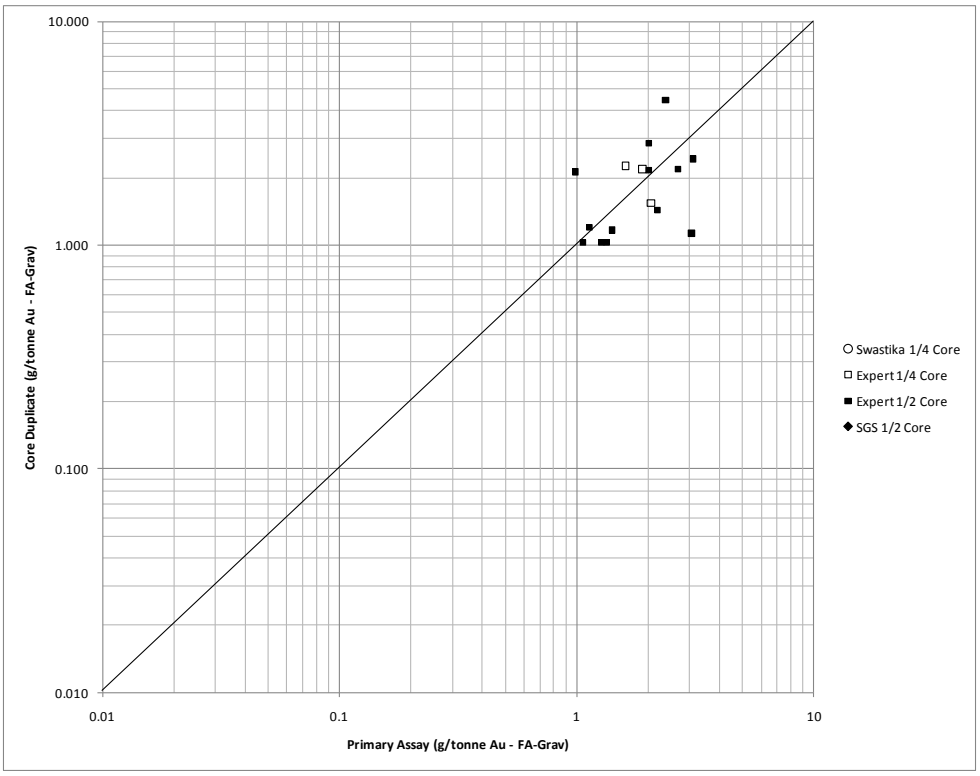


Figure 11-10: Plot of primary assays versus core duplicate assays (FA-Gravimetric)

Preparation Duplicates

Preparation duplicates are split after crushing; so much of the initial geological variability should be eliminated, resulting in better precision overall.

The Company has submitted a total of approximately 757 preparation duplicate samples in the 2010 and 2011 programs to date. Original analysis data vs. the preparation duplicate analysis data is plotted in Figure 11-11 and Figure 11-12. Any values that plot significantly away from the correlation line may indicate a potential nugget effect or, less likely sample preparation errors or analytical errors. Overall, the graph shows good correlation between the original samples and preparation duplicates.

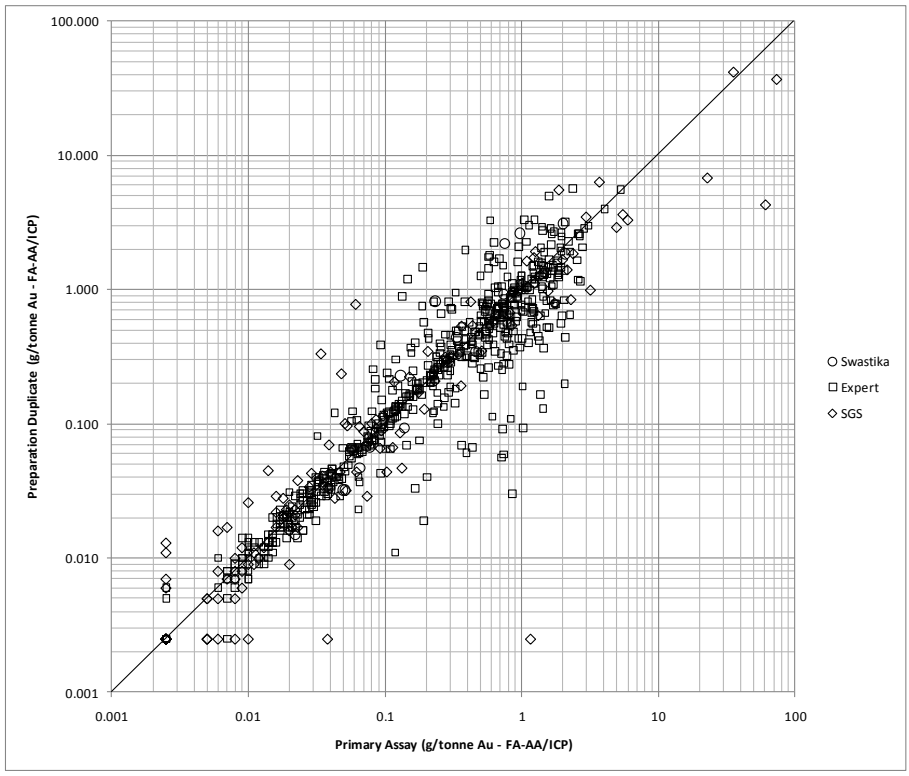


Figure 11-11: Plot of primary assays versus preparation duplicates (FA-AA)

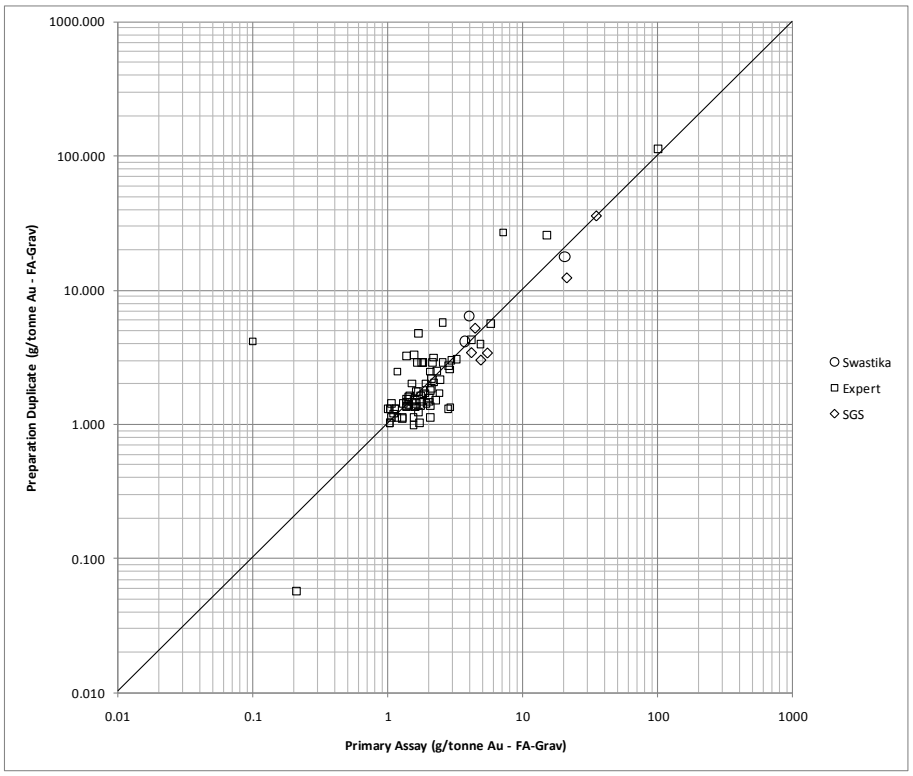


Figure 11-12: Plot of primary assays versus preparation duplicates (FA-GRAV)

Pulp Duplicate Check Analyses

In many QA/QC programs, pulp duplicates are also submitted for external check analyses at another laboratory to provide an independent check of relative bias and accuracy. In a routine quality control program approximately 5% of pulps may be submitted along with standard reference material to a second lab. Pulps are the preferred sample type as it eliminates much of the sampling error and provides a better comparison of the analyses.

Northern Gold has submitted a total of approximately 610 check samples (primary sample pulps) to date from the 2010 and 2011 drill programs to secondary labs.

Check (pulp duplicate) results are presented as a scatter plots (Figure 11-13 and Figure 11-14) and absolute relative percent difference (RPD) plot (Figure 11-15). The scatter plot is presented with log scales that provide detail at lower concentrations.

Absolute RPD is a measure of precision, calculated by:

$$RPD(\%) = \left[\frac{|(X_1 - X_2)|}{X_{ave}} \right] \times 100 \text{ where:}$$

X_1 = concentration observed in first analysis (Swastika);
X_2 = concentration observed duplicate analysis (Polymet); and
X_{ave} = average concentration = ((X_1 + X_2) / 2)

A RPD of 0% is an optimum result where both the first and duplicate analyses have identical results and therefore perfect precision. The larger the RPD value, the greater the difference between the two analytical results and the poorer the precision.

Pulp duplicates are split after pulverising; so the initial geological variability in the sample should be eliminated, resulting in the best overall precision in comparison to ¼ or ½ core duplicates and preparation duplicates. Significant differences in pulp duplicate pairs may be an indication of errors in the sample preparation or analysis, a mix-up laboratory sample labeling or coarse gold / nugget effect.

The scatter plot generally shows significant scatter at grades less than approximately 1.0 g/tonne with better clustering about the 1:1 correlation line at higher grades (Figure 11-13). The check samples generally show poorer analytical precision at lower grades closer to the lower detection limit resulting in the large absolute RPD values (Figure 11-15). RPD values range up to greater than 190% at grades less than 0.7 g/tonne Au. At grades greater than 0.7 g/tonne Au the RPD values are less than 60% and with exception to one sample the values are less than 40% at grades greater than 1.4 g/tonne Au (Figure 11-15 and Figure 11-16).

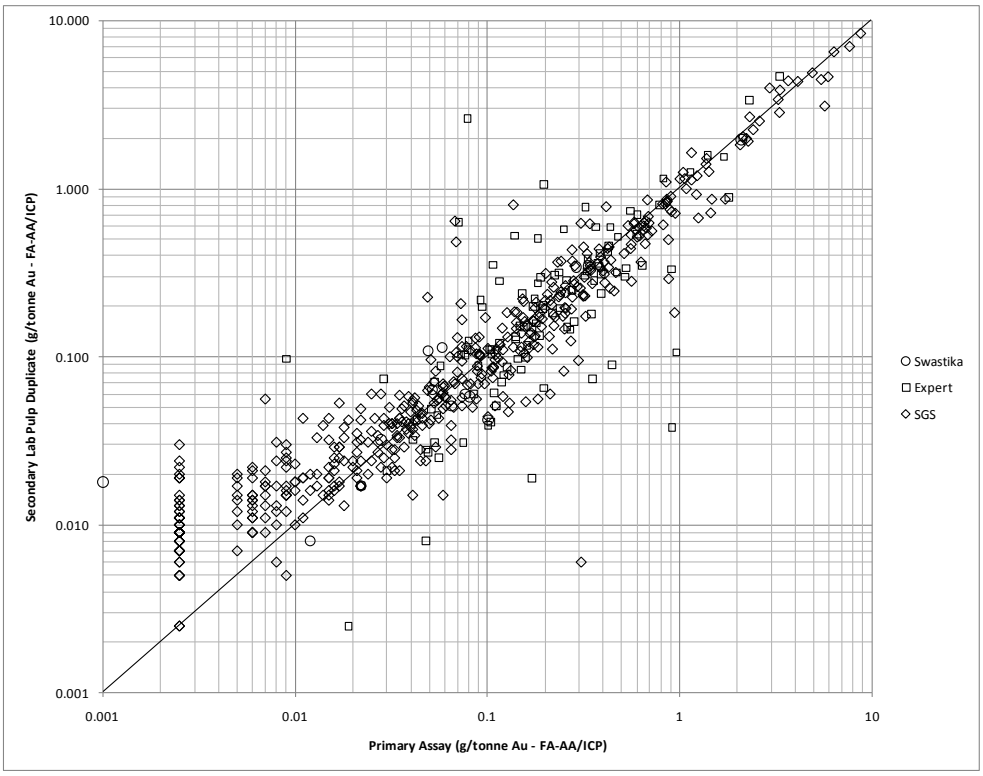


Figure 11-13: Pulp Duplicate Check Assay Scatter plot Comparison (FA-AA)

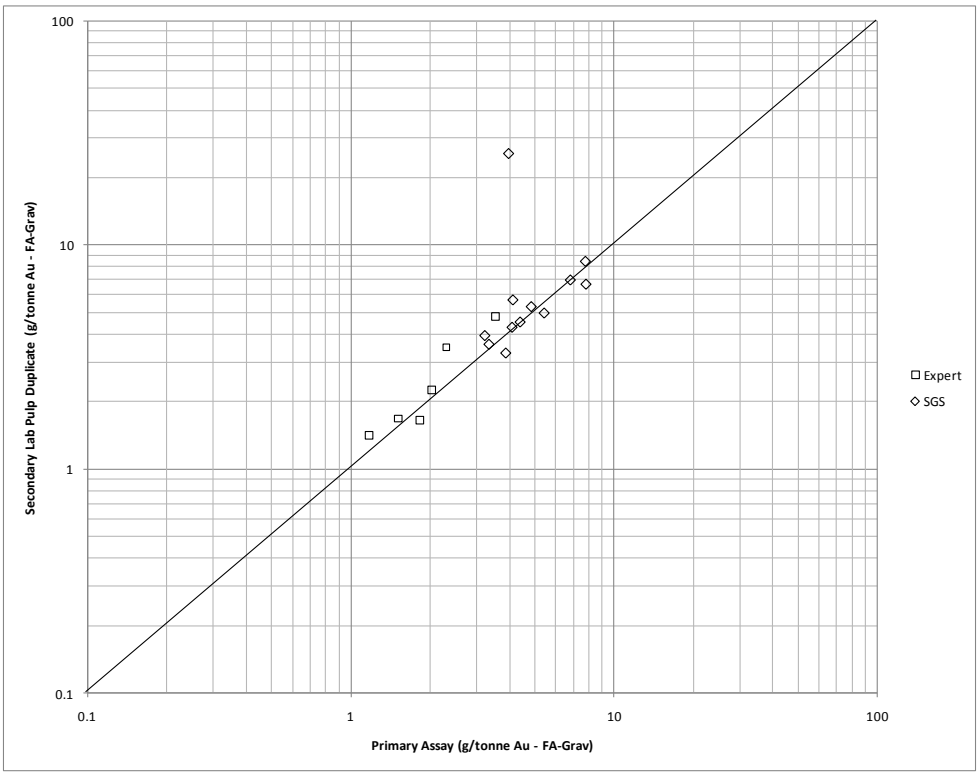


Figure 11-14: Pulp Duplicate Check Assay Scatter plot Comparison (FA-Gravimetric)

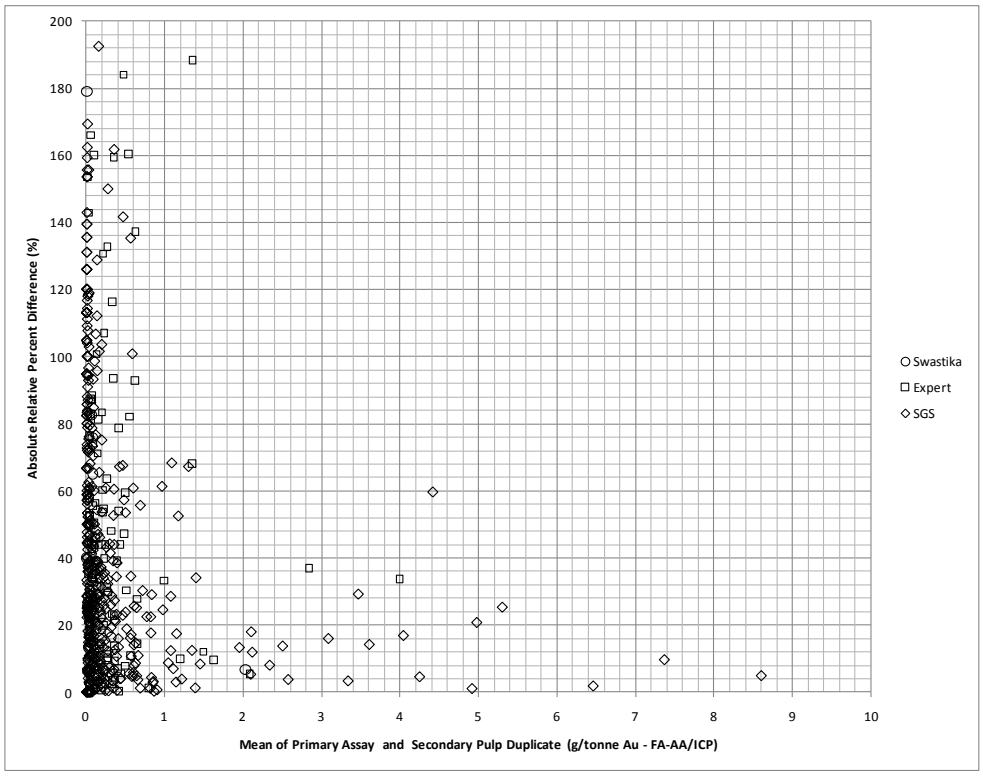


Figure 11-15: FA-AA Check Assay Absolute Relative Percent Difference (RPD) Plot

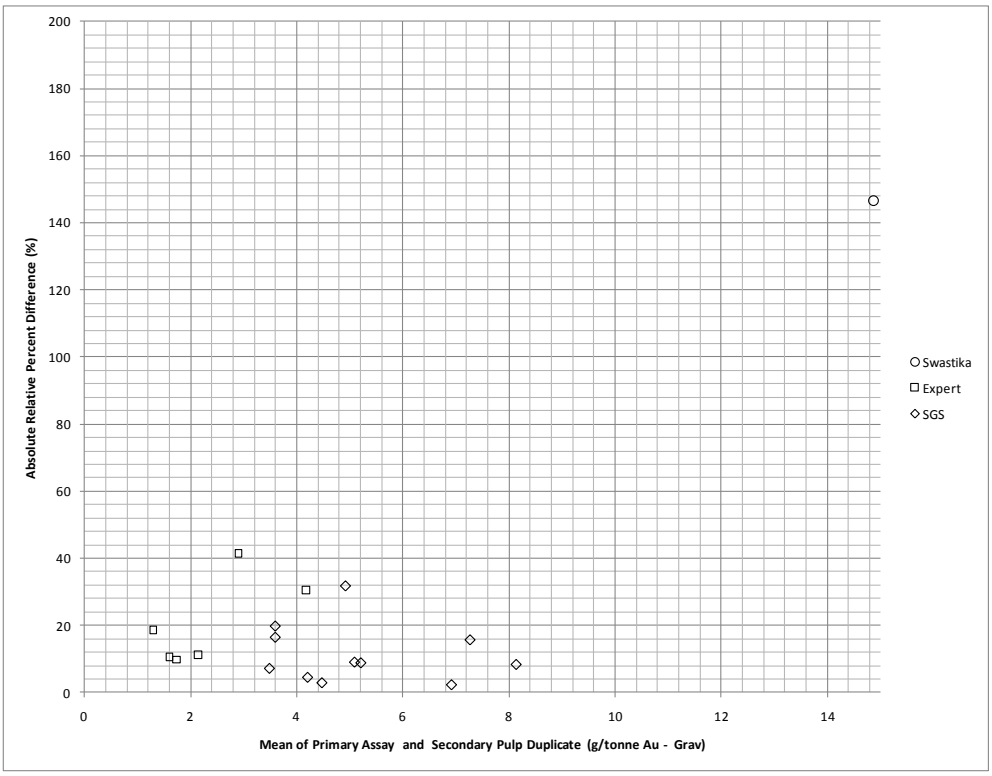


Figure 11-16: FA-Gravimetric Check Assay Absolute Relative Percent Difference (RPD) Plot

12 DATA VERIFICATION

12.1 ACA HOWE 2010 VERIFICATION

12.1.1 ACA Howe Site Visits

Confirmation of the existence of reported work sites was conducted by Howe representative and Co-author Mr. I. Trinder during his visit to the Property on July 12th, 2010 as part of Howe's due diligence in the preparation of its 2010 technical report. Mr. Trinder completed an inspection of isolated surface outcrops, historic trenches, 2010 stripped areas and selected drill hole collars. The core logging / field office and sample preparation facilities were inspected. The condition of Company's onsite core storage racks and sample storage containers was checked and core from several holes was examined. All of the work sites and technical observations were as reported by the Company.

Mr. I. Trinder revisited the Property on January 21st, 2011 as part of Howe's due diligence in the preparation of this technical report. Mr. Trinder completed an inspection of the diamond drill rigs and selected drill hole collars. The upgraded core logging / sample preparation facility and field office were inspected. The core from several holes was examined. All of the work sites and technical observations were as reported by the Company.

Mr. I. Trinder made a third visit to the Property on May 20, 2011 to review the results of the Photonic Knowledge's preliminary spectrographic core mapping program.

As part of the property visits, Mr. Trinder met with Mr. Michael Gross, Northern Gold's Vice President Exploration and Mr. Greg Matheson, Northern Gold's Project Geologist on July 12th 2010 at the Property site and on July 13th 2010 at the Company's Kirkland Lake office to discuss and review the Company's exploration activities, methodologies, data, results and interpretations. Further discussions and review were conducted on January 19th, 20th and 22nd, 2011 at the Kirkland Lake office.

12.1.2 ACA Howe Verification Sampling

Howe conducted limited verification sampling during its 2010 site visit which included two rock samples from outcrop and six samples of quarter core from holes GAR-09-01 and GAR-09-06. Results are discussed in Howe's 2010 report (Roy and Trinder, 2010).

Howe conducted additional limited verification sampling during its January 2011 site visit which comprised four samples of half core from holes GAR-10-26 and GAR-10-39.

Mr. Trinder collected and sealed the sample bags with ladder lock ties and maintained possession of all samples until delivery by courier to SGS Canada's geochemistry lab at 1885 Leslie Street, Toronto, Ontario. SGS-Toronto is a reputable, ISO/IEC17025 accredited laboratory qualified for the material analysed. SGS quality control procedures are method specific and include duplicate samples, blanks, replicates, reagent / instrument blanks for the individual methods.

The samples were prepared using SGS sample preparation package PRP89, which consists of conventional drying if required, in 105°C ovens; crushing; splitting and; pulverizing. After drying, the sample was passed through a primary oscillating jaw crusher producing material of 75% passing a 2mm screen. A 250-gram sub-sample was split from the crushed material using a stainless steel riffle splitter. This split was then ground to 85% passing 75 microns or better using a ring pulveriser.

The verification samples were analysed for gold using SGS analytical code FAI323 (Table 12-1).

Table 12-1: ACA Howe Verification Samples – SGS Analytical Method

Method code	Description	Lower Detection Limit
FAI323	Au fire assay; ICP finish, 30 g nominal sample weight.	>5 ppb Au

As with the 2010 verification samples, the 2011 duplicate core samples provide an independent confirmation of the presence of significant gold mineralisation at the Garrcon Deposit (Table 12-2, Appendix B). Data are too limited however, to make a meaningful comparison of Howe's duplicate sample analytical results with Northern Gold's original analytical results. Howe notes however, that the variation between the original and duplicate assay results are reasonable and are typical for gold exploration projects with coarse visible gold (nugget effect). The results do however confirm difficulty in assaying nugget gold mineralization and the requirement for duplicate samples to check precision/nugget effect.

Table 12-2: ACA Howe Duplicates *vs*. Original Samples

ACA Howe Sample #	ID	From	To	Zone	Sample Type	ACA Howe Au (ppb)	Northern Gold Sample #	Northern Gold Au (ave) (ppb)
ACA61661	GAR-10-26	66.0	67.0	Garrcon	1/2 core	665	61661	652
ACA61662	GAR-10-26	67.0	68.0	Garrcon	1/2 core	1290	61662	1704
ACA85378	GAR-10-39	220.0	221.0	Garrcon	1/2 core	1210	85378	360
ACA85381	GAR-10-39	221.0	222.0	Garrcon	1/2 core	13000	85381	1312
ACA10001	CDN-GS-5D Rec. Value: 5060 ppb Au				Standard	4910		

12.1.3 Database Verification

Howe compiled all of the drill hole information into digital spreadsheet files. The drilling data was imported to Micromine and the database files were validated. No significant errors were

detected. All errors were corrected and documented. Unassayed drill hole intervals were assigned a grade of zero g/tonne Au.

Howe is of the opinion that the assay database for the Garrcon Deposit is of sufficient quality to provide the basis for the conclusions and recommendations reached in this Report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 PRELIMINARY METALLURGICAL STUDIES

In late November 2010, Northern Gold submitted two samples (Sample A and Sample B) to SGS Mineral Services (SGS), P.O. Box 4300, 185 Concession Street, Lakefield, Ontario to evaluate the processing and recovery characteristics of the Garrcon gold-bearing mineralization at a scoping level. The program incorporated ore characterization tests (head analysis and mineralogy), comminution tests as well as the evaluation of a number of processing options, including gravity separation, flotation and cyanidation.

Northern Gold indicates that the samples were obtained from diamond drill core logged and assayed during its 2009 and 2010 drilling programs. One composite sample (Sample A) was obtained from the mineralized area known as the Shaft Zone and the other (Sample B) was obtained from the mineralized area known as the North Zone. Each sample consisted of approximately 60 kilograms of archived 1/2 drill core splits. Individual sample lengths varied from 0.5 meters to 1.0 meter. The samples were selected from 10 different drill holes, five in each of the mineralized zones. The Shaft Zone composite sample included material from 32 different locations within the five drill holes. The North Zone composite sample included mineralized material from 30 separate sample intervals within the five drill holes sampled. Northern Gold notes that the samples were typical of the lithologies, alteration and mineralization logged and assayed to date.

The following description of test results is extracted from the Executive Summary of SGS' final report dated January 31, 2011 (SGS Mineral Services, 2011).

"The average calculated gold head assay from the testwork for the two samples was 1.06 g/tonne for Sample A and 1.73 g/tonne for Sample B. The sulphur content of the two samples was 0.56% for Sample A and 0.25% for Sample B. The samples were also submitted for Bond ball mill grindability and abrasion index tests. Both samples were characterized as hard to very hard with BWI values of 21.9 and 21.6 kWh/t, respectively. The samples also fell into the abrasive range with abrasion indices (Ai) of 1.161 and 0.878.

The test program included a number of standard gold processing options including; gravity separation, flotation and cyanidation. Gravity separation tests yielded gold recoveries of approximately 32% and 30% for Samples A and B respectively.

Sample A gravity tailing and whole ore flotation testwork achieved gold recoveries of approximately 94% independent of the grind size which was varied from ~131 µm to ~45 µm. Sample B gravity tailing flotation testwork did not achieve as high recoveries with values ranging from approximately 81% to 89%. There was also a direct correlation between increased gold recovery and finer grind size shown in the Sample B gravity tailing flotation testwork.

Cyanidation test results on gravity tailings and whole ore were excellent for both samples. Gold recoveries ranged from ~94% to 97% in the tests conducted on the gravity tailings and ~93% to 98% for the whole ore samples. Given the degree of gravity recoverable gold, inclusion of a gravity circuit within the process flowsheet is recommended even though the whole ore cyanidation results were comparable to gravity tailings results. Single carbon-in-leach tests were performed on both samples and there was no indication of preg-robbing.

Cyanidation tests were also conducted on the flotation concentrate to evaluate the effect of regrinding. The gold recoveries did increase when the flotation concentrate was reground prior to leaching. Overall gold recoveries by flotation and concentrate cyanidation for Samples A and B were lower than the other test options with gold recoveries of 92% and 86%, respectively."

SGS concluded that the results from the study indicated that the process flowsheet should focus on gravity separation and gravity tailing cyanidation. SGS noted that further testwork to optimize the design parameters is required so that an optimum process flowsheet can be developed. Flotation conditions and parameters would need to be studied further in order to increase flotation recovery to include this type of processing in the flowsheet.

13.2 HOWE DISCUSSION

Howe's PEA is based on limited test work and site knowledge. In addition to the preliminary SGS metallurgical studies, Howe was provided geologic information in the form of drill logs describing the lithologies, alteration, veining and the homogeneity of the mineralized area along with fire assays, multi-element analyses and sulphur analysis. While this geological and analytical information cannot replace metallurgical testing, it can suggest potential processing techniques. This geologic information, along with the limited test work performed to date suggest that the processing scenario outlined in Section 17, or a similar one, may potentially provide a satisfactory method for recovering gold from the deposit. The suggested processing scenario must be verified, with the support of additional test work, for incorporation into a future pre-feasibility study. This PEA study is to be used for initial cost estimations only.

The SGS report indicates good gold recovery with cyanide. Additional test work is necessary to confirm recovery and the optimum mineral processing flow sheet. At this level, Howe is assuming a recovery of 98% for the processing plant based on the SGS testwork. A recovery of 65% for a heap leach facility was assumed as no column tests have yet been conducted to determine recovery rates. Slightly lower recoveries would have an insignificant impact on the overall capital and operating costs of the circuits analyzed.

14 MINERAL RESOURCE ESTIMATE

14.1 INTRODUCTION

During January-to-June, 2011, ACA Howe International Limited ("Howe") carried out a resource estimate update for Northern Gold's Garrison Project, Garrcon Zone. The resource estimate includes holes up to Hole GAR-11-74, drilled during 2011.

This resource estimate was prepared by Doug Roy, M.A.Sc., P.Eng., Associate Mining Engineer with Howe. Ian Trinder, M.Sc. P.Geo., Senior Geologist with Howe assisted with the geological interpretation of the deposit. Micromine software (Version 2010) was used to facilitate the resource estimating process.

The resource estimate was prepared in accordance with CIM Standards on Mineral Resources and Reserves[5] where:

- A *Measured Mineral Resource*, as defined by the CIM Standing Committee 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* as defined by the CIM Standing Committee 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." And,
- An *Inferred Mineral Resource* as defined by the CIM Standing Committee 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, working and drill holes."

A *Mineral Reserve* is "the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study." This Study must include adequate information on mining, processing, metallurgical, economic and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A

[5] CIM Standards in Mineral Resources and Reserves, Definitions and Guidelines, adopted December 11, 2005

Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

- A *Probable Mineral Reserve* is "the economically mineable part of an Indicated, and in some circumstances a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified."

- A *Proven Mineral Reserve* is "the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors."

Classification, or assigning a level of confidence to Mineral Resources, has been undertaken in strict adherence to the CIM Standards on Mineral Resources and Reserves.

Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of economic feasibility studies.

Only mineral resources are identified in this report. No mineral reserves are identified as no economic work that would enable the identification of mineral reserves has been carried out.

14.2 DATA SOURCES

Northern Gold provided data from the 2010/2011 drilling program in Excel spreadsheet format. The following files were supplied:

Description	Includes Information for Holes Up To	Destination Micromine File
Collar survey information.	GAR-11-91	Collars.dat
Downhole survey information.	GAR-11-90	Dhsurvey.dat
Lithologic description of the core.	GAR-11-95	Lithology.dat
Sample assay intervals and results.	GAR-11-74	Assays.dat

Though collar information was available for holes up to GAR-11-91 at the time of the cut-off date for the estimate, other information (such as assays) were not yet available/completed for some of the more recently drilled holes. This resource estimate considers holes up to GAR-11-74 – the most recently drilled hole for which assay data was available at the time of the mineral resource estimate.

Howe imported the 2010 and 2011 Garrcon drill hole data to Micromine and merged it with the existing data files.

The data was validated – checked for logical or transcription errors such as overlapping intervals. There were a few, very minor errors that were corrected.

One such error was that the assay file contained assays for Hole 10-34 when in fact they should have been labelled 10-34C (Holes 10-34 and 10-34B failed in overburden). Similarly, Hole 10-38 in the assay file was changed to 10-38A (10-38 failed in overburden). There were several holes with similar problems – i.e.: holes with a letter suffix in the collar file, but no suffix in other files. Howe recommends that Northern Gold check their drill logs and internal databases to ensure that drill hole names are consistent.

The historical collars from the 2009 drill program were re-surveyed using a differential GPS in 2010. The "collars.dat" file was updated using the new measurements.

Two of the historical holes, C06-02 and C06-05B, were re-surveyed using a gyroscopic downhole instrument. The "dhsurvey.dat" file was updated using the new measurements.

14.3 SITE GRID TRANSFORMATION

Northern Gold has accurately surveyed hole collar coordinates using a differential GPS instrument in UTM NAD 83 coordinate system. The site grid baseline is 20° counter-clockwise from true east (UTM NAD 83). The site baseline origin (0 m East, 1000 m North) is located at the UTM NAD 83 coordinates (579,770.638 m East, 5,374,367.875 m North).

UTM NAD 83 collar survey data is available for historical and current holes. Collar data for all holes was transformed using those transformation parameters so that all holes would have a consistent position in the current grid coordinate system.

During the 2010 resource estimate previously completed by ACA Howe, the same rotation was used but an arbitrary site grid origin was used. The previous site baseline origin (5,000 m East, 5,000 m North) was located at the UTM NAD 83 coordinates of Hole GAR-09-01 (578,625.69 m East, 5,373,998.41 m North).

To transform zone outline string files and wireframe "solids" from the previous site grid to the present site grid required subtracting 6,202.26 metres from the previous site grid easting and 3,955.59 metres from the previous site grid northing. Recall that the previous site grid and the current site grid have the same rotation value.

14.4 MINERALISED ZONE INTERPRETATION

Mineralised zones were outlined to enforce geological control during block modeling.

Because of the larger scale and lower grade nature of the mineralisation, the deposit was modeled with consideration of the use of larger scale, surface mining methods.

The following guidelines were used during the interpretation process:

1. A cut-off grade of 0.1 g/tonne of gold was generally used. Cut-off grades are further discussed in Section 14.10.
2. Along strike, zones were extended halfway to the next, under-mineralised cross-section.
3. Zones were extended down-dip by a maximum of 100 metres beyond the last intercept – approximately double the omni-directional semi-variogram range (Figure 14-5).
4. Zones were allowed to extend through "below cut-off" intercepts so long as there was a "geological reason" to do so.

Garrcon Zone mineralisation is constrained to the south by the Porcupine-Destor Fault which is delineated by ultramafic and chlorite talc schists. Similarly there appears to be a smaller more limited ultramafic body bounding (at least locally) the mineralisation to the north.

Interpretations were accomplished by plotting and interpreting hard-copy cross-sections (refer to Table 14-1 for cross-section definitions; refer to Figure 14-3 for cross-sections; refer to Appendix C for a complete set of interpreted cross-sections). Those interpretations were digitised and zone intercepts were tagged.

Figure 14-1 and Figure 14-2 show three-dimensional views of the interpreted zones.

Table 14-1: Cross-section definitions.

Number	Section (Current Site Grid)	Name	Facing	Towards the Viewer	Away from Viewer	Width	Section Name in 2010 Grid*
1	-1450	1450W	West	25	25	50	4750E
2	-1400	1400W	West	12.5	25	37.5	4800E
3	-1375	1375W	West	12.5	12.5	25	4825E
4	-1350	1350W	West	12.5	12.5	25	4850E
5	-1325	1325W	West	12.5	12.5	25	4875E
6	-1300	1300W	West	12.5	12.5	25	4900E
7	-1275	1275W	West	12.5	12.5	25	4925E
8	-1250	1250W	West	12.5	12.5	25	4950E
9	-1225	1225W	West	12.5	12.5	25	4975E
10	-1200	1200W	West	12.5	12.5	25	5000E
11	-1175	1175W	West	12.5	12.5	25	5025E
12	-1150	1150W	West	25	12.5	37.5	5050E
13	-1100	1100W	West	25	25	50	5100E
14	-1050	1050W	West	25	25	50	5150E
15	-1000	1000W	West	50	25	75	5200E
16	-900	900W	West	50	50	100	5300E
17	-800	800W	West	50	50	100	5400E

* Supplied to relate previous cross-sections to current cross-sections.

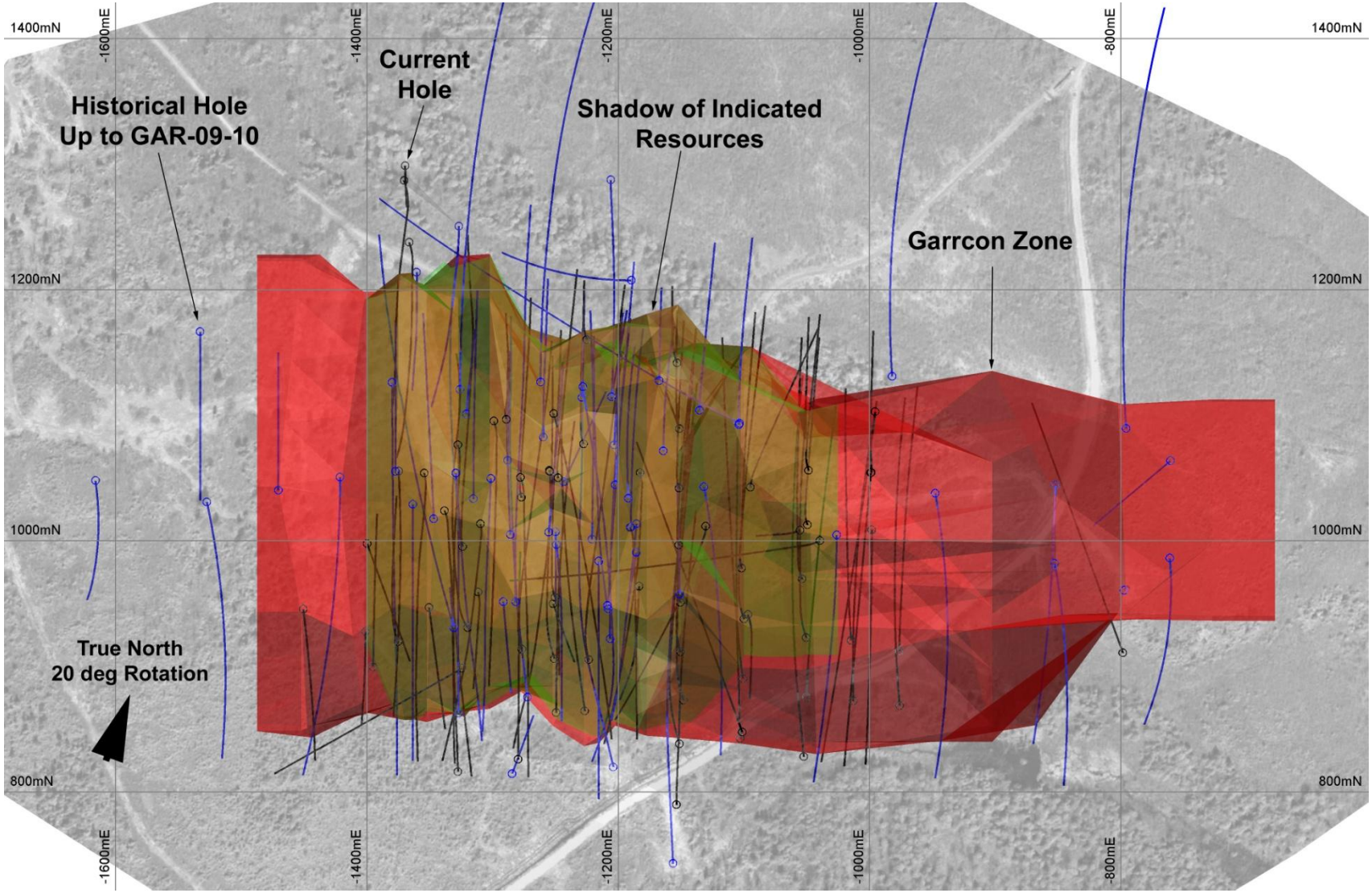


Figure 14-1: Plan view of drilling and mineralised zone.

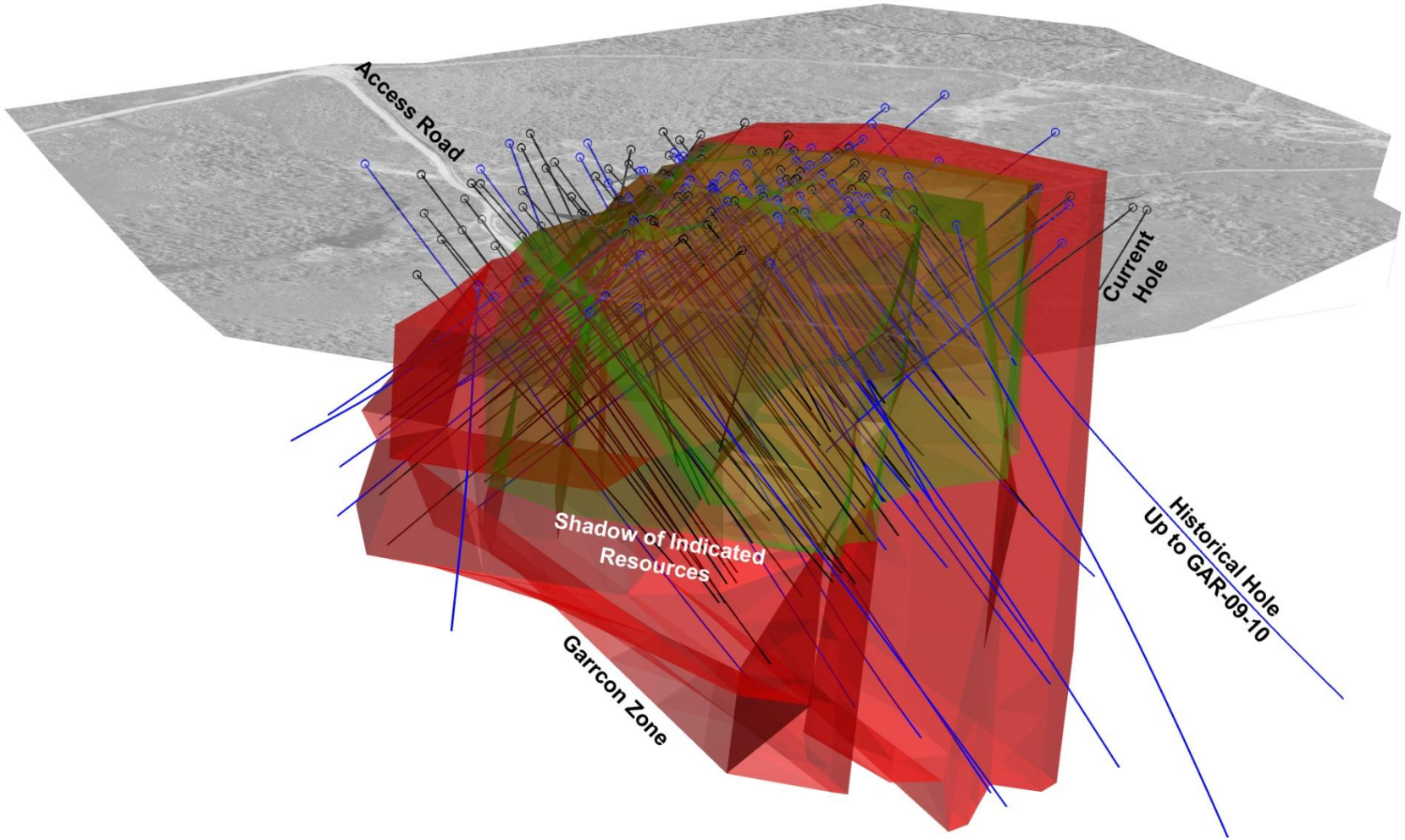
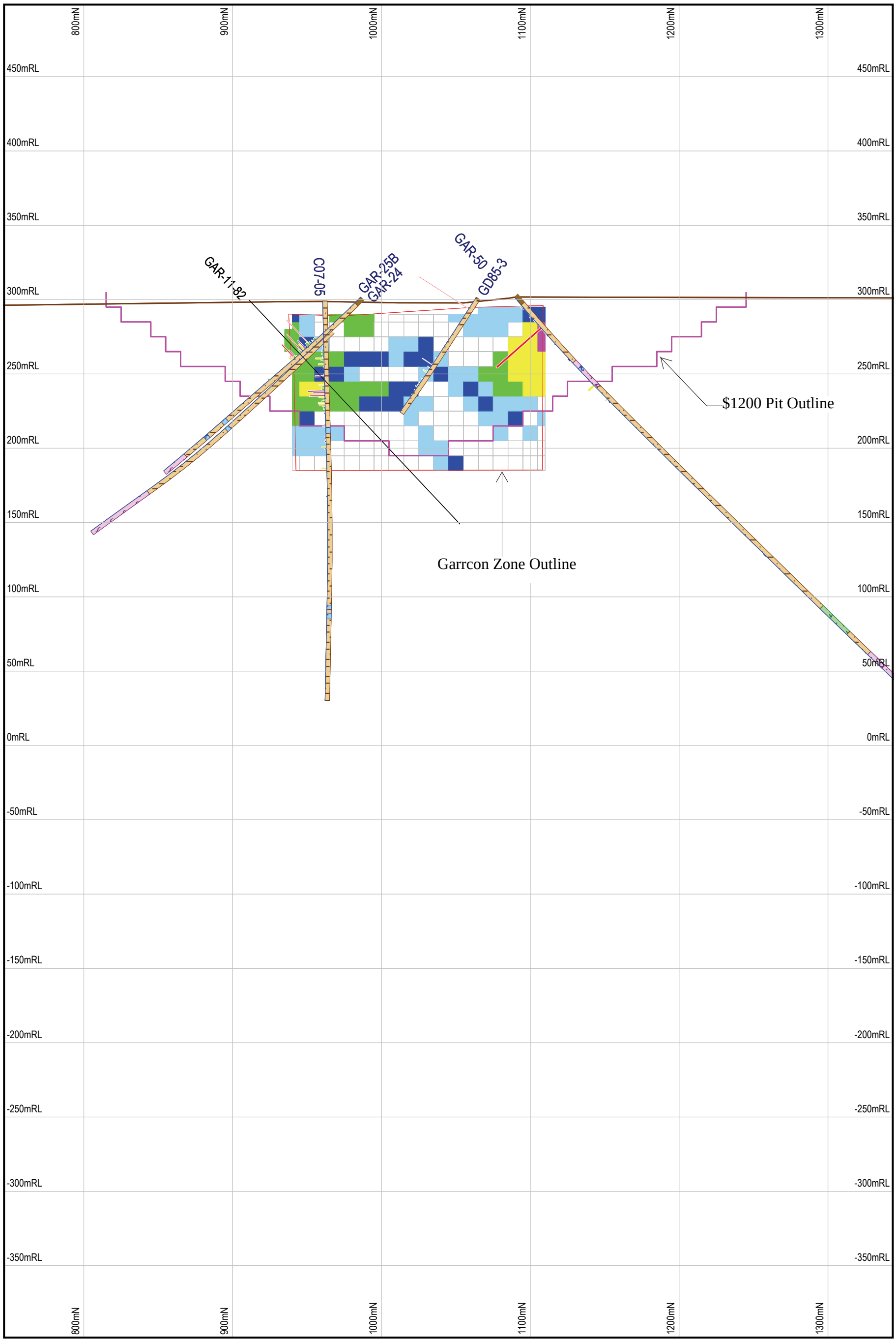


Figure 14-2: 3-D view of outlined zone, facing southwest.



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Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

Plot File: 0800W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 0800W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada

Figure 14-3

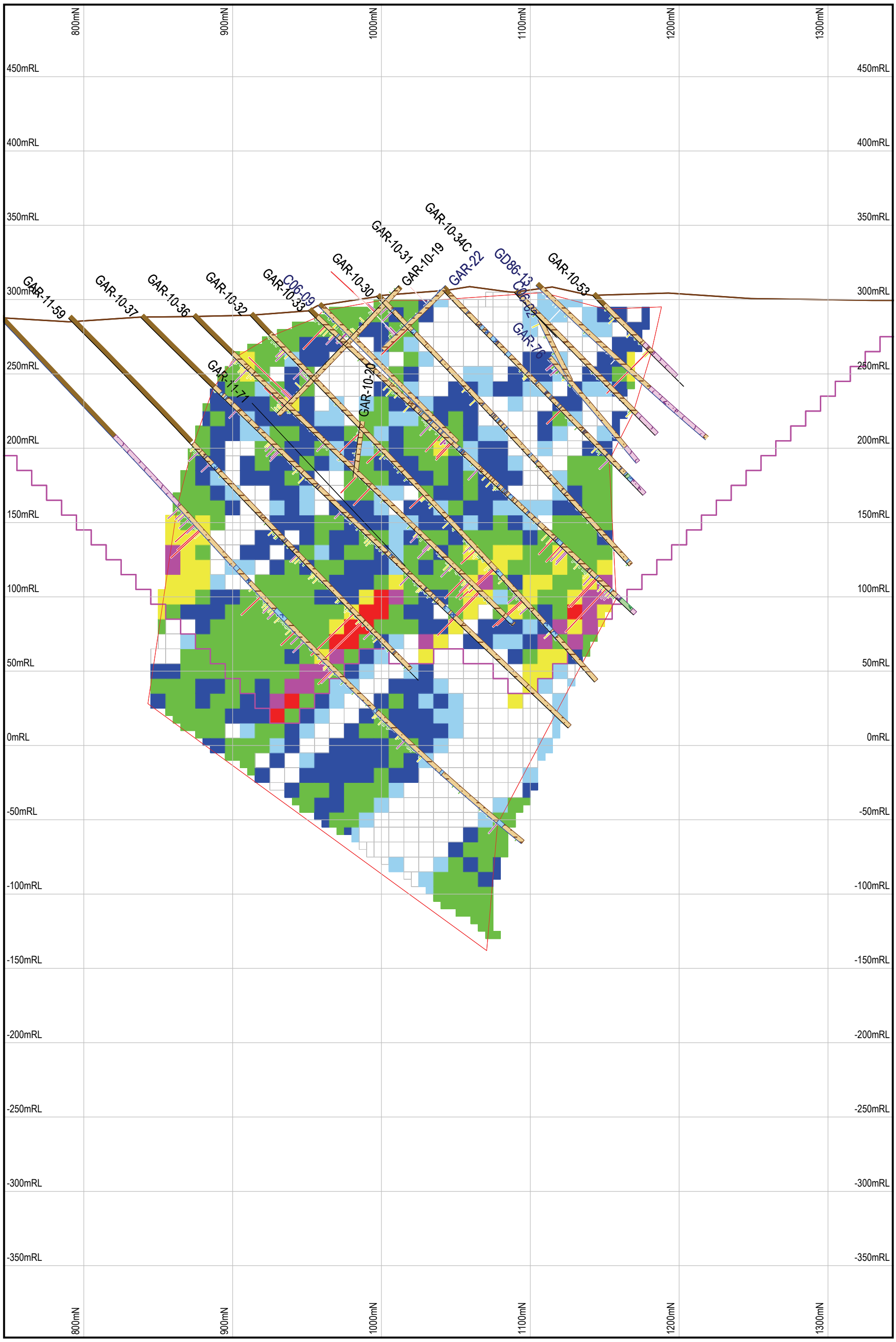
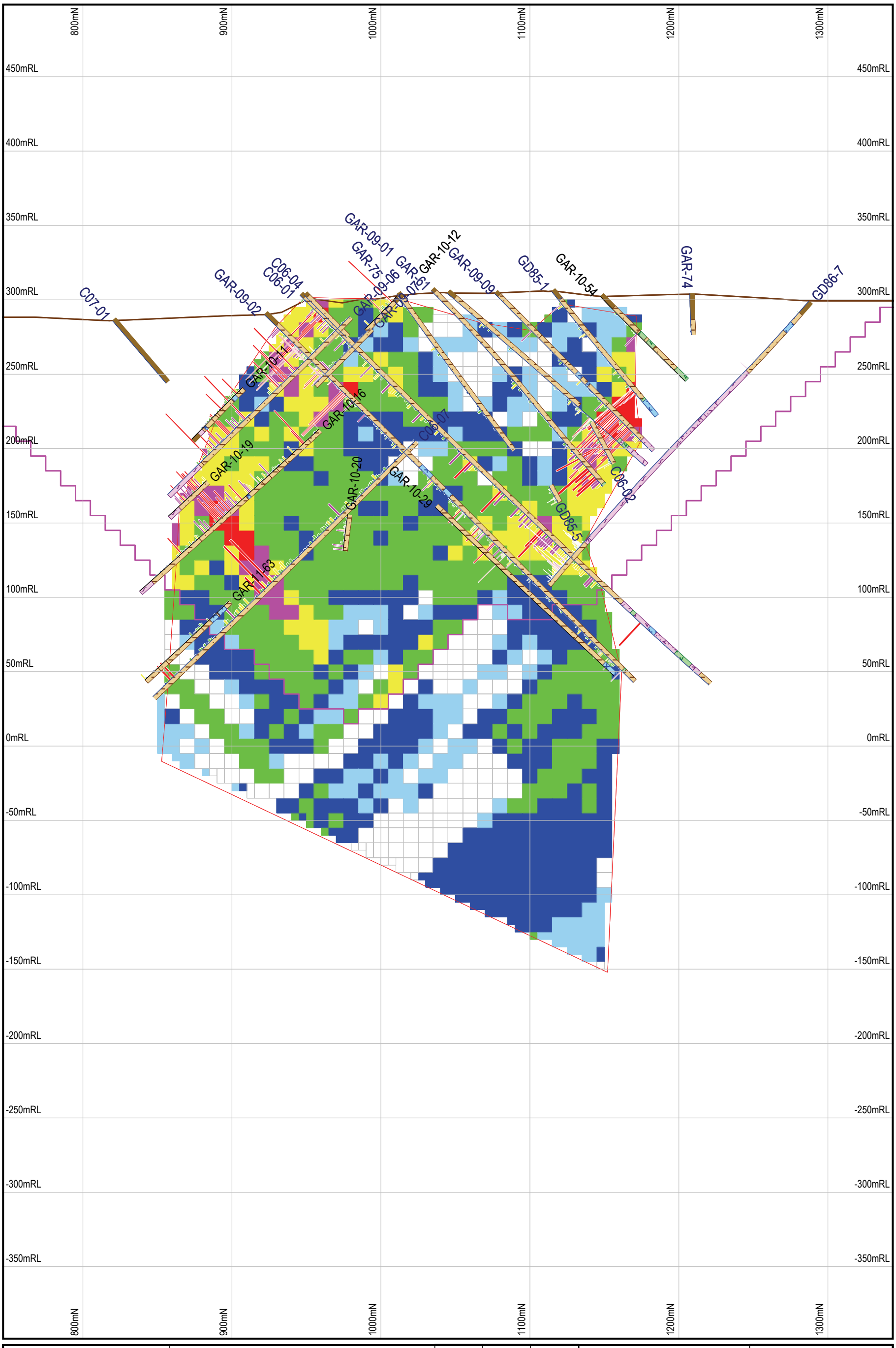


Figure 14-3 (Continued)



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Associate Mining Engineer

Lithology

CMS		GAB	
CSM		SY	
CST		CK	
CT		T	
K		OB	
UM		SED	

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

Plot File: 1200W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1200W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada

Figure 14-3 (Continued)

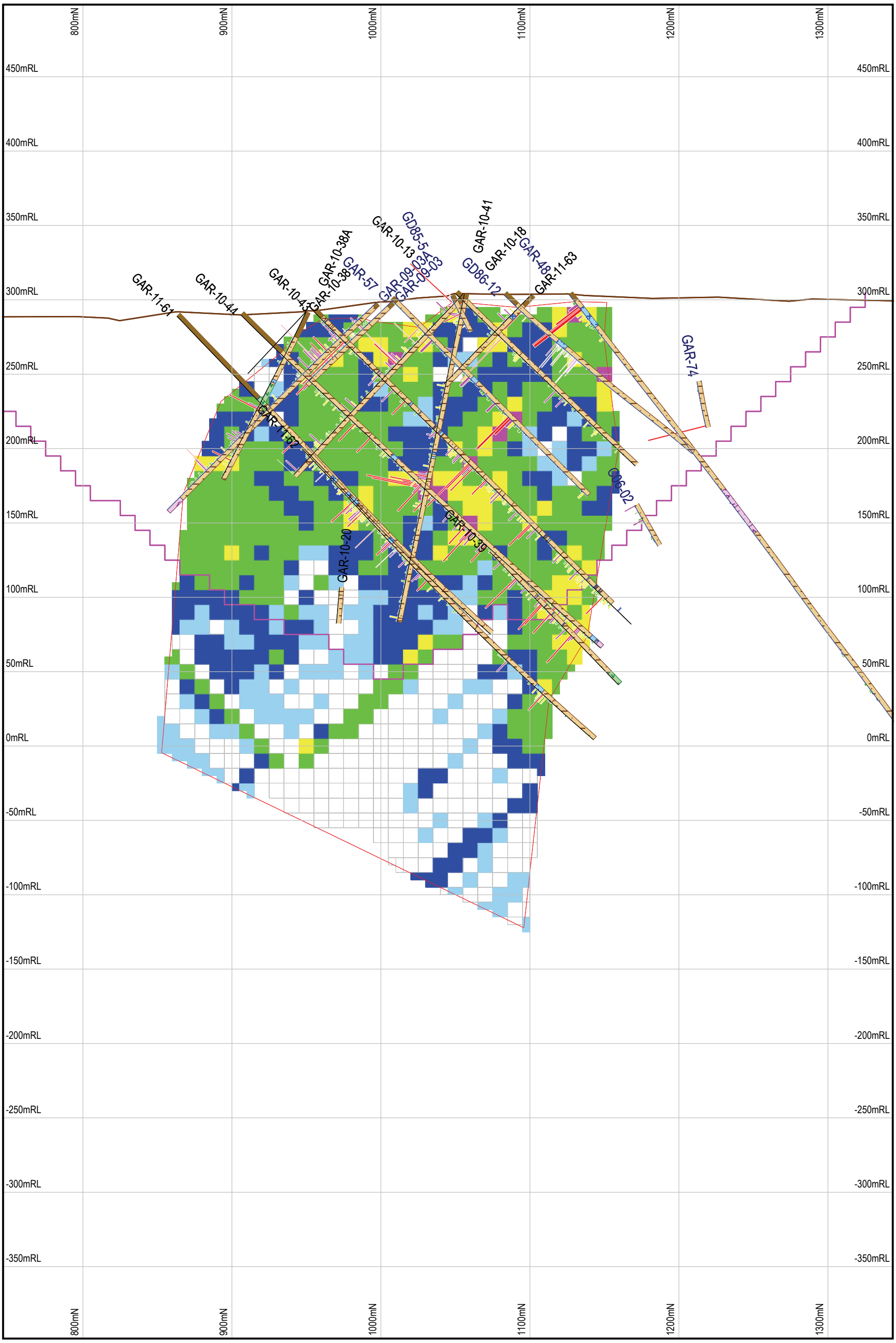

Figure 14-3 (Continued)

14.5 SAMPLE REGULARISING

Samples were regularised (normalised) over 1.0 metre intervals - the most common sample interval for samples within the mineralised zones.

14.6 SAMPLE STATISTICS

Statistics were calculated for regularised (over 1.0 metre intervals) samples within the Garrcon mineralised zone (Figure 14-4). The mean value for all regularised samples was 0.44 g/tonne.

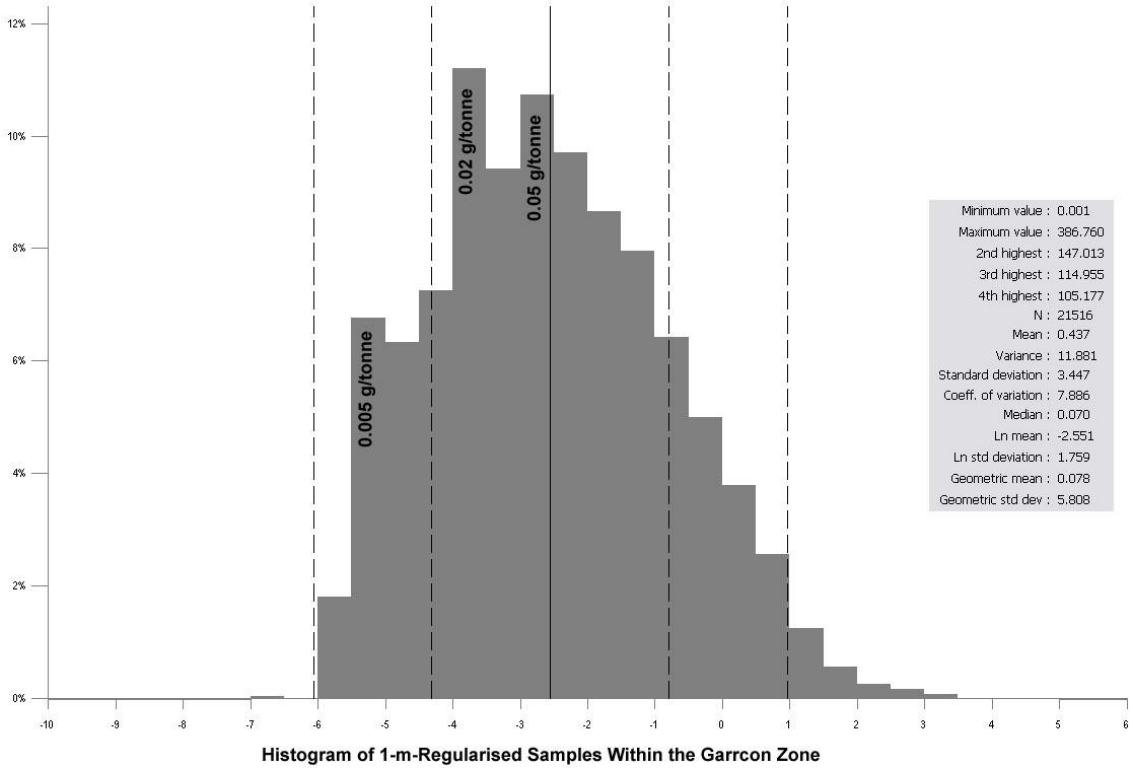

Figure 14-4: Sample statistics for the Garrcon Zone (natural log of regularised samples).

14.7 SPECIFIC GRAVITY

Based on a limited number of measurements, a representative specific gravity ("SG") value is estimated to be 2.73. Further SG work is recommended.

14.8 VARIOGRAPHY

Experimental variograms were constructed using assays that were regularised (normalized) over 1.0 metre intervals. The lag was ten metres.

Review of the cross-sections revealed what appears to be trends along certain search directions. Directional semi-variograms were therefore constructed and reviewed. However, orthogonal to those directions (i.e.: along secondary and tertiary search directions), the range was not significantly different. More detailed directional variography *may* be successful in exposing grade trends. However, such detailed work is beyond the scope of this report.

The omni-directional variogram produces excellent data to which an exponential model can readily be fit (Figure 14-5).

Table 14-2: Semi-variogram exponential model parameters.

Direction	Nugget	Partial Sill	Range (m)
Omni-Directional	1.43	1.33	50

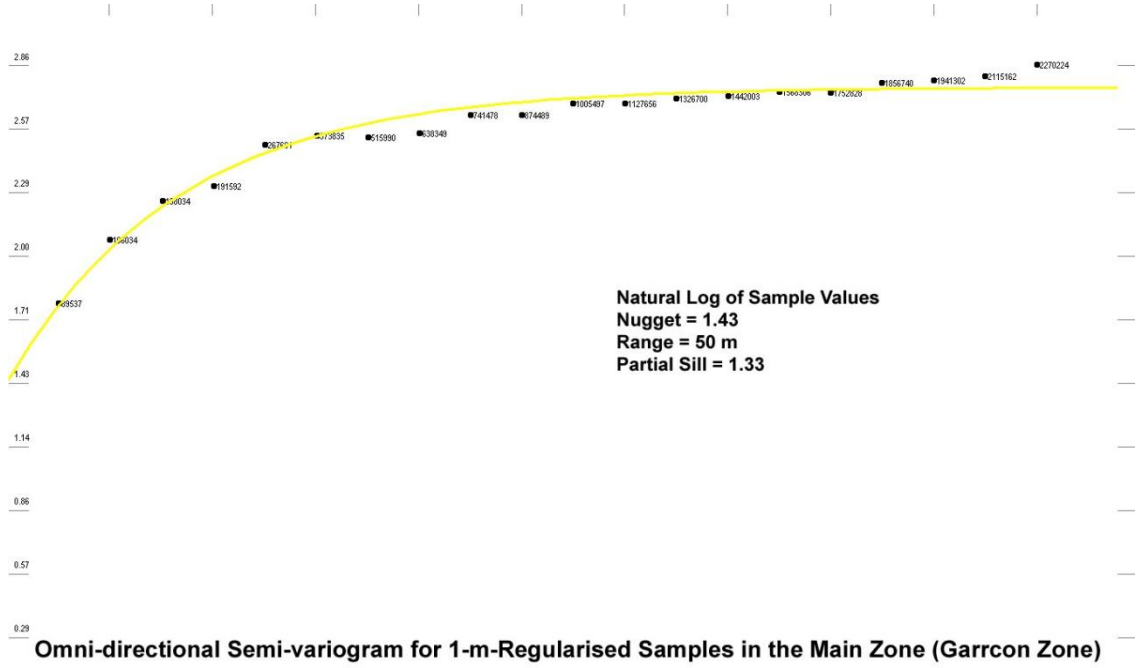

Figure 14-5: Omni-directional semi-variogram model (exponential model using 1.0 metre regularised samples within the Garrcon Zone).

14.9 BLOCK MODELLING

A blank block model with the file name "Blocks Blank.dat" was created with the parameters that were reported in Table 14-3. The blocks were constrained by the mineralised zone wireframe.

The "parent" block size is 10x10x10 metres (Easting x Northing x Elevation).

There are two sub-blocks in each direction for a geological resolution of 5x5x5 metres (Easting x Northing x Elevation).

Table 14-3: Block model parameters.

Direction	Model Origin (Grid, m)	Model Limit (Grid, m)	Model Extent (m)	Block Size (m)	Number of Blocks	Number of Sub-blocks
East	-1900	-400	1500	10	151	2
North	500	1500	1000	10	101	2
Elevation (RL)	-200	400	600	10	61	2

14.10 CUT-OFF GRADES

14.10.1 Zone Interpretation

The chosen cut-off grade for mineralised zone interpretation is 0.1 g/tonne of gold. This value, chosen through iteration, is the cut-off that, in the Co-author's (Doug Roy) opinion, when used for outlining the extent of the lower grade mineralisation, provided the closest approximation of the continuity of that mineralisation.

14.10.2 Mineral Resources

The chosen "block cut-off" [6] grade for defining mineral resources is 0.3 g/tonne. Considering a typical mining recovery of 95%, a typical overall processing recovery of 95%, a typical smelter return of 98% and a gold price of $US 1200 per ounce, rock with that grade will have a revenue of $US 10 per tonne. This is considered to be a reasonable block cut-off grade for conventional surface mining and processing – the most likely mining methods to be applied to this deposit.

14.11 TOP-CUT GRADE

A top-cut value is normally chosen to prevent the overestimation of block grades by a small number of very high assays or *outliers.*

There was no indication that there is more than one sample population present. Eleven samples (1.0 metre regularised) out of a population of 17,367 regularised samples within

[6] The grade at which it is possible to mine and process and exposed block (*i.e.*: stripping not included).

the Garrcon zone, or 0.06 % had a gold grade that was greater than 31.1 g/tonne (one troy ounce per tonne). Because there are so few very-high-grade samples, it is believed that no arbitrary top-cut is necessary.

No top-cut is applied because, in the Co-author's (Doug Roy) opinion, a top-cut would not affect the global estimate.

Although no top-cut grade is applied, certain samples are restricted in their influence on block grades (Section 14.12).

14.12 Restriction of Certain Samples

Preliminary grade estimation work indicated that three intercepts, two at the east end deposit and one at the west end, were responsible for causing large lenses of higher grade blocks that were poorly supported. These areas occurred at opposite ends of the deposit in areas of low sample density.

In the Co-author's (Doug Roy) opinion, restriction of the influence of the three intercepts is necessary to avoid overestimating the grade values and metal content of the affected areas. This has been accomplished by limiting the influence of certain higher grade samples to the semi-variogram range of 50 metres. This limiting process is further described in Section 14.13.

Table 14-4: Intervals that were restricted in influence.

Hole	Interval (m)	Grade (g/tonne)
GAR-50	26.82 - 28.29	10.00
GAR85-3	10.7 3- 11.33	18.00
C06-05B	421.0 - 425.5	3 Samples, 1.42, 6.995, 2.46

14.13 Grade Estimation

Because of the very good fit of the global semi-variogram model to the raw semi-variogram data, (Figure 14-5), ordinary block kriging is considered to be an acceptable, and appropriate method for estimating block grades in this deposit.

Blocks were discretised twice in each dimension. The grade estimation process was carried out using the parameters that are reported in Table 14-5. A description of the block model file fields is reported in Table 14-6.

To accomplish the limiting of the three problem intercepts (Section 14.12) grade estimation was carried out in two sets of three "runs" per set.

14.13.1 First Set of Runs – Non-Constrained

In the first set of runs, samples were not constrained as described in Section 14.12 and Section 14.13.2. The purpose of these runs was to estimate the grades of blocks around the "problem" samples that would be ignored during grade estimation for the rest of the block model, as described in Section 14.13.2.

The first run had a maximum search radius of 50 metres and required samples from at least three holes. In subsequent runs, the parameters were relaxed.

The resulting three block model files were compiled into a single block model titled "Blocks – Kriged - Compiled Runs.dat". Run 2's block grades overprinted Run 3's grades and Run 1's grades overprinted Runs 2's and 3's grades.

Fifty-metre-radius spheres of influence were drawn around the three problem intervals (Table 14-4) and all blocks outside of the spheres were deleted. The resulting model was comprised of blocks that were within 50 metres from the problem intervals.

Table 14-5: Grade estimation parameters.

Parameter	**Run 1**	**Run 2**	**Run 3**
Model Type	Exponential, Omni-directional	Exponential, Omni-directional	Exponential, Omni-directional
Model Range	50 m	50 m	50 m
Nugget	1.43	1.43	1.43
Partial Sill	1.33	1.33	1.33
Min. Number of Holes	3	2	1
Min. Number of Samples Per Hole	3	3	3
Max. Number of Samples Per Hole	12	12	12
Search Sphere Radius (m)	50	100	100
Resulting File	Blocks – Kriged – Run 1.dat	Blocks – Kriged – Run 2.dat	Blocks – Kriged – Run 3.dat

14.13.2 Second Set of Runs – Constrained

In the second set of runs, the three problem intervals (Table 14-4) were ignored. The runs were given the same file names as the non-constrained runs, suffixed with an "a".

14.13.3 Merging of Sets Into a Single Block Model File

The two sets of runs were merged into a single block model file named "Blocks - Kriged - Compiled Runs.DAT". The first set of runs, limited to 50 metres from the problem samples, overprinted the second series block model.

Table 14-6: Block model fields.

Field	Description
East	Easting (Grid)
_East	Block Dimension, East Direction
North	Northing (Grid)
_North	Block Dimension, North Direction
RL	Reduced Level (Grid)
_RL	Block Dimension, North Direction
Zone	Outlined Zone
Resource Category	Resource category.
Assay G/T	Estimated Gold Grade (g/tonne)
Points	Number of Samples Used for Estimate
KR_VAR	Kriging variance.
KR_STDERR	Kriging standard error.
Number of Holes	Number of Holes Used for Estimate

14.14 RESOURCE CLASSIFICATION PARAMETERS

Resource classification parameters were chosen based on a combination of variography results and the Co-author's (Doug Roy) judgement. The degree of confidence in the reported resources is based on the validity and robustness of input data and the proximity of resource blocks to sample locations. Resources are reported, as required by NI 43-101, according to the CIM Standards on Minerals Resources and Reserves.

Rather than classifying resources using the search ellipse parameters (Table 14-2), Inferred resources were outlined graphically, on cross-sections using the process that was described in Section 14.4.

Indicated Resources were outlined graphically on cross-sections within areas where the intercept spacing was approximately 40-50 metres – approximately the variogram range of 50 metres (Table 14-2). Generally, Indicated Resources were outlined in the area with the highest concentration of drilling, between -1500 and -1035 metres East and within 200 to 250 metres of surface (on average).

It is the Co-author's (Doug Roy) opinion that the geometry of the higher grade zones within the Garrcon Zone is not known to the level of confidence required for the classification of Measured mineral resources. Also, there have been an insufficient number of specific gravity ("SG") measurements for the classification of Measured mineral resources. Further SG work is recommended.

14.15 RESULTS

Mineral resources are defined using a block cut-off grade of 0.3 g/tonne (Table 14-7 and Table 14-8).

The volume of the shaft, drifts and crosscuts historically excavated by Cominco have not been deleted from the mineral resource volume. Utilizing approximate cross-sectional dimensions typical of underground workings for the era, Howe estimates that the total volume and tonnage of the material extracted by Cominco from the resource area was approximately 7,000 cubic metres and 20,000 tonnes respectively. This is less than 0.1% of Howe's combined inferred and indicated resource tonnage and therefore is insignificant.

Howe recommends that Northern Gold investigate whether weakly to non-mineralised dykes internal to the Garrcon Zone are spatially continuous enough to be effectively modeled as distinct units. This will require revising the lithologic database to subdivide and separately code the various types of dykes.

Howe is unaware of any known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues that may materially affect the mineral resource estimate.

14.15.1 Indicated Mineral Resources

Non-diluted Indicated Mineral Resources, less than 150 metres deep total 15 million tonnes with an average gold grade of 0.9 g/tonne containing 430,000 ounces gold. Non-diluted Indicated Mineral Resources, more than 150 metres deep total 9.9 million tonnes with an average gold grade of 0.9 g/tonne containing 290,000 ounces gold.

The grand total for Indicated mineral resources is 24.9 million tonnes with an average gold grade of 0.9 g/tonne, containing 720,000 ounces gold.

14.15.2 Inferred Mineral Resources

Non-diluted Inferred Mineral Resources, less than 150 metres deep total 5.6 million tonnes with an average gold grade of 0.8 g/tonne containing 140,000 ounces gold. Non-diluted Inferred Mineral Resources, more than 150 metres deep total 13.0 million tonnes with an average gold grade of 0.7 g/tonne containing 290,000 ounces gold.

The grand total for Inferred mineral resources is 18.6 million tonnes with an average gold grade of 0.7 g/tonne, containing 430,000 ounces gold.

Table 14-7: Summary of mineral resources (non-diluted).

Summary

Mineral Resource Category	Block Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated				
Less Than 150 m Deep	0.3	15,000,000	0.9	430,000
More than 150 m Deep	0.3	9,900,000	0.9	290,000
Total Indicated	**0.3**	**24,900,000**	**0.9**	**720,000**
Inferred				
Less Than 150 m Deep	0.3	5,600,000	0.8	140,000
More than 150 m Deep	0.3	13,000,000	0.7	290,000
Total Inferred	**0.3**	**18,600,000**	**0.7**	**430,000**

Notes:

1. Cut-off grade for mineralised zone interpretation was 0.1 g/tonne.
2. Block cut-off grade for defining Mineral Resources was 0.3 g/tonne.
3. No top-cut grade was used. In the author's opininion, the use of a top cut would not have significantly affected the results.
4. Gold price was $US 1200 per troy ounce.
5. Zones extended up to 100 metres down-dip from last intercept. Along strike, zones extended halfway to the next cross-section.
6. Minimum width was 5 metres, though in no place was the zone that narrow.
7. Non-diluted.
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
9. Resource estimate prepared by Doug Roy, M.A.Sc., P.Eng.
10. A specific gravity (bulk density) value of 2.73 was applied to all blocks (a representative value based on a limited number of measurements).
11. Ordinary block kriging ("OBK") was used for estimating block grades.
12. Indicated resources identified where sample intercept spacing was 50 metres or less (based on variography).
13. No Measured Mineral Resources or Mineral Reserves of any category were identified.
14. The volume/tonnage of historic Cominco shaft, drifts and crosscuts have not been deleted from the Howe mineral resource volume/ tonnage. Howe estimates the tonnage extracted from the resource area was less than 0.1% of the total inferred and indicated resource tonnage.

Table 14-8: Details of mineral resources.

Indicated Category, Less than 150 m Deep:

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
4.00	380,000	8.3	100,000
3.00	530,000	6.9	120,000
2.00	800,000	5.4	140,000
1.50	1,200,000	4.2	160,000
1.00	2,500,000	2.6	210,000
0.75	4,400,000	1.9	270,000
0.50	8,400,000	1.3	350,000
0.40	11,000,000	1.1	390,000
0.30	**15,000,000**	**0.9**	**430,000**
0.20	*21,000,000*	*0.7*	*470,000*

Indicated Category, More than 150 m Deep:

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
4.00	270,000	6.0	52,000
3.00	490,000	4.9	77,000
2.00	860,000	3.8	110,000
1.50	1,300,000	3.1	130,000
1.00	2,200,000	2.3	160,000
0.75	3,400,000	1.8	200,000
0.50	5,900,000	1.3	250,000
0.40	7,600,000	1.1	270,000
0.30	**9,900,000**	**0.9**	**290,000**
0.20	*13,000,000*	*0.8*	*330,000*

Inferred Category, Less than 150 m Deep:

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
4.00	49,000	4.9	7,700
3.00	170,000	4.0	22,000
2.00	430,000	3.0	41,000
1.50	590,000	2.6	49,000
1.00	1,200,000	1.9	73,000
0.75	1,800,000	1.6	93,000
0.50	3,100,000	1.2	120,000
0.40	4,000,000	1.0	130,000
0.30	**5,600,000**	**0.8**	**140,000**
0.20	*8,000,000*	*0.6*	*150,000*

Inferred Category, More than 150 m Deep:

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
4.00	180,000	5.4	31,000
3.00	260,000	4.7	39,000
2.00	410,000	3.9	51,000
1.50	610,000	3.2	63,000
1.00	1,200,000	2.2	85,000
0.75	2,300,000	1.5	110,000
0.50	6,700,000	0.9	190,000
0.40	9,200,000	0.8	240,000
0.30	**13,000,000**	**0.7**	**290,000**
0.20	*20,000,000*	*0.5*	*320,000*

Note: Figures in *italics* represents material within the block model that was not considered to be a mineral resource and was included for information puposes only.

Notes:

1. Cut-off grade for mineralised zone interpretation was 0.1 g/tonne.
2. Block cut-off grade for defining Mineral Resources was 0.3 g/tonne.
3. No top-cut grade was used. In the author's opininion, the use of a top cut would not have significantly affected the results.
4. Gold price was $US 1200 per troy ounce.
5. Zones extended up to 100 metres down-dip from last intercept. Along strike, zones extended halfway to the next cross-section.
6. Minimum width was 5 metres, though in no place was the zone that narrow.
7. Non-diluted.
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
9. Resource estimate prepared by Doug Roy, M.A.Sc., P.Eng.
10. A specific gravity (bulk density) value of 2.73 was applied to all blocks (a representative value based on a limited number of measurements).
11. Ordinary block kriging ("OBK") was used for estimating block grades.
12. Indicated resources identified where sample intercept spacing was 50 metres or less (based on variography).
13. No Measured Mineral Resources or Mineral Reserves of any category were identified.
14. The volume/tonnage of historic Cominco shaft, drifts and crosscuts have not been deleted from the Howe mineral resource volume/ tonnage. Howe estimates the tonnage extracted from the resource area was less than 0.1% of the total inferred and indicated resource tonnage.

14.16 CROSS-VALIDATION OF RESULTS

Block grades were recalculated using inverse distance weighting with a power of two ("ID2") and compared against the results obtained using ordinary block kriging ("OBK"). Both methods compared very well (Table 14-9).

Table 14-9: Cross-validation of results.

Ordinary Block Kriging:

Mineral Resource Category	Block Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated				
Less Than 150 m Deep	0.3	15,000,000	0.9	430,000
More than 150 m Deep	0.3	9,900,000	0.9	290,000
Total Indicated	**0.3**	**24,900,000**	**0.9**	**720,000**
Inferred				
Less Than 150 m Deep	0.3	5,600,000	0.8	140,000
More than 150 m Deep	0.3	13,000,000	0.7	290,000
Total Inferred	**0.3**	**18,600,000**	**0.7**	**430,000**

Inverse Distance:

Mineral Resource Category	Block Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated				
Less Than 150 m Deep	0.3	15,000,000	0.9	430,000
More than 150 m Deep	0.3	9,700,000	0.9	280,000
Total Indicated	**0.3**	**24,700,000**	**0.9**	**710,000**
Inferred				
Less Than 150 m Deep	0.3	5,200,000	0.9	150,000
More than 150 m Deep	0.3	13,000,000	0.7	290,000
Total Inferred	**0.3**	**18,200,000**	**0.8**	**440,000**

14.17 COMPARISON WITH PREVIOUS 2010 HOWE RESOURCE ESTIMATE

The current mineral resource estimate results were compared with the results from the previous estimate (Roy and Trinder, 2010). For this exercise, in order to carry out an "apples to apples" comparison, a 0.5 g/tonne block cut-off grade was used in both cases (Table 14-10).

The fill-in drilling that was carried out in 2010 and to date in 2011 has resulted in a shift of resources from the Inferred category to Indicated (Table 14-10). The grades for both

categories remain the same. The overall metal content of the resources has increased – the increase in Indicated ounces outweigh the decrease in Inferred ounces.

Table 14-10: "Apples to apples" comparison with previous resource estimate using a 0.5 g/tonne block cut-off for both.

2010 Estimate

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	3,780,000	1.2	144,000
Inferred	18,500,000	0.9	530,000

Current Estimate (0.5 g/tonne Cut-off)

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	14,300,000	1.3	600,000
Inferred	9,800,000	1.0	310,000

Change from 2010

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	+10,520,000	+0.1	+456,000
Inferred	-8,700,000	+0.1	-220,000

A "straight" comparison between the previous 2010 Howe estimate (Roy and Trinder, 2010) and the current estimate was also made. Recall that the previous estimate used a block cut-off grade of 0.5 g/tonne while the current estimate used 0.3 g/tonne as a cut-off.

As with the "apples-to-apples" comparison at a 0.5 g/tonne cut-off (Table 14-10), it is apparent in the "straight" comparison (Table 14-11) that 2010's fill-in drilling has resulted in a portion of the mineral resources shifting from Inferred to Indicated.

Understandably, decreasing the block cut-off has also resulted in a decrease in the average resource grade for both Indicated and Inferred categories.

There is a significant net increase in metal content since 2010. Indicated ounces increased significantly, outweighing the decrease in Inferred ounces. The Co-author (Doug Roy) considers this to be primarily due to the decrease in block-cut off grade and secondarily the 2010 and 2011 fill-in drilling through known, well-mineralised parts of the Garrcon Zone.

Table 14-11: "Straight" comparison with previous resource estimate (i.e.: 0.5 g/tonne block cut-off for 2010 estimate and 0.3 g/tonne cut-off for current estimate).

2010 Estimate (0.5 g/tonne)

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	3,780,000	1.2	144,000
Inferred	18,500,000	0.9	530,000

Current Estimate (0.3 g/tonne Cut-off)

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	24,900,000	0.9	720,000
Inferred	18,600,000	0.7	430,000

Change from 2010

Mineral Resource Category	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
Indicated	+21,120,000	-0.3	+576,000
Inferred	+100,000	-0.2	-100,000

15 MINERAL RESERVE ESTIMATES

This section is not relevant to the current Garrison Gold Property resource estimate. No mineral reserves have been estimated for the Property.

16 MINING METHODS - PROPOSED

16.1 CAUTION TO THE READER

The reader is cautioned that this PEA uses Inferred Mineral Resources. NI 43-101 Part 2, Section 2.3(1)(b) and Companion Policy 43-101CP, Part 2, Section 2.3(1) Restricted Disclosure, prohibits the disclosure of the results of an economic analysis that includes or is based on inferred mineral resources, an historical estimate, or an exploration target.

"Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies." (Adopted by CIM Council on December 11, 2005)

Inferred Mineral Resources are based upon widely spaced samples and are speculative in nature. They may never be part of a mineral reserve.

Companion Policy 43-101CP, Part 2, Section 2.3(1), Restricted Disclosure states that "CIM considers the confidence in inferred mineral resources is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. The Instrument extends this prohibition to exploration targets because such targets are conceptual and have even less confidence than inferred mineral resources. The Instrument also extends the prohibition to historical estimates because they have not been demonstrated or verified to the standards required for mineral resources or mineral reserves and, therefore, cannot be used in an economic analysis suitable for public disclosure."

The Companion Policy 43-101CP, Part 2, Section 2.3(1), on the Use of Term "Ore" states: – *We consider the use of the word "ore" in the context of mineral resource estimates to be potentially misleading because "ore" implies technical feasibility and economic viability that should only be attributed to mineral reserves.*

However, under NI 43-101, Part 2, Section 2.3(3) and Companion Policy 43-101CP, Part 2 section 2.3(3), a Preliminary Economic Assessment is allowed to use inferred mineral resources and to carry out an economic assessment in order to inform investors of the potential of the property. Investors must be informed that the preliminary economic assessment is preliminary in nature, that 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. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

The next logical step is to follow up the PEA with a pre-feasibility study which requires validation of resources through closer spaced sampling and cost confirmation by obtaining and using detailed quotes from suppliers. A detailed knowledge of the physical conditions at the site and extensive confirmation testing to determine the optimum processing method is also required.

16.2 INTRODUCTION

The Mineral Resources outlined to date for the Garrcon deposit indicate a large tonnage-low grade open pit mine. Howe used a circular type of analysis to determine a best case scenario for the deposit.

> "*the approach to solve it is based on a circular analysis combined with certain heuristic tools. ... In order to manage this complex problem, the mine planning process can be conveniently split off in three stages which are conceptual, feasibility and operational planning.*" (Camus and Jarpa, 1996).

Howe examined the open pit mine potential of the Garrcon deposit using processing capacities from 4,000 to 11,300 tonnes per day. In general, the higher the production rate, the lower the operating costs.

16.3 SUMMARY OF RELEVANT INFORMATION AVAILABLE

Data received from Northern Gold and available through public and government sources includes:

- detailed drill hole data;
- mineral and waste inventory as per the Mineral Resource estimate in this report;
- Rock Quality Data from 46 of the 2010 drill holes included in this resource estimate;
- hydrologic and geotechnical information is sparse but acceptable for an order of magnitude cost study;
- topographic maps, including property boundaries are sufficient for a preliminary mine layout;
- preliminary metallurgical test work; and,
- a property / claim map.

Northern Gold geologists record core recovery and RQD measurements as well as descriptive logs including rock type, structure, alteration, and mineralisation. Drill core and sample information are input into a digital database using portable computer

workstations at the workbenches. The core is digitally photographed before sampling (Howe, 2010).

Northern Gold has retained N.A.R. Environmental Consultants Inc. (NAR) of Sudbury to conduct environmental baseline studies. Water sampling stations were installed at three sites on and around the Garrison Gold Property on April 28, 2010. Two ground water monitoring wells have been drilled for sampling and these in conjunction with water levels in the Jonpol shaft will establish a three point ground water monitoring system to be used by NAR to determine regional ground water movements. (Howe 2010).

The information base is sufficient for an estimate of the capital and operating costs for this PEA. Additional geotechnical, hydrological and social and environmental studies are required as recommended in the Recommendations section.

16.4 PROPOSED MINING AND PROCESSING METHODS

Mining will be by open pit with a stripping ratio of about 2:1. Shovels will be used to load 100 ton haul trucks. Ore will be designated, and the remaining material sent to the waste dumps. If the waste material contains sufficient gold to justify recovery by heap leach, it would be sent to a primary crusher and from there either to the processing plant or a heap leach facility.

A conventional gravity-agitated cyanide leach plant capable of treating 11,300 tonne per day plant is planned for higher grade ore, + 0.3 g/tonne, (average 0.9 g/tonne) and a seasonal heap leach facility is planned for the lower grade material with grades between 0.15 g/tonne and 0.3 g/tonne. The processing plant will operate 365 days per year and the heap leach facility will operate about 274 days per year (9 month operating season), treating 8,000 tonnes per day or about 2.3 million tonnes per year. (Figure 16-1).

After mining and crushing, the lower grade material for a heap leach operation will go to a heap leach facility via a conveyor system.

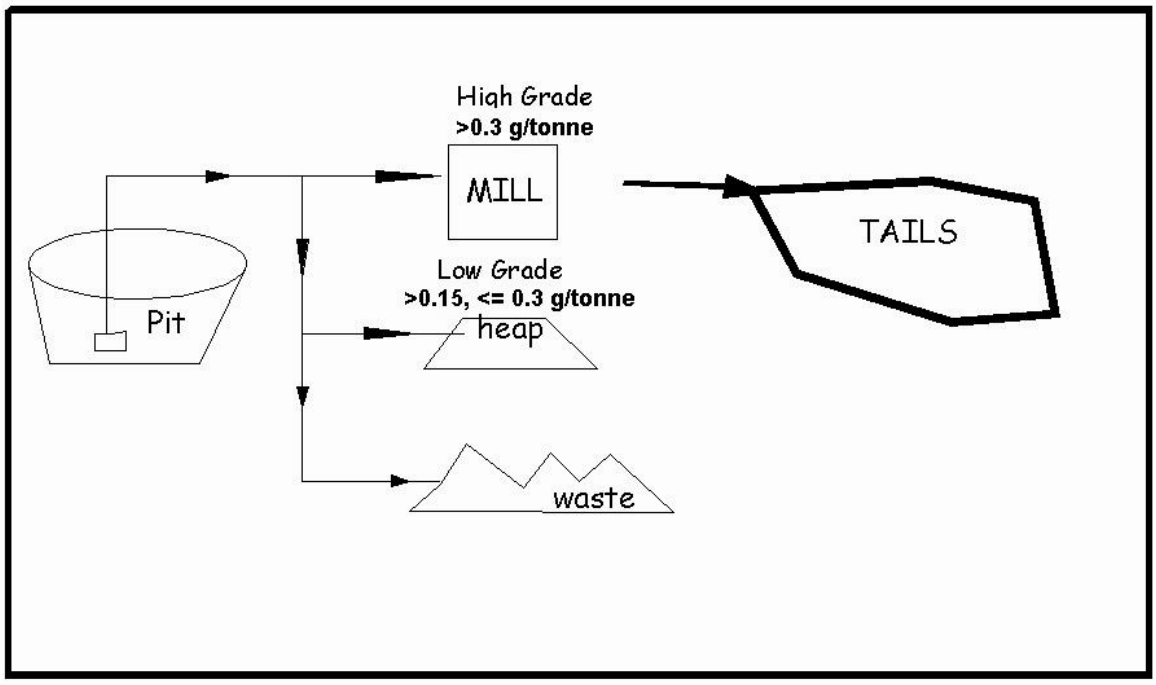

Figure 16-1: Mining and Processing of the Garrcon Gold Deposit

16.5 Open Pit Mining

16.5.1 Pit Optimisation

A pit was optimized using the parameters in **Table 16-1**. The pit optimisation was based on the plant milling costs (gravity with CIL/CIP). Revenue from heap leaching was not considered during pit optimisation, as the intent there was to process gold-bearing waste rock.

Table 16-1: Pit optimisation parameters.

Parameter	Value
Mining Cost, Ore or Waste (Drilling, Blasting, Loading & Hauling)	$2.34 per tonne
Rehab Cost	$0.25 per tonne Milled
Dilution	5%
Mining Recovery	95%
Gold Price	$US 1,200 per ounce
Processing Cost (CIL/CIP, Heap Leach)	$5.31 / $4.22, per tonne Processed
Processing Recovery	98%, 65%
Specific Gravity	2.73
Overall Slope Angle (rock, overburden / fault material)	45°, 30°

The proposed open pit mine will be roughly 0.9 km east-west (along strike) by about 700 metres north-south and nearly 300 metres deep with a footprint of 43 hectares (refer to

Figure 16-2). The pit contained 33.0 million non-diluted (Indicated plus Inferred) tonnes of mill feed with an average grade of 0.90 g/tonne. Material that must be mined, that did not meet the 0.30 g/tonne cut-off grade but met the 0.15 g/tonne heap leach cut-off grade, amounted to an additional 18.3 million tonnes with an average grade of 0.20 g/tonne. Almost 90% of the gold would be recovered in the mill.

Waste tonnes, which included zero-grade waste rock and block model material that was below the 0.15 g/tonne heap leach cut-off, amounted to 102 million tonnes for an overall stripping ratio of 2:1.

Table 16-2: Summary of pit optimization results (Indicated plus Inferred mineral resources).

Pit Details	**CIL/CIP**	**Heap Leach**	**Total**
Gold Price ($US per Ounce)	$1,200		
Cut-off Grade (g/tonne):	0.30	0.15	
Non-Diluted Ore (tonnes)	33,000,000	18,300,000	51,300,000
Non-Diluted Ounces	960,000	120,000	1,080,000
Non-Diluted Grade (g/tonne)	0.90	0.20	0.65
Waste Tonnes	102,000,000		
Pit Depth (m)	300		
Footprint (Hectares)	43		
Stripping Ratio (t_{waste}:t_{ore})	2:1		

Table 16-3: In-pit mineral resources, by cut-off.

Indicated Category

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
10.00	101,000	16.4	53,000
8.00	160,000	13.6	70,000
6.00	277,000	10.7	95,000
4.00	645,000	7.4	150,000
2.00	1,660,000	4.6	240,000
1.50	2,470,000	3.7	290,000
1.00	4,630,000	2.5	370,000
0.90	5,500,000	2.3	400,000
0.80	6,750,000	2.0	430,000
0.70	8,410,000	1.8	470,000
0.60	10,600,000	1.5	520,000
0.50	13,600,000	1.3	570,000
0.40	17,900,000	1.1	630,000
0.30	**24,000,000**	**0.91**	**700,000**
0.20	*32,100,000*	*0.74*	*760,000*
0.15	*37,400,000*	*0.66*	*790,000*
0.10	*43,700,000*	*0.58*	*810,000*

Inferred Category

Cut-off Grade (g/tonne)	Tonnes Above Cut-off	Average Gold Grade (g/tonne)	Ounces
10.00	2,730	12.8	1,100
8.00	21,800	9.1	6,400
6.00	36,900	8.2	9,700
4.00	217,000	5.3	37,000
2.00	818,000	3.5	91,000
1.50	1,100,000	3.0	110,000
1.00	1,930,000	2.3	140,000
0.90	2,140,000	2.1	150,000
0.80	2,520,000	1.9	160,000
0.70	3,220,000	1.7	170,000
0.60	4,070,000	1.5	190,000
0.50	5,280,000	1.3	210,000
0.40	7,030,000	1.1	240,000
0.30	**9,000,000**	**0.9**	**260,000**
0.20	*11,600,000*	*0.8*	*280,000*
0.15	*13,900,000*	*0.7*	*290,000*
0.10	*18,100,000*	*0.5*	*310,000*

Note: Figures in *italics* represents material within the block model that was not considered to be a mineral resource and was included for information puposes onl

Notes:

1. Cut-off grade for mineralised zone interpretation was 0.1 g/tonne.
2. Block cut-off grade for defining Mineral Resources was 0.3 g/tonne.
3. No top-cut grade was used. In the author's opininion, the use of a top cut would not have significantly affected the results.
4. Gold price was $US 1200 per troy ounce.
5. Zones extended up to 100 metres down-dip from last intercept. Along strike, zones extended halfway to the next cross-section.
6. Minimum width was 5 metres, though in no place was the zone that narrow.
7. Non-diluted.
8. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
9. Resource estimate prepared by Doug Roy, M.A.Sc., P.Eng.
10. A specific gravity (bulk density) value of 2.73 was applied to all blocks (a representative value based on a limited number of measurements).
11. Ordinary block kriging ("OBK") was used for estimating block grades.
12. Indicated resources identified where sample intercept spacing was 50 metres or less (based on variography).
13. No Measured Mineral Resources or Mineral Reserves of any category were identified.
14. The volume/tonnage of historic Cominco shaft, drifts and crosscuts have not been deleted from the Howe mineral resource volume/ tonnage. Howe estimates the tonnage extracted from the resource area was less than 0.1% of the total inferred and indicated resource tonnage.

Table 16-4: Resources by level.

Bench Elevation (m)	Up to Elevation (m)	Resource Category	Total Tonnes	Tonnes In-Pit	Total Average Grade (g/tonne)	In-Pit Average Grade	Total Ounces	In-Pit Ounces	Percent of Total Within Pit	
									Tonnes	Ounces
250	300 (Approx)	Indicated	4,980,000	4,980,000	0.85	0.85	136,000	136,000	100%	100%
250	300 (Approx)	Inferred	2,860,000	2,860,000	0.82	0.82	75,400	75,400	100%	100%
200	250	Indicated	4,770,000	4,770,000	0.75	0.75	115,000	115,000	100%	100%
200	250	Inferred	1,800,000	1,450,000	0.81	0.90	46,900	42,000	81%	90%
150	200	Indicated	5,660,000	5,600,000	0.98	0.98	178,000	176,000	99%	99%
150	200	Inferred	892,000	631,000	0.87	0.99	25,000	20,100	71%	80%
100	150	Indicated	6,020,000	5,660,000	0.77	0.79	149,000	144,000	94%	97%
100	150	Inferred	1,780,000	1,130,000	0.67	0.71	38,300	25,800	63%	67%
50	100	Indicated	3,610,000	2,870,000	1.19	1.36	138,000	126,000	80%	91%
50	100	Inferred	3,740,000	1,770,000	0.64	0.69	77,000	39,300	47%	51%
0	50	Indicated	321,000	112,000	0.98	1.55	10,100	5,580	35%	55%
0	50	Inferred	4,220,000	1,150,000	0.78	1.56	106,000	57,700	27%	54%
-50	0	Indicated	-	-	-	-	-	-	0%	0%
-50	0	Inferred	1,800,000	-	0.59	-	34,100	-	0%	0%
-100	-50	Indicated	-	-	-	-	-	-	0%	0%
-100	-50	Inferred	1,440,000	-	0.54	-	25,000	-	0%	0%
-150	-100	Indicated	-	-	-	-	-	-	0%	0%
-150	-100	Inferred	311,000	-	0.41	-	4,100	-	0%	0%

Table 16-5: Percent of Resources in the Indicated category, by Level.

Bench	Tonnes	Ounces
250	64%	64%
200	73%	71%
150	86%	88%
100	77%	80%
50	49%	64%
0	7%	9%
-50	0%	0%
-100	0%	0%
-150	0%	0%

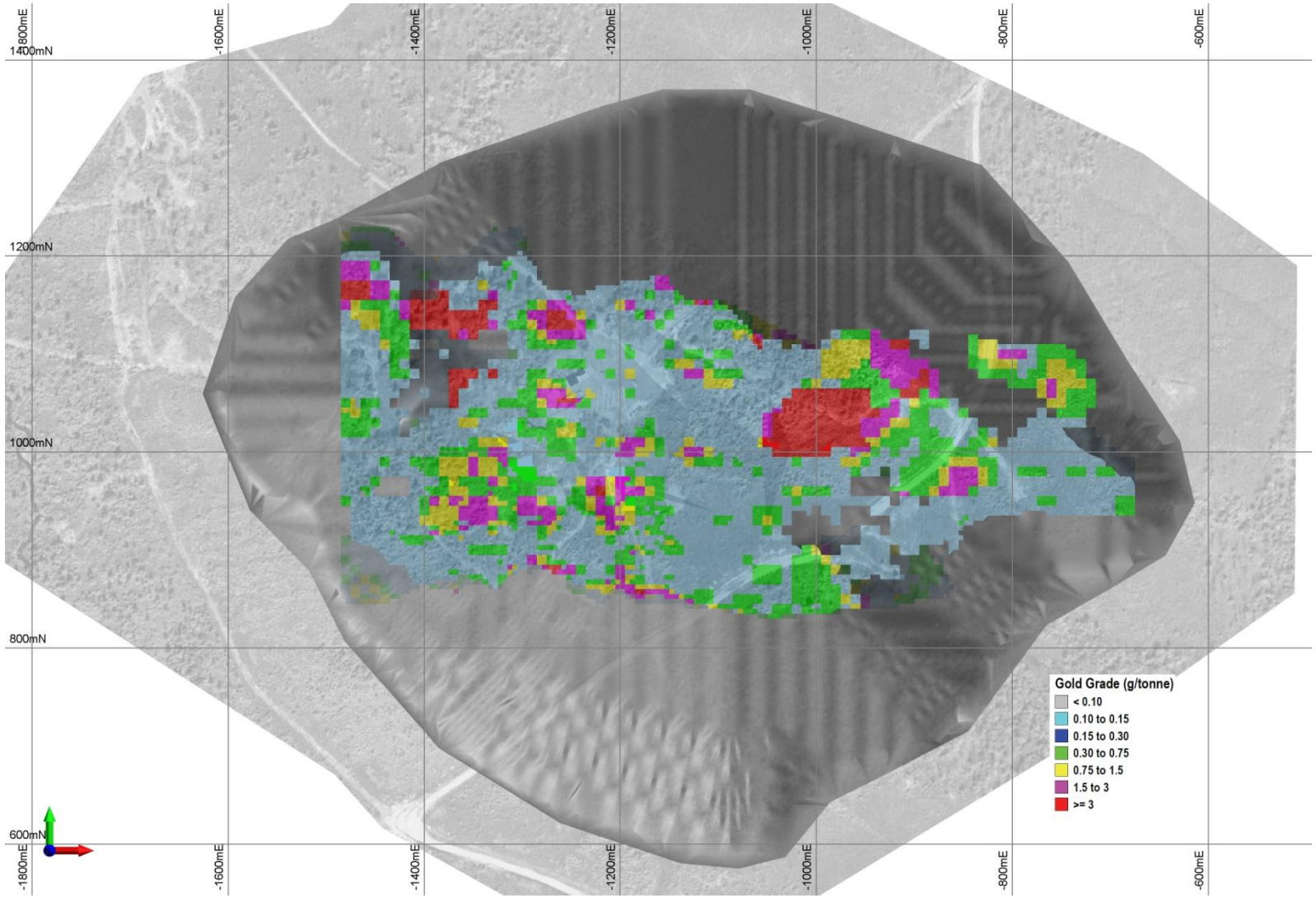

Figure 16-2: Plan view of $1200 pit (optimum pit).

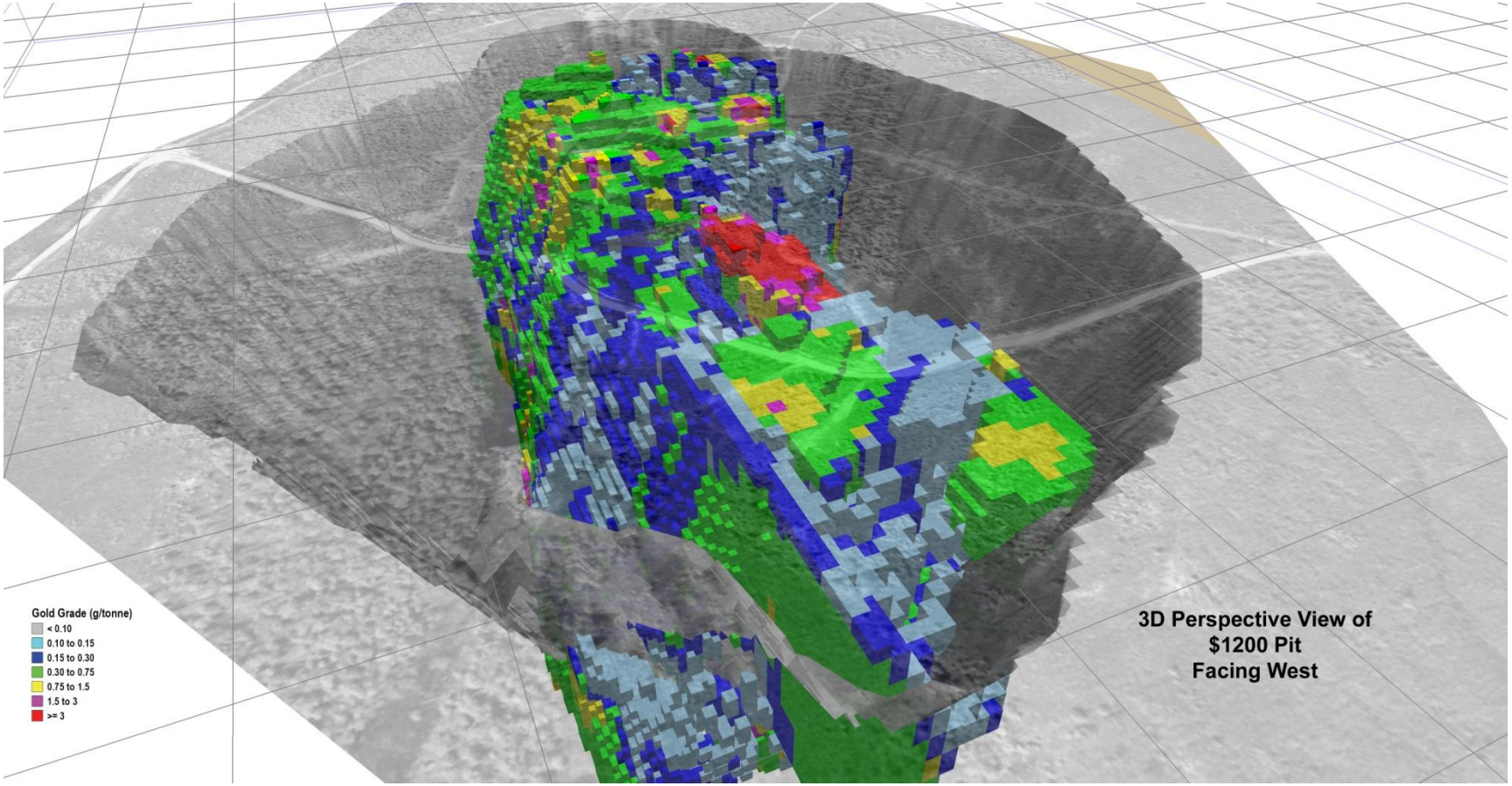

Figure 16-3: Three-dimensional view of the $1200 pit (optimum pit).

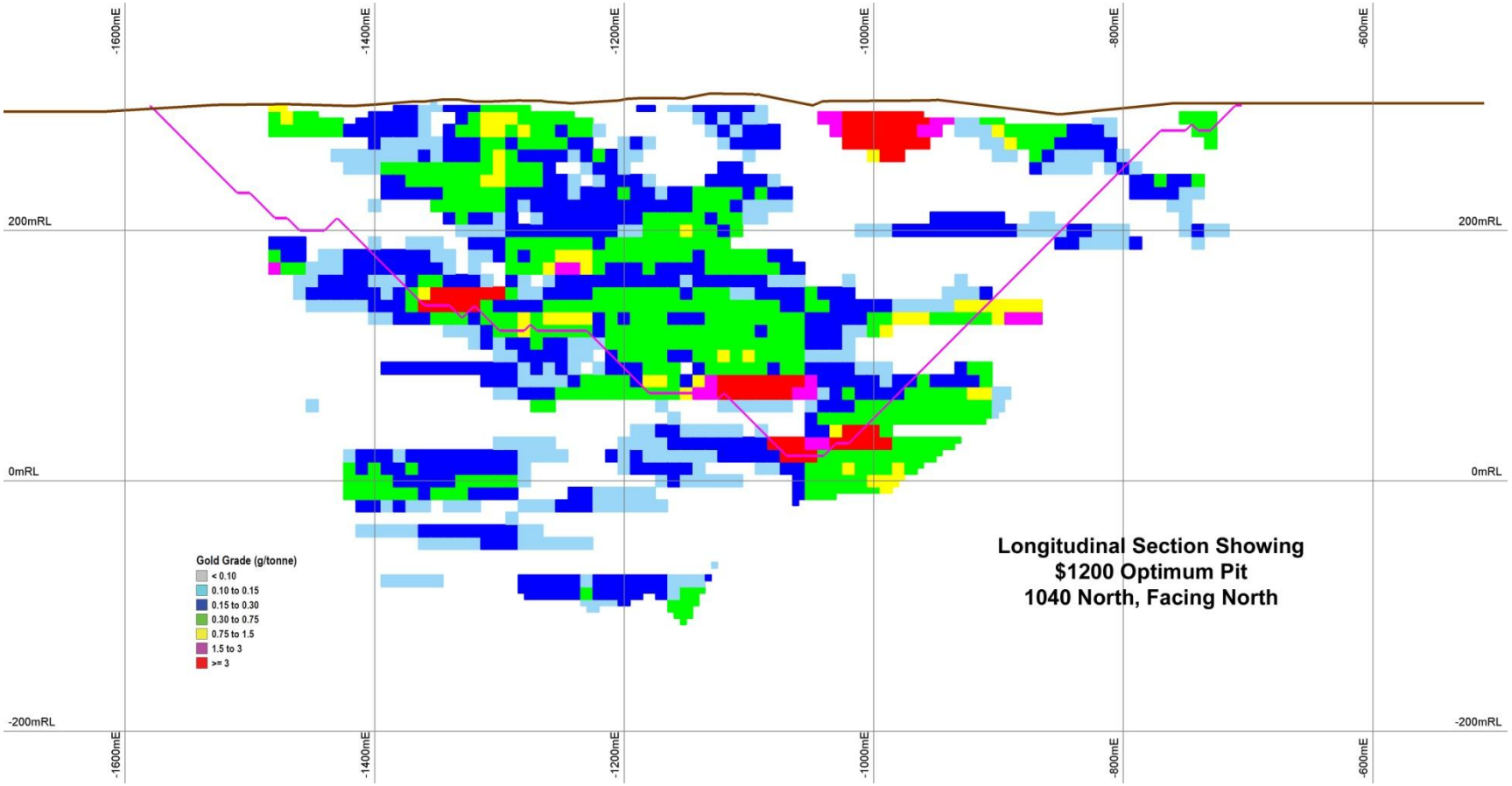

Figure 16-4: Longitudinal section showing the $1200 pit (optimum pit).

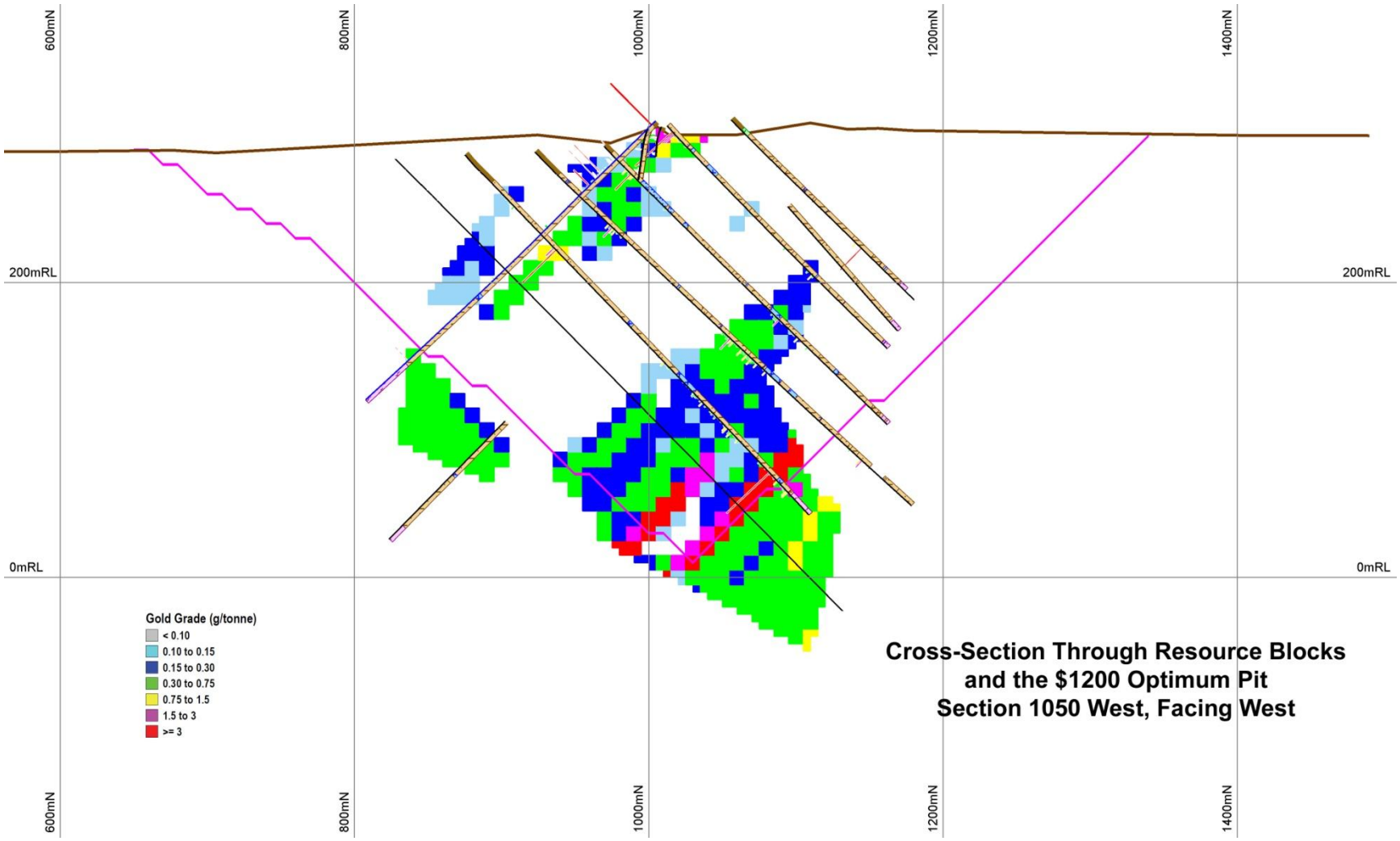

Figure 16-5: Cross-section 1050 West.

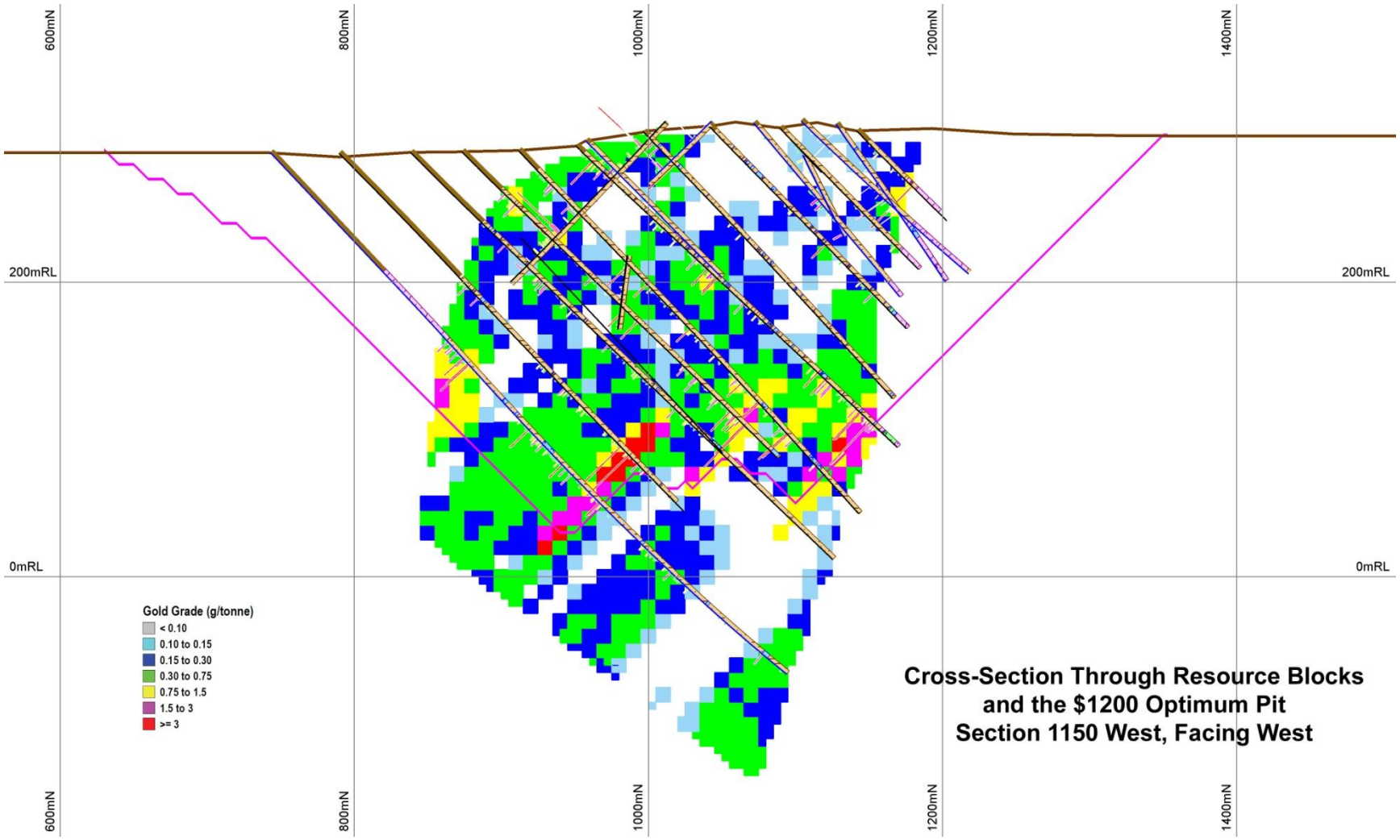

Figure 16-6: Cross-section 1150 West.

16.5.2 Practical Pit Design ("De-optimisation")

Benches and haul roads were added to the base case optimum pit.

The minimum haul road width is 20 metres. A 100 tonne capacity haul truck (a typical size for this deposit type and size) has a 6 metre width. Roads should be 2-3 times the haul truck width. The chosen width (20 metres) allows for a ditch on the "toe" side of the road and a safety berm on the "crest" side (refer to Table 16-6 and Figure 16-7).

Refer to Figure 16-8 and Figure 16-9 for the conceptual, "de-optimised" pit design.

Table 16-6: Pit design parameters ("de-optimisation").

Parameter	Value
Haul Road Width	20 metres (Minimum)
Bench Face Angle	80 deg
Final Bench Height	20 metres (Maximum)
Catch Bench Width	20-25 metres (Varies to Suit Overall Slope)
Overall Slope Angle	45 deg

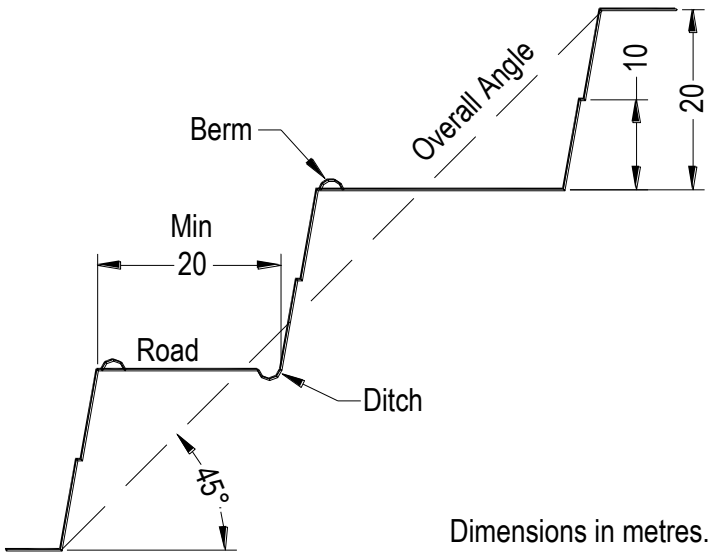

Figure 16-7: Conceptual pit design cross-section.

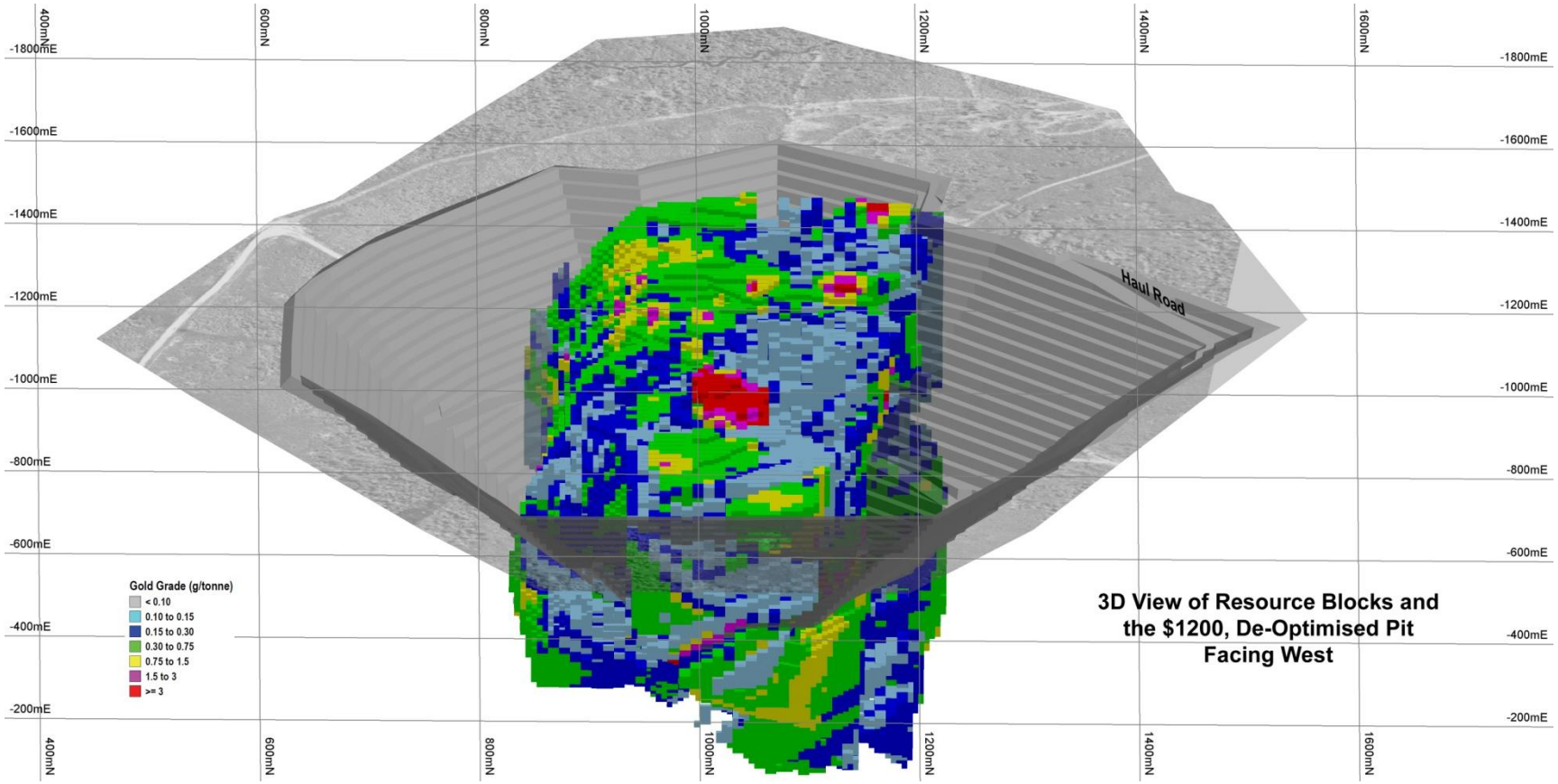

Figure 16-8: 3D view of the de-optimised (benches and haul roads added), $1200 pit, facing west.

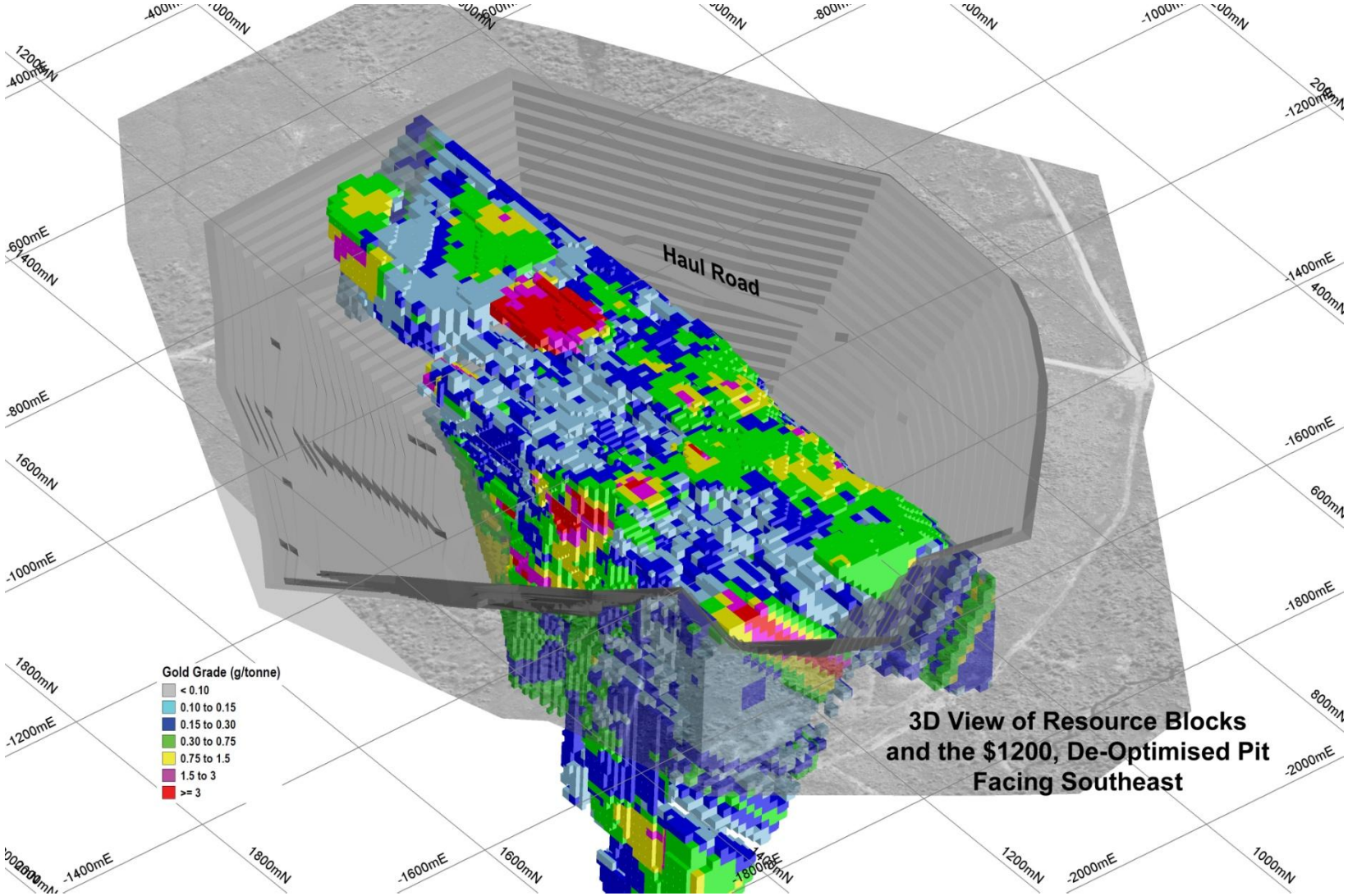

Figure 16-9: 3D view of the de-optimised (benches and haul roads added), $1200 pit, facing southeast.

16.6 PRODUCTION RATE

Howe has created a cash flow model for the Garrcon deposit and this model is used to estimate the net present value of the revenue stream from the mine using production capacities ranging from 1,000 tpd to 12,000 tpd. The optimum tonnage rate, based on this work, is 11,300 tonnes per day giving an 8 year mine life.

16.7 MINE SCHEDULE

Waste stripping will be completed 6 months to a year prior to mining. For the purpose of the PEA, the grade of the ore is treated as being uniform throughout the life of mine. As additional work is done, the schedule should be revised to reflect the actual pit ore grade. After the mill has been commissioned, higher grade material may be mined early, reducing the payback period.

Table 16-7 - Mining Schedule for 10,300 tpd plant (quantities rounded)

	Pre-Production Year 1	Pre-Production Year 2	Year 1	Year 2	Year 3-8
Waste tonnes Mined		6,311,000	12,519,000	12,519,000	6,259,000
LG ore to Crusher then Heap		572,000	2,288,000	2,288,000	1,716,000
H.G. Ore to Crusher the to Mill PAD		1,031,000	4,125,000	4,125,000	3,094,000
Dilution		52,000	206,000	206,000	155,000
Tonnes moved per year		7,966,000	19,138,000	19,138,000	11,223,000
loose m3 moved per year		5,431,000	13,049,000	13,049,000	7,652,000

16.8 MINE PLANNING PARAMETERS

The mine engineering department will be responsible for mine planning and design, production scheduling, surveying, geotechnical design, and performance statistics and any other technical requirements that support the operation. The mine geology department will be responsible deciding which ore goes to the processing plant and which will go to the heap leach. Low and high grade can be mapped and confirmed by blast hole sampling. Processing options are discussed in processing section of the report.

Table 16-8 provides the basic criteria used in the pit design. The mine and mill operate 7 days per week, nominally 365 days per year. In reality however, there will be storm days and other times when it is not possible to work in the mine. The heap leach will operate about 9 months per year, 7 days per week. The mine will move and stockpile about 52,000 tonnes per 24-hr day. Large stockpile areas are required at the mill and at the first crushing station. In practice, more ore will be mined during the summer than during the winter and provisions are to be made for ore stockpiles to supply a minimum of 2 months mill feed (680,000 tonnes, requiring about 5 ha of storage area).

Table 16-8: Pit Quantities, Non-Diluted

Pit Quantities	1.98	tonnes waste/tonnes ore
Tonnes HG ore	***33,000,000***	tonnes
approximate m^3 tailings	***25,384,615***	m^3, s.g. = 1.3
tonnes/year to plant	***4,125,000***	per year
Tonnes LG Ore	***18,300,000***	tonnes
tonnes/year to heap leach	***2,287,500***	Seasonal, 9 months/year
approximate m^3 Heap Ore	***11,437,500***	m^3, s.g. = 1.6
waste rock, estimated	***101,800,000***	tonnes
approximate loose m^3	***63,625,000***	m^3, s.g. = 1.6
Ore plus waste tonnage combined	**153,100,000**	tonnes
INSITU HG Ore, g/t	**0.90**	g/t
Mine recovery	**0.95**	
INSITU LG Ore g/t	**0.20**	g/t

Table 16-9 lists the quantities used in the mine plan. These quantities were determined from the optimum pit at a gold price of $1,200 per ounce. Dilution of the ore to the mill is assumed to be 5% at zero grade. The mining recovery is assumed to be 100% for this PEA as the mineralized zones are wide, in reality however, mining recovery will be less than 100%.

Stripping is scheduled to be done a year ahead of mining in the PEA. This will ensure enough working places to permit a steady production of rock. The ore:waste strip ratio is approximately 2:1.

Table 16-9: Quantities used in the PEA study

GARRCON GOLD PROPERTY Mine Life, years 8.0 **BASIC CRITERIA for Garrcon Open Pit Mine Plan**	
Total tonnes ore plus waste	153,100,000
Dilution	5%
annual ore tonnes	4,125,000
annual loose cubic metres ore	2,580,000
annual waste tonnes	12,725,000
annual heap leach cubic metres (s.g. = 1.6)	1,430,000
annual heap leach tonnes	2,287,500
annual loose cubic metres waste	7,953,000
Annual tonnes ore and waste combined	19,137,500
Weekends and Annual legal holidays of total shutdown	0
Scheduled operating days per week	7
Annual scheduled operating days	365
Nominal tonnes mined / day	52400
Processing Plant, tonnes per day	11300
Number of shift crews	4
Heap Leach - 6 cells, heap depth, m	3
Heap Cycle, days- stack, leach, wash, prep for next lift,	70
scheduled hours per year	8,760
Average daily tonnage per 24 hour day	52,432
average hourly tonnage	2,185
peak delivery to dumping points	2,913
Overall job efficiency (55 min hour)	92%
Average mechanical availability of scheduled time	85%
Annual outage factor	95%

16.8.1 Required Mining Fleet and Machinery

Mining fleet and machinery requirements for the proposed pit are presented in **Table 16-10**.

Table 16-10: Major Mining Items

Item	Number
Hydraulic large shovel	2
Hydraulic Backhoe, 45 tonne	1
Frontend Loader , 350 kW	2
Haul Truck (New or good used)	13
Water Truck	2
Blast Hole Drills	4
Bull Dozer and ripper, 4.7m maximum blade width	3
Rubber Tired Front end loader, 300 kW	1
Grader, 4.3m blade width	1

16.8.1.1 Drilling and Blasting

A minimum of 4 good used or new rotary drills are required with the capacity to drill at least 10m per hour. Drilling tests should be completed to determine bit wear, drilling speed etc. A blast hole diameter of 223mm (9 inch) diameter holes will provide a good penetration rate and a good powder distribution. Blast hole specifications and drill requirements are presented in Table 16-11.

Larger diameter drills lower drilling and blasting costs (greater down-hole pressure on the bit, thus drill faster; fewer detonators etc.). The larger 9 inch hole will also provide finer muck and thus lower crushing and grinding costs.

Table 16-11 – Blasthole Specifications and Drill Requirements

Hole Size	0.2286	m
Bench Height	15	
Hole Depth	17	m
Total Hole Volume	0.68	m^3
Percent of hole depth filled with explosives	60%	
volume of explosive	0.41	m^3
bulk density of explosives, average	1000	kg/m^3
Weight of explosive in hole	406	kg
explosive factor, kg/t rock blasted	0.25	
tonnes broken per hole	1625	
total tonnes ore and waste per year	19,137,500	tonnes
total holes per year	11775	
total length of hole	194282	m
drilling rate while drilling the hole	10	m/hr
actual drilling time required	19428	hours
scheduled annual hours	8,760	hr
overall job efficiency	80%	
mechancal availability	80%	
annual outage factor	95%	
production utilization	61%	
actual production hours	5,326	hr
drills required	3.6	
minimum drills in use or available	**4**	

Vertical holes will be drilled 17m deep to provide 15m benches. Holes will be bottom loaded and blasted in rows at least 5 deep. Burden, spacing and blast hole timing will be determined taking geotechnical elements into consideration as well as timing between holes and down holes will be determined for optimal fragmentation in the ore and waste. The ore near the waste contact can be

blasted in 5 meter benches for grade control. Cushion blasting near the waste contact and final wall should minimize overbreak and dilution.

The physical properties of the rocks have not been determined but should be close to typical for the area, and from Morrison, 1971.

Table 16-12 - Physical Properties of Rocks

	Unconfined Strength				Elastic Moduli		
					stress/longitudinal strain	lateral strain / long. Strain	Shear Modulus
Physical Properties of Rocks[1]	**Compression, psi**	**Tension, psi**	**Shear, psi**	**Torsion, psi**	**Young's Modulus x 10-6 psi**	**Poisson's Ratio**	**Modulus of Rigitity x 10-6**
Conglomerate, Denison Mine	26,890	1,090	5,745		10.30	0.13	4.50
Conglomerate, Miliken Mine	17,590	1,070		1,658	13.20	0.10	6.30
Porphyry, Lakeshore Mine	36,280	1,900	3,430	3,600	9.40	0.21	3.90
1. from Table 1 (14) Morrison, p.20							
Physical Properties of Rocks	**Compression, Mpa**	**Tension, Mpa**	**Shear, Mpa**	**Torsion, Mpa**	**Young's Modulus x 10-6 Mpa**	**Poisson's Ratio**	**Modulus of Rigitity x 10-6**
Conglomerate, Denison Mine	185	8	40	-	0.0710	0.13	4.50
Conglomerate, Miliken Mine	121	7	-	11	0.0910	0.10	6.30
Porphyry, Lakeshore Mine	250	13	24	25	0.0648	0.21	3.90

16.8.1.2 Truck Fleet and Shovel Requirements

Haulage truck and shovel requirements (Table 16-13, Table 16-14 and Table 16-15) are estimated with the assumption that land for waste dumps, stockpiles, heap leach pads etc. are available close to the mine. A minimum of 13, 100 tonne trucks will be required. The 100-t units are recommended for better overall availability.

Waste rock and ore is assumed to be hauled, on average 3 km (giving a round trip of 6 km) over the life of mine. At a 6 % grade, the haul from the bottom of the pit to the top would be about 3.6 km. If the haul becomes longer than 3 km one way, then, a larger truck may be justified.

A 100 ton capacity haul truck (a typical size for this deposit type and size) has a 6.1 metre operating width and a height of 10 metres at full dump. The overall truck length is 9.8 metres. The truck has a fully loaded top speed of 60 km/hr and a turning radius of about 25 metres. When hauling material, truck speeds are determined by the weight per axel, which in turn depends upon the tires and the condition of the road surface.

Roads should be 2-3 times the haul truck width. The minimum haul road width is 20 metres which allows for a ditch on the "toe" side of the road and a safety berm on the "crest" side. Power lines and maintenance bay doors should be at least 13 metres high at the lowest point.

Table 16-13 - Haulage Truck Cycle Time

Truck Cycle Time		
manuvering for position	1.5	minutes
loading	3.5	minutes
Accelerating loaded truck	1.5	minutes
Haulage to dump point	10	minutes
decelerate and dump	2	minutes
Retrn empty	8	minutes
Total	**26.5**	**minutes**

Table 16-14 - Haulage Truck Requirement

Haulage trucks capacity:	100	tonne
Cycle time (continuous)	26.5	min
trips per hour	2.3	
tonnes per hour	230	
overall job efficiency	92%	
mechancal availability	85%	
annual outage factor	95%	
Scheduled hours/year	8,760	hrs
actual production hours	6,484.23	hr
annual production by truck	1,491,372	tonnes
annual production required	19,137,500	tonnes
	13	**trucks required**

Table 16-15 Shovel Cycle Time & Total Shovels Requirement

Shovel Cycle Time	Minutes		3.85
digging and hoisting	0.2		
Manuvering	0.2	Shovel Size, m^3	16
Backing and Turning Loaded	0.1	Shovel Fill Factor	90%
Traveling Loaded	0.15	Shovel Load, LCM	14.4
Dumping	0.08	Load Cycle time, minutes	3.85
Backing and Turning empty	0.1	Trucks Loaded per hour	14
Traveling Empty	0.08	1 shovel, maximum tonnes per	1429
Truck Exchange	0.45	Tonnes per year	19,137,500
Swinging Loaded	0.08	effective hours per year	7073.7
Swinging Empty	0.03	Shovels Required	2
Site Cleanup	0.5		

16.8.2 Dewatering

Water wells will be installed around the open pit to dewater and to reduce water pressure in the walls. Ground water pumped from the pit area will be used in processing. Water pressure reduces the stability of pit slopes by reducing the shear strength of potential failure surfaces and freezing groundwater during winter can cause wedging in water-filled cracks. Also, freezing surface water on slopes can block drainage paths causing excessive pressure on the walls (MEH, p 1276[7]).

Rock support such as cable bolts and an active wall drainage program will allow the walls to be kept stable.

16.8.3 Waste Management Area

Approximately 33,000,000 tonnes of gold ore will be processed through the mill, equating to about 25 million cubic metres of tailings, assuming a bulk S.G. of 1.3.

Potential land requirements for mine, processing, and waste management facilities are discussed in Section 18.1. The Garrison Gold Property covers an area of 476.1 ha which when combined with adjacent 370.4 ha land area of the recently acquired Plato claim group gives a Northern Gold a total land area of 846.5 ha (Figure 4.4) in the immediate area of the Garrcon deposit. Detailed site engineering is required to confirm the suitability and sufficiency of the current property areas for final mine, processing, and waste management facilities should they be constructed. For the purpose of this PEA, Howe assumes that Northern Gold will be successful in acquiring any additional land in the vicinity of the deposit that may be required to carry out the mining plan.

16.9 HEAP LEACH FACILITY

The heap leach material will be stacked in prepared areas that have a clay base and a double pad liner. The liners will incorporate a leak detection system in the sand layer between the liners.

The time to extract approximately 65% of the gold from the lower grade material is estimated at 70 days. During this period, a second heap leach cell would be established. Both cells would have a working area 100 metres long by about 70 metres wide. The heaps would be established on a slight slope to enhance the movement of leach solution. Water consumption, the sprinkling rate, the time it takes to recover the gold is a function of the overall permeability of the lift and the local permeability. In practice most heap leach operations apply solution to crushed-ore heaps ranging from 7 to 20 litres per hour per square metre with an average of 11 litres/hr/sq. metre (Kappes, 2001).

The heap leach operation would therefore require approximately 125,000 cubic metres of water per 24 hour day (about 1,500 litres/second). Most of the heap leach water would be re-circulated. The heap leach facility is assumed to operate 9 months per year.

[7] MEH – Mining Engineering Handbook, Society for Mining, Metallurgy, and Exploration, Inc. 2nd printing: December 1996

The heap leach facility that operated at The Brewery Creek mine in the Yukon, described in "Yukon Mineral Property Update 2008" provides some guidance to operating in a cold climate (Deklerk and Burke, 2008). The Brewery Creek mine produced gold at about $250/ounce during the late 1990s utilizing a large permanent heap leach pad. As described by Deklerk and Burke (2008): "*The leach pad was divided into seven discrete cells, each nominally 83 m wide and 462 m long, with total capacity of 11.7 million tonnes of ore. The permitted and ultimate pad layout provided space to accommodate 18 million tonnes of stacked, run-of-mine ore.*

"A multiple-layer liner system was installed under the heap to collect process solution and direct it to the recovery plant, as well as prevent leakage to the environment. The possible loss of solution to the ponds and subsequent freezing of the drip-emitter system during an equipment failure was of prime concern because of the severe winter conditions. Temperatures have dipped to as low as minus 43.5°C. The following features were incorporated into the design to prevent this freezing.

- *Emitters were placed into the surface to act as an insulator;*
- *All outside piping was insulated and heat-traced;*
- *Waste heat from the diesel generator engines was used to heat the outgoing barren solutions.*
- *A waste-oil-fired heat exchanger was used to heat circulating solutions*."

It would be beneficial to heat the proposed Garrcon heap leach solution with waste heat or perhaps geothermal heat.

16.9.1 Design Considerations for Reclamation and Closure

Once the heap leaching operation is completed, the facility must be closed in accordance with local environmental requirements. Closure activities are highly variable depending on the environmental sensitivity of the site, and on the regulatory regime. In general, heaps are washed for a short period of time (commonly three years), during which time one tonne of wash water or recycled treated process solution is applied. Heaps are then capped, and ponds are filled and capped.

Kappes (2001) in his paper "Precious Metal Heap Leach Design and Practice" describes the reclamation of heap leach sites

> "the easiest heaps to reclaim are single-lift heaps because the older heaps are abandoned early in the life of the operation and can be washed while production operations continue. In "Valley Fill" heap leaches, nearly all the ore ever placed on the pad is situated directly under active leach areas. Thus, washing of the entire heap must wait until operations are completed. Larger operations may have two or more "Valley Fill" leach areas, and can appropriately schedule closure activities. Environmental regulations usually call for reasonably complete washing of the heap to reduce pH, to remove cyanide, and to partially remove heavy metals. Cyanide is fairly easy to remove since it oxidizes naturally, but pH and heavy metals are more difficult to control. Regulators are recognizing that a better approach is to conduct a "limited" washing program and then to cap the heap with clay and/or an "evapotranspiration" cover of breathable soil with an active growth of biomass. These covers are designed to prevent infiltration of water into the heap. After several years of active closure activities, the flowrate of the heap effluent decreases to a manageable level (or to zero in arid environments)."

SGS metallurgical testwork and ongoing geochemistry find that sulfide sulfur is only about 0.5%, and arsenic varies from slightly above to below its detection limit. The content of heavy metals as a group is very low, especially when compared to other Abitibi Greenstone Belt gold deposits that have been mined. The calcium content of the deposit (SGS metallurgical testwork and geochemistry) is in the range of 20% to 30% which provides an excellent buffer against ARD and heavy metals contamination. The SGS work and geochemistry to date suggest that ARD and heavy metals do not appear to be problem issues for the Garrcon Deposit; pending confirmation by additional testwork.

17 RECOVERY METHODS

Available information on test work is limited to two small samples (discussed in Section 13).

There are no operating results available relating to the recoverability of the gold at the Garrcon deposit.

The SGS work allows for a standard gold processing method to be tested. The operating philosophy is always to get the gold out of the rock as soon in the process as possible. To accomplish this, a standard gravity – cyanide circuit is proposed for the rock with greater than 0.3 g/tonne gold. Rock with a gold content between 0.15 g/tonne and 0.3 g/tonne would be sent to a heap leach facility.

Energy Requirements are estimated to be in the order of 10 Megawatts.

Water requirements are between 5 and 10 tonnes water per tonne of solids or between 50,000 m3/day and 100,000 m3/day (600 to 1,200 L/s). Essentially all of this is internally recycled.

17.1 Introduction

The proposed concentrator for this study is based on an annual mineable resource throughput of 4.1Mt, or 11,300 tpd at a 93% plant availability, for the production of a gold product; that being a gravity product, float product or gold bars, depending on the options chosen. The processing plant will operate 24 hours/day, 365 days/year. No assumptions are made on the grade of the material as this has an insignificant impact on capital and operating costs within the range of values analyzed. The tests done to date suggest that this could be on the order of 0.9 g/tonne. The company plans (subject to column test confirmation) to process all material between a grade of 0.15 g/T and 0.3 g/T in the heap leach system and material with a grade greater than or equal to 0.3 g/T will be processed in the gravity/vat leaching process.

In this circuit, it is assumed that sulphide separation requires a finer grind than 2000 micrometers and that essentially half of the crusher product will be ground. It also assumes that the sulphide separation is performed at a size of approximately 75 micrometers. A gravity separation circuit is included, as spirals, however, this may have to be replaced by a flotation circuit. In addition, no waste stream is produced at this point. The sulphide stream is assumed to represent 12% of the initial flow, or 1,360 tpd. This stream is reground and vat leached. The gravity, or flotation, underflow/tailings, is then vat leached.

The processing scenario presented in this report includes various run-of-mine stockpiles, crushing, fine and course ore stockpiles, heap leaching, the loading and unloading of gold onto the carbon, carbon regeneration, cyanide recycling and destruction, electrowinning and gold bar production. This circuit is shown as a block diagram in Figure 17-1.

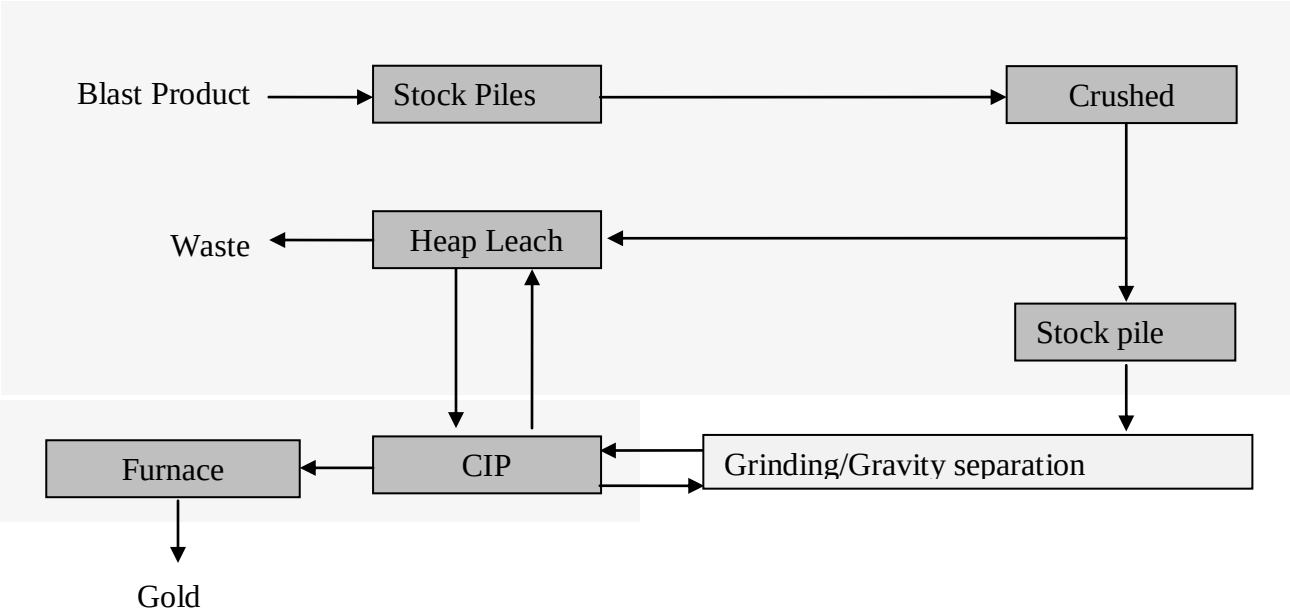

Figure 17-1: Gold processing sub-circuits including crushing, stock piles, heap leach, CIP and furnace as well as carbon regeneration and cyanide recycle and destruction. All processes concerning the tailings have not been included in the processing analysis.

The crushing section assumes a feed material similar to the blast fragmentation size analysis, provided by Northern Gold, as shown in Table 17-1.

Table 17-1: Blast fragmentation size analysis

Size finer than	Fraction	Cumulative
-1/4”	22%	22%
1”	22%	44%
2”	22%	66%
4”	13%	79%
8”	10%	89%
12”	8%	97%
+12”	3%	100%

The suggested crushing circuit is shown in Figure 17-2.

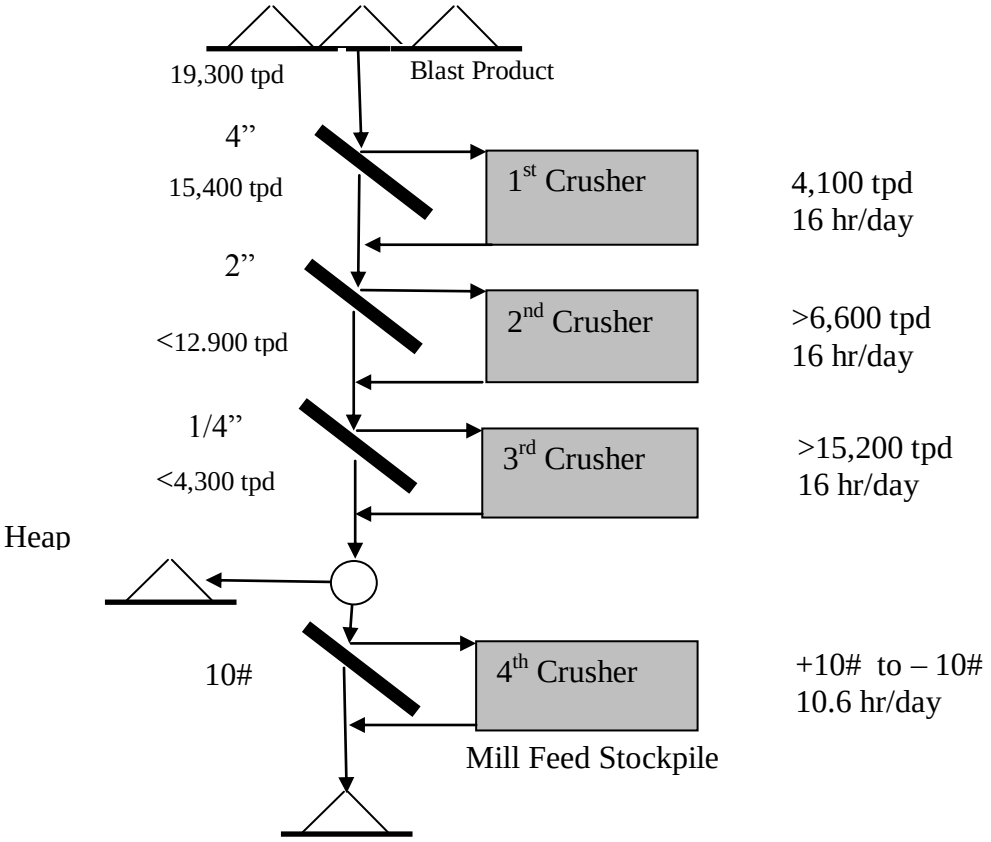

Figure 17-2: Northern Gold Crushing Circuit

The following assumptions are made in the configuration and costing of this circuit:

- 12” top rock size
- 100 metres of conveyors required to feed the crushing plant for the run-of-mine stockpiles
- The suitability of vertical shaft impact crushers
- Stockpile costs are taken as $100,000. This cost is ball-park only as it depends on the location and the size that will be required; Howe is estimating a 2 month supply for the mill, amounting to about 680,000 tonnes and requiring an area of about 5 ha. The coarse ore storage will consist of run-of-mine stockpiles that will be established and maintained in three categories. The main stockpile will be feed for the mill. This stockpile is assumed to have an average grade of 0.9 g/tonne. The second stockpile will be a run-of-mine stockpile for heap leach operations and will consist of rock grading between 0.15 and 0.30 g/tonne. The heap leach stockpile will be available to supplement mill feed if required. The third stockpile will be low grade stockpile whose grade is as yet unknown.
- VSI costs were substituted by Single rotor impact crusher at 400 t/hr, or a 32” by 44” model. Furthermore, it is assumed as there are two stages of this crusher so that two will be required.

The use of VSI must be further investigated and compared to additional stages alternative crushers in terms of effectiveness, capital cost and operating costs.

- That 11,300 tpd of 0.3 g/T, or greater, ore will be processed through the mill.
- The 8,000 tpd (9 months/year) of ore, ranging between 0.15 and 0.3 g/T, will be processed through the heap leach.

17.2 Gravity-Cyanide Circuit Design

The process circuit includes the following assumptions:

- Liberation of crystals within the rock can be achieved at a size of 75 micrometers
- Sulphides, the gold bearing silica and carbonates can be separated using gravity separators:
- Gold associated with the sulphides is exposed either on surface or in cracks, at a size of 75 micrometers; thus can be leached.
- The proper percent solids for the leach must be decreased from the hydrocyclone overflow by using thickeners.

The consumable costs are estimates only as the pumps have not been priced or sized, the exact mill size or grinding media consumption rate has not been determine and the chemical consumption rates have not been determined. The consumables include steel media, activated carbon and cyanide.

17.2.1 Basis of Design

1. That a grind size can be determined that will both liberate the pyrite and expose the gold sufficiently for cyanidation. A two stage grind may be considered at this point if these two sizes are considerably different. This size can be determined using representative mineralogical grain size studies and cyanidation tests.
2. A pyrite separation stage is to be performed if gold is found within the pyrite as small particles capable of being leached on exposure to cyanide solution as opposed to being encapsulated within the sulphide crystal lattice itself.
3. That the size of pyrite liberation is appropriate for gravitational separation techniques. It may be necessary to use a flotation as opposed to a gravitational separation. The selection of the type of gravity separation is also dependent upon this size.
4. That the regrind of the pyrite be performed to reduce the pyrite to a size where the particles of gold are exposed.
5. The silica/carbonate stream does not need to be reground and sufficient gold recovery is achieved at 120 micrometers.

The circuit is presented in Figure **17-3** as a block diagram. There are many other configurations that could result depending on results of future test work.

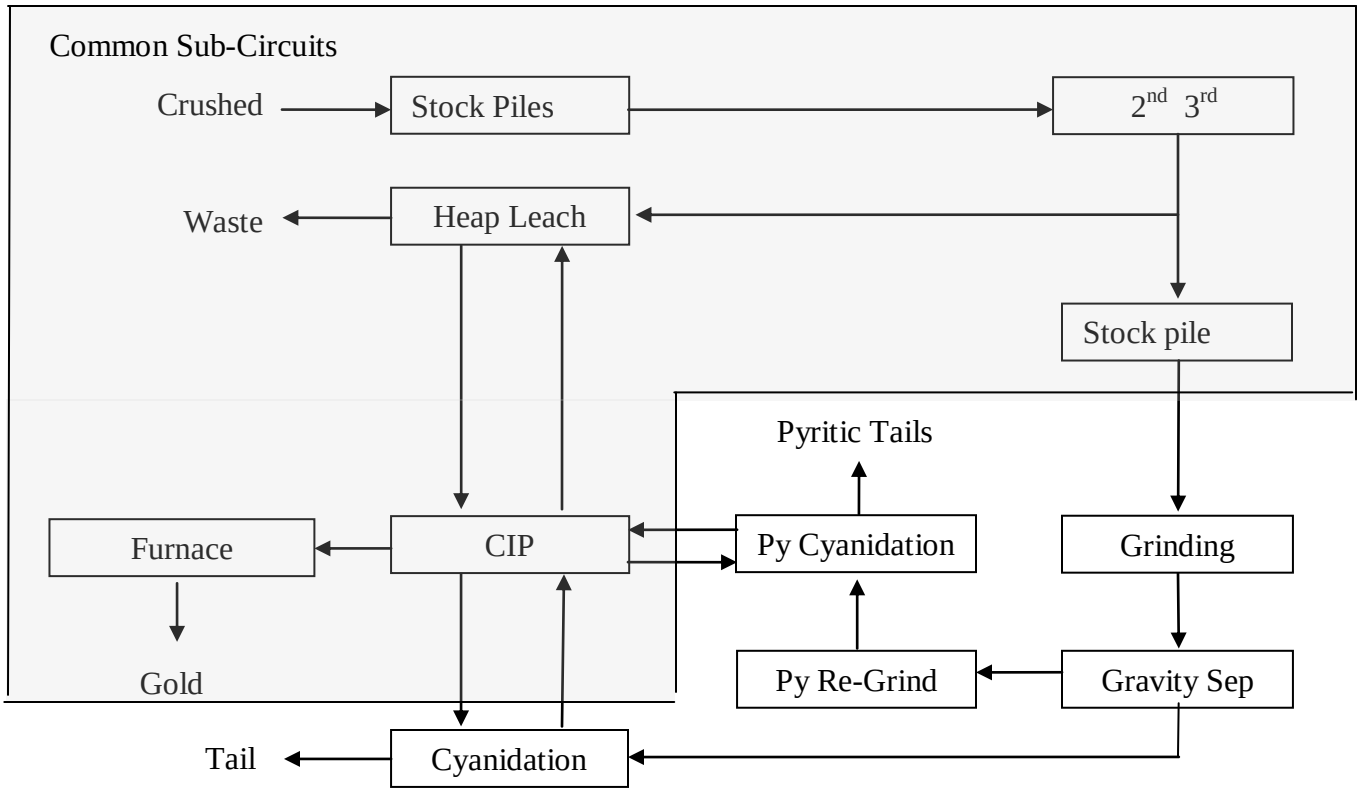

Figure 17-3: Simplified initial flow sheet showing 120 micrometers initial grind.

17.2.2 Grinding

This circuit is used to reduce the particle size from the crushed ore to that required for cyanidation or flotation. The grinding is assumed to be performed using ball mills in closed circuit. The resulting particle size is assumed to be on the order of 120 micrometers.

The consumption of grinding media, or steel balls, has been estimated at approximately 1.5 kg per tonnes of ore, or 17 tonnes per day. This will change depending on the grind size chosen and ore specific characteristics. This does not include any of the capital or consumption of potential regrind circuits. The hourly cost includes overhaul, maintenance and wear in terms of both labour and parts. No accounting is made for operating staff in this calculation.

17.2.3 Regrind

A regrind circuit reduces the particle size of the gravity circuit concentrate (pyrite) to expose the gold within the pyrite. It has been assumed that this circuit will process 12% of the ore, the costs of this regrind will be that of a hydrocyclone acting as a thickener and closing the circuit and one ball mill. The costs of alternatives; that is Knelson/Mozley, jigs or flotation have not been approximated at this time.

17.2.4 Sulphide Concentration

This section describes the circuit used to concentrate the sulphide minerals.

This circuit assumes that the pyrite in the rock will be removed and treated separately from the silicates and carbonates and that the largest grind size possible, to liberate the pyrite, is used in the grinding circuit. The type of separation used to remove the pyrite depends on the particle size. For larger sizes, gravity separation can be used. Two scenarios have been analyzed: (i) spirals and (ii) Knelson and Mozley type separators. Jigs should be considered for larger particle sizes and flotation for smaller sizes.

In case (i) the comminution circuit product is pumped at 25% solids (w/w) to a number of spirals, probably a series of three, that produce a heavy and light component. It is assumed that the heavy component will be composed of 12% of the feed. It is unlikely that this circuit will achieve the recovery of the test work, so, the recovery has been set at approximately 30% of the gold. It is assumed that the spirals have a capacity of 8 tonnes per hour; however, this is just an estimate that depends on the type of spiral, the percent solids, the size of the gold and other particles and other factors.

At 11,300 tonnes per day, 470 tonnes need to be produced per hour, or about 60 spirals in parallel. Assuming a 50% mass recovery in each, 30 will be needed in the second stage and 15 in the third for a total of 105 spirals. Two pumps and an appropriate splitter could feed the first stage, and one pump and splitter feed the second and third stages.

17.2.5 Silicate/Carbonate Leach

In this circuit the feed is assumed to be taken directly from either the grinding circuit cyclone overflow or the gravity circuit underflow to a thickener where the percent solids is adjusted from about 25% to 45%. Depending on the particle size, it may be possible to use screens or cyclones to replace the thickener.

The thickener has not been designed and its eventual size will depend on the grind size and rheology of the resulting slurry. Generally, this is assumed to be in the range of 0.3 to 1.3 m^2 per tonne of ore. The feed thickener is only changing the percent solids from 25% to 45% thus will be on the smaller side of these values. A value of 0.3 m^2/tonne, or 3000 m^2 is used in this estimate. In the 11,300 tonne per day scenario this results in a thickener 62 metres (200') in diameter. This is probably an over estimate of the size required.

The tanks themselves are based on a requirement of a 24 hour residence time, based on 8 tanks in series, in two parallel lines. In the 11,300 tonne per day scenario a volume of approximately 1000 m^3 will be required per tank. Air lift will be required on each tank; this can also be done using oxygen sparging to increase the cyanidation rate. The solids then flow to a series of 16 leaching tanks, two parallel lines of 8, to give a total residence time of about 24 hours. Double the number of tanks is assumed for the 48 hour retention time scenario.

17.2.6 Cyanidation Consumables

The consumables have been estimated for only the whole rock cyanidation scenario. The cyanide consumption may change depending on the iron content. All other consumables are anticipated to remain approximately the same. Lime has been included in this section despite the fact that it is added in the grinding circuit as it is required when cyanidation is performed. The consumables for the refinery have also been included in this section because without cyanidation refining would probably not be performed on site. No cost estimates have been made on transportation or inventory costs. No cost has been included for kiln fuel.

Cyanide consumption is based on a consumption of 0.9 kg/tonne. Heap cyanidation consumable are included in the heap section.

17.3 Heap Leaching

It may be possible to use a heap leach to process the rock containing insufficient gold for the conventional leaching processes. The advantages of the heap leach is usually cost; however, this would come with a reduced recovery. The recovery is assumed to be 65% in this costing[8]. This scenario assumes the leached rock will contain between 0.15 and 0.30 g/T gold.

The rock would be removed from the crushing circuit between the tertiary and quaternary crushing stages.

This circuit assumes that the fragmentation from intense blasting along with crushing will develop the necessary cracks to enable cyanide solutions to contact the gold.[9]

The cyanide consumption in the heap has been assumed to be 0.35 kg/tonne of ore. Lime has been included in this section; however the amount of lime that will be required is not yet known as there are known carbonates in the rock itself.

[8] A 65% recovery is based on a number supplied by the company and has not been proven by metallurgical testing.
[9] The optimal size for leaching has yet to be determined

18 PROJECT INFRASTRUCTURE

There is no modern mining or processing infrastructure on site at this time. All facilities for a 11,300 tpd plant and heap leach facility are required.

Required infrastructure includes:

- Security / first aid building;
- office and administration building with employee parking;
- maintenance shop with doors high enough for the haul trucks,
- water storage ponds,
- fuel and lube storage,
- powder and cap explosives magazines,
- dry storage areas;
- an electrical substation for mine and substations for the processing plant;
- a +/- 10 km power line to the site and power distribution lines;
- a tailings management area;
- waste rock and ore stockpile areas;
- water treatment facility;
- heap leach cells, pregnant and barren solution ponds;
- processing plant; and,
- water and sewage facilities.

18.1 Land Requirements

Table 18-1 presents a range of estimated land area required for the mining plan dependant on the ultimate depths of potential tailings facilities and stacking heights of wastes dump and leach pads. Final land requirements will depend on ultimate mine design and detailed engineering and topographic studies of the property area.

The Garrison Gold Property covers an area of 476.1 ha which when combined with adjacent 370.4 ha land area of the recently acquired Plato claim group gives a Northern Gold a total land area of 846.5 ha (Figure 4.4) in the immediate area of the Garrcon deposit. Detailed site engineering is required to confirm the suitability and sufficiency of the current property areas for final mine, processing, and waste management facilities should they be constructed. For the purpose of this PEA, Howe assumes that Northern Gold will be successful in acquiring any additional land in the vicinity of the deposit that may be required to carry out the mining plan.

Table 18-1: Estimated land area required for the mining plan based on solids depths.

LAND REQUIREMENTS	
Tailings Area Required (ha) 2X area of solids	Average Solids Depth
1015	5
508	10
338	15
254	20
Waste Rock Area Required (ha)	Average Solids Depth
1914	5
957	10
638	15
478	20
383	25
319	30
Heap Leach Area Required (ha)	Average Solids Depth
381	3
191	6
127	9
95	12
76	15
64	18

19 MARKET STUDIES AND CONTRACTS

19.1 Gold Market

With some fluctuations, the spot price for gold has risen from approximately $US 250 per troy ounce since 2001 to a current spot price at the time of this report of approximately $US1,520 per ounce (Figure 19-1). Howe has elected to use a price of $US 1,200 per ounce ($US 37,324 per kilogram or $US 37.24/gm) as the base case gold price for the economic analysis.

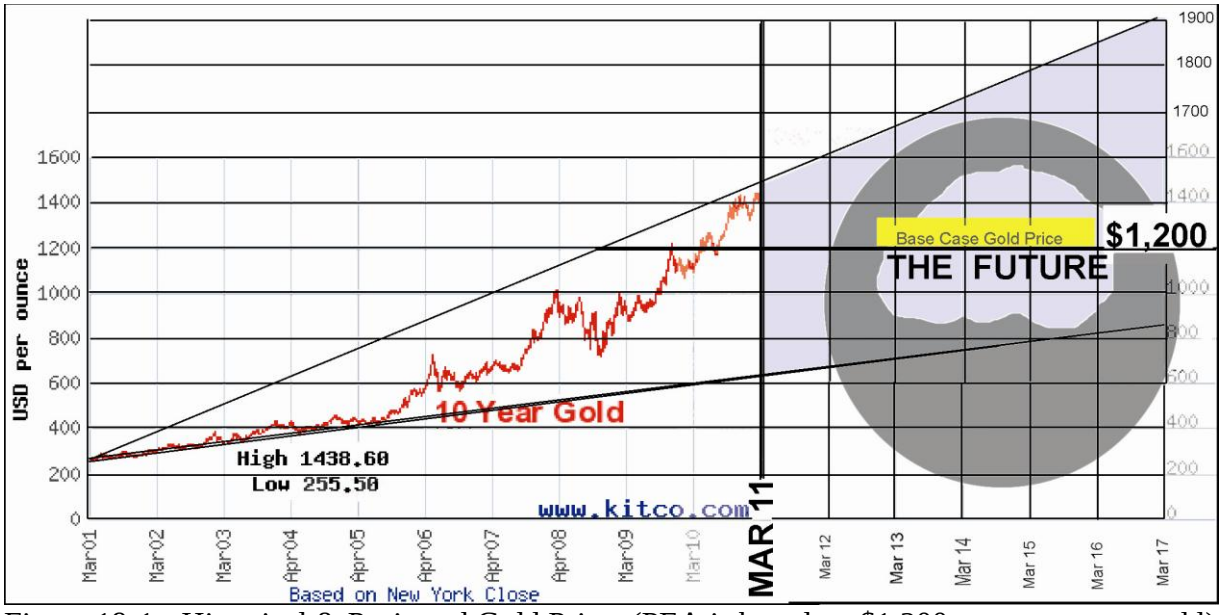

Figure 19-1 - Historical & Projected Gold Price. (PEA is based on $1,200 per troy ounce gold)

The Royal Bank of Canada's Capital Market group (RBCCM) forecast for the next few years predicts the rise in gold price outpacing the cost of labour and materials, although these parameters are rising at a faster rate than the early part of the century (Figure 19-2).

> "*While operating cost escalation is seen as becoming a more pressing issue in 2011, gold price gains have been outpacing costs "thereby leaving producers with healthy margins to fund projects and return capital to shareholders; however, we may see contraction in 2011 if the gold price stalls. We forecast EBITDA margins of 51% in 2011 vs. 53% in 2010 for our coverage universe, reflecting our gold price assumption of $1,400 minus all-in cash costs*" (RBCCM, 2010).

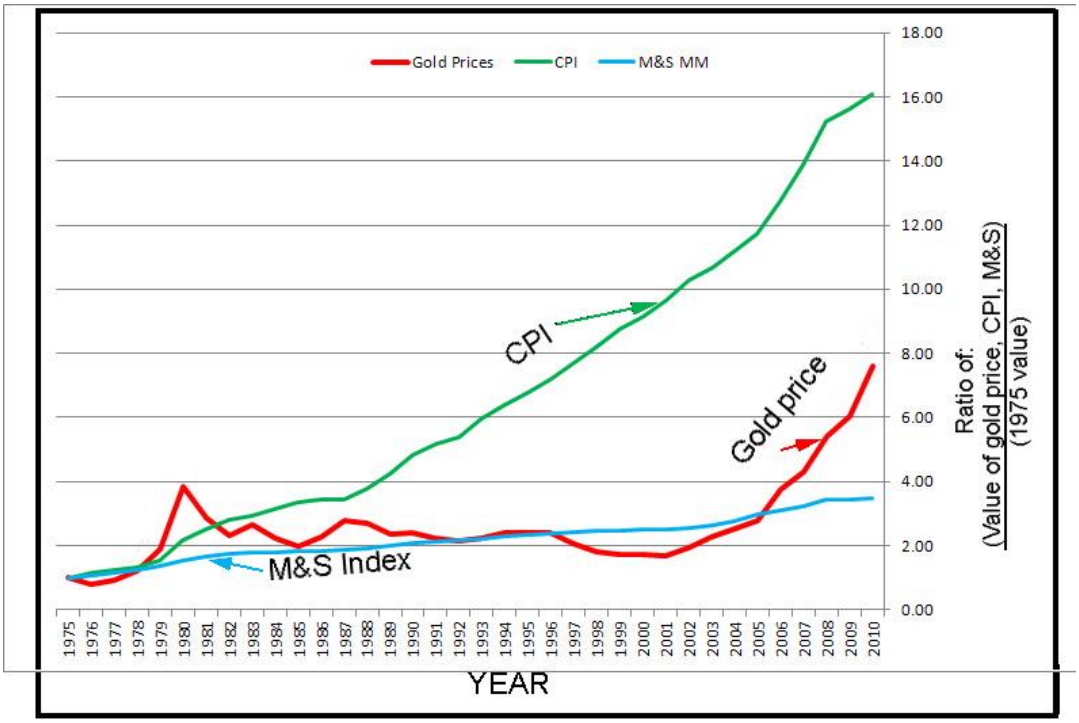

Figure 19-2: Gold price, consumer price index and the M&S Mine-Mill Index plotted against time from 1975 to present. The graph illustrates the value in year x divided by the value in 1975.

20 CAPITAL AND OPERATING COSTS

20.1 ACCURACY OF COST ESTIMATE

The accuracy of this PEA cost estimate is +30%, -20%. Figure 20-1 illustrates the accuracy range for the various classes of estimates.

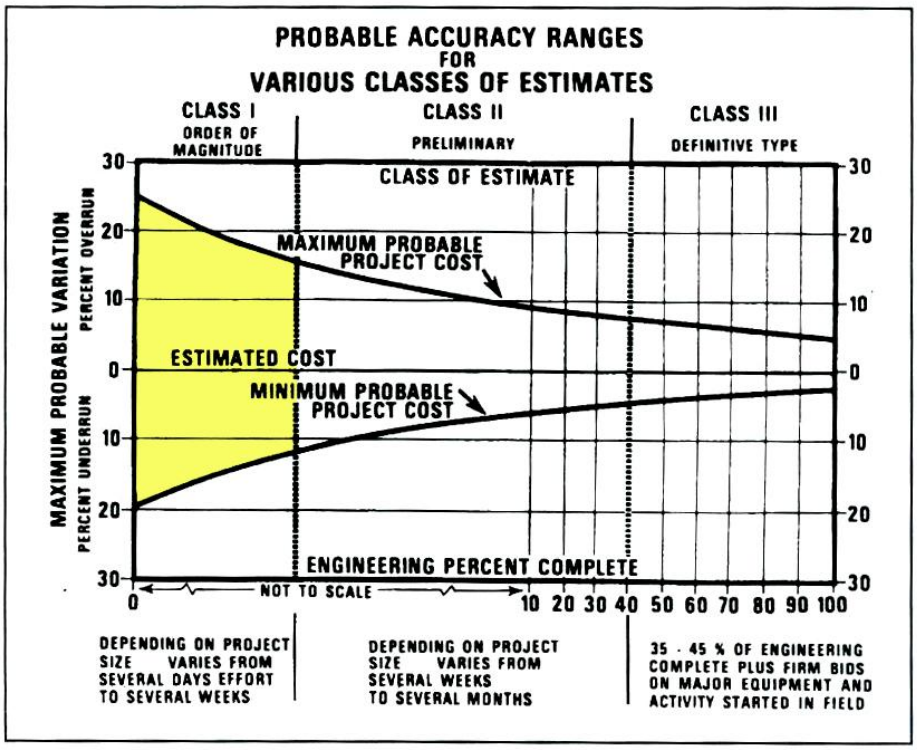

Figure 20-1 - Accuracy of Estimates for Projects (Modified after A.L. Mular, CIM S. Val. 25, 1982)

This cost analysis is based on limited metallurgical test work carried out by a SGS on two composite samples, thus, may not be representative of the entire ore body. Thus, this costing must be considered to be generic in nature and subject to variations that are not known at this time.

Historical capital costs were inflated and adjusted to present dollars using the Marshall and Swift Mine-Mill Index for processing plant costs (Figure 20-2). It is interesting to note that from 1975 to 2010, while the capital costs, as measured by the M&S Mine-Mill Index, have increased 3.5 times and the Consumer Price Index (CPI) has increased 16 times, the price of gold increased about 8.8 times. In 1975 the gold price averaged $160.86 and in 2010, the gold price averaged $1224.53 for a ratio of 1225/161 = 7.6. The Consumer Price Index (CPI) was set at 100 in 1975 and to 1606 in 2010 for a ratio of 1606/100 = 16.06. The Marshall and Swift (M&S) index was 451 in 1975 and grew to 1577 in 2010 for a ratio of 1577/451 = 3.5.

Operating costs for the open pit were derived from Howe personnel's experience with open pits and also from sourcebooks and trade publications. Key consumable prices (fuel, explosives, cyanide and lime) were obtained from operating mines.

One of the risks to the project is inflation of labour and equipment costs; however, in the past few years the gold price has outpaced the rise in capital and labour (RBCCM, 2010).

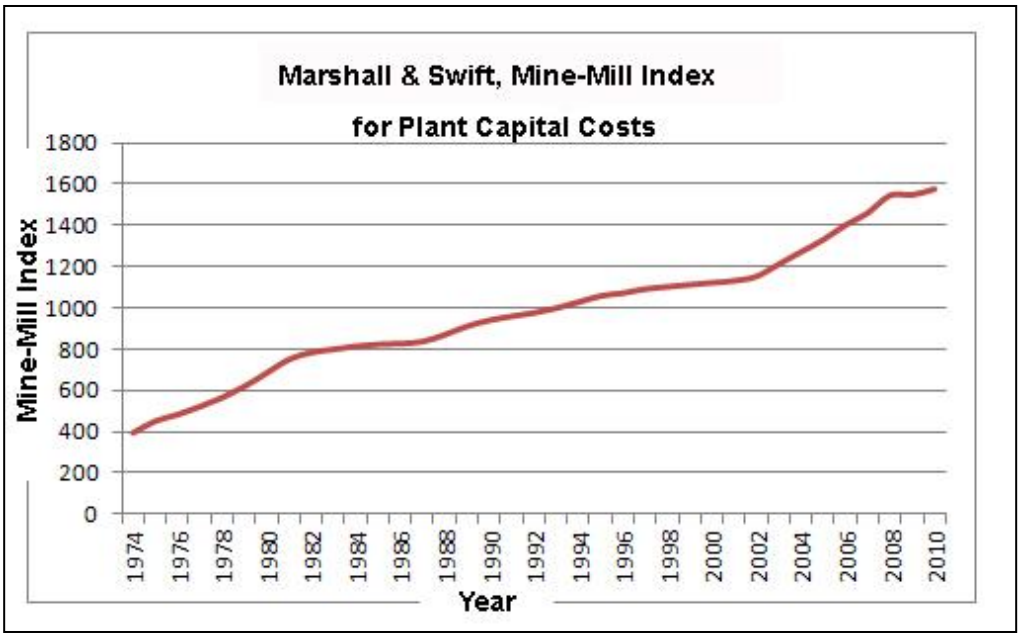

Figure 20-2 - Marshall & Swift Mine-Mill Index, 1974-2010

20.2 CAPITAL COSTS

20.2.1 Mining Capital Costs

Mining will be by open pit. Shovels will be used to load 100 ton haul trucks. Ore will be then sent to a primary crusher and from there either to a 11,300 tpd gravity-agitated leach processing plant (365 day year) or a 8,000 tonnes/day heap leach facility (274 day year). Table 20-1 lists the major capital items required for the mining portion of the project.

Table 20-1: Major Mine Equipment Capital Costs

Number	Item	cap cost	total
2	Hydraulic large shovel	2640000	$4,999,661
1	Hydraulic Backhoe, 45 tonne	750000	750,000
2	Frontend Loader , 350 kW	750,000	750,000
13	Haul Truck (New or good used)	1,200,000	15,600,000
2	Water Truck	250000	500,000
4	Blast Hole Drills	200000	800,000
3	Bull Dozer and ripper, 4.7m maximum blade width	536000	1,608,000
1	Rubber Tired Front end loader, 300 kW		500,000
1	Grader, 4.3m blade width	386500	386,500
1	Admin Building, Warehouse & Shop, 3,000 square metres		1,500,000
1	Mine Drainage Pumps, starters, electrical Equipment		350,000
1	Shop and Office Equipment		300,000
1	Haulage Dispatch System, Computerized. Includes installation, 20 units	470000	470,000
1	Water & Sewer		150,000
1	Power Lines		1,000,000
1	Substation		500,000
7	Pick-up Trucks	25000	175,000
1	Personal Safety Equipment		25,000
1	Miscellaneous Equipment		100,000
1	Conveyor distribution system		450,000
1	conveyor magnet, 1.2m long, 65 kg.,		1,200
1	Cyanide neutralization and detoxification plant (0.4 mg/l - 3 total CN, 0.25mg/l Free CN)		200,000
1	Fuel tank, 80,000 Litre, 4.57m diam., 4.87m high, 5.5 tonnes		63,700
1	Plant & Plumbing		50,000
1	Laboratory		200,000
1	Engineering & Constr. Supervision		664,188
1	Waste Management Area		5,000,000
	Subtotal	Subtotal	$37,100,000
			$11,130,000
	Total		$48,230,000

20.2.2 Processing Capital Costs

The processing plant / heap leach capital costs are summarized in Table 20-2 and are subject to change with additional test work that must be conducted before definitive processes can be designed. The estimate is considered to be order-of-magnitude only.

The capital cost for the various processing scenarios was estimated using the cost index ratio:

$$\text{Capital Cost "B"} = \left(\frac{\text{Capacity A}}{\text{Capacity B}}\right)^{\left(\frac{2}{3}\right)} \text{X Capital Cost "A"}$$

Capital Cost A in this case is the estimated cost of a 10,000 tonne per day conventional gravity – cyanide leach processing plant.

The capital cost table includes equipment capital costs and other items estimated using cost factors - see Section 20.2.2.1.

Table 20-2: Major Mill Equipment Capital Costs

Item	Capital Cost (rounded)
Crushing	$3,549,000
Grinding	$4,721,000
Regrind	$1,194,000
Gravity, Sulfide Concentration	$358,000
Pyrite Leach	$1,020,000
Silica/Carbonate Leach	$3,419,000
CIP	$814,000
Carbon Stip	$434,000
Electrowinning	$260,000
Refining	$109,000
Carbon Regeneration	$543,000
Cyanide destruction	$868,000
Total Equipment	**$17,289,000**
Construction Labor	$6,566,000
Civil/Earthwork	$901,000
Concrete	$1,302,000
Buildings	$2,822,000
Structural Steel	$1,878,000
Piping	$3,744,000
Electrical/Instrumentation	$3,744,000
Painting/Insulation/Sealants	$901,000
Subtotal Direct Mill Costs	$39,000,000
Heap Costs	**$9,877,000**
Subtotal Direct Plant Costs	**$49,024,000**
EPCM @15%	*$7,348,000*
Freight @ 10%	*$4,906,000*
Initial Spares	$705,000
First Fills	$412,000
Vendor Commissioning/Startup	$65,000
Mobile Equipment	$217,000
Contingency @ 30%	*$14,706,000*
Subtotal Plant costs	$28,360,000
Total Capital Cost	**$77,384,000**

20.2.2.1 Estimation method and factors

The processing capital costs were estimated using the Western Mine Engineering, Inc., Mine and Mill Equipment Costs: An Estimators Guide and adjusted for inflation. These will have to be adjusted for local conditions. Factors were used, based on the equipment costs, in order to estimate the building and other costs associated with the final plant. These factors are shown in Table 20-3.

Table 20-3: Processing Capital Cost Estimation Factors

Item	Factor	Comments
Construction Labor	0.35	
Civil/Earthworks	0.05	
Concrete	0.07	
Buildings	0.15	Could be lower if leach tanks and thickener are outside
Structural Steel	0.10	
Piping	0.20	
Electrical/Instrumentation	0.20	Might be higher as cyanide is used
Painting/Insulation/Sealants	0.05	
EPCM	0.15	Based on the equipment subtotal
Freight	0.10	Based on the equipment subtotal
Initial Spare Parts	0.05	
First Fills	0.035	Initial inventory
Commissioning/Startup	0.04	Does not include plant commissioning
Mobile Equipment	0.015	
Contingency	0.30	

20.2.2.2 Crushing Circuit

The capital cost of the crushing circuit is tabulated Table 20-4.

Table 20-4 Crushing Circuit

Item	Description	Number	Cap Cost
1	High Grade Stockpile	1	$109,000
2	Low Grade Stockpile	1	$109,000
3	Other Stockpile	1	$109,000
4	Conveyors (60m assumed)	1	$315,000
5	Main Grizzly	1	$54,000
6	4" Grizzly	1	$54,000
7	Conveyors (20 m assumed)	3	$466,000
8	Jaw Crusher (22" x 50")	1	$304,000
9	2" Grizzly	1	$54,000
10	Cone Crushers(s) (4.25'd 200 hp)	1	$662,000
11	¼" screen	2	$54,000
12	-¼ VSI crusher (73"x83")	2	$1,150,000
13	Dust and negative pressure system	1	$109,000
	Total		**$3,549,000**

20.2.2.3 Heap Leaching

The estimated capital and operating expense for the heap leach facility as stated in Table 20-2 is detailed below in Table 20-5.

Table 20-5 Heap Leach Capital Costs

Part	Capital
Leach Pad & Ponds	$4,884,000
Conveying & Stacking	$3,473,000
Solution Pumps	$271,000
Heap Leach Piping	$380,000
Clarification	$868,000
Consumables	
Total	**$9,876,000**

The quoted heap leach capital costs must be considered to be low quality order of magnitude only because leach rates, topography and environmental considerations are not currently known and the assumption is made that an appropriate location can be found. Also, the performance of the heaps during the winter months has not been factored into the capital costs, operating costs or performance. The heap leaching will probably be seasonal for eight to nine months each year. In off months the run-of-mine material is stockpiled.

20.2.2.4 Grinding

This section describes the circuit used to reduce the particle size from the crushed ore to that required for cyanidation or flotation. The grinding is assumed to be performed using ball mills in closed circuit. The resulting particle size is assumed to be on the order of 120 micrometers.
The total estimated cost of the grinding section is $4.72 million. Not included in this part of the estimate are the building costs, installation costs, or the cost of any support equipment such as ball loaders, cranes, liner replacement equipment or any equipment associated with maintenance.

Table 20-6: Grinding circuit capital cost summary

Part	Capital	Total Hp
Ball Mill	$3,983,000	2,800
Feed distributor	$54,000	-
Cyclones	$520,000	-
Pumps various	$163,000	200
Total	**$4,720,000**	**3,000**

20.2.3 Reclamation Bonding

A reclamation bond will be required during mine operation. Howe has factored a $5 million bond into its PEA.

20.3 OPERATING COSTS

Summary estimated mine and mill processing costs are presented in Table 20-7.

Table 20-7 – Mine and Mill Operating Costs

Operating Costs		Pre-Production	Year 1	Year 2- 7	Year 8
Haulage, Fuel, lub, Maintenance		$7,492,000	$17,999,000	$17,999,000	$10,555,000
$/tonne (waste & ore)		$0.94	$0.94	$0.94	$0.94
Drilling, explosives		$3,215,000	$7,724,000	$7,723,702	$4,529,371
$/tonne (waste & ore)		$0.40	$0.40	$0.40	$0.40
Mine Personnel Cost		$1,723,000	$9,913,000	$10,082,000	$8,398,000
$/tonne (waste & ore)		$0.22	$0.52	$0.53	$0.75
Total/yr		$12,430,000	$35,636,000	$35,804,702	$23,482,371
Mining cost/tonne moved		$1.56	$1.86	$1.87	$2.09
Mining Cost/tonne HG Ore		$12.05	$8.64	$8.68	$7.59
G&A Personnel Cost		$825,500	$929,500	$929,500	$825,500
G&A Personnel Cost/tonne HG Ore		$0.80	$0.23	$0.23	$0.27
Total G&A Cost		$825,500	$929,500	$929,500	$825,500
Plant Processing Cost		$4,766,912	$15,889,706	$15,889,706	$11,917,279
HG Processing Cost		$4,870,912	$17,644,706	$17,644,706	$13,672,279
Total HG Processing Cost/tonne HG processed		$4.72	$4.28	$4.28	$4.42
Processing personnel cost		$104,000	$1,755,000	$1,755,000	$1,755,000
personnel cost/tonne HG ore processed		$0.10	$0.43	$0.43	$0.57
Heap Leach Processing personnel cost		$135,200	$540,800	$540,800	$182,000
Heap Leach personnel cost/t processed		$0.24	$0.24	$0.24	$0.11
Operating cost for bulldaozer, ripper, pick up trucks		$114,000	$458,000	$458,000	$343,000
Heap Processing consumables & Misc. Cost		$1,739,804	$6,959,217	$6,959,217	$5,219,413
Heap Processing Cost		$1,989,000	$7,958,000	$7,958,000	$5,744,000
Heap Processing Cost, per tonne		$3.48	$3.48	$3.48	$3.35
Overall Total Processing Costs		$6,860,000	$25,603,000	$25,603,000	$19,416,000
total Processing Cost/tonne: (HG+LG Costs)/(HG+LG tonnes)		$4.15	$3.87	$3.87	$3.91
Total Operating Costs		$20,115,500	$62,168,500	$62,337,202	$43,723,871
Operating Cost per tonne HG Ore processed		$19.51	$15.07	$15.11	$14.13
Operating Cost per troy ounce produced, HG & LG		$636.16	$491.36	$492.70	$460.74
Reclamation					$5,000,000

20.3.1 Estimation method and factors

Processing operating costs were determined using the Western Mine Engineering, Inc., Mine and Mill Equipment Costs: An Estimators Guide and adjusted for inflation. These will have to be

adjusted for local conditions. Operating costs that are not direct consumables are shown in Table 20-8.

Table 20-8: Indirect operating cost estimation factors excluding electricity, consumables, and process operators.

Item	Factor
Maintenance repair costs $/hr	$50
Diesel Fuel $/L	**$1.00**
Gasoline	$1.00
Natural Gas MCF	$10
Mill liners $/kg	$2.50
Electricity $/MWhr	$150

20.3.2 Mine Explosives

Boosters, detonators and liners for 15 metre blast holes cost approximately $36, plus ANFO. A powder factor of 0.25 kg/tonne was used so approximately 5,000 tonnes will be required per year. ANFO costs $1,500/tonne and is delivered by bulk truck. There will be almost 12,000 holes per year for a total annual drilling and blasting cost of about $8 million, without labour. **Table 20-9** is an estimate of the powder requirements for the site. A higher powder factor may be necessary to assist in fragmentation in the ore. This is one of the necessary research projects recommended for the next phase of economic analysis - a preliminary feasibility study.

Table 20-9 - Explosives Use

Explosives Use				
delivery by ANFO, truck	$1,500	tonne		
		kg	tonnes	Total
explosives, ANFO; truck loaded		4784400	4784.4	$7,177,000
blast holes per year		11775		
Bits and drill consumables,			bits	
bits, 4000m/bit		$2,500	49	$122,500
booster, detonators & liners		$36.0	each hole	$424,000
			total	$7,723,500
			$/tonne	$0.40

20.3.3 Mine/Heap Leach Fuel Use and Storage

Approximately 12 million litres of fuel will be required per year, at the site (approximately 33,000 litres per mine working day). Ten -10,000 litre fuel tanks will be required for the fleet, giving about 3 days supply of fuel. Table 20-10 presents an estimate of fuel and maintenance costs for the mine and heap leach operation.

Table 20-10 - Fuel and Lubricant Use

Number	fuel	litres/hr	hours/yr	total litres	Lub & Maint Op Cost/hr	hours/year	Total op cost
13	Haul Trucks	80	6,500	6,760,000	$ 26.00	6500	$ 8,957,000
3	Excavators/shovels	75	6,500	1,410,733	$ 56.00	6500	$ 2,464,000
2	Water Truck	40	3,250	260,000	$ 25.00	3250	$ 423,000
4	Blasthole Drill	60	6,500	1,560,000	$ 50.00	6500	$ 2,860,000
2	Bull Dozer and ripper	50	6,500	650,000	$ 40.00	6500	$ 1,170,000
3	Rubber Tired Front end loader, 300 kW	50	6,500	975,000	$ 40.00	6500	$ 1,755,000
1	Grader, 4.3m blade width	40	3,200	128,000	$ 40.00	3200	$ 256,000
5	pickup trucks	5	4,333	108,333	$ 0.25	4333	$ 114,000
				11,852,066	$6,146,934		$ 17,999,000
	Diesel Fuel	$1.00	per litre, bulk		Fuel-LubMaint Cost/tonne		$0.94/tonne ore
leap Leach							
Number	fuel	litres/hr	hours/yr	total litres	Lub & Maint Op Cost/hr	hours/year	Total op cost
1	Bull Dozer and ripper	58	2,190	127,600	$ 50.00	6570	$ 434,000
2	pickup	5	2,190	21,900	$ 0.25	6570	$ 23,500
						total	$ 457,000
					Fuel-LubMaint Cost/tonne		$0.20/tonne

20.3.4 Mine and Mill Personnel

A total of 157 persons are estimated for the mine and mill. Mine personnel should be available throughout the north and good mill personnel will be available in the Timmins / Kirkland Lake area.

Table 20-11 - Mine and Mill Personnel, Salary plus burden

Position	Number (yr3)	Rate, $/yr		Total
General and Administration				
General Mine Manager	1	170000		$170,000
Mill Manager	1	170000		$170,000
Clerical	5	40000		$200,000
Environment Manager	1	90000		$90,000
Human resources	1	85000		$85,000
		Office/Admin sub-total	$715,000	
Processing Plant				
Metallurgist	1	80000		$80,000
Comminution Operator	3	70000		$210,000
Gravity Operator	3	70000		$210,000
Labourer	2	30000		$60,000
Cyanidation Operator	4	70000		$280,000
Laboratory Manager	1	90000		$90,000
Laboratory Techs	4	60000		$240,000
Instrumentation Tech	2	90000		$180,000
		Plant, sub-total	$1,350,000	
Heap Operator	8	52000		$416,000
Mine Sift Foreman	4	85000		$340,000
Geologist	2	85000		$170,000
Surveyor	3	60000		$180,000
planning engineer	2	70000		$140,000
Security	4	60000		$240,000
Equipment Operators	87	65000		$5,655,000
Electrician	3	65000		$195,000
Mechanic	6	65000		$390,000
Welder	2	65000		$130,000
Tire Person	3	65000		$195,000
Casual Labour	4	30000		$120,000
		Mine sub-total	$8,171,000	
			Sub-Total	$10,236,000
		$85,000	*Burden, 30%*	*$3,070,800*
Total Employment	**157**	**157**	Annual Cost	**$13,307,000**

20.3.4.1 Common Processing Operating Costs

The operating cost of the common elements for the processing plant are presented in Table 20-12. Operating costs are presented as dollars per hour and dollars per tonne without the labour element. These numbers include all costs except heap costs. The heap costs are presented separately because they do not incur the same building costs.

Table 20-12: Common sub-circuit Operating costs in dollars per hour and dollars per tonne.

Tonnes crushed and treated in common		6,412,500	tonnes		
Description	**Non-Labour, $/hr**	**hours/year**	**$/YEAR**	**$/tonne**	
Crushing (2 shifts)	$222	5,840	$1,296,480	$0.20	HG+LG
CIP (/24hr)	$78	8,760	$683,280	$0.11	HG+LG
Carbon Stripping	$80	8,760	$700,800	$0.11	HG+LG
Electrowinning	$17	8,760	$148,920	$0.02	HG+LG
Refining					
Carbon Regeneration	$52	8,760	$455,520	$0.07	HG+LG
Cyanide destruction	$50	8,760	$438,000	$0.07	HG
Dewatering					
Common Circuit Total for process plant ore	$499	8,760		**$0.58**	HG
Common Circuit total for Heap Leach ore.	$449	6,480		**$0.51**	LG

Note: costs are based on 19,300 tonnes per day, whereas, the actual processing rate will depend on the time of year as the flows in some of the circuits depend on the heap operation. Where the flows vary the cost per tonne of the highest flow is used.

Note: Heap costs, in $/hr, assume a process rate of 6,000 tpd averaged over the year; this figure will change based on seasonal processing rates, about 8,000 tpd for 9 months and zero for 3 months.

20.3.4.2 Grinding Circuit

The operating costs – without labour – for the processing plant is tabulated below in Table 20-13.

Table 20-13 Estimated Operating Cost for the circuit

Sub-circuit	Op. Cost $/hr	Hours	$/year	Op. Cost $/t
Grinding	$385	8760	$3,372,600	$0.82
Sulfide regrind	$90	8760	$788,400	$0.19
Silica/carbonate regrind	$190	8760	$1,664,400	$0.40
Gravity	$60	8760	$525,600	$0.13
Pyrite Leach	$26	8760	$227,760	$0.06
Silica/Carbonate Leach	$220	8760	$1,927,200	$0.47
Consumables	$380	8760	$3,328,800	$1.03
				$3.09

20.3.4.3 Heap Leaching

The estimated operating expense for the heap leach facility are listed Table 20-14.

Table 20-14 Heap Leach Operating Costs

Heap Leach Operating Cost	
Leach Pad & Ponds	$0.15
Conveying & Stacking	$0.50
Solution Pumps	$0.35
Clarification	$0.20
Consumables	$1.33
Crushing	$0.20
CIP	$0.11
Carbon Stripping	$0.11
Electrowinning/Refining	$0.02
Carbon Regeneration	$0.07
Dozer and pick up trucks	$0.20
Total, less labour	**$3.24**
Heap Leach personnel cost/t processed	$0.24
Total with Labour	**$3.48**

20.3.5 Anticipated Reclamation and Environmental Costs during Closure Phase

Costs relative to environmental considerations during the closure phase consist of the environmental monitoring costs that may post-date the completion of the physical reclamation (removal of buildings, vegetation of stockpiles, etc.). It is typical for monitoring programs to run for 3-5 years after physical reclamation is completed and are in the order of $50,000 to $100,000 per year. We are not able to cost the physical reclamation program as the final mine design and permitted layout and reclamation approach will be developed later. Howe has assumed a $5 million reclamation cost in this PEA.

21 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

The following items categories are identified as potential conditions to permitting the Garrison Project:

1) *Bio-Physical*
2) *Archaeological and Heritage Resources*
3) *Aboriginal Peoples*
4) *Local Residents*
5) *Concurrent Developments*
6) *Public Consultation*

An abbreviated overview of the identified conditions follows.

21.1 Bio-Physical Conditions

The Project site is immediately south of Highway 101. A 115 kV power transmission line runs along the Highway 672 corridor from Kirkland Lake to St Andrew Goldfield Ltd.'s Holloway mine in Holloway Township, approximately 15 kilometres east of the Property. Surface diamond drilling and some limited underground mineral development activity dates back to 1935 with the most recent phase of surface diamond drill exploration initiated in 2006. A forestry haul road cuts through the Project area. Some disturbance of the site has therefore already occurred.

The Perry Lake North County Lodge is located 12.5 kilometres west of the Project site and provides year-round drive-in recreational activities including fishing, hunting, snowmobiling and ATV and horseback trail riding. The Project site is located 7 kilometres north of Thackery Provincial Nature Reserve. Thackery Provincial Nature Reserve covers an area of 116 hectares and protects a significant sequence of Archean metavolcanic rocks of the Kenojevis Group. The nature reserve is managed to protect its significant bedrock outcroppings. The Project site is located 18 kilometres north-northeast of Esker Lakes Provincial Park. Esker Lakes Provincial Park covers an area of 3,237 ha and straddles the continental divide between Arctic and Atlantic watersheds. The park features dozens of kettle lakes, part of the famous 250 kilometre Munroe esker, undulating hills and sand dunes. Recreational activities in the park include camping, fishing, animal viewing, birding, canoeing/boating, swimming, hiking and cycling.

An Environmental Assessment (EA) evaluates the potential environmental effects of a project and identifies appropriate mitigation and monitoring to minimize these effects. The resulting documentation focuses on the effects of the project on the receiving environment, and to a lesser extent, how the environment affects the project. Bio-physical components that are normally evaluated may include:

- aquatic habitat;
- wetlands;
- ground and surface water resources;
- rare and sensitive flora and fauna;

- air quality; and
- geology and soils.

At the mine planning and permitting stage considerable importance will need to be placed on evaluating the surface water quality, flow volumes and associated aquatic habitats for health and species diversity. If the aquatic habitats are designated as being valuable for specific species or rare/endangered plants or animals then alteration or destruction of the habitat will most likely trigger federal involvement and possibly federal environmental assessment. Where possible, the mine development should avoid causing impacts to aquatic habitats that have been deemed valuable through the baseline environmental studies. Public concern relative to possible effects of the mine development on access to any commonly used recreational locations and surface water quality within the site area will need to be examined and discussed at the public consultation stage.

21.1.1 Environmental Baseline Studies

In Spring 2010, Northern Gold retained the services of N.A.R. Environmental Consultants Inc. (NAR) to facilitate the collection of all environmental baseline data in support of the Provincial and Federal regulatory permitting required for the development and operation of both the Garrcon and Jonpol mine deposits, collectively known as the Garrison Project.

NAR's efforts to date have focused on the collection of environmental baseline data, as well as the establishment of engineering survey controls on site, topographic mapping, and the tie-in of key physical features, the location of diamond drill holes, monitoring wells, etc.

21.1.1.1 Environmental Baseline Components

The following study components have either been completed or are on-going:

- meteorological data collection (active)
- continuous hydrologic monitoring - Garrison Creek (active)
- surface water quality monitoring on Garrison and Thackery Creeks; 4 stations (active, monthly sampling)
- benthic community and sediment quality assessments; Garrison and Thackery Creeks (complete)
- fisheries and fish habitat assessment; Garrison and Thackery Creeks (complete)
- Species At Risk and wetland review/assessment; site overview (complete)
- regional ground water assessment; 2 wells plus supplementary measurement point at Jonpol shaft established
- preliminary Acid Base Accounting (ABA) – geochemistry characterization of Garrcon deposit; initial samples submitted for characterization (turnaround – 30 days)
- geophysical site characterization in support of ~~Spring~~ 2011 geo-environmental/geo-technical groundwater study – proposed Garrcon open pit area.

21.1.1.2 Study Rationale, General Findings and Recommendations to February 2011

Data collection and studies to date have been designed to assess the Garrcon and Jonpol deposits until a clear plan of development is set based on exploration results and project economics.

The increasing resources and tonnage of the Garrcon deposit and the shift in its proposed development to an open pit facility, potentially with an on-site mill, has substantially scaled up the scope of baseline characterization studies required to permit the proposed mining facilities.

During the historic development of the two sites, Garrison Creek served as both the water supply and the receiving water for discharges for the Jonpol mine. However, this stream has limited assimilative capacity (i.e. dilution under the 7Q20 low flow index – 7 day low flow with a 20 year return period) and is sensitive in that it supports a coldwater, brook trout fishery. Thackery Creek to the east is equally limited in its assimilative capacity, but is a less sensitive receiver based on the coolwater fishery determined during the baseline studies.

The development of a proposed open pit which would possibly extend below the local ground water table has expanded the need to develop a much more comprehensive assessment of the local and regional ground water site-setting, potentially including the development of a ground water flow model to characterize and quantify inflows to the pit(s), as well as determination of pumping rates and any engineering controls (and associated costs).

Cooperatively, the client and NAR's staff have adapted the Exploration Program to include both geo-technical (e.g. bulk density) and geo-environmental (e.g. fracture logging, ABA - geochemistry sampling) data requirements into day-to-day rock core logging activities in order to provide both a cost-effective and timely delivery of both deposit and regional site-level bedrock characterization data.

Study plans in 2011 are to be scoped and delivered within the field year to address the following broad recommendations:

- A preliminary siting study for a mill (and associated tailings management facility);
- Expansion of the environmental baseline characterization studies (i.e. biota, water and sediment quality and hydrology) to include the Ghost River, the next larger (Order 4 or 5) watershed east of the proposed mining development;
- Further acid base accounting sampling and geochemical assessment, including the development of a ARD or neutral drainage control strategy as necessary, for both Garrcon and Jonpol deposits. However, ARD work will not be done on Jonpol until new drill holes are drilled or until the portal is opened and underground work commenced to provide fresh rock samples ; and
- An expanded and comprehensive regional and local ground water study, including ultimately the development of a ground water model for any proposed production mine facility.

In summary, both on-going and recommended studies need to parallel in terms of timing and delivery with the exploration activities at the site in order to match regulatory permitting requirements for either Advanced Exploration or a full Production start-up.

21.2 Archaeological and Heritage Resources

No specific areas of archaeological or heritage resources are known with respect to the site. However, it is reasonable to assume that there is potential for Aboriginal Peoples sites to exist. Given the history of the regional area, potential also exists for historic resources related to past mining or forestry uses of the site area. Assessment through literature review, desktop study and aboriginal consultation to determine areas for shovel testing would be required.

Prior to finalization of site layout an archaeological assessment of the site should be completed to determine if and where archaeological and heritage resources exist. Depending on the type, location and value of resources, site layouts may need to be modified.

21.3 Aboriginal Peoples

The Wagoshig First Nation community, a political member of the Algonquin Anishinabeg Nation Treaty Council, is located 5 kilometres north-northwest of the proposed project.

Consultation with First Nations is a mandatory requirement for any development project of this kind. The project is also located in the region of the Timmins Métis Nation of Ontario Council, based in Timmins. Although Métis Nations do not have treaty rights, as do First Nations, and may not have archaeological features/conditions in the Site area, Métis peoples are deemed to be Aboriginal Peoples, as defined by the Constitution Act, 1982, and as such must be consulted along with First Nations.

21.4 Local Residents

Area residents include both full and part time (recreational cottagers). The Wagoshig First Nation community, with an estimated population of 250 persons, is located 5 kilometres north-northwest of the proposed project. There are approximately 45 residences located on Perry Lake approximately 12.5 kilometres west of the Project site, of which 7 are full-time. There one residence located on Harker Lake approximately 10 kilometres east of the Project site..

Typically, issues related to local residents that will need to be considered include concerns such as stockpile locations, placement of entrance roads, trucking schedules, operating hours, blasting schedules and noise levels. As the local residents and lodge at Perry Lake are focused on recreation, there will be a high degree of sensitivity to issues of noise, surface water, fish habitat and visual (including light) impacts. Based on the proximity of the Wagoshig community and sensitivities of First Nations to industrial development and water quality, there likely will need to be a high level of First Nations involvement.

21.5 Other Developments

There are no other developments being considered, to the best knowledge of Howe, in the vicinity of the project. The Ontario Ministry of Environment has no projects listed under consideration for development near the Project site in their Environmental Assessment summary [Online – accessed May 2011].

21.6 Public Consultation

Typically, there are significant discussions relative to both the site layout and permitting process that involve the public. These discussions can be "formal", where parties involved document the items discussed and outcomes and these are part of the legislated public consultation requirement or "informal" where there is often follow-up documentation but the process is not necessarily required under any legislation.

21.7 Anticipated Permitting Timetable and Costs

Based on existing information on the site layout and constraints identified, Howe anticipates that the Garrison Project - Garrcon deposit will require a Provincial Environmental Assessment with some potential federal involvement for fisheries issues. Figure 21-1 presents a flow chart outlining the Ontario EA Process and timelines. This process has roughly 40 weeks of mandated requirements in addition to the time required for environmental baseline studies (EBS) and public consultation. It would be reasonable for the EBS stage to take 12-15 months with some overlap with the 40 weeks noted above resulting in a 20-24 month period from initiation of the process to receipt of EA Approval.

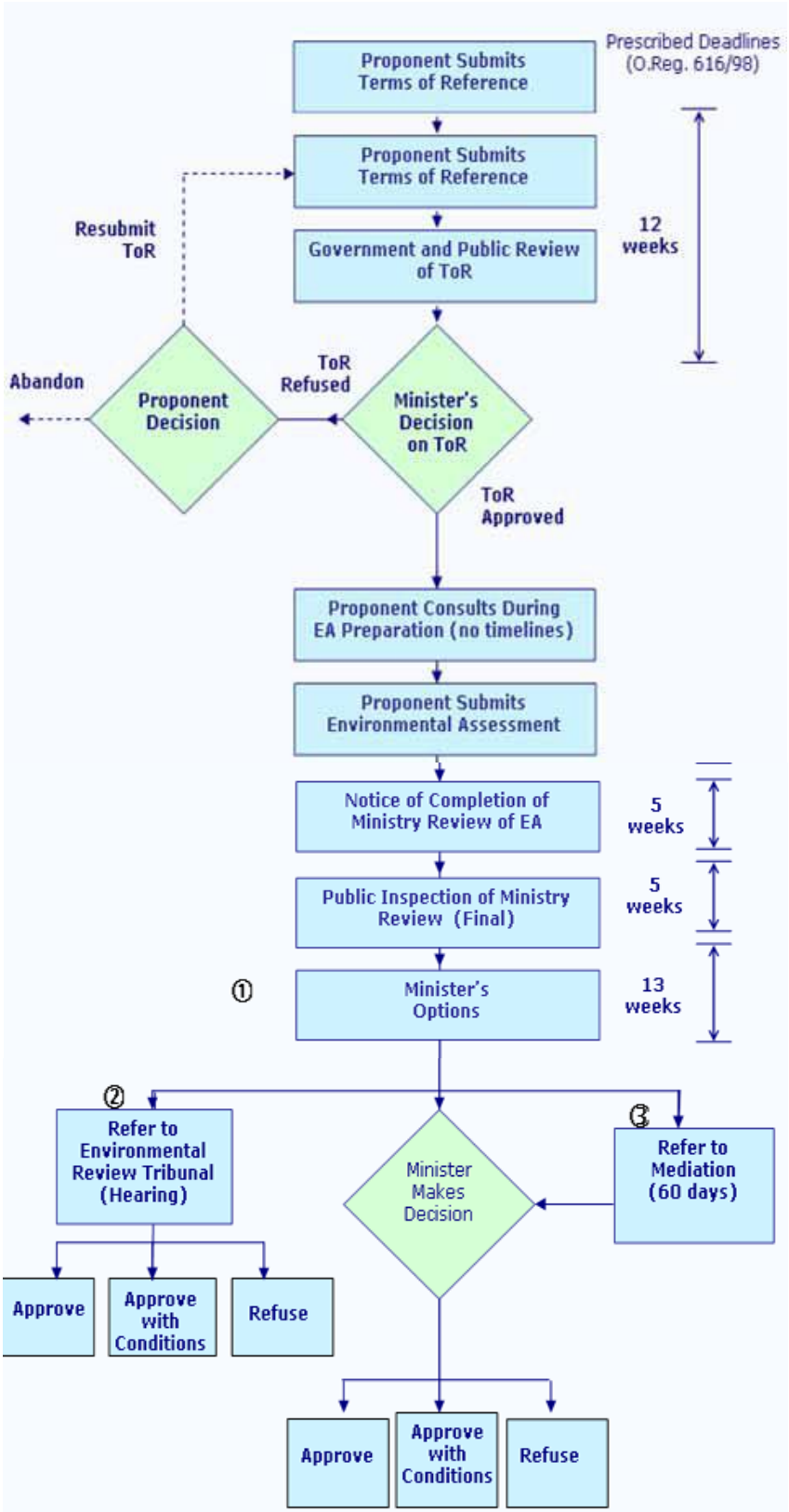

Figure 21-1: Province of Ontario's EA Process

The EBS start date is critical to meeting the 20-24 month EA process schedule, as there are seasonality issues with certain aspects and species (ex. plant surveys in the winter are not valid). It is also critical that the site layout is well defined prior to the EBS and public consultation phases so that impacts can be defined and the project interaction with the environment can be well understood and explained during public consultation. Northern Gold informs Howe that its initial EBS work on the Garrison Gold property is now complete but the study is being expanded to include recently acquired adjacent claims. That work will be require an additional 12 months and is scheduled to start in the near future. Water flow monitoring and water sample analysis on streams is ongoing.

Howe includes as Figure 21-2, organizational charts that highlight various permitting and approvals requirements with respective provincial and federal agencies, which may need to be addressed in the permitting process. Specific permits and approvals to which a mineral project may be subject will depend on the specific features of the proposed project and its location in the social and environmental landscape. A more detailed summary of approvals processes for mining activities including provincial and federal laws, as well as local municipal bylaws that govern, or may govern, mineral development in Ontario is presented in MNDF's *Practitioner's Guide to Planning for and Permitting a Mineral Development Project in Ontario* which is attached as Appendix D.

How the mine, or mines are developed and their tonnage throughputs will ultimately dictate their specific permitting requirements (e.g. Federal Environmental Assessment and/or Provincial), but generically any mine in production in Ontario would require a Permit to Take Water (PTTW) and a Section 53 Approval for an Industrial Sewage Works with supporting Receiving Water Assessment under the requirements of the *Ontario Water Resources Act*, and a Closure Plan under the provisions of the *Mining Act*.

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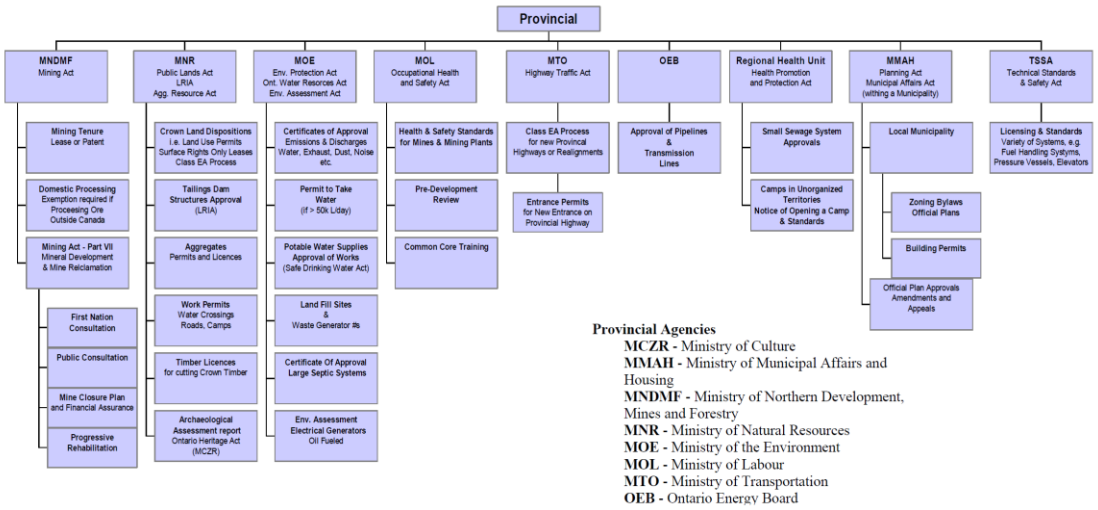
Requirements for Opening / Re-opening a Mine in Ontario (Provincial Agencies)



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March 2010

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Ministry of Northern Development, Mines and Forestry

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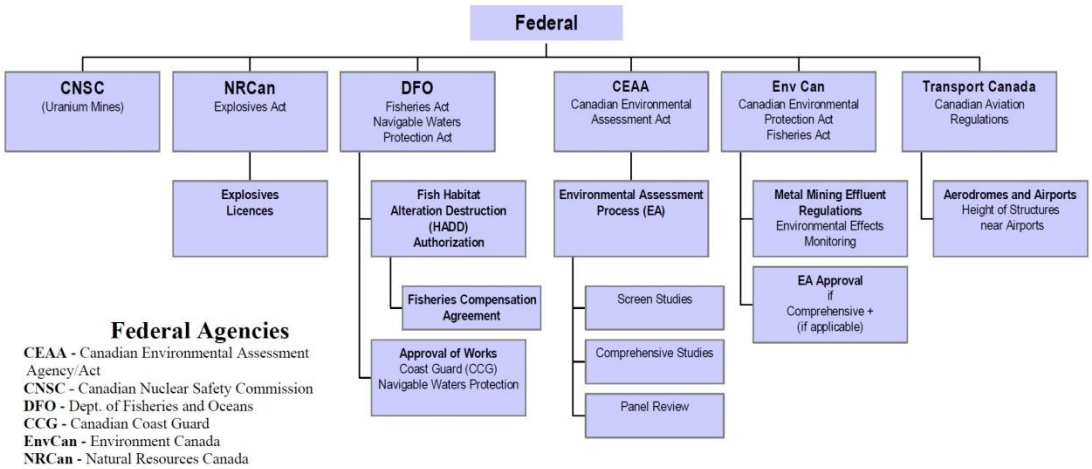
Requirements for Opening / Re-opening a Mine in Ontario (Federal Agencies)



Ontario

March 2010

Mineral Development and Lands Branch
Ministry of Northern Development, Mines and Forestry

Figure 21-2. Overview Permitting and Approval Requirements that may Potentially Affect a Mine Development in Ontario – **(http://www.mndm.gov.on.ca/mines/mg/mindev/permits_e.asp)**

Northern Gold has budgeted approximately $828,000 for the EBS, Public Consultation and Permitting phases of the project for 2011 and the first six months of 2012 (Table 21-1).

Table 21-1: Northern Gold Proposed Budget – 2011 to mid 2012 EBS, Public Consultation and Permitting

Item #	Task	Year Needed	Cost
1	Desk-Top-Siting Review - Mill Complex and Tailings Management Area		$30,000
	Prepare Mapping for Closure Plan	2012	
	Complete Mapping Requirements for Engineering	2011	
	Tentative Location for Haulage/Conveying Right of Way	2011	
1A	Detailed Siting Review - Mill Complex and Tailings Management Area	2011 & 2012	$50,000
	Site Specific Investigations as Needed		
	Includes Haulage Roads and Conveyor Routes		
2	Meteorological Data Collection	Ongoing	$20,000
	Includes Purchase of Equipment For Ongoing Monitoring		
3	Hydrology Monitoring		$40,000
	Garrison Creek: on-going	Ongoing	
	Ghost River: install and operate continuous	2011	
	Low flow modeling; 7Q20 analysis	2012	
	Includes Equipment Purchase		
4	Surface Water Monitoring, Includes Analytical		
	Garrison & Thackery Creeks: On-Going	Ongoing	$30,000
	Ghost River: Establish Stations and Monitor	2011	$20,000
5	Biological Baseline Monitoring: Ghost River	2011	$35,000
	(Garrison and Thackery Creeks Completed)		
	(Background Environmental Data)		
6	Species at Risk and Wetland Assessments	2011	$40,000
	(Background Environmental Data)		
	Linton, Simms and Plato Claim Groups		
7	Garrcon Ground Water Assessment & ARD		
	Geophysical Investigation	2011	$30,000
	Drilling and Construction of Monitoring Wells	2011	$125,000
	Ground Water Sampling & Analysis	2011 & 2012	$75,000
	Ground Water Level Monitoring	2011 & 2012	$25,000
	Continuing ARD Testing	Ongoing	$50,000
8	Garrcon Advanced Exploration Permit		
	Closure Plan	2011	$50,000
9	First Nation and Public Consultation	2011	$25,000
		2012	$50,000
10	Archeological Assessment	2011 & 2012	$25,000
	Subtotal		**$720,000**
	Contingency	**15%**	**$108,000**
	Total		**$828,000**

21.8 Anticipated Environmental Costs During Operational Phase

Environmental costs during the operations phase of typical mining projects consist of compliance monitoring (as outlined in the EA and Operating Permits), effects monitoring (including Metal Mining Effluent Regulations requirements) and other monitoring and stewardship commitments made by the proponent or stipulated by approvals. For this scale of operation a budget of $250,000 per annum should be allocated. Approximately 50% of this relates to analytical costs and equipment requirements such as groundwater monitoring wells and surface water monitoring data loggers and 50% relates to staff and outside consulting for specialized services (benthic invertebrate, breeding bird surveys, etc.). A more detailed budget can be prepared after the EBS and permitting phases are complete because the costs related directly to the stipulations from the Province.

A reclamation bond will be required during mine operation. Howe has factored a $5 million bond into its PEA. Note that the bond value is typically returned in full after the reclamation program is completed and the company is "released" by the Province, so the net costs are only the interest costs on the bond.

21.9 Anticipated Environmental Costs During Closure Phase

Costs relative to environmental considerations during the closure phase consist of the environmental monitoring costs that may post-date the completion of the physical reclamation (removal of buildings, revegetation of stockpiles, etc.). It is typical for these programs to run for 3-5 years after physical reclamation is completed and are in the order of $50,000 to $100,000. We are not able to cost the physical reclamation program as the final mine design and permitted layout and reclamation approach will be developed later.

22 ECONOMIC ANALYSIS

22.1 Principal Assumptions

The purpose of the economic analysis is to evaluate the effects of price assumptions and operational and cost factors on the Project's cash flow over the project's life and to calculate internal rate of return ("IRR") and net present values ("NPV") for the project.

This is a preliminary economic assessment (PEA) of the Garrcon deposit. It includes inferred mineral resources which 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 assessment will be realized. Metal prices used have been estimated from in-house and industry sources.

This study uses financial mathematics to determine an optimum path for the company to follow given the mineral resources identified on the property at a point in time, that being, May 2011.

This PEA makes the following assumptions:

- Zero inflation;
- No change in grade or tonnage throughout the mine life;
- No salvage value at the end of mine life;
- Gold price is $1,200 per ounce throughout the mine life;
- Currency exchange of $Cdn 1.00 = $US 1.00;
- No royalties or NSR to other parties;
- No tax loss carryforwards;

These assumptions will be refined in future studies, if the project looks economic under these ideal "rule of thumb" conditions.

22.2 Economic Analysis

22.2.1 Capital and Operating Costs

Capital and operating costs are detailed in Section 20.

Total capital costs are $156 million (including working capital) (Table 22-1).

Table 22-1: Capital Cost Summary

Capital Item	Cost (Millions)
Mining	$48.2
Processing Plant and Heap Leach	77.4
Pre-Production Stripping	19.3
Working Capital	6.7
Reclamation Bonding (Closure Costs)	5.0
Total Capital (Rounded)	**$156**

Yearly operating costs are summarized in Table 22-2.

Table 22-2: Yearly Operating Cost Summary

Operating Cost/Year	Pre-Production	Year 1	Years 2-7	Year 8
Mining	12,430,000	35,600,000	35,800,000	23,500,000
G&A	825,000	929,0000	929,000	825,000
Processing Plant	4,870,000	17,600,000	17,600,000	13,700,000
Heap Leach	1,990,000	8,000,000	7,960,000	5,740,000
Total Operating (Rounded)	**20,100,000**	**62,200,000**	**62,300,000**	**43,700,00**
Cost per troy oz	636	491	493	461
Reclamation				5,000,000

22.2.2 Projected Revenue

Table 22-3 – Projected Revenue

	Pre-Production		Production		
REVENUE	**Year 1**	**Year 2**	**Year 1**	**Year 2 - 7**	**Year 8**
Waste tonnes Mined		**6,310,938**	**12,518,750**	**12,518,750**	**6,259,375**
LG ore to Crusher then Heap		**571,875**	**2,287,500**	**2,287,500**	**1,715,625**
H.G. Ore to Crusher the to Mill PAD		1,031,250	4,125,000	4,125,000	3,093,750
Dilution		51,563	206,250	206,250	154,687.50
Tonnes moved per year		7,966,000	19,138,000	19,138,000	11,223,000
loose m3 moved per year		5,431,364	13,048,636	13,048,636	7,652,045
Metallurgical Recovery					
Grade of ore to heap leach		0.20	0.20	0.20	0.20
mining days per year		91	270	270	270
recovery, Leach		65.0%	65.0%	65.0%	65.0%
Grade of ore to mill		0.90	0.90	0.90	0.90
tonnes ore mined per day		11,866	11,866	11,866	8,900
mining days per year		91	365	365	365
grams gold in in HG ore to mill		928,100	3,712,500	3,712,500	2,784,400
grams gold in ore to LG heap		114,400	457,500	457,500	343,100
Total Grams in Ore		1,042,500	4,170,000	4,170,000	3,127,500
Total Troy Ounces in Ore		33,500	134,100	134,100	100,600
CIL/CIP		98.0%	98.0%	98.0%	98.0%
gold Recovery from CIL/CIP Plant, grams		909,500	3,638,300	3,638,300	2,728,700
gold Recovery from CIL/CIP Plant, troy ounces		29,200	117,000	117,000	87,700
gold Recovery from Heap Leach, grams		74,000	297,000	297,000	223,000
gold Recovery from Heap Leach, Troy Ounces		2,380	9,550	9,550	7,170
Total Grams gold recovered		983,500	3,935,300	3,935,300	2,951,700
Total Troy ounces gold recovered		31,620	126,523	126,523	94,899
gold value, per troy ounce		$ 1,200	$ 1,200	$ 1,200	$ 1,200
gold value, per gram		$ 38.58	$ 38.58	$ 38.58	$ 38.58
Value of gold Recovered from HEAP LEACH		$ 2,855,000	$ 11,459,000	$ 11,459,000	$ 8,604,000
Value of gold Recovered from CIL/CIP		$35,089,000	$140,369,000	$140,369,000	$105,276,000
Revenue before insurance, freight, refining		$37,944,000	$151,828,000	$151,828,000	$113,880,000
less, insurance, freight, refining		$758,880	$3,036,560	$3,036,560	$2,277,600
Gross Revenue	**$0**	**$37,185,000**	**$148,791,000**	**$148,791,000**	**$111,602,000**

22.2.3 Taxes

The combined Federal income tax and the Ontario Income, Mining and Capital tax on mining production is about 28% of the operating profit. In addition, there will be municipal taxes and fees, so the financial examination of the project uses a 30% overall tax on operating profits.

Details of the Federal taxes that mining operations are subject to can be found at http://www.nrcan.gc.ca/mms-smm/busi-indu/mtr-rdm/mst-rps-eng.htm#lnk6.

22.2.3.1 Ontario Mining Tax

Ontario's mining tax is levied at 10% of taxable profits in excess of $500,000, which are derived from mining operations in Ontario.

Determination of taxable profit:

- Gross Revenue in excess of $500,000

Less

- Cost of production;
- Processing costs;
- Depreciation at prescribed rates;
- Exploration and development expenses;
- Processing allowance at prescribed rates;
- Operating and maintenance costs of certain social assets (e.g., housing, recreational and service facilities); and
- Scientific research conducted in Canada that relates to the output of mines.

22.2.4 Economic Summary

Table 22-4 summarizes the cash flow estimate for the PEA.

Table 22-4 Economic Summary - Income, Taxes and Interest Estimate

	Pre-Production Year 1	Pre-Production Year 2	Year 1	Year 2-7	Year 8
Net Operating Income (Gross Margin)					
Operating Cash Flow		$ 17,069,500	$ 86,622,500	$ 86,453,500	$ 72,878,129
Less Overhead Costs	$ 3,140,000	$ 3,140,000	$ 3,140,000	$ 3,140,000	$ 3,140,000
Net Operating Income (Gross Margin)	*-$ 3,140,000*	*$ 13,929,500*	$ 83,482,500	$ 83,313,500	$ 69,738,129
Per Tonne of Ore		$ 8.69	$ 13.02	$ 12.99	$ 14.50
Taxes and Interest					
Net Operating Income (Gross Margin)	-$3,140,000	$13,929,500	$83,482,500	$83,313,500	$69,738,129
Minus Loss Carried Forward		-$3,140,000	-$45,786,500		
Minus Capital Cost Allowance Deduction		$78,118,000	$78,117,000	$52,079,000	$964,000
Minus Resource Allowance Deduction		-$15,262,000	$2,126,000	$8,594,000	$16,729,000
Minus Interest Expenses		$0	$0	$0	$0
Taxable Income	-$3,140,000	-$45,786,500	$49,026,000	$22,640,500	$52,045,129
Federal Income Tax (18%)	$0	$0	$8,825,000	$4,075,000	$9,368,000
Ontario Mining Tax (10 %)	$0	$0	$4,903,000	$2,264,000	$5,205,000
Total Income Tax Payable	$0	$0	$13,728,000	$6,339,000	$14,573,000
Net Income After Interest and Taxes					
Net Operating Income (Gross Margin)	-$3,140,000	$13,929,500	$83,482,500	$83,313,500	$69,738,129
Add back working capital recovery					$6,705,167
Minus Total Income Tax Payable	$0	$0	$13,728,000	$6,339,000	$14,573,000
Minus Interest on Capital	$0	$0	$0	$0	$0
Net Income After Interest and Taxes	-$3,140,000	$13,929,500	$69,754,500	$76,974,500	$61,870,296

Present Value of Net Income	Pre-Production Year 1	Pre-Production Year 2	Year 1	Year 2	Year 8
Net Income After Interest and Taxes	-$3,140,000	$13,929,500	$69,754,500	$76,974,500	$61,870,296
Minus Capital Costs	$26,039,194	$78,117,583	$52,235,389	$0	$0
Subtotal	-$29,179,194	-$64,188,083	$17,519,111	$76,974,500	$61,870,296
Cumulative	-$29,179,194	-$93,367,278	-$75,848,167	$1,126,333	$394,194,725

$NPV_{5\%}$	$ 266,400,000
$NPV_{8.0\%}$	$ 211,500,000
$NPV_{10.0\%}$	$ 181,500,000
$NPV_{12.5\%}$	$ 150,000,000
$NPV_{15.0\%}$	$ 123,900,000
Internal Rate of Return (IRR)	47%

22.3 Financial Indicators

The Garrcon deposit appears to be viable as a large low grade mining operation as long as the gold price stays strong, above approximately $US 800 / troy ounce.

PEA indicators are presented in Table 22-5:

Table 22-5 - PEA Financial Indicators, Garrcon Deposit

NPV_{05}	$266,000,000
Cumulative Cash Flow	$394,000,000
Taxes Payable	$120,000,000
IRR	47%
Payback from start of production is just under 2 years	
$494 - average operating cost/ounce	
$154 - required capital /oz	
$648 total cost/ounce	
Troy Ounces of Gold produced, just over 1,000,000 - NOTE: with PEA outlined 50% Inferred resources	
PEA - EBITDA Margin 58%	

22.4 Payback

A payback of just under 2 years from the start of production is indicated in this study (Table 22-5). The Income Tax Act states that the start of commercial production is "The first day of the first 90 day period throughout which the mill operated consistently at 60% capacity or more".

The PEA EBITDA margin, ratio of earnings before interest, tax, depreciation and amortization and the total revenue is 58% (Table 22-5), which is above the average for gold producers.

22.5 Royalties

This PEA assumes no royalties.

22.6 Sensitivity

A sensitivity analysis was carried out on four key parameters: head grade, gold price, capital costs and operating costs.

Profitability is most sensitive to head grade and metal price which is a typical result. At $840 per ounce, the project's $NPV_{5\%}$ is $50 million and the IRR is 14%. At the average gold price as of the date of this report, approximately $US 1,560 per ounce gold, the $NPV_{5\%}$ is $480 million and the IRR is 79%, assuming all other variables are constant. Even with capital costs at 200% of the PEA value, $NPV_{5\%}$ remains positive at $141 million and the IRR is 18%.

Sensitivity of the various parameters are presented in Table 22-6 and graphically in Figure 22-1.

Table 22-6: Sensitivities Table

	$NPV_{5\%}$			
Change	**Grade**	**Capital**	**Operating**	**Gold Price**
-50%	-$97,000,000	$327,000,000	$418,000,000	-$97,000,000
-40%	-$23,000,000	$315,000,000	$388,000,000	-$23,000,000
-30%	$50,000,000	$303,000,000	$357,000,000	$50,000,000
-20%	$124,000,000	$291,000,000	$327,000,000	$124,000,000
-10%	$195,000,000	$279,000,000	$297,000,000	$195,000,000
PEA case	**$266,000,000**	**$266,000,000**	**$266,000,000**	**$266,000,000**
+10%	$338,000,000	$254,000,000	$236,000,000	$338,000,000
+20%	$409,000,000	$242,000,000	$206,000,000	$409,000,000
+30%	$480,000,000	$230,000,000	$175,000,000	$480,000,000
+40%	$551,000,000	$218,000,000	$145,000,000	$551,000,000
+50%	$622,000,000	$205,000,000	$115,000,000	$622,000,000

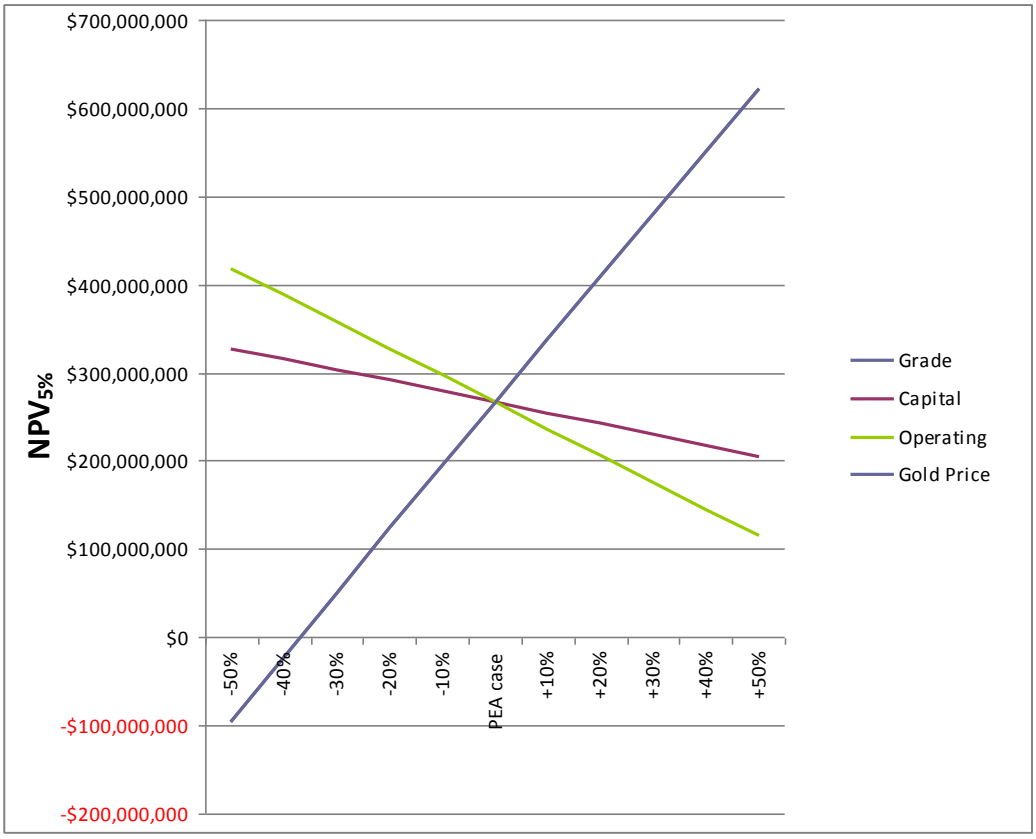


Figure 22-1: Sensitivity Spider diagram (Gold Grade and Gold Price have same trend)

23 ADJACENT PROPERTIES

Howe is unaware of any significant exploration results on immediately adjacent mineral properties.

Gold is extracted from the St Andrew Goldfield Ltd.'s underground Holloway mine in Holloway Township and Brigus Gold's Black Fox open-pit and underground mine in Hislop Township (approximately 15 kilometres east and 32 kilometres west of the Property respectively). Most recently, ore production commenced during the third quarter of 2010 at St Andrew Goldfield Ltd.'s open-pit Hislop Mine approximately 27 kilometres west of the Property in Hislop Township. In addition, St Andrew Goldfield Ltd.'s underground Holt mine approximately 15 kilometres east of the Property in Holloway Township is in development.

24 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant information known to Howe that if undisclosed would make this Report misleading or would make this Report more understandable.

25 INTERPRETATION AND CONCLUSIONS

Howe has reviewed the Garrcon Deposit data provided by Northern Gold, including the drilling database, has visited the site and has reviewed sampling procedures and security. Howe believes that the data presented by the Company are generally an accurate and reasonable representation of the Garrcon Deposit mineralisation. Howe concludes that the database for the Garrcon Deposit is of sufficient quality to provide the basis for the conclusions and recommendations reached in this Report.

Work by the Company at the Garrcon Deposit has confirmed the grade of mineralisation outlined by previous operators, provided further detail on the nature of the mineralised zones and permitted the completion a NI 43-101 compliant updated Mineral Resource Estimate.

Northern Gold's QA/QC results to date indicate that there are no major problems with the accuracy of the analyses. The current sampling and analytical protocols are considered by Howe to be appropriate.

Northern Gold's exploration drilling program during 2010 and 2011 has confirmed a significant gold resource and was successful in (a) adding metal content (ounces) and (b) upgrading Inferred mineral resources to the Indicated category. Using a cut-off grade of 0.1 g/tonne gold for mineralised zone interpretation, Howe outlined a mineralised zone that is nearly vertical, 800 metres long, up to 500 metres deep and 300 metres wide (on average).

Indicated mineral resources total 24.9 million tonnes with an average gold grade of 0.9 g/tonne, for 720,000 ounces gold using a 0.3 g/tonne block cut-off grade.

Inferred mineral resources total 18.6 million tonnes with an average gold grade of 0.7 g/tonne, for 430,000 ounces gold using a 0.3 g/tonne block cut-off grade.

Howe has reviewed the Garrcon Deposit at the level of a Preliminary Economic Assessment (PEA). The reader is cautioned that this PEA uses Indicated and Inferred Mineral Resources.

NI 43-101 Part 2, Section 2.3(1)(b) and Companion Policy 43-101CP, Part 2, Section 2.3(1) Restricted Disclosure, prohibits the disclosure of the results of an economic analysis that includes or is based on inferred mineral resources, an historical estimate, or an exploration target. However, under NI 43-101, Part 2, Section 2.3(3) and Companion Policy 43-101CP, Part 2 section 2.3(3), the use inferred mineral resources is allowed in a Preliminary Economic Assessment in order to inform investors of the potential of the property.

This 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. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

A mining schedule and economic model has been developed for the operation. The PEA indicates that the mining of the Garrcon gold deposit by open pit mining methods would be feasible today. This PEA has determined that, with the Mineral Resources outlined to date, a combination gravity-agitated leach plant and a heap leach facility would be economic with a base case net present value (5.0% discount rate) of $266 million and an internal rate of return of 47%.

PEA conditions included $1,200/troy ounce gold, a processing rate of about 11,300 tonnes per day and a heap leach facility processing about 2.3 million tonnes per year.

The project is most sensitive to grade and the price of gold and least sensitive to capital costs. The PEA has been completed using order of magnitude costs and rock quality values typical of northern Ontario. The project economics would be even better if the present price of gold ($1500 +) were used; however, at this stage the project is still 3 to 5 years from production and it is prudent to use a lower number. As the project advances, a gold price closer to the present price can be used.

Based on the mineral resource update and PEA, Howe concludes that the Garrcon Deposit and the Garrison Gold Property is a property of merit and warrants additional expenditures to be further developed.

26 RECOMMENDATIONS

Howe recommends that the following work be incorporated into Northern Gold's ongoing project development plans to further refine estimates of costs, recoveries, engineering and mine design to facilitate the development of a Pre-feasibility Study:

1. Continue the advanced exploration permitting currently in progress to be followed by the work necessary for operational permitting.

2. Expand the permitting process to include potential mill sites, heap leach pads and tailings management areas using claims recently acquired by Northern.

3. Continue and expand the current drilling program:
    a. Add additional drills to increase the rate at which resources are upgraded, delineated and discovered.
    b. Continue the infill drilling program to improve the quality of existing resources.
    c. Increase the infill drilling rate to speed up the upgrading of resources and the delineation of additional resources within the resource footprint as identified by Howe.
    d. Emphasis be placed on step out drilling beyond the current resource footprint to test meta-sediment outcrops and newly stripped meta-sediments hosting stockwork veining with anomalous gold mineralization.

4. Northern Gold should continue specific gravity measurements of representative samples. Sufficient samples should be tested to be representative of the various mineralized and non-mineralized rock types within the Garrcon Zone along its entire strike length, width and depth. The number of samples will depend on the statistical variance of the measurements.

5. Further mineral processing work should be carried out to support assumptions that were made in this report. The work that has been carried out thus far is quite preliminary. This work should be expanded by exploring various processing options, determining which options would best suit this particular deposit and optimising the most promising flowsheet. Should that flowsheet consider heap leaching, a bulk sample pilot trial should be carried out to determine the actual, realised processing recovery value as opposed to the laboratory-predicted value. Testwork should include:
    a. Sieve analysis vs. gold grade.
        i. For each stage of the rock breakage history, a sieve analysis and grade of gold should be determined. This should be completed for selected bulk sampling sites where at least several hundred tonnes can be blasted on surface. At each stage of crushing, the ore should be sieved and a gold grade determined for each size fraction..
    b. Flotation Test Program

i. Test four different grinds from approximately 70% at -200 mesh to 95% at -200 mesh. In these tests use reagent X-523 for 10 minutes followed by a 10-minute float with frother and potassium amyl xanthate.
ii. Take the best of the above conditions and repeat with reagent Aerofloat 208 replacing the X-523. Take the best of the above conditions and jig the flotation feed and remove the coarser gold prior to flotation.
iii. Have all tests that are performed above assayed for gold, silver and sulphur.
iv. Repeat the best test of above and have all flotation floats performed for five 3-minute intervals to establish the flotation rate for the various minerals.
v. Repeat the best tests of above but clean, reclean and re-reclean the two flotation products, and have the final re-reclean concentrate assayed for copper, lead and zinc as well. Also, repeat the best test using reclaimed water from a previous float test.

c. Bottle roll tests to give some indication of the leaching character of the rock.
d. Column leaching tests should be completed to get some idea of percolation rates for the heaps.
e. Determination of solution application rates and solution percolation rates, crushing and agglomeration testing.

6. Continue testing the deposit for any potential Acid Rock Drainage (ARD) and confirmation of the relatively high calcium content, which is expected to neutralize any ARD potential.

7. A study of the structural geology, a map of the jointing system and a report on the geotechnical properties of the potential pit should be completed. The geotechnical properties of the rock types at the Garrcon property (Uniaxial Compressive Strength (UCS), Tensile Strength, Young's modulus and Poisson's ratio) should be determined. A suite of samples representing different parts of the deposit and each rock type should be tested at a rock mechanics laboratory.

8. Additional land may be required around the deposit, to store waste rock and tailings facilities. More detailed site engineering is required to confirm the suitability and sufficiency of the current property area for final mine and processing facilities should they be constructed.

9. Approximately 10 kilometres of line will be required to bring 3 phase power to the site. A right of way for this line should be investigated and talks with Ontario Hydro should be initiated.

10. A hydrological study should be completed to determine the amount of water that must be pumped to keep the pit dry. Any water bearing fractures found should be mapped so that they can be grouted off if necessary. A water storage facility will have to be in place to supply mill water, heap leach water as well as fire-fighting water.

11. A rock penetration rate study should be undertaken in order to determine the penetration rate for down the hole hammer type blast hole drills. Drill manufacturers often offer this service. A variety of core or rock samples should be tested so that an accurate penetration rate can be determined.

12. Update of the Garrcon resource estimate to include the results of the ongoing 2011 drill program. The update should be completed after sufficient drilling has been completed along strike of the currently defined mineral resource.

In line with these recommendations, Northern Gold has proposed a budget totaling $10,330,000 for a work program for the last four months of 2011. The proposed program and budget as shown Table 26-1 below will permit Northern Gold to complete 44,000 metres of diamond drilling and approximately 11,200 metres of RC drilling to upgrade and expand the resource in addition to EBS and Permitting, metallurgical and engineering studies some of which are budgeted to continue into the first six months of 2012 (as per Table 26-1).

Howe considers Northern Gold's proposed budget reasonable and recommends that the Company proceed with the proposed work program.

Table 26-1: Proposed Budget – September to December 2011 (some work into 2012)

Item #	Task / Exploration Element	Year	Cost
1	EBS, Public Consultation and Permitting (See Table 21-1)	2011 & 2012	$720,000
3	Continue and Expand Diamond Drilling Program*	2011 Sept-Dec	$6,564,000
4	Metallurgical Testwork	2011 & 2012	$1,500,000
5	Update Resource Estimate	Late 2011 or Early 2012	$50,000
6	Initate Pre-Feasibility & Feasibility Data Collection & Engineering	2011 Sept-Dec	$150,000
		Total	**$8,984,000**
	Approximate 15%	**Contingency**	**$1,346,000**
		Grand Total	**$10,330,000**
* Drill program (Sept to Dec 2011)			
2011	44,000m diamond drilling @ $125/m and 11,200m RC drilling @ $95/m		

27 REFERENCES

Ayer, J. A. and Trowell, N. F., 2001, Project Unit 95-24, The Abitibi Greenstone Belt: A Program Update. In Summary of Field Work and Other Activities 2001, Ontario Geological Survey, OFR 6070, p. 4-1 to 4-9.

Bath, A.C., 1990, Mineral Occurrences, Deposits, and Mines of the Black River – Matheson Area, Ontario Geological Survey Open File Report 5735, 1883 p.

Berger, B. R., 2002, Geological Synthesis of the Highway 101 Area, East of Matheson, Ontario; Ontario Geological Survey Open File Report 6091, 124 p.

Bradshaw, R.J., 1989, A Report on the Newfield Property Gold Deposits, Garrison Township, Ontario, August 17, 1989, pp. 14.

Card, K. D., Poulsen, K. H., and Robert, F., 1988, The Archean Superior Province of the Canadian Shield and Its Lode Gold Deposits, p. 19-36; in Economic Geology Monograph 6: The Geology of Gold Deposits; the Perspective in 1988, edited by R. R. Keays, W. R. H. Ramsey, and D. I. Groves, Economic Geology Publishing Company, 667p.

Deklerk, R. and Burke, M. (compilers), 2008. Yukon Mineral Property Update 2008. Yukon Geological Survey, p.3-7, 94 p.

DDH Geomanagement, 1989, unpublished exploration report

George, P.T., 2008, Technical Report, Mineral Resource Estimate and Preliminary Assessment of Garrison Gold Property, Abitibi Greenstone Belt, Garrison Township, Ontario, Canada for ValGold Resources Inc.; A.C.A. Howe International Limited Technical Report.

George, P.T., 2009, Technical Report, Mineral Resource Estimate and Preliminary Assessment of Garrison Gold Property, Abitibi Greenstone Belt, Garrison Township, Ontario, Canada for Northern Gold Mining Inc.; A.C.A. Howe International Limited Technical Report.

Jackson, S. L., and Fyon, J. A., 1991, The Western Abitibi Subprovince in Ontario; in Geology of Ontario, Special Volume 4, Part 1, Chapter 11, p.405-482.

Northern Miner, various

Robert, F., 1996, Quartz-carbonate vein gold; in Geology of Canadian Mineral Deposit Types, edited by O. R. Ekstrand, W. D. Sinclair, and R. I. Thorpe, Geological Survey of Canada, Geology of Canada, No 8, p 350-366.

Robert, F., 1998, An Overview of World Class Archean Gold Deposits; in The First Age of Giant Ore Formation; Stratigraphy, Tectonics, and Mineralisation in the Late Archean and Early

Proterozoic; papers presented in a technical session at the Annual Convention and Trade Show of the Prospectors and Developers Association of Canada, Sunday March 8, 1998, p.137-162.

Rogers, D. S., 1982, Drilling as an aid in ore definition at the Dome Mine, Canadian Institute of Mining and Metallurgy, vol. 75, no. 842, June 1982, p. 98-104.

SGS Mineral Services, 2011, An Investigation into the Recovery of Gold from the Garrcon Gold Deposit located on the Garrison Gold Property, prepared for Northern Gold Mining Inc., Project 12566-001 – Final Report January 31, 2011.

Sinclair, D.G., Keely, E.C., Cooper, D.F., Weir, E.B. and Webster, A.R., 1937, Mines of Ontario in 1935; Ontario Department of Mines, Annual Report of 1936, Volume 45, Part 1, p. 77-188.

Sinclair, D.G., Tower, W.O., Bayne, A.S., Cooper, D.F., Weir, E.B. and Webster, A.R., 1938, Mines of Ontario in 1936; Ontario Department of Mines, Annual Report of 1937, Volume 46, Part 1, p. 90-238.

Sinclair, D.G., Tower, W.O., Taylor, J.B., Douglas, D.P., Bayne, A.S., Cave, A.E., Cooper, D.F., Weir, E.B. and Webster, A.R., 1939, Mines of Ontario in 1937; Ontario Department of Mines, Annual Report of 1938, Volume 47, Part 1, p. 80-249.

Satterly, J., 1949, Geology of Garrison Township; Ontario Department of Mines Annual Report, v.58, pt.4, including Map M1949-01, Scale 1:12,000.

Squair, H., 2000, A Report on the Garrison Gold Project, Garrison Township, District of Cochrane, Ontario, for Aurado Exploration Ltd., April 2000, 34 p.

Roy, D. and Trinder, I. 2010, Technical Report and Mineral Resource Estimate on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada for Northern Gold Mining Limited, ACA Howe International Limited, September 23, 2010, 94 p.

Young, A.C., 1937, Statistical Review of the Mineral Industry of Ontario for 1935, Ontario Department of Mines, Annual Report of 1936, Volume 45, Part 1, p. 1-60.

28 DATE AND SIGNATURE PAGE

This report titled "Technical Report and Preliminary Economic Assessment on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada" for Northern Gold Mining Limited dated June 23, 2011, was prepared and signed by the following authors:

Dated at Halifax, Nova Scotia
August 5, 2011

Patrick J. Hannon, M.A.Sc., P.Eng.
Associate Consulting Engineer
A.C.A. Howe International Limited

Dated at Halifax, Nova Scotia
August 5, 2011

William D. Roy, M.A.Sc., P.Eng.
Associate Consulting Engineer
A.C.A. Howe International Limited

Dated at Toronto, Ontario
August 5, 2011

Ian D. Trinder, M.Sc., P.Geo.
Senior Geologist
A.C.A. Howe International Limited

29 CERTIFICATES OF QUALIFICATIONS

Certificate of Qualifications

Name:	Patrick James Francis Hannon, M.A.Sc., P.Eng.
Address:	MineTech International Limited, 1161 Hollis St., Suite 211, Halifax, Nova Scotia, Canada B3H 2P6. Telephone: 1-902-492-4049; Facsimile: 1-902-492-9302; Email: pat@minetechint.com
Occupation:	Consultant Geological and Mining Engineer

Qualifications

I, Patrick J. F. Hannon, do hereby certify that:

1. I am director and President of:
MineTech International Limited of 1161 Hollis St., Suite 211, Halifax, Nova Scotia, Canada B3H 2P6 and an Associate Consulting (Mining) Engineer with A.C.A. Howe International Limited.

2. I graduated with a Bachelor of Science (Eng.) degree in Geological Engineering from Queen's University at Kingston in 1972. In addition, I have a Sr. Mining Technician Certificate from the Haileybury School of Mines (1968) and I obtained a M.A.Sc. in Mining Engineering from the Dalhousie University, Halifax in 1987.

3. I am a Member of Engineers Nova Scotia, the Professional Engineers and Geoscientists Newfoundland and Labrador and a member of the Association of Professional Engineers in Ontario. I am a Fellow of the Canadian Institution of Mining and Metallurgy and a member of the American Institute of Mining Engineers.

4. I have worked in the mining industry for a total of 39 years since my graduation from university.

5. I have read the definition of "qualified person" and hereby 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.

6. I have not personally visited the Garrcon property of Northern Gold; however, I am familiar with the terrain having worked on several properties in the Kirkland Lake camp during the 1980s.

7. I am responsible for sections 13, 16, 17, 18, 19, 20 and 22, essentially the preparation of the mining engineering and financial analysis for the Preliminary Economic Assessment part section of this NI 43-101 Technical Report for Northern Gold Mining Limited's Garrcon Deposit located in Garrison Township, Ontario.

8. 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.

9. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.

10. I have not had any prior involvement with the property that is the subject of this Technical Report.

11. I have read NI 43-101 and NI 43 101 Form 43-101F1. This Technical Valuation Report has been prepared in compliance with those instruments.

Patrick J.F. Hannon, M.A.Sc., P.Eng.
August 5, 2011

CERTIFICATE of CO-AUTHOR

I, William Douglas Roy, M.A.Sc., P.Eng., do hereby certify that:

1) I am an Associate Mining Engineer of ACA Howe International Limited, whose office is located at 365 Bay St, Toronto, Ontario, Canada.

2) I graduated with a B.Eng. degree in Mining Engineering from the Technical University of Nova Scotia (now Dalhousie University) in 1997 and with a M.A.Sc. degree in Mining Engineering from Dalhousie University in 2000.

3) I am a Professional Engineer (Mining), registered with the Association of Professional Engineers of Nova Scotia (Registered Professional Engineer, No. 7472). I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") and of the Prospectors and Developers Association of Canada ("PDAC").

4) I have worked as a mining engineer for 14 years since graduating from university. This work has included the estimation of resources and reserves for precious metals, base metals and industrial minerals, as well as participation in pre-feasibility and feasibility studies.

5) 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.

6) I am co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada" for Northern Gold Mining Limited dated June 23, 2011 (the "Technical Report"). I am responsible for Section 14: Mineral Resources, 16.5.1: Pit Optimisation and 16.5.2: Practical Pit Design ("De-Optimisation").

7) I have read NI 43-101 and Form 43-101 F1. This Technical Report has been prepared in accordance with that Instrument and form.

8) I have not visited the Garrison Gold Property.

9) I have had prior involvement with the issuer and property as co-author of ACA Howe's 2010 technical report titled: Technical Report and Mineral Resource Estimate on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada for Northern Gold Mining Limited, dated September 23, 2010,

10) I am not aware of any material fact or material change with respect to the subject matter of this Report that is not reflected in the Report, the omission to disclose which makes the Report misleading.

11) I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.

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

13) 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.

Dated this 5th Day of August 2011.

William Douglas Roy, M.A.Sc., P. Eng.
Associate Mining Engineer
ACA Howe International Limited

CERTIFICATE of CO-AUTHOR

I, Ian D. Trinder, M.Sc., P.Geo. (ON, MAN), do hereby certify that:

1. I reside at 4185 Taffey Crescent, Mississauga, Ontario, L5L 2A6.

2. I am a self-employed geologist and have been retained since 2007 as an associate consulting geologist with the firm of A.C.A. Howe International Limited, Mining and Geological Consultants located at 365 Bay St., Suite 501, Toronto, Ontario, Canada. M5H 2V1.

3. I graduated with a degree in Bachelor of Science Honours, Geology, from the University of Manitoba in 1983 and a Master of Science, Geology, from the University of Western Ontario in 1989.

4. I am a Professional Geoscientist (P.Geo.) registered with the Association of Professional Engineers and Geoscientists of Manitoba (APEGM, No. 22924) and with the Association of Professional Geoscientists of Ontario (APGO, No. 452). I am a member of the Society of Economic Geologists and of the Prospectors and Developers Association of Canada.

5. I have over 20 years of direct experience with precious and base metals mineral exploration in Canada, USA and the Philippines including project evaluation and management. Additional experience includes the completion of various National Policy 2A and NI 43-101 technical reports for gold and base metal projects.

6. 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.

7. I am co-author of the technical report titled: "Technical Report and Preliminary Economic Assessment on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada" for Northern Gold Mining Limited dated June 23, 2011 (the "Technical Report"). I am responsible for Sections 1 to 12, 15, 21 and 23 to 27 of the report. I have visited the Garrison Gold Property from July 12th to 13th, 2010, January 19 to 22, 2011 and May 20, 2011.

8. I have prior involvement with the issuer and property as co-author of ACA Howe's 2010 technical report titled: Technical Report and Mineral Resource Estimate on the Garrcon Deposit- Garrison Gold Property, Larder Lake Mining Division, Garrison Township, Ontario, Canada for Northern Gold Mining Limited, dated September 23, 2010,

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 National Instrument 43-101.

11. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

12. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this 5th Day of August 2011.

PROFESSIONAL GEOSCIENTIST
08/05/2011
IAN D. TRINDER
PRACTISING MEMBER
0452
ONTARIO

Ian D. Trinder, M.Sc., P. Geo.

APPENDIX A

Diamond Drill Holes used in Resource Estimate

DDH ID	*Easting UTM E NAD 83	*Northing UTM N NAD 83	Elev m	Azimuth True	Dip	Length m	Start	Finish	Company	Core Dia
C06-01	578654.3	5373903.7	303.0	342.2	-44.5	383.00	26/06/2006	??/07/2006	Valgold	NQ
C06-02	578702.0	5374078.3	311.0	277.5	-44.6	461.00	??/07/2006	18/07/2006	Valgold	NQ
C06-03	578701.6	5374077.2	311.0	340.4	-54.4	254.00	18/07/2006	21/07/2006	Valgold	NQ
C06-04	578652.7	5373906.1	303.3	331.3	-45.1	323.00	21/07/2006	26/07/2006	Valgold	NQ
C06-05	578543.8	5373847.5	290.0	334.7	-43.4	45.00	26/07/2006	11/08/2006	Valgold	NQ
C06-05B	578543.8	5373847.5	290.0	324.3	-52.04	497.00	26/07/2006	11/08/2006	Valgold	NQ
C06-06	578583.0	5373884.0	298.0	338.1	-44.9	455.00	13/08/2006	16/08/2006	Valgold	NQ
C06-07	578574.6	5374063.1	305.0	151.4	-44.7	422.00	16/08/2006	??/08/2006	Valgold	NQ
C06-08	578430.8	5374014.5	303.3	159.7	-43.0	422.00	31/08/2006	12/09/2006	Valgold	NQ
C06-09	578703.8	5373934.2	296.0	338.6	-45.1	131.00	13/09/2006	??/09/2006	Valgold	NQ
C07-01	578701.1	5373786.9	286.0	326.5	-48.6	499.00	25/02/2007	12/03/2007	Valgold	BQ
C07-02	578771.9	5373730.9	288.0	337.4	-46.6	500.00	12/03/2007	26/03/2007	Valgold	BQ
C07-03	578617.9	5373815.8	290.0	333.0	-56.1	512.00	26/03/2007	11/04/2007	Valgold	BQ
C07-04	578570.7	5373784.9	288.0	340.0	-57.0	581.00	11/04/2007	26/04/2007	Valgold	NQ
C07-05	579035.0	5374058.1	299.0	340.0	-88.0	269.00	29/06/2007	05/07/2007	Valgold	NQ
GAR-20	578324.9	5373874.6	300.4	148.0	-45.0	275.84	25/11/1986	10/12/1986	Cominco	BQ
GAR-21	578235.7	5373860.2	295.2	152.0	-45.0	142.34	13/12/1987	15/12/1987	Cominco	BQ
GAR-22	578692.6	5374021.2	309.5	150.0	-45.0	282.55	16/12/1986	08/01/1987	Cominco	BQ
GAR-23	578867.2	5374079.4	304.4	150.0	-45.0	303.89	09/01/1987	13/01/1987	Cominco	BQ
GAR-24	578975.7	5374059.4	295.3	150.0	-45.0	233.78	14/01/1987	18/01/1987	Cominco	BQ
GAR-25B	579060.3	5374094.5	301.7	155.0	-45.0	178.92	20/01/1987	25/01/1987	Cominco	BQ
GAR-47	578483.6	5374027.7	301.2	340.0	-52.0	529.74	11/08/1987	22/08/1987	Cominco	BQ
GAR-48	578541.7	5374055.0	303.5	340.0	-52.0	674.43	22/08/1987	10/09/1987	Cominco	BQ
GAR-49	578803.1	5374154.9	304.8	336.0	-50.0	470.06	10/09/1987	21/09/1987	Cominco	BQ
GAR-50	578992.3	5374179.7	301.7	336.0	-50.0	474.88	26/09/1987	01/10/1987	Cominco	BQ
GAR-52	578499.3	5373923.7	304.0	337.0	-45.0	213.94	05/10/1987	17/10/1987	Cominco	BQ
GAR-55	578523.3	5373949.6	302.0	340.0	-45.0	228.94	17/10/1987	23/10/1987	Cominco	BQ
GAR-56	578560.7	5373932.6	301.4	337.0	-45.0	197.57	24/10/1987	30/10/1987	Cominco	BQ
GAR-57	578588.8	5373945.0	300.3	345.0	-45.0	186.96	31/10/1987	06/11/1987	Cominco	BQ
GAR-59	578375.2	5373902.7	301.0	340.0	-45.0	152.95	31/10/1987	06/11/1987	Cominco	BQ
GAR-61	578639.2	5373991.9	306.2	337.0	-45.0	183.95	12/11/1987	17/11/1987	Cominco	BQ
GAR-63	578457.7	5373948.7	304.6	340.0	-45.0	167.98	17/11/1987	23/11/1987	Cominco	BQ
GAR-74	578581.9	5374155.9	304.3	250.0	-50.0	165.96	26/02/1988	29/02/1988	Cominco	BQ
GAR-75	578648.9	5373971.0	303.9	340.0	-55.0	271.42	29/02/1988	10/03/1988	Cominco	BQ
GAR-76	578652.4	5374037.0	308.2	340.0	-50.0	154.96	11/03/1988	13/03/1988	Cominco	BQ
GD85-1	578598.9	5374063.3	305.7	350.0	-50.0	110.05	21/11/1985	24/11/1985	Cominco	BQ
GD85-2	578627.2	5373754.3	289.0	360.0	-58.0	93.88	??/11/1985	??/11/1985	Cominco	BQ
GD85-3	579034.3	5374167.6	301.6	210.0	-45.0	111.00	28/11/1985	30/11/1985	Cominco	BQ
GD85-4	578573.8	5373880.4	298.5	155.0	-60.0	144.30	01/12/1985	04/12/1985	Cominco	BQ
GD85-5	578586.3	5373986.8	302.3	5.0	-61.0	160.00	05/12/1985	10/12/1985	Cominco	BQ
GD86-6	578630.2	5374088.5	307.3	340.0	-56.0	129.95	22/02/1986	24/02/1986	Cominco	BQ
GD86-7	578539.2	5374225.5	299.3	160.0	-49.0	259.08	25/02/1986	02/03/1986	Cominco	BQ
GD86-8	578577.0	5374054.7	304.5	340.0	-50.0	129.54	03/03/1986	06/03/1986	Cominco	BQ
GD86-9	578479.5	5373928.9	302.0	160.0	-45.0	279.98	07/03/1986	14/03/1986	Cominco	BQ
GD86-10	578634.0	5373936.8	300.0	160.0	-45.5	256.85	15/03/1986	24/03/1986	Cominco	BQ
GD86-11	578273.5	5374000.1	300.8	160.0	-45.5	180.31	24/03/1986	02/04/1986	Cominco	BQ
GD86-12	578558.8	5374014.7	303.4	340.0	-45.0	165.56	02/04/1986	07/04/1986	Cominco	BQ
GD86-13	578668.4	5374077.1	309.5	340.0	-45.0	180.82	08/04/1986	11/04/1986	Cominco	BQ
GD86-14	578417.7	5373929.4	300.4	160.0	-45.0	300.41	12/04/1986	18/04/1986	Cominco	BQ
GD86-15	578804.8	5374021.2	309.6	160.0	-45.0	273.92	19/04/1986	26/04/1986	Cominco	BQ
GD86-16	578538.4	5373987.6	302.4	340.0	-45.0	115.49	27/04/1986	30/04/1986	Cominco	BQ
GD86-17	578438.2	5374149.5	298.6	160.0	-45.0	198.12	01/05/1986	05/05/1986	Cominco	BQ
GD86-18	578419.2	5374103.7	299.5	160.0	-45.0	131.12	05/05/1986	08/05/1986	Cominco	BQ
GD86-19	578495.0	5374011.0	302.5	345.0	-45.0	95.31	09/05/1986	11/05/1986	Cominco	BQ
GAR-09-01	578626.4	5373997.2	304.5	343.5	-40.5	177.00	27/10/2009	29/10/2009	Northern Gold	NQ
GAR-09-02	578664.3	5373880.9	290.1	339.2	-44.6	350.00	29/10/2009	03/11/2009	Northern Gold	NQ
GAR-09-03	578594.2	5373944.9	298.8	159.8	-43.7	79.60	03/11/2009	04/11/2009	Northern Gold	NQ
GAR-09-03A	578598.5	5373936.3	298.1	154.3	-43.7	198.00	24/11/2009	27/11/2009	Northern Gold	NQ
GAR-09-04	578504.0	5373962.3	305.1	156.0	-42.6	291.00	04/11/2009	12/11/2009	Northern Gold	NQ
GAR-09-05	578531.7	5373968.0	304.5	162.5	-45.6	288.00	12/11/2009	17/11/2009	Northern Gold	NQ
GAR-09-06	578661.1	5373952.7	300.9	170.4	-45.3	189.00	17/11/2009	19/11/2009	Northern Gold	NQ
GAR-09-07	578653.3	5373973.0	301.9	165.9	-45.2	83.00	24/11/2009	25/11/2009	Northern Gold	NQ
GAR-09-08	578624.1	5373950.5	299.0	340.8	-45.3	237.00	28/11/2009	30/11/2009	Northern Gold	NQ
GAR-09-09	578614.9	5374026.6	304.3	343.4	-45.4	150.00	30/11/2009	03/12/2009	Northern Gold	NQ
GAR-09-10	578956.0	5374116.7	292.7	162.5	-45.0	293.00	08/12/2009	11/12/2009	Northern Gold	NQ
GAR-10-11	578671.0	5373929.0	295.8	161.6	-44.0	129.00	5/10/2010	5/12/2010	Northern Gold	NQ
GAR-10-12	578648.3	5373970.6	302.2	155.3	-45.4	237.00	5/12/2010	5/14/2010	Northern Gold	NQ

DDH ID	*Easting UTM E NAD 83	*Northing UTM N NAD 83	Elev m	Azimuth True	Dip	Length m	Start	Finish	Company	Core Dia
GAR-10-13	578581.0	5373988.2	304.2	346.6	-44.0	231.00	5/17/2010	5/20/2010	Northern Gold	NQ
GAR-10-14	578479.6	5373955.3	304.7	162.6	-45.9	324.00	5/20/2010	5/28/2010	Northern Gold	NQ
GAR-10-15	578590.8	5374020.4	304.3	339.9	-42.8	138.00	5/28/2010	6/1/2010	Northern Gold	NQ
GAR-10-16	578640.9	5374014.2	304.7	162.2	-44.3	297.00	6/1/2010	6/7/2010	Northern Gold	NQ
GAR-10-17	578535.6	5373932.6	306.8	166.2	-45.0	260.00	6/8/2010	6/11/2010	Northern Gold	NQ
GAR-10-18	578573.1	5373990.7	304.1	162.0	-46.5	330.00	6/14/2010	6/17/2010	Northern Gold	NQ
GAR-10-19	578704.6	5373992.2	309.4	179.2	-45.8	231.00	6/18/2010	6/22/2010	Northern Gold	NQ
GAR-10-20	578793.8	5374012.5	306.1	241.9	-44.9	75.00	6/22/2010	6/24/2010	Northern Gold	NQ
GAR-10-21	578776.3	5374015.0	305.6	245.9	-44.7	51.00	6/24/2010	6/25/2010	Northern Gold	NQ
GAR-10-22	578760.1	5373937.6	290.7	160.0	-45.0	96.00	6/28/2010	6/29/2010	Northern Gold	NQ
GAR-10-23	578552.8	5373978.2	304.2	158.8	-44.8	336.00	7/19/2010	7/23/2010	Northern Gold	NQ
GAR-10-24	578526.2	5374018.0	303.8	349.1	-44.5	120.00	7/23/2010	7/26/2010	Northern Gold	NQ
GAR-10-25	578496.9	5373985.6	304.9	161.5	-44.0	354.00	7/27/2010	8/3/2010	Northern Gold	NQ
GAR-10-26	578505.0	5373932.6	304.4	156.6	-43.9	291.00	8/3/2010	8/10/2010	Northern Gold	NQ
GAR-10-27	578506.0	5373822.1	289.3	337.3	-48.5	177.00	8/10/2010	8/12/2010	Northern Gold	NQ
GAR-10-28	578552.2	5373881.0	293.4	164.9	-58.2	150.00	8/12/2010	8/16/2010	Northern Gold	NQ
GAR-10-29	578653.4	5373860.6	289.6	343.5	-44.8	351.00	8/17/2010	8/24/2010	Northern Gold	NQ
GAR-10-20X	Hole Extension					276.00	8/24/2010	8/31/2010	Northern Gold	NQ
GAR-10-30	578689.6	5373970.9	302.1	342.2	-45.8	249.00	9/1/2010	9/7/2010	Northern Gold	NQ
GAR-10-31	578674.4	5374013.3	305.7	340.3	-45.6	192.00	9/8/2010	9/10/2010	Northern Gold	NQ
GAR-10-32	578719.8	5373891.3	289.5	341.3	-45.6	339.00	9/13/2010	9/20/2010	Northern Gold	NQ
GAR-10-33	578706.5	5373928.2	292.5	339.1	-43.4	300.00	9/20/2010	9/24/2010	Northern Gold	NQ
GAR-10-34	578658.2	5374058.1	304.8	340.0	-45.0	42.00	9/24/2010	9/27/2010	Northern Gold	Failed ovb
GAR-10-34B	578658.2	5374058.1	304.8	340.0	-45.0	43.00	9/28/2010	9/28/2010	Northern Gold	Failed ovb
GAR-10-34C	578658.2	5374058.1	304.8	338.2	-45.3	135.00	9/28/2010	9/29/2010	Northern Gold	NQ
GAR-10-35	578564.8	5374099.4	301.7	341.1	-43.3	66.00	9/30/2010	9/30/2010	Northern Gold	NQ
GAR-10-36	578735.2	5373856.0	288.7	340.9	-44.0	300.00	10/1/2010	10/7/2010	Northern Gold	NQ
GAR-10-37	578744.3	5373822.1	288.2	341.8	-43.8	300.00	10/7/2010	10/15/2010	Northern Gold	NQ
GAR-10-38	578611.5	5373892.6	292.1	160.0	-45.0	70.00	10/15/2010	10/18/2010	Northern Gold	Failed ovb
GAR-10-38A	578611.5	5373892.6	292.1	155.1	-62.9	126.00	10/18/2010	10/19/2010	Northern Gold	NQ
GAR-10-39	578600.5	5373850.0	289.6	342.6	-43.3	300.00	10/19/2010	10/25/2010	Northern Gold	NQ
GAR-10-40	578558.8	5373963.6	303.6	343.4	-44.8	225.00	10/25/2010	10/28/2010	Northern Gold	NQ
GAR-10-41	578572.5	5373991.4	304.1	160.4	-78.1	225.00	10/29/2010	11/1/2010	Northern Gold	NQ
GAR-10-42	578517.5	5374013.1	304.0	159.9	-45.0	300.00	11/3/2010	11/9/2010	Northern Gold	NQ
GAR-10-43	578611.3	5373897.8	292.5	339.8	-44.7	300.00	11/9/2010	11/16/2010	Northern Gold	NQ
GAR-10-44	578627.6	5373851.8	289.9	340.4	-43.3	330.00	11/16/2010	11/23/2010	Northern Gold	NQ
GAR-10-45	578528.2	5373910.7	302.1	348.2	-45.0	351.00	11/24/2010	11/29/2010	Northern Gold	NQ
GAR-10-46	578554.1	5373851.4	290.0	326.8	-44.9	300.00	11/29/2010	12/9/2010	Northern Gold	NQ
GAR-10-47	578405.4	5374124.0	295.8	160.0	-45.0	234.00	12/10/2010	12/13/2010	Northern Gold	NQ
GAR-10-48	578384.8	5374168.8	293.6	160.0	-45.0	249.00	12/13/2010	12/17/2010	Northern Gold	NQ
GAR-10-50	578758.4	5373933.3	290.6	335.3	-45.2	300.00	10/25/2010	11/3/2010	Northern Gold	NQ
GAR-10-51	578742.9	5373970.6	294.8	343.9	-45.4	300.00	11/3/2010	11/10/2010	Northern Gold	NQ
GAR-10-52	578727.4	5374033.4	309.1	2.1	-45.8	198.00	11/10/2010	11/15/2010	Northern Gold	NQ
GAR-10-53	578638.5	5374106.7	302.8	338.5	-44.7	87.00	11/16/2010	11/17/2010	Northern Gold	NQ
GAR-10-54	578594.9	5374096.7	302.3	341.6	-45.2	81.00	11/17/2010	11/19/2010	Northern Gold	NQ
GAR-10-55	578791.0	5373979.0	292.4	336.4	-45.0	270.00	11/23/2010	11/28/2010	Northern Gold	NQ
GAR-10-56	578810.1	5373936.1	288.4	340.0	-45.0	351.00	11/28/2010	12/9/2010	Northern Gold	NQ
GAR-10-57	578780.3	5374020.8	306.2	340.9	-46.8	213.00	12/10/2010	12/13/2010	Northern Gold	NQ
GAR-10-58	578766.3	5374062.0	310.3	340.0	-45.0	175.00	12/13/2010	12/16/2010	Northern Gold	NQ
GAR-11-37X	Hole Extension					100.00	4/16/2011	4/18/2011	Northern Gold	NQ
GAR-11-39X	Hole Extension					57.00	2/9/2011	2/16/2011	Northern Gold	NQ
GAR-11-49	578381.6	5374180.1	293.6	166.5	-64.2	75.00	1/4/2011	1/4/2011	Northern Gold	NQ
GAR-11-50X	Hole Extension					51.00	2/1/2011	2/2/2011	Northern Gold	NQ
GAR-11-59	578758.6	5373775.7	287.5	342.1	-45.1	339.00	1/4/2011	1/10/2011	Northern Gold	NQ
GAR-11-60	578627.8	5373766.6	288.3	335.7	-55.5	300.00	1/11/2011	1/20/2011	Northern Gold	NQ
GAR-11-61	578643.4	5373811.9	289.0	337.2	-46.1	330.00	1/21/2011	2/1/2011	Northern Gold	NQ
GAR-11-62	578664.5	5373820.9	288.9	332.4	-46.7	399.00	2/1/2011	2/9/2011	Northern Gold	NQ
GAR-11-63	578560.1	5374035.0	303.8	145.1	-43.2	370.00	2/17/2011	2/24/2011	Northern Gold	NQ
GAR-11-64	578459.9	5373949.8	303.6	157.1	-43.8	277.00	3/1/2011	3/5/2011	Northern Gold	NQ
GAR-11-65	578561.0	5373819.4	289.0	340.00	-55.00	327.00	3/5/2011	3/15/2011	Northern Gold	NQ
GAR-11-66	578586.2	5373741.1	288.3	337.1	-57.3	313.00	3/16/2011	3/23/2011	Northern Gold	NQ
GAR-11-67	578519.8	5373856.0	290.8	151.6	-61.5	195.00	3/23/2011	3/31/2011	Northern Gold	NQ
GAR-11-68	578494.1	5373796.2	288.6	342.3	-47.9	175.00	4/1/2011	4/3/2011	Northern Gold	NQ
GAR-11-69	578478.9	5373820.6	289.3	158.5	-63.1	150.00	4/4/2011	4/14/2011	Northern Gold	NQ
GAR-11-70	578773.8	5373888.2	288.1	332.1	-45.7	300.00	1/5/2011	1/9/2011	Northern Gold	NQ
GAR-11-70X	Hole Extension					69.00	2/3/2011	2/5/2011	Northern Gold	NQ
GAR-11-71	578788.0	5373848.0	300.0	340.0	-45.0	62.00	1/18/2011	1/20/2011	Northern Gold	Failed ovb
GAR-11-71A	578788.2	5373842.8	286.9	336.5	-46.4	351.00	1/21/2011	1/27/2011	Northern Gold	NQ
GAR-11-72	578862.4	5373901.5	285.4	340.1	-46.1	348.00	2/5/2011	2/16/2011	Northern Gold	NQ
GAR-11-73	578883.4	5373951.2	286.5	341.1	-45.5	312.00	2/17/2011	2/21/2011	Northern Gold	NQ

DDH ID	*Easting UTM E NAD 83	*Northing UTM N NAD 83	Elev m	Azimuth True	Dip	Length m	Start	Finish	Company	Core Dia
GAR-11-74	578826.5	5373891.4	286.6	342.4	-50.7	318.00	1/9/2011	1/18/2011	Northern Gold	NQ
GAR-11-74X	Hole Extension					21.00	4/15/2011	4/15/2011	Northern Gold	NQ
GAR-11-75	578844.5	5373946.2	287.6	335.9	-47.9	291.00	2/21/2011	3/2/2011	Northern Gold	NQ
GAR-11-76	578898.5	5373910.7	285.1	334.0	-46.4	348.00	3/2/2011	3/8/2011	Northern Gold	NQ
GAR-11-77	578813.8	5374077.5	309.1	338.2	-45.0	162.00	3/8/2011	3/15/2011	Northern Gold	NQ
GAR-11-78	578813.5	5374077.0	309.1	164.6	-45.1	336.00	3/15/2011	3/20/2011	Northern Gold	NQ
GAR-11-79	578829.7	5374034.6	305.8	159.1	-45.0	264.00	3/21/2011	3/24/2011	Northern Gold	NQ
GAR-11-80	578800.1	5374124.0	308.0	167.2	-44.4	399.00	3/29/2011	4/3/2011	Northern Gold	NQ
GAR-11-81	578840.6	5373846.4	283.7	334.4	-44.4	432.00	4/4/2011	4/15/2011	Northern Gold	NQ
GAR-11-82	579051.0	5374011.0	300.0	340.0	-45.0	258.00	4/18/2011	4/27/2011	Northern Gold	NQ
GAR-11-83	579064.0	5373967.0	300.0	340.0	-45.0	420.00	4/27/2011	5/6/2011	Northern Gold	NQ
GAR-11-84	579023.0	5374074.0	300.0	340.0	-45.0	171.00	5/9/2011	5/11/2011	Northern Gold	NQ
GAR-11-85	578832.0	5374022.0	300.0	340.0	-70.0	306.00	5/11/2011	5/18/2011	Northern Gold	NQ
GAR-11-86	578849.0	5373977.0	300.0	340.0	-65.0	354.00	5/18/2011	5/26/2011	Northern Gold	NQ
GAR-11-87	578896.0	5373993.0	300.0	340.0	-65.0	363.00	5/26/2011	6/6/2011	Northern Gold	NQ
GAR-11-88	578944.0	5374010.0	300.0	340.0	-65.0	350.00	6/6/2011	6/15/2011	Northern Gold	NQ
GAR-11-89	578899.0	5373984.0	300.0	340.0	-60.0	354.00	6/15/2011	6/23/2011	Northern Gold	NQ
GAR-11-90	578426.1	5373820.5	291.3	152.7	-61.4	222.00	4/14/2011	4/17/2011	Northern Gold	NQ
GAR-11-91	578456.0	5373887.0	300.0	160.0	-60.0	219.00	4/17/2011	4/26/2011	Northern Gold	NQ

APPENDIX B

ACA Howe Duplicate Samples
Analytical Certificates

Certificate of Analysis

Work Order: TO114786

To: **Ian Trinder**
A.C.A. Howe International Ltd.
365 Bay Street
Suite 501
TORONTO
ONTARIO M5H 2V1

Date: Jun 01, 2011

P.O. No.	:	-
Project No.	:	-
No. Of Samples	:	5
Date Submitted	:	May 19, 2011
Report Comprises	:	Pages 1 to 2 (Inclusive of Cover Sheet)

Distribution of unused material:
Return to client:

Certified By :

Lawrence Ng
Regional Business Manager (GEOCHEM)

SGS Minerals Services (Toronto) is accredited by Standards Council of Canada (SCC) and conforms to the requirements of ISO/IEC 17025 for specific tests as indicated on the scope of accreditation to be found at http://www.scc.ca/en/programs/lab/mineral.shtml

Report Footer:

L.N.R. = Listed not received
n.a. = Not applicable
I.S. = Insufficient Sample
-- = No result

*INF = Composition of this sample makes detection impossible by this method

M after a result denotes ppb to ppm conversion, % denotes ppm to % conversion

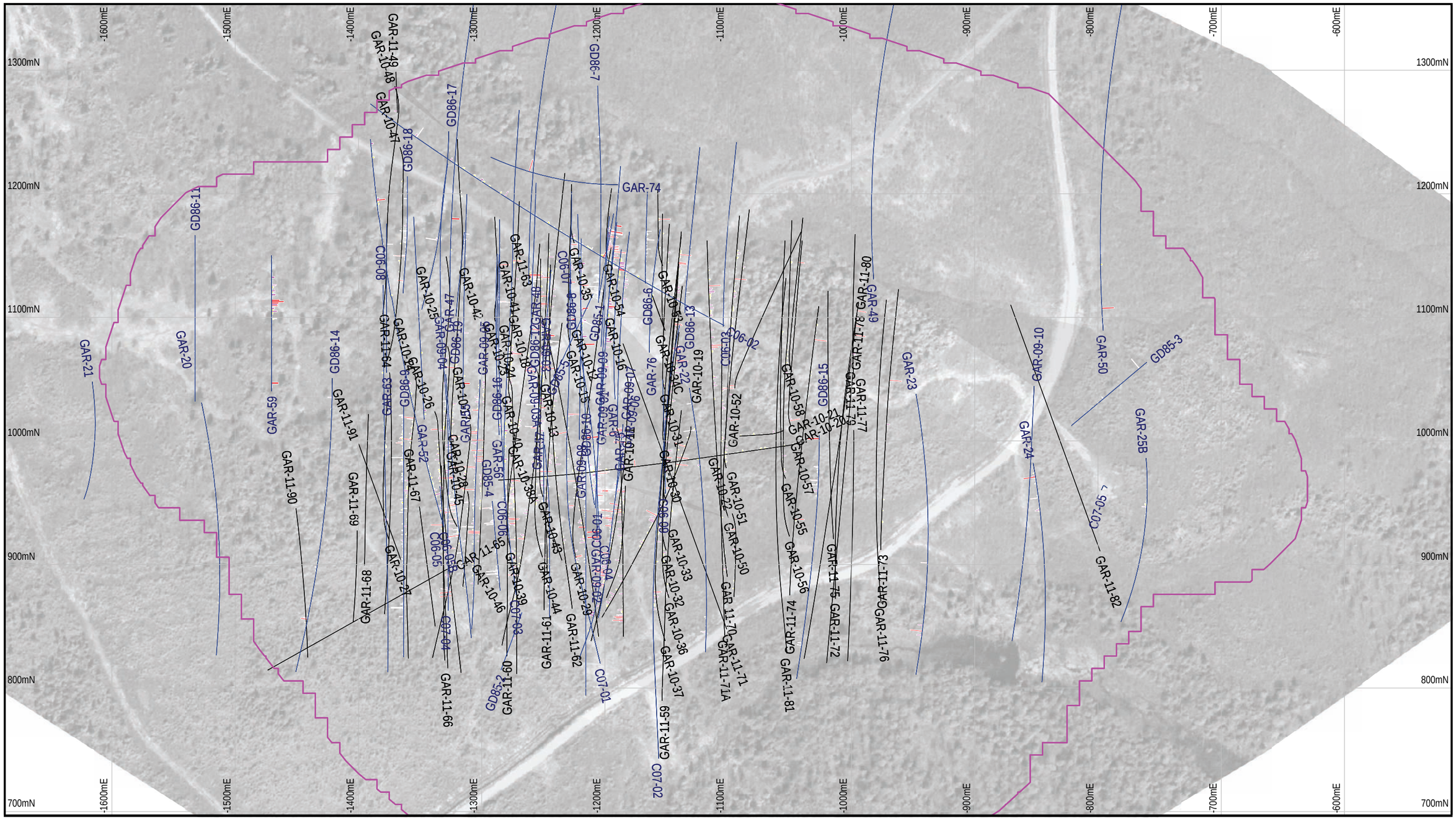
Methods marked with an asterisk (e.g. *NAA08V) were subcontracted
Methods marked with the @ symbol (e.g. @AAS21E) denote accredited tests

Final : TO114786 Order:

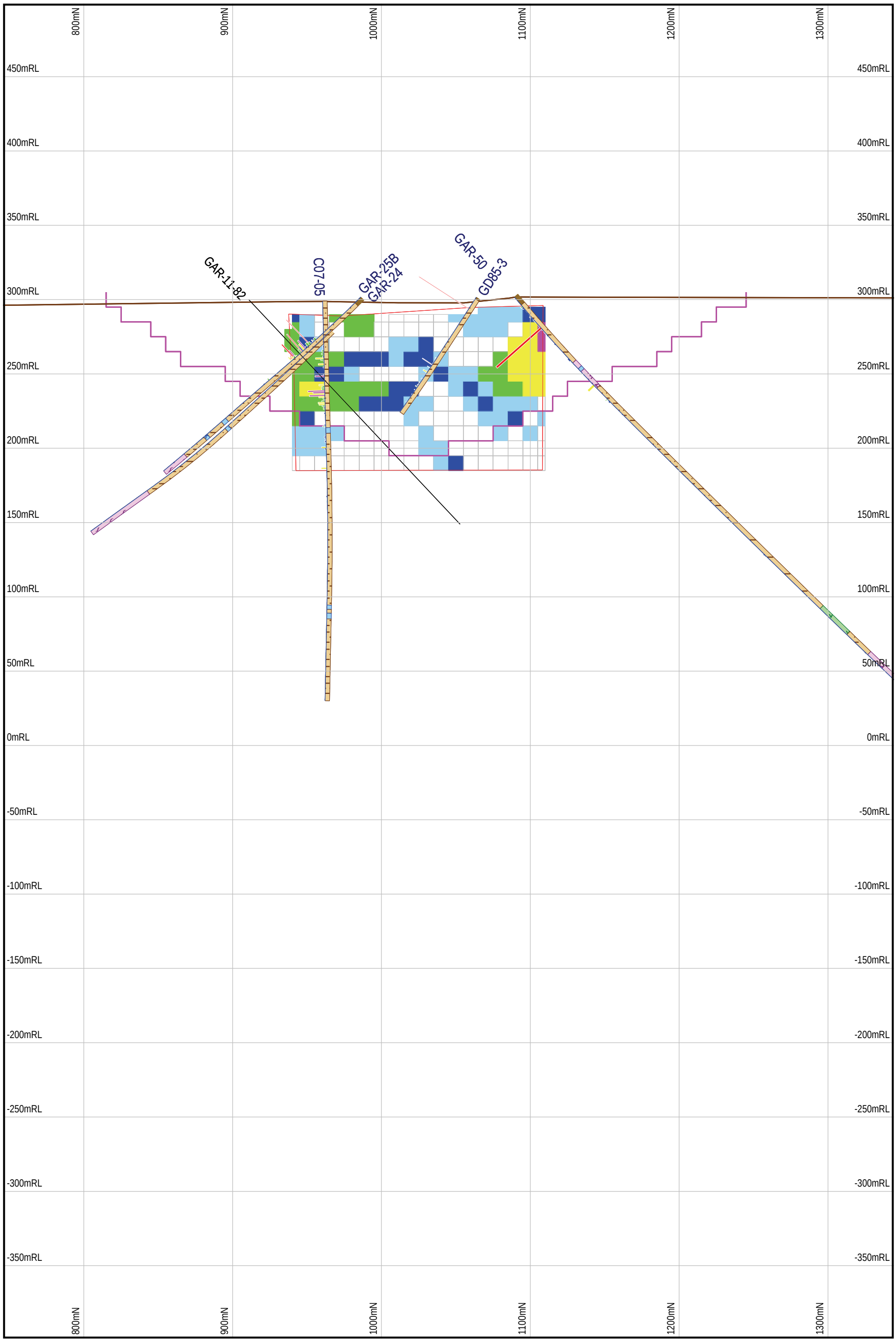
Element	WtKg	Au
Method	WGH79	FAI323
Det.Lim.	0.001	5
Units	kg	ppb
ACA61661	2.112	665
ACA61662	1.892	1290
ACA85378	2.338	1210
ACA85381	2.370	13000
ACA10001	0.064	4910
*Rep ACA61661		527

APPENDIX C

Resource Estimate Cross Sections



A.C.A. HOWE INTERNATIONAL LIMITED Mining and Geological Consultants UK - Toronto - Halifax www.acahowe.co.uk	**Assay Histograms (g/tonne)** < 0.25 — 1 to 2 0.25 to 0.5 — 2 to 5 0.5 to 1 — >= 5	Scale 1 : 3000 Plot Date 21-Jun-2011 Sheet 1 of 1 Plot File: Plan View of Drilling 2011 50 0 50m	**Plan View of Drilling Showing Showing $1200 Pit Crest**	NORTHERN GOLD Garrison Gold Property Garrcon Deposit Garrison Township Ontario, Canada



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Mining and Geological Consultants
UK - Toronto - Halifax
www.acahowe.co.uk

Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

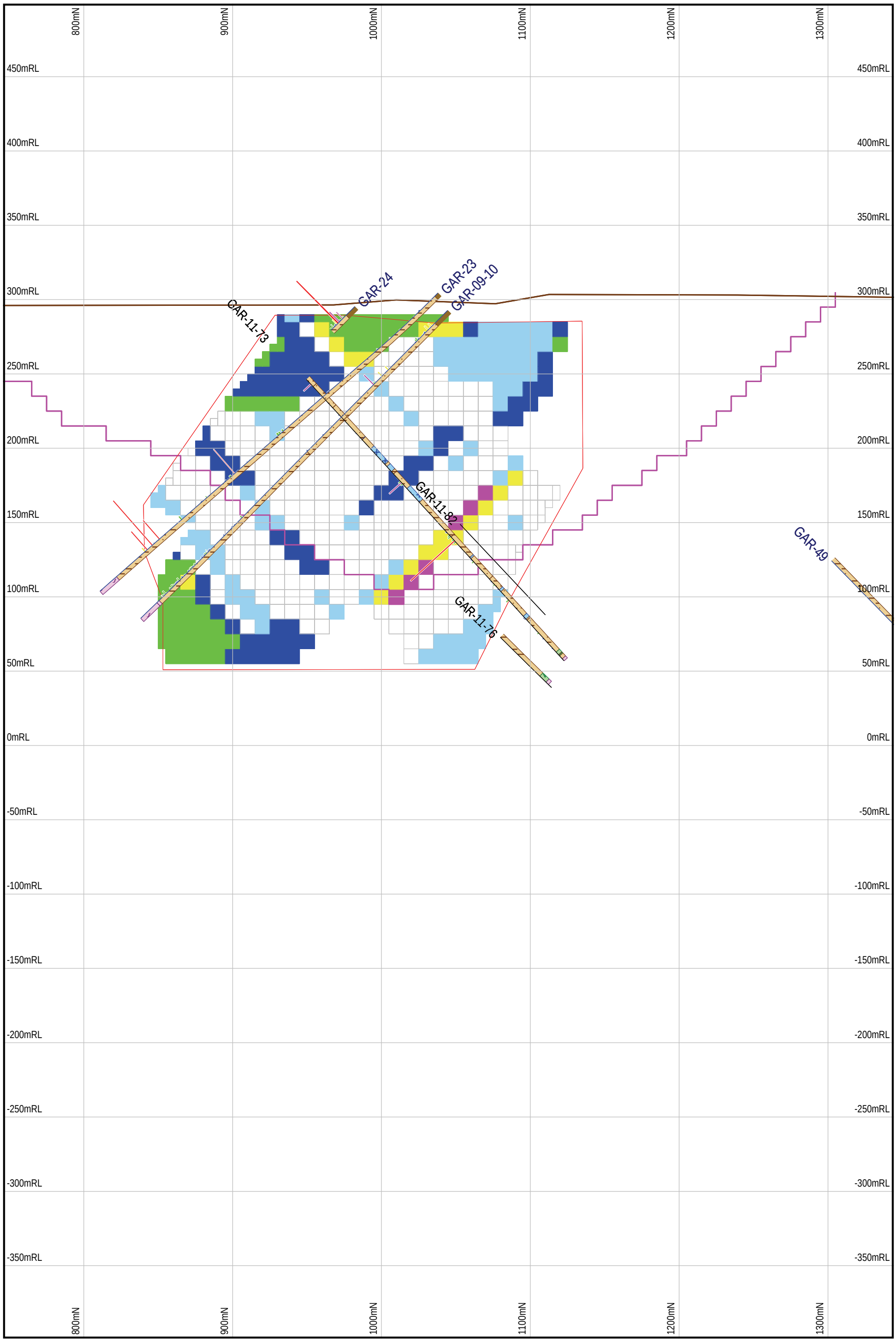
Plot File: 0800W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 0800W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

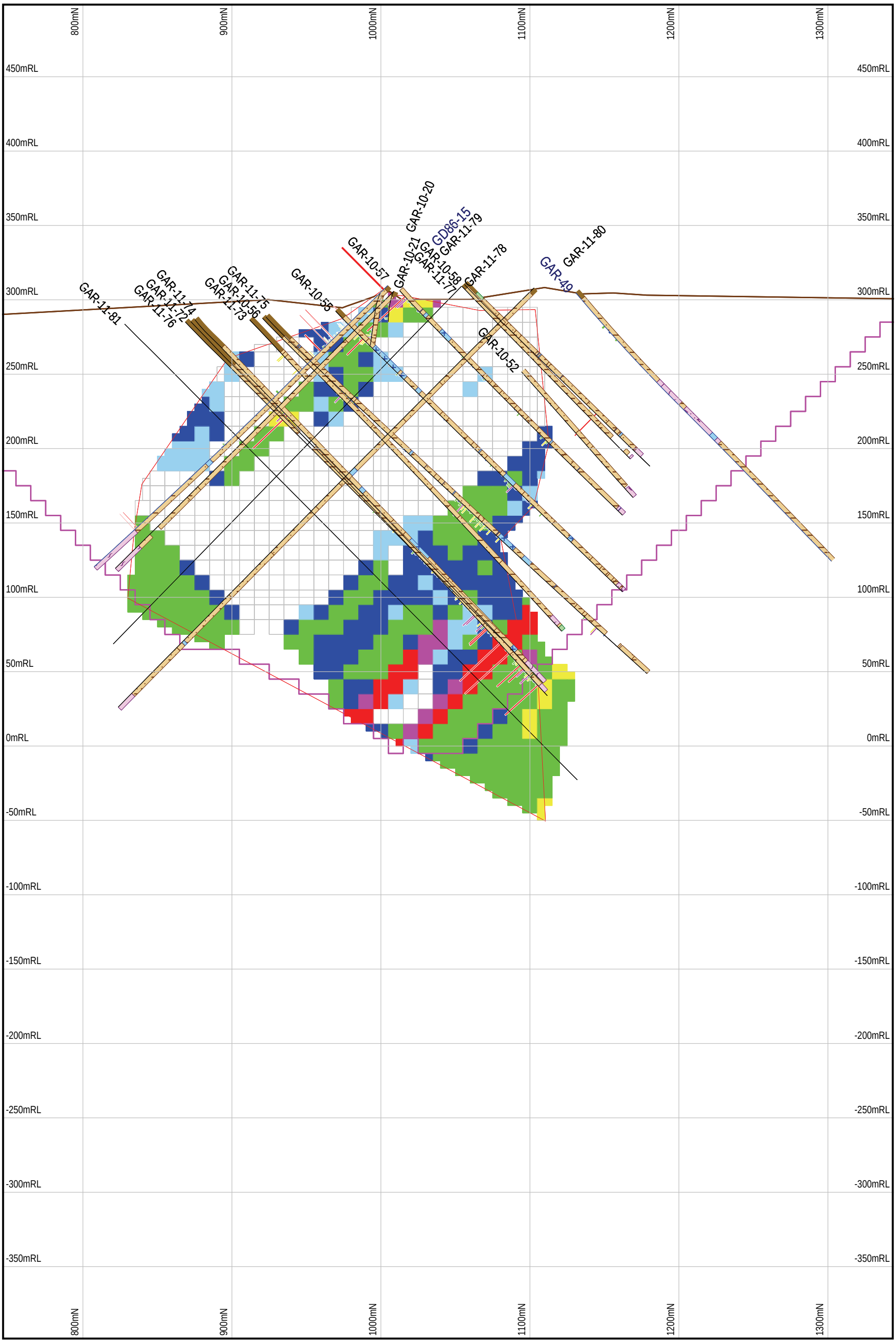
Plot File: 0900W

20 0 20m

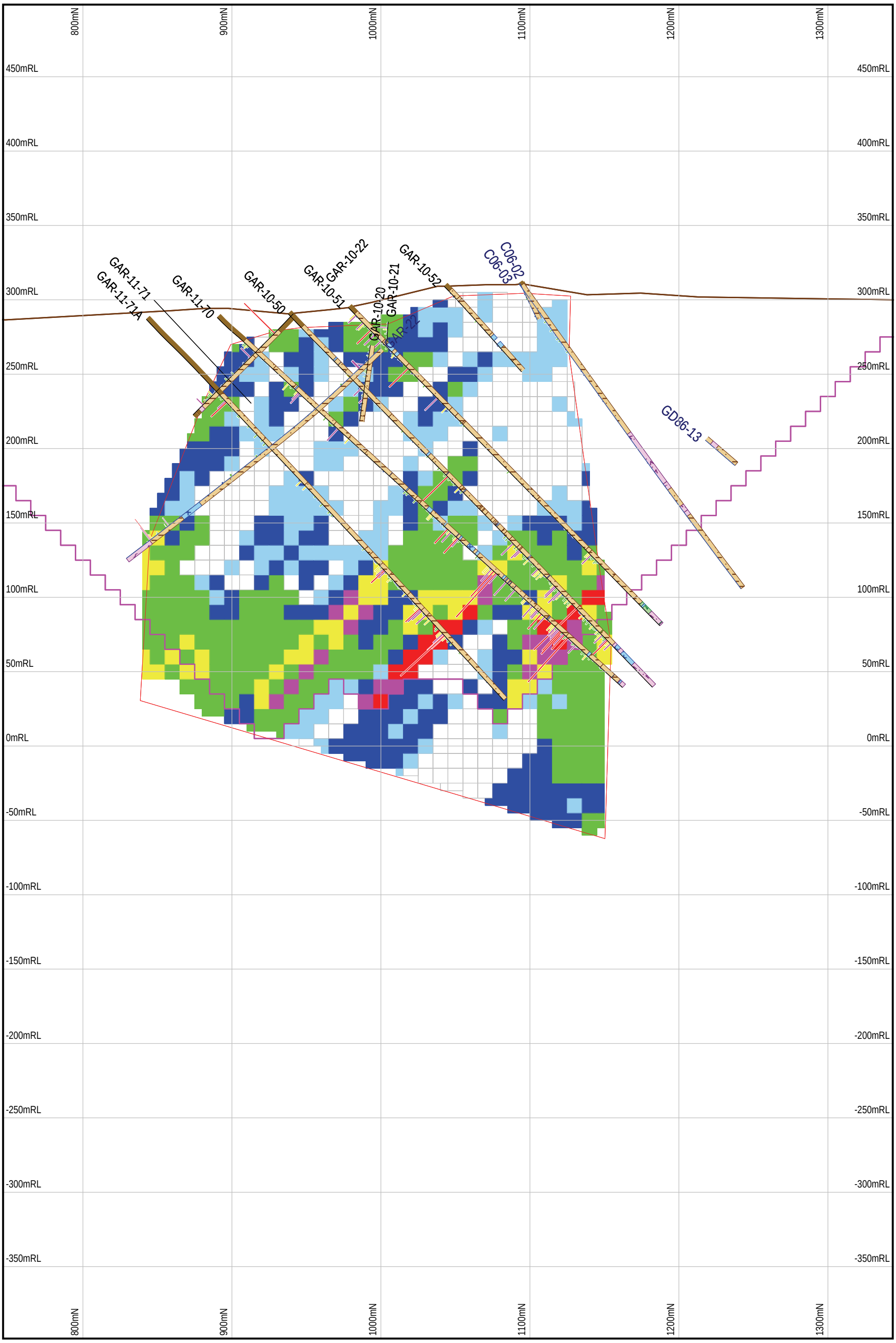
Cross-Sections Facing West Showing $1200 Pit 0900W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



A.C.A. HOWE INTERNATIONAL LIMITED Mining and Geological Consultants UK - Toronto - Halifax www.acahowe.co.uk	Lithology CMS GAB CSM SY CST CK CT T K OB UM SED	Gold Grade (g/tonne) < 0.10 0.10 to 0.15 0.15 to 0.30 0.30 to 0.75 0.75 to 1.5 1.5 to 3 >= 3	Scale 1 : 2500	Plot Date 23-Jun-2011 Plot File: 1050W	Sheet 1 of 1	**Cross-Sections Facing West Showing $1200 Pit 1050W**	NORTHERN GOLD Garrison Gold Property Garrcon Deposit Garrison Township Ontario, Canada
Drawn by Doug Roy, M.A.Sc., P.Eng. Associate Mining Engineer			20 0 20m				



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Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

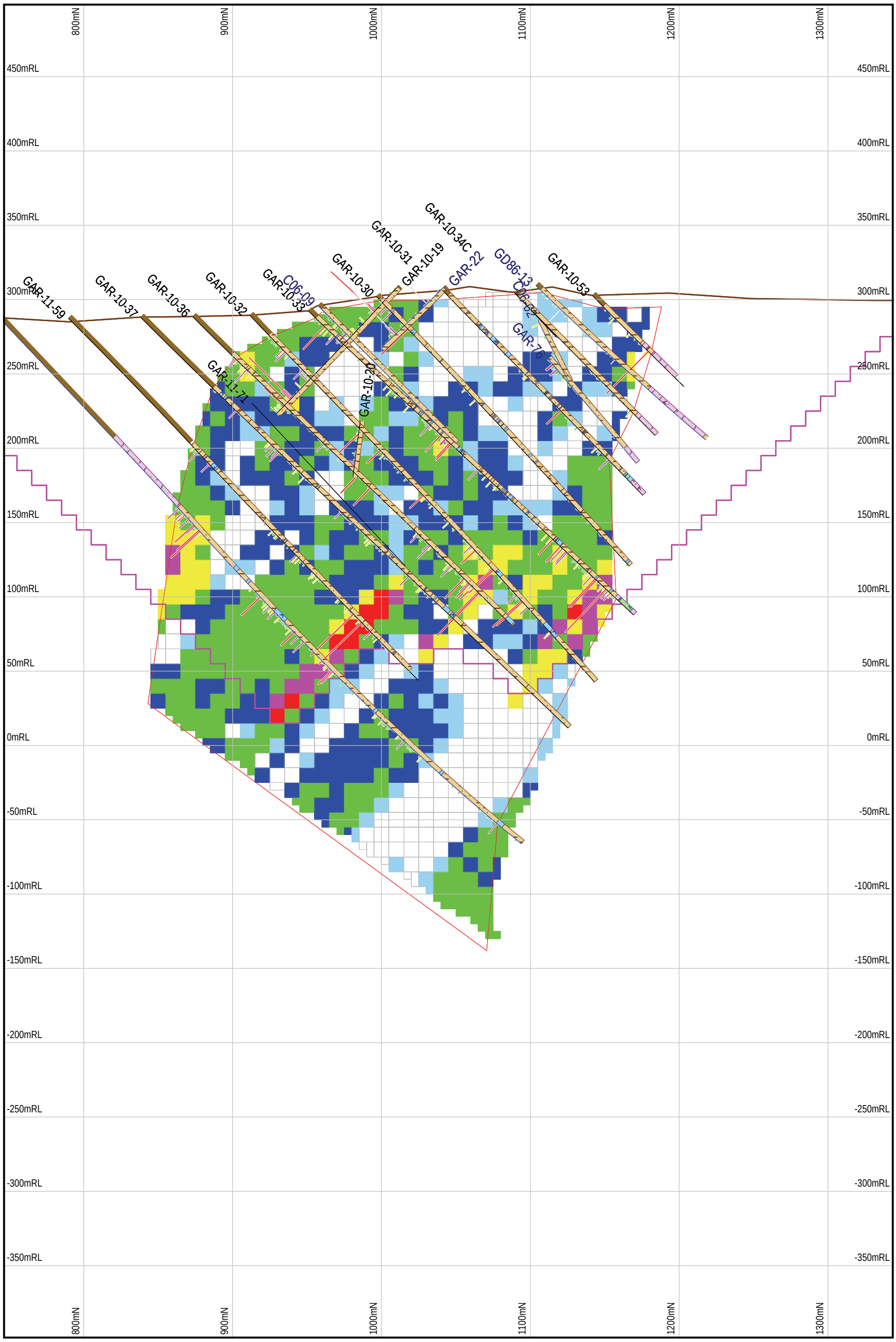
Plot File: 1100W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1100W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Mining and Geological Consultants
UK - Toronto - Halifax
www.acahowe.co.uk

Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

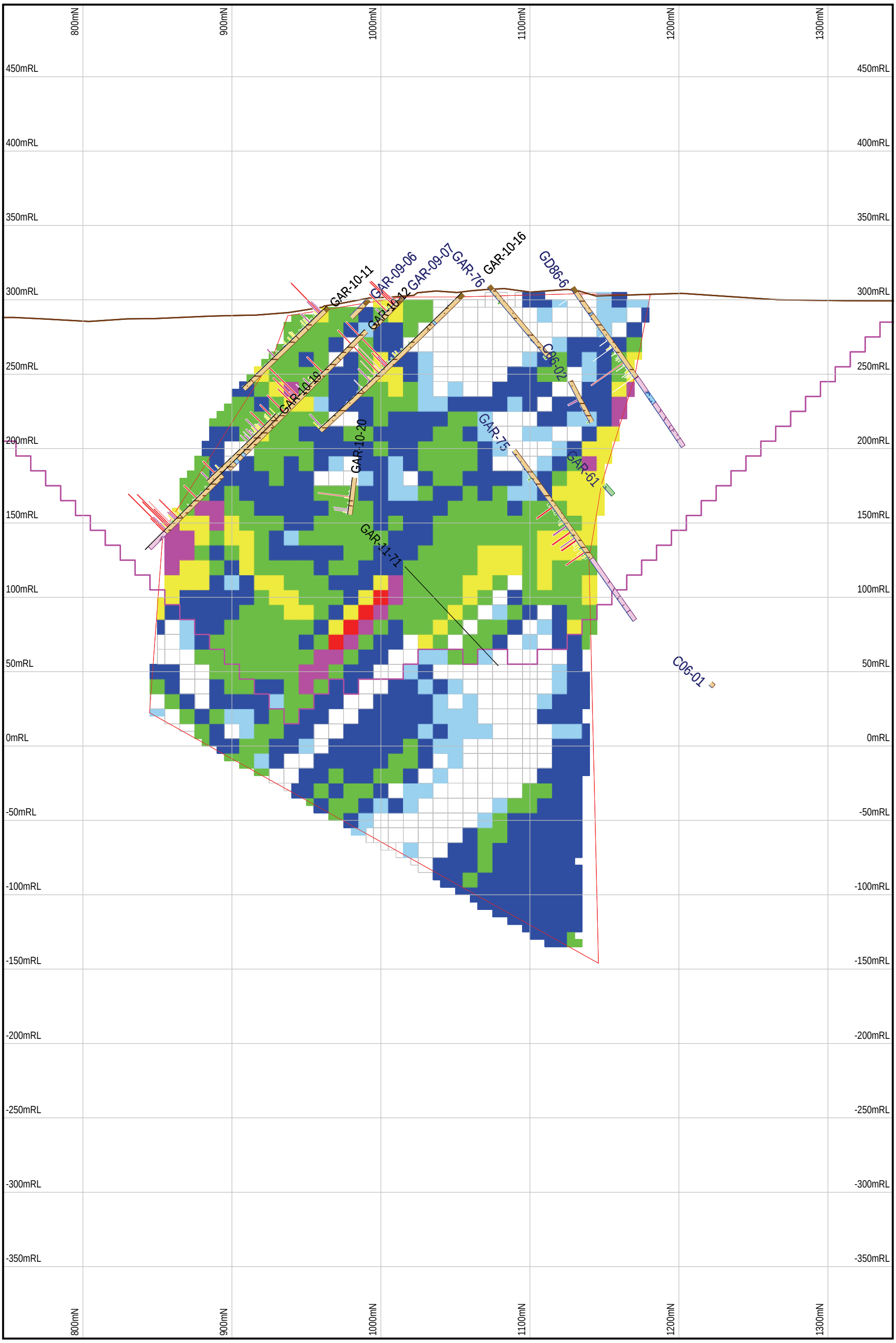
Plot File: 1150W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1150W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Mining and Geological Consultants
UK - Toronto - Halifax
www.acahowe.co.uk

Drawn by Doug Roy, M.A.Sc., P.Eng.
Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

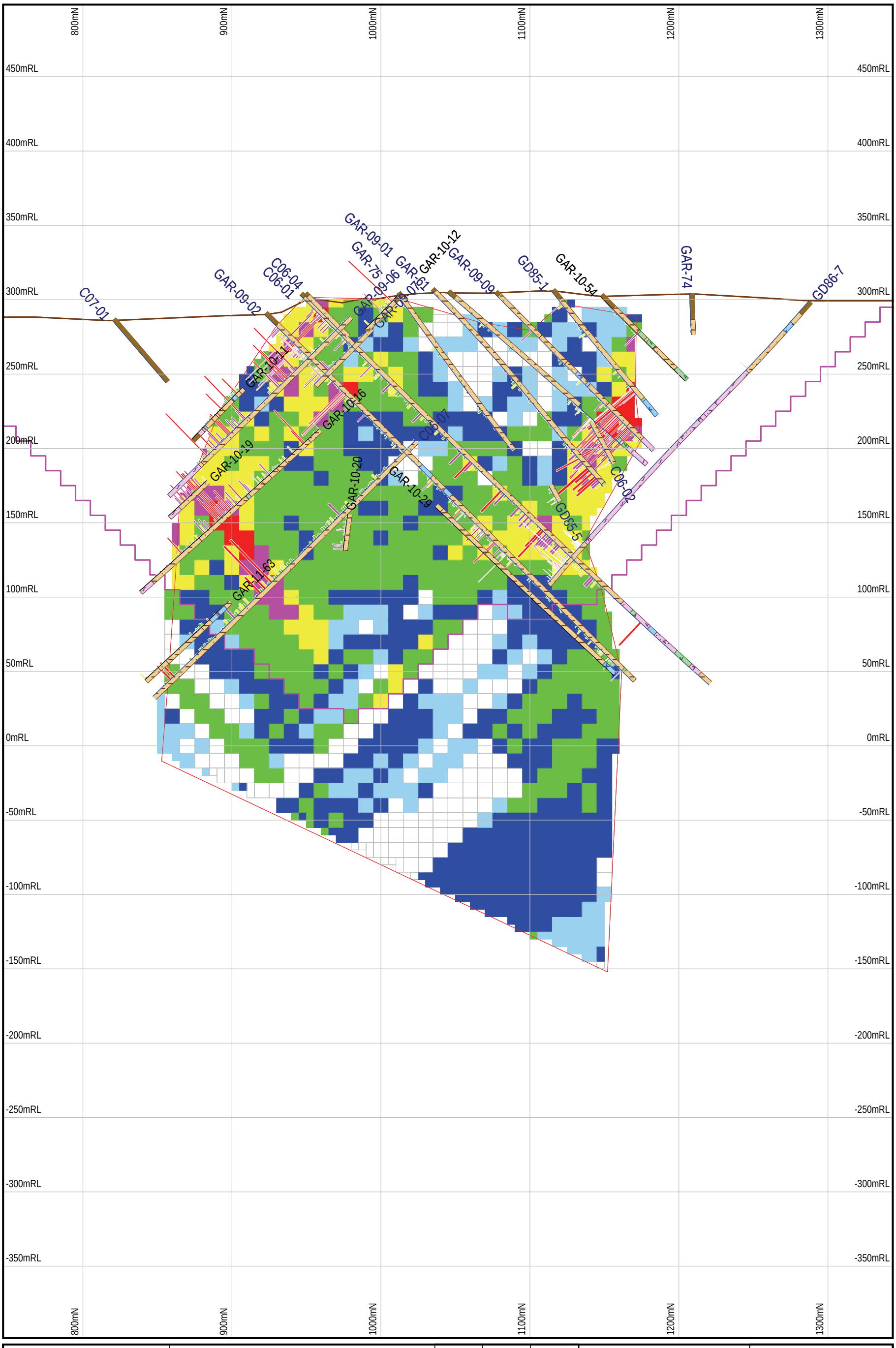
Plot File: 1175W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1175W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Associate Mining Engineer

Lithology

CMS		GAB	
CSM		SY	
CST		CK	
CT		T	
K		OB	
UM		SED	

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale
1 : 2500

Plot Date
23-Jun-2011

Sheet
1 of 1

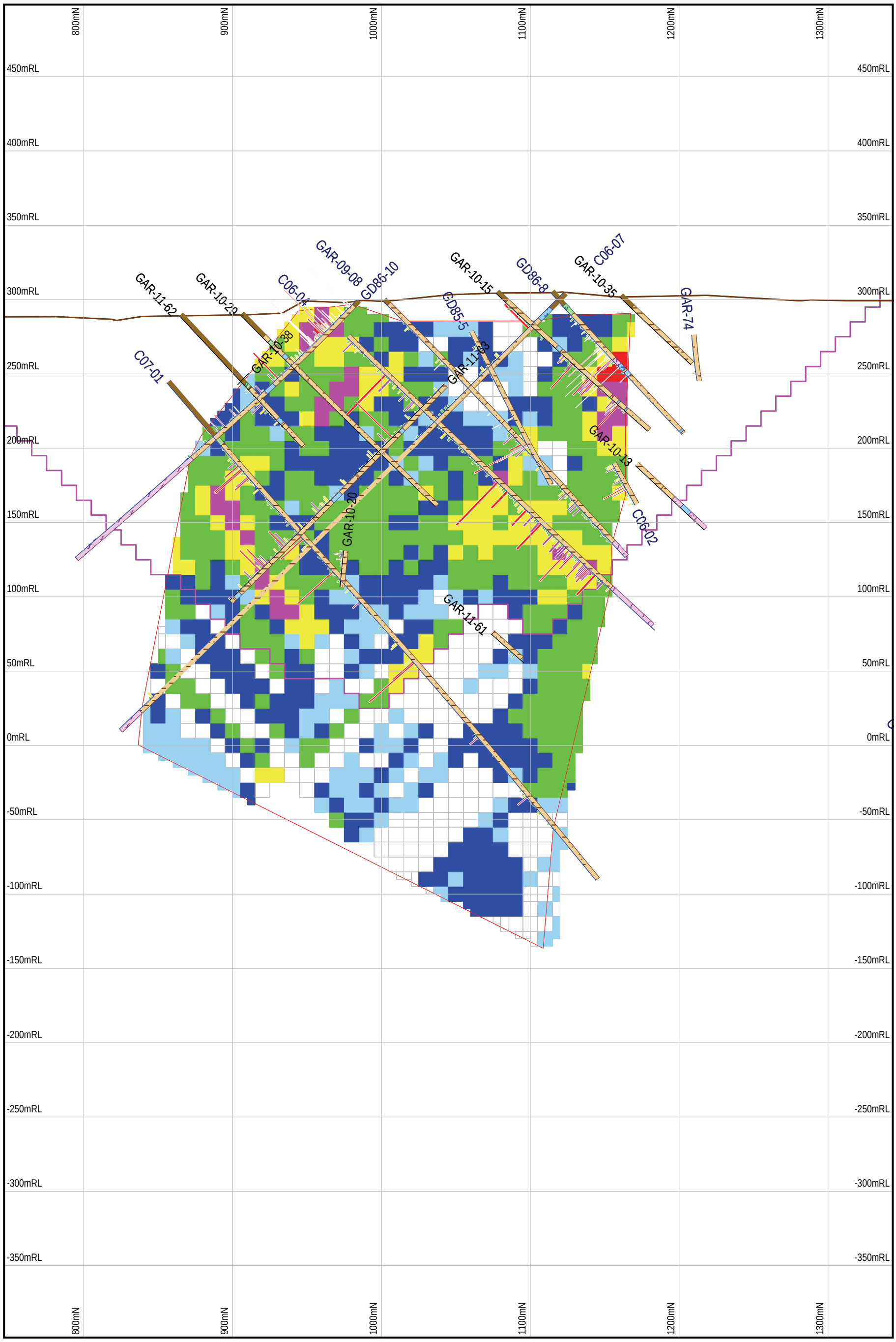
Plot File: 1200W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1200W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Associate Mining Engineer

Lithology

CMS	GAB
CSM	SY
CST	CK
CT	T
K	OB
UM	SED

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale
1 : 2500

Plot Date
23-Jun-2011

Sheet
1 of 1

Plot File: 1225W

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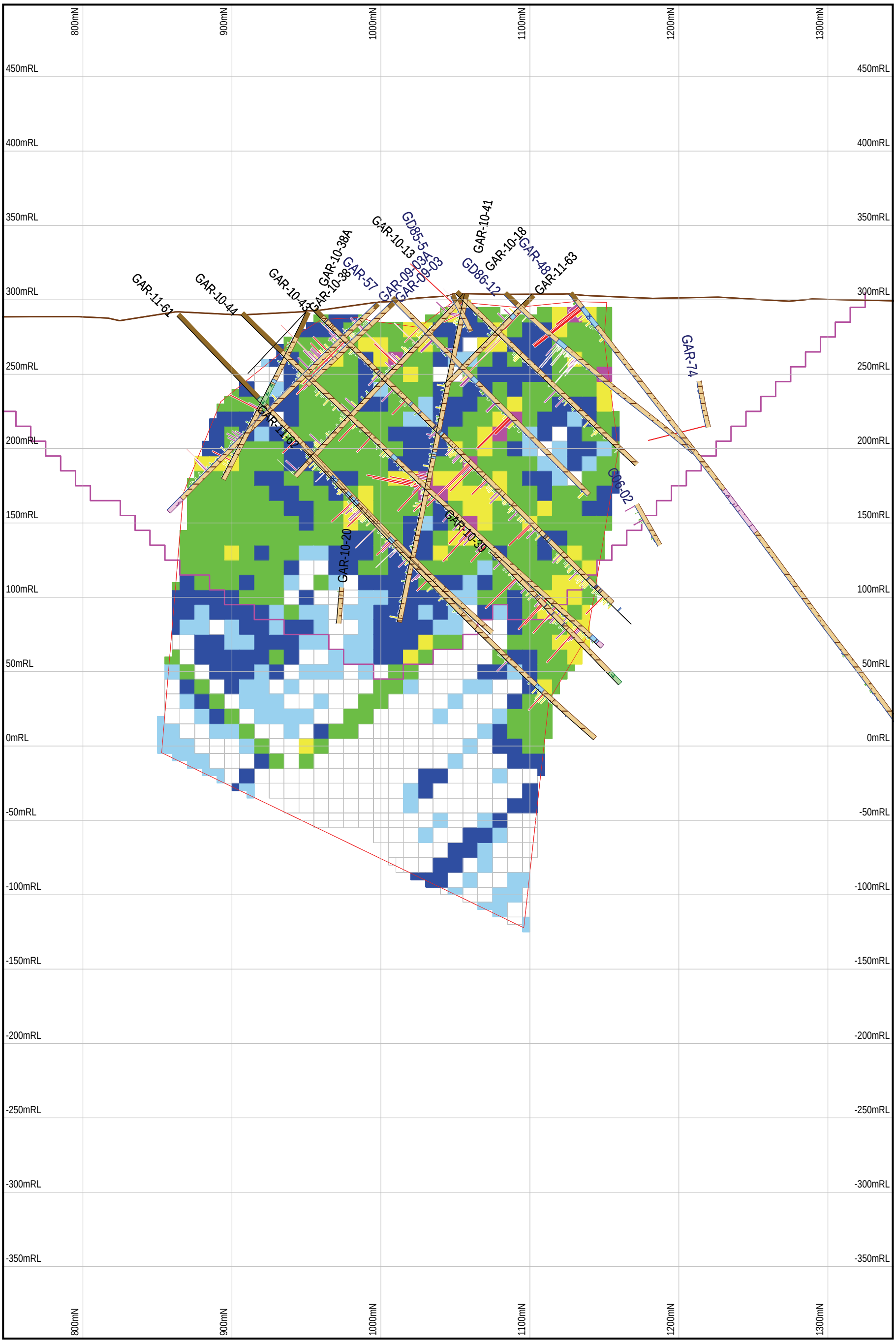
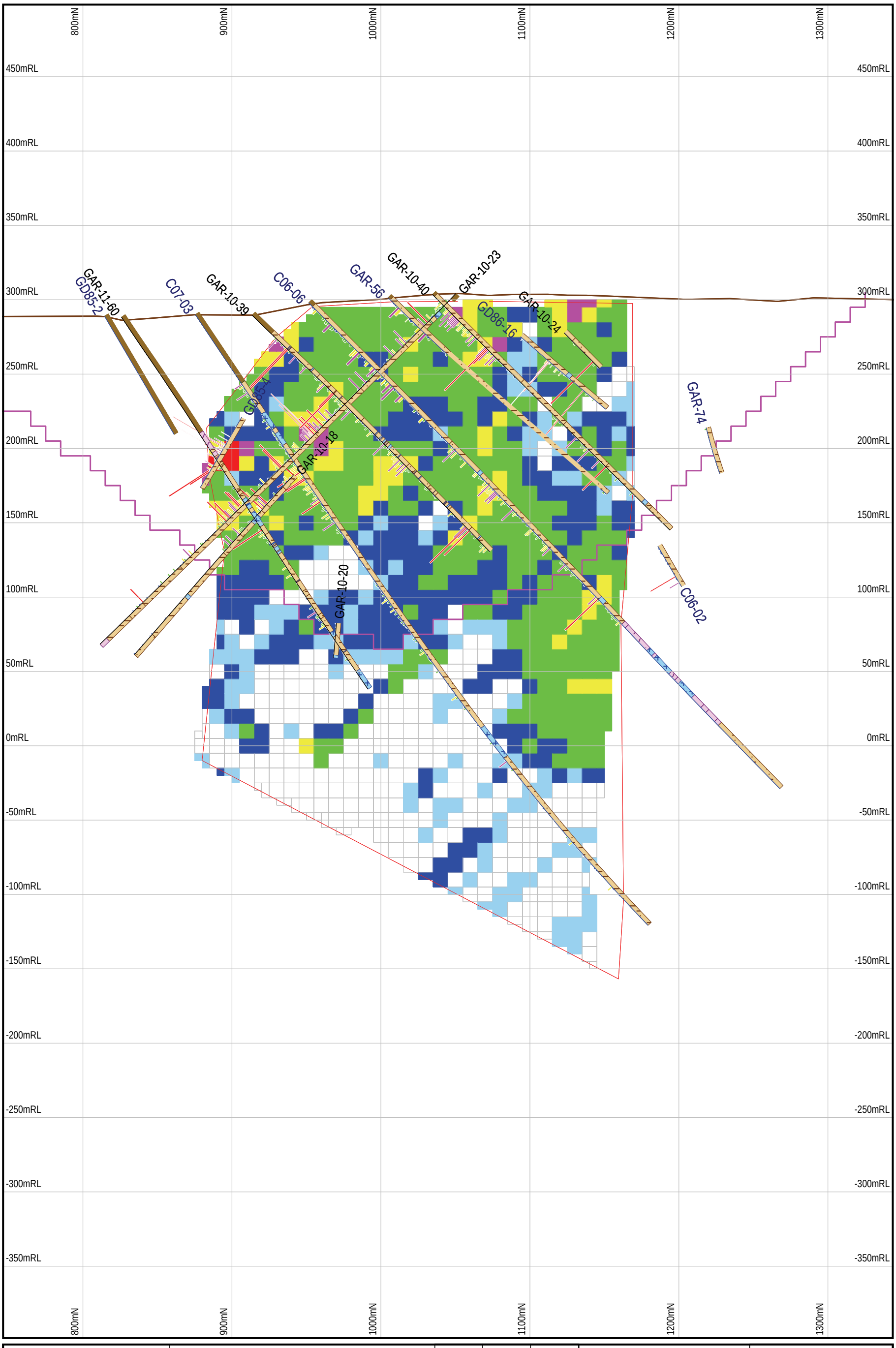
Cross-Sections Facing West Showing $1200 Pit 1225W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



A.C.A. HOWE INTERNATIONAL LIMITED Mining and Geological Consultants UK - Toronto - Halifax www.acahowe.co.uk	Lithology CMS GAB CSM SY CST CK CT T K OB UM SED	Gold Grade (g/tonne) < 0.10 0.10 to 0.15 0.15 to 0.30 0.30 to 0.75 0.75 to 1.5 1.5 to 3 >= 3	Scale 1 : 2500	Plot Date 23-Jun-2011 Plot File: 1250W	Sheet 1 of 1	**Cross-Sections Facing West Showing $1200 Pit 1250W**	NORTHERN GOLD Garrison Gold Property Garrcon Deposit Garrison Township Ontario, Canada
Drawn by Doug Roy, M.A.Sc., P.Eng. Associate Mining Engineer			20 0 20m				



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Associate Mining Engineer

Lithology

CMS		GAB	
CSM		SY	
CST		CK	
CT		T	
K		OB	
UM		SED	

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

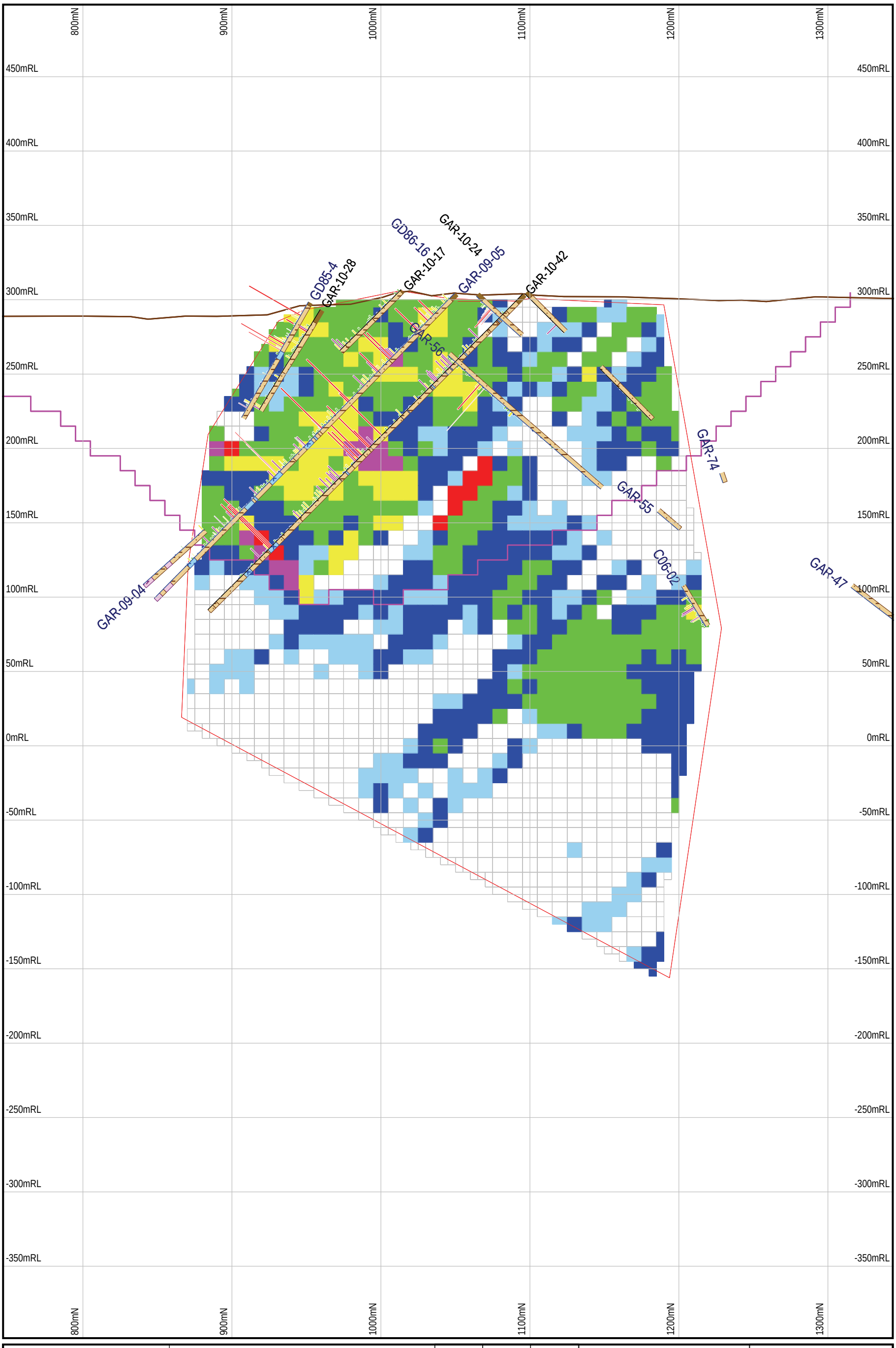
Plot File: 1275W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1275W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Associate Mining Engineer

Lithology

CMS		GAB	
CSM		SY	
CST		CK	
CT		T	
K		OB	
UM		SED	

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale
1 : 2500

Plot Date
23-Jun-2011

Sheet
1 of 1

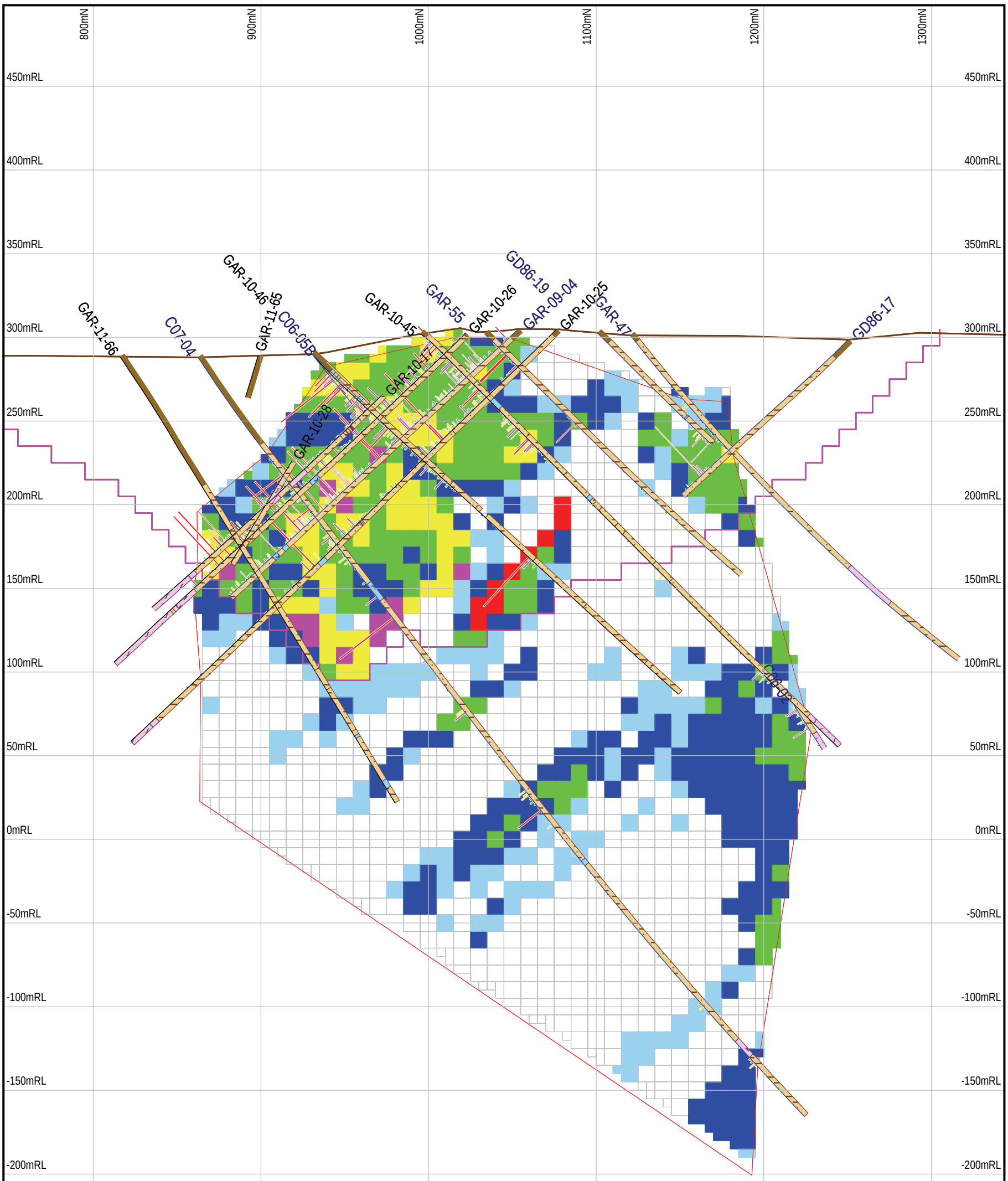
Plot File: 1300W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1300W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Gold Grade (g/tonne)

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- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

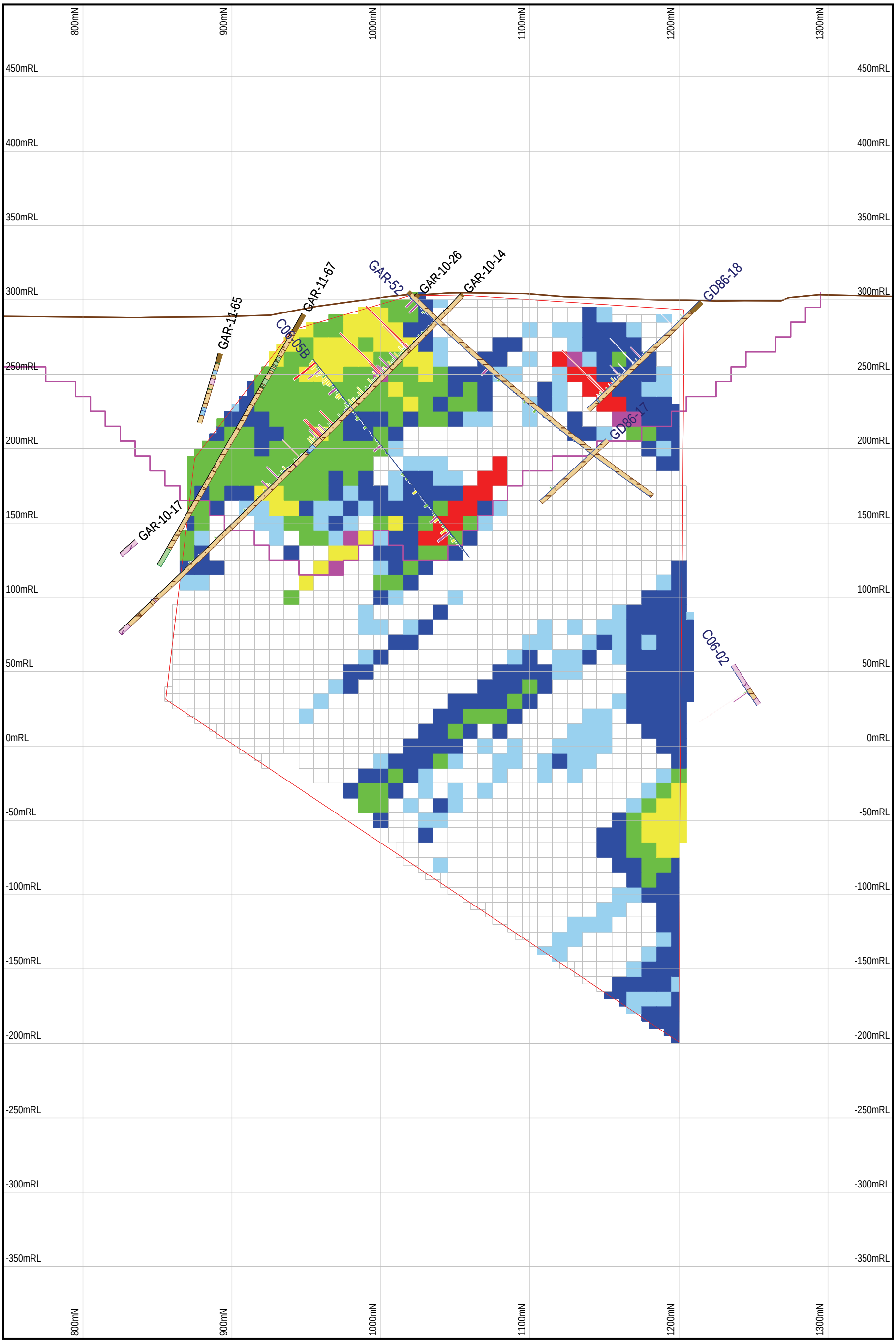
Plot File: 1325W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1325W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

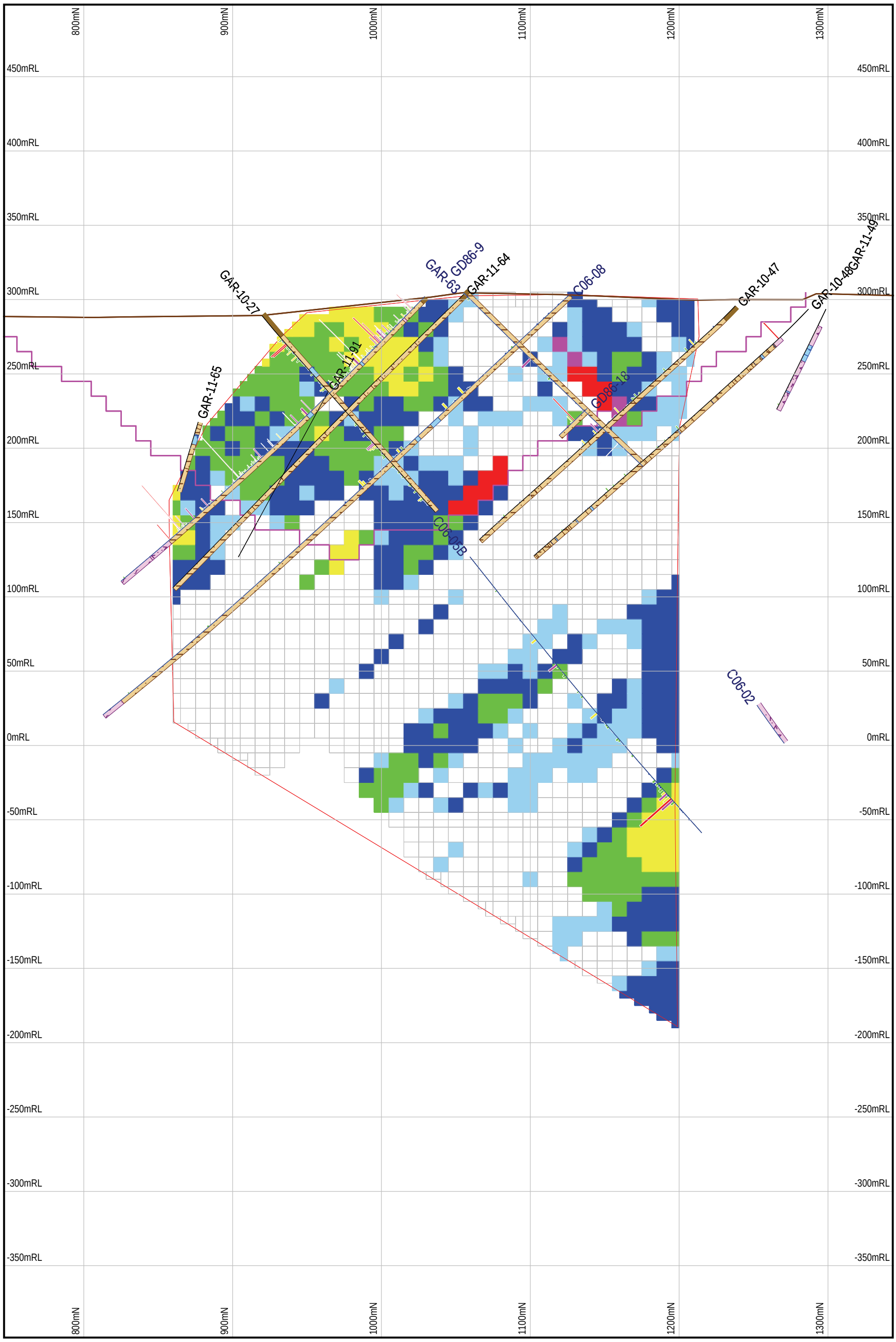
Plot File: 1350W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1350W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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CMS	GAB
CSM	SY
CST	CK
CT	T
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Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

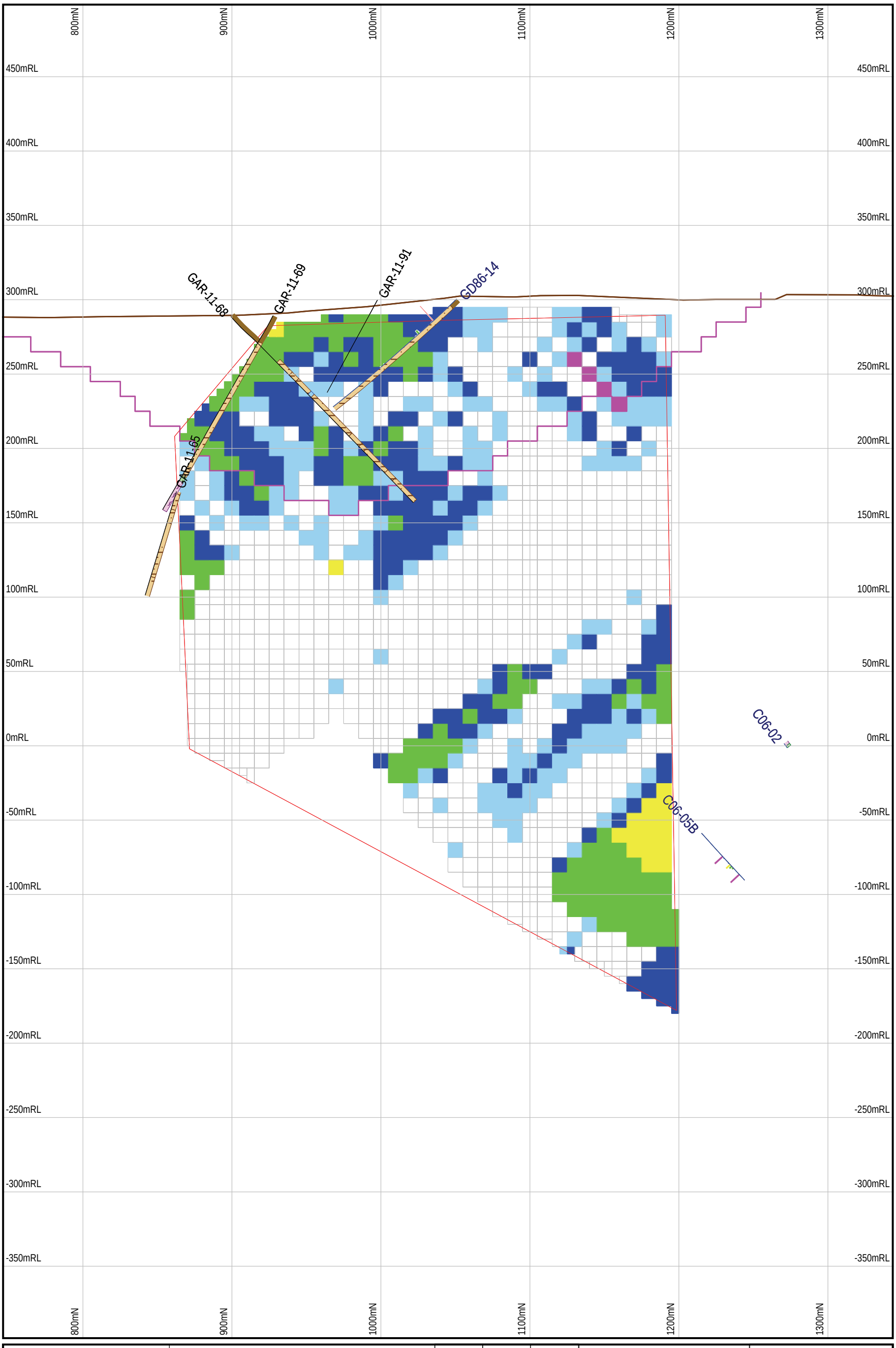
Plot File: 1375W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1375W

NORTHERN GOLD MINING INC.

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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Lithology

CMS		GAB	
CSM		SY	
CST		CK	
CT		T	
K		OB	
UM		SED	

Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale
1 : 2500

Plot Date
23-Jun-2011

Sheet
1 of 1

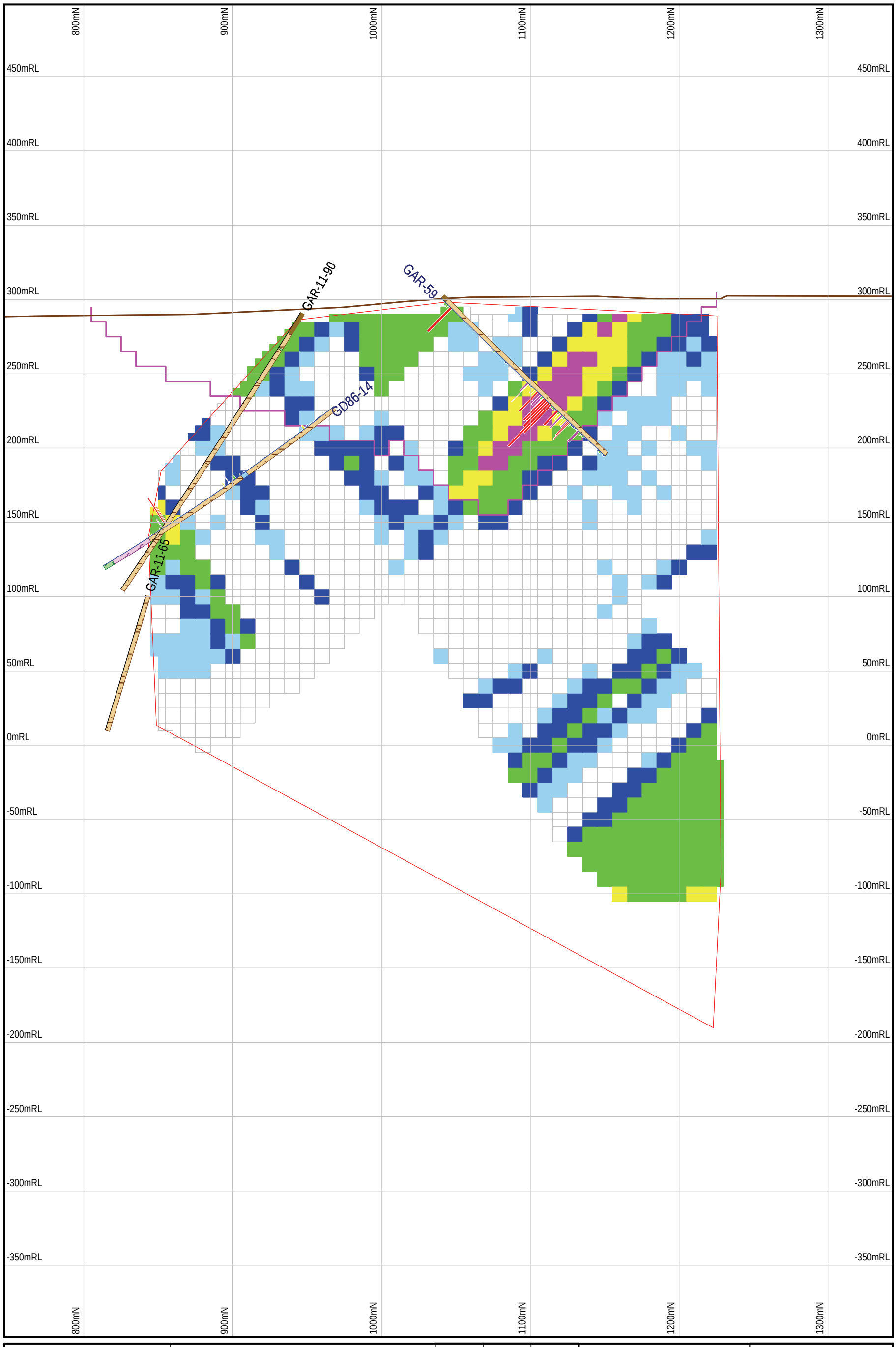
Plot File: 1400W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1400W

NORTHERN GOLD

Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada



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CMS		GAB	
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K		OB	
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Gold Grade (g/tonne)

- < 0.10
- 0.10 to 0.15
- 0.15 to 0.30
- 0.30 to 0.75
- 0.75 to 1.5
- 1.5 to 3
- >= 3

Scale 1 : 2500

Plot Date 23-Jun-2011

Sheet 1 of 1

Plot File: 1450W

20 0 20m

Cross-Sections Facing West Showing $1200 Pit 1450W

NORTHERN GOLD MINING INC.

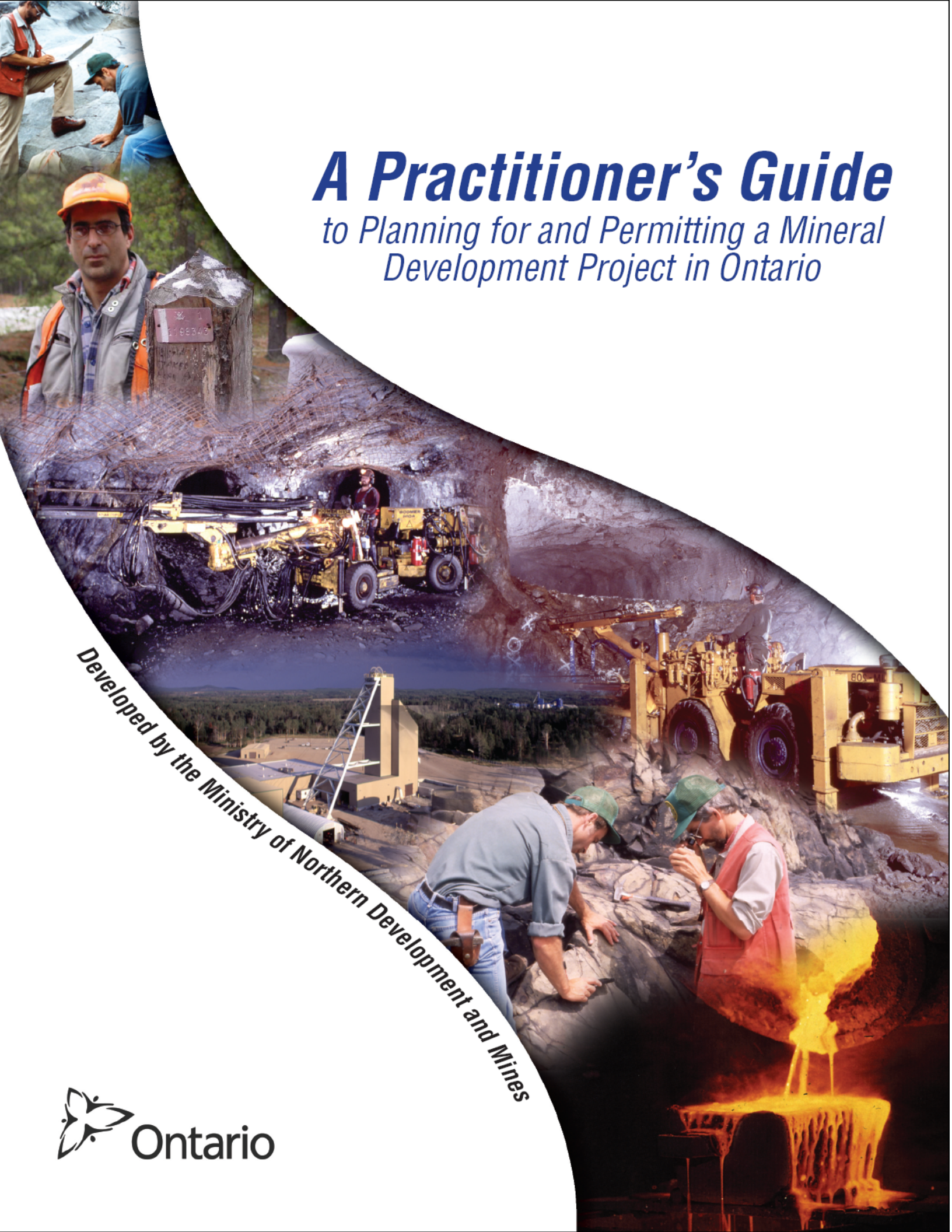
Garrison Gold Property
Garrcon Deposit
Garrison Township
Ontario, Canada

APPENDIX D

MNDF's Practitioner's Guide to Planning for and Permitting a Mineral Development Project in Ontario

A Practitioner's Guide

to Planning for and Permitting a Mineral Development Project in Ontario



Developed by the Ministry of Northern Development and Mines

Ontario

A PRACTITIONER'S GUIDE TO PLANNING FOR AND PERMITTING A MINERAL DEVELOPMENT PROJECT IN ONTARIO

Part of the
Modernizing Permits and Approvals Initiative

Prepared for:
Ministry of Northern Development and Mines

Mines and Minerals Division
Willet Green Miller Centre, 6th Floor
933 Ramsey Lake Road
Sudbury ON P3E 6B5

Prepared by:

SENES Consultants Limited
901 Bank Street
Ottawa, ON K1S 3W5

March 2008

Disclaimer

Although the Ontario Ministry of Northern Development and Mines (MNDM) has used considerable effort in preparing the information in this Guide, MNDM does not warrant the accuracy, timeliness, or completeness of the information. You should not rely upon it for legal advice, nor as authoritative in your particular circumstances. Proponents will be responsible for ensuring that they meet all legal requirements for their project and therefore should verify the accuracy and applicability of information in the Guide before acting on it. MNDM is not responsible for any damage, however caused, which results directly or indirectly from your use of the information in this Guide.

Table of Contents

1.0 Introductory Overview to the Guide

1.1 Executive Summary

Ontario's rich mineral resources are an important part of our economy. The Government of Ontario has a responsibility to manage the many aspects of mining activity in this province. It acts as a repository of information concerning the provincial geology, land ownership and mineral rights, and assists prospective miners and mining companies through the various stages of the mining cycle, from prospecting to exploration, operation and decommissioning. In addition, in conjunction with federal and municipal governments, the Ontario government must also ensure that mineral rights and land ownership are respected, and that the mining sector is regulated to prevent possible contamination of the natural environment and infringement on the interests of local communities. These latter objectives are accomplished through a system of permits and approvals.

The Ontario Ministry of Northern Development and Mines (MNDM) has commissioned this Guide to clarify permitting requirements for mine development in Ontario, and to serve as a quick reference for planners of new mining activities. Section 1 explains the purpose of the Guide and how to get the most out of it. Section 2, entitled "Project Planning", summarizes the steps of the planning process and the important factors to be considered at each stage. Particular attention is paid to project scoping, land ownership and use of land and mineral resources, the environmental assessment process, consultation with First Nations as well as with the public, and accessing Ontario government resources. In section 3, "Navigating the Regulatory Process" and accompanying Appendices A to E, "Permit Navigation System", the requirements of the regulatory process are explained in detail for each stage of the mining cycle.

Throughout the Guide, hyperlinks and references to many other relevant and useful websites and publications are included for further information.

This Guide is intended to help project planners focus their efforts on preparing for and proceeding smoothly through the planning process, with minimal delays due to oversights or confusion about regulatory requirements. The Guide promotes responsible mining practices in Ontario and will help ensure that new mines are planned and implemented to benefit local communities and the province as a whole.

1.2 Introduction

Mining is a human activity that has evolved over time to respond to society's need for minerals removed from our earth's surface in order to provide a vast array of products that make our lives simpler. These products range from fertilizers for growing food; to metals for cars, appliances, machinery, electronics and communications networks; to uranium for provision of energy to power our activities and interests. As the technology and knowledge of how to use earth-derived materials has improved over time, so have the efficiency and effectiveness of procedures to extract these materials and the permitting and approvals processes that regulate them.

1.2.1 Purpose of the Practitioner's Guide

This Practitioner's Guide represents a current overview of the permits and approvals needed to establish a mineral development project in Ontario. The Guide provides an easy-to-use reference to properly plan and implement a mineral development project through all the stages of mining – from advanced exploration to closure. This Guide addresses a number of items including: the existing regulatory framework for mining activities in Ontario; First Nations and the public understanding and requirement for involvement; oversight and the assurance of a safe and healthy environment. As well, it creates an awareness of the needs of the various regulatory agencies which may be involved when undertaking a mineral development project in Ontario.

Although the information provided in this Guide is current at the time of preparation, its content is also designed to be applicable over time without need for significant revision. To that effect, the Guide's discussion of topics—relevant to anyone considering or planning a mineral development project in Ontario—are at a more strategic level, covering those general principles and elements of successful project planning and implementation that do not change over time. Key information required to successfully plan and implement a mineral development project is provided here, with numerous references included throughout for additional web, paper and human resources that will be helpful in working through relevant and current project planning details. For a more thorough and complete review of regulatory requirements for mineral development projects in Ontario, project proponents are urged to contact their nearest MNDM Mineral Development Office. Current contact information is available at http://www.mndm.gov.on.ca/mndm/mines/mg/advex/default_e.asp

1.2.2 Guide Overview

One of the most important messages for a planner of a mineral development project is an appreciation that moving from mineral exploration through to mine development, operation, and eventually to plant closure, is a complex process that must allow adequate time for engagement and meaningful involvement of all the potential stakeholder interests. A mineral development project has the potential to impact a broad scope of First Nation, public and private interests. Some examples of stakeholder interests include:

- Aboriginal land claims or developing land claims on or near the area;
- land tenure issues, which vary according to whether the landowner is private or the Crown, for mineral development projects located on or near public or privately owned land;
- potential environmental impacts to forested areas, sensitive habitats and watercourses, associated with emissions to air or water, or waste disposal;
- potential impacts from infrastructure development associated with the project;

- potential business opportunities associated with mine development and operation;
- public health and safety aspects of the development and mining operation; and
- known or potential cultural/archaeological sites within or near the project area.

The main objective of this Guide is to adequately prepare the project planner by helping to define the role and interest for each of the entire range of potential stakeholders; identify why and how each stakeholder could become involved; what steps to take; and how to fulfill the associated permitting and approval requirements.

1.3 Format of the Practitioner's Guide

This Guide provides an overview of information that's needed when planning a mineral development project in Ontario. More detailed information is available through a number of sources, such as the Ministry of Northern Development and Mines and other government and private organizations. Some of these include:

- The Mining Gateway, established by the Ontario Ministry of Northern Development and Mines (MNDM), is a comprehensive resource on all aspects of planning a mineral development project;
- Prospectors and Developers Association of Canada (PDAC), http://www.pdac.ca/;
- Ontario Mining Association (OMA), http://www.oma.on.ca/;
- Mining Association of Canada (MAC), www.mining.ca/ .

The above references should be relevant to the majority of mineral development project managers. Other relevant ministry/agency resources are referenced throughout this Guide, within each of the main topics addressed.

Other available tools to facilitate planning and implementation of mineral development projects include:

- The Project Definition Template, available from MNDM at The Mining Gateway ;
- The Project Description Template, provided by the Canadian Environmental Assessment Agency (CEAA), http://www.ceaa.gc.ca/013/0002/ops_ppd_e.htm;
- Land tenure and land use planning websites, http://www.mndm.gov.on.ca/MNDM/MINES/lands/claimap3/Default_e.asp;
- MNR Crown Land Use Atlas and direction for Crown land use planning initiatives for Crown resources, http://crownlanduseatlas.mnr.gov.on.ca/ ;
- Ontario's 'One Window' Coordination Process, a description of which is also available at The Mining Gateway.

2.0 Project Planning

2.1 Importance of Planning

The greatest risk to a mineral development project is when unforeseen issues or requirements crop up. Often these are related to an incomplete assessment of the issues to be dealt with; be they related to the specifics of the land itself or to a community's interest in the proposed project. Some project proponents, particularly small or inexperienced ones, have unrealistic expectations of the length of time it takes to comply with regulatory requirements. A sensitive land feature or use not identified in the original project plan—a nearby fish habitat or recreational facility, for example—that could be impacted by the proposed project, could add months or even years to the time required to adequately permit and approve a project. Similarly, proponents can make the mistake of losing sight of the big picture, i.e. the overall perception of the proposed project in the landscape and community by becoming too focused on project details. Inadequate planning can significantly lengthen a project's timeframe and increase expenses.

In general, successful project planning involves answering the fundamental five W and H questions.

- What and why? Describe the project: What is its vision? Why is the project being implemented?
- Who? Who will be involved? What will be their responsibilities?
- When? When will the project take place? What will be the major milestones? Keep in mind the time required to complete each task, what resources are available, and whether or not a task depends on the completion of other tasks.
- Where? Where will the project be located? What will be the physical extent?
- How? How will the project be executed and controlled to ensure tasks are completed effectively, on time and on budget?

There are five main stages in the development of a mining project from concept through to mineral extraction and site decommissioning. The stages are: 1) exploration; 2) advanced exploration; 3) development; 4) operations; and 5) closure. Each of these phases and their related activities is defined below in Table 1, with an indication of some of the major regulatory and permitting requirements to be taken into consideration during project planning. More specific details are contained in Appendices A to E. As well, resources on the Mining Gateway such as the Mining Sequence can assist the project planner in identifying specific project activities over time.

Table 1. Major planning considerations for the five phases of a mineral development project.

Phase	Associated Activities	Major Permit / Approval Planning Considerations
Prospecting and Staking / Exploration – Staking involves the marking of land on the ground and on formal mining claim maps as an indication of ownership of mineral rights for potential future exploration and mine development. Once lands have been staked, preliminary exploration of the lands may be undertaken to assess the potential or extent of mineral deposits.	Staking of lands involves on-the-ground marking of the area of interest and registering of this area with the Mining Recorder. Activities associated with prospecting and preliminary exploration may include: • various ground surveys, usually in a grid pattern, for geological mapping or for geophysical/geochemical surveys; • geophysical surveys from the air; • limited stripping and trenching of soil at the ground surface; • limited sampling of ground materials; • various forms of drilling; • bulk sampling*. If a company is listed on Canadian Securities Exchanges, at this time the mine property owner(s) would submit documentation required under National Instrument 43-101 to verify mineral resources.	Activities under the prospecting and staking process require a **Prospector's License** from MNDM. A detailed description of the activities and related requirements are included in the Guide to Staking a Mining Claim. There are no other permits or approvals required for staking a claim. Prospecting or preliminary exploration may require: • *Provincial permits* associated with use of Crown land for road building, water crossings, tree cutting, burning of materials or approach to a Provincial highway. In addition, some of the permits required for activity on Crown land may require a limited Environmental Assessment • *Federal approvals* for crossing a watercourse designated as navigable; work near or within waters that are fish habitat; exploration on First Nation Reserve land; or purchase and possession of explosives • *Municipal approvals* for potential changes in land use, and sometimes for burning of materials • *Bulk samples greater than 10 tonnes may require a *"Permission to Test Mineral Content"* from the Director of the Mineral Development and Lands Branch, MNDM, for sampling of Crown mineral resources. In addition, a *Closure Plan* for the eventual rehabilitation of the site will be required if the sample exceeds 1000 tonnes Although the activities at this stage are limited in their potential for impact upon the surrounding environment or community, a comprehensive view of the subject land is highly recommended. This would include consideration of regional community interests such as land tenure, existing and traditional land use(s), projected future land use as well as type and extent of environmental features (forests, agricultural land, streams or water bodies, wetlands, sensitive habitat). An understanding of the social and environmental features of the lands at this stage will assist in planning for permit and approval stages of future activities at the exploration, development, operations or closure stages.

Phase	Associated Activities	Major Permit / Approval Planning Considerations
Advanced Exploration, as defined under the Ontario *Mining Act*, refers to the excavation of an exploratory shaft, adit or decline; the extraction of material in excess of 1000 tonnes (or where it involves a single location of an area >10,000 m^2, or a volume >10,000 m^3, or amounts less than 2500 m^2/m^3 if the activity is within 100 m of a water body), whether the extraction involves the disturbance or movement of prescribed material located above or below the surface of the ground; the installation of a mill for test purposes; or any other prescribed work. See http://www.mndm.gov.on.ca/mndm/mines/mg/advex/advdef_e.asp for a full definition of advanced exploration.	The purpose of this stage is to establish the feasibility of developing a full-scale mine for material extraction and processing. This phase may involve removal of significant amounts of rock for testing (bulk sample).	Many of the types of approvals noted under exploration will also apply at this stage. Most significantly, prior to any substantial work, one should consider establishing a set of environmental baseline conditions (i.e., a description of the natural environment of the project area before work commences). This should include: water resources – quality, quantity and movement; vegetation; wildlife habitat; soil resources; human land use and enjoyment; and air quality. This description of existing conditions will form the basis for the subsequent closure plan that must be implemented once mining operations have ceased. In many instances at the advanced exploration stage, *Permits to Take Water* and *Sewage Works Certificates of Approval* are needed. Bulk samples greater than 10 tonnes may require *"Permission to Test Mineral Content"* from the Director of the Mineral Development and Lands Branch, MNDM, for sampling of Crown mineral resources. In addition, a *Closure Plan* for the eventual rehabilitation of the site will be required if the sample exceeds 1000 tonnes. Prior to commencement of an advanced exploration project, which requires the issuance of a *Notice of Project Status (change)* (submitted to the MNDM), the following information must be compiled and submitted: • an operating plan (project description, site plan, site access details, targeted minerals, project term, number of workers, operating schedule); • map of project boundaries; • uses of adjacent land and water; • owners, occupants and users of project land and immediately adjacent land; • project schedule. Unpatented mining claims must be taken to a mining lease status before any mine production commences.

Phase	Associated Activities	Major Permit / Approval Planning Considerations
Development – under the *Mining Act*, "Mine production" means mining that is producing any mineral or mineral-bearing substance for immediate sale or stockpiling for future sale, and includes the development of a mine for such purposes.	This is the construction stage of a mining facility, which entails development of the infrastructure required to support an operating mine. The specific activities and resulting approval requirements depend on the type of mining operation, which in turn depends on the nature and extent of the deposit, the processing activities, materials handling needs and extent of new facilities.	Potential approvals at the development stage include *Environmental Assessment* if any of the project components are subject to the federal or provincial processes (see Section 2.3); *Provincial approvals* if any of the road or building construction activities are located on or may impact upon Provincial Crown land; and *federal agency permits* if the proposed mining development will impact upon a rail line, any fisheries habitat not already addressed, use or impact upon federal or First Nation land, or use and storage of explosives. Prior to commencement of mining operations, which requires the issuance of a *Notice of Project Status (change)* (submitted to the MNDM), the following information must be compiled and submitted: • an operating plan (project description, site plan, site access details, targeted minerals, project term, number of workers, operating schedule); • map of project boundaries; • uses of adjacent land and water; • owners, occupants and users of project land and immediately adjacent land; • project schedule. The requirement for a *Federal Environmental Assessment* may be triggered if any federal authorizations are required, or federal land or federal monies are involved in the project.
Operations – implementation of the project operating plan.	Potential activities for mine operation include: soil and overburden removal; blasting; mineral extraction (processing); tailings disposal and management; monitoring of air, wastewater and solid waste materials; construction of or modifications to existing infrastructure.	This stage involves management of many processes, in the present and long-term, in accordance with the approvals obtained during the development stage or just prior to commissioning of mine operations. Before mining operations can begin, MNDM requires that a *Closure Plan with Financial Assurance* be submitted and approved. The Province will also require *certificates of approval (C of A)* for any discharges to air or water, with the latter including potentially separate certificates and treatment processes for industrial wastewater and domestic sewage generated from the mine operations. Ontario also requires a C of A for a waste disposal site, if this is to be part of the mining operation.
Closure, Reclamation and Monitoring – The closure plan for a mine development site, often submitted for approval to the MNDM at the advanced exploration stage, will see site rehabilitation to approximate pre-development conditions. This means removal of site facilities, restoration of soil cover materials, vegetation and surface water features to a quality, quantity and appearance that is as close as feasible to pre-development conditions or the baseline environmental conditions measured and described at the advanced exploration stage.	This stage involves the cessation of mineral materials extraction, processing and transportation activities and a closure of the project site which supported these activities.	No additional approvals are required at this stage, however, the proponent must file a completion report that documents how the mine site closure has complied with the requirements of the approved closure plan.

2.1.1 Approvals and Permitting Overview

As noted in Table 1, a broad range of approvals may be required in advance of undertaking a mineral development project. The majority of these approvals are required by Ontario government ministries or agencies (e.g., Ministry of Natural Resources (MNR), Ministry of the Environment (MOE)), or organizations established under provincial authority (municipalities, conservation authorities). Occasionally, federal agencies have jurisdiction over a mineral development-related activity, for example, requirements under the federal *Fisheries Act* will be triggered if a mineral development activity may potentially disturb a fisheries habitat. Other mineral development activities may trigger requirements under the *Canadian Environmental Assessment Act*.

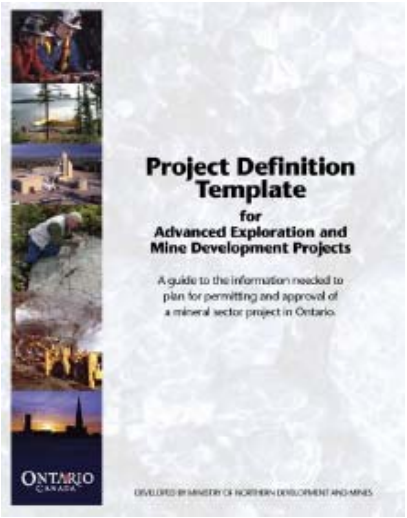
Table 2 provides an overview of various areas of jurisdiction that could impact on a mineral development project, and which of the different levels of government have authority in that area of jurisdiction. Further details concerning the agencies likely to be involved in various mineral development-related activities, and the types of approvals they require, are outlined throughout the rest of Section 2 and summarized within the "Permit Navigation System", Appendices A to E.

Table 2. Examples of areas of jurisdiction and legislative authority of the various levels of government.

Federal	Provincial	Municipal
• Navigation and shipping • Sea coast and inland fisheries • Federally owned land, or other federal resources, such as funding provided by a federal government department • Aboriginal people and lands reserved for Aboriginal people • Regulation of trade and commerce, such as import and export of rough diamonds under the *Kimberley Process* • Other specified classes of activities, such as regulation of explosives	• Provincially owned and/or regulated resources such as lands, fish, wildlife, water, timber, aggregates and minerals • Exploration, development, conservation and management of non-renewable natural resources • Development, conservation and management of forest resources • Development, conservation and management of sites and facilities for generation and production of electricity • Treatment of ore outside Canada • Taking of water • Discharges to air and water and land	• Approvals for land use or zoning changes required for project development • Building permits • Noise restrictions and other bylaws • Local infrastructure needs such as transportation, drainage

2.2 Determining the Scope of a Project

Every properly managed project needs a well-thought-out description before the project begins. Overall, the intent of a project description is to assist the project planner in scoping the specific activities and extent of a proposed project. Once set out in writing, the project description can also serve as a reference to assist others, including relevant agencies that may play an approval role for components of the project. For example, the project description can assist the proponent and/or the Canadian Environmental Assessment Agency (CEAA) and Ontario Ministry of Environment (MOE) to determine whether or not the project is subject to an environmental assessment. The most valuable benefit, however, is that developing a project description helps a planner define the exact steps and extent of a proposed project, which in turn assists in identifying in advance the permits and approvals required over the project steps.



2.2.1 Developing a Project Description

The primary resource available to mineral development planners for preparing a project description is MNDM's "Project Definition Template for Advanced Exploration and Mine Development Projects". It can be found at The Mining Gateway. This template provides advice on:

- **when** to prepare a project description (as early in the process as possible, even if some of the suggested information is not yet available);
- **how to use the template** (it's meant primarily as a guide, but remember to consult with your local Mineral Development Coordinator early and throughout project development);
- **purpose of a project description** (a project description is a valuable communications tool to explain your proposed development to relevant regulatory agencies so that they are better able to advise you on approval requirements at an early stage); and
- **content of a project description** (the template contains a listing of recommended sections, with explanations of the information to be included in each).

Some of the recommended content for a mineral development project description is presented below, and explained in more detail in sections to follow.

- *Introduction* – Identification of proponent(s), summary of project, location, data gathered, consultations to date, contact information
- *General Site Information* – Exact location and summary description of site, site address, proposal status and project name
- *Land Tenure* – Land ownership, ownership of surface and timber rights, ownership of aggregate resources, identification of potentially affected nearby owners, presence of federal or provincial Crown lands, First Nation Reserve lands, other easements or rights-of-way
- *Site Plans* – Position of project features at regional, property and site scale
- *Project Detail* – Detailed description of proposed mining activities, supporting facilities and infrastructure
- *Project Location and Environmental Baseline Data* – Detailed description and presentation of environmental features on the site and surrounding the subject site
- *Project Schedule* – Detailed schedule for project development activities, regulatory approvals, public and Aboriginal consultations

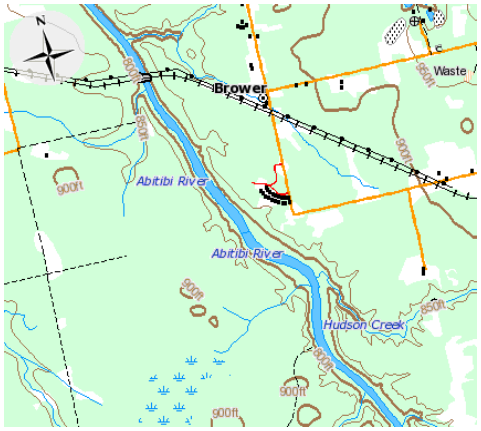
Other documents that could serve as complementary resources for additional guidance when developing a project description include ones from CEAA and the Mining Association of Canada. CEAA's guide Preparing Project Descriptions under the Canadian Environmental Assessment Act offers a sample outline for preparation of a detailed project description for initiatives subject to the federal environmental assessment process (a requirement that may not always be applicable). Useful background is also available through the "Facility Description" section (Chapter 4) of the Mining Association of Canada's guide Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities.

2.2.2 Approach for Developing a Project Description

Some, or in other cases all, of the components of a project description can be completed by the proponent; however, it is likely that professional assistance will be needed for completion of some of the project design, site documentation and evaluation tasks. Engaged professionals could include a mining engineer for site layout, description of production processes and operations management; environmental specialists for documentation of the area's natural features; civil engineers for tailings dams; chemical engineers for waste water treatment etc.; and a planner to assist with identifying past, present and future land uses for the site and surrounding area.

2.2.2.1 Supporting Resources for a Project Description

Resources that can be used to assist in preparing a project description for a mineral development project include:



- Topographic maps and aerial photographs
  - scanned 1:50,000 and 1:250,000 NTS topographic maps are available for free through Geogratis at http://geogratis.gc.ca/
  - maps and air photos are available through The MNR Store at http://themnrstore.mnr.gov.on.ca/default.htm
  - Ontario Base Mapping and current and past aerial photographs are available through the Ontario Ministry of Natural Resources, Natural Resources Canada Air Photo Library, Google or through any number of private companies
- Municipal Official Plan(s) and zoning bylaws for the area that show the existing and future planned land uses in a municipality's geographic boundaries

  This information, combined with base maps and aerial photos, can provide good background information on existing land uses and resources for the project site and adjacent land. Mapping provided by MNR and the relevant municipality can also provide information on potential environmental or cultural sites of interest, with links to supporting reports with more detailed information, if available.
- Local weather data, collected over time to provide ranges for temperature, precipitation
- Review of local newspapers or discussion with community experts, such as municipal councillors or mayor, to identify potential features of interest and stakeholders
- On-the-ground data collection

  Information from existing data sources will likely need to be augmented by field visits for confirmation or refinement of the current environmental and social setting of the project site. Details such as the types of natural vegetation present, type and significance of fish and wildlife habitat, size and nature of water bodies, size and flow of watercourses, type and extent of current land use, type and location of man-made structures, and presence of archaeological features should be confirmed by field visits.

2.2.2.2 Level of Detail

The level of detail in a project description should be appropriate not only for the project manager but also for other project stakeholders or partners, as well as potential approval / permitting agencies. The project description should provide:

- a good understanding of the nature and extent of the proposed project;
- an understanding of all the social and environmental aspects of the site and of the adjacent lands; and
- an insight on how the planned project activities might affect these social and environmental features.

Nevertheless, the project description is a summary, not an exhaustive and detailed description of the project and its host site. Instead, it should present project and site data that are significant and represent site or project features that are sensitive to development and/or are regulated because of their environmental or social sensitivity.

2.3 The Land Situation

Once the project has been scoped through the process of creating a project description, the next major step is to determine the overall land situation for the subject and adjacent lands. This step includes establishing land tenure, which involves determining the ownership of the land underlying and in proximity to the project area, as well as potential variations of ownership of surface, mineral and timber rights of the land. Also, if potentially impacted First Nation communities have not already been engaged by this time[1], they should be.

Mining land tenure must be secured by the project proponent in order to develop and operate a mine. This means that unpatented mining claims within the project area must be taken to lease prior to the start of any significant advanced exploration activities or mine production.

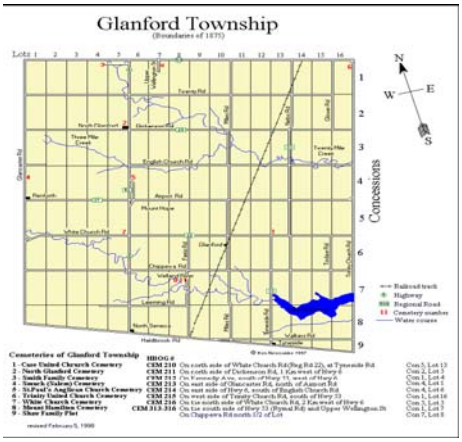
An understanding of how the lands have or are to be used is also needed. Current and future land uses for an area are shown on municipal plans, which place land-use designations and zoning controls on all lands within their geographic boundaries. A brief description of the various types of land tenure, the process for land use designation and zoning, as well as practical land use are provided below. How to determine property status of privately owned land underlying the site of a mineral development project is also described.

In general, the project proponent should consider the following:

- What rights or land considerations are associated with the project, given its proposed location on the landscape? (e.g., mineral rights, surface rights, timber, aggregate, fishing, hunting, recreation, Aboriginal, land use, watershed implications);
- Does the proposed mining property incorporate all the land potentially needed to support a project? What if additional land is required due to expansion? Think about site-specific considerations (e.g., roads, power, water, locations for waste management) and all the available options;
- Consider local activities and businesses and how they may be impacted by the project. Fishing, hunting, forestry, snowmobile and ATV trail use are common activities;
- What rights or claims, if any, do others have? The development of a mineral project in Ontario can be significantly affected by traditional use as well as land and mineral claims by First Nations peoples;

[1] It is strongly recommended that potentially impacted First Nation communities are engaged at the very earliest stage possible in the mineral exploration/development process.

- Are there are any restrictions on nearby land use, such as potential parks or conservation reserves, or archaeological sites?;
- Access issues need to be broadly considered (e.g., access to water, to aggregate, to power, to natural gas, etc.);
- Are there specific municipal zoning requirements? What is the implication of a zoning amendment change?; and
- Are there any other property considerations that must be taken into account at the start of a mineral development project (basically, critical things that hinge upon knowing the property status (tenure))?



2.3.1 Land Ownership

Identification of land ownership is relatively straightforward. The local Land Registry Office within the municipal offices of the subject lands provides detailed ownership information on a property parcel basis. Starting with lot and concession numbers, or property parcel numbers, and the township or municipality name for the subject lands, one can obtain the name and mailing address for the land owner. Land ownership can also be obtained for property parcels surrounding the subject lands, for as large an area as desired.

It is recommended that a search of ownership extends to all adjacent lands within which a potential environmental effect may occur as a result of the proposed project. The extent of the potential effects will depend on the nature of the activity. Factors to consider include:

- building of any supporting infrastructure such as roads, railways, aircraft runways, communication and electrical transmission lines, water or natural gas pipelines;
- any anticipated emissions to air (air contaminant, dust or noise) and their anticipated travel distance, with controls, vibration impacts;
- anticipated discharges to water, and the water bodies potentially affected;
- building of other support facilities, such as for processing, transfer or storage, on other lands, etc.;
- water supply.

Contact information for all Land Registry Offices across Ontario, operated by the provincial Ministry of Government and Commercial Services, is provided at http://www.cbs.gov.on.ca/mcbs/english/250a_3fe.htm. For property ownership and title searches of larger areas, an appointment may be required to use the registry's resources. It is recommended that you call in advance.

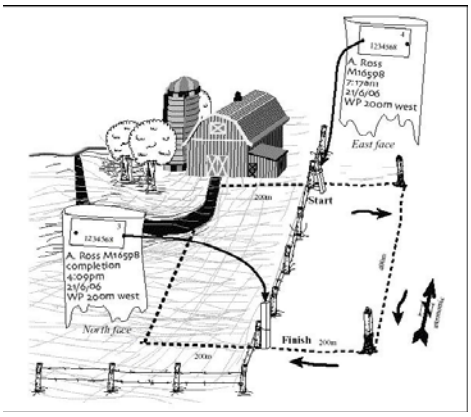
2.3.2 Surface and Resource Rights

In addition to land ownership, the Land Registry Offices also provide other relevant information on property parcels, such as resource ownership. Within Ontario, ownership of the mineral resources below or on land surface may differ from ownership of the overall surface, i.e., the ground on which buildings will be erected. This information must also be considered as part of the planning for a mineral development project. The following provides a brief explanation as to why ownership of surface and mineral rights may differ.

Historical changes over time have resulted in varied assignments of mineral rights. Prior to 1867, while Ontario was a British colony, Canada, as "The

Crown" granted land title to individuals. With the 1867 *Constitution Act*, the then provinces were granted ownership of public property within their boundaries, known as provincial Crown Lands. Ontario amended its *Public Lands Act* in 1913 to specify that any property granted to others by the Crown before 1913 included mineral rights ownership. Any lands granted by the Crown after 1913, may or may not include mineral rights, depending upon how the title was worded. The Province's current practice for any lands sold or leased under the *Public Lands Act* is to maintain the mining rights for most lands. In addition, sometimes land owners do not own the timber rights either. For both situations, if ownership of mineral or timber rights rest with the Province, this will be registered on the property's title at the Land Registry Office. Further information on property ownership considerations is included on the Mining Gateway.

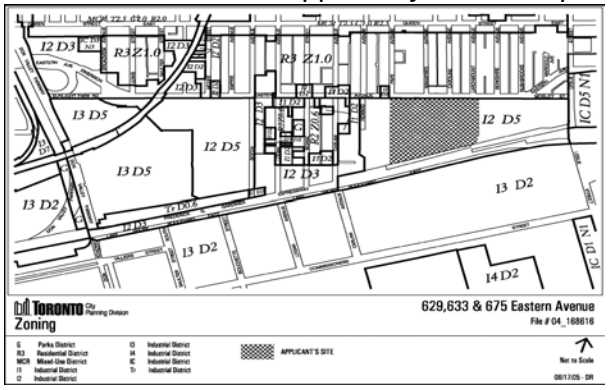
Generally, a project planner would not likely be working through ownership details until the proposed mineral development project is at the advanced exploration or development stages, which is when notification of private landowners potentially affected by the associated activities is required. For claim staking, the MNDM ClaimMaps website indicates the location of private lands, so that prospectors are aware of their location and can conduct their activities so as to not impact upon the landowners. Information on the ClaimMaps website is as accurate as possible and is updated regularly; however, should land ownership details be of concern, the Land Registry Offices have the most accurate data.



2.3.3 Municipal Land Use and Zoning

For information on existing and planned future land uses, one of the best starting points is with the Official Plan and Zoning Bylaw for the municipality within which the subject and surrounding lands are located. These documents set out restrictions for how land may be used, and are based on the tenets of the *Ontario Provincial Policy Statement*, which guides land use policies across the province and aims for wise management of the land resources throughout Ontario.

A municipality's Official Plan assigns land use designations for all lands within the municipality, effectively limiting or controlling land use in some areas, according to the resource potential of those lands. For example, lands that support identified mineral resources, aggregate deposits, significant wetlands, significant natural areas and habitat, highly productive agricultural lands or floodplains must be designated accordingly within a municipal official plan. Allowable land uses in these designated areas are restricted to those that will not prohibit future use or damage the integrity of the resources. The official plans also depict areas set aside for development, in the form of residential, commercial, industrial and institutional facilities, for lands that do not support any of these specific resource features.



A municipality's zoning bylaw builds upon the land use controls laid out within the official plan. Zoning specifies detailed site considerations, which aim to minimize potential land use conflicts by locating compatible land uses next to each other, wherever possible. Specifications within a zoning bylaw range from establishment of residential density, type of industrial activity, parking requirements, building setbacks from property lines, fencing requirements, etc.

Information from official plans and zoning bylaws can assist the mineral development project planner in identifying existing land uses and any community stakeholders who would need to be involved in consultations. The plans and bylaws also provide information on allowable land uses for all lands within the proposed project area. For example, proposed facilities such as buildings, waste treatment facilities, parking lots and storage facilities must be an accepted use of the land and must be built in the manner specified in the official plans and bylaws. If not, an Official Plan Amendment and/or Zoning Bylaw Amendment application must be filed and approved by the municipality prior to development.

The length of time it takes for an amendment application to be approved depends on the complexity of the requested change. Expect the process to take anywhere between 3 months to one year or more. The application for either amendment could also create the need for additional study, for example to assess traffic impact, natural resource impact, etc., and documentation not necessarily required for other components of the project.

For most Ontario municipalities, the offical plans and supporting policies for land use and zoning are publicly available and many are posted on the individual municipal websites; easily located by entering the municipality's name in Google™ or other search engines. Should these plans not be available electronically, they can be obtained directly from the Municipal Clerk or viewed at the Municipal offices or libraries. Municipal planning staff are available to assist project planners interpret the land use or zoning requirements and to advise on the amendment process, should this be needed.

2.4 Baseline Data Considerations

Now that an understanding of land ownership, resource rights and zoning issues has been developed, a logical next stage is to build upon the documentation of existing environmental features/criteria at the project description stage by collecting specific data on the existing landscape before any changes are made.

2.4.1 Description and Rationale

Baseline data considerations relate to establishing the current environmental and community status of the immediate or subject lands proposed for the mineral development project, and of those lands adjacent to the proposed project area and which may be affected by the project's activities. For example, they include assessment of any ecosystem inter- dependencies as well as human use concerns such as an appreciation of any local future expectations of the subject and adjacent lands (see below). Requirements for ongoing monitoring as part of the closure plan, as required by section 139 of the Mining Act, provides a good basis for initial baseline data needs, since it is this initial set of conditions prior to project activity against which the success of the closure plan's implementation will be measured.

2.4.2 Recommended Scope for Establishing Baseline Conditions

Examples of baseline conditions to establish include:

- Collection of environmental information – surface and ground waters, terrestrial, air and climate (data should be ideally collected over a full year, that is, over all four seasons);
- Cultural/heritage issues
- Aboriginal use, e.g., traditional use/traditional ecological knowledge
- Information on any other resources within the project area (trees; aggregate, etc.)
- Other land use in the area, e.g., tourism
- Any constraints on the project linked to seasonality, availability of information

2.4.3 Overview of *Mining Act* Closure Plan Requirements

In addition to the above data, it is recommended that project planners review the requirements for closure plan monitoring prescribed under the Ontario *Mining Act* to decide on pertinent baseline data to collect. The *Mining Act* requirements cover surface, biological and groundwater features under Parts 5 and 6, Schedule 1 of Ont. Reg. 240/00, as amended by O. Reg. 304/07, Mine Development and Closure under Part VII of the Act.

The objective of these regulations is to ensure that water quality is unimpaired by mining development activity, and that surface water can continue to support aquatic life, and surface and groundwater remain suitable for other uses. Monitoring programs of approved Closure Plans will be tailored for the specific site and its surroundings; however, they will include such items as:

- Acute and chronic toxicity and bioaccumulation testing for aquatic life of surface waters;
- Surface water chemical monitoring of any discharge or seepage from on-site or off-site sources; of on-site waterbodies; of waterbodies downstream from the site; and of background reference sites (for comparison). Parameters monitored are noted in Section 47 (2) of Schedule 1 and include pH, total solids, nutrients and metals;
- Groundwater studies to confirm whether or not migration of contaminants is occurring, and if so, to what extent; and
- Monitoring of similar chemical parameters for surface waters.

2.5 Environmental Assessment Considerations

This section outlines the intent of an environmental assessment (EA), its process, how projects trigger an EA and what to include in an EA that must be completed for a mineral development project.

2.5.1 Overview of Environmental Assessment

What is an EA? It is a process through which the potential environmental effects of a proposed project or set of activities can be predicted and managed in advance of carrying out the project. Through the process,

the existing environmental features of the lands that will support the project are described in detail, possible environmental effects of the project are described, measures are proposed to mitigate the possible environmental effects, and an assessment is made as to whether the project will cause significant adverse effects despite implementation of the identified mitigation measures.

The EA process is designed to build consideration of environmental factors into project planning and decision-making so that new development proceeds in a sustainable manner, thus ensuring that potentially damaging environmental effects can be reduced or avoided before they occur. Given that environmental assessment includes social impact considerations, EA processes provide the opportunity for public input as part of the evaluation of potential effects.

2.5.2 Environmental Assessment Legislation

The Ontario *Environmental Assessment Act* is the legislation most often applied to environmental aspects of mining projects in Ontario. The purpose of the Act is "the betterment of the people of the whole or any part

of Ontario by providing for the protection, conservation and wise management in Ontario of the environment". An overview of the EA process in Ontario is provided through this link.

Occasionally, mining project components may be subject to the federal *Canadian Environmental Assessment Act*, an overview of which is provided at http://www.ceaa-acee.gc.ca/012/002/CEAA-Overview_e.pdf. Its purpose is similar to Ontario's Act in that it aims "to ensure that {subject} projects are considered in a careful and precautionary manner before federal authorities take action in connection with them in order to ensure that such projects do not cause significant adverse effects".

Other stated purposes of the *Canadian Environmental Assessment Act* include encouraging responsible authorities to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy; to ensure projects do not cause significant adverse environmental effects outside the jurisdictions of the project; and to ensure that there are opportunities for timely and meaningful public participation throughout the environmental assessment process.

2.5.3 Purpose and Process of Environmental Assessment

The above stated purposes of environmental assessment are useful in providing the context for planning a mineral development project in Ontario, regardless of whether or not a defined project or its components are subject to a formal environmental assessment. Projects that are planned and delivered with the intention of maintaining or enhancing the environmental conditions of a project site and its environs will have an extremely high probability of success. This includes taking into consideration any human impact aspects. A successful project is one that is completed on time, on budget, with little to no unexpected developments, and is carried through to completion while maintaining a strong rapport with interested stakeholders.

Those projects that are directly undertaken by a public agency; are undertaken on their behalf to fulfill a public agency responsibility or involve a public agency resource (for example, use of Crown lands, funding from a government agency, or impact on resources under government jurisdiction such as water bodies, fish habitat, timber or mineral resources) are required to follow an EA process. Both the provincial and federal EA acts generally apply. The federal and provincial Ministers of Environment are provided with discretionary authority through their respective Acts to designate, by regulation, additional projects that require an EA (see Table 3 and Appendix A). This is not a common occurrence.

Both EA acts provide opportunities for varying levels of effort for conducting an EA, with the most intensive and longer term processes required either for those projects that have the greatest potential to cause significant adverse environmental effects, or which are relatively unique, with perhaps the scope of potential impacts unknown. Simpler and shorter term processes are prescribed for more routine projects with a demonstrated history of limited environmental effect, and with activities for which the effects can be mitigated by appropriate management actions. The types of EA processes and how they may be triggered for a mineral development project are described below.

2.5.4 Environmental Assessment Application

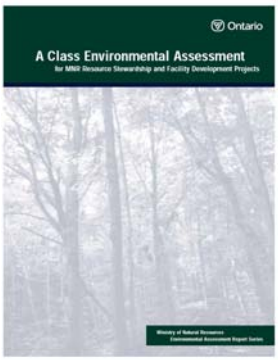
As noted in Table 1, an environmental assessment is most likely required when a mineral development project is at the advanced exploration or development phases, or when a significant change to a process/plant or to infrastructure at an existing project is needed. An EA can, however, be triggered at the exploration stage as well.

Overall, an EA will generally only be required when the proposed project is associated with provincial or federal government interests in such areas as:

- use of, or impact upon, provincial or federal lands or facilities;
- development of an electricity generating facility;
- construction of transmission lines;
- construction of a hydrocarbon pipeline for transport of oil or natural gas;
- construction of a new highway or relocation of an existing one;
- establishment of a water crossing;
- potential impact upon fisheries habitat.

Specific guides are available for mineral development activities that may be subject to environmental assessment, including:

- Conducting an EA under the responsibility of the Ministry of Natural Resources (MNR); their comprehensive guide to preparing an EA along with appendices provides an overview of other related legislations and approvals administered by other agencies;
- EA guidance document for development of an electricity project in Ontario;
- Guidance document for preparation of an EA under the Canadian Environmental Assessment Act (CEAA).



The amount of time required to complete an environmental assessment will depend greatly upon the complexity of the environmental characteristics and the stakeholder interests potentially impacted by the proposed project. A minimum amount of six months should be anticipated for completion of the environmental assessment, with a likely need of one year or more from the start of the process through to receipt of approval from the relevant agency. An estimate of environmental assessment timing can be obtained through discussion with Ontario's 'One Window' coordination process project coordinator or with the responsible agency contact(s).

Table 3 presents a summary of EA requirements that may be encountered during activities associated with a mineral development project.

Table 3. Summary of EA processes potentially applicable to a mineral development project*

Legislation	Responsible Agency	Trigger for Conduct of an EA	EA Process Description
Ontario Environmental Assessment Act	Ministry of Natural Resources	Construction of buildings, roads, dikes, excavation, water crossings, stream bank stabilization on Crown land	Class Environmental Assessment for MNR Resource Stewardship and Facility Development Projects
Ontario Environmental Assessment Act	Ministry of Transportation	Construction or re-alignment of a Provincial Highway as part of mine project	Class Environmental Assessment for Provincial Highway
Ontario Environmental Assessment Act	Ministry of Environment	Construction of a transmission line to provide power for mine development	Class EA for Minor Transmission Line Facilities
Ontario Environmental Assessment Act	Ministry of Environment	Construction of an Electricity Project to provide power	EA for Development of an Electricity Generating Facility
Canadian Environmental Assessment Act (CEAA)	Canadian Environmental Assessment Agency	Water Crossing that impacts upon fisheries habitat	Project Class Screening under CEAA
Canadian Environmental Assessment Act (CEAA)	Canadian Environmental Assessment Agency	Development of a mine project on federal lands or that includes the use of federal funds	Class Screening

*Including existing mines/plants

2.6 Aboriginal Consultation

Under the *Canadian Constitution Act*, 1982, Aboriginal and treaty rights are given special protection. This means that these rights cannot be unjustifiably interfered with. The Crown has a legal duty to engage in meaningful consultation whenever it has reason to believe that its decisions or actions might infringe upon existing or asserted Aboriginal or treaty rights.

The nature, scope and content of the Crown's duty to consult can vary widely, depending on the particular circumstances of a project. This analysis involves assessing the nature and strength of any rights that Aboriginal communities have claimed or asserted and how the government's proposed decisions and actions may affect those rights.

MNDM has the responsibility for coordinating the Crown's consultation efforts on decisions relating to mining and mineral exploration. If the project requires approvals or decisions by other Ministries with mineral development regulatory authority there will be a coordinated approach to the government's consultation with Aboriginal communities.

MNDM is working with Aboriginal communities and organizations as well as with mineral sector stakeholders on developing improved Aboriginal consultation processes for mineral sector activities. A broad based approach is being considered, including changes to the *Mining Act* and its regulations, new policies and improved practices. Please refer to MNDM's discussion paper "Towards Developing an Aboriginal Consultation Approach for Mineral Sector Activities at: http://www.mndm.gov.on.ca/MNDM/aboriginal/default_e.asp.

Given the time required to develop and implement an improved approach to Aboriginal consultations, the Ministry of Northern Development and Mines has implemented new measures that address some of the more immediate needs identified by both Aboriginal communities and the minerals sector to help us enhance our Aboriginal engagement activities.

For example:

- MNDM will be providing Aboriginal communities with maps and reports that highlight mineral claim staking activity, as well as information on who has staked a claim and when. They will send updated information throughout the year;
- When a mining claim has been recorded, MNDM will send a letter to the claim holder strongly encouraging them to contact those First Nations who may have an interest in an area where a company would like to explore; and
- MNDM will run a pilot project where it will withdraw culturally sensitive areas to protect them from mineral claim staking.

2.6.1 Why Engage with Aboriginal Communities?

Early and effective Aboriginal community engagement in mineral exploration and mining projects makes good business sense for communities and sector companies. Benefits include:

- Facilitating the Government review and permitting process, with the proponent completing some of the practical on-the-ground aspects of consultation
- Increased community participation in the project, ultimately leading to greater support
- Increased community awareness of project activities and the minimal footprint of mineral development projects compared to some other industrial activities

- Greater community comfort with project activities
- Improved access to Aboriginal community's labour pool
- Enhanced quality of community life through increased employment

Project proponents should also understand that:

- Government consultation is not a duplication of company engagement efforts
- Company–community engagements complement Government consultation
- To make informed permitting decisions, Government staff needs to be advised of company–community engagements, including consultations and any resulting agreements and accommodations, such as training programs and project-related jobs

Ontario's Mining Gateway (see: consultation with Aboriginal communities) provides a good summary of considerations for approaching consultation with Aboriginal communities.

The mineral development proponent is encouraged to commence discussions and engagement of potentially impacted Aboriginal communities as early as possible and should keep MNDM informed of their efforts. Good communication builds trust and lays the groundwork for ongoing engagement and productive relationships. Communities should be asked how they would like to be involved. Generally, in-person meetings with Aboriginal communities tend to work best. In some instances where language is a barrier, community translation services should be used.

Written descriptions of the proposed project activities should be provided.

Determining any community concerns and attempting to address those concerns by consensus is encouraged. For example, communities may indicate potential impacts on Aboriginal or treaty rights that can be avoided by changing the time or location of proposed activities.

Project proponents may also want to consider:

- the potential for community participation in the project, as part of the labour force, in provision of support services and goods, or as another type of project partner;
- exploring potential for a formalized understanding through agreement on respective roles throughout the project's life or for clarification of ongoing relationship principles and respective expectations, such as through a Memorandum of Understanding (MOU), Impact and Benefit Agreement (IBA), or Letter of Intent; and
- information the community can offer on the area's natural, physical or cultural characteristics as available through traditional or other local knowledge

Project proponents may wish to consult PDAC's e^3 program (Environmental Excellence in Exploration) which is a freely accessible database of guidelines and case studies. e^3 includes a detailed section on community engagement and working with indigenous peoples:http://www.mining.com/

2.7 Public Consultation

2.7.1 Purpose of Public Consultation

Development of a mineral resource through the stages of exploration, development, production and closure is likely to involve the interests of others beyond the project proponent. Generally a mineral development project will attract interest or represent a local interest to others due to past, current or future land uses of the project site or nearby lands. As a project planner needs to be aware of existing or developing initiatives that may affect his or her project, the same need to understand the how, what and where of a mineral development project applies to neighbours, owners and users of the land potentially affected by a proposed undertaking. If one understands the range of community needs and expectations for enjoyment and use of the land, and then uses this understanding to design a development approach that integrates all those factors, this is an approach that will go a long way towards meeting the objective of wise and balanced resource management.

2.7.2 Generally Accepted Practices

Within Ontario, development of new facilities or expanding existing ones commonly involves some type of public consultation, with the objective of identifying and addressing legitimate public issues or questions regarding the proposed development. Many types of development project require a consultation process. These include, for example, projects that are municipal, provincial or federal government related (e.g., building of roads, sewage works, government facilities), or provincial or federal regulated initiatives such as work on electrical power generating plants, transmission lines, gas or oil pipelines).

Although not generally subject to environmental assessment, it is also common for privately initiated developments, such as building of residential housing, industrial, institutional or commercial facilities, to undertake public consultation as part of the development approval procedures outlined by the municipalities within which the development is proposed. As well, public consultation, scoped to fit the likely extent of potential effect or influence on other people, or stakeholders, is accepted as a best management practice to assist in achieving a development concept that does not unduly impact upon others.

2.7.3 Planning for Public Consultation

Should advice on how to approach public consultation for a proposed mineral development project be desired, a myriad of written and professional resources are available. Books, government agency guides, agency staff resources or communications consultants can offer any range of support required. In general, considerations for developing a public consultation approach at different stages of a mineral development project include:

- **Purpose:** The overall purpose of consultation is to identify potential public concerns with a proposed project so that they can be considered and addressed. A good understanding of the planned project scope is critical;
- **Timing:** Consultation should occur early in the project stage; early identification of issues allows sufficient time for addressing concerns before major decisions are made, as well as provides opportunity and time for potential stakeholders to come forward, to understand the proposed project and be able to provide meaningful input;

- **Preparation:** At any stage of a project, prior to public consultation, the project manager should have a clear and relatively detailed understanding of the project purpose, its likely landscape impacts, an awareness and understanding of the likely permits and approvals required, and have identified potential stakeholders and their potential interests in the project;
- **Identification of Stakeholders:** As noted above, potential project stakeholders will include those individuals, businesses and groups/associations who own and/or enjoy the subject and adjacent lands for a variety of reasons, such as tourism, forestry, agriculture, recreation, mining, utility services, transportation corridors (rail, road), trapping, hunting, fishing, boating, etc. Many of the stakeholders will consist of the list of landowners, as identified through a review of the land tenure (described in section 2.2). Other stakeholder considerations are included in the Mining Gateway.
- **Choice of Appropriate Approach:** The method and extent of consultation is recommended to align with the project's complexity and potential for environmental effects. For example, a mine site project with development of extraction, processing, road and energy facilities will involve a longer consultation process with face-to-face meetings, versus prospecting a claim on private land that should see the proponent advising the affected property owner in advance of this activity. As well, a proposed project that occurs in an area with few stakeholders and with low potential for environmental effects will require less consultation than a project within an area with many different land uses and interested stakeholders, and/or if the project has the potential for significant effects requiring extensive mitigation;
- **Public Notification on Project Changes:** It is recommended that the public consultation process also include public notification of any significant project milestones that could trigger changes that would be noticed by the public. These could include initiation of drilling or stripping associated with advanced exploration; building of infrastructure and facilities during development; commissioning of the mine facilities; operating mine changes (generally major changes only); and initiation of site closure. The *Mining Act* specifies public notice requirements.

2.7.3.1 Public Consultation As Part of the EA Process

Consultation programs that are required as part of an environmental assessment will have numerous details strictly specified by the EA process. These include:

- methods of identifying stakeholders;
- timelines;
- notification requirements;
- recommended/required consultation methods; and
- requirements for documenting comments received and describing how these comments will be addressed throughout the lifespan of the project.

Direction on how to conduct a consultation process as part of an environmental assessment is part of the several agencies' guides, such as section **A.6.2 Public Consultation** in the Ontario Ministry of the Environment (MOE) Guide to EA Requirements for Electricity Projects, CEAA's Ministerial Guide for EA Screenings or MNR's Class EA for MNR Resource Stewardship and Facility Development Projects (Section 4), among many others.

The MOE has also published a general public consultation guide (1994*), Public Consultation Guide* (Publication Number PIBS 2819), available in paper copy through its Public Information Centre at 1-800-565-4923, and the MOE will soon release a *Guideline on Consultation in the Environmental Assessment Process*.

2.7.3.2 Public Consultation As Part of a Project Component Not Subject to EA

The general approaches outlined in various EA guides are also helpful in developing an approach for public consultation on project activities not subject to EA. They provide suggestions on, for example:

- identifying potentially affected stakeholders (*see* Section 2.2 "Land Tenure");
- developing a method for notifying relevant stakeholders about the proposed project (e.g., a summary of proposed activities and timelines);
- developing an approach for relaying to relevant stakeholders potential effects on the surrounding environment as a result of the project, and planned measures to mitigate these potential affects;
- devising an appropriate method of capturing stakeholders' comments; and
- following up with stakeholders on comments received and addressing these comments throughout the project's lifespan.

As with other aspects of managing mineral development projects, good planning will be a major factor in a successful public consultation program. Success can be measured as a relatively smooth consultation process through which the project proponent anticipates most to all concerns raised by stakeholders and is able to address them to the satisfaction of the majority of stakeholders and relevant agencies.

At a minimum, consultation should include an appropriate level of stakeholder discussions, consisting of two-way communication of the project details as they are developed and potential environmental and social effects, with sufficient time to receive and address public concerns prior to completion of project activities.

2.8 Coordinating the Regulatory Process

In addition to the background information and references provided throughout this Guide and through the Mining Gateway, recent changes to the provincial government's internal processes for managing approval and permit requirements have been developed, to facilitate a timelier and more efficient project planning and approvals process.

2.8.1 'One Window' Coordination Process

Development work has been completed on a new 'One Window' coordination process, establishing MNDM as the lead ministry responsible for coordinating the process leading to the issuance of all provincial mineral development permits in Ontario. A copy of the framework document that describes the process can be viewed at The Mining Gateway. A related initiative, under development as of writing, involves using a risk-based approach to determine if more optimal processes are available for granting permits and approvals that deal with low risk mineral development activities.

The various provincial government ministries involved with the regulation of mineral development projects in Ontario have also developed and implemented their own one-window protocols for managing their various permit and approvals procedures. The intended outcome is the improvement of client service through clearer and more efficient processes.

2.8.2 MNDM Resources

As part of its mandate to encourage sustainable development of mineral development projects in Ontario, the Ontario MNDM provides many written resources, tools such as guides, maps and databases as well as area experts to advise mineral development project planners throughout the life of their projects. Specifically, the Mines and Minerals Division works to generate new wealth and benefits for the residents of

Ontario by providing basic geological information gathering and interpretation in support of Ontario's exploration, mine development and mining sectors and the administration of Ontario's *Mining Act* in a fair and consistent fashion.

MNDM's head office is located in Sudbury, Ontario, Canada. Here, staff of the various MNDM branches collect, analyze and publish information about the state of the mining and mineral industries in Ontario, as well as information about the specific location and quality of mineral deposits.

Field staff located throughout the province provide consultative services to the industry through all phases of the mining sequence, and include resident geologists and mining recorders.

In addition, within the main regional offices of Sudbury, Timmins and Thunder Bay, MNDM provides the services of Mineral Development Coordinators. The role of the Mineral Development Coordinator is to promote advanced exploration and new mine development and assist mining industry clients throughout the permitting process by:

- providing information and advice on permitting requirements;
- bringing the proponent together with all relevant ministries in the early stages of project planning to discuss and facilitate permitting concerns;
- advising and assisting with public and First Nation consultation; and
- assisting with the resolution of project challenges.

Mineral Development Coordinators can be reached at your nearest MNDM Mineral Development office:

Location	Contact	Tel. #	E-Mail Address
Thunder Bay	Mike Grant	(807) 475-1746	mike.grant@ontario.ca
Thunder Bay	Mark O'Brien	(807) 475-1106	mark.o'brien@ontario.ca
Sudbury	Ramesh Mandal	(705) 670-5827	ramesh.mandal@ontario.ca
Timmins	Rob Ferguson	(705) 235-1628	rob.ferguson@ontario.ca
Timmins	Gord Yule	(705) 235-1626	gord.yule@ontario.ca

The Sudbury office is located at: 933 Ramsey Lake Road, 6th Floor, Sudbury, ON P3E 6B5

The Thunder Bay office is located at: Suite B002, 435 James Street South, Thunder Bay, ON P7E 6S7

The Timmins office is located at: 5520 Highway 101 East, South Porcupine, ON P0N 1H0

3.0 Navigating the Regulatory Process

Navigating the regulatory process includes consideration of provincial and federal laws, as well as local municipal bylaws that govern, or may govern, mineral development in Ontario. As described throughout this Guide, the specific permits and approvals to which a mineral project may be subject will depend on the specific features of the proposed project and its location in the social and environmental landscape. Appendices A to E provide an overview of 48 potential approvals processes associated with specific mine development activities, organized according to the appropriate mining cycle stage:

Appendix A - Exploration
Appendix B - Advanced Exploration
Appendix C - Mine Development
Appendix D - Mine Production
Appendix E - Mine Closure

This summary of approvals processes for mining activities is designed to provide a general understanding of the applicable legislation; the agencies that provide the approval or permit and can provide guidance; the issues involved; and additional sources of information required to successfully proceed through the approvals process.

Information provided in the appedices includes:

- *Activity* – The mining activity that has the potential to trigger requirement for an agency permit or approval;
- *Permit* – the type or name of approval required;
- *Issuing Agency* – the regulatory body responsible for reviewing the submitted information or application and for giving the formal approval to proceed with the activity;
- *Act* – the legislation that provides the authority for the required permit or approval, with a link to the full text of the enacting legislation;
- *Regulations* – the applicable regulation(s), if any, that specify the details on the permitting process and requirements;
- *Triggers* – specifics of the proposed activity that trigger the approval requirement;
- *Exemptions* – any specifics of the activity that exempt it from the specified approval process;
- *Critical Information Required* – key data and information, content and format, that must be provided in order for an approval to be granted;
- *Other Information Sources* – links to documents that provide guidance for this approval;
- *Professional Advice* – suggestions for support resources to successfully complete this approval.

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A01	Water crossing	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 975/90 – Work Permits - road or building construction on public lands (including water shore lands) Ont. Reg. 453/96 – Work Permit – Construction – for construction of road facility to enable crossing of a water body	Any work on water crossings (e.g., culvert installation, construction of a bridge, causeway or seasonal ice bridge)	None	Location of crossing, description of work, etc.	MNR work permit application and process	• Certified hydrogeologist • Professional engineer • Appropriate contacts at government • MNR Information Services and Offices
A02	Water crossing - construction of a dam	Approval	Conservation Authority (where exist) or Ministry of Natural Resources (MNR)	Lakes & Rivers Improvement Act	Ont. Reg. 454/96 - Construction	Work on water crossings that involves building a dam (e.g., culvert installation, construction of a bridge or causeway)	Not required if the *Public Lands Act* applies (work permit)	Location of crossing, description of work, etc.	MNR Information Services and Offices Conservation Authority Offices	• Certified hydrogeologist • Professional engineer • Appropriate contacts at government
A03	Water crossing that includes a dam that holds back, forwards or diverts water	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 975/90 – Work Permits - road or building construction on public lands (water shore lands) Ont. Reg. 453/96 – Work Permit – Construction – for construction of road facility to enable crossing of a water body	Any work on water crossings (e.g., culvert installation, construction of a bridge or causeway)	Not required if the *Public Lands Act* applies (work permit)	Location of crossing, description of work, etc.	Department of Fisheries and Oceans – Working in or around water	• Certified hydrogeologist • Professional engineer • Appropriate contacts at government • MNR Information Services and Offices
A04	Construction or upgrading of roads on Crown land	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 975/90 – Work Permits - for road or building construction on public land (Crown land)	Any work that involves upgrading of existing roads or building of new roads or trails on Crown land		Description of work type, timing, location	work permit application	• Professional engineer • Appropriate contacts at government • MNR Information Services and Offices

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A05	Water crossing of a navigable river	Approval	Transport Canada	Navigable Waters Protection Act	Navigable Waters Works Regulations	Any work for crossing of a navigable waterbody that may interfere substantially with navigation; e.g., construction of a bridge, boom, dam or causeway, dumping of fill or excavation of materials from the river bed, placement of any telegraph, power cable, wire, structure or device		Design of proposed works, location, structure, etc.	Transport Canada Regional Offices Information on Working In and Around Water (fish habitat management requirements, DFO) Approval Process	• Aquatic biologist • Professional engineer • Appropriate government contacts
A06	Water crossing	Fish Habitat Authorization	Department of Fisheries and Oceans (DFO) or Conservation Authorities, on behalf of DFO, where agreement exists	Fisheries Act	Fishery (General) Regulations (SOR/93-53)	Work on water crossings or work near water that is fish habitat		Detailed description of work, location, timing, diagrams, purpose, etc.	Information on Working In and Around Water (fish habitat management requirements, DFO) Work Authorization Process Application for Authorization for Works or Undertakings Affecting Fish Habitat	• Aquatic biologist • DFO Regional Offices Contact Information • Location and Contacts for Conservation Authorities

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A07	Trenching, stripping or drilling in designated environmentally sensitive areas	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ontario Regulation 349/98 Work Permit – Disruptive Mineral Exploration Activities	Special requirements for staking and exploration within Temagami area; potential activities in other designated environmentally sensitive areas identified within Schedule 1 of the above regulation		Description of proposed works – timing, location, nature	Working on Crown Land Environmental Excellence in Exploration guide (PDAC)	• Biologist • MNR District Contact Information • MNDM Regional Land Use Geologists
A08	Tree removal for road building, or advanced exploration activities of stripping, trenching or drilling	Timber Cutting Licence	Ministry of Natural Resources (MNR)	Crown Forest Sustainability Act	N/A	Tree removal on Crown land		Location of proposed works	Working on Crown Land Fact Sheet Ontario's Forest Licensing System	• MNR District Offices -
A09	Exploration activities – significant drilling, stripping or trenching	Official Plan Amendment or Zoning Bylaw Amendment	Municipality within which the site for the proposed activity falls	Planning Act	Applicable legal documents - Municipal Official Plans and Zoning By-Laws approved under the *Planning Act*	Proposed change in land use that is currently not allowed for the site under current land use designation and zoning	Current designated and zoned land use may allow the proposed mine development activities	Geographic location and nature of proposed activities	Ministry of Municipal Affairs and Housing Citizen's Guides to Land Use Planning Municipal jurisdictions and contact information	• Municipal Land Use Planner for the relevant area • Professional Planner • MNDM Regional Land Use Geologists

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A10	Burning of removed vegetation from road building, stripping, trenching or drilling	Burning Permit	Ministry of Natural Resources (MNR)	Forest Fire Prevention Act	Ontario Regulation 207/96 Outdoor Fires	Burning of removed vegetation		Activity timing, location	MNR Forest Fire Management Information	• MNR Fire Management Contacts
A11	Drilling on or adjacent to provincial highways	Encroach-ment Permit	Ontario Ministry of Transportation (MTO)	Public Transportation and Highway Improvement Act		Drilling activity that may impact upon the highway or its right-of-way		Location and description of proposed works near highway; determine if works may impact other infrastructure along highway (phone, pipes)	Encroachment Permit Application Background Information on Encroachment Permits	• MTO Corridor Management Office
A12	Exploration activities on First Nation reserves	Permit to Explore	Indian and Northern Affairs Canada	Indian Act	Indian Mining Regulations	Exploration activities on lands of a First Nation reserve		Location of the proposed activity	Maps of aboriginal communities	• INAC Offices in Ontario

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A13	Bulk sampling to test mineral materials	Permission to test material; Closure plan (see above)	Ministry of Northern Development and Mines (MNDM)	Mining Act Section 52	Ont. Reg. 240/00 – Mine Development and Closure under Part VII of the Act	Proposed removal of a mineral-bearing substance for the purpose of testing mineral content	Samples less than 10 tonnes that are not precious or semi-precious minerals	• Claim data • Permission of surface rights holder • Map • Type / amount of material to be excavated • Testing purpose • Approach and timing of activities • Disposal methods • Safety and rehabilitation measures • Financial assurance	Application Instructions for Bulk Sampling on Unpatented Mining Claims under Section 52 of the Mining Act MNDM Mineral Development Section	• MNDM Mineral Development Section
A14	Purchase and possession of blasting explosives	Blasting Explosives Purchase and Possession Permit (Previously Form 20)	Natural Resources Canada (NRCan) – Explosives Regulatory Division (ERD)	Explosives Act Section 7		Personal use (not for sale or transfer) of blasting explosives in a quantity of 75 kg or less, or 100 detonators, for road building, trenching		Proposed type and use of explosives	NRCan Information on Explosives Licensing Information on Permits Relevant application forms and Guidelines	• NRCan Explosives Regulatory Division Contacts

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A15	Establishment of explosives storage facility	Licence for Explosives Magazine (Form 10)	Natural Resources Canada (NRCan) – Explosives Regulatory Division (ERD)Division (ERD)	Explosives Act Section 7	None	Required for constructing or maintaining an explosives magazine		Location of facility, quantities to be transported and stored	NRCan Information on Explosives Licensing Information on Permits Relevant application forms and Guidelines Form 10	• NRCan Explosives Regulatory Division Contacts
A16	Construction of semi-permanent buildings	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 453/96 – Work Permit – Construction – for construction of buildings on public land	Construction of buildings on public land	Not required if the *Public Lands Act* applies (work permit)	Description of work, etc.	Working on Crown Land Fact Sheet	• Professional engineer • Appropriate contacts at government • MNR Information Services and Offices
A17	Establishment of commercial signage on provincial highway	Commercial Signage Permit	Ministry of Transportation (MTO) – Corridor Management	Public Transportation and Highway Improvement Act		Commercial signs placed near a highway		Application form, fee, copies of proposed signage	MTO Commercial signage information Commercial Sign Permit application	• MTO Corridor Management Offices
A18	Buildings on or near a highway corridor	Building / Land Use Permit	Ministry of Transportation MTO-Corridor Management	Public Transportation and Highway Improvement Act, S. 34		Building near highways				• MTO Corridor Management Offices
A19	Establishment of entrance to a provincial highway	Entrance Permit	Ministry of Transportation MTO-Corridor Management	Public Transportation and Highway Improvement Act		Requirement for a new or upgraded road entrance onto a provincial highway / highway interference or obstruction		Application, plans for proposed work, fee, proof of commercial zoning	Application for Entrance Permit	• MTO Corridor Management Offices

Appendix A. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Exploration

No.	*Activity*	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
A20	Encroachments on the MTO right-of-way	Encroachment Permit	Ministry of Transportation MTO-Corridor Management	Public Transportation and Highway Improvement Act		Activities within 45 metres of the highway may be controlled for safety considerations				• MTO Corridor Management Offices
	Note: In addition to the permits and licences regarding use of explosives, mineral development projects may also require a Project Premises Identification Number (PPID#), and/or a Notice of Use and Storage, both of which fall under the Ministry of Labour's *Occupational Health and Safety Act*.									

Appendix B. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Advanced Exploration

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
B01	Significant stripping and trenching	Closure Plan	Ministry of Northern Development and Mines (MNDM)	Mining Act	Mining Act Ont. Reg. 240/00 – Section 11	Advanced exploration activities require filing of a closure plan (section 140 of the *Mining Act*) Advanced Exploration is defined in section 139 of Mining Act	N/A	Project description: • current project site conditions (land use, surface waters, ground waters, terrestrial and aquatic biology • site history / potential mine hazards or contamination) Planned rehabilitation measures Monitoring Site conditions after close out		• MNDM Mineral Development Section • Rehabilitation Compliance and Inspection Office
B02	Construction of dams, dykes or diversions, including tailings dams	Work Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 975/90 – Work Permits Ont. Reg. 453/96 – Work Permit – Construction	Plans for construction of dams, channelizations, diversions, in-stream ponds and by-pass ponds		Description of site, proposed activity, project rationale, equipment, timeframe, potential impacts, mitigating measures	MNR: Working on Crown Land: What you should know about Mineral Exploration, Building Construction and Road and Trail Construction MNR: New MNR Guidelines for some Activities on Crown Land	• Certified hydrogeologist • Professional engineer • MNR Information Services and Offices

Appendix B. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Advanced Exploration

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
B03	Construction of dams, dykes or diversions, including tailings dams	Location approval, plans and specification approval	Conservation Authority, where one exists, or Ministry of Natural Resources (MNR)	Lakes & Rivers Improvement Act	Lakes and Rivers Improvement Act Ont. Reg. 454/96 – Construction	Retaining / diverting structures and channels	Not required if the *Public Lands Act* applies (i.e. for work permit)	Description of site, description of proposed activity	MNR Information Services and Offices Conservation Authority Offices	• Certified hydrogeologist • Professional engineer
B04	Construction of dams, dykes or diversions, including tailings dams	Fish Habitat Authorization	Department of Fisheries and Oceans (DFO) or Conservation Authorities, on behalf of DFO, where agreement exists	Fisheries Act	Fishery (General) Regulations (SOR/93-53)	Potential for harmful alteration, disturbance or destruction of fish habitat		Description of site, proposed activity, project rationale, equipment, timeframe, potential impacts, mitigating measures	Information on Working In and Around Water (fish habitat management requirements, DFO) Work Authorization Process Application for Authorization for Works or Undertakings Affecting Fish Habitat	• Aquatic biologist • DFO Regional Offices Contact Information • Location and Contacts for Conservation Authorities -
B05	Development of an electrical power generating facility	Environmental Assessment approval	Ontario Ministry of Environment	Ontario Environmental Assessment Act	Ont. Reg. 116 – Electricity Projects (individual EA for Power Generation Facilities)	Screening level assessment for diesel generation facilities >1MW and <5 MW EA for diesel generation >5 MW		Detailed project description for facility, size, location, power generation Environmental inventory and impact assessment	Overview of EA process Guide to EA Requirements for Electricity Projects	• Professional engineer • Relevant environmental specialists (biologists, air quality, etc.) • Environmental Assessment Branch MOE

Appendix B. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Advanced Exploration

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
B06	Construction of electrical transmission lines	Environmental Assessment approval	Ontario Ministry of Environment	Ontario Environmental Assessment Act		Class EA required for most transmission lines		Power source, requirements, size and length of transmission facilities Environmental inventory and impact assessment	Class EA for Minor Transmission Facilities http://www.ene.gov.on.ca/en/business/cofa/index.php EAB	• Professional engineer • Relevant environmental specialists (biologists, air quality, etc.) • Environmental Assessment Branch, Ministry of Environment
B07	Mineral collection export of mineral specimens	Export Permit	Canadian Heritage	Cultural Property Export and Import Act:	Cultural Property Export/ Import Act Canadian Cultural Property Export Control List – Group I Objects recovered fm soil/waters of Canada	Export of mineral specimens on *Canadian Cultural Property Export Control List*		Information with respect to exporter, receiver, dates, value, etc.	Canadian Heritage – Movable Cultural Property Program	• Canadian Heritage Movable Cultural Property Program Regional Offices
B08	Settling ponds, tailings dams, etc.	Certificate of Approval – Industrial Sewage Works	Ontario Ministry of Environment	Environmental Protection Act Ontario Water Resources Act, s. 53	Ont. Reg. 560/94 Effluent Monitoring and Effluent Limits – Metals Mining Sector ; Ont. Reg. 561/94 Effluent Monitoring and Effluent Limits – Industrial Minerals Sector	Sewage works greater than 10,000 litres per day		Pre-application consultation to define environmental objectives, e.g., effluent requirements, characterisation, source of raw water, special approvals, level of public consultation / notification	• Sewage Works Certificate of Approval Application form • Guide to Applying for Industrial Sewage Works	• MOE Environmental Assessment and Approvals Branch

Appendix B. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Advanced Exploration

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
B09	Discharging emissions to air (including noise)	Certificate of Approval – Air and Noise	Ontario Ministry of Environment	Environmental Protection Act	Ont. Reg. 419/05 Air Pollution – Local Air Quality Ont. Reg. 337 – Ambient Air Quality Criteria	Discharge of an airborne contaminant into the natural environment, including noise			Air Emissions Certificate of Approval Application form Guide to Applying for Approval (Air & Noise)	MOE Environmental Assessment and Approvals Branch
B10	Waste generation	Generator Registration Report	Ontario Ministry of Environment	Environmental Protection Act	Ont. Reg. 347/90 – General – Waste Management – Sections 18 to 27 (Registration, Manifests) (i.e., generator, carrier and receiver requirements)	Storage and transportation of hazardous wastes. Type / amount of waste is *registerable* or *hazardous* as defined in Ont. Reg. 347			Hazardous Waste Information Network	• Ministry of Environment Regional and District Offices
B11	Taking water (pumping, draining, dewatering)	Permit to Take Water (>50,000 L)	Ontario Ministry of Environment	Ontario Water Resources Act, s. 34	Ont. Reg. 387/04 – Water Taking	Taking more than 50,000 litres/day.	< 50,000 litres/day		Permit to Take Water Application form and guidelines Information on Water Taking	• Ministry of Environment Regional and District Offices
B12	Collection and possession of fish or other wildlife for scientific purposes	Authorization to Collect Fish for Scientific Purposes	Ministry of Natural Resources (MNR)	Fish and Wildlife Conservation Act s. 39	Ont. Reg. 664/98 – Fish Licensing – Part IV Miscellaneous – Section 34.1	Collection of fish for testing (e.g., for environmental baseline studies)				• MNR District Office
	Note: All projects should be evaluated on a case-by-case basis. Some permits and authorizations required in other Appendices may be equally appropriate to the advanced exploration stage of the mining cycle. In particular, MNR work permits described in Appendix A on lines A01, A03, A04, A07 and A16 may be necessary at this stage, as well as permits and licences described on lines A13 (Permission to test material), A15 (Licence for Explosives Magazine), A17 (Commercial Signage Permit), A18 (Building/Land Use Permit), A19 (Entrance Permit) and/or A20 (Encroachment Permit) may apply at this stage. An Advanced Exploration Closure Plan may be required under Part VII of the *Mining Act*, and where use of explosives is planned, mineral development projects may also require a Project Premises Identification Number (PPID#), and/or a Notice of Use and Storage, both of which fall under the Ministry of Labour's *Occupational Health and Safety Act*.									

Appendix C. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Development

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
C01	Building construction	Building Permit - municipality	Municipality within which the project is located, under authority of Ministry of Municipal Affairs and Housing	Building Code Act Section 8 – Construction and Demolition, Building Permits	Bylaw(s) of relevant municipality	Construction of facilities for development of mine operations	Construction of buildings	Site plan and building design	*Ontario Building Code* and associated publications	• Municipal Chief Building Official Staff – locate through Association of Municipalities of Ontario (AMO) • Ministry of Municipal Affairs and Housing – Building Code information
C02	Building construction on Crown land	Class Environ-mental Assessment (EA) for Resource Stewardship and Facility Development	Ministry of Natural Resources (MNR)	Environmental Assessment Act		Acquisition of Crown land for buildings, facilities, roads and water crossings		Project description, location, timing, potential impacts and mitigation measures	Guidance Document - Class EA for MNR Resource Stewardship and Facility Development Projects	• MNR District Offices
C03	Building construction on Crown land with need for land tenure	Land Use Permit	Ministry of Natural Resources (MNR)	Public Lands Act	Public Lands Act Ont. Reg. 973/90 – Land Use Permits	When land tenure is required to use Crown land for building		Location and proposed project details	MNR Crown Land Management MNR Crown Land Use Policy Atlas MNR Crown Land Use and Environmental Planning in Ontario	• MNR District Offices

Appendix C. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Development

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
C04	Mine site development with federal interest	Environmental Assessment Approval	Canadian Environmental Assessment Agency	Canadian Environmental Assessment Act (CEAA)	List of Regulations under CEAA	Any project proposed on federal land, supported by federal program or subject to federal legislation	Private mining projects are not usually designated for federal EA requirements	Project description, impact assessment, proposed mitigation measures	Description of Environmental Assessments under CEAA Basics of Environmental Assessment Canada-Ontario Agreement on EA Cooperation	• CEAA staff in Regional Offices • Ontario Ministry of Environment EA staff
C05	Mine site development with provincial interest	Work permit – PLA (Crown land)	Ministry of Natural Resources (MNR)	Public Lands Act	Ont. Reg. 975/90 – Work Permits Ont. Reg. 453/96 – Work Permit – Construction – both for construction of buildings on public lands	Work on provincial Crown land for mine site or supporting facilities, public undertaking			MNR: Working on Crown Land: What you should know about Mineral Exploration, Building Construction and Road and Trail Construction MNR: New MNR Guidelines for some Activities on Crown Land	• MNR District Offices
C06	Facility construction - construction adjacent to or on a provincial highway	Class Environmental Assessment Approval	Ministry of Transportation	Environmental Assessment Act		Construction or realignment of a provincial highway		Proposed activities, alternatives, location, impact upon environment	Guidance Document - Class EA for Provincial Transportation Facilities	• MTO Contact information

Appendix C. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Development

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
C07	Facility construction on First Nation Reserve land	Permit to Construct Facilities on First Nation Reserve Lands	Indian and Northern Affairs Canada (INAC)	Indian Act	Indian Mining Regulations	Construction of any facilities on First Nation reserve lands		Project description, rationale, proposed location		• INAC Offices in Ontario
C08	Mine site development	Pre-development review process	Ministry of Labour	Occupational Health and Safety Act	Occupational Health and Safety Act Ont. Reg. 854/90 – Mines and Mining Plants	Requires safety and procedures review of project prior to development				• Ministry of Labour Offices
C09	Tax exemption for a remote mine	Certification of a remote mine	Ministry of Finance Ministry of Northern Development and Mines (MNDM)	Mining Tax Act Sections 3 to 8:		Mine developed after May 7, 1996; closure plan for the mine under Part VII of the *Mining Act*; at least 30 kilometres between the pit's mouth and the nearest all-year road or railway able to meet mine's transportation requirements		Application form for Certification of a Remote Mine		• MNDM Mineral Development Section • Chartered Accountant
C10	Airstrip		Transport Canada							•
	• Note: All projects should be evaluated on a case-by-case basis. Some permits and authorizations required in other Appendices may be equally appropriate to the mine development stage of the mining cycle. In particular, permits described in Appendix A, lines A17 (Commercial Signage Permit) and A19 (Entrance Permit) may apply at this stage.									

Appendix D. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Production

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
D01	Aggregate Extraction	Aggregate Permit / Licence	Ministry of Natural Resources (MNR)	Ontario Aggregate Resources Act (ARA)	Ontario Regulation 244/97 (amended to Ont. Reg. 209/04)	Licence required for removal of aggregate from a pit or quarry	Any private lands not listed in the regulations		MNR Information on Aggregate Resources	• MNR District Offices
D02	Development of mining process facilities with emissions to water	Certificate of Approval	Ontario Ministry of Environment	Environmental Protection Act		Discharge of industrial wastewaters to surface water as a result of industrial process		Description of industrial process, including inputs, operations, controls, wastewater testing	Waste Disposal Site and Waste Management System Certificates of Approval Information Waste Certificate of Approval Application Form	• Professional engineer, air monitoring and pollution control • MOE Environmental Assessment and Approvals Branch • Ministry of Environment Regional and District Offices
D03	Waste management – water disposal of dredged materials	Permit to Dispose of Waste (Dredging) in Canadian Marine Waters	Environment Canada	Canadian Environmental Protection Act	Disposal at Sea Regulations Regulations Respecting Applications for Permits for Disposal at Sea Ocean Dumping Permit Fee Regulation	Disposal of dredged materials in waterways if in federal marine waters		Description of disposal site, materials to be disposed of, quantity, route, equipment, carrier, etc.	Permit application for marine disposal of dredged materials	• Environment Canada

Appendix D. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Production

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
D04	Waste management – waste disposal site construction and operation	Certificate of Approval	Ontario Ministry of Environment	Environmental Protection Act		Proposed construction of a waste disposal site		Description of quantity and quality of waste to be generated, handling and disposal details	Waste Disposal Site and Waste Management System Certificates of Approval Information Waste Certificate of Approval Application Form h	• Professional engineer, air monitoring and pollution control • MOE Environmental Assessment and Approvals Branch • Ministry of Environment Regional and District Offices
D05	Establishment of tailings facility for waste management – tailings dam construction **OR** Sewage treatment facility construction and operation	Certificate of Approval – Industrial Sewage Works	Ontario Ministry of Environment	Environmental Protection Act		Proposed construction of a tailings facility for waste management; facility development that would result in discharge of domestic sewage to surface water or ground		Description of quantity and quality of waste to be generated, handling and disposal details facility design	*****SEE APPENDIX B, LINE B08 FOR INFORMATION RE INDUSTRIAL SEWAGE WORKS CERTIFICATE OF APPROVAL*****	• Professional engineer, air monitoring and pollution control • MOE Environmental Assessment and Approvals Branch • Ministry of Environment Regional and District Offices
D06	Transportation of explosives	Permit	Natural Resources Canada (NRCan) – Explosives Regulatory Division (ERD)	Explosives Act Section 7	None	Required for constructing or maintaining an explosives magazine		Location of facility, quantities to be transported and stored	NRCan Information on Explosives Licensing Information on Explosives Permits Relevant application forms and Guidelines	• NRCan Explosives Regulatory Division Contacts

Appendix D. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Production

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
		Permit of Equivalent Level of Safety	Transport Canada (TC) – Transport Dangerous Goods Directorate	Transportation of Dangerous Goods Act	Transportation of Dangerous Goods Regulations, Part 14	There is no obligation on any person to apply for a permit for equivalent level of safety to handle, offer for transport or transport dangerous goods. However, if a person wants to conduct an activity in a way that is not consistent with the Act or Regulations, the person must apply for a permit for equivalent level of safety to do so under section 31 of the Act.		A description of the dangerous goods, the method of packaging, modes of transport, timelines / schedule, safe handling procedures, etc. Must show that the way in which the activity will be carried on will provide a level of safety equivalent to complying with the Regulations.	Transportation of Dangerous Goods Primer	• Transport Dangerous Goods Directorate
D07	Construction or relocation of a highway	Class Environ-mental Assessment Approval	Ministry of Transportation	Environmental Assessment Act		Construction or realignment of a provincial highway		Proposed activities, alternatives, location, impact upon environment	Guidance Document - Class EA for Provincial Transportation Facilities	• MTO Contact information • Professional engineer

Appendix D. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Production

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
D08	Construction of a hydrocarbon pipeline	Order Granting Leave to Construct a Hydrocarbon Pipeline	Ontario Energy Board	Ontario Energy Board Act	N/A	If size of the pipeline is >20 km in length, if any portion of the line is 12 inches or more in diameter, if the pipeline has an operating pressure of 2,000 kilopascals or more, or other criteria prescribed by regulations		Environmental impact assessment of proposed pipeline	Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario	• Relevant environmental specialists • Ontario Energy Board
D09	Processing of minerals outside of Canada	Domestic Processing Exemption *Mining Act* Section 91 exemption	Ministry of Northern Development and Mines (MNDM)	Mining Act Section 91 (1), (3)		Required to process ore outside of Canada		Rationale for exemption: where ores/ minerals are to be treated; why they cannot be treated in Canada; amount and description of ores / minerals; description of source location(s); time of exemption	MNDM Domestic Processing Requirement/ Exemption	• MNDM Mineral Development Section

Appendix D. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Production

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
D10	Export and import of rough diamonds	*Kimberley Process* Certificate for Diamonds	NRCan – Kimberley Process Office	Export and Import of Rough Diamonds Act	Regulations SOR/2003-15	All rough diamonds being traded between *Kimberley Process* participants under Customs Tariff Subheadings 7102.10, 7102.21 and 7102.31 must be accompanied by a *Kimberley Process* certificate		Information regarding the origin of the diamonds, their mass and value, the exporter and destination	Kimberly Process Certificate Application form Information on Kimberly Process	• Kimberley Process Office, NRCan
	• Note: All projects should be evaluated on a case-by-case basis. Some permits and authorizations required in other Appendices may be equally appropriate to the mine production stage of the mining cycle. In particular, permits and licences described in Appendix A, lines A15 (Licence for Explosives Magazine) and A19 (Entrance Permit), and in Appendix B, lines B09 (Certificate of Approval – Air and Noise) and B11 (Permit to Take Water) may apply at this stage. As well, Natural Resources Canada requires annual production statistics (on behalf of the Province of Ontario) under Part IX of the *Mining Act*. Under the Ontario *Mining Act*, MNDM requires that accurate mine plans be maintained annually. Notices of Material Change and/or of Project Status Changes are also required, should these changes occur. Environment Canada is responsible for administration of the (federal) Metal Mining Effluent Regulations (MMER), which also apply to any mine in Canada.									

Appendix E. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Closure

	Activity	*Permit / Approval*	*Issuing Agency*	*Act*	*Regulations*	*Triggers (if any)*	*Exemptions (if any)*	*Critical Information Required*	*Other Information Sources*	*Professional Advice*
E01	Mine closure	Verification of Closure Plan Completion	Ministry of Northern Development and Mines (MNDM)	Mining Act	Ontario Regulation 240/00 – Mine Development and Closure Plan Under Part VII of the Act	Completion of closure plan		Submission of all information required under Part VII of the Act and Regulation		• MNDM Mineral Development Section • Rehabilitation Compliance and Inspection Office
	Note: All projects should be evaluated on a case-by-case basis. Some permits and authorizations required in other Appendices may be equally appropriate to the mine closure stage of the mining cycle. In particular, the Certificate of Approval for Industrial Sewage Works, described in Appendix B, line B08, would apply to long-term monitoring of effluents. As well, under the Ontario *Mining Act*, MNDM requires that accurate mine plans be maintained annually. Notices of Material Change and/or of Project Status Changes are also required, should these changes occur.									

Appendix E. Permit Navigation System - EXPLORATION / MINING CYCLE STAGE: Mine Closure