TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY

(compliant with National Instrument 43-101 and Form 43-101F1)

Project Location

Latitude 48º 22' North and Longitude 78 º 23' West
Fournière, Malartic, and Surimau Townships
Province of Quebec, Canada

MINE CANADIAN MALARTIC

AGNICO EAGLE YAMANAGOLD

Qualified Persons:

Donald Gervais, P. Geo.
Christian Roy, Eng.
Alain Thibault, Eng.
Carl Pednault, Eng.
Daniel Doucet, Eng.

Effective Date: June 16, 2014
Signature Date: August 13, 2014

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**TECHNICAL REPORT ON THE MINERAL
RESOURCE AND MINERAL RESERVE ESTIMATES
FOR THE CANADIAN MALARTIC PROPERTY
(Compliant with National Instrument 43-101 and Form 43-101F1)**

Prepared for

Canadian Malartic GP
100, chemin du Lac Mourier
Malartic, Québec
Canada, J0Y 1Z0.

(signed and sealed) Donald Gervais, P.Geo.
Donald Gervais, P.Geo.
Canadian Malartic GP

Signed at Val-d'Or on 13th August, 2014

(signed and sealed) Christian Roy, Eng.
Christian Roy, Eng
Canadian Malartic GP

Signed at Val-d'Or on 13th August, 2014

(signed and sealed) Alain Thibault, Eng.
Alain Thibault, Eng.
Canadian Malartic GP

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SIGNATURE PAGE (2)

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Prepared for

Canadian Malartic GP
100, chemin du Lac Mourier
Malartic, Québec
Canada, J0Y 1Z0.

(signed and sealed) Carl Pednault, Eng.
Carl Pednault, Eng.
Canadian Malartic GP

Signed at Val-d'Or on 13th August, 2014

(signed and sealed) Daniel Doucet, P.Eng.
Daniel Doucet, Eng.
Agnico Eagle Mines Limited

Signed at Val-d'Or on 13th August, 2014

CERTIFICATE OF AUTHOR – DONALD GERVAIS

I, Donald Gervais, P.Geo. (OGQ No. 520), from Val-d'Or (Québec) do hereby certify that:

1. I am employed by and carried out this assignment for Canadian Malartic General Partnership, 100, chemin du Lac Mourier, Malartic, Québec, Canada, J0Y 1Z0;
2. I graduated with a Bachelor's degree in Geology (1986; B.Sc.) from Université du Québec à Chicoutimi (Chicoutimi, Québec);
3. I am a member of the Ordre des Géologues du Québec (OGQ No. 520);
4. I have practiced my profession in geology and mining for more than 25 years, and I have gained experience in gold, silver and base metals. I have worked for Northgate, Westminer, Ressources MSV (1987-95), Inmet Mining (1995-97), Pan American Silver Corp (1998-2000), IAMGOLD (2001-06), Breakwater Resources (2006-09) and Osisko Mining Corporation (2010-13). I have been working in the domain of mine geology my entire carrier. I have specialized in computer modelling of mineral resources and grade control in open pit and underground mines. I worked as Geology Superintendent for 3 years and I have been working as Director of Technical Services at the Canadian Malartic Mine (the "Mine") since January 2013;
5. I am a "qualified person" as that term is defined in National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* ("NI 43-101");
6. I am responsible for sections 1, 2, 3, 4, 6 to 12, 14, 15, 23, 25, 26 and 27 of the technical report titled "TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY" (the "Report") with an effective date of June 16, 2014 (the "Effective Date") relating to the Mine;
7. At the Effective Date, to the best of my knowledge, information and belief, the sections of the Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Report not misleading;
8. I am not independent of Agnico Eagle Mines Limited, as that term is described in section 1.5 of NI 43-101; and
9. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101.

Dated this 13th day of August, 2014.

(signed and sealed) Donald Gervais, P.Geo.

Donald Gervais, P. Geo.

CERTIFICATE OF AUTHOR – CHRISTIAN ROY

I, Christian Roy, Eng. (OIQ No. 130674), from Malartic (Québec) do hereby certify that:

1. I am employed by and carried out this assignment for Canadian Malartic General Partnership, 100, chemin du Lac Mourier, Malartic, Québec, Canada, J0Y 1Z0;
2. I graduated with a Bachelor's degree in Mining Engineering (2003; B.Sc.A.) from Université Laval (city of Québec, Québec);
3. I am a member of the Ordre des Ingénieurs du Québec (OIQ No. 130674);
4. I have practiced my profession in engineering and mining for more than 10 years, and I have gained experience in gold, silver and base metal mining. I have worked for Inmet Mining (2002-2004), Agnico Eagle Mines Limited (2005), Vale Inco (2006-2008), Orica Mining Services (2008-2010) and Osisko Mining Corporation (2010-2014). I have worked in mine engineering my entire carrier. I have worked in Canada and abroad. I currently am the Engineering Superintendent at the Canadian Malartic Mine (the "Mine");
5. I am a "qualified person" as that term is defined in National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* ("NI 43-101");
6. I am responsible for sections 1, 2, 16, 18, 19, 21, 25, 26 and 27 of the technical report titled "TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY" (the "Report") with an effective date of June 16, 2014 (the "Effective Date") relating to the Mine;
7. At the Effective Date, to the best of my knowledge, information and belief, the sections of the Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Report not misleading;
8. I am not independent of Agnico Eagle Mines Limited, as that term is described in section 1.5 of NI 43-101; and
9. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101.

Dated this 13th day of August, 2014.

(signed and sealed) Christian Roy, Eng.

Christian Roy, Eng.

CERTIFICATE OF AUTHOR – ALAIN THIBAULT

I, Alain Thibault, Eng. (OIQ No. 43848), from Rivière-Héva (Québec) do hereby certify that:

1. I am employed by and carried out this assignment for Canadian Malartic General Partnership, 100, chemin du Lac Mourier, Malartic, Québec, Canada, J0Y 1Z0;
2. I graduated with a Bachelor's degree in Mining Engineering (1987; BSc.A.) from the Université Laval (city of Québec, Québec);
3. I am a member of the Ordre des Ingénieurs du Québec (OIQ No. 43848);
4. I have been an Engineer since April 2008 at the Canadian Malartic Mine (the "Mine") where I have been Project Engineer, Senior Metallurgist, and now Trainer – Process Plant. Since my graduation from university, I have gained over 27 years of experience as a engineer in mines and processing plants (Industries Piedmont, Agnico Eagle (Joutel mine), Les Mines Selbaie Inc. (Selbaie mine), Breakwater Resources Ltd (Bouchard-Hébert and Langlois mines));
5. I am a "qualified person" as that term is defined in National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* ("NI 43-101");
6. I am responsible for sections 1, 2, 13, 17, 25, 26 and 27 of the technical report titled "TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY" (the "Report") with an effective date of June 16, 2014 (the "Effective Date") relating to the Mine;
7. At the Effective Date, to the best of my knowledge, information and belief, the sections of the Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Report not misleading;
8. I am not independent of Agnico Eagle Mines Limited, as that term is described in section 1.5 of NI 43-101; and
9. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101.

Dated this 13th day of August, 2014.

(signed and sealed) Alain Thibault, Eng.

Alain Thibault, Eng.

CERTIFICATE OF AUTHOR – CARL PEDNAULT

I, Carl Pednault, Eng. (OIQ No. 135738), from Malartic (Québec) do hereby certify that:

1. I am employed by and carried out this assignment for Canadian Malartic General Partnership, 100, chemin du Lac Mourier, Malartic, Québec, Canada, J0Y 1Z0;
2. I graduated with a Bachelor's degree in Geological Engineering (2000; BSc.A.) from École Polytechnique de Montréal (Montréal, Québec);
3. I am a member of the Ordre des Ingénieurs du Québec (OIQ No. 135738);
4. I was hired as an Engineering Consultant by Golder Associates Inc. in June 2004. In October 2007, as project manager at Golder Associates, I became involved in several aspects of the design of the Canadian Malartic Mine (the "Mine"), such as the geotechnics, geomechanics, hydrology and hydrogeology studies and reports, and more particularly in the design of the tailings, the waste dumps and the ponds. I was also involved in the process for various authorizations and permits. Since March 2012, I have been an employee at the Mine. I am responsible for the tailings and waste dump management, for the water management, and for the closure plan of the Mine site;
5. I am a "qualified person" as that term is defined in National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* ("NI 43-101");
6. I am responsible for sections 1, 2, 5, 20, 25, 26 and 27 of the technical report titled "TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY" (the "Report") with an effective date of June 16, 2014 (the "Effective Date") relating to the Mine;
7. At the Effective Date, to the best of my knowledge, information and belief, the sections of the Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Report not misleading;
8. I am not independent of Agnico Eagle Mines Limited, as that term is described in section 1.5 of NI 43-101; and
9. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101.

Dated this 13th day of August, 2014.

(signed and sealed) Carl Pednault, Eng.

Carl Pednault, Eng.

CERTIFICATE OF AUTHOR – DANIEL DOUCET

I, Daniel Doucet, Eng. (OIQ No. 39106), from Val-d'Or (Québec) do hereby certify that:

1. I am Corporate Director Reserve Development of Agnico Eagle Mines Limited since April 2008 and I work at 10200 Route de Preissac, Rouyn-Noranda, Québec, Canada, J0Y 1C0;
2. I graduated with a B.Eng. in Geological Engineering from University of Quebec at Chicoutimi in 1983;
3. I am a Professional Engineer registered with the Ordre des ingenieurs du Quebec (OIQ No. 39106);
4. I have worked as an Eng. geologist in the exploration and production domains since 1983, and I have supervised several drilling programs, grade control protocols and mineral reserve and resource estimates;
5. I am a "qualified person" as that term is defined in National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* ("NI 43-101");
6. I am responsible for Sections 1, 2, 15, 25, 22, 24, 26 and 27 of the technical report titled "TECHNICAL REPORT ON THE MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES FOR THE CANADIAN MALARTIC PROPERTY" (the "Report"), with an effective date of June 16, 2014 (the "Effective Date") relating to the Canadian Malartic Mine (the "Mine");
7. I most recently personally inspected the Mine on several visits done in June and July 2014, for an equivalent period of 4 days. During these visits, I did surface visits of the operation and reviewed with the technical department of the Canadian Malartic Mine the work being conducted regarding the mineral reserves and resources estimates and the grade control;
8. Other than my involvement in the preparation of the Report, my prior involvement with the Mine includes the verification and the validation of the working protocols involving (i) the data acquisition and exploration programs, (ii) the modelling strategy of the ore zones, and (iii) the parameters used for estimating reserves;
9. At the Effective Date, to the best of my knowledge, information and belief, the sections of the Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Report not misleading;
10. I am not independent of Agnico Eagle Mines Limited, as that term is described in section 1.5 of NI 43-101; and
11. I have read NI 43-101 and the Report has been prepared in compliance with NI 43-101.

Dated this 13th day of August, 2014

(signed and sealed) Daniel Doucet, P.Eng.

Daniel Doucet, P. Eng.

1. SUMMARY

1.1 Introduction

This Technical Report on the Canadian Malartic Property (the “Property”) was prepared for Canadian Malartic General Partnership (“Canadian Malartic GP” or the “issuer”) by Mr. Donald Gervais, P.Geo., Mr. Christian Roy, Eng., Mr. Alain Thibault, Eng., Mr. Carl Pednault, Eng. and Mr. Daniel Doucet, Eng.

This Technical Report (the “Report”) complies with the reporting requirements of Canadian National Instrument 43 101 (“NI 43 101”) and Form 43 101F1. It supports the disclosure of Mineral Resources and Reserves for the Canadian Malartic Property, and is based on geological information and the latest block model geological interpretation from December 31, 2013. The contents of the Report are also based on the 2014 Canadian Malartic mine budget.

InnovExplo, an independent mining and exploration consulting firm based in Val-d’Or, Québec, performed an audit on the Mineral Resources and Mineral Reserves of the Canadian Malartic Property. InnovExplo was responsible for assembling all items of the Technical Report. The peer review of the Technical Report was the responsibility of Daniel Doucet, Corporate Director, Reserve Development for Agnico Eagle Mines Ltd, and Greg Walker, Senior Manager, Resource Estimation for Yamana Gold Inc.

1.2 Property Description and Location

The Canadian Malartic property hosts the Canadian Malartic mine, Canada's largest gold mine, which will produce on average approximately 600,000 ounces of gold a year for the next 14 years. The mine was commissioned just six years after the first exploration drill holes were completed in 2005. The first gold pour was in April 2011 and commercial production began in May 2011.

The Canadian Malartic property is located approximately 25 km west of Val-d’Or and 80 km east of Rouyn-Noranda, on Highway 117. The property lies within the Municipality of Malartic. It straddles the townships of Fournière, Malartic and Surimau.

The Canadian Malartic Property represents the amalgamation of the East Amphi property of Richmont Mines, the CHL Malartic property of Abitibi Royalties and Osisko, and the Canadian Malartic property of Osisko. The Canadian Malartic property consists of a contiguous block comprising 1 mining concession, 5 mining leases, and 208 mining claims covering an aggregate area of 8,735.9 hectares. The Canadian Malartic property, other than the CHL Malartic property, is owned by Canadian Malartic GP. The CHL Malartic property is owned as to 70% by Canadian Malartic Corporation (formerly Osisko Mining Corporation) and as to 30% by Abitibi Royalties.

1.3 Geological Setting and Mineralization

The Canadian Malartic property lies within the Abitibi Subprovince (Abitibi Greenstone Belt) of the Archean Superior craton, eastern Canada, along the Cadillac–Larder Lake Fault Zone. The rocks in the Canadian Malartic property are predominantly composed of metavolcanic rocks, metasedimentary rocks, and related intrusions.

Mineralization in the Canadian Malartic deposit occurs as a continuous shell of 1 to 5% disseminated pyrite associated with fine native gold and traces of chalcopyrite, sphalerite and tellurides. The gold resource is mostly hosted by altered clastic sediments of the Pontiac Group (70%) overlying an epizonal dioritic porphyry intrusion. A portion of the deposit also occurs in the upper portions of the porphyry body (30%).

Alteration in the metasediments consists of biotite-sericite-carbonate (potassic alteration) overprinted by cryptocrystalline silica-carbonate. Carbonates include calcite and minor ankerite. Highly silicified zones adopt a “cherty” texture and are commonly brecciated. Potassic alteration in the porphyry consists mostly of alkali-feldspar replacement of plagioclase that is contemporaneous with minor quartz veining. Cryptocrystalline quartz replacement with minor carbonate also overprints potassic alteration in the porphyry. Late, coarse-grained, quartz-feldspar-muscovite veins mineralized with native gold form relatively small, higher grade stockworks along the northern edge of the deposit.

1.4 Deposit Type

Before the acquisition of the property in 2004 by Osisko, several models were proposed by various authors to explain the origin of the gold deposits in the Malartic camp. Among the proposed models are an epigenetic model with structural and lithological control, an orthomagmatic-origin porphyry-related model, a porphyry gold model, and a disseminated-stockwork zone model centered on felsic porphyry intrusions.

In 2004, Osisko's personnel adopted the porphyry gold model as a tool to drive exploration on the property. More recently, a new model was proposed to define the deposit type explaining the gold mineralization of the Canadian Malartic mine. It represents a magmatic-hydrothermal model that calls for the exsolution of an ore fluid from monzodioritic magma at mid-crustal levels. During its ascent, this fluid potassically altered, carbonated, sulphidized and locally silicified the host rocks and deposited gold. The porphyritic rocks that host some of the mineralization were thus not the source of the fluids. Rather, their contacts with Pontiac greywacke and Piché mafic and ultramafic rocks provided the competency contrasts that helped focus the mineralizing fluids.

1.5 Data Verification

The available data from the QA/QC programs for the Canadian Malartic, Jeffrey and Western Porphyry databases show overall acceptable results.

The statistics of the Certified Reference Materials (standards) are considered within industry-accepted limits of accuracy.

The level of contamination appears to be low as the blank samples do not display evidence of significant contamination.

The samples sent to an external laboratory do not show any significant bias as the global average is about the same and the coefficient of correlation between the two populations is higher than 98%.

It is the author's opinion that Osisko ran an industry-standard QA/QC program for its insertion of control samples into the stream of core samples.

For reference standard samples, the control charts produced by Osisko consist of the assay results for each standard plotted on the y axis against time on the x axis. Superimposed on this chart are five horizontal reference lines representing the accepted value for the standard, the accepted value +2SD and +3SD (standard deviations), and the accepted value -2SD and -3SD. An analysis of a standard is considered a QA/QC failure if the result comes back outside of the ±3SD lines. Such charts can also show trends of drift over time indicating problems with calibration of instruments.

It is recommended that re-numbered rejects be submitted to the primary laboratory to complete the QA/QC program.

Diamond drilling and reverse circulation (RC) drilling were used equally during interpolation over a portion of the Canadian Malartic deposit. Although the RC portion represents less than 10% of the entire tonnage (22.6 Mt over 245.9 Mt), it would be worthwhile to run a comparative study to confirm that no bias exists between both drilling and sampling methods although good reconciliation during recent mining activities suggest that no bias is to be expected.

The Canadian Malartic, Jeffrey and Western Porphyry drill hole databases are considered robust and suitable enough for use in mineral resource estimation studies.

1.6 Mineral Processing and Metallurgical Testing

1.6.1 Canadian Malartic Deposit

Canadian Malartic ore is composed of four main lithologies (CPO, SPO, CGR and SGR) spread throughout the deposit in an average ratio of 10%, 20%, 28% and 42%. The deposit was studied (metallurgical testwork) along three axes: east-west, north-south and depth. The main parameters studied were hardness and abrasion variability, reagent consumption and gold recovery.

The Canadian Malartic ore has been subjected to a full drop weight test program over the last 2 years to study hardness. The conclusion of the testwork is that the materials' Axb values range from 17 to 45 with an average of 26.8, which justifies the need for extra crushing capacity, installed after initial startup, due to the very

competent nature of the ore; in fact, this constitutes the characteristic of the ore that limits the capacity of the process plant throughput.
The deposit was split into four zones (West, North, East and South) based on similar metallurgical behaviour. Recovery curves (recovery vs. head grade) were generated based on the years of operation to date.

All reagent consumptions are based on the years of operation to date and should remain in the same range based on the fact that the deposit shows similar consumptions throughout all sections of the pit.

Gold deportment and diagnostic leach tests demonstrated that the residual gold, after the leach process, is encapsulated mainly in pyrite. The significant proportion of the gold remaining in the tailings after the leach process was characterized as very fine. It was demonstrated that gravimetric processes are inefficient due to the small grain size. The grind of the leach feed is the most important parameter observed, especially for the gold encapsulated in sulphide. The finer the grind, the higher the recovery, especially for the gold in sulphide.

1.6.2 Barnat Deposit

The Barnat deposit, located northeast of the Canadian Malartic deposit, straddles the Cadillac Faultwithe the Pontiac Zone is on the south side the Piché Zone on the north. The Pontiac Zone, including 30% of Barnat total tonnes and 25% of the total ounces, is mainly composed of sedimentary material (GR) and has very similar characteristics as the Sladen extension of the Canadian Malartic deposit (east portion).

The Piché Zone contains 70% of Barnat total tonnes and 75% of the total ounces. The ore is mainly composed of porphyry (PO) and the waste is ultramafic (UM) material.

The bond work index of the Barnat material is 14.8 kWh/t. Gold recoverable by gravimetry (GRG) on the PO lithology (Piché) is 54%, which is much higher than the GRG obtained for the Canadian Malartic ore (18%).

The lime consumption for the Barnat ore is 0.23 kg/t and the cyanide consumption is 0.45 kg/t.

Gold recoveries are higher in the PO versus the GR by 2% to 3% on average.

1.7 Mineral Resource Estimates

The Canadian Malartic Property mineral resource estimate includes the Canadian Malartic deposit, South Barnat deposit, Gouldie Zone, Jeffrey Zone and Western Porphyry Zone. Resource classification is based on the robustness of the various available data sources including:

- Quality and reliability of drilling and sampling data
- Presence of RC and/or production drilling
- Distance between sample points (drilling density)

- Confidence in the geological interpretation
- Continuity of the geologic structures and continuity of the grade within these structures
- Variogram models and their related ranges (first and second structures)
- Statistics of the data population
- Quality of assay data
- Tonnage factor

Based on these criteria, resources have been classified according to the data search used to estimate each block and also on the type of data used for the estimate.

Measured resources are limited to the blocks estimated in the first estimation pass and only within mineralized zones for which the recent drilling represents a high majority of the data (>65%). Additionally, all material within 20 m of reach of either RC drilling or blast holes for the Canadian Malartic and Gouldie deposits was also classified as Measured.

Indicated resources correspond to the blocks estimated in the second estimation pass plus the blocks estimated in the first pass but not classified as Measured.

Inferred resources correspond to the blocks estimated in the third estimation pass. All blocks interpolated in the Western Porphyry Zone were reclassified as Inferred due to drill hole orientation with regard to the main trend of the ore zone. . A better understanding of the geology is necessary to convert these resources to Indicated and/or Measured categories in this zone.

The classification model has been reviewed on each level plan and some minor manual adjustments were made where needed.

The OK (ordinary kriging) model is the official model used for the reporting of the mineral resource estimates.

1.7.1 Global Resources

Based on economic parameters, it was calculated that the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

At these cut-offs, the global Measured + Indicated (M&I) mineral resource totals 314.2 Mt at a grade of 1.07 g/t Au, representing 10.80 Moz gold (refer to table below). The Inferred resources represent 46.5 Mt at 0.77 g/t Au for 1.14 Moz gold (refer to table below).

Resources for the Canadian Malartic Property (OK Model – Global Resources) (Table 14.32)

Canadian Malartic Project - JUNE 2014 MINERAL RESOURCE ESTIMATE (GLOBAL RESOURCE)					
Resource Class	Cut-off Grade (g/t Au)	Potential Material	Tonnes	Capped Au (g/t)	Contained Au (oz)
Measured	0.277 - 0.349	Global	56,802,700	0.98	1,786,098
Indicated	0.277 - 0.349	Global	254,928,200	1.09	8,974,593
Stockpiles (Classified as Measured)			2,485,100	0.51	40,747
Grand Total (Measured + Indicated)			**314,216,000**	**1.07**	**10,801,438**
Inferred	0.277 - 0.349	Global	46,469,300	0.77	1,144,544

**Due to rounding, number totals may not match exactly.*

Cautionary notes:

- *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. Also, note that the global resource is not constrained by an optimized pit shell. Therefore, it cannot be assumed that all of the global resource can be considered as potentially extractable by open-pit even though cut-offs presented here are based on open-pit potential.*
- *This resource statement is exclusive of all material owned by a third party (Abitibi Royalties) via a mining option agreement and joint venture (30% of the CHL-Malartic claims).*

1.7.2 In-Pit resources (including stockpiles)

Based on economic parameters, a Whittle optimized pit shell was generated on M&I resources only (Canadian Malartic, South Barnat and Gouldie) and compared to the current pit design. Variations were judged non-significant and therefore the current pit design was used to constrain In-Pit resources. A Whittle optimized pit shell was also prepared by the Canadian Malartic technical team for the Jeffrey Zone. No resource is currently declared as In-Pit for the Western Porphyry Zone.

As mentioned previously, the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

At these cut-offs, the global In-Pit M&I mineral resource totals 250.8 Mt at a grade of 1.12 g/t Au, representing 9.03 Moz gold (refer to table below). The In-Pit Inferred resource represents 6.3 Mt at 0.80 g Au/t for 0.16 Moz gold (refer to table below).

Resources for the Canadian Malartic Property (OK Model – In-Pit Resources) (Table 14.33)

Canadian Malartic Project - JUNE 2014 MINERAL RESOURCE ESTIMATE (IN PIT + STOCKPILE)					
Resource Class	Cut-off Grade (g/t Au)	Potential Material	Tonnes	Capped Au (g/t)	Contained Au (oz)
Measured	0.277 - 0.349	Open Pit	51,770,200	0.99	1,648,184
Indicated	0.277 - 0.349	Open Pit	196,502,200	1.16	7,344,556
Stockpiles (Classified as Measured)			2,485,100	0.51	40,747
Grand Total (Measured + Indicated)			**250,757,400**	**1.12**	**9,033,487**
Inferred	0.277 - 0.349	Open Pit	6,342,400	0.80	162,246

**Due to rounding, number totals may not match exactly.*

Cautionary notes:

- *Mineral resources are not mineral reserves as they do not have demonstrated economic viability.*
- *The quantity and grade of the reported Inferred resources in this estimate are uncertain in nature. There has been insufficient exploration to define these resources as Indicated or Measured and it is uncertain whether further exploration would result in upgrading any of the Inferred resource to an Indicated or Measured category.*
- *The mineral resource is presented inclusive of mineral reserves, meaning that mineral reserves were not subtracted from the resources presented herein.*
- *While the results are presented undiluted and in situ, the reported mineral resources are considered to have reasonable prospects for economic extraction.*
- *The number of metric tons was rounded to the nearest hundred. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.*
- *This resource statement is exclusive of all material owned by a third party (Abitibi Royalties) via a mining option agreement and joint venture (30% of the CHL-Malartic claims).*

1.8 Mineral Reserve Estimates

The Canadian Malartic Property mineral reserve estimate includes open pit and stockpile reserves. Mineral Resources are converted to Mineral Reserves by applying mining cut-off grades, mining dilution, and mining recovery factors. Resource model blocks classified as Measured and Indicated are reported as Proven and Probable reserves.

Detailed mining costs were estimated for all activities of the mining cycle. Drilling and blasting costs are different forcertain zones of the pit given the requirements in some cases to limit noise and dust environmental nuisances. The mining costs vary from US$2.28 to US$4.69.

Processing costs used for the pit optimization and cut-off estimation amount to US$7.34 per tonne milled based on a milling rate of 55,000 tpd. The general and administrative (G&A) costs for the pit optimization amount to US$2.12 per tonne milled based on actual annual expenses.

The ore outlines include a 1-metre dilution envelope around economic ore blocks and also enclose marginal material surrounded by economic mineralization. The dilution envelope and enclosed waste in most cases is mineralized, with an associated dilution grade. Dilution is estimated at 8.0%.

Based on economic parameters, it was calculated that the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

The total Proven and Probable mine reserves as of June 15, 2014 are estimated at 263.2 Mt at 1.06 g/t Au for 8,943,552 ounces. The majority of the reserve tonnage (78.1%) is in the Probable category. The reserves include 2.5 Mt of stockpiled ore at an average grade of 0.51 g/t Au for 40,747 ounces.

There is good reconciliation between mineral reserves and actual production results, and the records maintained by Canadian Malartic allow the changes in reconciliation to be studied over time. Based upon the reconciliation results, the Mineral Reserve Estimation is reliable and can be used for mine planning in the short, medium and long term.

Mineral reserve by category (June 15, 2014) (Table 15.7)

Sector	Tonnes (M)	Grade (g/t)	Au (M oz)
Canadian Malartic			
Proven Reserves	38.0	0.82	1.06
Probable Reserves	136.6	1.04	4.56
Proven and Probable Reserves	174.6	0.99	5.56
Barnat			
Proven Reserves	11.6	1.37	0.51
Probable Reserves	67.0	1.23	2.65
Proven and Probable Reserves	78.6	1.25	3.16
Gouldie			
Proven Reserves	5.5	0.71	0.13
Probable Reserves	2.0	0.83	0.05
Proven and Probable Reserves	7.5	0.74	0.18
Stockpiles			
Proven Reserves	2.5	0.51	0.04
Probable Reserves			
Proven and Probable Reserves	2.5	0.51	0.04
Total			
Proven Reserves	57.6	0.91	1.69
Probable Reserves	205.6	1.10	7.26
Proven and Probable Reserves	263.2	1.06	8.94

The reader should note that resources corresponding to the 70% interest in the CHL property have not been transferred to the Canadian Malartic GP. This 70% interest is held by Canadian Malartic Corporation (the successor to Osisko Mining Corporation). Abitibi Royalties Inc. claims that its right of first refusal has been triggered (refer to section 24 for more details about this litigation). These resources, representing 0.12 Moz, may never be included in the mining plan by Canadian Malartic GP and thus cannot be considered as reserves.

Sensitivity of the Proven and Probable reserves to gold price has been estimated using Whittle pit shells and lower cut-off grades. The results of the sensitivity analysis are presented in Table below. Sensitivity was calculated using the surface and Whittle pit shells of January 1, 2014.

Reserve sensitivity (Table 15.8)

Gold Price (US $)	Cut-off Grade (g/t)	Average Grade (g/t)	Ore Tonnage (Mt)	In-Situ Ounces (M)	Difference vs. $1300 (M oz)	Difference vs. $1300 (%)
1000	0.45	1.23	203.7	8.03	-1.30	-14.0%
1100	0.41	1.14	236.7	8.69	-0.64	-6.9%
1200	0.38	1.10	255.8	9.02	-0.31	-3.3%
1300	0.35	1.06	274.2	9.34	0.00	0.0%
1400	0.32	1.02	291.8	9.64	0.30	3.3%
1500	0.30	1.00	305.2	9.83	0.50	5.3%

1.9 Mining Methods

The Canadian Malartic mine is a large open pit operation comprising the Canadian Malartic, Barnat and Gouldie pits. In order to maximize productivity and limit the number of units operating in the pit, large scale equipment was selected for the mine operation. The primary loading tools are hydraulic excavators, with a wheel loader added as a secondary loading tool. The selected hydraulic excavator model is the O&K RH340-B with an operating weight of 567t fitted with a 28 m^3 heavy-duty rock bucket. One Caterpillar 994F HL, two L-1850 front-end wheel loaders ("FEL") and one CAT6050 shovel complement the primary loading fleet. A fleet of Caterpillar 793F rigid trucks with 227t payloads provide a good pass-match with the O&K RH340-B shovels. The FEL is configured in a high-lift arrangement in order to clear the sideboard of the 227 t class truck.

The production rate was approximately 52,000 tpd in 2013. The mine production schedule was developed to feed the mill at a nominal rate of 55,000 tpd. The main highlights of the pit design are the following:

- Total amount of 817.5 Mt mined from the pit
- 263.2 Mt milled @ 1.06 g/t Au (average)
- In-situ gold content of 8.94 Moz
- Mine life of 14 years.

1.10 Recovery Methods

The process design criteria are based on a processing plant with 55,000 tpd capacity and a plant design utilization of 92%. At the time of writing, the throughput is limited to about 50,000 tpd. A project study to increase average throughput to 55,000 tpd is under review. The basis for the plant design assumed a head grade of 1.2 g/t Au and a gold recovery of 86%.

Run of mine ore is transported to the gyratory crusher. From the primary crusher, material is conveyed to a secondary crushing plant. The crushed ore is feed transported by a conveyor belt to the covered stockpiled. The ore is reclaimed from the pile in an underground reclaim tunnel and is conveyed to feed the primary grinding SAG mill in the concentrator. The SAG mill is in a closed circuit with scalping screens and two pebble crushers. The SAG circuit product is fed to the two secondary grinding ball mills which feed the one tertiary grinding ball mill to produce a final product size suitable for feeding the leach circuit. Each of the two secondary ball mills are close-circuited with one cluster of hydro-cyclones while the tertiary grinding ball mill requires two clusters of hydro-cyclones due to a higher slurry volume to handle.

The slurry is brought to a pH of around 11 with lime added to the SAG mill feed. Cyanide is added to the grinding circuit to start the leaching process of gold from the ore to the solution phase. The ground slurry passes through linear screens, before the thickener, to screen out any organic material and any other tramp material that has come into the mill with the ore. The slurry is then thickened to 50% solids before being fed to the leach tank circuit.

The leach tanks are located outside and consist of four series of five tanks in parallel with agitators. Oxygen is added to raise the oxygen level in the solution phase, in order to maintain the leach kinetics. From the leach tanks, the slurry flows by gravity to the activated carbon recovery circuit. The circuit is composed of two parallel sets of Kemix CIP pump cell carousel systems. The loaded carbon is pumped from the first stage in the carousel circuit to a loaded carbon screen where the loaded carbon is separated from the slurry. The loaded carbon transfers into the stripping vessels by gravity.

The zadra process is used to extract the gold from the loaded carbon. The caustic solution is heated to about 140° Celsius and is then passed through the pressurized stripping vessel, stripping the gold from the loaded carbon back into the solution. The solution is sent to the electrowinning (EW) circuit where gold is precipitated onto stainless steel cathodes in the form of sludge.

The gold precipitate is pressure washed from the cathodes and then filtered, dried and sent to a refining furnace where the gold is poured into gold doré bars. The gold bars contain a significant amount of silver as the silver in the ore leaches and is stripped along with the gold and eventually recovered in the EW cells. The stripped carbon is transferred to the carbon reactivation kilns where it is reactivated by heating to about 800° Celsius in a reducing atmosphere. The carbon is then re-used in the CIP circuit. Fresh carbon is regularly added to make up for attrition losses. The activated carbon is pumped to the empty tank in the CIP circuit to start a new tank in the carousel. Before being added to the last tank in the carousel series, the carbon is screened to ensure that no fine particles of carbon are introduced into the circuit.

The slurry flowing from the last tank in the series in the carousels is barren in gold and is considered as final process tailings. This slurry is discharged over linear safety screens as an insurance against coarse carbon losses from the circuit. Any oversize from the linear safety screens is fed to a carbon catch screen (ongoing project). The oversize from the carbon catch screen is returned to the circuit via the carbon sizing screen and the underflow is directed to the carbon settling tank to remove as much carbon as possible. This settled carbon material is collected in bags and sold to the smelter for its gold and silver content.

The tailings slurry is thickened to approximately 60% solid. Studies to increase the tailing percent solid are ongoing. The thickened tailings slurry is pumped to the detoxification plant where the cyanide content is reduced to less than 20 ppm using the combinox process (sulfur dioxide and hydrogen peroxide). Copper sulphate is also used as a catalyst to the reaction. A project study to convert the cyanide destruction process to Caro's acid (sulphuric acid and hydrogen peroxide) is ongoing. The detoxified slurry is subsequently pumped to the tailings management facility where most of the water drains out to be reclaimed back to the process.

Sampling of the various process streams is carried out to be able to both quantify the plant performance on a shift and daily basis and to be able to control areas of the process on a continuous/semi-continuous basis.

1.11 Project Infrastructure

The main infrastructure includes the administration/warehouse building, the mine office/truck shop building, the process plant, and the crushing plant. The workforce requirement is 658 employees to support the proposed mine nominal throughput rate of 55,000 tpd.

A buffer zone 135 m wide is developed along the northern limit of the open pit to mitigate the impacts of the mining activities on the citizens of Malartic. Inside this buffer zone, a landscaped ridge was built mainly using rock and topsoil produced during the pre-stripping work. The height of this landscaped ridge is 15 m where the concentration of residents is higher and 5 to 6 m in non-resident sectors.

The electrical power for the Canadian Malartic Project is supplied from the existing Hydro-Québec 120 kV Cadillac main substation. A 120 kV electrical transmission line approximately 19 km long was built. Power demand for the entire project is about 85.3 MW including all mill and mine support facilities and a long term contract is in place to deliver power to the mine.

The plant water systems consist of the process water system which is supplied principally from the plant thickener overflows, the fresh water system which is supplied from the old underground mine dewatering system, the reagent preparation water system, the gland water distribution system, and the reclaim water from the Southeast Pond area. The Canadian Malartic mine is also connected to the Malartic municipal sewage and potable water systems.

The fuel storage facilities have 250,000 litres of storage capacity and are located northeast of the truck shop.

Canadian Malartic GP continues to work with Québec's Ministry of Transport and the town of Malartic on the deviation of Highway 117 to gain access to the higher grade Barnat deposit. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014 and a request for public hearings will be made.

1.12 Environmental Studies, Permitting and Social or Community Impact

1.12.1 Environment

The main components of the Canadian Malartic mine (open pit mine, process plant, tailings facility and waste rock dump) are located within the urban and peri-urban perimeter of the town of Malartic. Before the construction of the mine, an environmental study area, covering approximately 24 km^2, was defined by taking into account the probable range of the project's impacts on the social, physical and biological environments as well as the area of influence of historical mining operations. Several components were identified as key subjects for study: fauna, water and sediments, climate and hydrology, ambient air quality, background noise and vibrations, vegetation and wetlands, soils, and net acid generation.

Since 2009, there have been 52 non-conformance blast notices, 46 non-conformance noise notices, 12 non-conformance notices for dust and air quality, 4 non-conformance notices for water quality (surface and final effluent) and 15 other non-conformance notices. In 2011, a detailed plan was developed by Osisko to manage hazardous materials, assess infrastructure safety, and monitor noise, vibrations, air quality, dust, atmospheric emissions, effluent quality, groundwater and surface water. Mitigations measures were put in place to improve the process and avoid any non-conformance. The mine's team of on-site environmental experts continuously monitor regulatory compliance in terms of approvals, permits, and observance of directives and requirements.

The original design of the waste rock pile was developed to accommodate approximately 326 Mt of mechanically placed waste rock requiring a total storage volume of approximately 161 Mm^3. Some aspects of the Canadian Malartic Project have been modified since the mine tailings site and waste rock pile development plan was developed. Most notably, the Gouldie reserve was recently added to the operating sequence of the mine. The Gouldie reserve is located in the center of the initially planned footprint of the waste rock pile, making it necessary to revise the waste rock piling sequence in order to keep the Gouldie pit area available for mining. Taking into account certain basic assumptions, the current waste rock pile development sequence should accommodate a total of 59.2 Mm^3 (121.3 Mt). From May 2011 to June 2014, 50 Mt of tailings from the process plant were deposited on the footprint of the old tailings of the East Malartic mine and its settling pond. For the Canadian Malartic mine operations, the former tailings and settling pond were divided using waste rock inclusions to form seven (7) cells and a polishing pond. As of June 2014, the available space in the Tailings Management Facility (TMF) is about 100 Mt, corresponding to 5 years of operation at a nominal production rate of 20.075 Mt per year.

The existing polishing pond, adjacent to the tailings cells and located east of the TMF, is contained within the current authorized footprint of the TMF. This pond will be later used as a cell to store tailings. Before using this pond, the Canadian Malartic mine plans to build a new polishing pond east of dyke A , the eastern limit of the Southeast Pond. The existing polishing pond, converted into a tailings cell, will be the 8th cell of the TMF with an estimated capacity of 48 Mt adding 2.5 years to the TMF capacity for a total of 148 Mt and 7.5 years of operation. The total capacity of the current TMF is therefore estimated at 198 Mt. The expansion of the open-pit, with the production of the Barnat pit, will increase to 342 Mt the total amount of tailings to manage, requiring an additioanl 144 Mt in tailings storage capacity. The plan is to store tailings in an extended tailings facility and in the Canadian Malartic pit at the end of its operations. According to the mining plan, at the end of mine life, 50 to 100

Mt of tailings will be deposited in the pit. The rest of the tailings, a minimum of 59 and a maximum of 109 Mt, will be deposited in the extended tailings facility.

Regulatory approval for the proposed tailings deposition in the Canadian Malartic pit and the expansion of the current authorized tailings area are part of the approval process for the Canadian Malartic pit extension (Barnat deposit) subject to the environmental impact assesssment (EIA) process of the Quebec Environmental Protection Act (section IV.1 of chapter 1).. The EIA is currently underway. Golder is designing the tailings extension component and is preparing a hydrogeological study to demonstrate that the Canadian Malartic pit would provide a hydraulic trap and contain the tailings with minimum environmental risk.

An annual hydrological site balance is maintained to provide a yearly estimation of water volumes that must be managed in the different structures of the water management system of the Canadian Malartic mining site during an average climatic year (in terms of precipitation). Results of this hydrological balance indicate that excess water from the Southeast Pond will eventually need to be released into the environment. A water treatment plant is currently under construction to ensure that in the short and medium term the water to be released to the environment will meet water quality requirements at all times. Moreover, adding a treatment plant will greatly reduce the risks associated with surface water management and will add flexibility to the system.
Reclamation and closure costs have been estimated for rehabilitating the tailings facility and waste dump, vegetating the surrounding area, dismantling the plant and associated infrastructure, and performing environmental inspection and monitoring for a period of 10 years. The reclamation and closure cost is estimated at $51.5 million and includes the following (all amounts in Canadian dollars):

- Tailings facility and waste dump $31.45 M
- Water management facilities $3.22 M
- Contaminated soil and pit closure $7.87 M
- Dismantling of complex $4.92 M
- Environmental inspection and monitoring $4.04 M

Total $51.50 M

1.12.2 Community

Since the project was first announced, various communication and consultation activities have taken place within the community and with municipal and regional representatives. These activities can be grouped into three distinct themes: communication activities organized by Osisko, those organized by the Monitoring Committee (“Comité de suivi”), and consultations and surveys conducted within the context of the EIA. Canadian Malartic GP will continue with these communication and consultation activities.

1.12.3 Permitting

Environmental baseline, environmental data collection and assessment started in June 2007 to be used as a basis for the EIA. This process lasted until February

2008. The results of the study were published in the EIA study completed in August 2008.

In September, 2008, the Canadian Malartic filed the EIA for the Canadian Malartic Project with the MDDELCC. The EIA was reviewed and accepted by Québec governmental authorities who established its compliance with MDDELCC guidelines. The formal process of the Bureau d'audiences publiques sur l'environnement ("BAPE") commenced on March 9, 2009 and on July 9, 2009, the MDDELCC published the report on the public inquiry and hearings. The report concluded that the Canadian Malartic Project could be authorized under certain conditions including the implementation of certain monitoring programs, and the deposit of financial guarantees sufficient to ensure that the Canadian Malartic project could be carried out in a sustainable development perspective. On August 20, 2009, the Conseil des ministres du Québec approved the order in council (Decree No. 914-2009) authorizing the construction of the Canadian Malartic mine.

As of December 31, 2010, the Canadian Malartic mine had received all formal government permits required for its construction and related activities, with the exception of the authorization for the mill and mine operations. The official certificate of authorization for the mill and operations was granted on March 31, 2011, at which point the Canadian Malartic mine was fully permitted.

On February 26, 2014 the Government of Québec adopted a decree authorizing the mining of the Gouldie deposit, which allowed pre-stripping work to proceed.

Canadian Malartic GP continues the collaboration with Québec's Ministry of Transport and the town of Malartic on a project to deviate a portion of Highway 117 in order to gain access to the higher grade Barnat deposit, which is expected to provide mill feed for the continuation of the Canadian Malartic operation. The final design and mine plan has been completed, the EIA is expected to be submitted to the authorities in the fourth quarter of 2014, and at that time a request for public hearings will be made by the Canadian Malartic GP.

1.13 Capital and Operating Costs

1.13.1 Capital Cost Estimates

Estimated capital costs to the Canadian Malartic mine essentially correspond to sustaining capital for mine and development costs, as well as construction costs during the deviation of Highway 117 (refer to table below).

For mine operations, capital costs in the near term include an estimate for the purchase of new equipment of $16 million in 2015. For the processing plant, capital costs in the near term include an estimate for improvement costs of approximately $16 million in 2015.

Canadian Malartic GP plans to extend the Canadian Malartic mine by enlarging the existing open pit in the Barnat sector. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014. If the Canadian Malartic GP obtains all necessary permits and authorizations for the construction of the Highway 117 deviation, the work could start in 2014. The estimated cost of the construction work is $60.3 million and it is expected to take three years.

Canadian Malartic mine 3-year capital cost forecast (in $M) (Table 21.1)

CAPITAL COST (C$)	2014	2015	2016
Sustaining Cost	$ 54.8	$ 44.5	$ 57.1
Development Cost	$ 65.6	$ 75.1	$ 54.1
Deviation of Highway 117	$ 5.4	$ 30.8	$ 25.1
TOTAL CAPITAL COST	**$ 125.8**	**$ 150.4**	**$ 136.3**

1.13.2 Mine Operating Cost

Estimated operating expenditures at the Canadian Malartic open pit mining and milling operations are presented in table below.

Operating costs consist of annual expenditures incurred at the Canadian Malartic mine to extract ore and waste rock and to process the ore. The mining consumables are based on the costs and contracts and the costs for future operation consumables, such as mill reagents, grinding media, etc., are based on recent supplier quotations, general and administrative (G&A) costs, and transport and refining costs.

Canadian Malartic mine 3-year operating cost forecast (in $M) (Table 21.2)

OPERATING COST (C$)	2014	2015	2016
Projected processed tonnes	18,533,000	20,075,000	20,130,000
Projected gold ounces recovered	532,000	591,600	630,900
Mining Cost ($M)	$ 180.8	$ 198.1	$ 188.6
Processing Cost ($M)	$ 158.4	$ 162.2	$ 162.7
General and Administrative (G&A) ($M)	$ 43.5	$ 43.5	$ 43.5
Transport and Refining ($M)	$ 1.6	$ 1.8	$ 1.9
TOTAL OPERATING COSTS ($M)	**$ 384.3**	**$ 405.7**	**$ 396.6**
TOTAL OPERATING COSTS/TONNES	**$ 20.74**	**$ 20.21**	**$ 19.70**

1.14 Economic Analysis

Canadian Malartic GP, being a producing issuer, is not required to include information under Item 22 (Economic Analysis). There is currently no firm plan to expand the current Canadian Malartic mine production of 55,000 tonnes per day (tpd).

1.15 Risks and Opportunities

The Canadian Malartic mine operation is subject to a number of known and unknown risks, uncertainties, and other factors as presented in table below. The opportunities associated with the mine operation are also presented.

Risks associated with the Canadian Malartic Property (Table 25.3)

Risk	Potential Impact	Possible Risk Mitigation
Difficulty to increase the mill capacity of 55,000 tpd	Income will decline and process costs will increase	- Fragmentation improvement in the pit with new drilling patterns, reduced stemming height, modified hole diameters, and modified powder factors. Increasing the quantity of fines and more importantly inducing micro-fractures in the coarse portion to improve mill throughput. - The Barnat Zone is known to be much easier to grind to the required size fraction; this was confirmed by the original metallurgical lab tests but has not been tested in the current mill configuration. The improved throughput is dependent on the ratio of Barnat/CM in the feed. - Ore feed from another mine in the area could supplement mill feed and improve global throughput. That feed could be either easier to grind (higher Axb) or crushed to a minimum size fraction in order to “by-pass” the SAG. - Increasing crushing capacity to produce more fines will increase mill throughput. Gyratory product could be screened, fines reporting to the dome and coarse feeding the 2 current XL2000. Secondary crusher product could be screened, fines reporting to the dome and a portion of the coarse feeding one XL2000 producing fine particles. - Increasing grinding capacity to reduce pebble product size will increase mill throughput. Scats could also be managed in the extra pebble/rodmill equipment. Depending on the size and power of the designed mill, the C.S.S. of both gyratory and secondary crushers could be loosened up a bit to reduce maintenance costs. The pebble/rod mill should have a lengthy chamber to allow pebble breakage. It would be fed by a screened SAG discharge allowing for a redistribution of the pebble crushing power and C.S.S would also allow the BM scats to be managed.
The MDDELCC will not allow Canadian Malartic GP to put the tailings in the Canadian Malartic pit during the extraction of ore from the Barnat pit	Delay in mine production.	Plan an alternative by proposing an enlargement of the current authorized tailings to avoid delays in mine production.
The MDDELCC will not allow Canadian Malartic GP to proceed with the deviation of Highway 117	Loss of gold reserves in the Barnat pit.	Continue the negotiations and discussions with the local community and the MDDELCC in order to obtain authorizations.
Notices of non-compliance from the MDDELCC	Theses notices create a poor image of the Canadian Malartic mine operation in the public eye.	Continue to work towards reducing most of the environmental impacts, thereby improving public opinion.
Abitibi Royalties may be successful in its claim that it is entitled to acquire Canadian Malartic Corporation's mining titles in the CHL Property	Loss of gold resources in the Jeffrey Zone which are convertible to reserves (71 000 oz).	Pursue litigation and continue negotiations and discussions with the management of Abitibi Royalties.

Risk	Potential Impact	Possible Risk Mitigation
Gouldie is located inside the current waste dump footprint, limiting the tonnage that can be piled on the waste dump.	It may not be possible to completely mine the Gouldie pit.	Continue negotiations and discussions with the MDDELCC in order to obtain authorizations for an extension of the waste dump on the east side of the property or inside the current footprint of the property.
The gradual rehabilitation of the waste rock dump and tailings would be compromised	Adapt the rehabilitation plan .	The gradual rehabilitation of the waste rock dump and tailings would be compromised
The MDDELCC will not allow Canadian Malartic GP to move the polishing pond and extend the current tailings	Lack of space for tailings	Modify the tailings management plan to increase the height of the tailings
The mine's revenues from the sale of gold and silver are in US dollars	Any appreciation of the Canadian dollar compared to the US dollar could increase the cost of doing business.	Reduce operating costs. Managing operating costs will help deal with any changes in currency.
Lower gold price (impossible to know future price of gold)	A prolonged drop in the price of gold may have a negative impact on the mine.	Managing operating costs will help deal with any fluctuations in future gold prices.

Opportunities associated with the Canadian Malartic Property (Table 25.4)

Opportunity	Explanation	Potential benefit
The Canadian Malartic mine can stockpile lower grade material (below cut-off) and process it at the end of the mine life if the gold price allows	40 Mt to 50 Mt of low grade material (0.20 g/t Au cut-off grade) must be excavated to access higher grade ore over the course of the mine life	Additional income
Better metallurgical recoveries at the Barnat deposit	The metallurgical recoveries for Barnat based on an earlier study are higher than the actual recoveries for ore from the Canadian Malartic pit	A better recovery will increase reserves and the recovered ounces at the process plant.
Potential to develop other mineralized zones present on the property	The development of the East Amphi, Fourax and Western Porphyry zones could increase the mineral resources present on the property.	It will be possible to transfer mineral resource in mineral reserve, if a study will demonstrate that resources economically mineable.
Revenues from the sale of gold and silver are in US dollars	A depreciation in the Canadian dollar compared to the US dollar could decrease the cost of doing business	Increased revenues in Canadian dollar terms
Change in gold price	A prolonged rise in the price of gold would have a positive impact on the mine	Resources outside the current pits could potentially be converted to reserves

1.16 Recommendations

1.16.1 Process Plant Capacity of 55,000 tpd

There are many options under study to increase the throughput rate to 55,000 tpd from the current 51,500 tpd. It is recommended that these various options be analyzed based on cost and ability to execute. The options are described below.

- Fragmentation improvement in the pit

The engineering department is overseeing a number of tests in the pit to improve fragmentation. New drill patterns, reduced stemming height, changes in hole diameter, and the powder factor are all being considered. Increasing the quantity of fines and more importantly inducing micro-fractures in the coarse portion will improve throughput in the process plant.

- Adding feed from an outside source

  Adding ore feed from another mine in the area could supplement the process plant feed and improve global throughput. The feed could be either easier to grind (higher Axb) or crushed to a minimum size fraction in order to “by-pass” the SAG.

- Crushing capacity

  Increasing the crushing capacity to produce more fines would increase mill throughput. The gyratory product could be screened, with fines reporting to the dome and the coarse fraction feeding the two current XL2000 cones. The secondary crusher product could be screened, with fines reporting to the dome and a portion of the coarse fraction feeding one XL2000 cone to produce fine particles. This should eliminate the recurring problems caused by muddy ore mainly in spring and fall. In addition, screening the feed of the two XL2000 cones could also lower the frequency of mechanical maintenance on the cones.

- Other scenarios

  Many other scenarios are possible using more crushing and screening capacity in which the increased throughput could surpass the target of 55,000 tpd. The economics of their implementation and the increase in the electrical power required for those projects have to be evaluated.
  Increasing the grinding capacity to reduce pebble product size will increase mill throughput, and scats could also be managed in the extra pebble/rod mill equipment.

  Depending on the size and power of the designed process plant, the close side setting (CSS) of both gyratory and secondary crushers could be loosened up a bit thereby reducing maintenance costs. The pebble/rod mill should have a lengthy chamber to allow pebble breakage. It would be fed by a screened SAG discharge allowing for a redistribution of the pebble crushing power and CSS, and also would allow the BM scats to be managed.

1.16.2 Pit operation optimization

Marginal material stockpiling should be considered to optimize revenues. Assuming around 40 Mt at a 0.23 cut-off grade, there is real potential to generate more revenue if the gold price is higher at the end of mining activities.

The pit sequence optimization can be reviewed when mining the Barnat pit to consider the possibility of feeding the mill with a mixture of hard rock (CM) and softer material.

The development of known resources elsewhere on the Canadian Malartic Property should also be considered to increase mine life. An exploration program should be prepared by geology department of Canadain Malartic mine.

1.16.3 Notices of non-compliance and complaints

The Canadian Malartic mine is now a mature operation and should demonstrate full control of the operation regarding compliances. A detailed game plan and dedicated resources are required to overcome the situation of multiple non-compliances and insure the success of this ambitious task.

The game plan should specifically address every area where the operation is at risk of non-compliance and/or complaints. The overall perception of the community and regulators will be positively affected. The plan should be transparent with the follow-up committee and be based on a short (6 to 9 months if possible) execution schedule to demonstrate the strong intention of reversing the situation.

1.16.4 Water Monitoring

Water has always been a primary community concern. Multiple studies and monitoring programs have taken place since the initial project proposal and many recommendations have been proposed over the years.

Given the extremely fast pace of the operation and the fact that the physical state of the site changes almost every day, water management and monitoring requires special attention so that planning and forecasting are paramount and reactive scenarios are avoided. During the 2013 monitoring programs, concerns were raised over surface water contamination. It is essential that actions to mitigate, monitor and control surface water are documented. In the coming years with the likely addition of tailings in the pit, the full control and monitoring of underground water will be even more critical. A clear and robust plan is recommended.

1.16.5 Optimization of tailing thickener effiency

The mine is currently considering several options to increase the percentage solid of the thickened tailings. The volume of water withdrawn of tailings could have several advantages, including better surface water management in the tailings, increasing of recirculation of reagents in the process plant and improving the safety of tailings management facility.

1.16.6 Water treatment plant

Monitoring of surface water shows an increase in concentrations of ammonia nitrogen, nitrite and nitrate in mine water. A new water treatment plant will soon be in function, but will not have the capacity to treat these contaminants. The option to treat these contaminants in the new water treatment plant could increase the number of days per year of discharge of the final effluent. This could provide more flexibility during the water management.

2. INTRODUCTION

This Technical Report on the Canadian Malartic Property (the "Property") was prepared for Canadian Malartic General Partnership ("Canadian Malartic GP" or the "issuer") by Mr. Donald Gervais, P.Geo., Mr. Christian Roy, Eng., Mr .Alain Thibault, Eng., Mr. Carl Pednault, Eng. and Mr. Daniel Doucet, Eng.

The Canadian Malartic Property, located in Québec, hosts the Canadian Malartic mine, Canada's largest gold mine, which will produce more than 600,000 ounces of gold a year for the next 14 years. The mine was commissioned just six years after the first exploration drill holes in 2005. The first gold pour was in April 2011 and commercial production began in May 2011.

This Technical Report (the "Report") complies with the reporting requirements of Canadian National Instrument 43-101 ("NI 43-101") and Form 43-101F1. It supports the disclosure of Mineral Resources and Reserves for the Canadian Malartic Property, and is based on geological information and the latest block model geological interpretation from December 31, 2013. The contents of the Report are also based on the 2014 Canadian Malartic mine budget.

InnovExplo, an independent mining and exploration consulting firm based in Val-d'Or, Québec, performed an audit on the Mineral Resources and Mineral Reserves of the Canadian Malartic Property. InnovExplo was responsible for assembling all items of the Technical Report. The peer review of the Technical Report was the responsibility of Daniel Doucet, Corporate Director, Reserve Development for Agnico Eagle Mines Ltd, and Greg Walker, Senior Manager, Resource Estimation for Yamana Gold Inc.

2.1 Overview of the Osisko Transaction

2.1.1 Parties Involved

Osisko Mining Corporation ("Osisko") was a corporation incorporated under the Canada Business Corporations Act ("CBCA") with a head office and registered office located at 1100 avenue des Canadiens-de-Montréal, Suite 300, P.O. Box 211, Montreal, Québec, Canada, H3B 2S2. The common shares of Osisko were listed for trading on the TSX under the symbol "OSK" and on the Deutsche Börse under the symbol "EWX".

Agnico Eagle Mines Limited ("Agnico Eagle") is a company incorporated under the Business Corporations Act (Ontario). Agnico Eagle's head office and registered office is located at 145 King Street East, Suite 400, Toronto, Ontario, Canada, M5C 2Y7. The common shares of Agnico Eagle are listed for trading on the TSX under the symbol "AEM" and on the NYSE under the symbol "AEM".

Yamana Gold Inc. ("Yamana") is a company existing under the CBCA. Yamana's head office is located at 200 Bay Street, Royal Bank Plaza, North Tower, Suite 2200, Toronto, Ontario, Canada, M5J 2J3 and its registered office is located at 2100 Scotia Plaza, 40 King Street West, Toronto, Ontario, Canada, M5H 3C2. The common shares of Yamana are listed for trading on the TSX under the symbol "YRI" and on the NYSE under the symbol "AUY".

2.1.2 Arrangement Transaction

On April 16, 2014, Osisko entered into an arrangement agreement with Agnico Eagle Mines Limited (“Agnico Eagle”) and Yamana Gold Inc. (“Yamana”), pursuant to which Agnico Eagle and Yamana agreed to jointly acquire 100% of the outstanding shares of Osisko pursuant to a court-approved plan of arrangement (the “Arrangement”) under the Canada Business Corporations Act, which Arrangement was completed effective as of 12:01 a.m. on June 16, 2014. Under the Arrangement, Agnico Eagle and Yamana formed a new acquisition entity called Canadian Malartic Corporation (“AcquisitionCo”) of which Agnico Eagle and Yamana each indirectly own 50%.

Pursuant to the Arrangement, AcquisitionCo acquired all of the outstanding Osisko shares and became the sole shareholder of Osisko. Following the completion of the Arrangement and Assignment, Osisko was continued under the laws of the Province of Ontario as 1797729 Ontario Inc. and subsequently amalgamated with AcquisitionCo, and the amalgamated entity continued as “Canadian Malartic Corporation” effective as of June 17, 2014. Indirectly held by Yamana and Agnico Eagle, Canadian Malartic Corporation is the main partner of the Canadian Malartic GP (the “issuer”).

Under the Arrangement, the holders of outstanding Osisko shares received for each Osisko share held by them C$2.09 in cash, 0.07264 of an Agnico Eagle share, 0.26471 of a Yamana share, and one common share of a newly formed company called Osisko Gold Royalties Ltd that acquired certain assets of Osisko that were transferred to it as part of the Arrangement.

Among other things, on closing of the Arrangement, Osisko Gold Royalties held a 5% net smelter return (NSR) royalty interest on the Canadian Malartic Property. The common shares of Osisko Gold Royalties were listed for trading on the TSX under the symbol "OR".

2.2 Terms of Reference

This Technical Report supports the disclosure of the updated mineral resource and reserve estimate covering the Canadian Malartic Property, which hosts the Canadian Malartic open-pit mine, near the town of Malartic in the Province of Québec.

The Canadian Malartic Property represents the amalgamation of the East Amphi property of Richmont Mines, the CHL Malartic property of Abitibi Royalties Inc. (“Abitibi Royalties”) and Osisko Mining Corporation (“Osisko”), and the Canadian Malartic property of Osisko. The Canadian Malartic property, other than the CHL Malartic property, is owned by Canadian Malartic GP. The CHL Malartic property is owned as to 70% by Canadian Malartic Corporation (formerly Osisko Mining Corporation) and as to 30% by Abitibi Royalties.

2.3 Qualified Persons and Inspection on the Property

InnovExplo was responsible for assembling this Technical Report. Sections were contributed by the staff of InnovExplo and Canadian Malartic GP. Table 2.1 lists all the qualified persons ("QPs") for the Report as defined by the Canadian Securities Administrators' National Instrument 43-101 ("NI 43-101"), in accordance with generally accepted *Exploration Best Practices Guidelines* and *Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines* of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM).

Each QP retains the responsibility for their contribution as noted below:

- Donald Gervais, P.Geo., Technical Services Manager for Canadian Malartic GP, is responsible for the sections on mineral resource and mineral reserve estimates, data verification, and geology.
- Christian Roy, Eng., Engineering Superintendent for Canadian Malartic GP, is responsible for the sections on mining methods, infrastructure, and market studies and contracts.
- Alain Thibault, Eng., Trainer, Process Plant for Canadian Malartic GP, is responsible for the sections on mineral processing, metallurgical testing and recovery methods.
- Carl Pednault, Eng., Tailings Environment Superintendent for Canadian Malartic GP, is responsible for the environmental section.
- Daniel Doucet, Eng., Corporate Director, Reserve Development for Agnico Eagle, is responsible for the economic analysis sections and the overall supervision of the Technical Report.

Table 2.1 – List of qualified persons for the 2014 Technical Report on the Canadian Malartic Property

Author	Position	Employer	Independant of Canadian Malartic GP	Sections
Donald Gervais, P.Geo.	Technical Services Manager	Canadian Malartic GP	No	3, 4, 6, 7, 8, 9, 10, 11, 12, 14,15, 23
Christian Roy, Eng.	Engineering Superintendent	Canadian Malartic GP	No	16, 17, 18
Alain Thibault, Eng.	Trainer, Process Plant	Canadian Malartic GP	No	13, 17
Carl Pednault, Eng.	Tailings Environment Superintendent	Canadian Malartic GP	No	5, 20
Daniel Doucet, Eng.	Corporate Director, Reserve Development	Agnico Eagle	No	22, 24

2.4 Principal Sources of Information

The authors' review of the Canadian Malartic Property was based on published material in addition to the data, professional opinions and unpublished material submitted by the issuer and/or by its agents. Authors also consulted other information sources, such as the Québec government's online claim management system via the GESTIM website and the SIGEOM online warehouse for assessment work, both available via the website of the Ministry of Energy and Natural Resources of Québec, as well as technical reports, annual information forms, annual reports, management's discussion and analysis reports, and press releases published by Osisko on the SEDAR website.

The authors conducted a review and appraisal of the available information used to prepare all items in this report and to formulate its conclusions and recommendations, and believe that such information is valid and appropriate considering the status of the project and the purpose for which the report is prepared. The authors have fully researched and documented the conclusions and recommendations herein.

2.5 Effective Date

- The effective date of the 2014 Mineral Resource herein is June 16, 2014.
- The effective date of the 2014 Mineral Reserve herein is June 16, 2014.
- The effective date of the Technical Report is August 13, 2014.

2.6 Units and Currencies

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

3. RELIANCE ON OTHER EXPERTS

The experts who contributed to the realization of this technical report are detailed in Table 3.1.

Table 3.1 – List of experts for the 2014 Technical Report on the Canadian Malartic Property

Expert	Position	Employer	Independent of Canadian Malartic GP	Sections or contributions
Bruno Turcotte, P.Geo.	Consulting Geologist	InnovExplo	Yes	1 to 23 and 25 to 27 and assembling of the Technical Report
Pierre-Luc Richard, P.Geo.	Deputy Director	InnovExplo	Yes	12 and 14
Denis Gourde, Eng.	Vice President – Engineering and Sustainable Development	InnovExplo	Yes	13, 15 to 22, 25 and 26
Sylvie Poirier, Eng.	Manager – Consulting Geologist	InnovExplo	Yes	15
Carl Pelletier, P.Geo	Co-President and Founder	InnovExplo	Yes	15
Eric Labbé	Senior Legal Counsel	Canadian Malartic GP	No	4 and 24
François Bouchard, P.Geo.	Senior Geologist - Exploration	Canadian Malartic GP	No	4, 6 to 8
Pascal Lehouiller, P.Geo.	Resource Geologist	Canadian Malartic GP	No	6 to 8, 12 and 14
Christian Tessier, P.Geo.	Project Geologist	Canadian Malartic GP	No	12
Patrick Champagne, Eng.	Process Plant Manager	Canadian Malartic GP	No	13 and 17
Jean Châteauneuf	Process Plant Production Superintendent	Canadian Malartic GP	No	13 and 17
Christian Laroche	Director of Metallurgy	Canadian Malartic GP	No	13 and 17
Denis Cimon, Eng.	Vice President – Technical Services	Canadian Malartic GP	No	13 and 17
Simon Desrocher, Eng.	Electrical Engineer	Canadian	No	18

Expert	Position	Employer	Independent of Canadian Malartic GP	Sections or contributions
	– Process Plant	Malartic GP		
Patrick Frenette, Eng.	Senior Engineer - Geotechnics	Canadian Malartic GP	No	13, 15, 16, and 21
Amélie Foucault	Community Relations Agent	Canadian Malartic GP	No	20
Boubacar Camara	Director of Environment	Canadian Malartic GP	No	5-20
Hélène Thibault	Director of Communications	Canadian Malartic GP	No	20
Jessica Morin	Environmental Superintendent	Canadian Malartic GP	No	20
Kim Counoyer	Environmental Coordinator - Data Analysis	Canadian Malartic GP	No	20
Mélanie Benoit	Environmental Coordinator	Canadian Malartic GP	No	20
Christine Lapointe, CPA, CA	Controller	Canadian Malartic GP	No	20 and 21
Rock Trépanier	Superintendent, Warehouse Purchase	Canadian Malartic GP	No	19
Greg Walker, P.Geo.	Senior Manager – Resource Estimation	Yamana Gold	No	Peer review
Daniel Doucet, Eng.	Corporate Director – Resource Development	Agnico-Eagle Mines	No	Peer review
Venetia Bodycomb		Vee Geoservices	Yes	Linguistic review

4. PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Canadian Malartic Property is located in the province of Québec, Canada, approximately 25 km west of Val-d'Or and 80 km east of Rouyn-Noranda (Fig. 4.1). The property lies within the Municipality of Malartic. It is located on NTS map sheet 32 D/01 in the townships of Fournière, Malartic and Surimau. The approximate centre of the property is at Latitude 48º 22'N and Longitude 78º 23'W and the approximate UTM coordinates are 712825E and 5334750N, NAD 83, Zone 17.

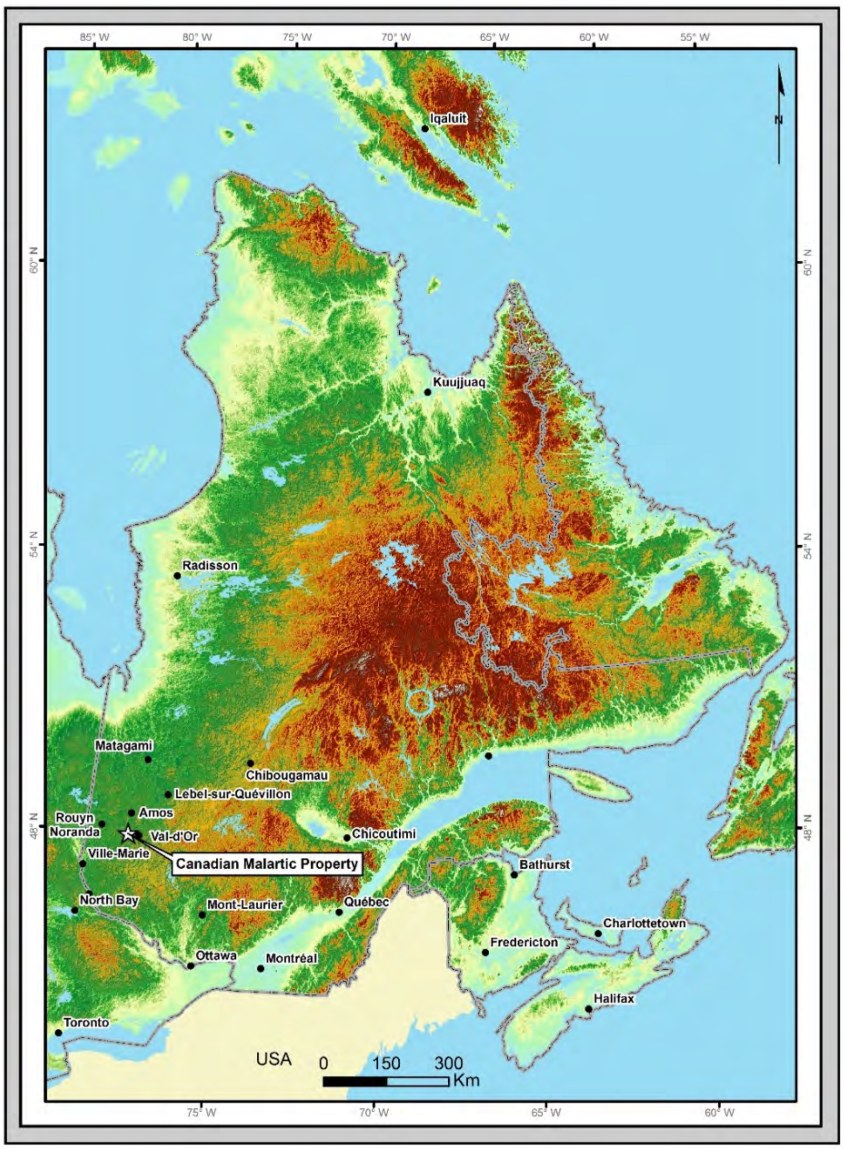

Figure 4.1 – Location of the Canadian Malartic property in the Province of Québec

4.2 Mining Rights in the Province of Québec

The following discussion on the mining rights in the province of Québec was largely taken from Guzon (2012) and Gagné and Masson (2013), and from the Act to Amend the Mining Act (“Bill 70”) assented on December 10, 2013 (National Assembly, 2013).

In the Province of Québec, mining is principally regulated by the provincial government. The Ministry of Energy and Natural Resources (“MENR”; *Ministère de l’Énergie et des Ressources naturelles du Québec*) is the provincial agency entrusted with the management of mineral substances in Québec. The ownership and granting of mining titles for mineral substances are primarily governed by the Mining Act (the “Act”) and related regulations. In Québec, land surface rights are distinct property from mining rights. Rights in or over mineral substances in Québec form part of the domain of the State (the public domain), subject to limited exceptions for privately owned mineral substances. Mining titles for mineral substances within the public domain are granted and managed by the MENR. The granting of mining rights in privately owned mineral substances is a matter of private negotiations, although certain aspects of the exploration for and mining of such mineral substances are governed by the Act. This section provides a brief overview of the most common mining rights for mineral substances within the domain of the State.

4.2.1 The Claim

A claim is the only exploration title for mineral substances (other than surface mineral substances or petroleum, natural gas and brine) currently issued in Québec. A claim gives its holder the exclusive right to explore for such mineral substances on the land subject to the claim but does not entitle its holder to extract mineral substances, except for sampling and in limited quantities. In order to mine mineral substances, the holder of a claim must obtain a mining lease. The electronic map designation is the most common method of acquiring new claims from the MENR whereby an applicant makes an online selection of available pre-mapped claims. In a few territories defined by the government, claims can be obtained by staking.

A claim has a term of two years, which is renewable for additional periods of two years, subject to performance of minimum exploration work on the claim and compliance with other requirements set forth by the Act. In certain circumstances, if the work carried out in respect of a claim is insufficient or if no work has been carried out at all, it is possible for the claimholder to comply with the minimum work obligations by using work credits for exploration work conducted on adjacent parcels or by making a payment in lieu of the required work.

Additionally, it requires a claim holder to submit to the Minister, on each claim registration anniversary date, a report of the work performed on the claim in the previous year. Moreover, the amount to be paid in order to obtain renewal of a claim at the end of its term when the minimum prescribed work has not been carried out now corresponds to twice the amount of the work required. Any excess amount spent on work during the term of a claim can only be applied to the six subsequent renewal periods (12 years in total). Holders of a mining lease or a mining concession are no longer able to apply work that is carried out in respect of a mining lease or a mining concession to renewal of claims.

4.2.2 The Mining Lease

Mining leases and mining concessions are extraction (production) mining titles which give their holder the exclusive right to mine mineral substances (other than surface mineral substances or petroleum, natural gas and brine). A mining lease is granted to the holder of one or several claims upon proof of the existence of indicators of the presence of a workable deposit on the area covered by such claims and compliance with other requirements prescribed by the Act. A mining lease has an initial term of 20 years but may be renewed for three additional periods of 10 years each. Under certain conditions, a mining lease may be renewed beyond the three statutory renewal periods.

The Act (as amended by Bill 70) states that an application for a mining lease must be accompanied by a project feasibility study as well as a scoping and market study as regards to processing in Québec. Holders of mining leases must then produce such a scoping and market study every 20 years. Bill 70 adds, as an additional condition for granting a mining lease, the issuance of a certificate of authorization under the Environment Quality Act. The Minister may nevertheless grant a mining lease if the time required to obtain the certificate of authorization is unreasonable. A rehabilitation and restoration plan must be approved by the Minister before any mining lease can be granted. In the case of an open-pit mine, the plan must contain a backfill feasibility study. This last requirement does not apply to mines in operation as of December 10, 2013. Bill 70 sets forth that the financial guarantee to be provided by a holder of a mining lease be for an amount that corresponds to the anticipated total cost of completing the work required under the rehabilitation and restoration plan.

4.2.3 The Mining Concession

Mining concessions were issued prior to January 1, 1966. After that date, grants of mining concessions were replaced by grants of mining leases. Although similar in certain respects to mining leases, mining concessions granted broader surface and mining rights and are not limited in time.

A grantee must commence mining operations within five years from December 10, 2013. As is the case for a holder of a mining lease, a grantee may be required by the government, on reasonable grounds, to maximize the economic spinoffs within Québec of mining the mineral resources authorized under the concession. It must also, within three years of commencing mining operations and every 20 years thereafter, send the Minister a scoping and market study as regards to processing in Québec.

4.2.4 Other Information

The claims, mining leases, mining concessions, exclusive leases for surface mineral substances, and the licences and leases for petroleum, natural gas and underground reservoirs obtained from the MENR may be sold, transferred, hypothecated or otherwise encumbered without the MENR's consent. However, a release from the MENR is required for a vendor or a transferee to be released from its obligations and liabilities owing to the MENR related to the mine rehabilitation and restoration plan associated with the alienated lease or mining concession. Such release can be obtained when a third party purchaser assumes those obligations as part of a property transfer. For perfection purposes, the transfers of mining titles and grants of hypothecs and other encumbrances in mining rights must be recorded in the register of real and immovable mining rights maintained by the MENR and other applicable registers.

Under Bill 70, a lessee or grantee of a mining lease or a mining concession, on each anniversary date of such lease or concession, must send the Minister a report showing the quantity and value of ore extracted during the previous year, the duties paid under the Mining Tax Act and the overall contributions paid during same period, as well as any other information as determined by regulation.

4.3 Property Description

The current Canadian Malartic Property represents the amalgamation of the East Amphi property of Richmont Mines, the CHL Malartic property of Abitibi Royalties Inc. ("Abitibi Royalties") and Osisko Mining Corporation ("Osisko"), and the Canadian Malartic property of Osisko. The Canadian Malartic property, other than the CHL Malartic property, is owned by Canadian Malartic GP. The CHL Malartic property is owned as to 70% by Canadian Malartic Corporation (formerly Osisko Mining Corporation) and as to 30% by Abitibi Royalties.

The Canadian Malartic Property consists of a contiguous block comprising 1 mining concession, 5 mining leases, and 208 mining claims covering an aggregate area of 8,735.9 hectares (Fig. 4.2). The mining claims, mining leases and mining concession are all held, completely or partially, by Canadian Malartic GP. The mining claims, mining leases and mining concession for the property are subject to terms under a number of agreements. A detailed list of mining titles, ownership and royalties is provided in Appendix IV.

4.4 Claim Status

Claim status was supplied by Eric Labbé, Senior Legal Counsel of Canadian Malartic GP. The status of all claims was also verified using the Québec government's online claim management system via the GESTIM website at:

https://gestim.mines.gouv.qc.ca/MRN_GestimP_Presentation/ODM02101_login.aspx

According to the GESTIM website, all mining titles related to the Canadian Malartic (Osisko) property are now registered to Canadian Malartic GP. Most of the mining titles from the historical East Amphi property (Richmont Mines) are now registered to Canadian Malartic GP, except mining titles owned 15% by the Currie Mills estate and Paul Boyd (pale green area in Fig. 4.2) that are now registered to Canadian Malartic Corporation (85%). The mining titles representing the historical CHL Malartic property (purple area in Fig. 4.2) are registered to Abitibi Royalties Inc. (30%) and Canadian Malartic Corporation (70%).

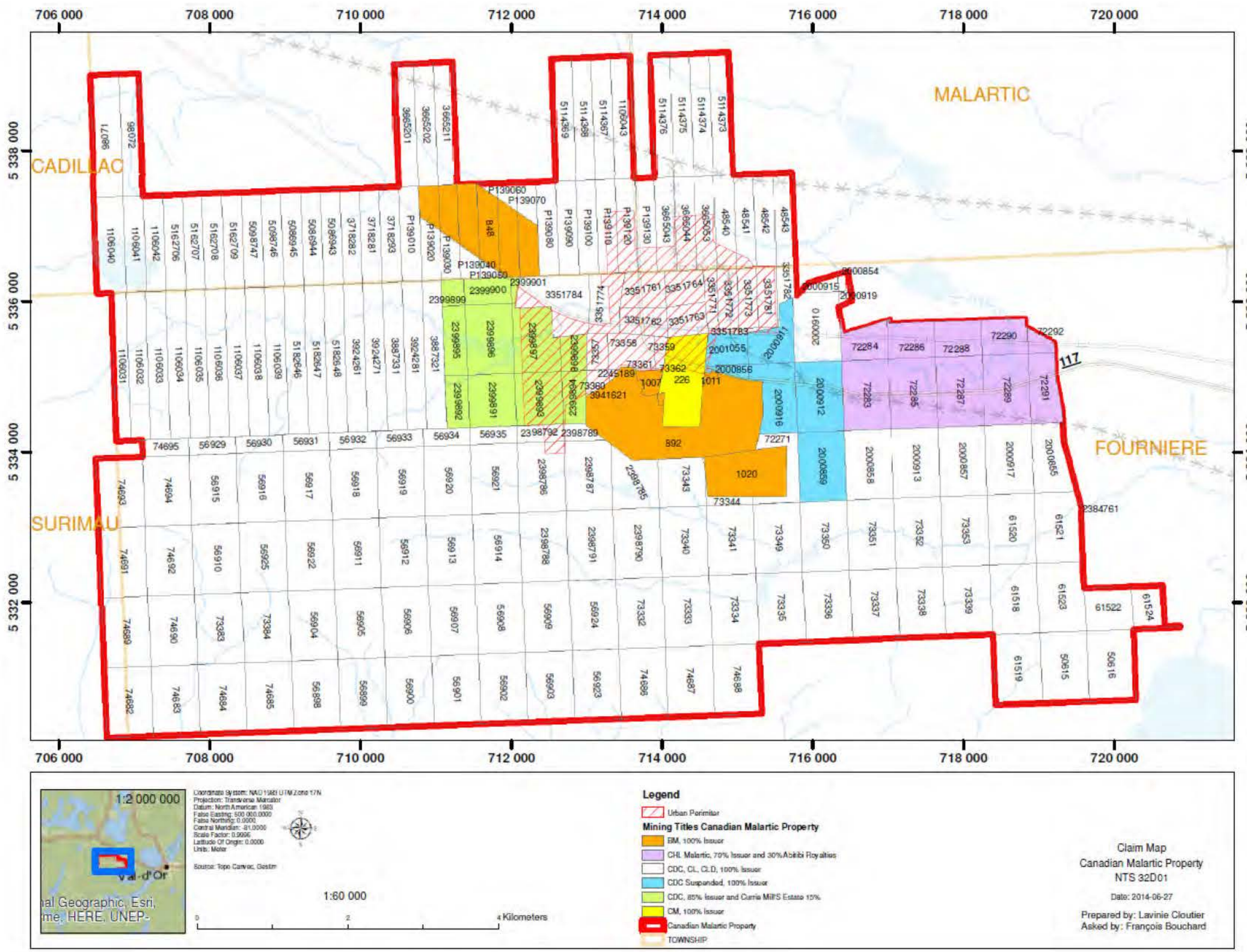

Figure 4.2 – Location map of Canadian Malartic Property mining titles

Six mining titles have a suspended status (light blue area in Fig. 4.2). These claims are subject to a demand of modification of the mining lease. Following the normal procedure, these six mining titles are affected by the modification of the future mining lease boundaries. A portion of these claims remaining beyond the mining lease boundary will be re-activated once the modifications of the mining lease will be delivered.

4.4.1 Osisko's East Amphi Property

The East Amphi property was formed through the amalgamation of the historical East Amphi, Fourax, Malartic Extension, Radium-Nord, Reservoir and West Amphi properties held by Richmont Mines. The East Amphi property comprises 88 contiguous mining titles for a total of 3,111.3 hectares.

Richmont Mines sold its East Amphi property to Osisko Exploration Ltd ("Osisko") on June 29, 2007. In exchange, Richmont Mines received a cash payment of $2,450,000 and 1,109,000 common shares of Osisko valued at $6,086,000. Richmont Mines retains a net smelter return royalty (NSR) of 2% on a specified portion of the future production of the East Amphi property and a similar royalty on future production of up to 300,000 ounces of gold on another portion of the property.

Mining titles were subject to other historical royalties. A detailed description of each is present in Section 4.5 – Agreements and Encumbrance.

After acquiring the East Amphi property, Osisko purchased back some part of the NSR royalties affecting the mining titles. Net smelter return is the amount actually paid to the mine owner from the sale of ore, minerals or concentrates mined and removed from mineral properties, net of expenditures such as transportation of the product sold, smelting and refining charges.

4.4.2 Osisko's CHL Malartic Property

The Malartic CHL property comprises 10 contiguous mining titles. The total surface area of these claims (numbers 72283 through 72292) amounts to 388.64 ha. The 10 claims were originally registered in the name of Golden Valley Mines Ltd. ("Golden Valley") but were transferred to Abitibi Royalties upon its creation and listing in March 2011.

In 2006, Golden Valley entered into a mining option agreement with Osisko in regard to the 10 claims. In return for cash payments totalling $150,000 and a work commitment of $2,000,000, Osisko would be vested with a 70% interest in the property. Golden Valley would then be carried to production with a 30% interest in the CHL property, now transferred to Abitibi Royalties. Osisko became the operator of the joint venture and the option was exercised by Osisko in 2011. A joint venture between Abitibi Royalties (30%) and Osisko (70%) was deemed to be formed upon Osisko's exercise of the option.

The mining titles are free and clear of all hypothecs, or any other encumbrance, including royalties and NSR, whether for minerals, metals, extracts or by-products.

The CHL Malartic Property is subject to ongoing litigation with Abitibi Royalties. See section 24 below.

4.4.3 Osisko's Canadian Malartic Property

The Canadian Malartic Property is comprised of 115 contiguous mining titles covering a total of 5,236.0 ha. All titles were registered with 100% ownership to Osisko.

In November, 2004, Osisko, through an intermediary, purchased a 100% interest in six claims and one CM (mining concession) covering the past-producing Canadian Malartic Mine for an amount of C$80,000. The mining titles were purchased from a liquidation trustee following the bankruptcy of McWatters Mining Inc. ("McWatters") earlier in 2004. A sliding 2% to 3% NSR is payable to Barrick Gold Corporation for these titles, half of which was purchased for C$1.5 M.

Osisko elected not to purchase the CM covering the past producing Barnat, Sladen and East Malartic Mines from the liquidation trustee due to concerns over acquired environmental liabilities. Control of this portion of the property was assumed by the Government of Québec in December 2004 after the liquidation trustee failed to find a buyer.

On December 29, 2004, Osisko announced the signing of a letter of intent with Dianor and its wholly-owned subsidiary Threegold to acquire a 100% interest in a block of six claims to the southwest of, and contiguous with, the property purchased from the McWatters trustee. These claims are subject to a 2% Net Smelter Royalty payable to a private individual, but the royalty may be purchased for C$2.0 M. Official documents for the transfer of these claims were filed on December 29, 2005.

Between February and June 2005, 92 additional claims were staked by Osisko or its appointed intermediaries, surrounding the original block of seven mining titles and the Dianor block. In December 2005, Osisko staked six more claims along the southern margin of the property.

In late 2005, the Government of Québec cancelled the CM and claims covering the portion of the McWatters property that was transferred from the liquidation trustee and converted the area to 16 CDCs. The conversion of mining titles to CDCs effectively freed any eventual owner of the titles of the associated environmental liabilities. The claims were made available through the government's electronic map staking system, and eight separate parties simultaneously submitted applications for the titles. The ownership situation was resolved by a claim-by-claim lottery conducted on February 15, 2006. Osisko succeeded in acquiring two of the claims at the lottery. On March 2, 2006, Osisko announced that it had signed letters of intent with a group of four independent parties to purchase 100% interest in the remaining 14 titles. Seven of these titles were purchased outright from two individuals, without additional encumbrance. The remaining seven claims were purchased from two other individuals and are subject to a 1% Gross Overriding Royalty.

Effective February 10, 2006, Osisko entered into a purchase and sale agreement with Golden Valley Mines to purchase a 100% interest in a single claim (number 72271) contiguous to the property. The claim is subject to a 2% NSR payable to Golden Valley Mines. The purchase of claim number 72271 was completed by Osisko on May 17, 2006. The 2% NSR was subsequently transferred to Abitibi Royalties in March 2011.

Mining titles were subject to other historical royalties. Detailed descriptions of these royalties are presented in Section 4.5 – Agreements and Encumbrance. After acquiring these mining titles, Osisko purchased back some part of the NSR royalties affecting the titles.

4.5 Agreements and Encumbrances

Mining titles constituting the current Canadian Malartic Property were acquired by Osisko in stages between 2004 and 2014. Many of the mining titles of the property were map-staked by Osisko or its appointed intermediaries and are not subject to any encumbrances. Others were purchased outright from independent parties, without royalties or other obligations. Of the 208 mining titles constituting the Canadian Malartic Property, 101 are subject to agreements presented in Table 4.1 and shown on Figure 4.3.

4.6 Osisko Transaction

On June 16, 2014, Agnico Eagle Mines Ltd (“Agnico Eagle”) and Yamana Gold Inc. (“Yamana”) completed the acquisition of Osisko Mining Corporation (“Osisko”), owner of the Canadian Malartic mine. Agnico Eagle and Yamana Gold jointly acquired 100% of the issued and outstanding common shares of Osisko.

Agnico Eagle and Yamana Gold now each own 50% of Osisko and have formed a joint committee (Canadian Malartic GP) to operate the Canadian Malartic mine in Quebec.

Each outstanding common share of Osisko was exchanged for:

- C$2.09 in cash;
- 0.07264 of an Agnico Eagle common share;
- 0.26471 of a Yamana Gold common share;
- And of one common share of Osisko Gold Royalties Ltd, a newly formed company that has commenced trading on the Toronto Stock Exchange under the symbol "OR".

Pursuant to the Arrangement, the following assets of Osisko have been transferred to Osisko Gold Royalties Ltd:

- a 5% NSR on the Canadian Malartic Property;
- C$157 M cash;
- a 2% NSR on the Kirkland Lake assets, the Hammond Reef Project, and certain other properties;

- all assets and liabilities of Osisko in its Guerrero camp; and
- certain other investments and assets.

The historical CHL Malartic property and the mining titles owned 15% by the Currie Mills estate and Paul Boyd are not subject to the 5% NSR payable to Osisko Gold Royalties (Fig. 4.4).

Table 4.1 – Mining titles subject to royalties

Mining Titles	Agreements and Encumbrances
CL 3490181, CL 3490151, CL 3263051, CL 3263011, CL 3263012, CL 3263351, CL 3263002 (converted)	- Mining rights registered to Canadian Malartic GP for an interest of 85%, the remaining 15% is held by the Currie Mills estate and Paul Boyd. - Titles purchased from Richmont Mines Inc. for cash and shares. - Titles are subject to a sliding 1% to1.5% NSR payable to RG Exchangeco Inc. - The royalty rate is tied to the price of gold, with the higher rate taking effect if the gold price is greater than US$350/oz. - Titles are subject to a 15% NPI (Net Profit Interest) amount is payable on a monthly basis to the Currie-Mills estate
CM 226, CL 3941621, CL 3941633, CL 3941634, CL 3941635, CL 3950771, CL 3950772	- Mining rights 100% owned by Canadian Malartic GP. - Titles purchased from McWatters Mining Inc. liquidating trustee in consideration of a cash payment. - Titles are subject to a sliding 1% to 1.5% Net Smelter Royalty payable to RG Exchangeco Inc. - The royalty rate is tied to the price of gold, with the higher rate taking effect if the gold price is greater than US$350/oz.
CL 5144234, CL 5144235, CL 5144236, CL 5144237, CL 5144238, CL 5144239 (converted)	- Mining rights 100% owned by Canadian Malartic GP. - Titles acquired from Dianor Resources Inc. and subsidiary Threegold Resources Inc. for cash and shares. - Titles are subject to a 2% NSR payable to Mike Lavoie. - The entire royalty may be purchased back by Osisko for C$2,000,000.
CDC 72271	- Mining rights 100% owned by Canadian Malartic GP. - Titles acquired from Golden Valley Mines for cash consideration. - Titles is subject to a 2% NSR payable to Abitibi Royalties
CDC 2000854, CDC 2000855, CDC 2000856, CDC 2000857, CDC 2000858, CDC 2000859, CDC 2001055	- Mining rights 100% owned by Canadian Malartic GP. - Titles acquired from Jack Stoch for cash consideration. - Titles is subject to a 1.5% Gross Overriding Metal Royalty payable to Franco-Nevada.
CL 3887321, CL 3887331, CL 3924261, CL 3924271, CL 3924281	- Mining rights 100% owned by Canadian Malartic GP. - Titles purchased from Richmont Mines Inc. for cash and shares. - Titles are subject to a sliding 1% to 1.5% NSR payable to RG Exchangeco Inc. - The royalty rate is tied to the price of gold, with the higher rate taking effect if the gold price is greater than US$350/oz.
CL 3665043, CL 3665044, CL 3665053, CL 3665201, CL 3665202, CL 3665211, CL 3718281, CL 3718282, CL 3718293, CL 5086943, CL 5086944, CL 5086945, CL 5098746 CL 5098747, BM 848, CLD P139010, CLD P139020, CLD P139030, CLD P139040, CLD P139050, CLD P139060, CLD P139070, CLD P139080, CLD P139090, CLD P139100, CLD P139110, CLD P139120, CLD P139130	- Mining rights 100% owned by Canadian Malartic GP. - Titles purchased from Richmont Mines Inc. for cash and shares. - A 2% NSR is payable to Richmont Mines Inc. from 35,000 to 300,000 ounces of gold. - A 2% NSR is payable to Globex Mining Inc. after 300,000 ounces of gold.

Mining Titles	Agreements and Encumbrances
CL 3351761, CL 3351762, CL 3351763, CL 3351764, CL 3351771, CL 3351772, CL 3351773, CL 3351774, CL 3351781, CL 3351782, CL 3351783, CL 3351784	- Mining rights 100% owned by Canadian Malartic GP. - Titles purchased from Richmont Mines Inc. for cash and shares. - A 2% NSR is payable to Richmont Mines Inc. from 35,000 to 300,000 ounces of gold (only if the Royal Oak Mines Inc.'s royalty is not payable). - A 2% NSR is payable to Globex Mining Inc. after 300,000 ounces of gold have been produced. - To the knowledge of the Parties, for every ounce produced from the Fourax Block, a 3% NSR may be payable quarterly to Royal Oak Mines Inc. based on the prevailing price of gold.
CDC 48540, CDC 48541, CDC 48542, CDC 48543, CDC 1106043, CL 5114367, CL 5114368, CL 5114369, CL 5114373, CL 5114374, CL 5114375, CL 5114376, CDC 1106031, CDC 1106032, CDC 1106033, CDC 1106034, CDC 1106035, CDC 1106036, CDC 1106037, CDC 1106038, CDC 1106039, CL 5182646, CL 5182647, CL 5182648	- Mining rights 100% owned by Canadian Malartic GP. - Titles purchased from Richmont Mines Inc. for cash and shares. - A 2% NSR is payable to Richmont Mines Inc.

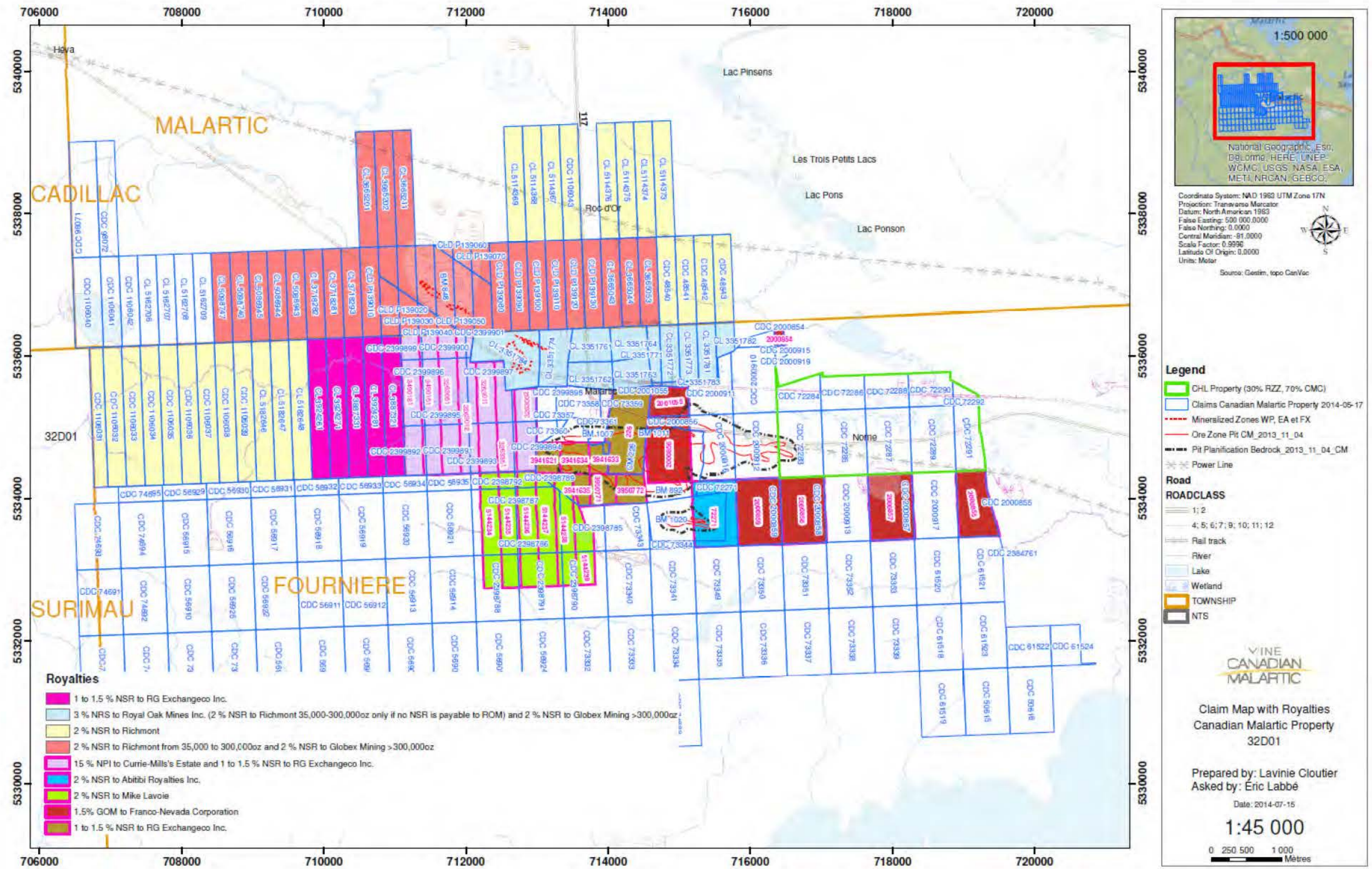

Figure 4.3 – Location map of the Canadian Malartic Property showing mining titles subject to a royalty.

Note: The number of mining titles corresponds to the original number of mining titles present in the historical agreement detailed in Table 4.1 and may thus differ from mining leases subsequently granted and a number mining titles recently converted into cells from electronic map designation.

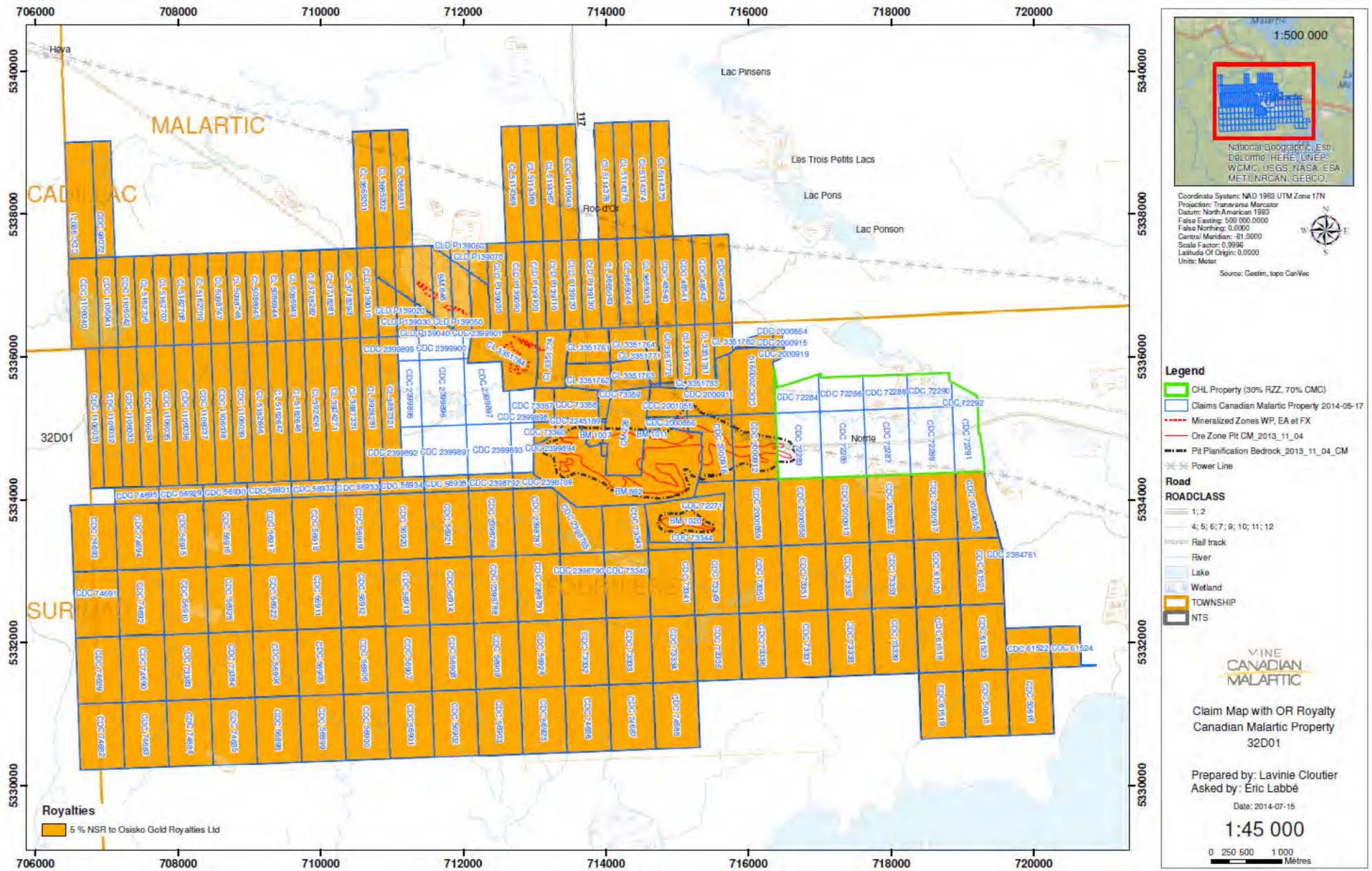

Figure 4.4 – Location map of the Canadian Malartic Property showing mining titles subject to the 5% NSR payable to Osisko Gold Royalties

4.7 Urban Perimeter

As far as exploration and mining activities are concerned, a part of the Canadian Malartic property is affected by regulations regarding the presence of an "Urban Perimeter" (red hatched area in Fig. 4.2). The restriction, as documented on GESTIM, is one of "Exploration Prohibited" (see Bill 70, 2013, chapter 32, section 124). According to Bill 70, any mineral substance forming part of the domain of the State and found in an urban perimeter shown on maps kept at the registrar's office, except mineral substances found in a territory subject to a mining right obtained before December 10, 2013, is withdrawn from prospecting, mining exploration and mining operations as of that date, until the territories provided for in section 304.1.1 of the Mining Act are determined (as of December 10 2013, the Act to amend the Mining Act: Bill 70).

According to section 304.1.1, any mineral substance forming part of the domain of the State and found in a parcel of land on which a claim may be obtained and that is included in a mining-incompatible territory delimited in a land use and development plan in accordance with the Act respecting land use planning and development (chapter A-19.1) is withdrawn from prospecting, mining exploration and mining operations from the time the territory is shown on the maps kept at the office of the registrar. A mining-incompatible territory is a territory in which the viability of activities would be compromised by the impacts of mining.

The Canadian Malartic Property only includes mining rights obtained before December 10, 2013 and thus exploration is permitted on the mining rights overlapping the urban perimeter until mining-incompatible territories are determined by the regional county municipality. In the event that a claim overlaps a mining-incompatible territory, exploration will still be permitted on the overlapping claim, but renewal of such claim will only be permitted if work is performed on the claim during any term occurring after the determination of the mining-incompatible territory (section 61 of the Mining Act). It is expected that the current urban perimeter in Malartic will be determined as a mining-incompatible territory by the regional county municipality.

4.8 Access to land and notices

As of December 10, 2013, Canadian Malartic GP must obtain a written authorization from the landowner at least 30 days in advance in order to access the site or may acquire, by agreement, any real right or property to access the site or conduct exploration work (section 235 of the Mining Act). Once the relevant regulations will be approved, Canadian Malartic GP will also have to notify the landowner, the lessee, the holder of an exclusive lease to mine surface mineral substances and the local municipality within 60 days after registering a claim of the fact that they have obtained the claim, and must inform the municipality and the landowner at least 30 days before performing work (see Bill 70, 2013, chapter 32, sections 31 and 127).

4.9 Permits

The current permitting status of the Canadian Malartic Property and the kinds of permits likely to be required to support project development are discussed in Section 20.

4.10 Environment

The current status of the environmental studies, community consultation, and environmental permitting are discussed in Section 20.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The northern part of the Canadian Malartic property can be accessed directly from Highway 117, a major east-west highway in northwestern Québec. A paved road running north-south from the town of Malartic (Fig. 5.1) towards Mourier Lake cuts through the central area of the Canadian Malartic property. The Canadian Malartic property is further accessible by a series of logging roads and trails.

Malartic is also serviced by a rail-line which cuts through the middle of the town. The nearest large airport is located in Val-d'Or, about 25 km east of Malartic.

Figure 5.1 – Aerial photograph of the town of Malartic and the Canadian Malartic open-pit mine. (*From Mine Canadian Malartic website*)

5.2 Local Resources and Infrastructures

The Canadian Malartic property is located in the southern portion of the town of Malartic. The town has a population of about 3,500 people and hosts a variety of commercial establishments, including motels, restaurants, service suppliers, retailers and a community health clinic, as well as elementary and high schools. The city of

Val-d'Or, some 25 km east of Malartic, hosts a large number of manufacturers and suppliers who serve the mining industry.

Skilled workers are available from the areas within an approximate 25 km radius of Malartic, specifically Cadillac to the west and Val-d'Or to the east, where a number of mines are still in operation.

5.3 Physiography

The Canadian Malartic property (Fig. 5.2) is situated in the Abitibi lowlands and is relatively flat, consisting of plains with a few small hills. The topography on the property has altitudes ranging from 310 metres above sea level (masl) to 360 masl.

Most of the area is sparsely wooded with secondary growth black spruce, larch and birch as the dominant species. The central, east-central and west- central parts of the property are cut by a number of small streams, generally oriented east-west and connecting bogs or swampy areas.

Overburden is characteristically a thin layer of till, typically only a few metres thick, with local surface development of organic-rich boggy material. Outcropping exposures of rock are rare to moderate, generally increasing towards the southern portion of the property and lithologies become harder and more resistant to erosion.

5.4 Climate

The following information on temperature and precipitation is based on data collected at the Val-d'Or meteorological station between 1970 and 2001, as reported by the *Centre de Ressources en Impacts et Adaptation au Climat et à ses Changements* (CRIACC). Data on wind velocity and direction are based on records from 1961 to 1991.

Mean annual temperature for the Val-d'Or/Malartic area is 1.2°C, with average daily temperatures ranging from -17.2°C in January to 17.2°C in July. The average total annual precipitation is 914 mm, peaking in September (102 mm) and at a minimum in February (40.5 mm). Snow falls between October and May, with most occurring between November and March. Peak snowfall occurs in December, averaging 610 mm, equivalent to 54 mm of water. Winds are generally from the south or southwest from June through January, and from the north or northwest from February through May. Average wind velocities are in the order of 11 to 14 km/h.

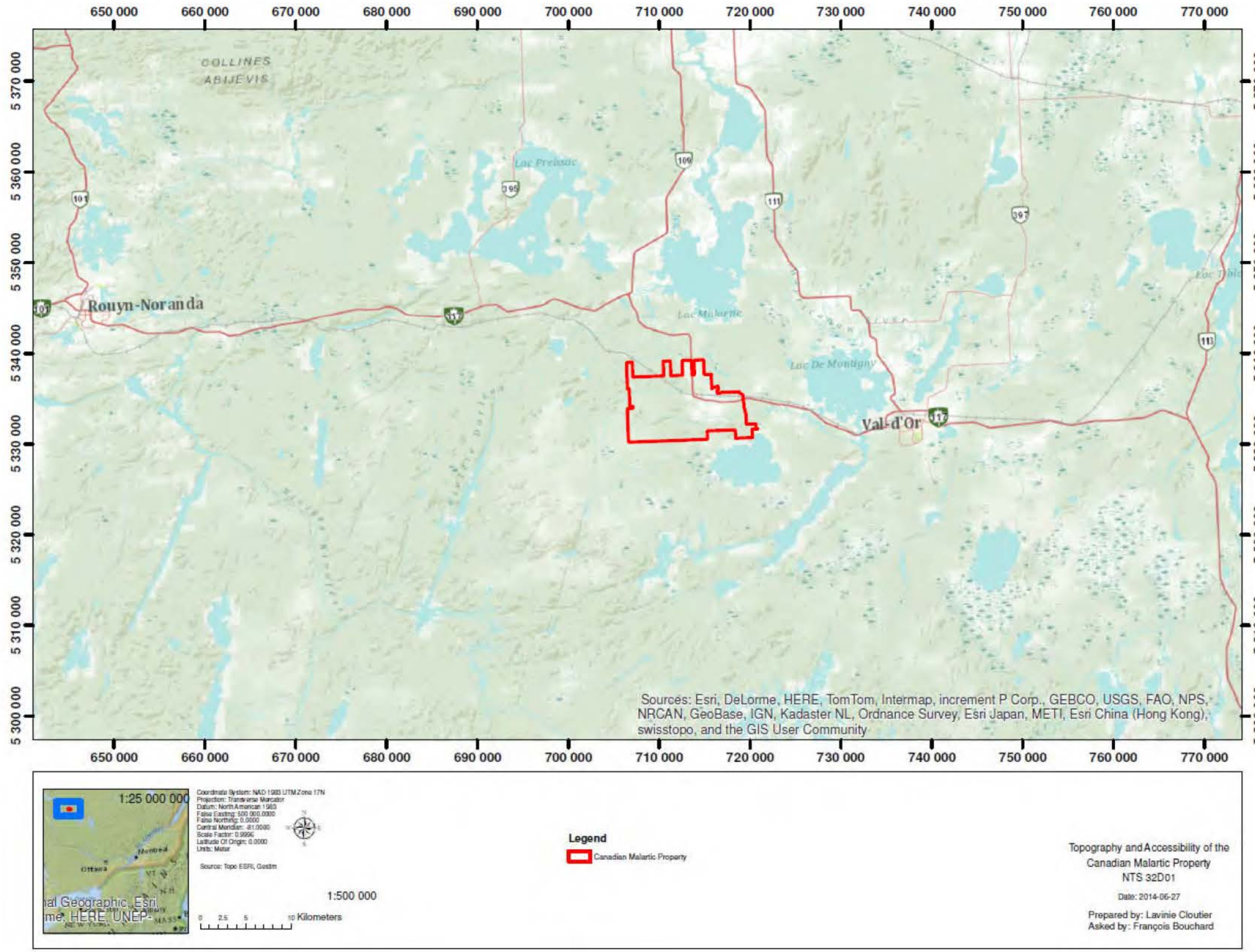

Figure 5.2 – Topography and accessibility of the Canadian Malartic property

6. HISTORY

6.1 Osisko's Canadian Malartic and CHL Malartic Properties

This section on historical work covers the Canadian Malartic, Barnat, Sladen and East Malartic mines, including the sector of the Gouldie and Jeffrey zones. The Jeffrey Zone is the along-strike continuation of the immediately adjacent East Malartic and Barnat mines.

Detailed information can be found in the following publications: Gossage and Inwood (2007); Gossage and Slater (2007); Runnels et al. (2008a; 2008b; 2008c); Hennessey et al. (2008); Belzile (2009a; 2009b); Belzile and Gignac (2010); Belzile and Gignac (2011); Wares and Burzynski (2011); and Hennessey and San Martin (2012).

The information provided herein was taken from the above reports as well as from Osisko documents available on the SEDAR website (annual information forms, annual reports, and management's discussion and analysis reports; www.sedar.com).

6.1.1 Prior to Osisko (1923-2003)

Gold was first discovered in the Malartic area in 1923 by the Gouldie Brothers at what is now designated the Gouldie Zone (Trudel et Sauvé, 1992). In 1925, a new showing was discovered and staked by an Ottawa-based prospecting syndicate, located about 1.6 km northwest of the Gouldie prospect. This property was sold to the newly-incorporated Malartic Gold Mines in 1927. Malartic Gold Mines undertook drilling, trenching and limited underground development on the deposit until 1929, when the project was suspended with the onset of the Great Depression.

In 1933, the Canadian Malartic Gold Mines Company took possession of the Malartic Mines property as well as the claims covering the Gouldie prospect. Production at the Canadian Malartic mine began in 1935 and continued uninterrupted until 1965. The deposit was mined mostly by underground long-hole stoping methods, making it the only underground bulk tonnage gold mine in Québec at the time.

In 1964, Falconbridge Nickel Ltd purchased the Canadian Malartic mine and, following cessation of gold production in 1965, refurbished the mill to process nickel ore from its Marbridge mine. These operations ceased in 1968, after which the Canadian Malartic Mill was decommissioned and removed.

The Canadian Malartic success prompted additional exploration, discovery and development immediately to the east. The resulting Malartic gold camp included four past-producing gold mines, three of which (Canadian Malartic, Sladen and East Malartic) mined portions of a 4,000-m-long continuous mineralized system from west to east respectively. The Sladen mine, which worked the eastern extension of the Canadian Malartic deposit, went into production in 1938. Other small gold deposits immediately to the north were developed and mined at the same time by Barnat Mines Ltd, and as production waned at the Sladen mine in 1948, Barnat Mines purchased Sladen Mines Ltd as well as other ground to the north owned by National

Malartic Mines Ltd. The merged Barnat/Sladen mines continued operating in the area under Barnat Mines until 1970, although the Sladen ore zone had been exhausted by 1951. Lake Shore Mines Ltd purchased the Barnat/Sladen mine in 1970 and re-opened the mine in 1976, operating it until 1981. The East Malartic mine independently went into production in 1938 and continued with only minor interruptions until 1983. In 1974, the mining titles covering a portion of the historical Canadian Malartic holdings were purchased by East Malartic Mines.

According to Lavergne (1985), during the period from 1935 to 1983, these mines produced a total of 5,545,000 ounces of gold and 1,854,300 ounces of silver, mostly from underground operations (Table 6.1). Two small open pits (Buckshot and Mammoth) were excavated at the Barnat and East Malartic mines, to recover mineralization from crown pillars after the backfilling of underground stopes. The production figures reported here were obtained from Lavergne (1985), Sansfaçon et al. (1987a; 1987b), Trudel and Sansfaçon (1987), Sansfaçon and Hubert (1990) or Trudel and Sauvé (1992).

At the Canadian Malartic mine, a total of 9,931,376 tonnes of ore at an average grade of 3.37 g Au/t and 2.47 g/t Ag were extracted, for an aggregate production of 1,203,500 ounces of gold and 788,500 ounces of silver. Mineralization occurs as finely disseminated native gold within altered sediments and porphyry, and was recovered by standard milling and cyanide-leaching techniques with an 89.4% average recovery reported over the mine life.

At the Barnat/Sladen mine, a total of 8,452,000 tonnes of ore were processed at an average grade of 4.73 g Au/t and 1.17 g/t Ag, yielding a total of 1,285,300 ounces of gold and 317,900 ounces of silver. There are no specific production records for the South Barnat deposit. Production resumed in 1976 until 1981, but the production data were included in those of the East Malartic mine when both ores were processed at the East Malartic Mill.

The East Malartic mine represents the largest historical producer in the Malartic gold camp. Over the lifetime of the mine, a total of 18,316,000 tonnes of ore were extracted, at an average grade of 5.19 g Au/t and 1.27 g/t Ag, yielding 3,056,250 ounces of gold and 747,900 ounces of silver.

Table 6.1 – Gold production statistics for the Canadian Malartic, Barnat/Sladen and East Malartic mines (from Lavergne, 1985)

	Canadian Malartic Mine	Barnat/Sladen Mine	East Malartic Mine	TOTAL
Years of production	1935-1965	1938-1970	1938-1983	
Ore milled (metric tonnes)	9 929 000	8 452 000	18 316 000	36 697 000
Au Grade (g/t)	3.77	4.73	5.19	4.70
Ag Grade (g/t)	2.47	1.17	1.27	1.57
Gold ounces	1 203 477	1 285 321	3 056 251	5 545 050
Silver ounces	788 485	317 934	747 869	1 854 288

Following the cessation of mining in 1983, the entire Malartic gold camp, covering the balance of the Canadian Malartic ground, as well as the past-producing Barnat/Sladen and East Malartic Mines, was acquired by Long Lac Exploration Ltd. Relatively little exploration work was done before development began on the mines and, during mining operations, essentially all reports of geological work, drilling, development and production were internal, unpublished documents. The collective archives of the past-producing mines were acquired by Long Lac Exploration at the time it took control of the property, and stored in the administrative offices of the East Malartic mine. Long Lac Exploration, East Malartic Mines and a third Ontario-based company merged in 1982 to form Lac Minerals Ltd, which continued to explore the property over the next decade with the objective of defining a near-surface gold resource amenable to small open-pit mining methods. Lac Minerals produced gold from 1981 to 1983 from two small open pit operations that exploited crown pillars and processed the ore at the East Malartic Mill. The Mammoth pit was mined in 1979. The adjoining open stope 1-20 was mined in 1983 using a ramp stating at the bottom of the 1979 pit. The Buckshot pit at Barnat was also mined in 1983.

From 1980 to 1988, Lac Minerals explored the area of the Canadian Malartic deposit with the objective of defining a near-surface (less than 100 m deep) resource amenable to open pit mining. Work included drilling of approximately 500 surface drill holes on or near the site of the old Canadian Malartic mine. Several other drill campaigns were completed on the Barnat/Sladen and East Malartic portions of the property until 1990. Most of the drill data generated by Lac Minerals was filed for assessment with the Government of Québec and is publicly available. Only limited older drilling is known to exist for the Jeffrey Zone: East Malartic Mines drilled what became the Jeffrey Zone In 1941, and Lac Minerals drilled about five holes in 1982-83 that were located 300 m east of the zone. The latter holes were aimed at a locally narrow/discontinuous high-grade zone in porphyry dikes.

Lac Minerals undertook several ground geophysical surveys on the property including pole-dipole and dipole-dipole induced polarization surveys, magnetic and horizontal loop electromagnetic surveys, and VLF electromagnetic surveys. All surveys yielded inconclusive results because the anomalies, especially IP anomalies, could not be correlated to known mineralization. Given the poor response of the various geophysical survey techniques, Lac Minerals targeted its exploration drilling program based on results of historic drilling, underground development and surface geological mapping.

The exploration program led to the definition of five near-surface gold mineralized zones forming an aggregate unclassified resource of approximately 8,160,000 tonnes with an average grade of 1.98 g/t Au (520,000 oz Au), using a cut-off grade of 1.03 g/t Au. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*) Unbeknownst to Lac Minerals, the mineralized zones they defined were all the near-surface expression of a much larger, lower-grade, continuously mineralized gold system extending to a depth of at least 400 m.

Lac Minerals estimated in 1989 an unclassified resource of 27,210,000 tonnes with an average grade of 1.95 g/t Au (1,706,100 oz Au) at the Canadian Malartic deposit to a vertical depth of 305 m. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*) This figure was calculated using a cut-off grade of 1.03 g/t Au but gold prices at the time did not allow, according to Lac Minerals, open pit mining to depths of greater than 100 m.

As Lac Minerals completed a feasibility study on the project, control of the property fell to Barrick Gold Corp. ("Barrick") in 1994 when it acquired Lac Minerals. Barrick did not explore the property but completed a number of environmental and stope stability studies during the 1990s. Barrick drilled a limited number of geotechnical holes to determine the thickness and stability of the crown pillars of the Canadian Malartic mine, in the area underlying houses in the southern part of the town of Malartic. Barrick's principal activity in the area was to process ore from its Bousquet mine at the East Malartic Mill, which lasted until 2002. Barrick sold all of its interests in the Malartic camp, including environmental and reclamation liabilities, to McWatters Mining Inc. in February, 2003.

6.1.2 Osisko Period (2004-2014)

Osisko was founded in 1998 by Robert Wares and was initially engaged in general exploration for precious and base metals in Quebec. The Osisko team strategically chose to focus exploration/acquisition on bulk tonnage, open pit mineable gold deposits as these deposit types characterize the majority of large, world-class gold mining operations; i.e., those with greater than 5 Moz of reserves. From the mining side of such potential operations, popular perception in Canada at the time was such that bulk-tonnage gold mining operations are only economical in tropical or desert environments, where oxidation of the upper portions of such deposits allowed for easier mining, grinding and/or heap leaching, significantly favouring the economics of such mines. However, a review of Kinross' Fort Knox mine in Alaska convinced the Osisko team of the merits of bulk tonnage mining operations in northern climates, and the decision was made to include Canada in the definition of exploration targets.

Following the decision to search for porphyry-gold type deposits, or at least their Archean analogs in the Superior craton, further research and compilation efforts were focused on target definition on the Quebec side of the craton. This research immediately highlighted the site of the old Canadian Malartic mine as a high priority target. Of particular interest in the compilation results was the fact that disseminated mineralization and/or the potassic alteration footprint at the site of the old Canadian Malartic mine seem to cover a minimum surface area of two square kilometres, outlining what was evidently a large hydrothermal system that had never been drilled or evaluated as a deposit amenable to open pit, bulk tonnage mining methods. Given these favourable features, Osisko tagged this area in early 2004 as a probable porphyry gold system that constituted a high priority acquisition target.

In late October 2004, Osisko paid C$80,000 to purchase a 100% interest in six claims and one mining concession covering the past-producing Canadian Malartic mine. Subsequent to the acquisition of the Canadian Malartic property, Osisko purchased (mostly in 2005) the surrounding claims from various prospectors and junior exploration companies and also staked additional ground to the west. In mid-2005, the Government of Quebec cancelled the mining concessions over the remainder of the Malartic property it inherited from the trustee and converted the ground to claims. The claims were made available through the government's electronic map staking system, and eight separate parties simultaneously submitted applications for the titles when they opened for staking in the fall of 2005. The ownership situation was resolved by a claim-by-claim lottery conducted on February 15, 2006. Osisko succeeded in acquiring two of the claims at the lottery. On March 2, 2006, Osisko announced that it had signed letters of intent with a group of four independent parties to purchase a 100% interest in the remaining 14 titles. Seven of these titles were purchased outright from two individuals, without additional encumbrance. The remaining seven claims were purchased from two other individuals.

The acquisition of the initial claim block led to the acquisition of a large, unpublished paper database from the old Canadian Malartic mining operations as well as from exploration programs carried out on the property, particularly from the work done in the 1980s by Lac Minerals. Digitalisation, compilation and analysis of the large database over the following four months, including logs of over 4,500 surface and underground drill holes, allowed Osisko to refine the geological model for the gold deposit and confirm its bulk tonnage potential.

This led to immediate drill-testing of the model and in March 2005, Osisko drilled its first hole at the western extremity of the deposit. The target area was where Lac Minerals had previously outlined a significant near-surface mineralized zone, hosted entirely by porphyry and grading 1.5 g/t Au to a depth of 100 m. This first vertical hole intersected 93.9 m grading 1.01 g/t Au, and the subsequent 19 holes all intersected significant mineralization, both in porphyry and altered clastic metasediments. This group of holes tested the E-W strike length of the deposit (distance of 1,140 m) that was covered by the then-small claim group, confirming the potential of the property and setting the stage for the major exploration program to follow.

Subsequent 2005 drilling (total of 7,400 m) successfully tested N-S sections, establishing the 500 to 700 m width of the deposit to a depth of approximately 250 m. This success led to Osisko's first large brokered financing at the end of 2005, providing capital for a 60 x 60 m definition drill program in 2006. This initial 75,000 m definition program, combined with the historical database, allowed for a first Inferred resource estimate of 6.5 Moz of gold (178.4 Mt @ 1.1 g/t Au), which was released in the fall of 2006 (Gossage and Inwood, 2007). An expanded 60 x 60 m definition program (90,000 m) completed in the winter of 2006-2007 led to the release of an Inferred resource of 8.4 Moz gold (286.2 Mt @ 0.9 g/t Au) in the summer of 2007 (Gossage and Slater, 2007).

An airborne geophysical survey comprising total field magnetics, radiometry and time-domain electromagnetics was also completed in 2006 in an attempt to define, for regional exploration purposes, an airborne geophysical signature associated with the deposit. This failed in all respects because:

* Neither the porphyry intrusions nor the mineralization is magnetic (no magnetite nor pyrrhotite in the mineral assemblages), which means there is little magnetic contrast with the host unaltered greywackes;
* A strong radiometric anomaly in the potassium channel was obtained over the deposit but was related to the tailings ponds, indicating the presence of potassic alteration in the host rocks of the deposit (confirmed by petrography), but unfortunately masking the primary signature of the deposit;
* The deposit did not respond whatsoever to the electromagnetic survey, which was expected since in only contains 1-3% disseminated pyrite and no graphite.

The continued drilling success in 2006 led to additional financings for Osisko, paving the way for a major drill program launched in the fall 2007: a 330,000 m definition drill program on a 30 x 30 m grid, covering the entire deposit and designed to convert the deposit to a NI 43-101 compliant Measured and Indicated (M&I) resource.

In March 2008, a preliminary economic assessment study of the Canadian Malartic Project was filed on the SEDAR website (Runnels al., 2008a; 2008b). The preliminary pit design optimized from an Inferred resource generated by RSG Global Consulting Pty Ltd for a conservative gold price of $650/oz contained 7.79 Moz of gold in-situ, based on a 55° inter-ramp angle recommended by Golder Associates Ltd following a preliminary geotechnical investigation. Given the important quantities of low grade mineralization and a very favorable waste to ore strip ratio (1.16:1), it was determined that a high production rate of 55,000 tpd would maximize the value of the operation. The results of the preliminary economic assessment indicated that the Canadian Malartic Project warranted further development. It did not present significant technical difficulties, and economic indicators resulting from this study were encouraging. Preliminary estimates indicated a capital investment of $760 M and an internal rate of return (IRR) of 22.2% based on a gold price of $775/oz. The study concluded that Osisko should advance the project to the next stage with a feasibility study.

By September 2008, Osisko had outlined an in situ M&I resource of 7.69 Moz gold (232.2 Mt @ 1.03 g/t Au; 6.42 M in-pit M&I ounces in a US$775 Whittle pit shell and cut-off grade of 0.36 g/t Au), with an additional 0.72 Moz in the Inferred category (Hennessey et al., 2008). By the fall of 2008, the environmental impact and preliminary economic impact studies had been completed and the relocation program for the town of Malartic had been initiated.

The feasibility study was completed by December 2008, outlining Proven & Probable (P&P) reserves of 6.28 Moz gold (183.3 Mt @ 1.07 g/t Au with a lower cut-off of 0.36 g/t Au at US$775/oz) (Runnels al., 2008c). The study recommended a 55,000 tpd milling operation with strip ratio of 1.78 with a LOM of 10 years for 5.4 M oz recovered (85.9% recovery by whole-ore leach). CAPEX was estimated at US$790 million with OPEX at US$320/oz.

The year 2009 focused on definition drilling of the South Barnat deposit, representing in good part the eastern extension of the Canadian Malartic deposit where it is truncated by the Cadillac Fault. Approximately 180,000 m were drilled into the Sladen Extension and the South Barnat deposit. In February 2009, the first resource estimate on South Barnat (Belzile, 2009a) added 2.04 M in-pit ounces in the Measured and Indicated categories (37.1 Mt @ 1.71 g/t Au). A second resource estimate was published on June 2009 stating that Osisko had outlined an in situ M&I in-pit resource of 2.04 Moz in a US$775 Whittle pit shell (cut-off grade of 0.36 g/t Au), with an additional 0.07 Moz in the Inferred category (Belzile, 2009b).

By January 2010, this new extension was added to the main Canadian Malartic deposit and a new integrated P&P reserve of 8.97 M oz gold (245.8 Mt @ 1.13 g/t Au) was calculated (Belzile and Gignac, 2010). The new reserve was calculated using a US$825 engineered pit shell at a lower cut-off of 0.34 g/t Au.

Meanwhile, the construction permits for the Canadian Malartic Mill and mine site civil works were obtained in August 2009. By the beginning of 2010, construction was well underway and permitting was obtained for a satellite (starter) pit. The southern town relocation program was completed by mid-2010, which included the relocation of 200 homes to a new neighbourhood at the north end of the town and the construction of five new institutional buildings, including an elementary school, a day care facility, a long-term health care facility, an adult learning center and a cultural/recreational center. Pre-stripping of the future mine site started in November 2010. An additional 110,000 m of definition and exploratory drilling was completed on the Malartic property in 2010.

Construction of a 60,000 tpd mill complex, tailings impoundment area, 5 M cubic metre polishing pond and road network was completed by February 2011 and the mill was commissioned in March 2011. A new reserve estimate was release in March 2011, outlining a P&P reserve of 10.71 M oz gold (343.7 Mt @ 0.97 g/t Au) (Belzile and Gignac, 2011). The new reserve was calculated using a US$1000 engineered pit shell at 0.30 g/t Au lower cut-off. Approximately 40% of the increase in reserves, with respect to the January 2010 estimate, was due to the increase in gold price and the rest was due to the definition of additional resources along the eastern extension of the South Barnat deposit. This extension remains open to the east.
Following a two-year construction period program, which necessitated an investment of approximately $1 billion, the mine reached commercial production on May 19, 2011. The first gold pour occurred in April 13, 2011. A number of residents located near the green wall expressed their interest to sell their home or be relocated. Osisko agreed to accommodate the individuals and acquired 41 houses and rental units in 2011. It also built 8 apartment blocks for 64 rental units in Malartic.

As of January 1, 2012, the updated ore reserve estimates stood at 10.71 Moz (337.7 Mt at 0.99 g/t Au) at the Canadian Malartic mine (Osisko's 2011 Management's Discussion and Analysis). The new reserve base was calculated at US$1,200 per ounce of gold and the mine life increased 31% or 3.8 years to 16.0 years. A mineral resource estimate was completed by March 2012 on the Jeffrey Zone, outlining an Indicated resource of 130,760 oz gold (5.8 Mt @ 0.7 g/t Au with a lower recovered cut-off of 0.265 g/t Au at US$1,100 gold) and an Inferred resource of 32,280 oz gold (1.8 Mt @ 0.6 g/t Au) (Hennessey and San Martin, 2012). An internal mineral resource estimate performed by Belzile Solutions Inc. on the Western Porphyry Zone reported an Inferred resource of 13.8 Mt @ 0.65 g/t Au for a total of 289,470 oz.

Construction of a park facility near the green wall in the south neighborhood in Malartic was completed in September 2012. Expenses incurred for that project amount to approximately $5.0 million and include a multi-service building, a playground, a skate park as well as volleyball and softball grounds.

Osisko completed the addition of two new large cone crushing units in March and August 2012 and, in December 2012, finalized the installation of a second pebble crusher. These modifications were an important step towards the completion of the Canadian Malartic mine ramp-up phase. As of January 1, 2013, the updated ore reserve estimates stood at 10.2 Moz (312.2 Mt @ 1.01 g/t Au) at the Canadian Malartic mine (Osisko's 2012 Management's Discussion and Analysis). The new reserve base is calculated at US$1,475 per ounce of gold. Compared to the reserves reported in January 2012, there is a reduction of tonnes in part due to the 2012 production, but there is an increase in grade from 0.99 g/t to 1.01 g/t Au.

On July 5, 2013, Osisko deposited an amount of $11.6 million with the Québec Government, representing the balance of the total guarantee required to cover the entire future costs of rehabilitating the Canadian Malartic mine site. The aggregate deposits for the Government of Québec amount to $46.4 million. On November 21, 2013, Osisko announced that it had produced its one millionth ounce of gold from its Canadian Malartic mine.

As of January 1, 2014, the updated ore reserve estimates stood at 9.37 Moz (281.2 Mt @ 1.04 g/t Au) at the Canadian Malartic mine (Osisko's 2013 Management's Discussion and Analysis). The reserve base was calculated at US$1,300 per ounce of gold. As at March 20, 2014, under this annual mine production plan, the mine life was now estimated at 14.2 years based on a 55,000 tpd milling rate, assuming 92% availability. Average gold production was estimated at 610,000 ounces per year over the next five years (2014-2018) at cash costs of US$516 per ounce and at 597,000 ounces per year over life of mine at cash costs of US$525 per ounce.
On February 26, 2014 the Government of Québec adopted a decree authorizing the exploitation of the Gouldie deposit. Since then the pre-stripping activity has been initiated for the Gouldie deposit. A few days earlier, on February 18, 2014, the Ministère des Ressources Naturelles granted Osisko a mining lease having an approximate total area 66 ha. As per these documents, Osisko has 30 months to mine the Gouldie Zone and shall not exceed a daily production rate of 6,990 t of ore and a daily extraction rate of 30,000 t of ore, waste and overburden.

On June 16, 2014, Agnico Eagle and Yamana Gold completed the acquisition of Osisko Mining Corporation including the Canadian Malartic mine. Agnico Eagle and Yamana Gold jointly acquired 100% of the issued and outstanding common shares of Osisko Mining Corporation.

6.1.3 Production History of Osisko (2004-2014)

The first gold pour occurred on April 13, 2011 and the first day of commercial production was May 19, 2011. Mining activity changed from the original feasibility study due to the inability to gain access to certain mining areas following delays in completing the original relocation program, in constructing the green wall, and in sourcing construction materials. As a result, lower grade material was being processed.

The mining operations continued to progress throughout 2012 as the pit floor was expanded, providing greater flexibility. Approximately 56.5 Mt were moved (154,000 tpd) compared to 40.4 Mt (111,000 tpd) in the previous year. In 2012, production reached 14,046,526 tonnes milled, representing an average of 38,378 tonnes milled per calendar day, a 15 % increase over the year 2011. The cash cost for 2012 stood at US$849 per ounce compared to US$955 per ounce in 2011.

Approximately 58.4 Mt of ore and waste and 6.9 Mt of re-handling from stockpiles were moved during 2013, compared to 50.7 Mt of ore and waste and 8.0 Mt of re-handling from stockpiles during 2012. Production reached 17,024,120 tonnes milled averaging 52,350 tonnes per operating day for the year 2013. Recoveries continued to exceed average feasibility forecasts by 2%, averaging 88.9% for the year. The cash cost for 2013 stood at US$738 per ounce compared to US$849 per ounce in 2012.

Production statistics of the Canadian Malartic mine from 2011 to March 31, 2014 are shown in Tables 6.2 and 6.3.

Table 6.2 – Canadian Malartic mine production from 2011 to March 31, 2014

Canadian Malartic Mine Production							
Year	**Ore (metric tons)**	**Waste (metric tons)**	**Total Mined (metric tons)**	**Waste/Ore Ratio**	**Re-handling (metric tons)**	**Total Moved (metric tons)**	**Overburden (metric tons)**
2011	9 095 754	26 177 486	35 273 240	2.88		35 273 240	5 144 832
2012	15 677 352	35 065 254	50 742 606	2.24	7 964 147	58 706 753	5 729 741
2013	17 024 120	41 409 871	58 433 991	2.43	6 850 626	65 284 617	3 118 012
Q1 2014	4 456 486	11 188 470	15 644 956	2.51	1 422 513	17 067 469	762 882
TOTAL	46 253 712	113 841 081	160 094 793	2.48	16 237 286	176 332 079	14 755 467

Table 6.3 – Gold and silver production from 2011 to March 31, 2014

Gold and Silver Production Statistics of the Canadian Malartic Mine										
Year	**Ore Milled Metric Tonnes**	**Tonnes Milled By Operating Day**	**Grade Au (g/t)**	**Grade Ag (g/t)**	**Recovery Au (%)**	**Recovery Ag (%)**	**Gold Ounces Produced**	**Gold Ounces Sold**	**Silver Ounces Produced**	**Silver Ounces Sold**
2011	8 502 323	33 474	0.83	0.70	87.7	59.7	200 138	175 000	114 130	96 400
2012	14 046 526	38 378	0.96	0.76	89.4	67.1	388 478	394 603	230 273	225 531
2013	17 024 120	52 350	0.92	1.04	88.9	70.5	475 277	464 991	422 619	393 545
Q1 2014	4 363 365	50 444	1.13	1.26	88.2	76.8	140 029	146 132	135 515	143 429
TOTAL	43 936 334	44 041	0.94	0.91	88.8	69.9	1 203 922	1 180 726	902 537	858 905

6.2 Osisko's East Amphi Property

This portion of the history covers all mining titles from the historical East Amphi property acquired by Osisko from Richmont Mines Inc., including the East Amphi mine and the Western Porphyry and Fourax zones.

The information provided herein is modified from Riopel (2006) and from data provided by Richmont Mines (Annual Information Form, Annual Report, and Management's Discussion and Analysis available on SEDAR website).

6.2.1 Prior to Osisko (1923-2003)

From 1934 to 1969, Sladen-Barnat Mines Ltd explored the sector of the Fourax Zone and the Western Porphyry Zone with 38 holes totalling 6,096 m (Joly and Ste-Croix, 1997).

In 1937, McIntyre Porcupine Mines Ltd explored the Cadillac Fault and drilled 18 surface holes (for a total of 3,823 m), intersecting mineralized diorite and feldspar porphyry containing minor mineralization. In 1940, Canadian Malartic drilled 8 surface drill-holes on the property for a total of 1,668 m. That same year, Howey Gold Mines drilled another 20 holes for a total of 3,193 m.

East Amphi Gold Mines Ltd became the owner in 1940 and carried out surface drilling between 1940 and 1945. A total of 31 surface holes were drilled for a total of 4,054 m. At the beginning of 1946, the company considered the surface drilling results sufficiently positive to justify underground development. Following the sinking of a three-compartment shaft to a depth of 155 m, 1,490 m of drifting and 415 m of cross-cuts were excavated on the -100m and -145m levels. It is reported that some 4,925 m of underground drilling was carried out. Geological work performed in 1946 led to the identification of six ore zones on the -100m level and one zone on the -145m level. In each case the gold was associated with porphyry dykes. In 1946, a resource of 623,695 tonnes at 8.84 g/t Au was estimated. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*) Early in 1948, the mining industry went through a difficult period and East Amphi Gold Mines announced its decision to suspend underground activities. In 1958-1959, East Amphi Gold Mines drilled another 8 surface holes for a total of 2,008 m.

In 1975-1976, Nordore Mining Company completed a magnetometer survey in the sector of the Fourax and Western Porphyry zones. Later, this company drilled 16 holes for a total of 2,258.3 m on the Townsite Diorite and Western Porphyry zones (Joly and Ste-Croix, 1997). In 1979-1981, Nor-Quest Resources Ltd drilled 43 holes totalling 8,845.6 m on the Western Porphyry Zone (Joly and Ste-Croix, 1997). The Western Porphyry Zone was estimated to contain 887,222 probable tonnes grading 3.5 g/t Au, and 489,887 possible tonnes grading 1.95 g/t Au (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*).

In 1979-1980, Darius Gold Mines carried out a 5-hole drilling program for a total of 1,259 m on the East Amphi deposit. Between 1981 and 1984, Sulpetro Minerals Ltd (Novamin Resources) began exploration for the Darius Joint Venture on the East Amphi property and nearby lands (Malartic 7M and Malartic 8M properties) by completing magnetometer, VLF, IP and geological surveys.

In 1983, a new resource estimate was performed by Beau Val Mines on the Western Porphyry Zone. The zone contained 220,091 probable tonnes at a grade of 4.46 g/t Au. During the summer of 1984, 8 holes were drilled for a total of 1,527 m (Joly and Ste-Croix, 1997). In 1986, Beau Val Mines drilled 8 surface drill-holes for a total of 2,604 m in the immediate vicinity of the East Amphi mine. Between 1987 and 1990, Bay Resources and Augmitto Explorations Ltd drilled 37 holes (total of 7,749 m) on the Townsite Diorite, Western Porphyry and Cadillac Tectonic zones.

During the winter of 1987-88, Breakwater Resources Ltd carried out a surface drilling program in the East Amphi mine area consisting of 56 diamond drill-holes for a total of 12,335 m, including two wedged holes. In 1988-89, the positive results of this program prompted the company to undertake an underground exploration program. The former East Amphi Gold Mines shaft and the two levels (-325' and -475' which are 100 m and 145 m below surface) were dewatered and the underground openings were mapped and sampled. A total of 92 underground drill-holes were drilled for a total of 3,246 m. Additional surface drilling was carried out as well: an additional 9 holes in 1989 for a total of 3,264 m, another 9 holes in 1990 for a total of 3,587 m, and an additional 11 holes in 1994 for a total of 5,262 m. A resource calculation was prepared in 1990 corresponding to 758,015 tonnes of Indicated resources at an average grade of 11.02 g/t. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*)

In 1995, Placer Dome optioned the property and started an exploration program. A magnetic survey and two IP surveys were carried out, as well as a surface diamond drilling program. In 1995, 20 holes were drilled for a total of 4,858 m, and in 1996 the company drilled another 23 surface drill-holes for a total of 8,450 m. Another three holes were drilled south of the property but the results are not included in the database. A resource calculation was carried out, based on their geological model, corresponding to 850,000 tonnes of Indicated resources at an average grade of 8.11 g/t. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*)

In 1996, Placer Dome drilled 3 holes totalling 813 m on the Fourax Zone. A mineral inventory, calculated in 1995 on this zone, estimated a tonnage of 243,045 tonnes grading 2.74 g/t Au, using a 1 g/t Au lower cut-off grade (Joly and Ste-Croix, 1997). (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*)

In 1998, McWatters Mining Inc. ("McWatters") acquired the property and carried out a surface drilling program. During this program, 27 drill holes were drilled on the East Amphi property for a total of 2,516 m, and 20 holes south of the East Amphi zones for an additional 1,907 m. A new resource calculation was carried out resulting in an estimated 2.29 Mt of M&I resources (cut-off grade of 3.0 g/t) at an average grade of 5.98 g/t. (*These "resources" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of context.*)

In the winter of 1999, an additional 17 surface drill-holes were drilled for a total of 3,034 m to delineate and validate the portion of Indicated resources in the Zone B-West block, which McWatters planned to mine as an open pit. A limited portion of the A-2 Zone was drilled as well. McWatters also completed sampling and analytical studies to confirm the results of earlier studies by Breakwater (1988) and Placer Dome (1995) in which it was shown that the East Amphi deposit and the surrounding host rocks are not acid generators.

Ore was excavated from an open pit from December 1998 to August 1999 and a total of 120,427 tonnes of ore was shipped to the Sigma Mill for processing. The average diluted grade of the ore was 5.66 g/t, which correlated well with the reserve estimate. In July 1999, McWatters prepared a study for the East Amphi deposit, prepared an underground mining plan, and calculated the resources and reserves. This plan and the resource/reserve estimate were reviewed by an external consultant (John V. Tully & Associates) and were reported at 1,124,600 tonnes of probable reserves at an average grade of 5.07 g/t Au. The reserves were calculated using the polygon method. (*These "reserves" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of* context.)

SNC-Lavalin was mandated in August 2002 by McWatters to carry out a feasibility study for an underground ramp mining project. This study shows an IRR of 43.6% before taxes and 33.6% after income taxes for an initial capital investment of $13.5 million based on a fixed gold price of US$315/oz and an exchange rate of US$1.00 = C$1.59. The operating costs were estimated at an average of $44.0 per tonne of ore milled. Proven reserves were estimated at 170,000 t at 4.7 g/t Au and Probable reserves at 1.2 Mt at 4.1 g/t Au for a total P&P reserve of 1.4 Mt at 4.2 g/t Au. (*These "reserves" are historical in nature and should not be relied upon. It is unlikely they conform to current NI 43-101 criteria or to CIM Standards and Definitions, and they have not been verified to determine their relevance or reliability. They are included in this section for illustrative purposes only and should not be disclosed out of* context.)

Following the acquisition of the property at the end of 2003, Richmont Mines Inc. launched an underground exploration program involving drilling and drifting in order to improve the quality of the resources, transfer resources to reserve categories, and increase the resources. A total of $23,719,554 was therefore invested in exploration in 2004-2005. Before reaching a decision about entering into commercial production, three bulk samples totalling 40,581 tonnes of ore were milled, of which 24,917 tonnes came from development and 15,664 tonnes from mined stopes. An NI 43-101 mineral resource estimate as at December 31, 2005 evaluated a total of 1,436,052 tonnes at a grade of 5.33 g/t Au for a total of 246,295 ounces of gold in the Measured and Indicated categories, and Inferred resources of 332,711 tonnes at 6.09 g/t Au for 65,134 ounces of gold (Riopel, 2006).

The East Amphi mine was brought into commercial production in February 2006. During the year, Richmont Mines extracted 179,194 tonnes of ore at an average recovered grade of 3.56 g/t from the East Amphi mine with a gold recovery of 97.6%. This production yielded gold sales of 20,000 ounces, produced at a cash cost of US$485 per ounce sold.

The probable reserves defined in 2006 were reclassified into resources in light of the substantial investment needed to gain access to the reserves, the grade falling short of expectations following exploration drilling, and the disappointing results in the zones offering the best potential near the existing workings. Richmont Mines ended its production work at the East Amphi mine during the second quarter of 2007 when all of the Proven reserves had been depleted. In 2007, gold production at the East Amphi mine was 128,189 tonnes at an average grade of 3.18 g/t (12,709 oz gold) and a gold recovery of 97.0%.

In May 2007, Richmont Mines announced its intention to sell the property to Osisko Exploration Ltd (“Osisko”) and the sale was completed on June 29, 2007.

6.2.2 Osisko Period (2007-2014)

Between 2007 and 2014, Osisko drilled 72 holes, totalling 20,086.1 m, on the East Amphi property. Additionally, between 2009 and 2012, 177 holes, totalling 45,997.2 m, were drilled on the Western Porphyry Zone, also located on the East Amphi property.

7. GEOLOGICAL SETTING AND MINERALIZATION

Information on the geology, mineralization and deposit types of the Canadian Malartic project has been previously described in the following NI 43-101 technical reports filed on SEDAR (www.sedar.com): Gossage and Inwood (2007); Gossage and Slater (2007); Hennessey et al. (2008); Runnels et al. (2008a,b,c); Belzile (2009a,b); Belzile and Gignac (2010); Belzile and Gignac (2011); and Hennessey and San Martin (2012). The information provided herein is modified from data provided by Osisko and those reports, and also from assessment files available from SIGEOM.

7.1 Regional Geology

The Malartic property straddles the southern margin of the eastern portion of the Abitibi Subprovince, an Archean greenstone belt situated in the southeastern part of the Superior Province of the Canadian Shield. The Abitibi Subprovince comprises an older northern volcanic zone (NVZ; 2730–2710 Ma) and a younger southern volcanic zone (SVZ; 2705–2698 Ma), separated by the regional Porcupine-Destor Fault Zone (PDFZ; Card and Poulsen, 1998). The Abitibi Subprovince is limited to the north by gneisses and plutons of the Opatica Subprovince, and to the south by metasediments and intrusive rocks of the Pontiac Subprovince. The contact between the Pontiac Subprovince and the rocks of the Abitibi greenstone belt is characterized by a major fault corridor, the east-west trending Larder Lake–Cadillac Fault Zone (LLCFZ; Fig. 7.1). This structure runs from Larder Lake, Ontario through Rouyn-Noranda, Cadillac, Malartic, Val-d’Or and Louvicourt, Québec, at which point it is truncated by the Grenville Front. The corridor defined by the PDFZ and the LLCFZ, generally known as the Timmins–Val-d'Or camp (Robert et al. 2005), hosts a great number of mineral deposits that account for the bulk of historical and current base and precious metal production from the Superior Province (Spooner and Tucker Barrie, 1993).

The regional stratigraphy of the southeastern Abitibi area is divided into groups of alternating volcanic and sedimentary rocks, generally oriented at N280°–N330° and separated by fault zones. The main lithostratigraphic divisions in this region are, from south to north, the Pontiac Group of the Pontiac Subprovince and the Piché, Cadillac, Blake River, Kewagama and Malartic groups of the Abitibi Subprovince. The Pontiac Group includes greywackes, shales and minor conglomerates (turbiditic clastic sediments), as well as thin horizons of ultramafic volcanic rocks. The Piché Group, confined within the LLCFZ, comprises abundant talc-chlorite-carbonate schists representing strongly deformed and altered magnesian basaltic to komatiitic volcanics. The schists include abundant irregular, deformed intrusions of diorite and feldspar porphyry, many of which are mineralized with gold. The Cadillac Group consists of greywackes and polymictic conglomerates; the Blake River Group is dominated by basalts; the Kewagama Group includes greywacke, shales, oxide-facies iron formation and conglomerates; and the Malartic Group comprises ultramafic volcanic rocks.

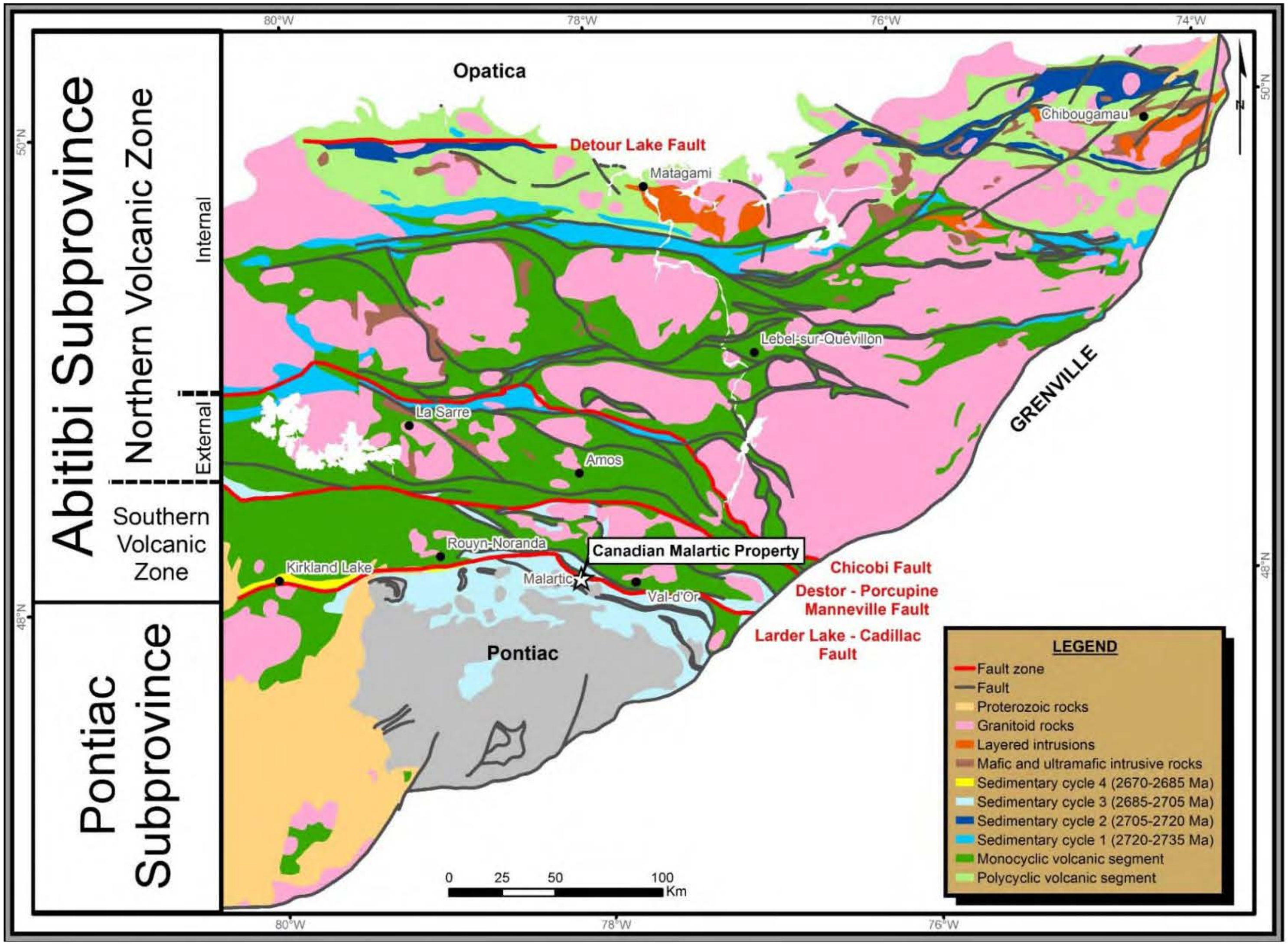

Figure 7.1 – Divisions of the Abitibi greenstone belt into southern (SVZ) and northern volcanic zones (NVZ) with external and internal segments in the NVZ. Modified from Chown et al. (1992), Daigneault et al. (2002, 2004), and Mueller et al. (2009).

The various stratigraphic units listed above are folded into a regional synclinal structure known as either the Malartic or Cadillac Syncline. The fold axis trends west-northwest and dips steeply to the north, with the axial trace located within the Cadillac Group sediments. The various lithological groups within the Abitibi Subprovince are metamorphosed to greenschist facies. Metamorphic grade increases toward the southern limit of the Abitibi belt, where rocks of the Piché Group and the northern part of the Pontiac Group have been metamorphosed to upper greenschist facies. The latter rocks have been subject to retrograde metamorphism, probably due to hydrothermal flux associated with the LLCFZ, as evidenced by chloritization of biotite, development of actinolite after hornblende, and albitization of more calcic plagioclase. Metamorphism increases rapidly to the south of the LLCFZ. Pontiac Group sediments at the southern end of the Canadian Malartic property are metamorphosed to staurolite-facies paraschists and into migmatitic gneisses further south. This higher grade metamorphic terrane is also punctuated by frequent peraluminous granite intrusions, derived from partial melting of the metasediments during orogenesis.

7.2 Property Geology

The majority of the Canadian Malartic property is underlain by metasedimentary units of the Pontiac Group, lying immediately south of the LLCFZ (Fig. 7.2). The north-central portion of the property covers an approximately 9.5 km section of the LLCFZ corridor and is underlain by mafic-ultramafic metavolcanic rocks of the Piché Group cut by porphyritic and dioritic intrusions. The Cadillac Group covers the northern part of the property (north of the LLCFZ). It consists of greywacke containing lenses of conglomerate.

At the point where the LLCFZ transects the town of Malartic, it is oriented N320°E, whereas further east it is oriented at N280°E–N290°E. The rapid change in the direction of the fault corridor has been interpreted by Gunning and Ambrose (1940) and Eakins (1962) as a bifurcation of the fault zone. The portion of the fault zone oriented N280°E–N290°E has been referred to as the Malartic Tectonic Zone. It is about 9 km along strike with a width of 600 to 900 m and includes many subordinate faults with orientations varying from subvertical to subhorizontal.

The portion of the Piché Group volcanic belt that transects the Canadian Malartic property is about 650 m wide. The Piché Group rocks are typically bluish-grey and pervasively foliated with numerous veinlets of talc-carbonate. Less altered variants occur as massive, aphanitic to fine-grained serpentinized ultramafic rock.

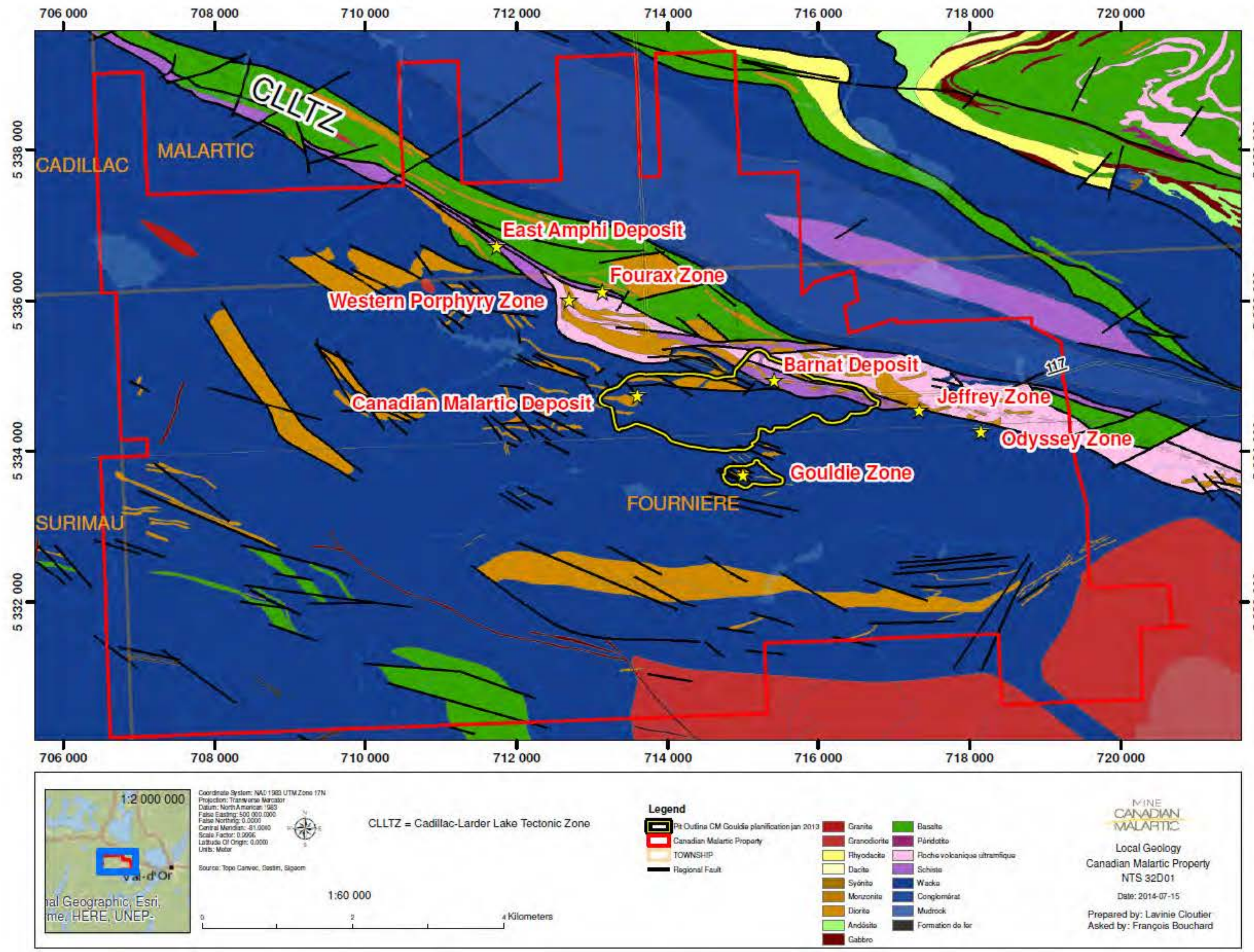

Figure 7.2 – Stratigraphy of the Canadian Malartic Property

The Pontiac Group metasediments on the property comprise turbiditic greywacke, mudstone and minor siltstone, generally rhythmically banded with beds of variable thickness ranging from about one millimetre to one metre. These sedimentary rocks typically have a well-developed foliation and are dark grey to black, occasionally exhibiting a brownish tint caused by development of biotite through metamorphism and/or potassic alteration proximal to porphyritic felsic intrusions.

The rocks of the Pontiac Group are intruded by a number of epizonal felsic porphyritic bodies, variously described as syenites, quartz syenites, quartz monzonites, granodiorites and tonalities. The geometries of these felsic intrusions are highly variable, and occur on the property as sills, dykes, discontinuous lenses or small isolated stocks.

7.3 Mineralization

Surface drilling by Lac Minerals in the 1980s defined several near-surface mineralized zones now included in the Canadian Malartic deposit (the F, P, A, Wolfe and Gilbert zones; Fig. 7.3), all expressions of a larger, continuous mineralized system located at depth around the old underground workings of the Canadian Malartic and Sladen mines. In addition to these, the Western Porphyry zone occurs 1 km northeast of the main Canadian Malartic deposit and the Gouldie mineralized zone occurs approximately 1.2 km southeast of the main Canadian Malartic deposit, although the relationship between these zones and the main deposit is presently unknown.

Several mineralized zones have been documented within the LLCFZ (South Barnat, Buckshot, East Malartic, Jeffrey, Odyssey, East Amphi, Fourax; Figs. 7.2 and 7.3), all of which are generally spatially associated with stockworks and disseminations within dioritic or felsic porphyritic intrusions.

Mineralization in the Canadian Malartic deposit occurs as a continuous shell of 1 to 5% disseminated pyrite associated with fine native gold and traces of chalcopyrite, sphalerite and tellurides (Eakins, 1962; Fallara et al., 2000). The gold resource is mostly hosted by altered clastic sediments of the Pontiac Group (70%) overlying an epizonal dioritic porphyry intrusion. A portion of the deposit also occurs in the upper portions of the porphyry body (30%). The porphyry intrusion pinches out in the Sladen Malartic Mine and disseminated mineralization continues in the silicified greywacke, forming a subvertical tabular body (Sladen Extension) that is truncated by the LLCFZ where it intersects the South Barnat Zone and the western extremity of the East Malartic mine.

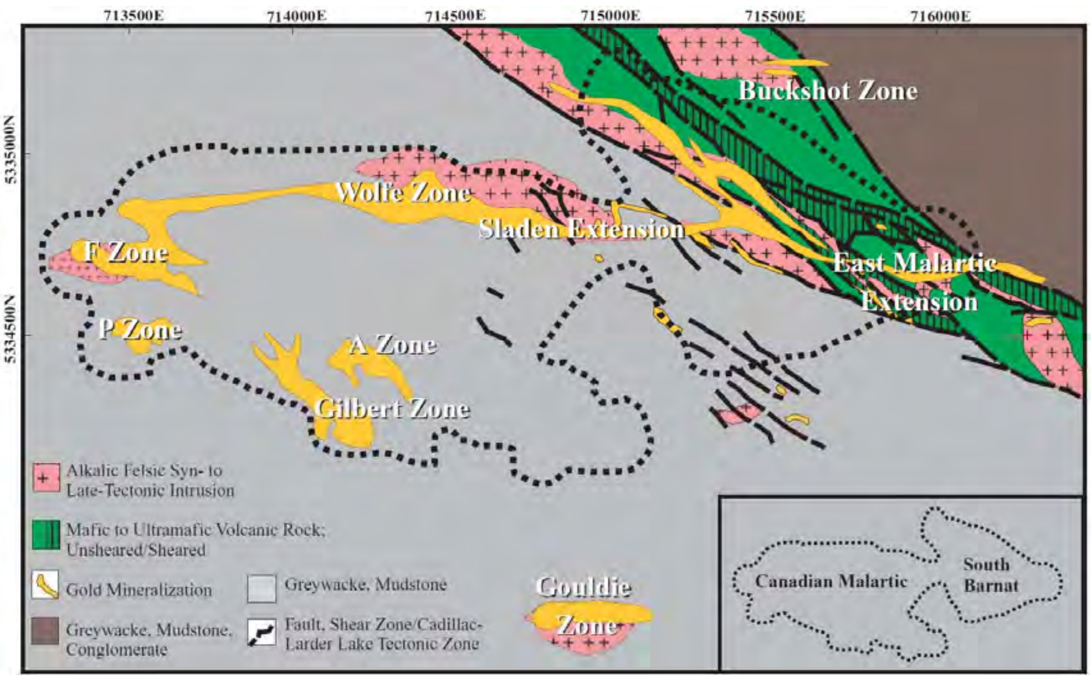

Figure 7.3 – Geologic map of the Canadian Malartic deposit showing near-surface mineralized zones with inset outlining the main Canadian Malartic orebody in the Pontiac Group, and the South Barnat orebody along the southern margin of the Malartic Tectonic Zone (from Helt et al., 2014). The cut-off grade is 0.3 g/t Au. Modified from Robert (1989; 2001) and data provided by Osisko.

The semi-continuous shells of higher grade mineralization (>1 g/t Au) at Canadian Malartic define an open synformal structure trending N110°E and plunging about N20° to the ESE. This structure closes at the western end of the deposit in the area of the F Zone, and has been previously interpreted as a post-mineralization fold structure that has deformed the deposit (Derry, 1939; Derry and Herz, 1948; Fallara et al., 2000). For most of the Canadian Malartic deposit, mineralization along the northern limb of the fold follows the porphyry-sediment contact. The structure becomes tabular with a steep dip to the south where the porphyry body pinches out in the Sladen extension. This extension of the deposit to the east represents the northern limb of the synform. Northerly-dipping branches to the main deposit along the southern limb of the fold appear to have served as hydrothermal feeder zones to the near-surface, subhorizontal P, A and Gilbert zones. Field evidence for such a fold structure in the area of the deposit, however, is scarce due to the paucity of outcrop and the fact that bedding and schistosities observed in core are invariably sub-vertical. A broad, sporadically mineralized shell of lower grade mineralization (0.3 to 1.0 g/t Au) forms a halo around the main deposit and is associated with a broad halo of potassic alteration.

Alteration in the metasediments consists of biotite-sericite-carbonate (potassic alteration) overprinted by cryptocrystalline silica-carbonate. Carbonates include calcite and minor ankerite. Highly silicified zones adopt a “cherty” texture and are commonly brecciated. Potassic alteration in the porphyry consists mostly of alkali-feldspar replacement of plagioclase that is contemporaneous with minor quartz veining. Cryptocrystalline quartz replacement with minor carbonate also overprints potassic alteration in the porphyry. Late, coarse-grained, quartz-feldspar-muscovite veins mineralized with native gold form relatively small, higher grade stockworks along the northern edge of the deposit (Eakins, 1962; Derry,1939). Retrograde chlorite-calcite alteration of the previous assemblages, particularly the biotite, is ubiquitous throughout the deposit but is particularly intense along ductile shear zones, forming chlorite-calcite schists.

The South Barnat deposit is located to the north and south of the old South Barnat and East Malartic mine workings, largely along the southern edge of the LLCFZ. The original South Barnat deposit of Barnat Mines Ltd in fact represents the north-westerly extension of the East Malartic mine. The disseminated/stockwork gold mineralization at South Barnat is hosted both in potassic-altered, silicified greywackes of the Pontiac Group (south of the fault contact) and in potassic-altered porphyry dykes and schistose, carbonatized and biotitic ultramafic rocks (north of the fault contact). Porphyry dykes on both sides of the fault, but especially abundant on the north side, contain disseminated mineralization as well as late quartz veins locally containing visible gold. Mineralization hosted by silicified sediments on the south side of the fault represents the Sladen (eastern) Extension of the Canadian Malartic deposit that has been deflected and possibly dismembered along the fault zone. Current modeling suggests that gold mineralization in the South Barnat Zone may extend further east along the north and south walls of the past-producing East Malartic mine.

8. DEPOSIT TYPES

The origin of gold deposits in the Malartic area is still a subject of controversy. Trudel and Sauvé (1992) favor an epigenetic model with structural and lithological control based on the association of high-grade gold mineralization and deformation zones throughout the camp.

According to Issigonis (1980) and Robert (2001), the gold deposits of the Malartic area are porphyry-related and possibly orthomagmatic in origin. The porphyries are generally considered to be syenitic (alkaline) in composition and of Timiskaming (syntectonic) age (Fallara et al., 2000; Robert, 2001),

Given the nature of the mineralization and the close spatial association with high-level porphyry dykes and stocks, Osisko's personnel adopted the porphyry gold model (Sillitoe, 2000) as a tool to drive exploration on the property.

Robert et al. (2005) includes these deposits in a style of mineralization named "disseminated-stockwork zones" consisting of zones of disseminated sulphides as fine, uniform disseminations or as bands concentrated along foliation planes. The mineralization is often centered on small, shallow-level intermediate to felsic porphyry intrusions, many of which were emplaced in clastic sedimentary rocks.

Helt et al. (2014) adopted a magmatic-hydrothermal model that calls for the exsolution of an ore fluid from monzodioritic magma at mid-crustal levels. During its ascent, this fluid potassically altered, carbonated, sulphidized and locally silicified the host rocks and deposited gold. The porphyritic rocks that host some of the mineralization were thus not the source of the fluids. Rather, their contacts with Pontiac greywacke and Piché mafic and ultramafic rocks provided the competency contrasts that helped focus the mineralizing fluids.

9. EXPLORATION

The issuer did not carry out any exploration work on the Canadian Malartic property prior to the effective date of this report.

10. DRILLING

The issuer did not carry out any drilling on the Canadian Malartic property prior to the effective date of this report.

Drilling carried out by Osisko are discussed in Item 6 (History).

11. SAMPLE PREPARATION, ANALYSES, AND SECURITY

The issuer did not carry out any sampling or sample analyses at the Canadian Malartic property prior to the effective date of this report.

Sample preparation and analyses carried out by Osisko are discussed in Item 12 (Data Verification).

12. DATA VERIFICATION

12.1 Databases

Three different drill hole databases in Gems format have been used to compile previous resource estimates as well as the new combined resource estimate presented in this Technical Report:

- The common database for the Canadian Malartic Deposit, the South Barnat Deposit, and the Gouldie Zone ("Canadian Malartic Database")
- The Jeffrey Zone database ("Jeffrey Database")
- The Western Porphyry Zone database ("Western Porphyry Database")

The databases have been well maintained by Osisko's personnel and contain the following tables and fields:

- Collar information - hole ID, xyz coordinates of collar, maximum depth
- Down-hole survey - hole ID, down-hole depth, dip, azimuth
- Assay - hole ID, depth from, depth to, sample ID, gold value in g/t
- Geology - hole ID, depth from, depth to, sample ID, rock code and alteration type

The databases have been externally reviewed and validated before being finalized into an appropriate format for resource evaluation. Micon performed following tasks during database validation (Hennessy et al., 2008):

- Cross-check total hole depth and final sample depth data.
- Check for overlapping and missing sampling intervals.
- Replace entries for "less than detection limit" with 0.001 g/t Au.
- Check drill hole survey data for unusual or suspect downhole deviations.
- Check lithology and alteration codes.

12.1.1 Previous Estimates

The Canadian Malartic Database was used by RSG Global Consulting ("RSG Global"; now Coffey Mining) for the two first inferred resource estimates at the Canadian Malartic Project (Gossage and Inwood, 2007; Gossage and Slater, 2007; Runnels et al., 2008a, 2008b); by Micon International Limited ("Micon") for an updated mineral resource for the Canadian Malartic Deposit (Hennessy et al., 2008); and by Belzile Solutions Inc. ("BSI") for the South Barnat Deposit resource estimates (Belzile 2009a, 2009b), for a combined estimate of the Canadian Malartic and South Barnat deposits (Belzile and Gignac, 2010), and for an updated combined estimate of the Canadian Malartic and South Barnat deposits (Belzile and Gignac, 2011).

The Jeffrey Database was used for a technical report prepared by Micon International Limited (Hennessey and San Martin, 2012) for Abitibi Royalties Inc.

The Western Porphyry database has never been used in the context of an NI 43-101 report.

RSG Global, Micon and BSI conducted their own data verification programs as described in their respective reports, all of which were filed by Osisko on SEDAR (www.sedar.com).

12.1.2 Current Estimates

The new combined resource estimate presented in this Technical Report used all three databases supplemented by additional drilling since May 2011. New information was reviewed and validated prior to being finalized into an appropriate format for resource evaluation following the same protocol used by Micon (see above; Hennessy et al., 2008).

12.2 Comparison of Data Types

The Canadian Malartic Database contains surface and underground diamond drill holes drilled by different operators over a period of about 80 years. Recently, reverse circulation (RC) drilling was also conducted. Any time different sample populations are present in the same database, it is important to compare them to be sure that there is no bias between the populations.

There is no concern about the recent Osisko drilling since it was conducted according to modern industry standards for drilling, sampling and assaying.

Osisko re-assayed the available core from the Lac Minerals drilling programs (about 90% of the Lac Minerals samples) and this new assay population was used for resource estimation instead of the original (Lac Minerals) dataset. Because the core was recently re-assayed with modern techniques, this population is also considered reliable (after QA/QC review) and suitable for resource estimation.

On the other hand, there are concerns about the older assay dataset from Canadian Malartic Mines. The early operators of the mine placed less importance on the accuracy of low grade assays since they mined only the higher grade parts of the deposit. The quality of this older data is often difficult to assess. It is not possible to perform an independent verification since the samples are no longer available. The comparison can only be made by comparing samples or groups of samples that are in both close proximity and the same geological environment.

For the purposes of this report, “recent” or “OSK” refers to the newer part of the Canadian Malartic database representing Osisko drilling and the Lac Minerals re-assays, and “historical” or “CM” refers to the older (Canadian Malartic Mines) part of the database.

Belzile and Gignac (2011) examined the drilling data on vertical sections and level plans and concluded that:

- Historical underground drilling focused on the higher grade portion of the deposit and was often limited to the high grade cores of high grade domains. There is also a strong sampling bias when compared to recent drilling (important clustering of the data for the historical holes).

- When comparing the data, it is crucial to discriminate between low and high grade domains because samples that are very close to each other (within a few meters) may in fact lie in different domains and can thus return very different grades.
- Even in high grade domains (>1.0 g/t), the grade is not evenly distributed. There is often a higher grade core (>3.0 g/t) that was the main focus of the underground operations. Recent surface drilling did not cross this high grade core very often, especially in areas close to stoping.
- Even after removing the samples in the old stopes, there are significantly more historical samples in the high grade cores than recent samples.

Based on these observations, Belzile and Gignac (2011) determined that when comparing datasets to identify potential analytical bias, it is important that samples are not only in close proximity but also in the same “geological environment”. This is difficult to achieve when only using a statistical approach, especially in the high grade domains where there is no information on the proximity sample is to the high grade core.

12.2.1 Comparative Statistics (recent vs. historical data)

A comparative study between recent (OSK) and historical (CM) data was presented in the NI 43-101 technical report prepared by Hennessy et al. in October 2008, filed by Osisko on SEDAR. The information provided herein is taken from that report. Even though the mineralization solids have been slightly modified since the 2008 study and there has been new drilling in the eastern part of the deposit, it is the opinion of the author that the conclusions of the study are still valid.

The reader is reminded that as per the 2008 study, “recent” or “OSK” refers to the newer part of the Canadian Malartic database representing Osisko drilling and the Lac Minerals re-assays, and “historical” or “CM” refers to the older (Canadian Malartic Mines) part of the database.

Table 12.1 compares the statistics of the 5m composites (cut) for historical and recent datasets within the main domains that were used for resource estimation (void samples removed) in October 2008.

Table 12.1 – Comparative statistics for recent vs. historical data (Hennessy et al., 2008)

	Low Grade Domains (10)		Pervasive Domains (70)		Main High Grade Domains (20)		Other High Grade Domains (30-60)	
	Historical	Recent	Historical	Recent	Historical	Recent	Historical	Recent
No. of composites	7380	28,597	2,005	8,433	10,074	5,831	1,969	3,766
Mean	0.50	0.29	0.79	0.72	2.07	1.58	1.72	1.42
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	7.00	7.00	9.80	8.28	22.00	22.00	15.00	15.00
Median	0.38	0.14	0.63	0.56	1.64	1.34	1.38	1.08
Standard deviation	0.61	0.47	0.80	0.67	1.77	1.27	1.38	1.38
Coefficient of variation	1.23	1.63	1.02	0.92	0.85	0.80	0.80	0.97
Comparison of means (recent/historical)		-42.0%		-8.6%		-24.0%		-17.7%

As shown in the table, the CM drilling (historical) has a higher mean for all domains than the more recent drilling (Osisko + Lac Minerals). The difference is more pronounced in the low grade domains where the discrepancy is 42% compared to roughly 20% in the high grade domains.

Even though this table compares data within the same domains, it is difficult to establish a true measure of analytical bias between recent and historical composite populations because the drill holes in each dataset are not equally distributed within the various domains. At least the comparison does succeed in pointing out a potential problem that requires further investigation.

12.2.2 Comparative Study within a Big Solid

In order to compare the two datasets in the same geological environment, Hennessy et al. (2008) constructed a relatively big 3D solid in an area containing both OSK and CM data but devoid of stoping (see Fig. 12.1 for plan view and Figs. 12.2 and 12.3 for section views). The dimensions of the solid are roughly 250 m (E-W) by 325 m (along dip) by 35 m (thickness). The volume of the solid is close to 2.7 million cubic metres, representing a tonnage of about 7.4 million tonnes using a specific gravity value of 2.75 t/m³. Gems software (v. 6.1.3) was used for the study. This solid is part of Domain 20 (subdomain 21) and represents more than 10% of the domain. This domain is by far the largest high grade domain.

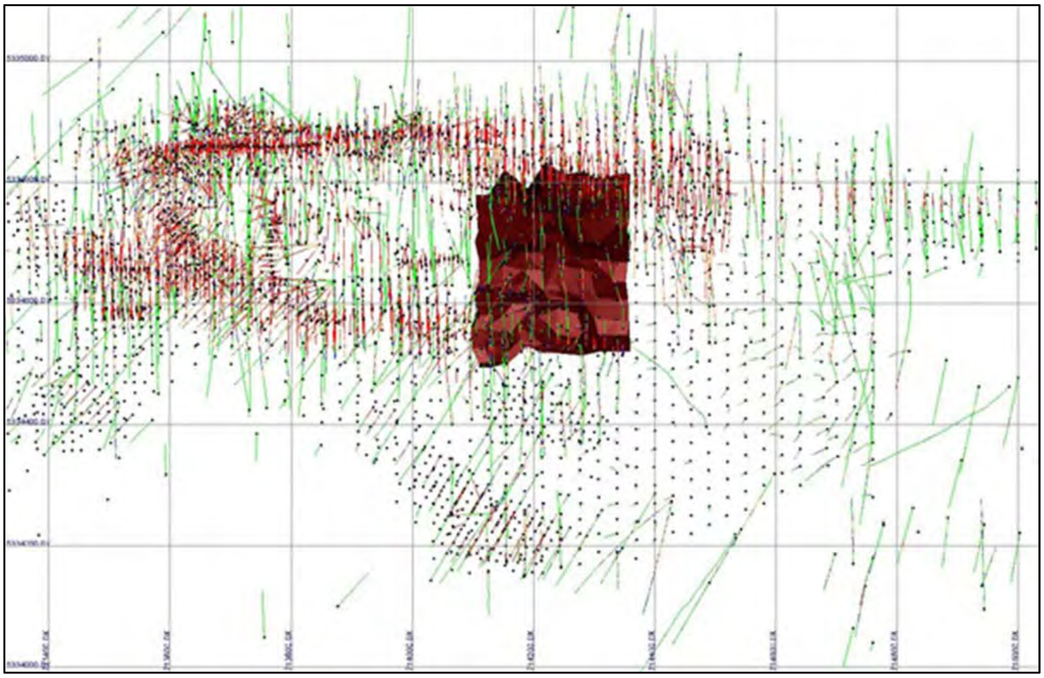

Figure 12.1 – Plan view of the solid used for the comparative study (Hennessy et al., 2008)

Three-metre (3m) composites were created within the solid, starting at each drill hole's entry point into the solid. The purpose of the study was to compare the statistics of the two populations (mean, median, coefficient of variation, etc).

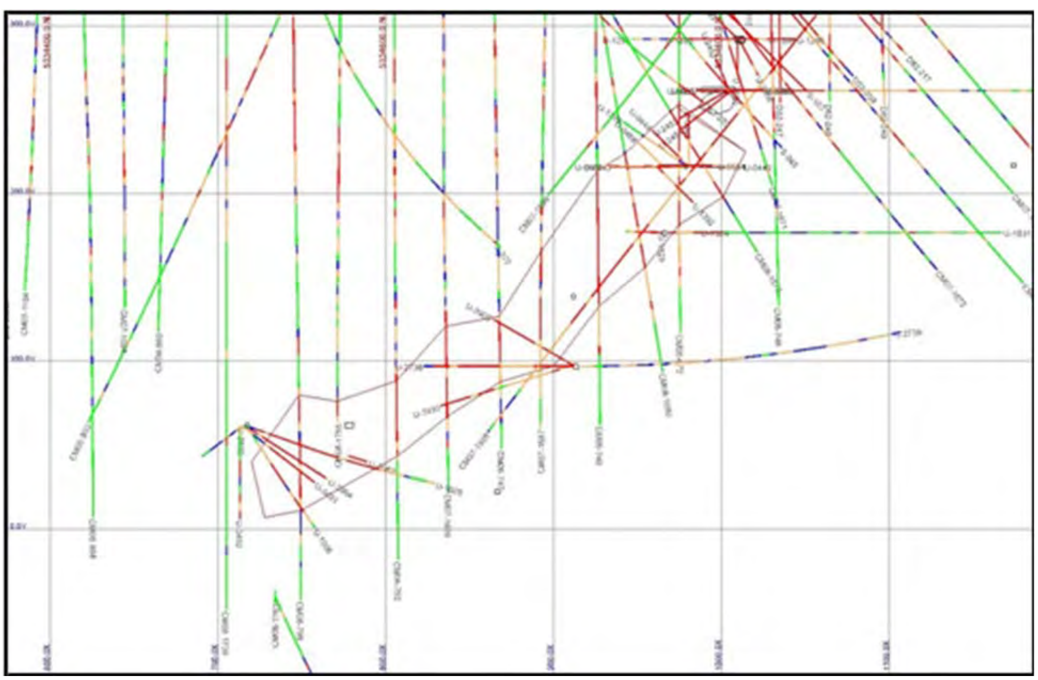

Figure 12.2 – Section 714340E (looking west) (Hennessy et al., 2008)

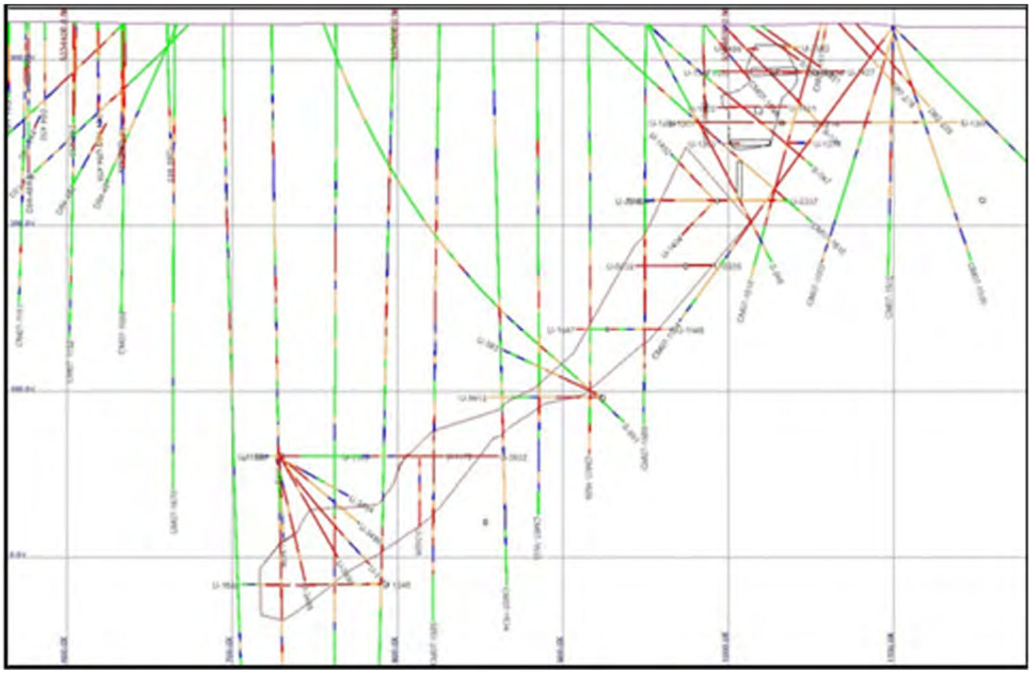

Figure 12.3 – Section 714250E (looking west) (Hennessy et al., 2008)

Table 12.2 compares the statistics of the 3m composites from historical holes (uncut and cut) with uncut composites from recent drilling. Only 6 composites were removed from the historical data, representing 0.3% of the population; this was done to avoid the presence of a few outliers.

As shown in Table 12.2, the mean value for the uncut OSK data is 7.6% lower than the cut historical composites and 9.4% lower than the uncut composites. This represents a much lower discrepancy than seen when comparing the entire high grade envelope (between 25-30%).

Table 12.2 – Statistics of the 3m composites (Hennessy et al., 2008)

	Historical (uncut)	Historical cut (10.0 g/t)	Recent uncut
No. of holes	178	178	72
No. composites	1,744	1,744	994
Minimum	0	0	0
Maximum	33.18	10.00	9.35
Mean	1.67	1.64	1.51
Median	1.35	1.35	1.30
Standard deviation	1.66	1.29	1.08
Variance	2.76	1.67	1.16
Coefficient of variation	1.00	0.79	0.71

12.2.3 Comparative Study using Smaller Volumes

Hennessey et al. (2008) also compared historical (CM) and recent drilling (OSK) using smaller volumes. Once again, the comparison used data from the same geological environment, but this time the study was done using 5-metre composites.

For this comparison, drilling sections were used to identify relatively small volumes containing both CM and OSK assay data that satisfy the dual criteria of close proximity and “same environment”. Volumes were identified in both high and low grade domains although it was more difficult to identify low grade volumes due to the scarcity of CM data (historical drilling focused on the high grade domains).

The result is 43 volumes in high grade domains and 17 in low grade domains. Some volumes compare only two holes but most compare many. There are more CM (underground) holes than OSK (surface) holes because the CM drilling included many fans of holes with a common origin. Individual underground hole intersections are shorter than surface hole intersections. For the comparison, 5m composites (uncut) were used for all drilling and the average of the composite grades (uncut) was calculated for the two datasets within each individual volume.

Figure 12.4 is a plan view showing the positions of the constructed solids (high grade in black and low grade in blue) while Figures 12.5 and 12.6 show two of the solids in section views.

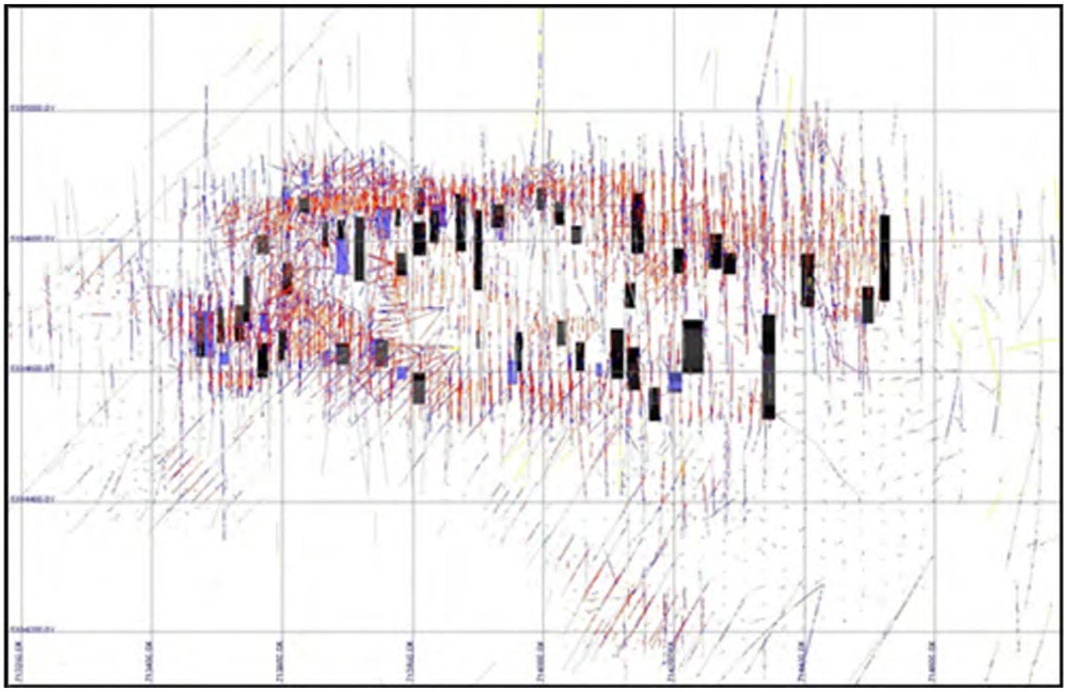

Figure 12.4 – Plan view of the solids (high grade in black and low grade in blue) (Hennessy et al., 2008)

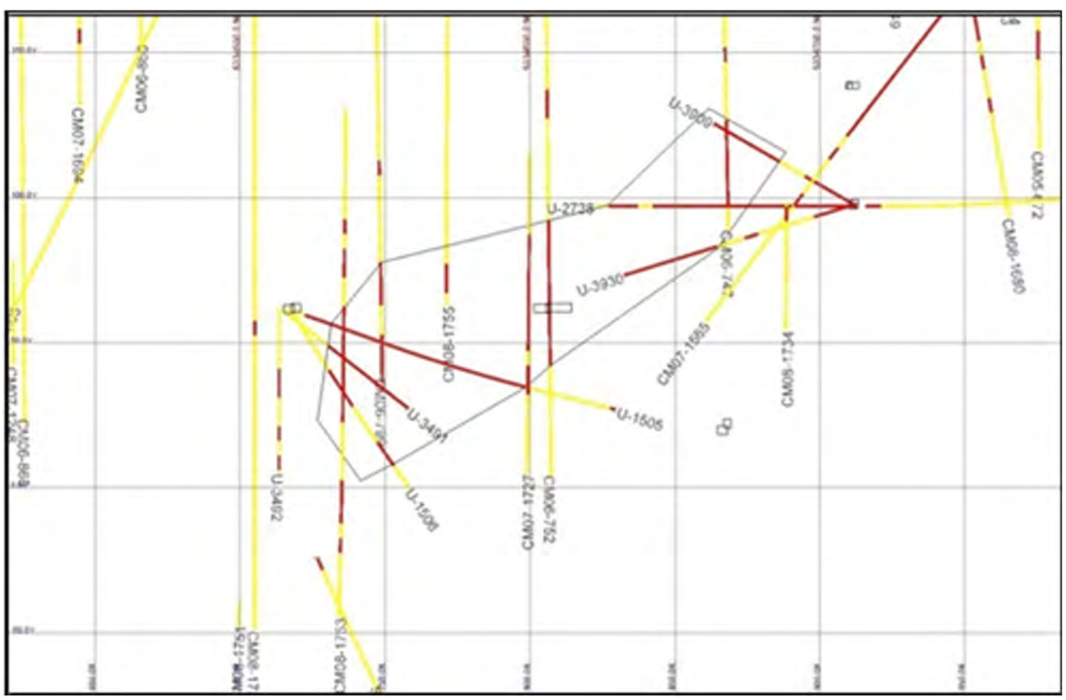

Figure 12.5 – Section 714350E solid in a high grade domain (Hennessy et al., 2008)

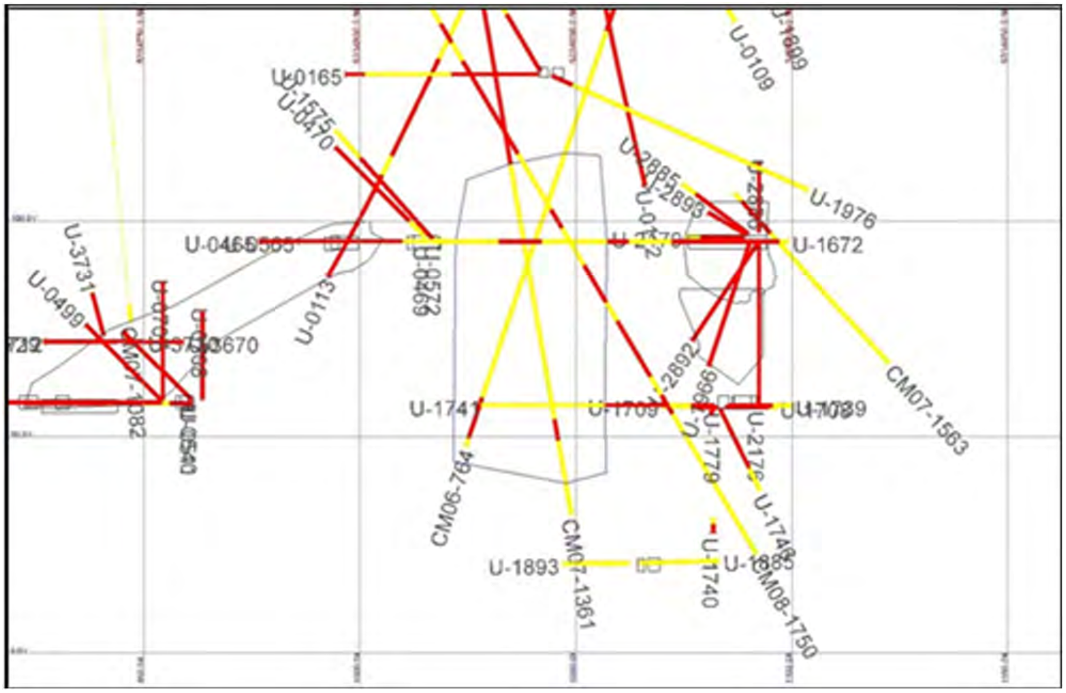

Figure 12.6 – Section 713840E solid in a low grade domain (Hennessy et al., 2008)

12.2.3.1 Comparison of high grade domains

Table 12.3 summarizes the results of the Hennessey et al. (2008) gold grade comparison for the two populations of assay data within the volumes for the high grade domain.

It can be seen that within the high grade material (>1.0 g/t), the average, mathematical or weighted by volume, is about 5% in favour of the OSK data, despite some large individual discrepancies.

Also, a scatter plot (Fig. 12.7) shows that the data are quite well distributed around the 45° line (red), except for one volume highly in favour or the Osisko drilling. If this "outlier" is removed, the averages would be the same for the two populations.

Figure 12.8 shows that there is no obvious relationship between the size of the volumes compared and the level of variance. It is interesting to note that the highest variances (>50%) are all in favour of the OSK data.

Table 12.3 – Comparison between historical and recent drill holes in high grade domains

Solid Name	Solid Volume (m^3)	Historical underground holes (Canadian Malartic Mines)			Recent surface holes (Osisko)			Variance (%)
		No. of Holes	No. of 5m Composites	Average (g/t)	No. of Holes	No. of 5m Composites	Average (g/t)	Recent/ Historical
713480-1	27,989	7	26	1.08	2	20	1.03	-4.6%
713510-1	25,581	6	23	1.29	1	22	1.63	26.4%
713540-1	31,832	2	16	1.23	1	11	0.94	-23.6%
713540-2	38,063	1	12	1.19	5	48	1.14	-4.2%
713570-1	53,176	3	18	0.89	4	56	0.76	-14.6%
713570-2	19,844	6	17	1.36	1	10	1.36	0.0%
713600-1	14,720	1	8	1.43	1	8	1.36	-4.9%
713600-2	22,612	4	15	0.88	4	27	0.74	-15.9%
713630-1	15,252	5	8	4.67	1	6	4.25	-9.0%
713660-1	21,631	4	23	1.61	3	28	2.07	28.6%
713690-1	7,991	3	14	2.26	1	4	3.29	45.6%
713690-2	30,520	14	49	3.29	1	10	5.41	64.4%
713720-1	36,058	2	9	2.31	2	9	2.58	11.7%
713750-1	34,629	3	12	1.93	1	8	2.56	32.6%
713780-1	7,438	1	10	2.77	1	10	2.70	-2.5%
713780-2	17,763	4	14	1.67	1	9	2.09	25.1%
713810-1	73,057	10	40	1.55	2	33	2.36	52.3%
713810-2	26,209	3	12	1.52	1	7	2.56	68.4%
713810-3	12,919	5	11	2.37	1	9	2.11	-11.0%
713840-1	21,388	5	20	1.62	1	8	1.85	14.2%
713870-1	32,845	5	12	1.10	4	19	1.51	37.3%
717900-1	2,845	1	5	1.93	1	4	1.80	-6.7%
713900-2	22,577	4	10	2.50	2	6	2.24	-10.4%

Solid Name	Solid Volume (m³)	Historical underground holes (Canadian Malartic Mines)			Recent surface holes (Osisko)			Variance (%)
		No. of Holes	No. of 5m Composites	Average (g/t)	No. of Holes	No. of 5m Composites	Average (g/t)	Recent/ Historical
713930-1	22,288	7	14	1.19	1	8	1.40	17.6%
713960-1	12,605	3	17	1.97	2	10	2.22	12.7%
713990-1	8,220	4	8	2.05	1	6	1.80	-12.2%
714020-1	17,659	10	27	2.73	1	7	2.04	-25.3%
714020-2	19,016	7	40	2.01	1	8	3.36	67.2%
714050-1	7,104	5	14	2.60	1	4	2.23	-14.2%
714050-2	9,234	1	4	1.58	1	3	1.12	-29.1%
714110-1	37,956	2	14	1.75	1	5	1.91	9.1%
714140-1	31,233	7	33	2.04	2	9	2.26	10.8%
714140-2	11,076	1	5	2.73	1	4	2.18	-20.1%
714140-3	108,999	8	36	2.01	2	23	1.70	-15.4%
714170-1	24,530	6	35	2.15	2	14	1.91	-11.2%
714200-1	13,574	1	5	1.78	2	12	2.15	20.8%
714230-1	111,166	7	59	1.75	2	18	1.57	-10.3%
714260-1	26,408	4	11	1.79	1	14	1.48	-17.3%
714290-1	14,332	3	11	1.91	1	8	1.90	-0.5%
714350-1	158,974	6	48	1.62	3	25	1.58	-2.5%
714410-1	56,158	4	20	1.82	3	17	1.17	-35.7%
714500-1	26,149	2	8	1.53	2	10	1.23	-19.6%
714530-1	110,534	10	33	3.56	3	35	3.92	10.1%
Based on volume	1,424,154	197	826	1.90	75	612	2.00	5.2%
Mathematical average				1.93			2.03	

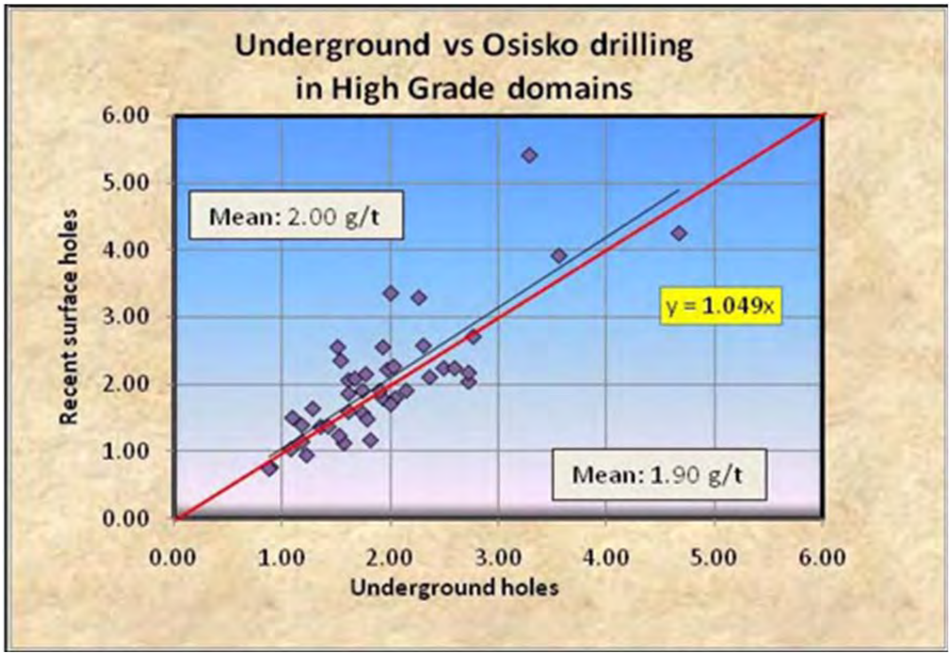

Figure 12.7 – Scatter plot of comparative assays in high grade domains (Hennessy et al., 2008)

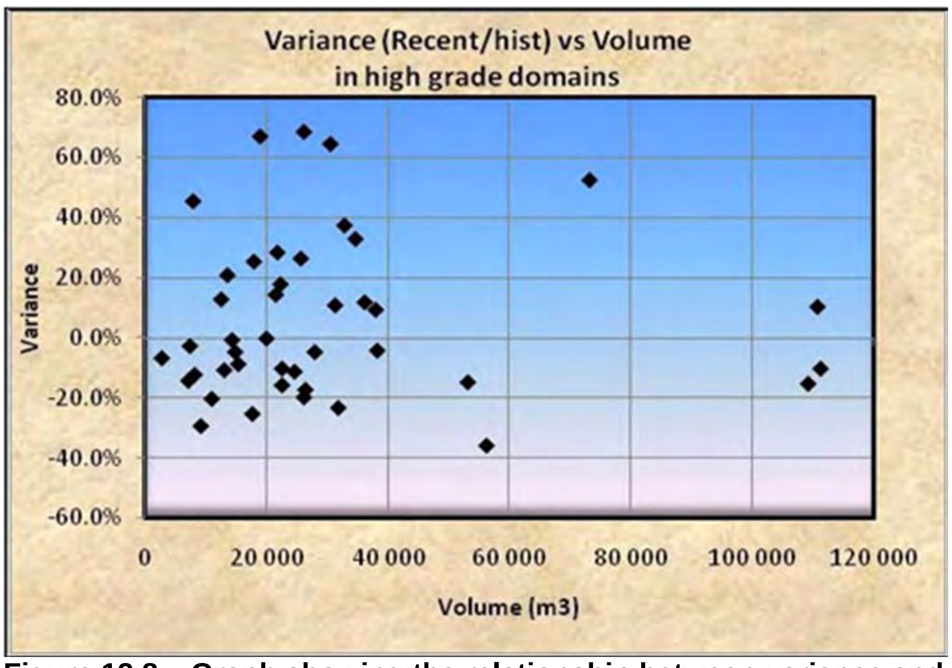

Figure 12.8 – Graph showing the relationship between variance and volume size in high grade domains (Hennessy et al., 2008)

12.2.3.2 Comparison in low grade domains

Hennessey et al. (2008) carried out the same exercise for volumes in the low grade domains.

Table 12.4 summarizes the results of the comparison of gold grade assays within the volumes for the low grade domain.

The result is very different than for the high grade domains. Almost all the comparisons are in favour of the CM (historical) data. The overall mathematical and volume weighted averages of the CM drilling data are respectively 32 and 24 % higher than the OSK data.

Table 12.4 – Comparison between historical and recent drill holes in low grade domains (Hennessy et al., 2008)

Solid	Solid Volume (m^3)	Historical underground holes (Canadian Malartic Mines)			Recent surface holes (Osisko)			Variance (%)
		No. of Holes	No. of 5m Composites	Average (g/t)	No. of Holes	No. of 5m Composites	Average (g/t)	Recent/ Historical
713480-1	114,315	3	22	0.50	3	35	0.40	-20.0%
713510-1	4,726	1	4	0.35	1	4	0.20	-42.9%
713570-1	12,702	1	6	0.46	1	6	0.27	-41.3%
713600-1	15,521	3	11	0.40	1	14	0.19	-52.5%
713630-1	16,142	2	8	0.26	1	3	0.31	19.2%
713660-1	3,331	1	7	0.46	1	9	0.33	-28.3%
713690-1	61,648	2	20	0.24	2	24	0.25	4.2%
713750-1	46,340	3	22	0.51	2	22	0.40	-21.6%
713750-2	19,744	1	6	0.48	2	13	0.36	-25.0%
713780-1	4,328	1	5	0.41	1	4	0.11	-73.2%
713810-1	10,858	2	9	0.58	1	7	0.55	-5.2%
713840-1	62,154	2	13	0.59	2	30	0.43	-27.1%
713930-1	8,913	1	4	0.52	1	3	0.36	-30.8%
713960-1	2,693	1	7	0.58	2	7	0.46	-20.7%
714080-1	3,720	1	5	0.19	1	4	0.07	-63.2%
713170-1	6,489	1	7	0.27	1	6	0.02	-92.6%
713200-1	26,681	3	16	0.38	2	20	0.18	-52.6%
Based on volume	420,305	29	172	0.45	25	211	0.34	-23.9%
Mathematical average				0.42			0.29	-31.9%

The scatter plot (Fig. 12.9) supports this result, with almost all points falling below the 45° line. It also appears that the highest variances are associated with the smaller volumes (Fig. 12.10).

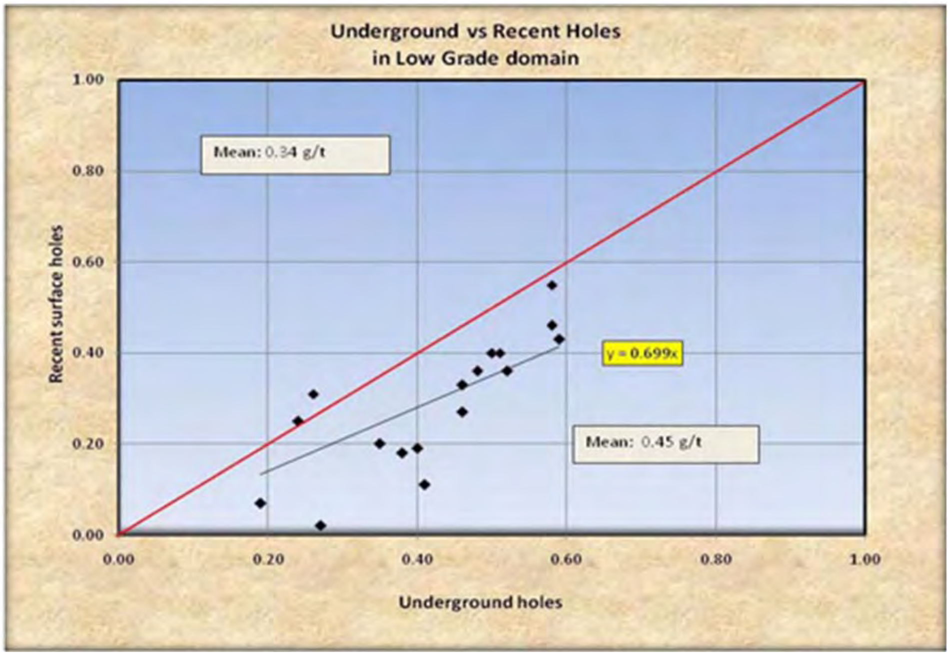

Figure 12.9 – Scatter plot of comparative assays in low grade domains (Hennessy et al., 2008)

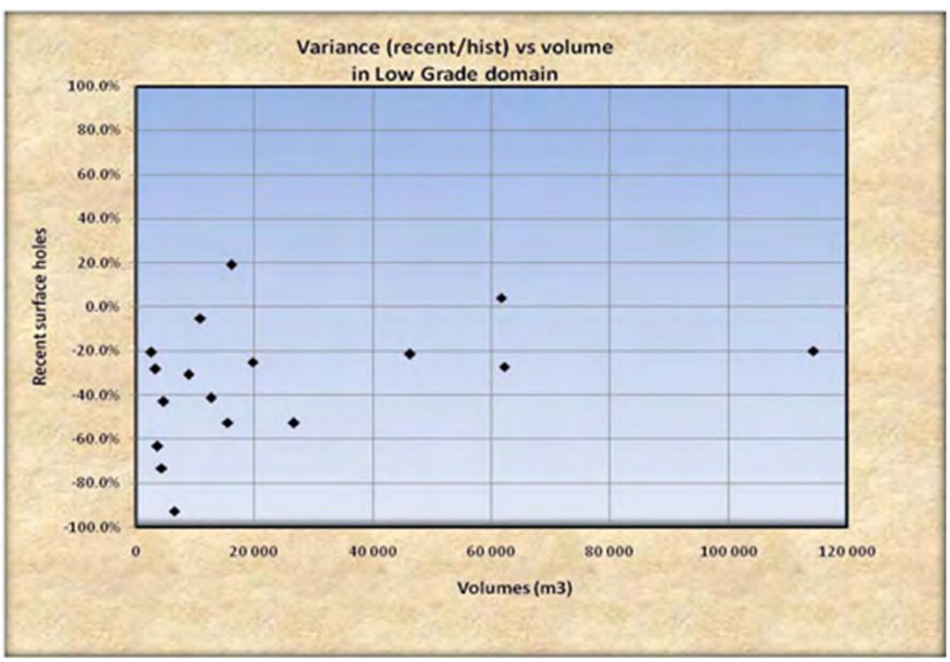

Figure 12.10 – Graph showing the relationship between variance and volume size in low grade domains (Hennessy et al., 2008)

12.2.4 Conclusion on the Comparison of Historical and Recent Data

The comparative gold grade study by Hennessey et al. (2008) has clearly identified a bias between the historical (CM) and recent (OSK) drilling populations in the low grade domain. Although it is difficult to really quantify the bias, the discrepancy seems significant, on the order of 25 to 30% in favour of the historical data. The historical data may be affected by the fact that the detection limit for gold assays was higher at that time and many of the assays between 0.20 and 0.60 g/t are not consistent with recent drilling results.

For the high grade material (envelopes of >1.0 g/t), the situation is different. Even though the discrepancy is in favour of the historical data within the global high grade envelopes, there is no evident bias when the comparison is done using volumes in the same geologic environment. Within small volumes, the average of the composites is about the same or even in favour of recent drilling.

In conclusion, the result of the comparative study led to the rejection of all historical (CM) data in the low grade and pervasive alteration domains. In these domains, only the recent Lac Minerals + Osisko (OSK) drilling data were used for grade interpolation and resource estimation.

As for the high grade domains (>1.0 g/t), since there is no evidence of bias for samples in the same geological environment, both historical and recent data were used for resource estimation.

12.3 Survey Control

The survey control on recent drilling has been well established. The detailed survey methods and results conform to industry standards. All drill hole collars were either surveyed by an external contractor or mine site personnel.
Much less survey control is available for the historical data, which lowers the level of confidence in this data.

12.4 Core Recovery Data

Core recovery data are available for the Osisko series of drilling. The core recoveries are considered very good overall (majority higher than 95%) and appropriate for use in the resource estimation herein.
No relationship is evident between core recoveries and gold assays, indicating that the data were not biased by recoveries.

12.5 Check Sampling Programs

Two different check sampling programs have been conducted on the property. The first program was done by RSG Global in January 2007 and the second by Micon in August 2008.

12.5.1 1RSG Global Sampling

RSG Global completed a check sampling program of original Osisko core in January, 2007. The following details were presented in the report by Gossage and Inwood (2007):

"RSG Global supervised a check sampling programme at the Canadian Malartic Project, Québec, Canada, completed on January 23, 2007. Randomly selected intervals of diamond drill core from the Canadian Malartic Project were selected by RSG Global. Quarter core from these intervals were collected with the core cutting, sampling and sample submission completed by Osisko technical staff and their contractors under the supervision of RSG Global. All aspects of the sampling and assaying were completed as per the Osisko standard protocols.

The check sampling programme consisted of 19 check intervals, collected from four drill holes, plus two certified standards. The intervals were selected to ensure a representative mix of lithology and alteration were considered, and that a reasonable grade range was investigated.

The following lithology / alteration types were sampled:

- CM05-686 - Silicified or partly silicified schist
- CM06-700 - Schist (+/- chlorite / carbonate alteration)
- CM06-767 - Silicified or partly silicified schist
- CM06-790 – Altered porphyry."

Table 12.5 presents the sampled intervals and results of the check assaying as presented in the RSG Global report.

After reviewing the check assay results, RSG Global concluded that no bias could be identified.

Table 12.5 – RSG Global check assay program intervals and results (Gossage and Inwood, 2007)

Hole ID	From (m)	To (m)	Sample number	Check sample number	Au (ppm)	Au check (ppm)	Sample type
CM05-686	145.5	147.0	142903	142903A/ML45952	5.550	5.0	Duplicate
CM05-686	147	148.5	142904	142904A/ML45953	3.74	3.7	Duplicate
CM05-686	148.5	150	142905	142905A/ML45954	2.29	2.17	Duplicate
CM05-686	150	151	142906	142906A/ML45955	1.48	1.685	Duplicate
CM05-686	151	152	142907	142907A/ML45956	1.115	0.88	Duplicate
CM06-700	100.1	101.6	144119	144119A/ML45957	2.24	2.43	Duplicate
CM06-700	101.6	103.1	144120	144120A/ML45958	7.6	7.63	Duplicate
CM06-700	103.1	104.6	144121	144121A/ML45959	5.74	6	Duplicate
CM06-700	104.6	106.1	144122	144122A/ML45960	4.79	4.41	Duplicate
CM06-767	231.3	232.8	224767	224767A/ML45945	0.103	0.102	Duplicate
CM06-767	232.8	234.3	224768	224768A/ML45946	0.48	0.982	Duplicate
CM06-767	234.3	235.8	224769	224769A/ML45947	1.09	0.598	Duplicate

Hole ID	From (m)	To (m)	Sample number	Check sample number	Au (ppm)	Au check (ppm)	Sample type
CM06-767	284.5	285.3	224806	224806A/ML45948	2.66	2.69	Duplicate
CM06-767	285.3	286.8	224807	224807A/ML45949	1.37	1.45	Duplicate
CM06-767	286.8	288.3	224809	224809A/ML45950	0.693	0.667	Duplicate
CM06-790	311.5	313	226869	226869A/ML45941	3.19	2.59	Duplicate
CM06-790	313	314.5	226870	226870A/ML45942	1.705	2.11	Duplicate
CM06-790	314.5	316	226871	226871A/ML45943	0.218	0.191	Duplicate
CM06-790	316	317.5	226872	226872A/ML45944	1.45	1.295	Duplicate
CM05-686	145.5	147	142903	142903S/ML45951	*1.326	1.305	Standard
CM06-700	104.6	106.1	144122	144122S/ML45961	*0.996	1.005	Standard

** Represents the certified standard value*

12.5.2 Micon sampling

During an August 2008 site visit, Micon completed its own program of check sampling of duplicate half-core (field duplicates) from a number of drill holes at a variety of grade ranges throughout the Canadian Malartic deposit (Hennessey et al., 2008). Ten (10) samples were taken and submitted to ALS Chemex Laboratories in Val-d'Or for analysis. The samples were prepared and assayed using the same protocols as employed by Osisko. Micon maintained custody of the samples until they were handed over to ALS Chemex staff at the laboratory receiving door.

Micon considered the variance for the assay results to be acceptable for field duplicate samples.

Table 12.6 – The results of Micon's field duplicate sample program

Hole ID	From (m)	To (m)	Sample number	Check sample number	Au (ppm)	Au Check (ppm)
CM08-1754	46	47.5	692608	330401	1.975	1.98
CM07-1710	291	292.5	722328	330402	4.46	3.79
CM08-1789	260.5	262	726957	330403	0.963	0.955
CM08-1823	117.5	119	800525	330404	2.04	1.84
CM07-1674	83	84.5	691388	330405	3.81	3.53
CM08-1691	235	236.5	642535	330406	7.87	7.96
CM07-1649	81	82.5	642008	330407	1.485	0.845
CM08-1875	136	137.5	744492	330408	4.66	3.05

Hole ID	From (m)	To (m)	Sample number	Check sample number	Au (ppm)	Au Check (ppm)
CM08-1847	96.5	98	801507	330409	1.49	1.095
CM07-1614	68	69.5	658749	330410	3.08	2.67
Mean					**3.183**	**2.772**

12.6 Sample Preparation, Analyses and Security

This section provides a description of sample preparation, analyses, and security procedures for Osisko's drilling programs. The information is based on discussions with Osisko representatives during on-site visits.

12.6.1 Sample Preparation

All samples received by ALS Chemex are processed through a sample tracking system that is an integral part of that company's Laboratory Information Management System (LIMS). This system uses bar coding and scanning technology that provides complete chain-of-custody records for every stage in the sample preparation and analytical process and limits the potential for sample switches and transcription errors.

Samples are dried and then crushed to 70% passing -10 mesh (1.7 mm). A 250 g subsample is split off the crushed material and pulverized to 85% passing -200 mesh (75 micron). A 50 gram split of the pulp is used for assay. Crushing and pulverizing equipment is cleaned with barren wash material between sample preparation batches and, when necessary, between highly mineralized samples. Sample preparation stations are also equipped with dust extraction systems to reduce the risk of sample contamination.

As part of the standard internal quality control procedures used by the laboratory, each batch of 84 fire-assay crucibles includes one blank, two internal (laboratory-generated) standards and three duplicate samples along with 78 client samples. In the event that any reference material or duplicate result falls outside the established control limits, an error report is automatically generated. This ensures that the person evaluating the sample set for data release is made aware that a problem may exist with the dataset and an investigation can be initiated.
Rejects from the samples are returned to the Malartic Regional Exploration office on a regular basis. These materials are securely stored in a locked facility for future reference.

12.6.2 Laboratories Accreditation and Certification

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories sets out the criteria for laboratories wishing to demonstrate that they are technically competent, operating an effective quality system, and able to generate technically valid calibration and test results. The standard will form the basis for the accreditation of competence of laboratories by accreditation bodies. ISO 9001 is for management support, procedures, internal audits and corrective actions. It provides a framework for existing quality functions and procedures.

The main difference between ISO/IEC 17025 and ISO 9001 is the accreditation and certification. ISO/IEC 17025 stands for accreditation, which means the recognition of competence of specific technical competence. ISO 9001 stands for certification, which means accordance with a standard assessed by management systems, certified by any independent body that is internationally agreed. Also, there is the difference with the accurate products. ISO 9001 does not mean accurate products are produced. For that, product should be approved by ISO/IEC 17025. Every conformance assessment body should have the ISO/IEC 17025 accreditation.

The general requirements for the competence of testing and calibration laboratories are described in the document CAN-P-4E (ISO/IEC 17025:2005). These requirements are designed to apply to all types of calibration and objective testing and therefore need to be interpreted with respect to the type of calibration and testing concerned and the techniques involved. The document CAN-P-1579:2014 is the Standard Council of Canada's ("SCC") requirements for the accreditation of mineral analysis testing laboratories. The program is designed to ensure mineral analysis testing laboratories meet minimum quality and reliability standards and to ensure a demonstrated uniform level of proficiency among these mineral analysis testing laboratories. CAN-P-1579:2014 identifies the minimum requirements for accreditation of laboratories supplying mineral analysis testing services. This includes, but is not limited to, the measurement of all media used in mining exploration and processing including sediments, rocks, ores, metal products, tailings, other mineral samples, water and vegetation.

All primary and duplicate assay work for the Canadian Malartic Property has been performed by ALS Chemex laboratories located in Val-d'Or, Québec and Timmins, Ontario. ALS Chemex is part of the ALS Global Group and has ISO 9001 certification and ISO/IEC 17025 accreditation through the SCC. ALS Chemex is an independent commercial laboratory.

Samples for umpire assaying were submitted to Acme Laboratories in Vancouver, British Columbia.

12.6.3 Gold Analysis

Prepared samples are analyzed by fire assay with atomic absorption finish. Samples returning assays in excess of 10 g/t Au are re-analyzed with a gravimetric finish. The gravimetric finish assay is used as the final assay.

12.7 Analysis of Assay Quality Control Data

A detailed statistical analysis of the available standards, blanks and duplicated quality control data has been undertaken for information that has become available since the last published technical report (Belzile and Gignac, 2011).

The standards measure the accuracy of the gold assay data while the blanks measure the potential for cross contamination of samples during sample preparation. The duplicate data are compiled to allow reasonable assessment of analytical precision in addition to accuracy as provided by the standards.

12.7.1 Standards

12.7.1.1 Canadian Malartic database

A total of 1,837 standards that were submitted to ALS Chemex (Val-d'Or) by Osisko were available for analysis. The standards are eight different commercial certified RockLabs and CDN standards. The summary statistics for the eight standards are shown in Table 12.7.

Table 12.7 – Standards summary for the Canadian Malartic Database

Standard	Expected value	Number	Mean ALS Chemex	E.V. Range (E.V. ± 3 SD)	% passing
J	0.78	280	0.790	0.690 to 0.870	92.14%
J2	0.71	211	0.714	0.605 to 0.815	93.84%
K	1.05	234	1.075	0.90 to 1.20	88.03%
K2	1.52	247	1.540	1.31 to 1.73	85.83%
L	2.16	346	2.198	1.80 to 2.52	92.49%
L2	2.40	102	2.328	2.085 to 2.715	88.24%
M	3.10	331	3.185	2.74 to 3.46	87.92%
M2	3.04	86	3.020	2.695 to 3.385	95.35%

The table shows that 9.8% of the assays did not pass the ±3 SD test (SD = standard deviation). This is considered a relatively good accuracy but ideally, less than 5% of the assays should fail the test. It should be noted that some bad assays might be explained by a mislabelling of the standards.

12.7.1.2 Jeffrey database

A total of 982 standards that were submitted to ALS Chemex (Val-d'Or) by Osisko were available for analysis. The standards are sixteen different commercial certified RockLabs and CDN standards. The summary statistics for the sixteen standards are shown in Table 12.8.

Table 12.8 – Standards summary for the Jeffrey Database

Standard	Expected value	Number	Mean ALS Chemex	E.V. Range (E.V. ± 3 SD)	% passing
A3	0.606	68	0.598	0.555 to 0.657	92.65%
B4	2.641	51	2.594	2.392 to 2.890	96.08%
C3	1.323	55	1.313	1.191 to 1.455	94.55%
C4	1.344	6	1.313	1.185 to 1.432	100.00%
D2	0.848	46	0.843	0.764 to 0.932	89.13%
F2	8.573	10	8.477	8.099 to 9.047	100.00%
G2	4.086	24	4.177	3.807 to 4.365	91.67%
H	0.996	43	0.994	0.912 to 1.080	97.67%
J	0.78	142	0.815	0.69 to 0.87	87.32%
J2	0.71	33	0.715	0.605 to 0.815	96.97%
K	1.05	14	1.028	0.90 to 1.20	92.86%
K2	1.52	163	1.580	1.31 to 1.73	84.05%
L	2.16	152	2.263	1.80 to 2.52	96.71%
L2	2.4	11	2.515	2.085 to 2.715	81.82%
M	3.10	155	3.271	2.74 to 3.46	85.81%
M2	3.04	9	3.198	2.695 to 3.385	88.89%

The table shows that 9.6% of the assays did not pass the ±3 SD test. This is considered a relatively good accuracy but ideally, less than 5% of the assays should fail the test.

12.7.1.3 Western Porphyry Database

A total of 1,234 standards that were submitted to ALS Chemex (Val-d'Or) by Osisko were available for analysis. The standards are seven different commercial certified RockLabs and CDN standards. The summary statistics for the seven standards are shown in Table 12.9.

Table 12.9 – Standards summary for the Western Porphyry Database

Standard	Expected value	Number	Mean ALS Chemex	E.V. Range (E.V. ± 3 SD)	% passing
J	0.78	109	0.800	0.69 to 0.87	91.74%
J2	0.71	223	0.706	0.605 to 0.815	94.62%
K2	1.52	323	1.543	1.31 to 1.73	88.24%
L	2.16	114	2.219	1.80 to 2.52	94.74%
L2	2.4	188	2.381	2.085 to 2.715	94.15%
M	3.1	105	3.179	2.74 to 3.46	92.38%
M2	3.04	172	3.030	2.695 to 3.385	92.44%

The table shows that 7.9% of the assays did not pass the ±3 SD test. This is considered a relatively good accuracy but ideally, less than 5% of the assays should fail the test. It should be noted that some bad assays might be explained by a mislabelling of the standards.

12.7.2 Blanks

12.7.2.1 Canadian Malartic Database

A total of 914 blanks were submitted to ALS Chemex. From this number, 94.97% came back with an assay result of twice the detection limit or lower (0.01 g/t). Only six samples show an assay higher than 0.05 g/t and three higher than 0.10 g/t, demonstrating that the level of potential contamination is low. The results are judged within acceptable limits.

12.7.2.2 Jeffrey Database

A total of 410 blanks were submitted to ALS Chemex. From this number, 99.27% came back with an assay result of twice the detection limit or lower (0.01 g/t). Only one sample shows an assay higher than 0.10 g/t, demonstrating that the level of potential contamination is low. The results are judged within acceptable limits.

12.7.2.3 Western Porphyry Database

A total of 615 blanks were submitted to ALS Chemex. From this number, 96.75% came back with an assay result of twice the detection limit or lower (0.01 g/t). Only three samples show an assay higher than 0.10 g/t, demonstrating that the level of potential contamination is low. The results are judged within acceptable limits.

12.7.3 Pulp duplicates

12.7.3.1 Canadian Malartic database

Some 1,162 pulp samples (assays higher than 0.01 g/t) were re-assayed by ALS Chemex. The mean of the re-assays is 0.825 g/t while the mean of the original assays was 0.847 g/t with a coefficient of correlation of 72%. These results demonstrate the ability of the lab to reproduce the global average despite discrepancies for the individual assays. The following scatter plot (Fig. 12.11) shows the correlation between the first and second assays. Table 12.10 shows the statistics of the sample pairs.

Table 12.10 – Statistics of the pulp duplicates for the Canadian Malartic Database

Pulp Duplicates	Au Original	Au Duplicate
No. of pairs	1,162	
Minimum (g/t)	0.016	0.000
Maximum (g/t)	49.50	20.90
Mean (g/t)	0.847	0.825
Median (g/t)	0.122	0.131
Standard deviation	2.27	1.89
Coefficient of correlation	0.72	

Some 5,643 RC pulp samples (assays higher than 0.01 g/t) were re-assayed by Techni-lab. The Figure 12.12 shows a good reproducibility of assays results.

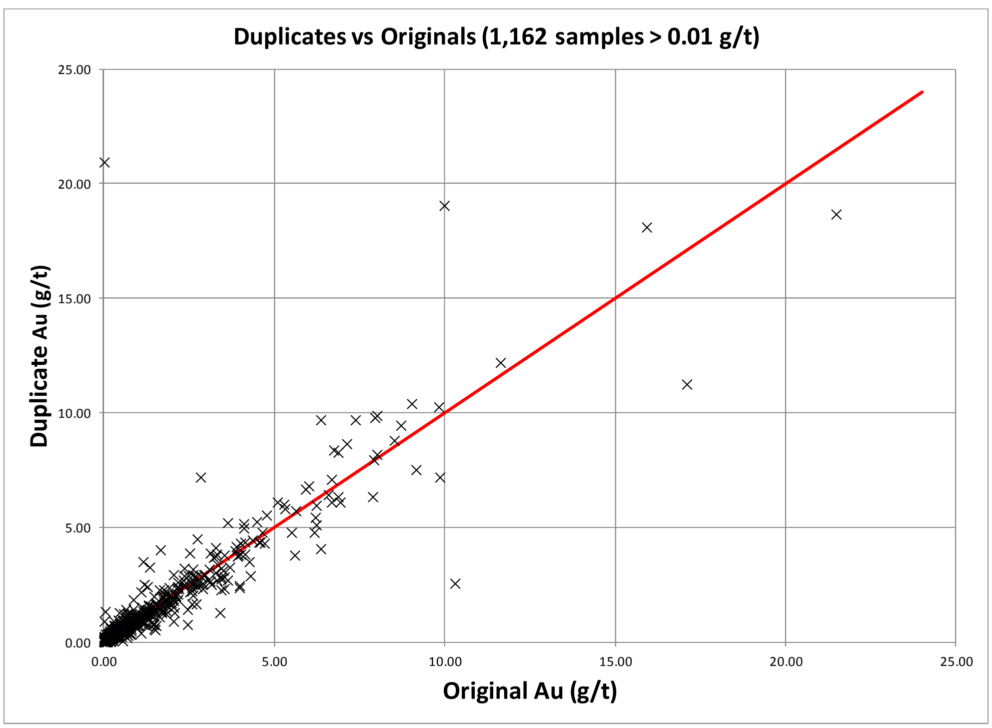

Figure 12.11 – Scatter plot of pulp duplicates for the Canadian Malartic Database

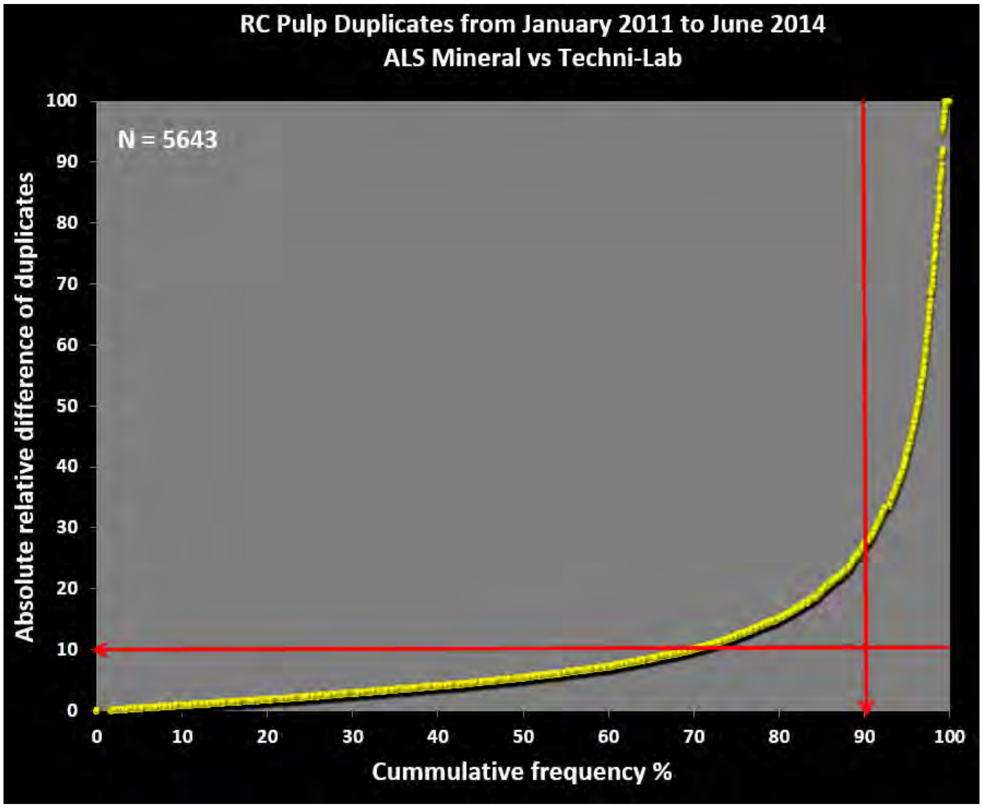

Figure 12.12 – RC pulp duplicates from January to June 2014

12.7.3.2 Jeffrey Database

Some 884 pulp samples (higher than 0.01 g/t) were re-assayed by ALS Chemex. The mean of the re-assays is 1.247 g/t while the mean of the original assays was 1.301 g/t with a coefficient of correlation of 74%. These results demonstrate the ability of the lab to reproduce the global average despite discrepancies for the individual assays. The following scatter plot (Fig. 12.13) shows the correlation between the first and second assays. Table 12.11 shows the statistics of the sample pairs.

Table 12.11 – Statistics of the pulp duplicates for the Jeffrey Database

Duplicates	Au Original	Au Duplicate
No. of pairs	884	
Minimum (g/t)	0.020	0.003
Maximum (g/t)	49.50	19.05
Mean (g/t)	1.301	1.247
Median (g/t)	0.550	0.546
Standard deviation	2.57	2.03
Coefficient of correlation	0.74	

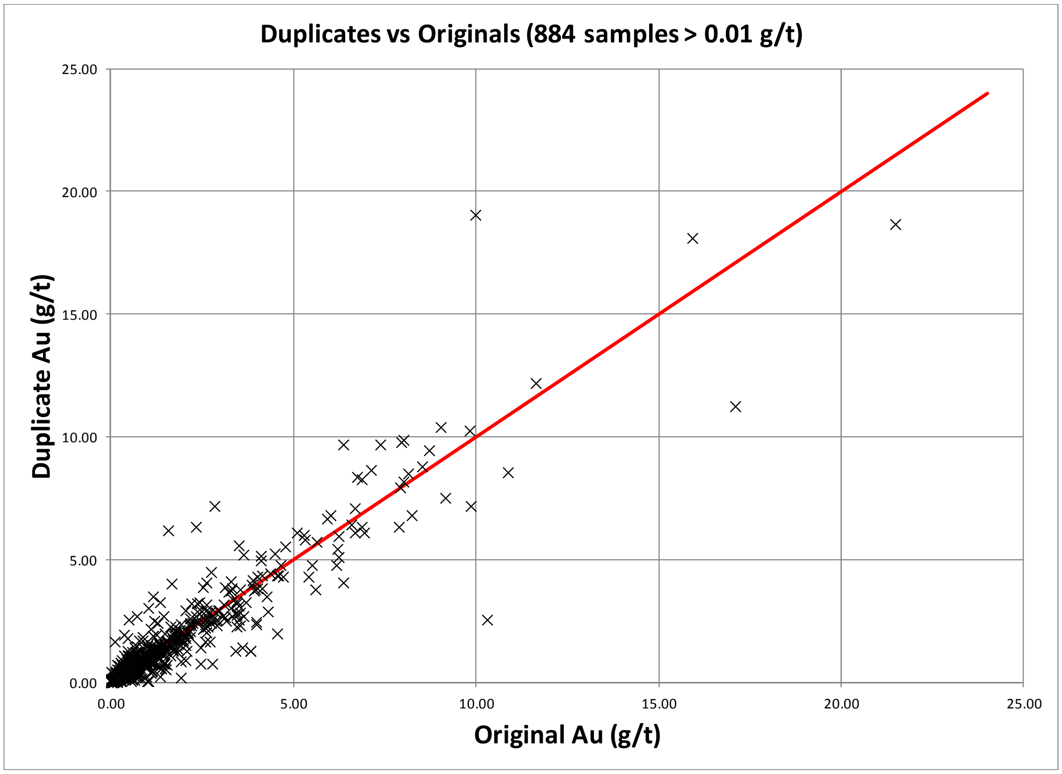

Figure 12.13 – Scatter plot of pulp duplicates for the Jeffrey Database

12.7.3.3 Western Porphyry Database

Some 714 pulp samples (higher than 0.01 g/t) were re-assayed by ALS Chemex. The mean of the re-assays is 0.454 g/t while the mean of the original assays was 0.444 g/t with a coefficient of correlation of 86%. These results demonstrate the ability of the lab to reproduce the global average despite discrepancies for the individual assays. The following scatter plot (Fig. 12.14) shows the correlation between the first and second assays. Table 12.12 shows the statistics of the sample pairs.

Table 12.12 – Statistics of the pulp duplicates for the Western Porphyry Database

Duplicates	Au Original	Au Duplicate
No. of pairs	714	
Minimum (g/t)	0.015	0.003
Maximum (g/t)	8.43	9.20
Mean (g/t)	0.444	0.454
Median (g/t)	0.213	0.208
Standard deviation	0.75	0.79
Coefficient of correlation	0.86	

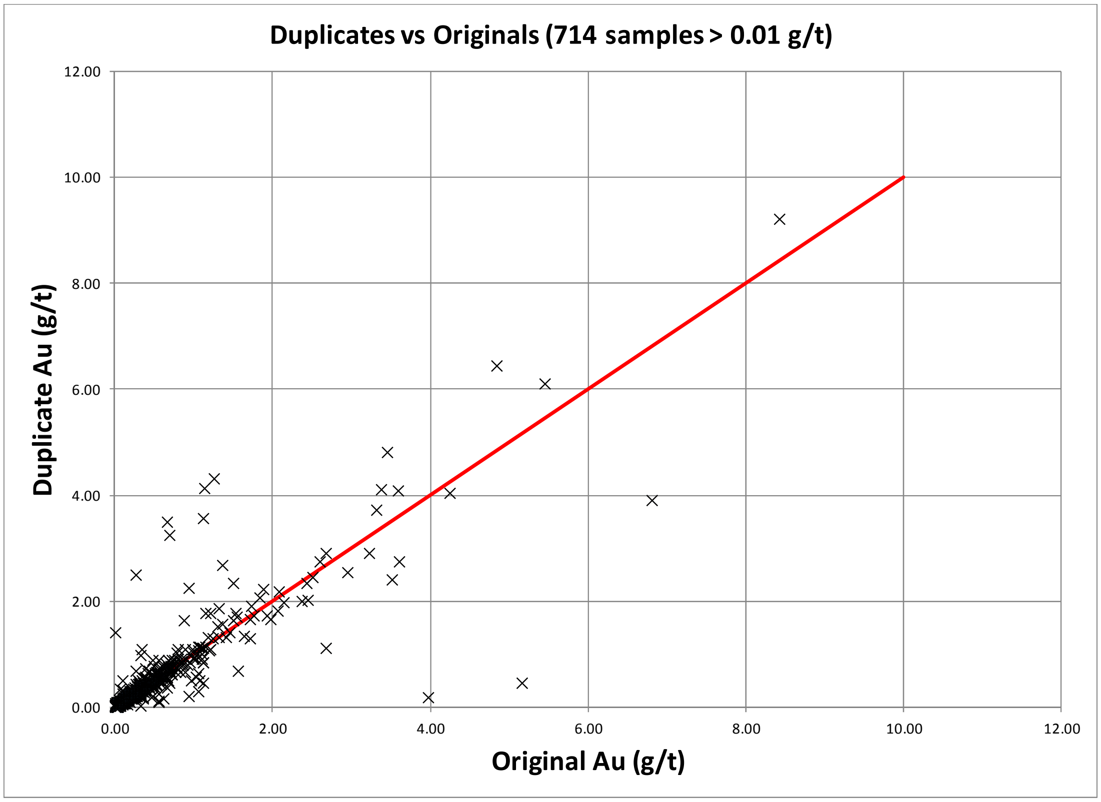

Figure 12.14 – Scatter plot of pulp duplicates for the Western Porphyry database

12.8 Umpire Laboratory Re-assays

Belzile and Gignac (2011) reported that some 946 pulp samples (assays higher than 0.01 g/t) were re-assayed at an umpire laboratory at an umpire laboratory (Acme Laboratories, Vancouver, Canada). All samples originated from the Canadian Malartic deposit. The average of the re-assays is 0.698 g/t while the average of the original assays was 0.686 g/t with a coefficient of correlation of 98%. The scatter plot (Fig. 12.15) indicates that the umpire laboratory replicates well the original assays from ALS Chemex.

The statistics of the two populations are quite close, showing that there is no evident bias between the two laboratories. Table 12.13 shows the statistics of the sample pairs.

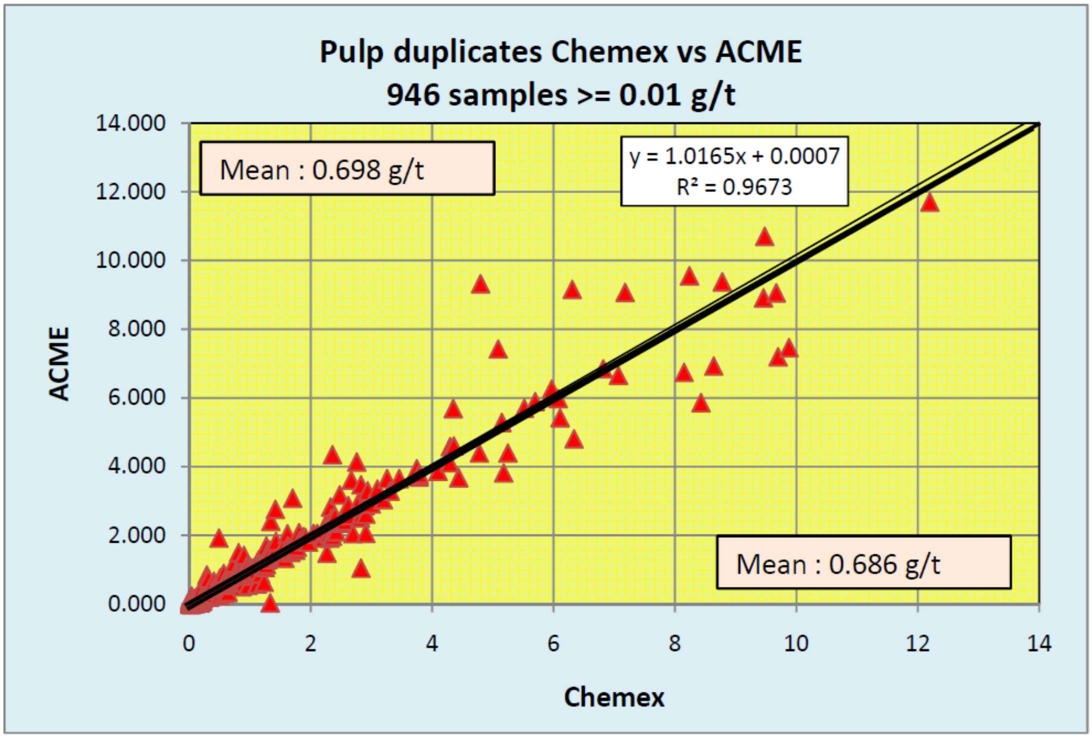

Figure 12.15 – Scatter plot of pulp duplicates sent to Acme Laboratories – Canadian Malartic deposit

Table 12.13 – Statistics of the pulp duplicates

Pulp duplicates	Au Original	Au check
No. of pairs	946	
Minimum (g/t)	0.01	0.01
Maximum (g/t)	20.9	22.6
Mean (g/t)	0.686	0.698
Median (g/t)	0.029	0.028
Standard deviation	1.646	1.700
Coefficient of correlation	0.983	

12.9 Summary of QA/QC Analyses

The available data from the QA/QC programs for the Canadian Malartic, Jeffrey and Western Porphyry databases show overall acceptable results despite some significant discrepancies for individual re-assays as it is quite often the case for gold deposits, particularly when visible gold is present.

The statistics of the Certified Reference Materials (standards) are considered within industry acceptable limits of accuracy.

The level of contamination appears to be low as the blank samples do not display evidence for significant contamination.

The samples sent to an external laboratory do not show any significant bias as the global average is about the same and the coefficient of correlation between the two populations is higher than 98%.

It is the author's opinion that Osisko ran an industry standard QA/QC program for its insertion of control samples into the stream of core samples.

For reference standard samples, the control charts produced by Osisko consist of the assay results for each standard plotted on the y axis against time on the x axis. Superimposed on this chart are five horizontal reference lines representing the accepted value for the standard, the accepted value +2SD and +3SD (standard deviations), and the accepted value -2SD and -3SD. An analysis of a standard is considered a QA/QC failure if the result comes back outside of the ±3SD lines. Such charts can also show trends of drift over time indicating problems with calibration of instruments.

In addition, it is recommended that re-numbered rejects be submitted to the primary laboratory to complete the QA/QC program.

Finally, diamond drilling and RC were used equally during interpolation over a portion of the Canadian Malartic Deposit. Although the RC portion represents less than 10% of the entire tonnage (22.6 Mt over 245.9 Mt), it would be worthwhile to run a comparative study to confirm that no bias exists between both drilling and sampling methods although good reconciliation during recent mining activities suggest that no bias is to be expected.

12.10 Conclusions

It is the author's opinion that the Canadian Malartic, Jeffrey and Western Porphyry drill hole databases are robust and suitable enough for use in mineral resource estimation studies.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Test Program (Canadian Malartic)

13.1.1 General

The feasibility study of the Canadian Malartic Project included a comprehensive study that provided a complete metallurgical test protocol and numerous verifications for equipment selection. The program testing was executed principally at SGS Minerals Services but also at the URSTM (*Unité de recherche et de service en technologie minérale*) and at other locations such as FLSmidth, Outotec, PSI, Knelson, Falcon, SNF, Ciba, Cyplus, etc. The data and analyses were reported to Osisko in the form of reports, emails and telecom meeting updates.

The original testwork program included the following activities:

- Selection and preparation of metallurgical composites
- Sample receiving, logging and preparation for metallurgical testing.
- Grinding testwork:
    - 11 Full DWT and 2 abbreviated SAG Mill Comminution (SMC) drop tests
    - 22 BWI determinations.
- Leaching testing on whole ore:
    - 956 Leach tests.

Following the tonnage ramp-up limitation, an important grinding testwork program was done to understand the source of the limitation. The following testwork was done by SGS and COREM on a duplicate sample.

- 35 Full DWT
- 30 Ball Mill Work Index
- 30 Bond Abrasion Index
- 35 Abrasion Test
- 35 Bond Rod Mill Work Index
- 30 SAG Power Index
- 30 Bond Low Energy Impact Test

13.1.2 Samples

13.1.2.1 Sample background

For the initial testwork, core samples were collected during the period from 2005 to 2008 by the drilling company representatives and subjected to a very detailed and rigorous procedure for logging, storage and assaying. Most of the assaying was performed by ALS Chemex. The majority of the deposit consists of four ore types, namely CPO, SPO, CGR and SGR (Table 13.1).

Table 13.1 – Description of ore types

Ore Type	Description	Average occurrence as percentage of the orebodies
CPO	Potassic altered porphyry with carbonate	10%
SPO	Silicified porphyry	20%
CGR	Potassic altered greywacke with carbonate	28%
SGR	Silicified greywacke	42%

The metallurgical samples were selected to give a good representation of the ore zones in the deposit. Approximately 338 drill holes were used for the testwork.

13.1.2.2 Compositing

In general, the composites for metallurgical testwork at SGS have been prepared as follows:

- Individual samples are combined to prepare a composite. The material is screened at 10 mesh (1.7 mm) and any oversize is crushed to minus 10 mesh (1.7 mm) and is split in 1 kg charges. The samples are blended. The composite is then split into charges using a rotary splitter. The head sample is riffled out of one of the test charges.

- For the large quantity of overall composites that have been prepared, each composite has been blended by placing it in a drum which is rotated end over end for about an hour.

For the grinding testwork, the samples were prepared as follows:

Drill core samples were received by SGS and each one was sampled and prepared for the SAG mill comminution (SMC) testwork where the cores are cut in ¼ cylinders using a diamond saw and the test is subsequently performed as per the standard drop weight test (DWT) procedure, except that only one size fraction is tested. The remainder was crushed to minus 6 mesh (3.4 mm) and 10 kg was removed for BWI determinations. Approximately 20 g of this crushed material was used for a specific gravity (SG) determination by pycnometer.

13.1.2.3 Ore mineralogy

An initial deportment study was conducted by SGS on four (4) composite samples. The objectives of the investigation were to determine the bulk mineralogy and the occurrence of gold in these samples, and to identify and evaluate any mineralogical factors that may affect recoveries.

The findings of this initial examination were:

- Gold mainly occurs as liberated fine particles of native gold and as some inclusions in pyrite. The gold particles had an average gold content of 87.8% for CPO, 87.1% SPO, 88.5% for CGR and 85.2% for SGR. Gold grains are measured as a geometric mean of average length and average width. Microscopic gold grains ranged from 2 to 50 microns in size for CPO (arithmetic average 16 microns), 1 to 85 microns in size for SPO (arithmetic average 11 microns), 1 to 35 microns in size for CGR (arithmetic average 7 microns) and 1 to 32 microns in size for SGR (arithmetic average 8 microns).
- Approximately 800 g of material passing 300 microns of each as-received sample was pre-concentrated by heavy liquid separation at an SG of 2.9 to generate a sink fraction and a float fraction. The percentage of gold carried in the sink fraction (mainly sulphide and iron-oxide) and considered to be mainly liberated or attached, was approximately 54.7% for CPO, 55.8% for SPO, 33.7% for CGR and 36.6% for SGR. For the combined CPO and SPO, 55% of the gold is recovered in the sink fraction. For the combined CGR and SGR, 35% of the gold is recovered in the sink fraction. The overall sink fraction represents only 3% of the sample weight.
- In the four samples, S^{2-} contents are less than 1.6%, and pyrite is the major sulphide mineral.
- In the four samples, Fe-oxide/hydroxides (mainly hematite, magnetite, goethite and limonite) are the major iron minerals and considered to be the source of the soluble iron that could come into solution during cyanidation.

13.1.3 Grinding Testwork

The initial objective of the testwork at the time of the feasibility study was to establish the expected capacity of the 38ft x 21ft EGL SAG mill, the XL1100 pebble cone crusher, and three 24ft x 36.5ft EGL ball mill grinding circuits.

Testwork (BWI and SMC) was carried-out by SGS on different representative samples of the orebody in order to confirm the parameters required for the design of the comminution circuit. Further analysis of the results of the SMC tests was used to determine the JKSimMet parameters.

The following summarizes the results:

The initial test results (feasibility study) show that the ore fell in the medium to hard range of hardness in terms of resistance to impact breakage (A x b) and in terms of BWI.

Table 13.2 – Grindability test summary, feasibility study

Sample	Ore Density (g/cm^3)		DWT	Parameters	BWI (kWh/t)			AI
Name	Pycno	W.D.	A x b	DWI	150M	*200M1	*200M2	g
Metso test								
SPO	-	2.66	36.2	-	-	12.6	-	-

Sample	Ore Density (g/cm^3)		DWT	Parameters	BWI (kWh/t)			AI
Name	**Pycno**	**W.D.**	**A x b**	**DWI**	**150M**	***200M1**	***200M2**	**g**
SGR+CGR	-	2.73	35.5	-	-	16.1	-	-
SGS test								
Overall Comp	-	-	-	-	-	15.6	15.5	-
PO Comp	-	-	-	-	-	15.2	14.8	0.846
CPO-2007-05	-	2.67	33.0	8.0	13.7	14.9	-	0.604
SPO-2007-06	-	2.66	38.2	6.9	13.0	14.7	-	0.654
GR Comp	-	-	-	-	-	16.1	15.9	0.476
CGR-2007-07	-	2.68	33.8	7.8	15.0	16.2	-	0.454
SGR-2007-08	-	2.69	37.7	7.0	14.7	15.9	-	0.533
REMGR	-	2.67	39.9	6.7	14.5	14.6	-	0.786
Comp G-E/S	2.77	2.75	44.3	6.2	-	15.9	-	0.455
Comp G-E/D	2.75	2.69	42.7	6.3	-	17.9	-	0.485
Comp G-M/S	2.75	2.74	40.8	6.7	-	16.8	-	0.677
Comp G-M/D	2.76	2.74	42.3	6.5	-	17.1	-	0.477
Comp G-W/S	2.75	2.73	35.3	7.7	-	15.1	-	0.473
Comp G-W/D	2.77	2.73	36.4	7.5	-	16.9	-	0.399
Minimum	**2.75**	**2.66**	**33.0**	**6.2**	**13.0**	**12.6**	**14.8**	**0.399**
Maximum	**2.77**	**2.75**	**44.3**	**8.0**	**15.0**	**17.9**	**15.9**	**0.846**
Average	**2.76**	**2.70**	**38.2**	**7.0**	**14.2**	**15.7**	**15.4**	**0.563**

**200M1 and 200M2 tests were done in duplicate.*

Pycno: ore specific gravity measured by pycnometer.

W.D.: ore density measured by water displacement technique on rocks -31.5 / +26.5 mm.

13.1.4 Post-Commissioning Grinding Testwork Results

Following the SAG mill ramp-up throughput limitation, a grinding testwork program was carried out. The grinding testwork was done by two laboratories on duplicate samples. Results of the new program confirm the work index parameter of the first program (feasibility study) but shows a much lower value for the Axb parameter (JKTech measure for resistance to impact). The new values explain the need to install extra crushing capacity compared to the initial process plant design. The results of the updated testwork are listed in Table 13.3, and Figure 13.1 shows the different areas in the pit.

Table 13.3 – Post-commissioning grinding testwork results

Sample Name	Laboratory	Relative Density	A	b	A x b	BMWI 200 mesh	AI	Ta	RMWI	SPI	CWI	Wet rod mill (rods)	Wet rod mill (liners)	Wet ball mill (balls)	Wet ball mill (liners)	Crusher (gyratory, jaw and cone)	Roll Crusher
Unit			%	t/kWh	t/kWh	kWh/t	g		kWh/t	SPI	kWh/t	kg/kWh	kg/kWh	kg/kWh	kg/kWh	kg/kWh	kg/kWh
CM-310-098-HG2	COREM	2.62	47.78	0.67	31.82	11.40		0.81									
Conv. #1 23 mai_11	COREM	2.74	56.76	0.47	26.71	12.24	0.2778	0.36				0.1429	0.0136	0.1336	0.0101	0.0343	0.0704
CM-320-208-LG07	COREM	2.68	78.72	0.32	24.96	12.03	0.6111	0.16	13.27			0.1211	0.0106	0.1017	0.0079	0.0205	0.0416
US02_11	COREM	2.74	68.25	0.37	24.93	12.98	0.4249	0.26	14.69			0.1325	0.0121	0.1179	0.0090	0.0266	0.0552
	SGS	2.71	83.50	0.36	30.10			0.35									
US02_12	COREM	2.73	61.05	0.45	27.74	14.57	0.4085	0.32	15.60			0.1314	0.0120	0.1163	0.0089	0.0259	0.0538
	SGS	2.74	71.90	0.32	23.00	14.12	0.4403	0.26	16.60	111.20	14.84						
US03_11	COREM	2.75	55.07	0.44	24.03	15.26	0.5194	0.30	15.75			0.1382	0.0129	0.1264	0.0096	0.0305	0.0631
	SGS	2.76	99.90	0.26	25.97	14.71	0.5908	0.19	16.80	125.12	14.44						
US03_12	COREM	2.71	64.10	0.46	29.38	13.72	0.6822	0.23	12.84			0.1462	0.0141	0.1387	0.0104	0.0372	0.0757
	SGS	2.73	86.10	0.31	26.69	16.45	0.4500	0.22	17.60	119.23	13.03						
US04_11	COREM	2.71	48.02	0.39	18.56	12.04	0.4666	0.29	15.35			0.1351	0.0125	0.1218	0.0093	0.0283	0.0588
	SGS	2.71	100.00	0.20	20.00			0.19									
US05_11	COREM	2.76	53.74	0.35	18.59	14.07	0.1601	0.35	15.37			0.1072	0.0089	0.0834	0.0066	0.0157	0.0288
	SGS	2.75	49.20	0.43	21.16	14.49	0.2270	0.21	17.50	163.87	13.71						
US06_12	COREM	2.69	62.15	0.44	27.55	16.34	0.6639	0.23	15.24			0.1454	0.0139	0.1374	0.0104	0.0364	0.0744
	SGS	2.70	74.10	0.40	29.60			0.22									
US07A_11	COREM	2.75	74.91	0.31	23.55	11.90	0.4343	0.29	13.85			0.1331	0.0122	0.1188	0.0091	0.0270	0.0560
	SGS	2.75	40.20	0.63	25.33	12.19	0.2504	0.32	16.20	101.64	14.04						
US07A_12	COREM	2.71	54.56	0.60	32.48	15.72	0.8578	0.18	16.40			0.1532	0.0151	0.1500	0.0112	0.0444	0.0882
	SGS	2.72	100.00	0.22	22.00	16.34	0.8245	0.19	19.30	143.31	15.32						
US08_11	COREM	2.72	41.81	0.52	21.88	17.62	0.2071	0.29	17.30			0.1135	0.0097	0.0916	0.0072	0.0176	0.0342
	SGS	2.76	100.00	0.20	20.00	16.06	0.2295	0.29	18.55	163.27	16.09						
US08_12	COREM	2.74	68.88	0.35	24.03	16.51	0.3129	0.29	18.56			0.1242	0.0110	0.1060	0.0082	0.0220	0.0450
	SGS	2.74	81.20	0.21	17.05	17.82	0.2583	0.21	19.30	151.96	12.40						
US09_11	COREM	2.66	75.70	0.30	22.50	16.10	0.9311	0.21	14.91			0.1558	0.0155	0.1542	0.0115	0.0475	0.0932
	SGS	2.68	92.70	0.31	28.70												
US09_12	COREM	2.68	82.69	0.35	29.03	15.48	0.6883	0.20	12.97			0.1465	0.0141	0.1391	0.0105	0.0375	0.0762
	SGS	2.68	100.00	0.29	29.00	14.77	0.5097	0.20	14.84	88.47	14.09						
US10_11	COREM	2.76	39.43	0.63	24.68	14.56	0.4294	0.29	15.01			0.1328	0.0122	0.1184	0.0091	0.0268	0.0556
	SGS	2.75	75.30	0.24	18.10	14.94	0.3000	0.20	16.90	134.18	12.49						
US10_12	COREM	2.75	57.89	0.49	28.36	13.46	0.4608	0.32	15.13			0.1348	0.0125	0.1213	0.0093	0.0281	0.0583
	SGS	2.70	68.80	0.36	24.77	14.20	0.3531	0.21	16.78	132.54	13.78						
US11_11	COREM	2.69	67.08	0.36	24.07	15.28	0.5521	0.29	13.15			0.1399	0.0132	0.1290	0.0098	0.0318	0.0658
	SGS	2.67	100.00	0.28	28.00	15.05	0.7413	0.16	14.35	108.20	16.77						
US11_12	COREM	2.68	72.06	0.43	31.01	15.21	0.6700	0.22	13.18			0.1457	0.0140	0.1379	0.0104	0.0367	0.0748
	SGS	2.67	88.00	0.32	28.16	14.53	0.4385	0.26	14.88	92.63	18.13						
US12_11	COREM	2.61	57.75	0.40	23.09	15.17	0.3341	0.31	16.55			0.1259	0.0113	0.1085	0.0084	0.0228	0.0471

Sample Name	Laboratory	Relative Density	A	b	A x b	BMWI 200 mesh	AI	Ta	RMWI	SPI	CWI	Wet rod mill (rods)	Wet rod mill (liners)	Wet ball mill (balls)	Wet ball mill (liners)	Crusher (gyratory, jaw and cone)	Roll Crusher
Unit			%	t/kWh	t/kWh	kWh/t	g		kWh/t	SPI	kWh/t	kg/kWh	kg/kWh	kg/kWh	kg/kWh	kg/kWh	kg/kWh
	SGS	2.73	43.00	0.47	20.21	16.38	0.2241	0.26	17.23	143.50	19.39						
US12_12	COREM	2.75	51.84	0.51	26.57	14.01	0.2433	0.33	16.45			0.1176	0.0102	0.0970	0.0076	0.0191	0.0381
	SGS	2.74	100.00	0.21	21.00			0.28									
US13_12	COREM	2.67	72.67	0.41	29.73	12.82	0.6718	0.22	12.84			0.1457	0.0140	0.1380	0.0104	0.0368	0.0750
	SGS	2.67	100.00	0.24	24.00	13.48	0.5993	0.17	13.44	92.52	15.22						
	SGS	2.75	86.30	0.50	43.15	13.08	0.3317	0.36	11.56	64.45	15.30						
US15_12	COREM	2.76	51.21	0.45	23.25	12.57	0.1809	0.38	16.40			0.1102	0.0093	0.0872	0.0069	0.0165	0.0313
	SGS	2.75	54.80	0.35	19.18	15.32	0.2809	0.22	18.63	156.62	13.09						
US16_12	COREM	2.72	47.22	0.66	31.17	13.08	0.1936	0.39	15.47			0.1119	0.0095	0.0894	0.0070	0.0171	0.0327
	SGS	2.73	66.10	0.38	25.12	14.83	0.1624	0.31	16.62	109.62	14.89						
US17_12	COREM	2.72	69.83	0.46	31.90	12.96	0.4241	0.29	13.50			0.1324	0.0121	0.1179	0.0090	0.0266	0.0552
	SGS	2.74	70.40	0.51	35.90	15.75	0.4130	0.33	15.32	112.75	14.28						
US18_12	COREM	2.71	67.44	0.68	45.62	14.05	0.4531	0.36	10.66			0.1343	0.0124	0.1206	0.0092	0.0278	0.0576
	SGS	2.71	53.40	0.77	41.12	14.50	0.4399	0.32	12.35	73.80	13.55						
US19	COREM	2.72	62.58	0.48	29.77	16.64	0.3744	0.21	16.40		18.87	0.1290	0.0117	0.1129	0.0087	0.0245	0.0508
	SGS	2.73	82.40	0.26	21.42	15.80	0.4330	0.19	17.79	159.67	17.39						
US20_A	COREM	2.69	60.31	0.48	28.90	16.35	0.2863	0.26	14.99		16.95	0.1218	0.0107	0.1028	0.0080	0.0209	0.0425
	SGS	2.69	92.20	0.23	21.21	16.19	0.4755	0.18	17.40	118.10	9.16						
US20_B	COREM	2.63	57.73	0.59	34.34	15.47	0.3703	0.30	13.90		18.17	0.1287	0.0116	0.1124	0.0086	0.0243	0.0504
	SGS	2.72	100.00	0.25	25.00	15.60	0.5006	0.21	16.28	106.56	10.42						
US20_C	COREM	2.65	82.48	0.54	44.13	16.69	0.7110	0.18	11.11		15.57	0.1474	0.0142	0.1407	0.0106	0.0384	0.0778
	SGS	2.66	100.00	0.34	34.00	15.90	0.7343	0.18	12.37	77.07	11.97						
US21_A	COREM	2.73	63.50	0.45	28.86	15.50	0.3310	0.23	18.16		N/D	0.1257	0.0112	0.1081	0.0083	0.0227	0.0468
	SGS	2.72	100.00	0.23	23.00	16.71	0.5224	0.27	19.80	144.69	14.30						
US21_B	COREM	2.67	69.72	0.48	33.58	16.02	0.6306	0.17	14.00		17.13	0.1438	0.0137	0.1351	0.0102	0.0351	0.0719
	SGS	2.69	100.00	0.28	28.00	14.58	0.7823	0.17	15.20	102.56	14.79						
US22	COREM	2.69	52.46	0.60	31.49	17.32	0.3796	0.21	15.55		17.49	0.1294	0.0117	0.1134	0.0087	0.0247	0.0512
	SGS	2.72	100.00	0.21	21.00	15.84	0.4133	0.19	17.30	133.23	14.59						
US23	COREM	2.67	84.67	0.33	27.60	14.03	0.5330	0.19	14.46		13.70	0.1389	0.0130	0.1275	0.0097	0.0311	0.0642
	SGS	2.66	69.00	0.30	20.70	14.16	0.6187	0.16	16.20	127.20	15.17						
Highrade	COREM	2.72	52.20	0.67	34.79	14.76	0.2711	0.25	15.18		17.53	0.1204	0.0106	0.1008	0.0078	0.0203	0.0409
Conv no. 1	COREM	2.72	55.07	0.50	27.41	13.64	0.2241	0.25	15.73		17.46	0.1155	0.0099	0.0942	0.0074	0.0183	0.0361
Conv no. 3	COREM	2.71	66.45	0.40	26.57	14.38	0.2265	0.26	15.21		16.89	0.1158	0.0100	0.0946	0.0074	0.0184	0.0363
Super blast	COREM	2.72	83.23	0.29	24.22	14.85	0.3230	0.23	16.30		16.87	0.1250	0.0112	0.1072	0.0083	0.0224	0.0460
09-21-CV1A-8h_12	COREM	2.74	81.93	0.30	24.21	17.84	0.2734	0.24	16.09		16.54	0.1206	0.0106	0.1011	0.0079	0.0203	
	SGS	2.74	100.00	0.24	24.00	14.75	0.4359	0.20	16.50	115.27	20.50						
10-31-CV1A-11h_12	COREM	2.72	79.12	0.35	27.42	13.55	0.2805	0.28	15.84		18.45	0.1213	0.0107	0.1020	0.0079	0.0206	
	SGS	2.72	100.00	0.24	24.00	14.98	0.3691	0.22	16.68	131.60	17.35						
02-12-CV1A-8h_13	COREM	2.72	100.00	0.26	26.23	14.20		0.19	15.91		17.54						

Figure 13.1 shows the distribution of the Axb values in the pit.

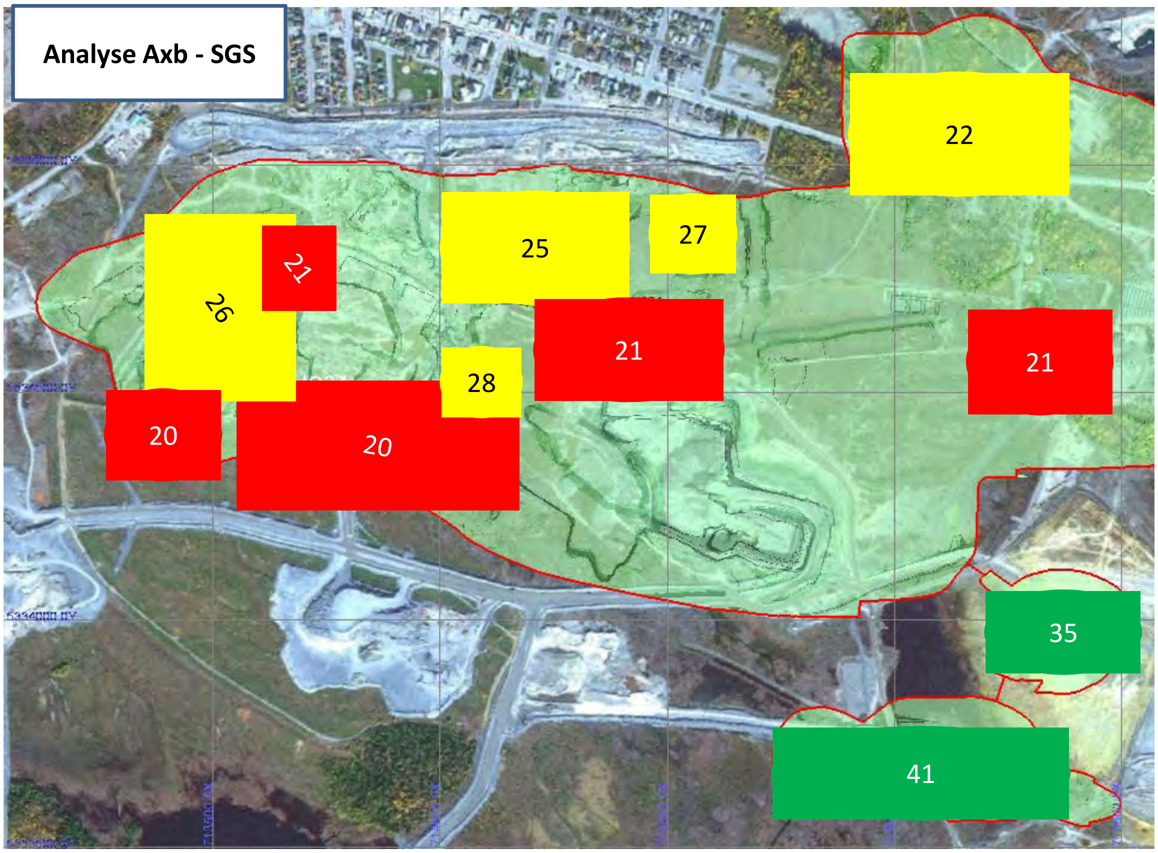

Figure 13.1 – Location of Axb sampling

As observed in the results obtained from the full drop weight test, the new Axb values are very different from the original values (Table 13.4) that were used to design the grinding circuit. These differences explain the SAG mill throughput limitation.

13.1.5 Leach Testwork

A series of scoping tests for whole ore leach were conducted on individual lithologies (CPO, SPO, CGR and SGR), composites of lithologies (PO and GR) and overall composite (OA) samples, to study the effect of process variables on gold extraction. The variables studied were: grind size; pH; leach time; cyanide, oxygen and lead nitrate addition; cyanide and lime consumption; and carbon in leach. The standard conditions used for leach tests were to grind the material to the proper sizes and pulp with water to 40% solids. The pH was adjusted with quicklime to 11.0 and the cyanide concentration was 0.5 g/l. The slurry was bottle-leached for the required leach times. Table 13.4 shows the relationship between time, grind and recovery on the Preliminary Assessment Study composite sample (Overall Comp 1).

Table 13.4 – Effect of grinding on leach time for the Preliminary Assessment Study overall composite (Overall Comp 1)

Leach Parameters Extraction% Au				
Leach Time (h)	Grind Size P_{80} (microns)			
	45	65	75	95
24 h	89	84	83	86
	87	84	82	86
	83	85	84	84
	85	83	82	83
	89	81	82	84
24 h (Average)	86.4	83.4	82.6	84.3
30 h	84.7	84	81.3	83.1
	84	84	80.4	84.2
	86	85	86	81.1
	86	85	85	82.9
	85.7	84	83.9	82.3
30 h (Average)	85.8	84.3	83.3	82.7
48 h	86.2	84.1	82.5	81.8
	87	83.5	81.8	82.9
	86.9	85.3	84.3	81
	86.1	85.2	85	81.5
	87.1	84.7	84.6	82.2
48 h (Average)	86.7	84.6	83.6	81.9
Tails (g/t Au)	0.15	0.17	0.17	0.21
Calc. Head (g/t Au)	1.12	1.12	1.08	1.13

A second series of tests were done on composite pit samples (overall comp 3) to confirm the initial results. Similar behavior was observed when compared with the Preliminary Assessment Study tests except that cyanide consumption was much lower mainly due to grinding in a stainless steel grinding mill. These tests show that an extended leach time improves the recovery (Fig. 13.2).

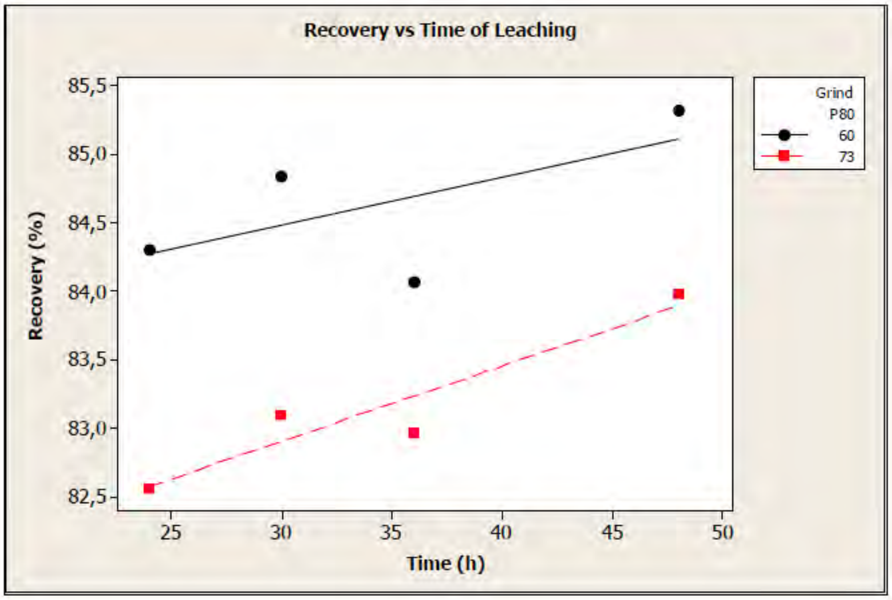

Figure 13.2 – Gold extraction (%) versus leaching time for pit composite sample (Overall Comp 3)

These tests also proved that finer grinding improves the recovery as shown in Figure 13.3. Overall recoveries obtained from testing the same pit composite, after regrinding the flotation concentrate, are also shown on Figure 13.3. It demonstrates that the relationship between grind and recovery is still consistent at grind as fine as a P80 of 20 microns.

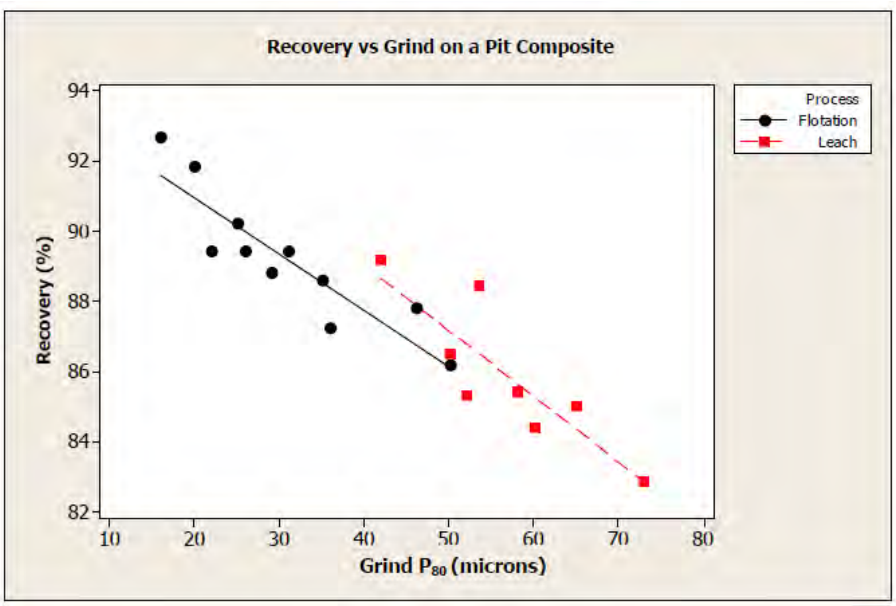

Figure 13.3 – Gold extraction (%) versus leach feed grind size (microns) at 30 h leaching time for pit composite sample (Overall Comp 3)

The general observations on the leach tests are:

- The majority of the gold is extracted after 24 h.
- Gold recovery is responding to finer grind.
- The NaCN consumption is relatively low and generally does not exceed 0.10 kg/t. Some tests were conducted with fresh carbon addition and in these cases, the cyanide consumption was averaging 0.20 kg/t.
- Leach tests at higher than 500 ppm NaCN concentration did not show improvement on recovery.
- The lime consumption averaged 0.60 kg/t when maintaining a pH of 11.
- Lead nitrate addition has not shown any improvement on the recovery or on cyanide consumption for either the whole ore leach process nor for leaching of flotation concentrate.
- Oxygen consumption is relatively low and increasing the DO levels has shown no significant improvement on recovery.
- Higher pH did not show significant improvement on recovery and only affected cyanide consumption, positively.
- Due to the presence of very fine gold particles, gravimetric recovery is not effective.

13.1.6 Deportment Study and Diagnostic Leach on Leach Tails

Following the initial metallurgical test program and the Preliminary Assessment Study results, an additional deportment study was conducted by SGS on a composite sample of leach tails. The objective of the investigation was to determine the occurrence of gold in the sample and to identify any mineralogical factors that could affect the dissolution of the gold.

The protocol and findings of this examination were:

- Approximately 800 g of as-received sample was pre-concentrated by heavy liquid separation at an SG of 2.9 to generate a sink fraction and a float fraction. The percentage of gold carried in the sink fraction (mainly sulphide and iron oxide) was 67.9%. The overall sink fraction represents 7.6% of the sample weight.
- The gold in the sink fraction is mainly locked in sulphides.
- The gold in the float fraction (accounting for 92.4% of the total mass and 32.1% of the total gold) is mainly locked in non-opaque minerals.
- The gold grains observed ranged in size from 0.7 to 5 microns with an average of 2 microns all locked in sulphides (mainly in pyrite).
- The gold locked in sulphides accounted for over 60%; the remaining gold was considered to be locked in non-opaque minerals.

A diagnostic leach was performed on a leach tail residue of the same set of tests. The tail samples were split in two and the first half was pre-leached in hydrochloric acid prior to being leached with cyanide. The second half of the sample was pre-leached with aqua regia then leached in cyanide. The results showed that 8% of the gold was associated with carbonates, Fe oxides or pyrrhotite (liberated by hydrochloric acid) and 77% was associated with sulphide. The reminder of the gold was trapped in the gangue (not liberated by aqua regia).

Considering that the gold that was not leached is encapsulated, it was determined that the grind is the factor that has the most effect on the recovery. At this point, a P80 of 64 microns was established as the required grind for the process design.

13.1.7 Recovery Curves by Area of the Deposit

Following the metallurgical testwork program of the Preliminary Assessment Study, it was determined that the deposit could be split into four main zones (North, South, East and West) based on metallurgical results from the tests executed on various specific drill holes.

A new set of samples were selected and prepared from those four major areas. The North, South, East and West zones were subdivided to represent similar metallurgical behaviour in each zone throughout the deposit. After several tests it was determined that the North zone could be split in two sub-parts: the deep part linked to the West zone and the shallow part linked to the East zone. Two sets of samples were selected and prepared for a complete new testwork leach program. The first set of samples was selected to represent the East, West and South zones at three different grades (3 grades per zone): 0.3 g/t Au, 0.6 g/t Au and 0.9 g/t Au. The intent was to establish recovery curves for each zone of the deposit. The second set of samples was selected to represent the East, West and North zones at two depths in the orebody: shallow samples represent a depth of 150 m below the surface, and deep samples are taken at a depth of 150 m from the bottom of the deposit. Leach tests were repeated several times on the same sample and at the same leach conditions to replicate the results. The selected leach conditions were 500 ppm NaCN, pH of 11.0, a P80 of 64 microns, and a leach time of 30 hours.

Gold recoveries were calculated using the average recalculated head grade from all leach tests of the database. The average recovery obtained for each of the samples was used to plot the recovery curves of each of the three areas. The regression curves were based on recovery results weighted with the gold content of the respective zone. A regression curve from a composite sample selected to represent all zones of the deposit is also included in that same Figure 13.4 and 13.5. A total of 18 different composite samples represent the three zones of the deposit:

- West: 85 leach tests from 8 composite samples
- East: 42 leach tests from 7 composite samples
- South: 36 leach tests from 3 composite samples.

The South zone has a significantly different grade-recovery response curve from the other zones. Most of the gold from the South zone appears in the top 200 metres.

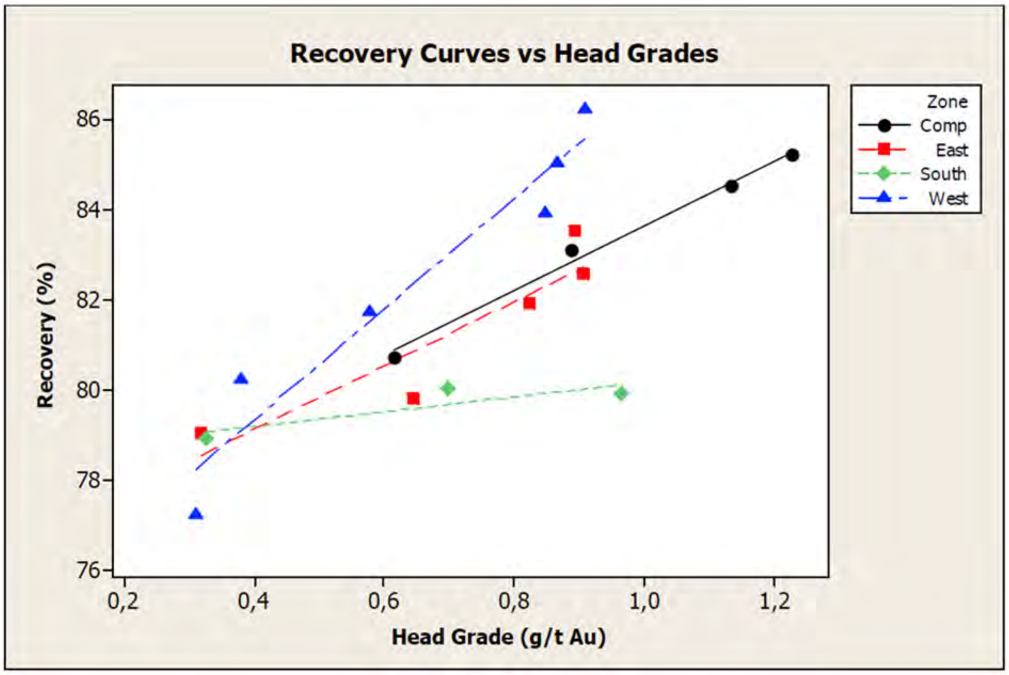

Figure 13.4 – Regression curves established for the West, East and South zones

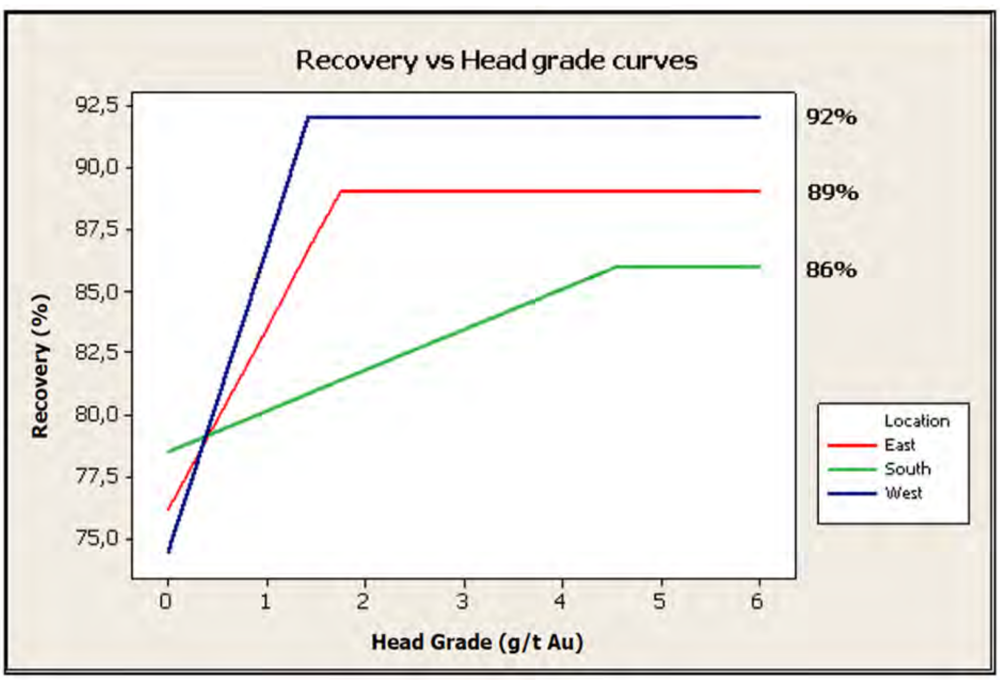

Figure 13.5 – Regression curves established for the West, East and South zones

The recovery equations for each of the three major zones are:

- West (including North Deep) [74.41 + (12.300 x head grade g/t Au)] (Max 92%)
- East (including North Shallow) [76.15 + (7.339 x head grade g/t Au)] (Max 89%)
- South [78.50 + (1.654 x head grade g/t Au)] (Max 86%).

The highest recoveries were obtained in the West zone and the lowest in the South. The South zone contains the lowest ratio of PO in the deposit which may explain why the recovery is lower. GR material samples proved to have lower recoveries throughout the complete testwork program. A maximum recovery value was attributed to each recovery curve based on historical recovery values and test results of each zone.

The actual gold recovery data from the mill in 2013 is presented in Figure 13.6. Based on the higher recoveries achieved since the beginning of the operation, the original recovery curves were updated and separated into four (4) zones in the pit (Fig. 13.7).. Figures 13.8 to 13.11 show the updated recovery curves.

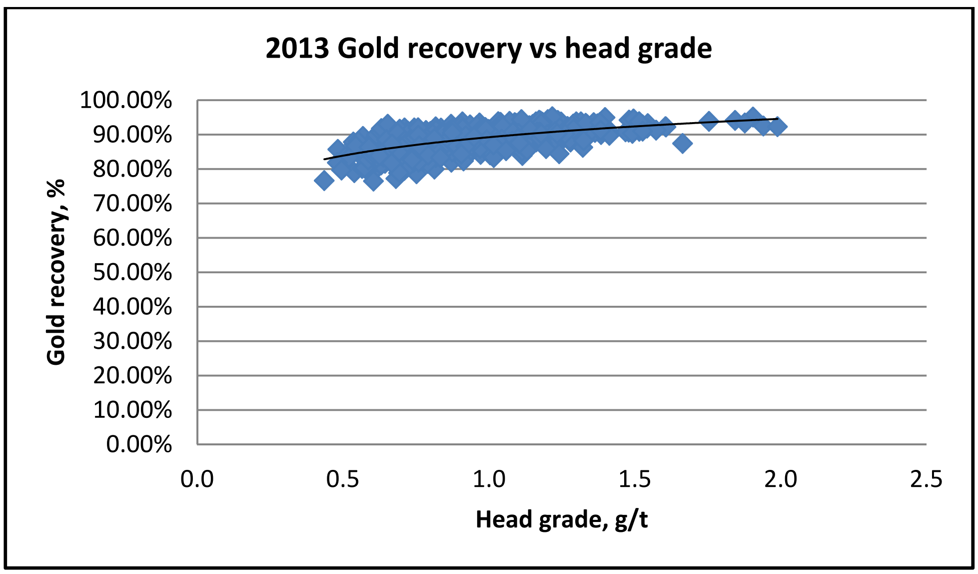

Figure 13.6 – 2013 Gold recovery vs. head grade

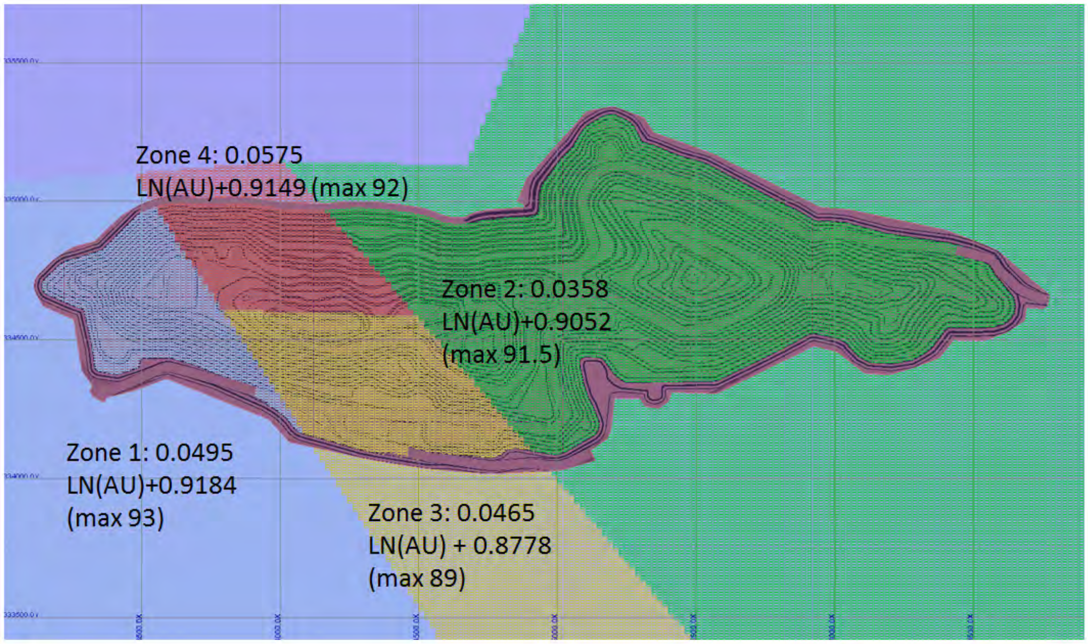

Figure 13.7 – Location of four zones based on metallurgical results within the Canadian Malartic open pit

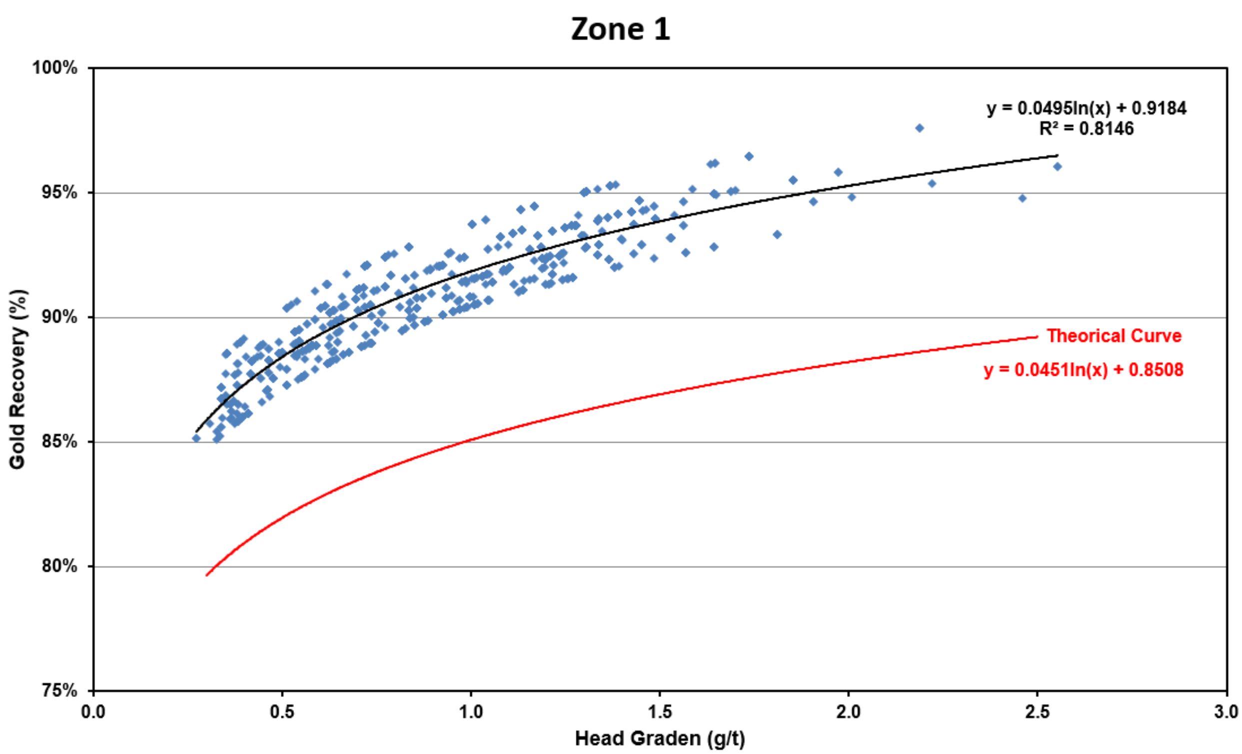

Figure 13.8 – Gold recovery curve for Zone 1

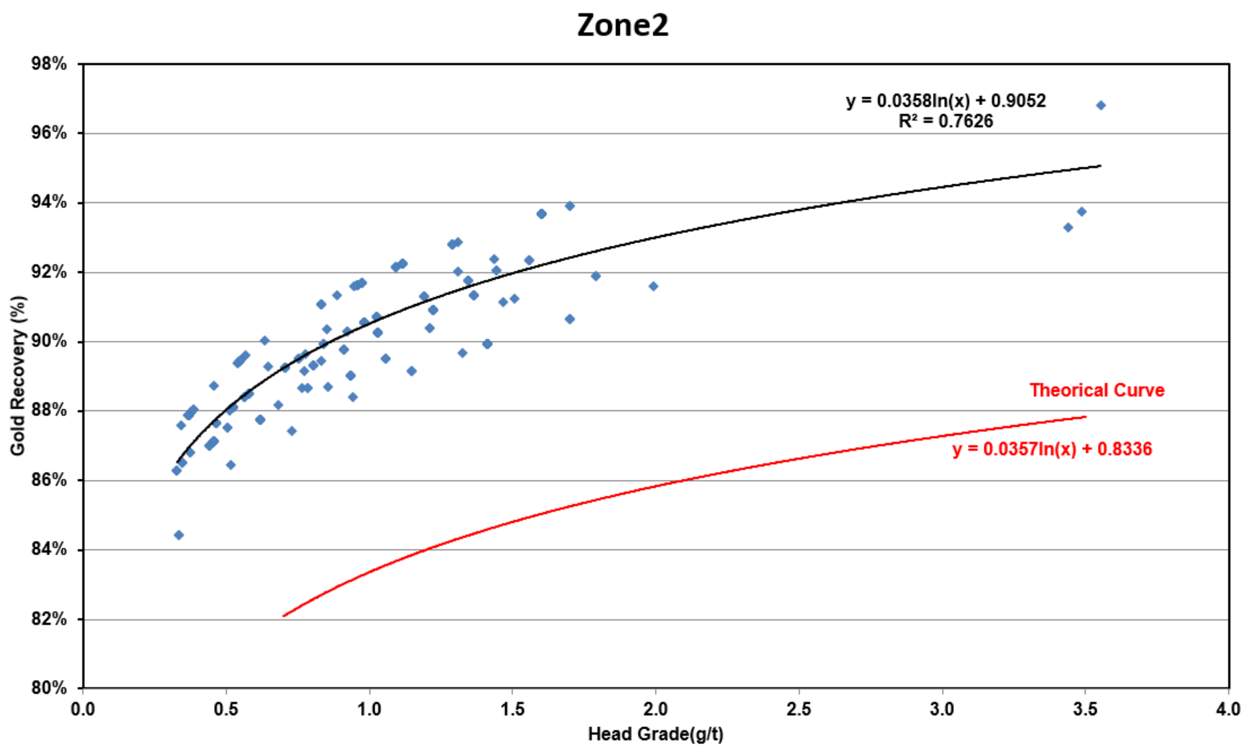

Figure 13.9 Gold recovery curve for Zone 2

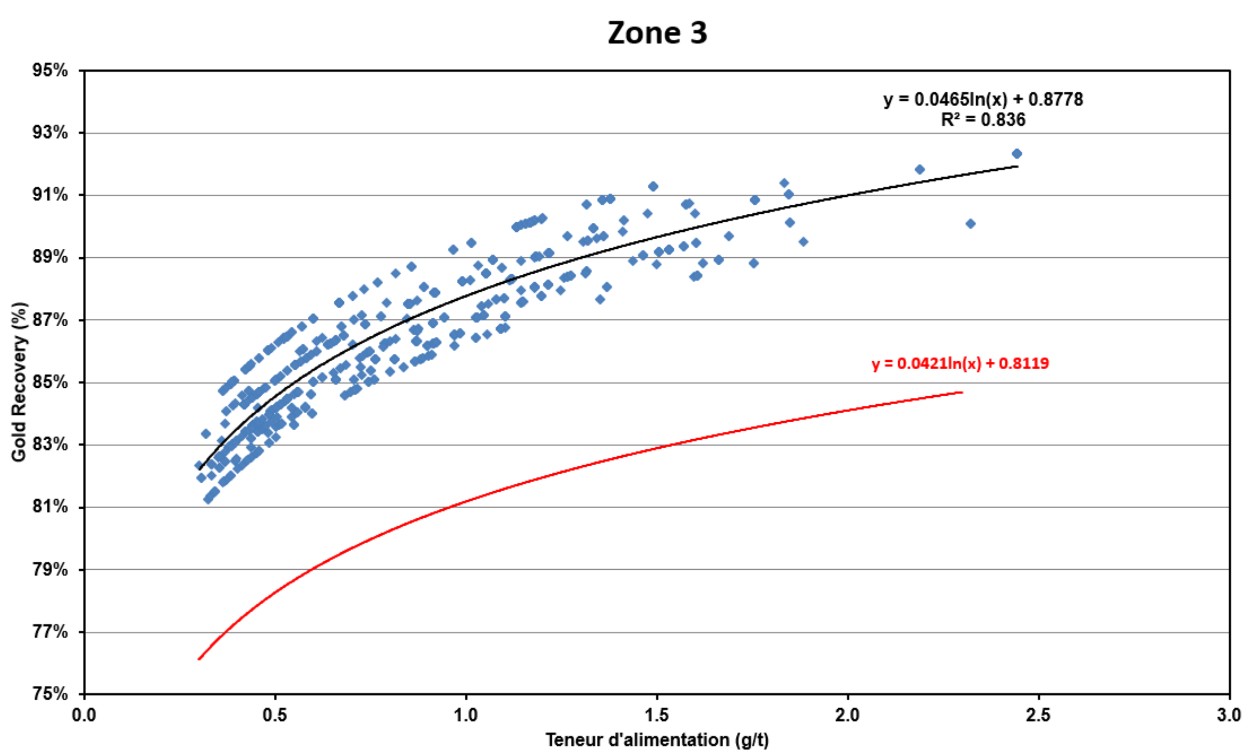

Figure 13.10 Gold recovery curve for Zone 3

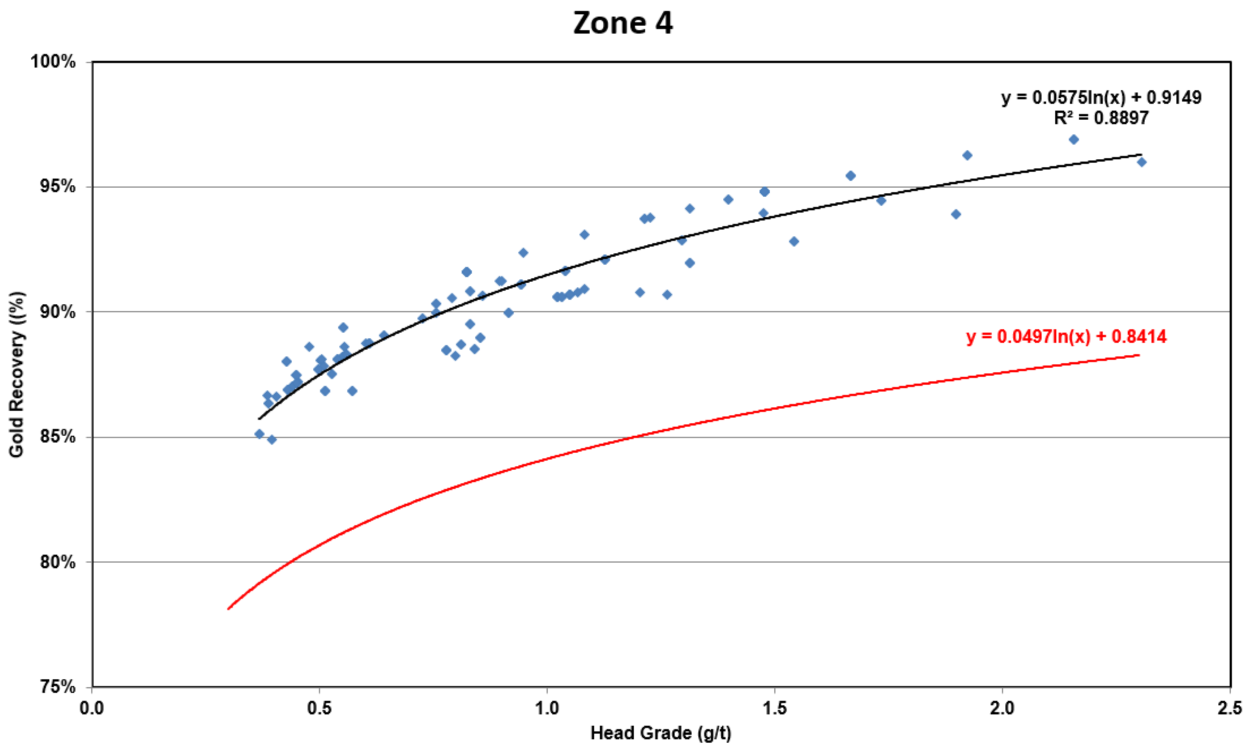

Figure 13.11 Gold recovery curve for Zone 4

13.1.8 Carbon-In-Leach

A series of carbon-in-leach (CIL) tests were conducted on four (4) lithologies (SPO, CPO, CGR and SGR) to study the effect of grinding size and carbon addition on gold extraction. The P80 considered were 55 to 91 microns. The material was ground to the required size and pulped with water to 40% solids. The pH was adjusted with quicklime to 11.5 and the cyanide concentration was 0.5 g/l. The slurry was bottle leached for 48 hours. The results show that:

- The majority of the gold is extracted after 24 h.
- A small increase in gold recovery from 0.1% to 1.6% was found when 10 g/l of activated carbon was added. This improvement was not statistically proven and so is not included in the global recovery estimation but was considered to compensate for the small loss of the carbon circuit not accounted for in the leach tests.
- As expected it was found in the laboratory tests that there was a significant increase in the NaCN consumption and lime consumption. This increase in the consumption does not represent the reality of industrial scale and is explained by the fresh (new) activated carbon used in the experimental tests that has a tendency to adsorb NaCN and lime mainly.

13.1.9 Grinding Media and Reagent Consumption

Grinding media and reagent consumption rates for the present study comes from latest years of operation of the processing plant.

13.1.9.1 Grinding media

SAG Mill Grinding Media
High-quality 5.0-inch diameter steel balls are used. The operation of the SAG mill with approximately 15% to 17% of steel charge consumes in the range of 0.40 to 0.45 kg/t.

Ball Mill (secondary: 2 mills) Grinding Media
High-quality 2.5-inch diameter casted chrome alloy steel balls are used for the secondary grinding circuit. The total consumption of the operation of two parallel ball mills is in the range of 0.35 to 0.40 kg/t.

Ball Mill (tertiary: 1 mill) Grinding Media
High-quality 1.0-inch diameter casted chrome alloy steel balls are used for the tertiary grinding circuit. The consumption for the operation of the ball mill is in the range of 0.20 to 0.25 kg/t.

13.1.9.1.1 Leaching and detoxification reagents

Flocculent (solid in bag)
The flocculent used is a polymer anionic water-soluble standard and typically in use at other mining operations. Total consumption is in the range of 0.040 to 0.045 kg/t based on two thickener applications.

Quicklime (solid in bulk)
Quicklime is used as pH modifier in the process. The total consumption is in the range of 0.40 to 0.50 kg/t.

Sodium Cyanide (solution at 30%)
Sodium cyanide is delivered as a solution at 30% from the supplier distribution center. The total consumption is in the range of 0.25 to 0.35 kg/t (on a 100% base).

Caustic Soda (solution at 50%)
Caustic soda total consumption is in the range of 0.025 to 0.030 kg/t (on a 100% base).

Anti-Scalant (liquid)
The selected anti-scalant (scale-guard) is chosen for its ability to resist heat and different water qualities. Anti-scalant is used in the stripping circuit, to keep the carbon clean of scaling and in the process water distribution system to minimize maintenance of the piping system. The total consumption is in the range of 0.015 to 0.020 kg/t.

Activated Carbon (solid in bag)
Natural coconut shell-type activated carbon (dimension 6 mesh x 12 mesh) is used in the adsorption circuit. The total consumption is in the range of 0.025 to 0.035 kg/t.

Nitric Acid Liquid (liquid)
Nitric acid is sporadically used in the stripping circuit to eliminate the scale accumulated on the activated carbon. There is no consumption of acid so far since the anti-scaling agent keeps the accumulation of scale under an acceptable level.

Oxygen (Liquid)
The liquid oxygen consumption is in the range of 0.075 to 0085 kg/t.

Sulfur Dioxide (liquid)
Sulfur dioxide is used at the detox plant. The total consumption is in the range of 0.07 to 0.09 kg/t.

Copper Sulfate (solid in bags)
The total consumption of copper sulphate is in the range of 0.040 to 0.050 kg/t.

Hydrogen Peroxide Solution (liquid)
Hydrogen peroxide 50% solution is used for cyanide destruction. The total consumption is in the range of 0.10 to 0.15 kg/t.

13.1.10 Conclusions

Canadian Malartic ore is composed of four main lithologies (CPO, SPO, CGR and SGR) spread throughout the deposit in an average ratio of 10%, 20%, 28% and 42%. The deposit was studied (metallurgical testwork) along three axes: east-west, north-south and depth. The main parameters studied were hardness and abrasion variability, reagent consumption and gold recovery.

The Canadian Malartic ore has been subjected to a full drop weight test program over the last 2 years to study hardness. The conclusion of the testwork is that the materials' Axb values range from 17 to 45 with an average of 26.8, which justifies the need for extra crushing capacity, installed after initial startup, due to the very competent nature of the ore; in fact, this constitutes the characteristic of the ore that limits the capacity of the process plant throughput.

The deposit was split into four zones (West, North, East and South) based on similar metallurgical behaviour. Recovery curves (recovery vs. head grade) were generated based on the years of operation to date.

All reagent consumptions are based on the years of operation to date and should remain in the same range based on the fact that the deposit shows similar consumptions throughout all sections of the pit.

Gold deportment and diagnostic leach tests demonstrated that the residual gold, after the leach process, is encapsulated mainly in pyrite. The significant proportion of the gold remaining in the tailings after the leach process was characterized as very fine. It was demonstrated that gravimetric processes are inefficient due to the small grain size. The grind of the leach feed is the most important parameter observed, especially for the gold encapsulated in sulphide. The finer the grind, the higher the recovery, especially for the gold in sulphide.

13.2 Metallurgical Test Program (South Barnat)

The information in this section was based on the Canadian Malartic Technical Report of March 22, 2010.

As the South Barnat deposit is located only 1.2 km northeast of the center of the Canadian Malartic deposit and has similar ore mineralogy, the South Barnat material would be processed in the same circuit as the Canadian Malartic ore.

SGS was contracted to conduct the metallurgical testwork program on the Barnat mineralized material under the supervision and guidance of Osisko. The tests were executed mainly at the SGS facility and the gravimetric testwork was conducted at the Knelson laboratory. The data and assays were reported to Osisko in the form of reports, emails and telecom updates.

The testwork program included the following activities:

- Sample receiving, logging and preparation.
- Selection and preparation of metallurgical composites.
- Grinding testwork:
  - o 3 SAG Mill Communition (SMC) tests;
  - o 5 Ball mill Bond Work Index (BWi) determinations;
  - o 3 Rod mill Bond Work Index (RWi) determinations;
  - o 3 Bond Abrasion Index (Ai) Tests.
- Whole ore leach testwork program:
  - o 90 Leach tests.
- Gravimetric testwork:
  - o 3 Gravimetric tests.

13.2.1 Sample Background

Core samples were collected in 2008 by the drilling company representatives. The same detailed and rigorous procedure as for the Canadian Malartic testwork program was carried out for logging and storage of the Barnat core. Most of the core assaying was performed by ASL Chemex.

The majority of the deposit consists of seven lithologies as presented in Table 13.5.

Table 13.5 – Ore type descriptions

Lithology	Description	Zone of occurrence in the Orebody
CPO	Carbonated porphyry	Piché
SPO	Silicified porphyry	Piché
AUM	Slightly altered ultramafic	Piché (Low grade and waste)
CUM	Carbonated ultramafic	Piché (Low grade and waste)
CGR	Potassic altered greywake with carbonate	Pontiac
SGR	Silicified greywake	Pontiac
AGR	Slightly altered greywake	Pontiac (Low grade and waste)

The Barnat deposit is composed of two main zones separated by the Cadillac Fault: Pontiac and Piché. The Pontiac zone is located on the south side of the fault and is composed mainly of SGR, CGR and AGR. The Pontiac waste material (dilution) is composed mainly of AGR which is very similar to the material from the Sladen extension of the Canadian Malartic deposit. The Piché zone is located on the north side of the fault and is mainly composed of SPO and CPO. The Piché waste material (dilution) is mainly composed of AUM and CUM.

Figures 13.12 and 13.13 show the proportion for total ore, low grade ore and waste for both Piché and Pontiac. The metallurgical samples were selected to be representative of the various ore zones of the deposit. A total of approximately 350 drill holes samples were used for the testwork.

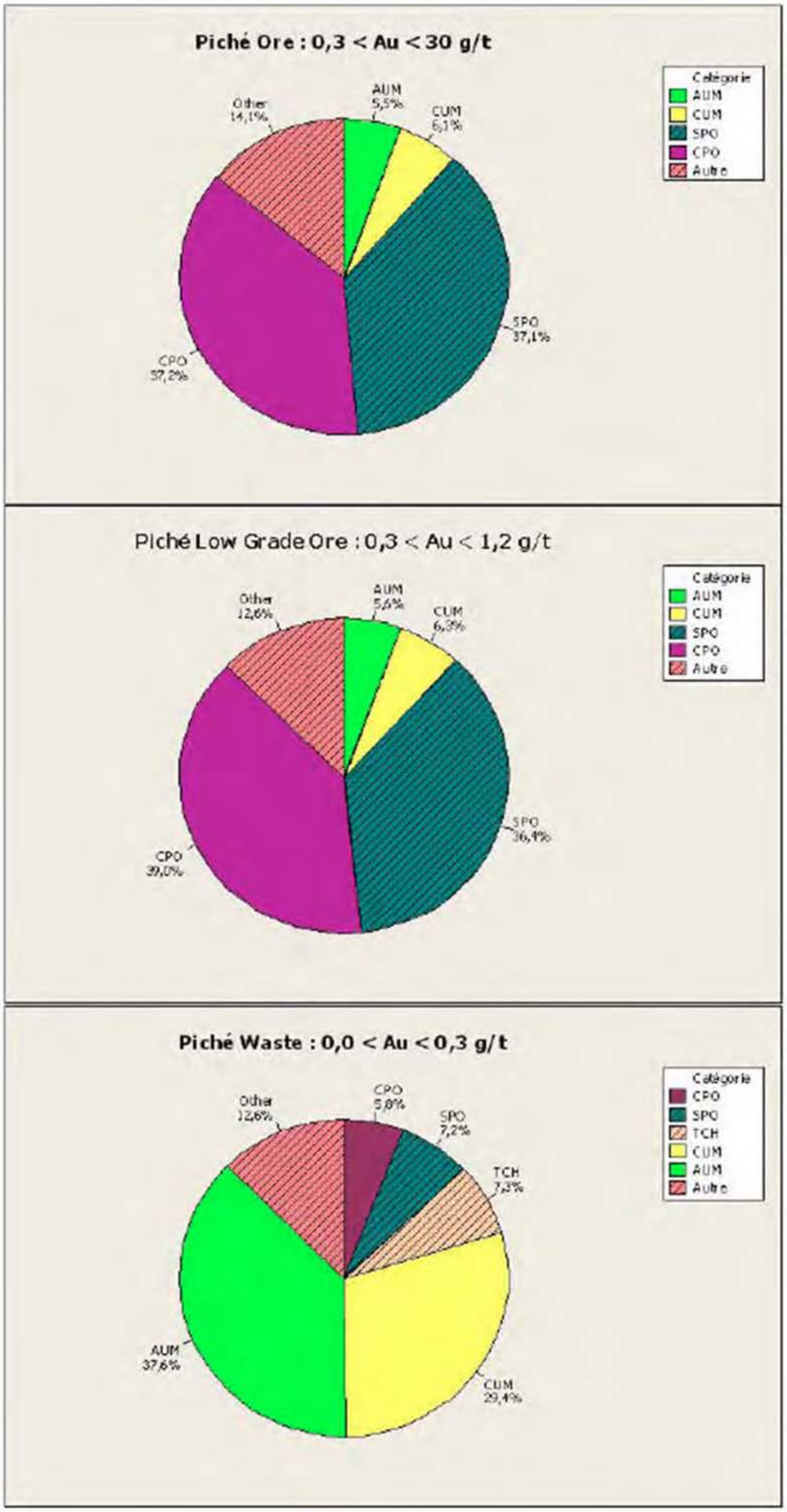

Figure 13.12 – Sample proportion in Piché

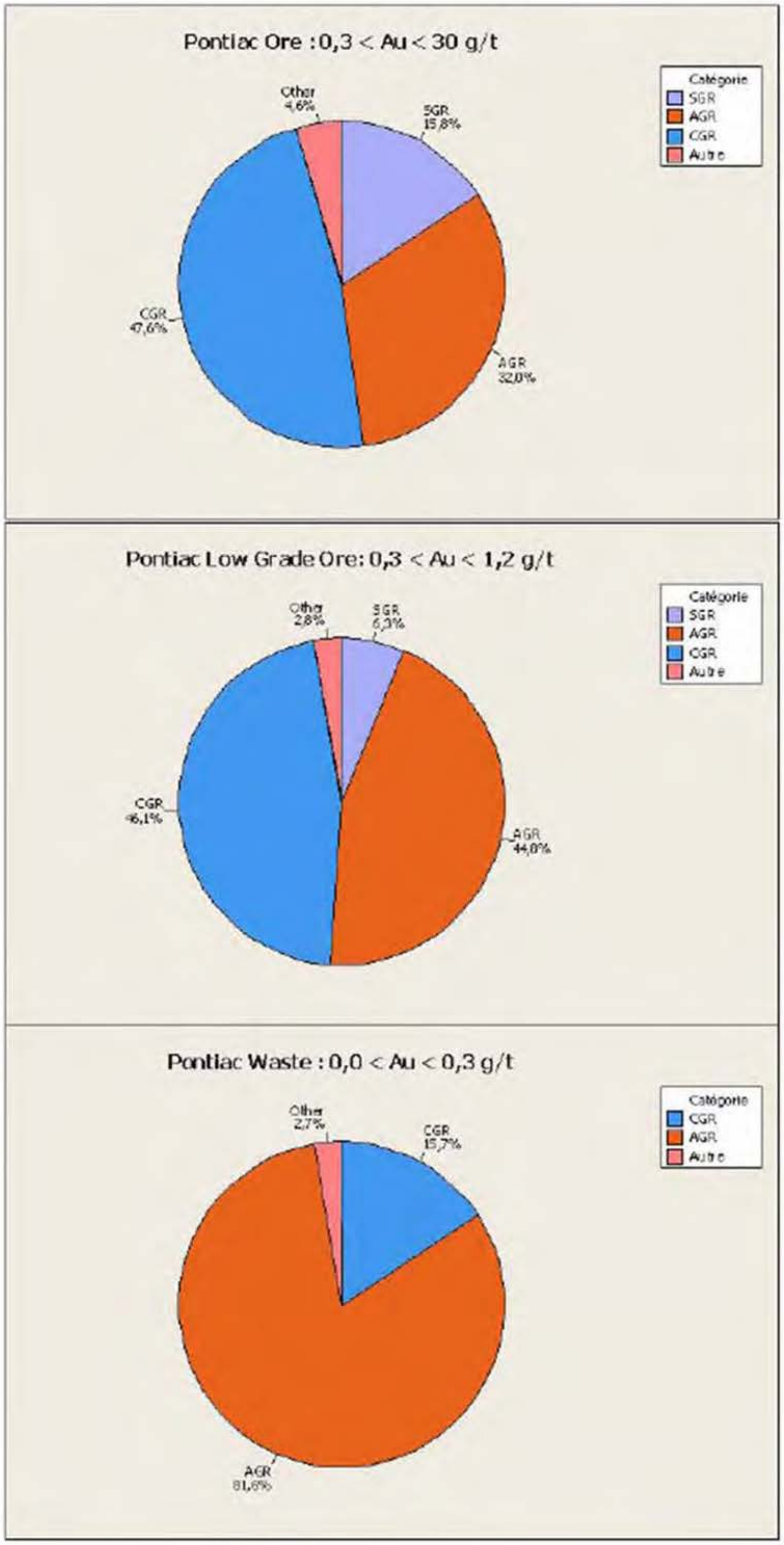

Figure 13.13 – Sample proportion in Pontiac

13.2.2 Compositing

The same procedure that was used for the Canadian Malartic testwork program was also used for the Barnat sample preparation and compositing.

The composites for the metallurgical testwork done at SGS were prepared as follows:

- Individual samples were combined to prepare a composite;
- The material was screened at 10 mesh (1.7 mm) and any oversize was crushed to minus 10 mesh (1.7 mm);
- The samples were blended;
- The composite sample was then split into individual charges using a rotary
- splitter;
- The head sample was riffled out of one of the test charges.

For the grinding testwork, the samples were prepared as follows:

- Each sample was prepared for the SMC testwork and the cores were crushed to nominal 1-¼ inch;
- The test was subsequently performed as per the standard drop weight test (DWT) procedure, except that only one size fraction was tested;
- The remaining material was crushed to nominal ¾ inch and 5 kg was kept for the Bond abrasion test;
- The remaining material was combined with the return product and rejects from the SMC test, stage-crushed to minus ½ inch, and 15 kg was kept for Bond RWi determination;
- The remaining 10 kg was stage-crushed to 6 mesh for the Bond BWi determination.

13.2.3 Grinding Testwork

Grinding testwork (BWi, RWi and SMC) was carried-out by SGS on representative samples of the deposit, in order to compare with the Canadian Malartic values. Table 13.10 is showing a summary of the results.

BWi, RWi, SMC and Ai were conducted for each of the two main lithology composites representing Pontiac (GR) and Piché (PO) zones. Additional tests were executed on composite replicating Piché low and very low (diluted) grade including UM type of ore.

Barnat BWi (14.8 kWh/t) is showing similar value to Canadian Malartic (15.7 kWh/t).

The value of A*b from the SMC tests is a measure of the resistance to impact breakage. Initial test results indicated that the Barnat ore is moderately hard to hard with a value of 36.3.

The abrasion index tests showed a slightly higher value for Barnat ore when compare with Canadian Malartic. This is due to the higher ratio of PO material in

Barnat ore when compare to Canadian Malartic (Canadian Malartic < 30% PO vs. Barnat > 65% PO). The PO material is more abrasive than the GR material.

The proportion of the different lithologies used for the grinding test samples were:

- Piché: 50% CPO, 50% SPO;
- Pontiac: 50% CGR, 25% SGR, 25% AGR;
- Piché low grade: 35% CPO, 35% SPO, 15% AUM, 15% CUM;
- Piché very low grade (diluted): 40% AUM, 25% CUM, 20% CPO, 15% SPO.

13.2.4 Leach Testwork

A series of tests considering the whole ore leach process was conducted using the same standard conditions as those selected for the Canadian Malartic ore. The charges were ground to a P80 of around 60 microns and pulped with water to 40% solids. The pH was adjusted with quicklime to 11.0 and the cyanide concentration was adjusted to 0.5 g/l.

The slurry was bottle-leached for 30 hours. The samples selected were representative of the two main zones. The proportions of the lithologies for the leach tests were:

PO comp: 50% CPO, 50% SPO;
GR Comp: 70% CGR, 30% SGR;
UM Comp: 60% AUM, 40% CUM.

Table 13.6 presents the average of six tests, each done on 14 samples.

Table 13.6 – Leach results on composites from the South Barnat deposit

Sample	Zone	P80 microns	NaCN Kg/t	CaO Kg/t	Tails G Au/t	Recalc Head G Au/t	Recovery %
BPO	Piché	55	0.37	0.21	0.19	1.80	89.46
BUM	Piché	65	0.40	0.26	0.09	1.41	93.86
Piché-UM/PO[1]	Piché	59	0.50	0.16	0.12	2.16	94.68
Pontiac- GR/PO[2]	Pontiac	48	0.49	0.28	0.25	1.90	87.01
Ba-Pic-PO-10	Piché	56	0.42	0.21	0.08	0.98	91.4
Ba-Pic-PO-20	Piché	69	0.50	0.16	0.13	1.56	91.9
Ba-Pic-PO-30	Piché	57	0.25	0.22	0.21	4.23	94.9
Ba-Pic-PO-40	Piché	57	0.49	0.20	0.16	3.88	95.9
Ba-Pic-PO-60	Piché	55	0.48	0.19	0.17	5.30	96.7
Ba-Pon-GR-10	Pontiac	59	0.44	0.31	0.18	1.13	84.2
Ba-Pon-GR-20	Pontiac	63	0.48	0.24	0.28	1.83	84.9
Ba-Pon-GR-30	Pontiac	62	0.46	0.23	0.33	3.11	89.3
Ba-Pon-GR-40	Pontiac	56	0.50	0.23	0.41	4.00	89.7
Ba-Pon-GR-60	Pontiac	52	1.01	0.28	0.55	5.76	90.5

1) 65% UM – 35% PO

2) 70% GR – 30% PO

13.2.5 General observations

As observed for the Canadian Malartic deposit, the recovery of the gold is higher for the PO material compared to the GR type.

Gold contained in ultramafic ore is easier to liberate and recover, but normally at a lower head grade.

The average cyanide consumption at 0.45 kg/t (Fig. 13.14) is higher compare to the average consumption of the Canadian Malartic ore.

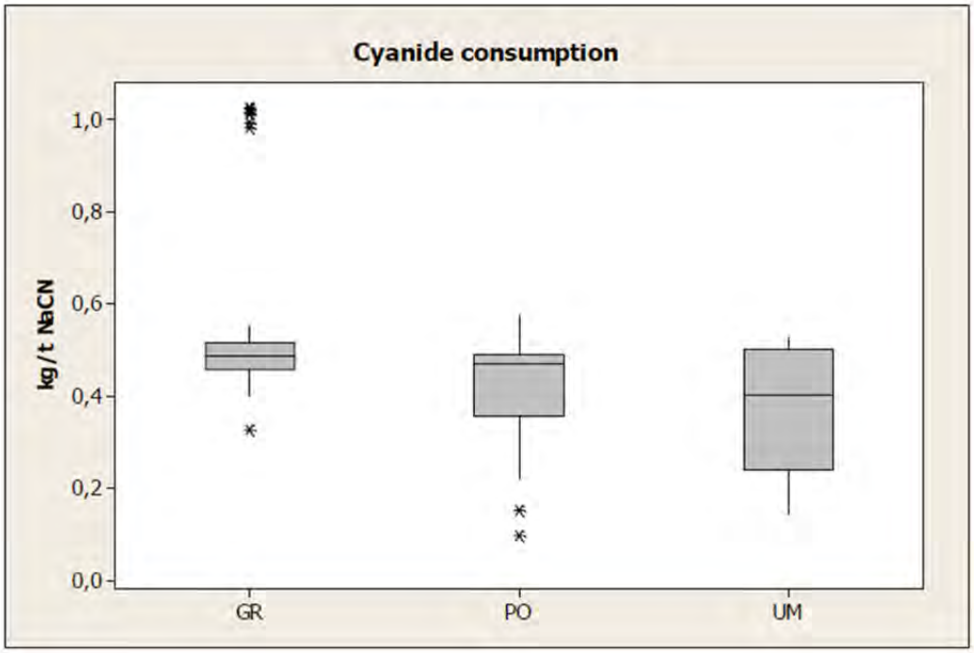

Figure 13.14 – Cyanide consumption

The average lime consumption is 0.23 kg/t (Fig. 13.15) when maintaining a pH of 11.0. This lime consumption is lower than the average Canadian Malartic consumption.

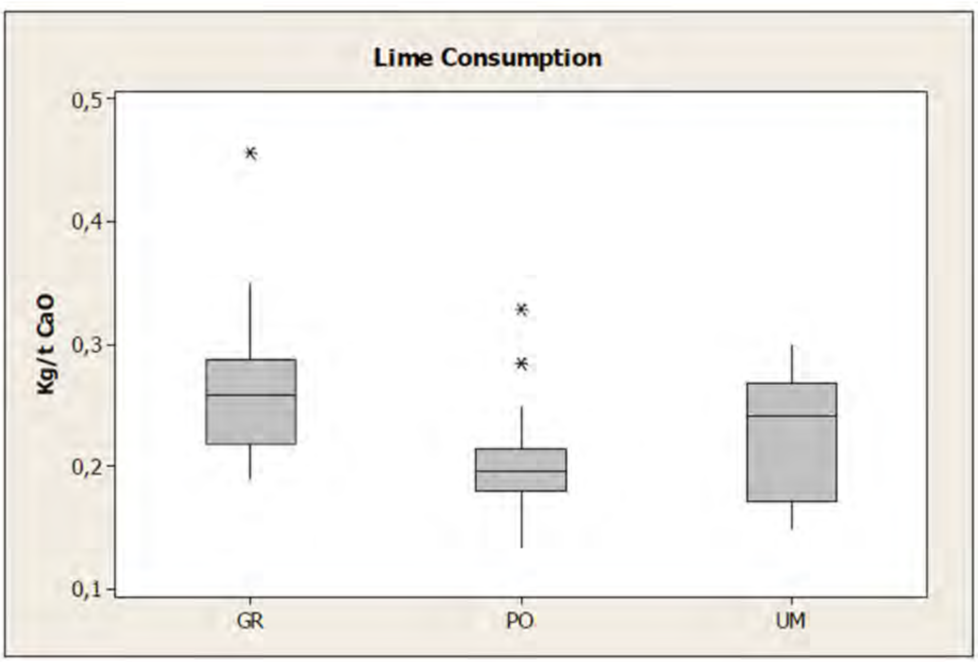

Figure 13.15 – Lime consumption

13.2.6 Diagnostic Leach on Pontiac Leach Tails

A diagnostic leach was performed on a leach tail of Pontiac material. The tail sample was split in two halves and the first half was pre-leached in hydrochloric acid prior to leaching with cyanide. The second half of the sample was pre-leached with aqua regia then leached in cyanide. The results show that none of the gold is associated with carbonates, Fe oxides or pyrrhotite (liberated by hydrochloric acid) and 91% of the gold was associated with sulphide. The remainder gold (9%) is trapped in the gangue (not liberated by aqua regia).

Considering the similarity of the sedimentary Pontiac material and the sedimentary Canadian Malartic material, it is expected to have similar amounts of refractory gold associated with the sulphide. The residual gold is expected to be very fine gold grains trapped in sulphide particles as demonstrated in the gold deportment study completed last year on Canadian Malartic leach tails residue.

13.2.7 Gravimetric Testwork

Gravimetric testwork was performed on a representative sample of the Piché zone (50% CPO, 50% SPO) which represents a large proportion of the current Barnat deposit. No sample representing Pontiac material was tested by gravimetry, considering that the ore in this zone is very similar to Canadian Malartic sedimentary material which showed poor gravimetric recovery of gold.

The test was performed by Knelson's Laboratories in Vancouver. The test was repeated three times and results give a consistent GRG value with a minimum value of 51.4% and a maximum of 54.4%. This is three times the average value of 18.5% obtained on Canadian Malartic composite ore. The average gold grains size in Barnat is considered to be moderate to coarse while Canadian Malartic was fine to moderate.

The northern Barnat material (Piché) shows good potential for gravimetric recovery.

13.2.8 Recovery Curves by Zone

Five grade levels were selected for each of the two zones (Pontiac and Piché) and six leach tests were performed on each of the composite samples for a total of 60 leach tests. The selected leach conditions were 500 ppm NaCN, pH of 11.0, a p80 of 60 microns and a leach time of 30 hours (Canadian Malartic determined the leach conditions). The recoveries were estimated using the average recalculated head grade from all leach tests of the database performed on a sample. The average recovery obtained for each sample was used to plot the regression curves of each zone. The lower grade levels were used for the calculation of the regression curve while the highest grade was used to determine the maximum recovery.

A total of 10 different composite samples represented the two zones of the deposit:

- Piché: 30 leach tests from 5 composite samples
- Pontiac: 30 leach tests from 5 composite samples

The recovery equations for the two zones are:

- Barnat Piché Group: 0.0372 * LN(Au) + 0.9017, MAX (96.7%)
- Barnat Pontiac Group: 0.0265 * LN(Au) + 0.8646, MAX (92%)

As expected, higher recoveries are obtained with the Piché ore compared to the Pontiac zone. Figure 13.16 shows the recovery curves.

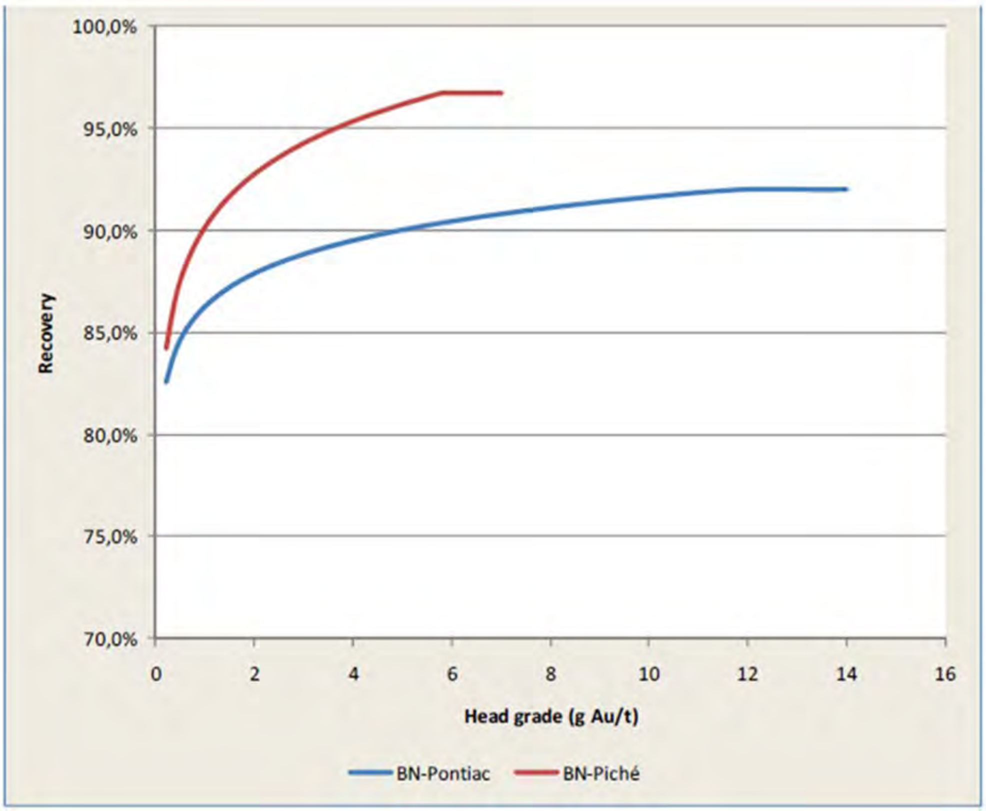

Figure 13.16 – Gold recovery regression

13.2.9 Extraction of Silver

Composite samples of the leach tests were assayed for silver. The results of those assays done on the 10 composite samples (5 Piché and 5 Pontiac) are listed in Table 13.7.

Table 13.7 – Gold and silver assays

Sample	Zone	Au assay	Ag assay	Ag/Au ratio	Ag Recovery
BPO	Piché-PO	1.72	0.60	0.35	n/a
BUM	Piché-UM	0.82	<0.5	n/a	n/a
Piche-UM/PO	Piché	4.62	1.00	0.22	n/a
Pontiac- GR/PO	Pontiac	1.76	2.40	1.36	n/a
Ba-Pic-PO-10	Piché	1.18	0.80	0.68	n/a
Ba-Pic-PO-20	Piché	1.63	0.60	0.37	n/a
Ba-Pic-PO-30	Piché	2.36	1.00	0.42	n/a
Ba-Pic-PO-40	Piché	2.55	0.80	0.31	n/a
Ba-Pic-PO-60	Piché	3.48	1.20	0.34	n/a
Ba-Pon-GR-10	Pontiac	0.99	1.20	1.21	n/a
Ba-Pon-GR-20	Pontiac	1.85	2.60	1.41	79.8*
Ba-Pon-GR-30	Pontiac	3.76	3.30	0.88	80.0*
Ba-Pon-GR-40	Pontiac	3.69	2.60	0.70	79.7*
Ba-Pon-GR-60	Pontiac	5.51	4.40	0.80	79.6*

*Average of 6 leach results.

Correlation curves (Fig. 13.17) were developed to estimate the silver content in the Piché and Pontiac zones (PO and GR).

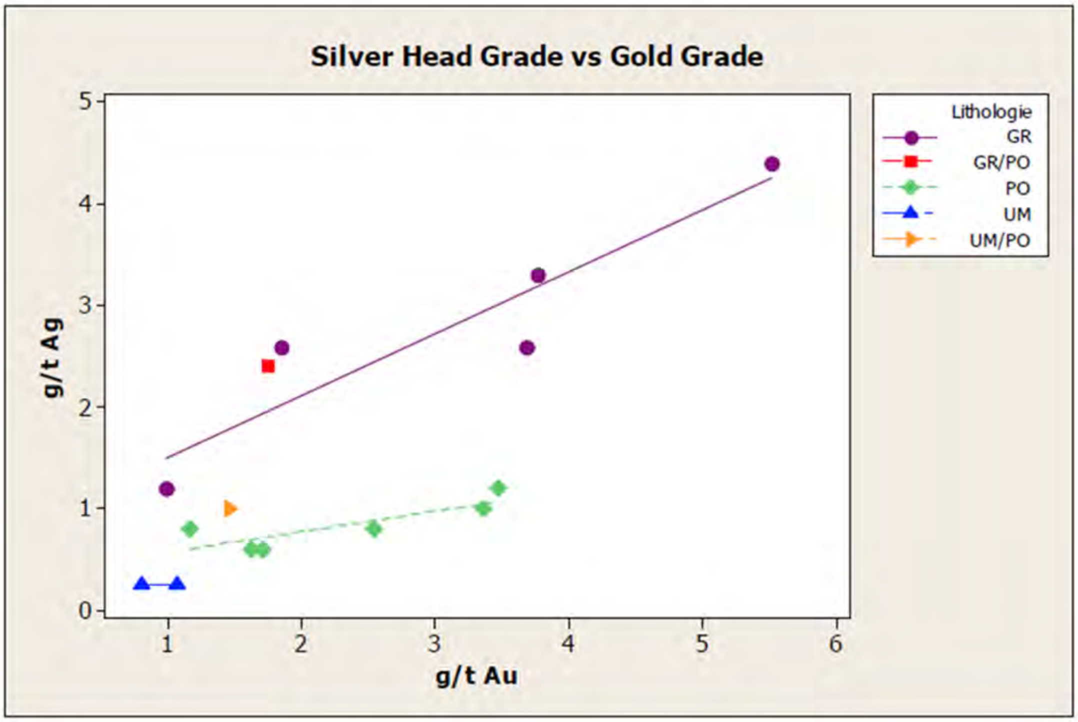

Figure 13.17 – Silver head grade regression curves

Figure 13.18 shows the two silver head grade regression curves for THE Piché and Pontiac zones.

The grade equations obtained for the silver content are:

- Head grade Piché (g/t Ag): 0.366 + 0.202 * (head grade g/t Au)
- Head grade Pontiac (g/t Ag): 0.890 + 0.611 * (head grade g/t Au)

The silver assays were higher in the Pontiac zone and the silver dissolution for head grades greater than 2 g/t Ag averaged 80% (based on 18 leach tests). For lower silver grades, below 2 g/t, the silver assays for the solid tails were below detection limits.

The extraction calculated using the head assays rather than solid tails were inconsistent but all with values higher than 80%. The average recovery for Barnat was then estimated at a flat 70%, assuming 80% dissolution of the silver and 10% losses in the recovery process efficiency (80% dissolution - 10% losses = 70% recovery).

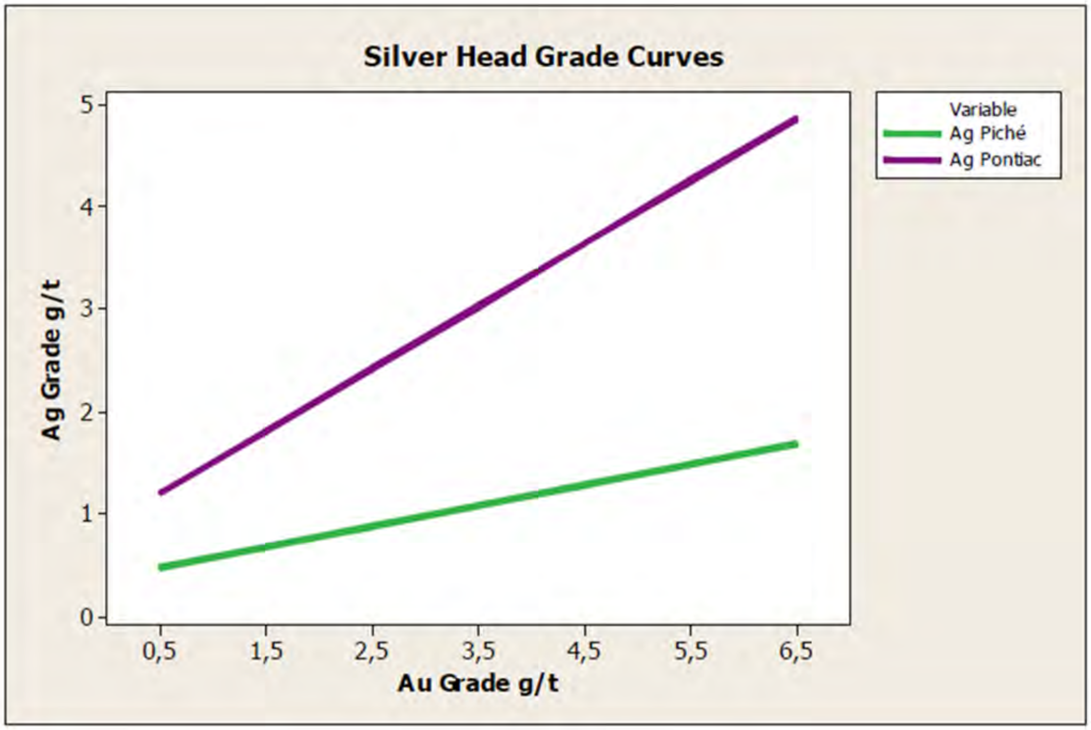

Figure 13.18 – Silver head grade curves

13.2.10 Conclusions

The Barnat deposit, located northeast of the Canadian Malartic deposit, straddles the Cadillac Fault. The Pontiac zone is on the south side and the Piché zone is on the north. The Pontiac zone, including 30% of Barnat total tonnes and 25% of the total ounces, is mainly composed of sedimentary material (GR) and has very similar characteristics as the Sladen extension of the Canadian Malartic deposit (east portion).

The Piché zone includes 70% of Barnat total tonnes and 75% of the total ounces. The ore is mainly composed of porphyry (PO) and the waste is ultramafic (UM) material.

The bond work index of the Barnat material is 14.8 kWh/t. Gold recoverable by gravimetry (GRG) on the PO lithology (Piché) is 54%, which is much higher than the GRG obtained for the Canadian Malartic ore (18%).

The lime consumption for the Barnat ore is 0.23 kg/t and the cyanide consumption is 0.45 kg/t.

Gold recoveries are higher in the PO versus the GR by 6% to 7% on average. Figure 13.19 shows the recovery curves for Pontiac and Piché with the four recovery curves from the Canadian Malartic feasibility study for comparison.

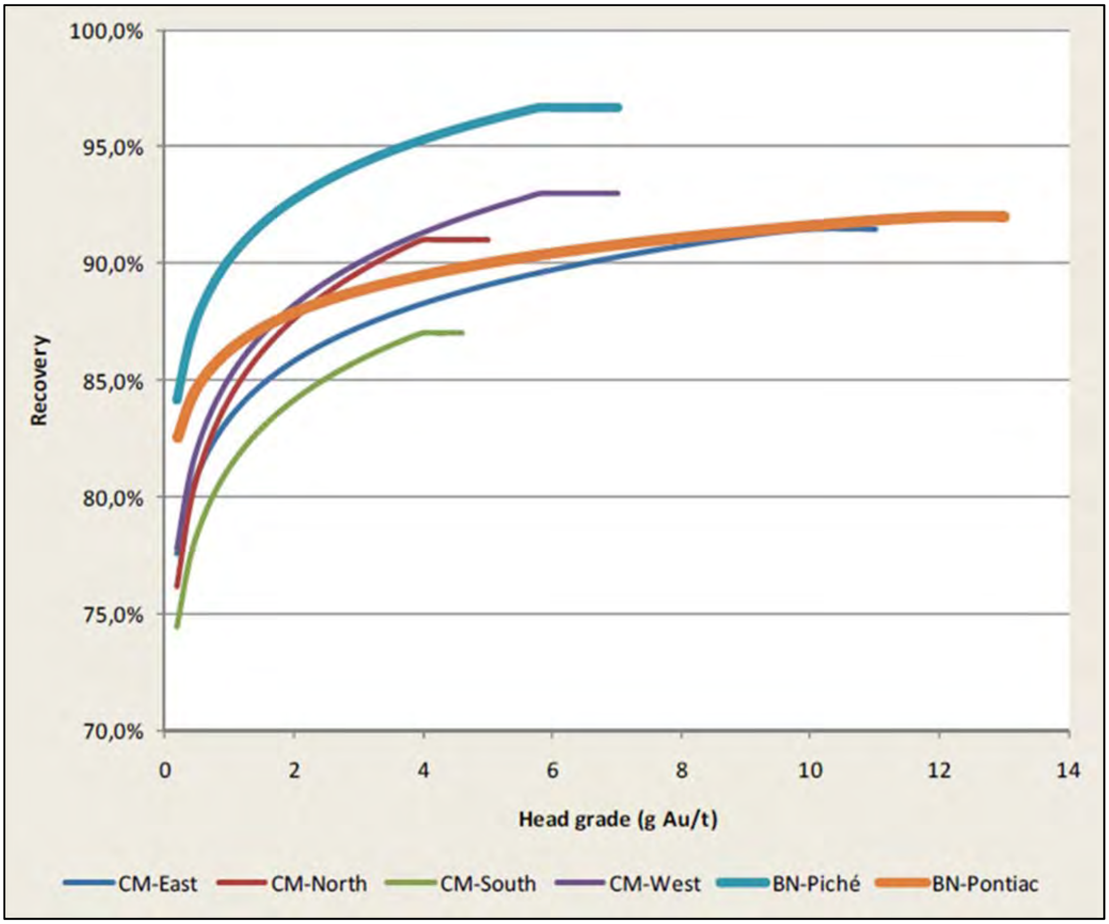

Figure 13.19 – Gold recovery curves, Barnat vs. Canadian Malartic

The ore from the Pontiac zone shows similar recoveries to the main zones of Canadian Malartic while the Piché zone clearly shows higher recoveries. Figure 13.20 shows leach recoveries for material from Barnat (PO, GR and UM) and Canadian Malartic (East and Sladen extension).

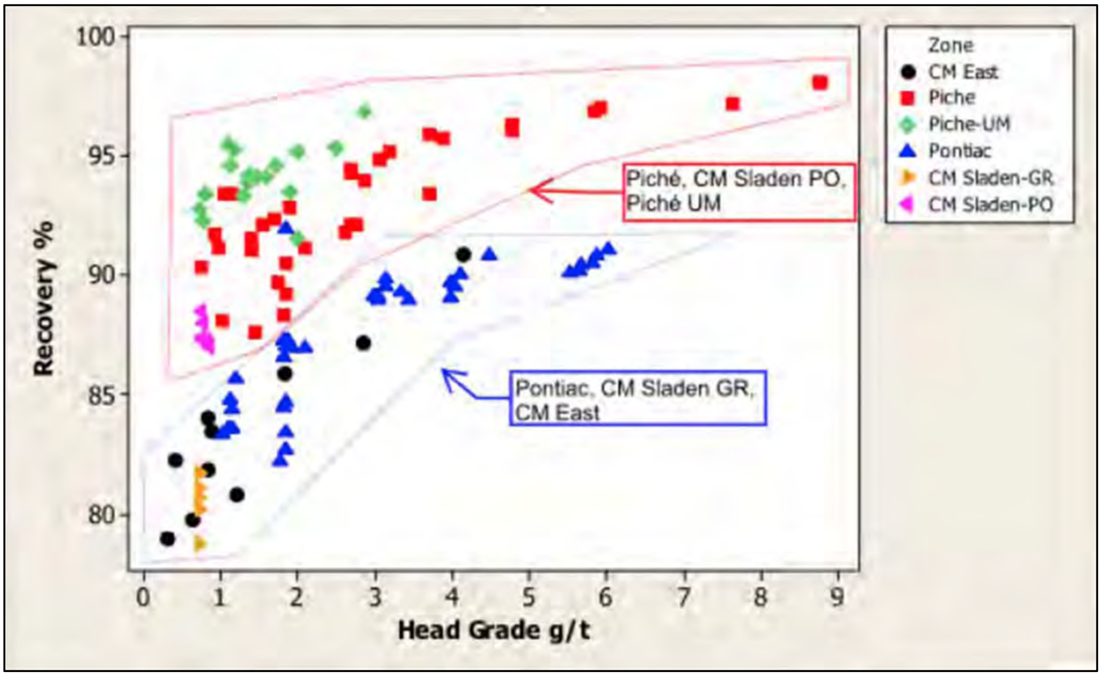

Figure 13.20 – Leach recoveries

14. MINERAL RESOURCE ESTIMATES

The Canadian Malartic Property mineral resource estimate herein includes the following:

- Canadian Malartic Deposit
- South Barnat Deposit
- Gouldie Zone
- Jeffrey Zone
- Western Porphyry Zone

14.1 Data

Multiple distinct phases of drilling have occurred on the Canadian Malartic Property. The following sections summarize these drilling phases by area (deposit and zone).

14.1.1 Canadian Malartic, South Barnat and Gouldie Area

Four distinct phases of diamond drilling have been completed on the Canadian Malartic Deposit, Barnat South Deposit and/or the Gouldie Zone. The statistics for the four phases are summarized in Table 14.1. In addition to the diamond drilling, 6,696 reverse circulation (RC) holes were drilled for a total 243,665 m. All the data used for resource estimation are derived from this drilling database (including RC drilling).

Table 14.1 – Drilling and sampling statistics (excluding RC)

Company	Date	No. of holes	Length (m)	No. of samples	Average length (m)
Canadian Malartic Mines	1928-1963	3,838	159,056	129,366	1.20
Lac Mineral and Barrick	1981-2000	630	69,738	34,794	1.51
Osisko	2005-2012	3,093	696,921	439,066	1.44
Total		7,561	925,715	603,226	1.39

Figure 14.1 illustrates the location of the various drilling phases. The drill hole density is sufficient to develop a reasonable picture of the distribution of mineralization and to quantify its volume and quality with a good degree of confidence.

The core size used is different for the four main phases of drilling. While Osisko recently used NQ size (47.6 mm) and Lac Minerals BQ size (36.5 mm), the core size used by Canadian Malartic Mines remains uncertain. Considering the decades in which this drilling occurred, the core size was likely to be AX (30 mm) and maybe less at the beginning of that period of time.

The latest published NI 43-101 compliant resource estimate on the property is dated May 2011 and was performed by Belzile Solutions Inc. ("BSI") using a database received from Osisko at the end of January 2011. This 2011 Resource Estimate represents the basis from which Osisko produced the current resource estimate after updating the data for some of the areas.

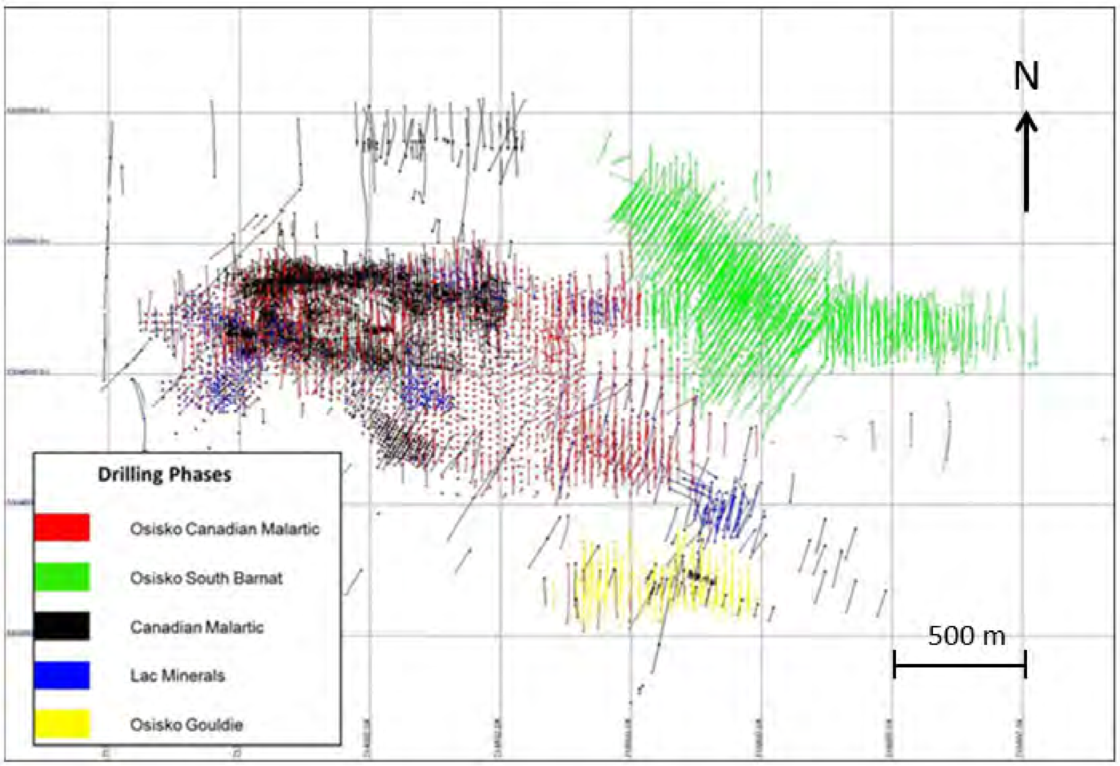

Figure 14.1 – Drilling phases (RC drilling not shown)

14.1.2 Jeffrey Zone

A total of 301 drill holes were used for the Jeffrey Zone Resource Estimate, for a total of 63,470 m. These were drilled by Osisko between 2006 and 2011. The number of samples is 41,791 and the average length is 1.42 m.

All the data used for resource estimation are derived from this drilling database. Figure 14.2 illustrates the location of the drilling.

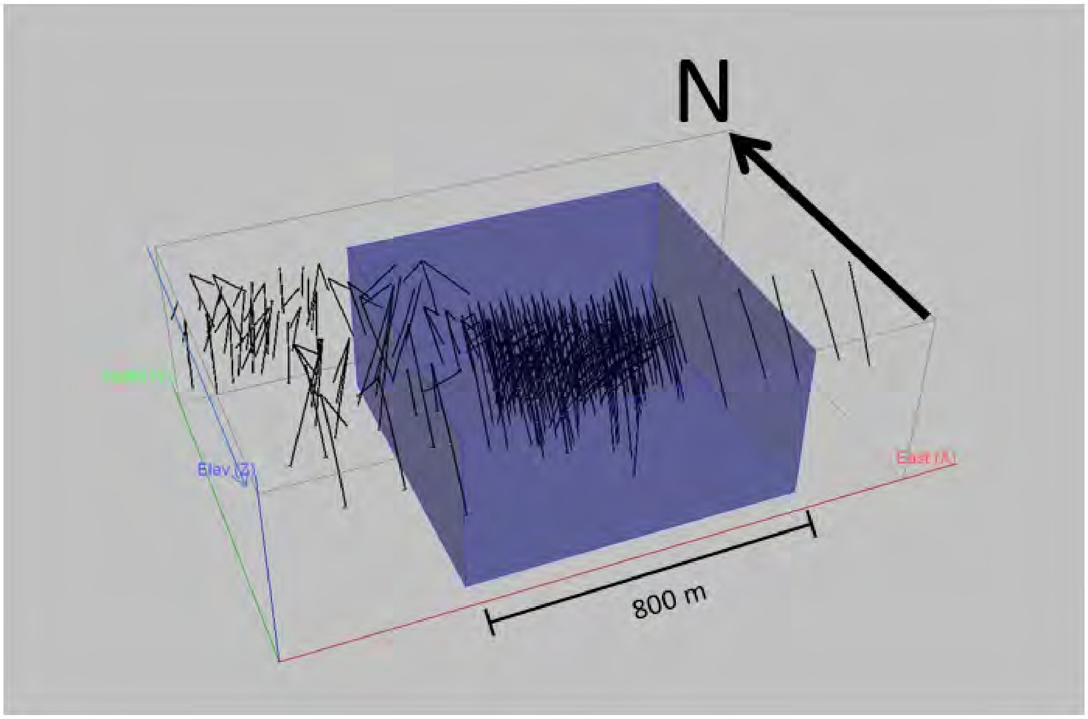

Figure 14.2 – 3D view looking northeast showing drill holes in the Jeffrey database. The blue box shows the resource definition area.

The drill hole density is sufficient to develop a reasonable picture of the distribution of mineralization and to quantify its volume and quality with a good degree of confidence.

Osisko used NQ core size (47.6 mm) for the entire Jeffrey database. Most of the holes were drilled on north-south oriented cross sections on 25 m intervals.

14.1.3 Western Porphyry Zone

Two distinct drill hole databases exist on the Western Porphyry Zone.

The first database contains 242 drill holes drilled by Osisko between 2006 and 2011, for a total of 68,692 m. The number of samples is 34,501 with an average length of 1.54 m. Osisko used NQ core size (47.6 mm) for the entire database. Most of the holes were drilled on N035-oriented cross sections on 25 m intervals.

The second database contains 717 drill holes drilled by numerous exploration companies prior to Osisko's involvement in the property, for a total of 118,845 m. The core size and drilling orientation vary. Due to uncertainties attributed to this database, it was used for modelling and variography studies, but not for grade interpolation. Figure 14.3 illustrates the location of the various drilling phases on the Western Porphyry Zone.

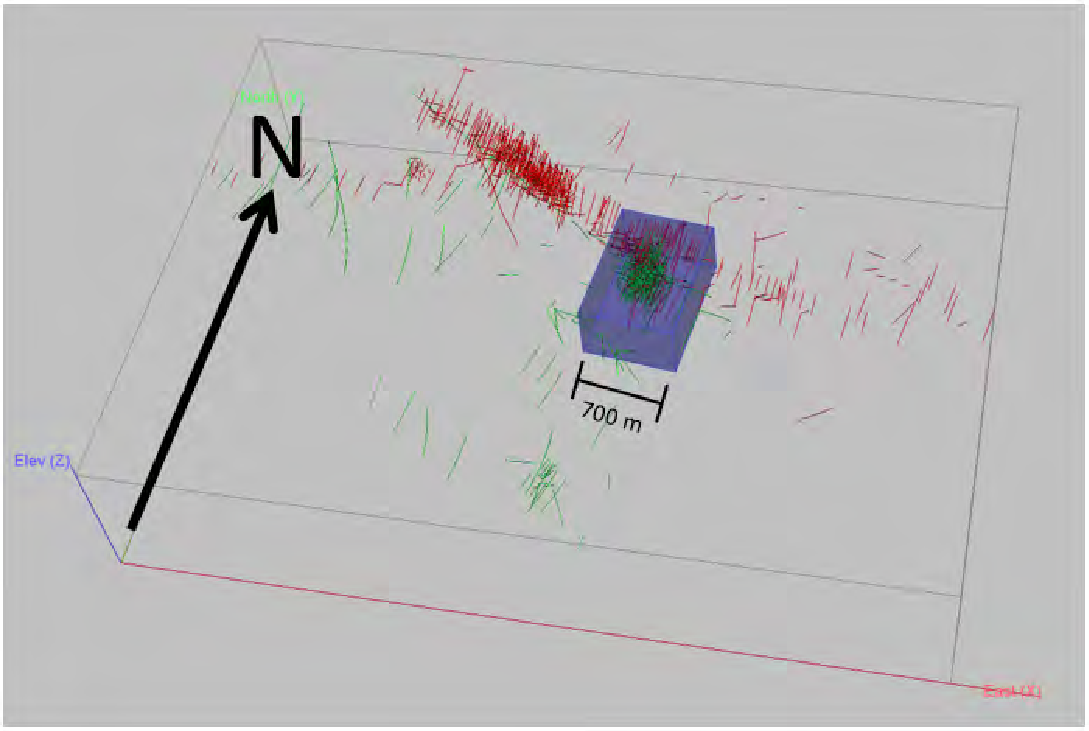

Figure 14.3 – 3D view looking northwest showing drill holes in the Western Porphyry database (green = Osisko holes; red = historical). The blue box shows the resource definition area.

The drill hole density is sufficient to develop a reasonable picture of the distribution of mineralization and to quantify its volume and quality with a good degree of confidence.

14.2 Modelling

The initial modelling done for this resource estimate was performed by BSI based on the drill hole database supplied by Osisko at the end of January 2011. The modelling of the geological contacts, mineralized zones and topographic and overburden surfaces was initially carried out using GEMS 6.2.4 software. Subsequent local updates were performed by Osisko personnel using GEMS versions 6.3.1 to 6.5 and Leapfrog version 2.6.0.24 for the Canadian Malartic, Barnat and Gouldie areas. The Jeffrey and the Western Porphyry zones were not included in the 2011 resource estimate. Osisko personnel performed all the modelling for these zones using GEMS version 6.3.1.

14.2.1 Porphyry Units

No distinction is made between the different types of sediments in the available geological logs, therefore the only geological units that can be modelled close to the deposit are the porphyry units that intrude the sediments.

The model of the main porphyry unit was based on interpreted sections and geological logging from Osisko's drilling program only. Figure 14.4 shows the extent of the modelled porphyry units.

This is not the only porphyry in the area. There are many additional small porphyries but they are not easy to model since geological information on them is only present in the Osisko geological logs (i.e., no geological information from the Lac Minerals and Canadian Malartic Mines drilling programs in the database). The modelling would benefit from this information if it could be made available in electronic format.

Mineralization is present in both porphyry and sedimentary rocks but the presence of the porphyry is important since the main high grade zones are located very close or at the contact between sediments and porphyry. Also, the porphyry unit is important for the tonnage estimation since the specific gravity of this unit is different than the surrounding sedimentary rocks.

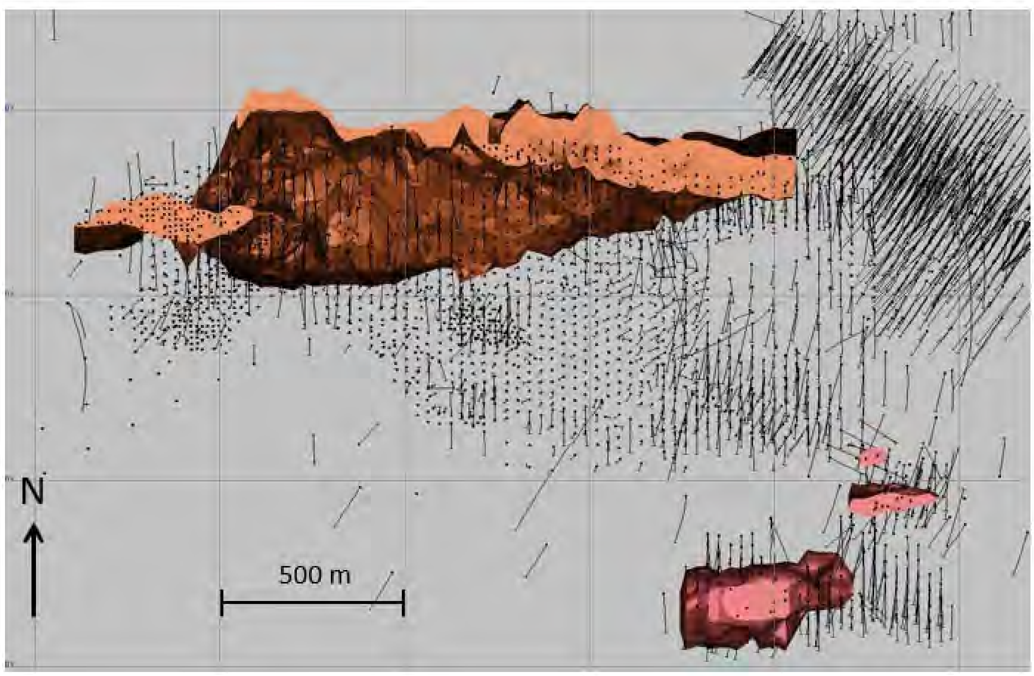

Figure 14.4 – Plan view showing the extent of the main porphyry units

14.2.1.1 Contact Between Sediments (Pontiac Group) And Ultramafics (Piché Group)

Based on the available geological logs, a surface representing the contact between the sediments of the Pontiac Group (to the south) and the ultramafic rocks of the Piché Group (to the north) has been modelled for block model coding purposes.

The location of the surface can be considered reasonably accurate in areas of good drilling density. For block model coding outside the resource estimate area, the surface has been extended and its location is therefore less accurate and more interpretive.

Figure 14.5 shows the ultramafic solid built from the contact surface between the two main rock types as well as the location of the drill holes and drill sections (from -25NE to 1125NE) oriented at 33°, and the north-south grid.

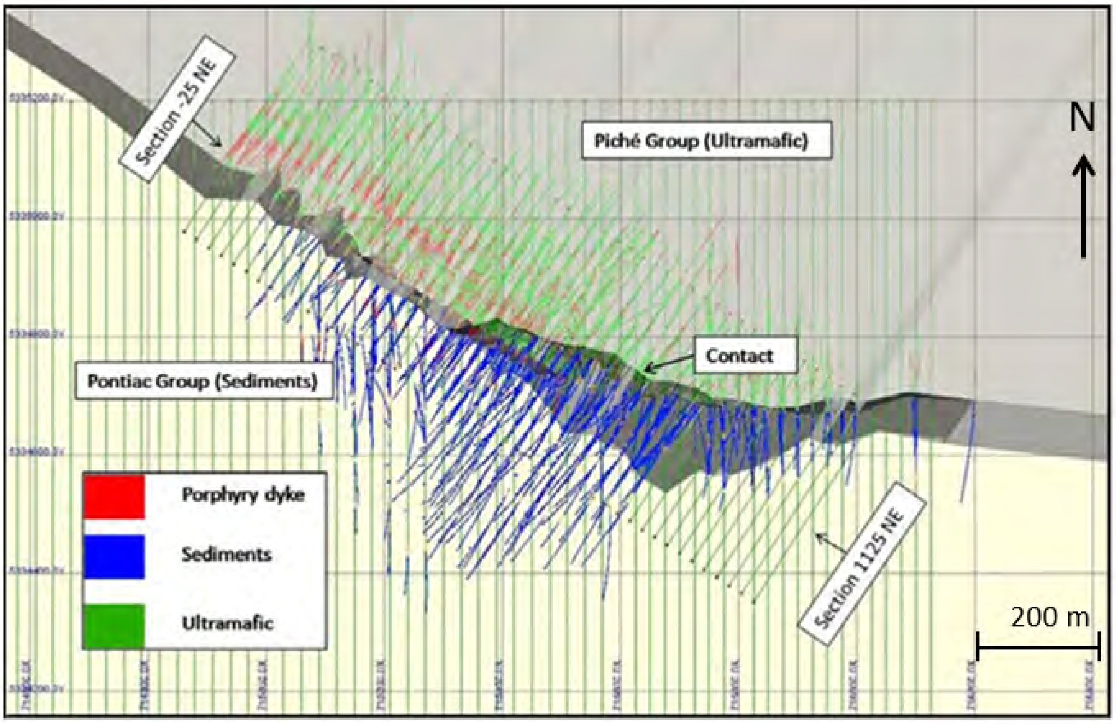

Figure 14.5 – Plan view showing the sediment-ultramafic contact and drill hole locations (South Barnat Deposit)

14.2.2 Canadian Malartic Deposit (Including Gouldie Area)

For the Canadian Malartic Deposit, seven (7) different high grade domains were modelled based on a cut-off of 1.0 g/t, along with eight (8) pervasive alteration envelopes (cut-off 0.4 g/t) and one (1) broader low grade envelope based on a 0.2 g/t cut-off.

The pervasive alteration envelope is based on the intensity of rock alteration (porphyry and sediments) and also on mineralization. Rocks are altered in the high grade zone but alteration is also associated with lower grade material (between 0.4 and 1.0 g/t), especially to the east side of the deposit. The continuity is good for this mineralization associated with alteration and can be differentiated from the wider low grade halo (0.2 g/t). High grade zones are often surrounded by pervasive alteration envelopes. All mineralized zones are included within the larger low grade envelope.

Two main directions of mineralization are observed for the Canadian Malartic Deposit. The main high grade zones are oriented more or less in an east-west direction (21, 22, 52 and 60) while three other zones (30, 40 and 51) are oriented west-northwest (300 to 320°).

For the Gouldie area, eight (8) different mineralized zones were modelled. The orientation is mainly east-west and some of the zones are associated with porphyry dyke intrusions.

Figures 14.6a to 14.8 show the modelled high-grade zones of the Canadian Malartic Deposit and their orientations in plan and isometric views.

As mentioned earlier, high-grade zones are surrounded by an altered, lower grade halo of mineralization. The various pervasive alteration zones are therefore of the same orientation as the high grade zones. It can be noted that there is no high grade zone in the southeast extension of the deposit, but only a pervasive alteration envelope (Zone 71). Nevertheless, the orientation is also about 310° (see the plan view of the pervasive alteration envelopes in Fig. 14.7).

Figures 14.8 to 14.12 show five different drilling sections (looking west) through the deposit. On each section, high grade and pervasive alteration zones can be seen along with the broad low grade envelope.

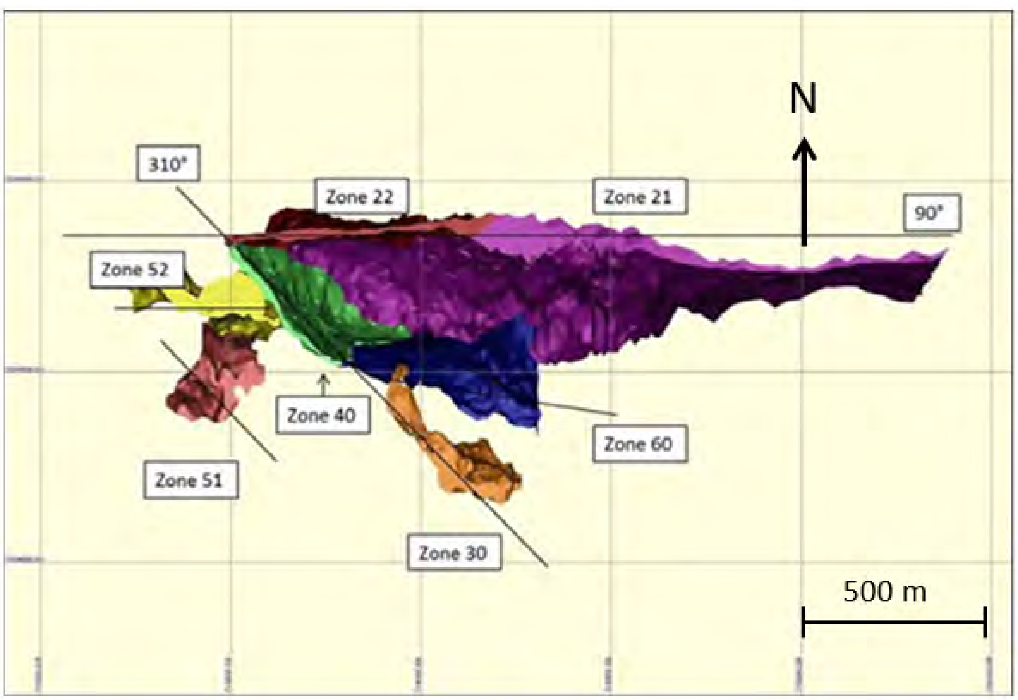

Figure 14.6a – Plan view of high grade zones, Canadian Malartic Deposit

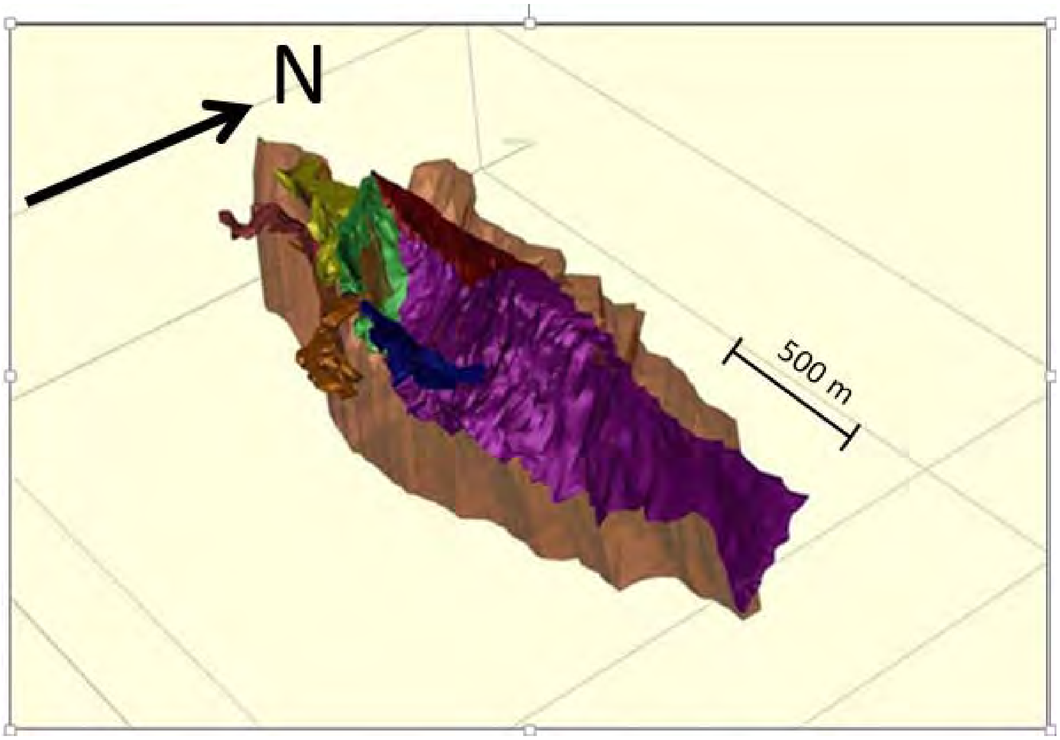

Figure 14.6b – Isometric view, high grade zones and porphyry unit, Canadian Malartic Deposit

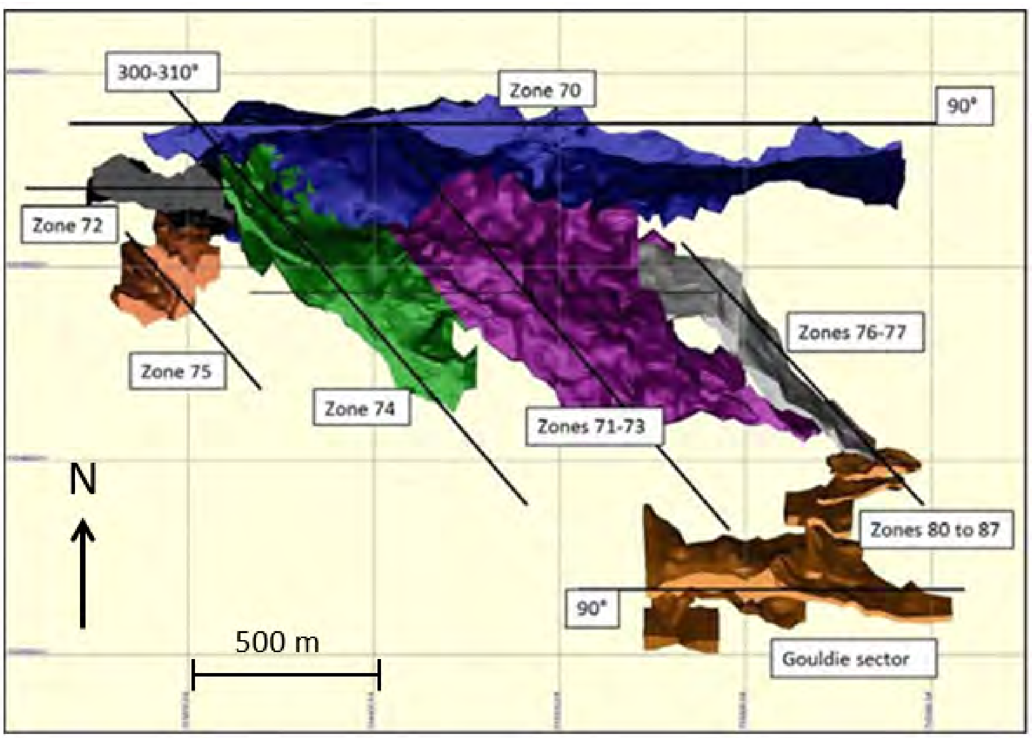

Figure 14.7 – Plan view of pervasive alteration zones and Gouldie area, Canadian Malartic Deposit

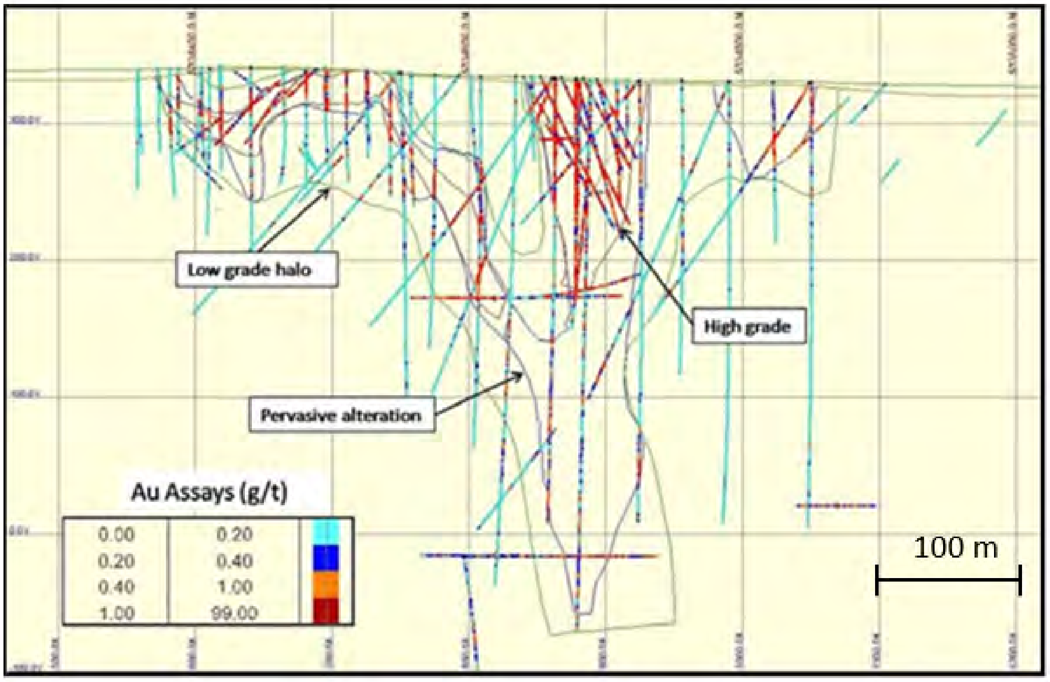

Figure 14.8 – Section 713440E of the Canadian Malartic Deposit (looking west)

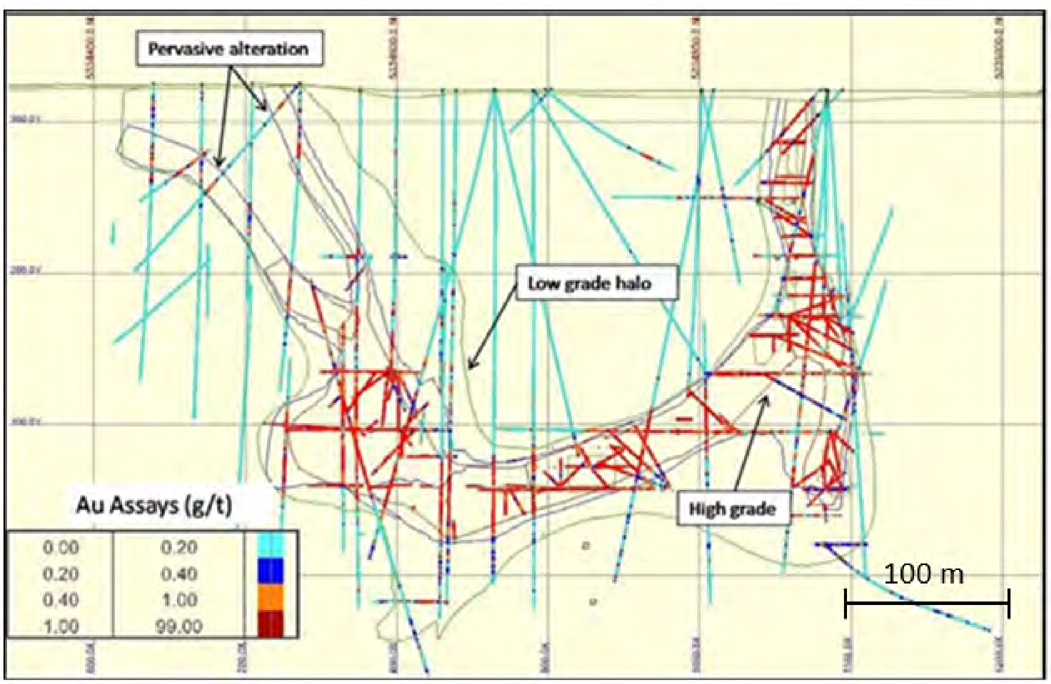

Figure 14.9 – Section 713800E of the Canadian Malartic Deposit (looking west)

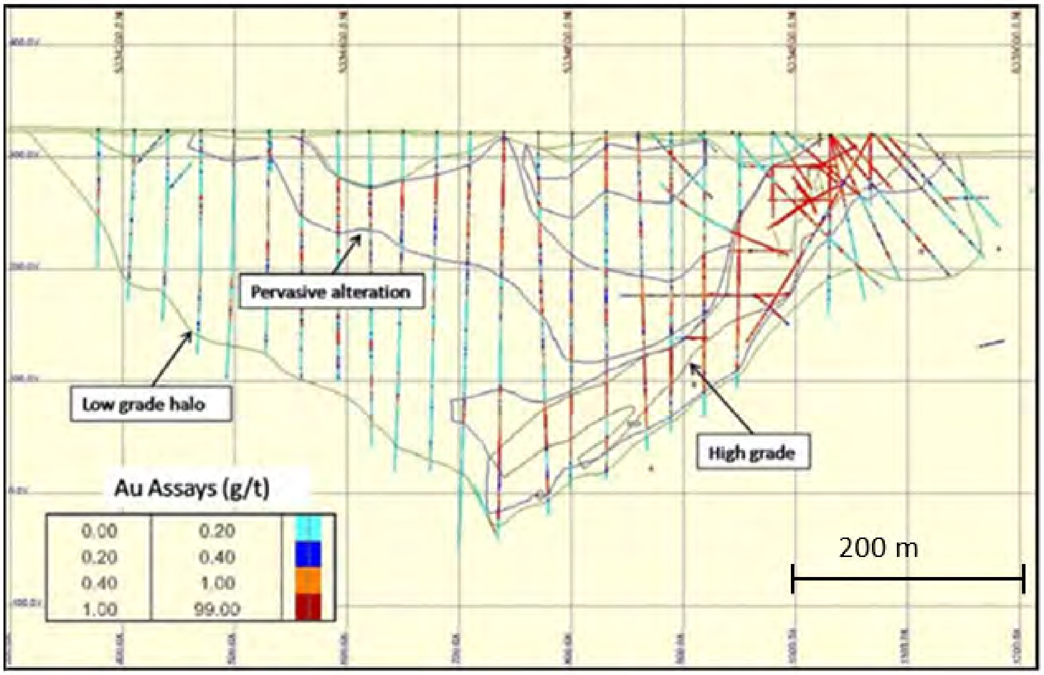

Figure 14.10 – Section 714370E of the Canadian Malartic Deposit (looking west)

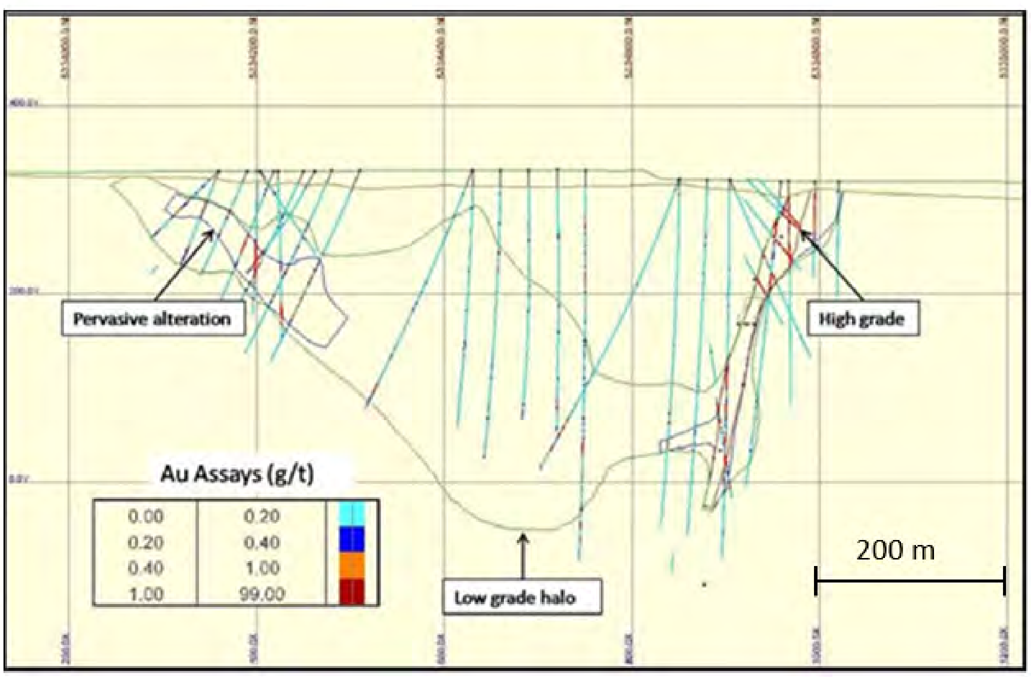

Figure 14.11 – Section 714820E Canadian Malartic Deposit (looking west)

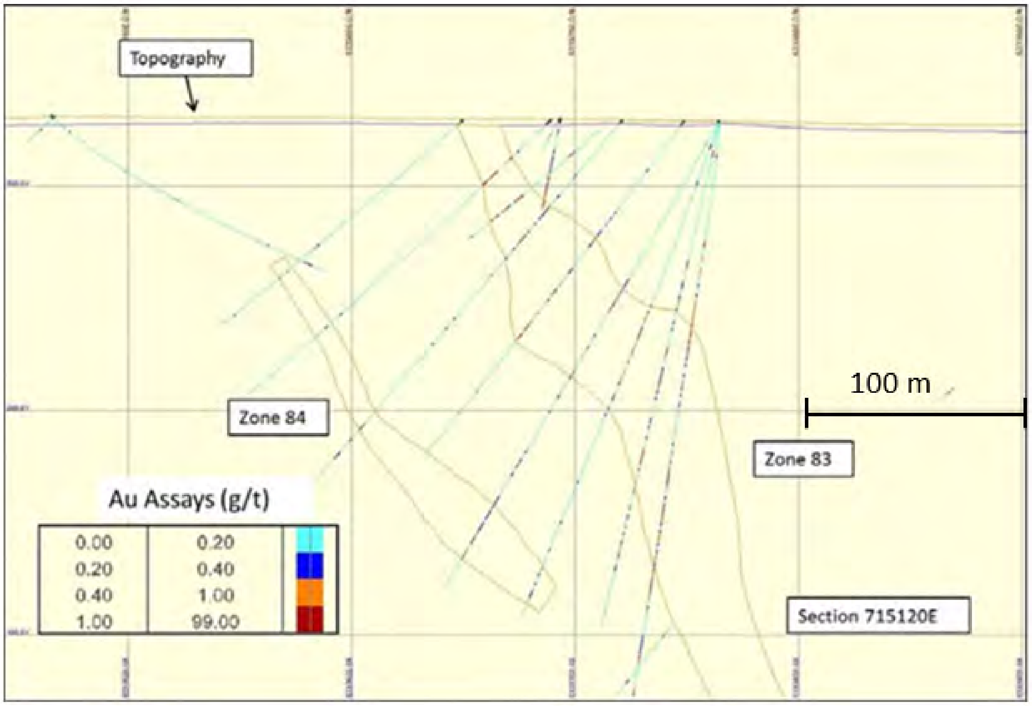

Figure 14.12 – Section 715120E in the Gouldie area (looking west)

14.2.3 South Barnat Deposit

In South Barnat Deposit, nine high grade domains used a 1g/t cut-off (201, 202, 204, 205, 206, 208, 209, 213 and 214). One super high-grade domain (97) used a 3.0 g/t cut-off confined into domain 214 and was used to interpolate in pillars between stopes. Three pervasive alteration domains used a 0.4 g/t cut-off (300, 301, and 302). As the mineralized zones are often closely associated with the presence of porphyry dyke swarms, geology was also used to delineate the mineralized zones.

The porphyry dykes are injected mainly in ultramafic rocks, more or less parallel to the sediment-ultramafic fault contact and most of the zones follow this orientation. Zones 205 and 206 are located in the sediments to the south of the contact, and Zone 202 is actually the continuity of Zone 21 of the Canadian Malartic Deposit (Sladen Extension).

It also can be noted that the broad low grade envelope used for the Canadian Malartic deposit (domain 10) also includes the sediment portion of the South Barnat deposit (domains 11 and 12).

Figures 14.13 and 14.14 show the location of the mineralized zones (isometric and plan views) and Figures 14.15 to 14.18 are four cross-sections (looking northwest) through the deposit.

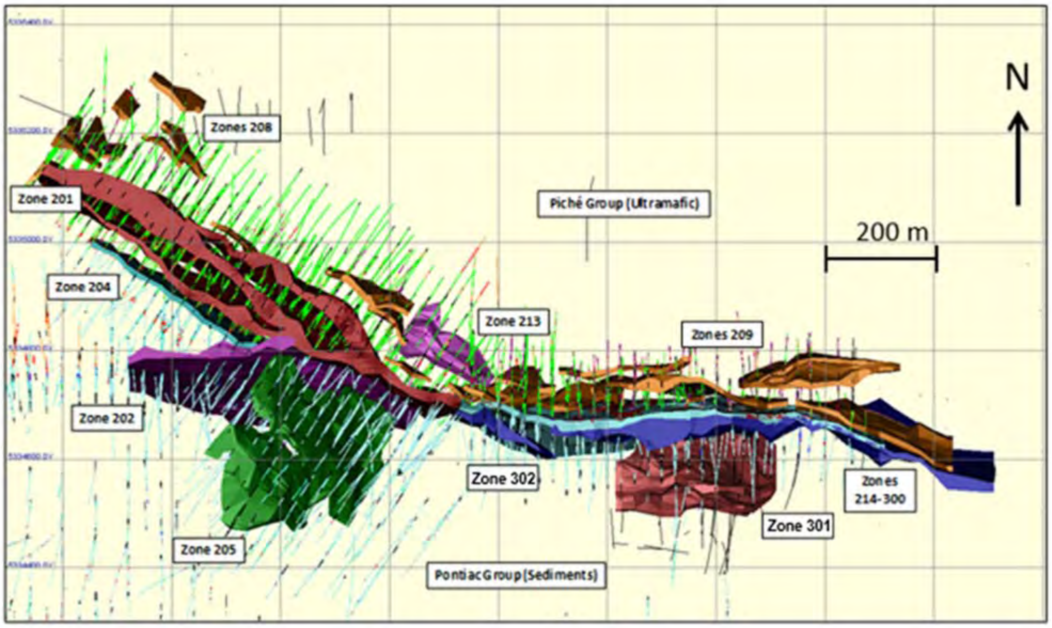

Figure 14.13 – Plan view showing the interpreted mineralized zones

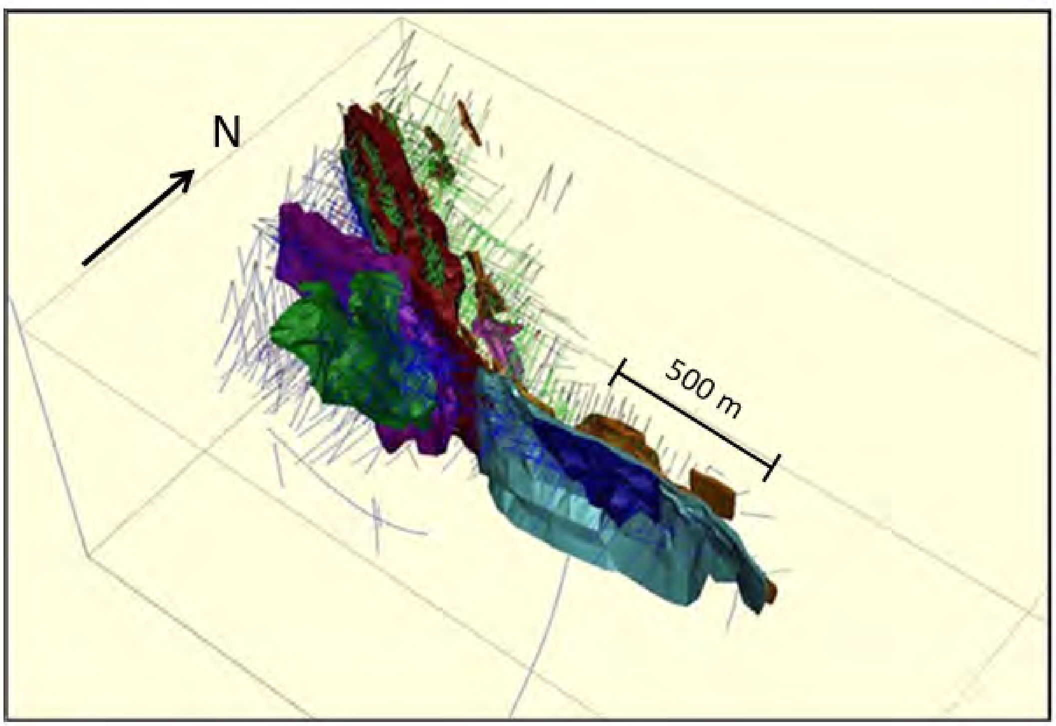

Figure 14.14 – Isometric view (looking NNW) showing the interpreted mineralized zones

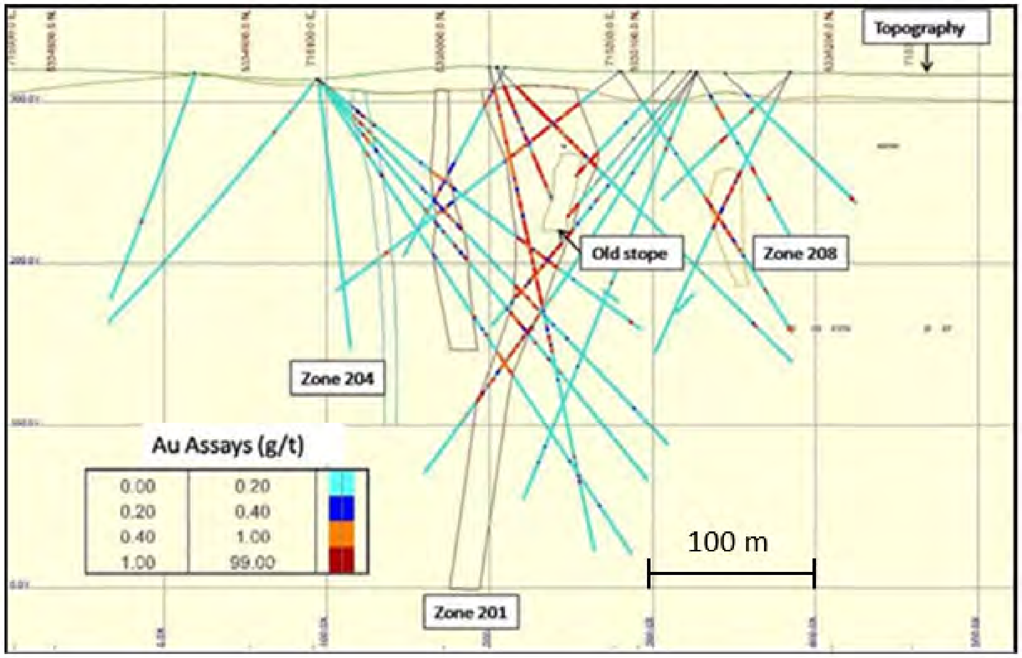

Figure 14.15 – Section 200NE (looking northwest)

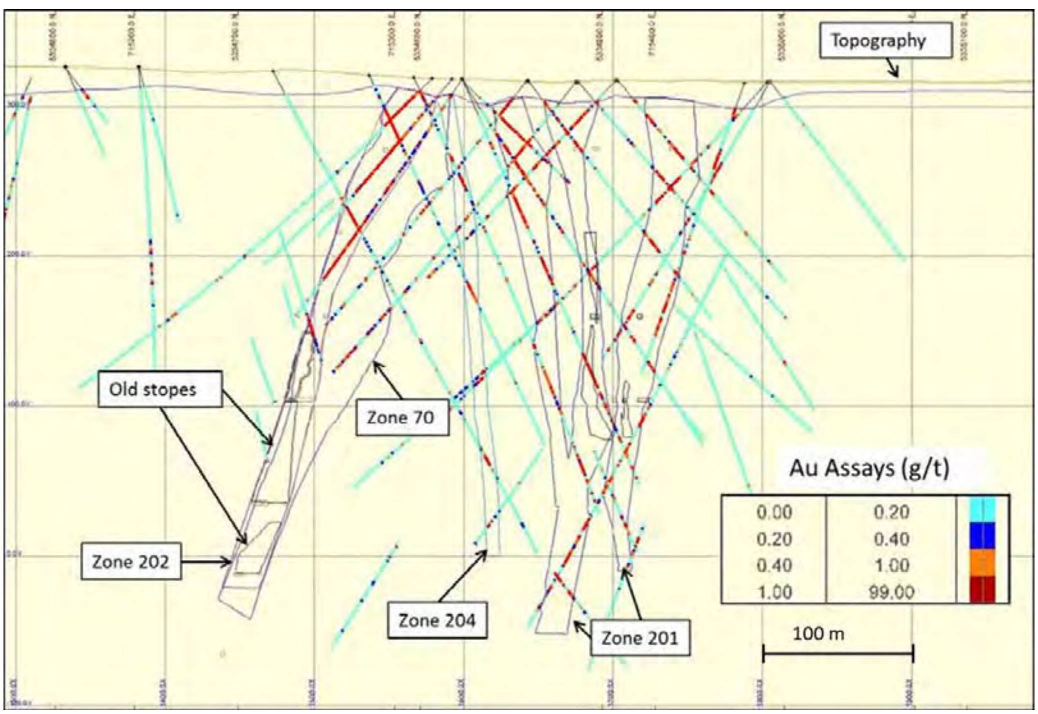

Figure 14.16 – Section 450NE (looking northwest)

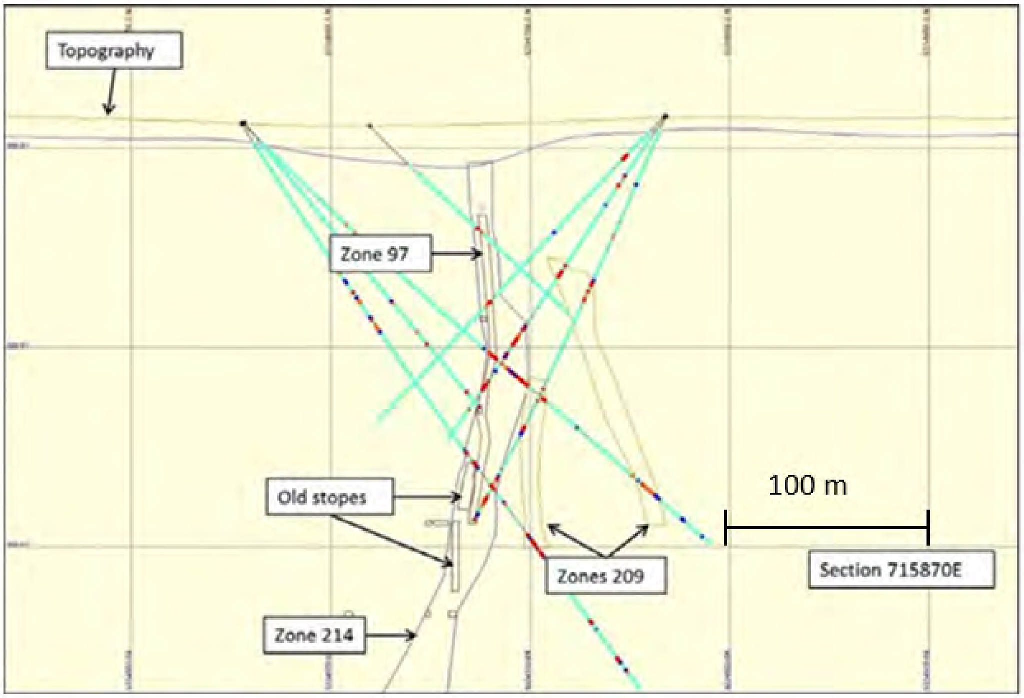

Figure 14.17 – Section 715870E (looking west)

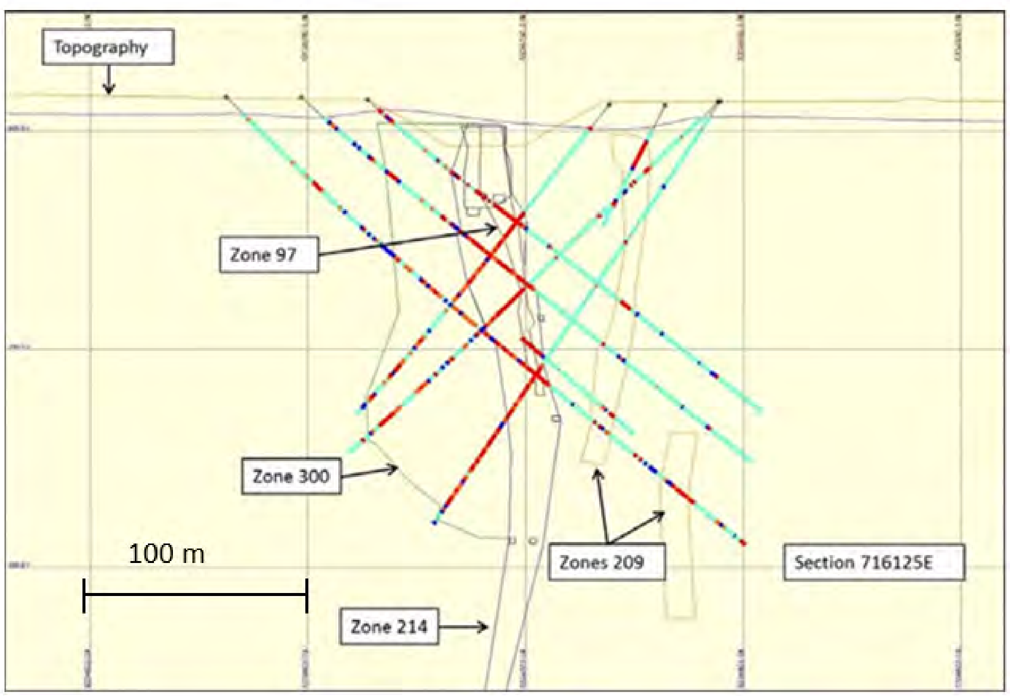

Figure 14.18 – Section 716125E (looking west)

Figure 14.19 shows the location of the zones of the South Barnat Deposit along with the pervasive alteration zones of the Canadian Malartic Deposit. In this figure, each square is 500 X 500 metres.

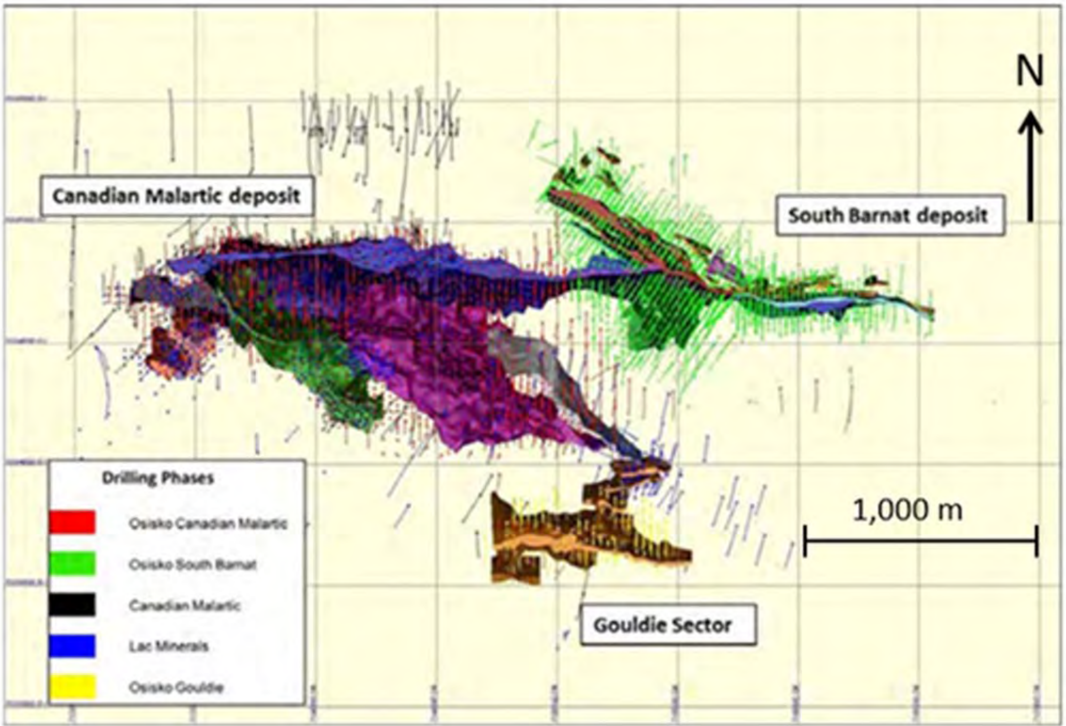

Figure 14.19 – South Barnat vs. Canadian Malartic deposits

14.2.4 Jeffrey Zone

The Jeffrey Zone is located approximately 700 m east of the eastern extremity of the South Barnat open pit and the context is quite similar to the eastern extension of the South Barnat Deposit.

The mineralization is essentially contained within a porphyritic unit injected through mafic and ultramafic volcanics (Fig. 14.20). The porphyritic unit and sediments were modelled (Fig. 14.21) prior to modelling the mineralized zones.

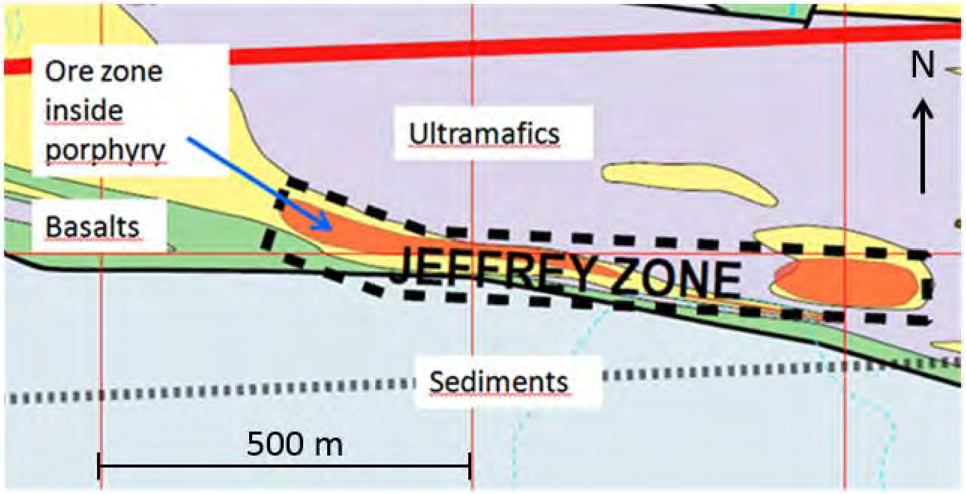

Figure 14.20 – Geological context for the Jeffrey Zone

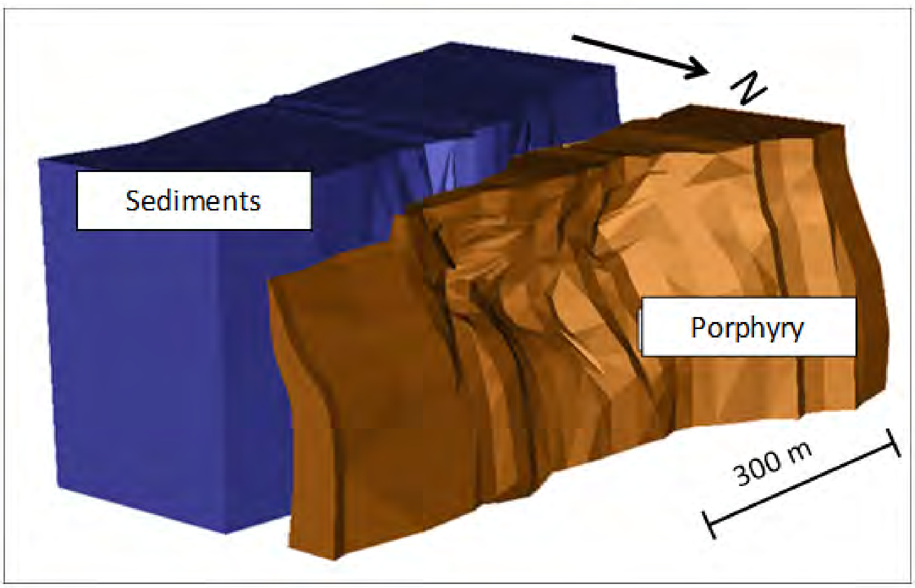

Figure 14.21 – Tridimensional view looking southwest showing the porphyritic unit and sediments

Three high grade domains were modelled (HG10, HG11, and HG12) within the porphyritic unit and one high grade domain was modelled south of the Cadillac Fault within sediments (Fig. 14.22). A broad low grade envelope was also modelled within the porphyritic unit that encloses HG10, HG11, and HG12 (Fig. 14.23).

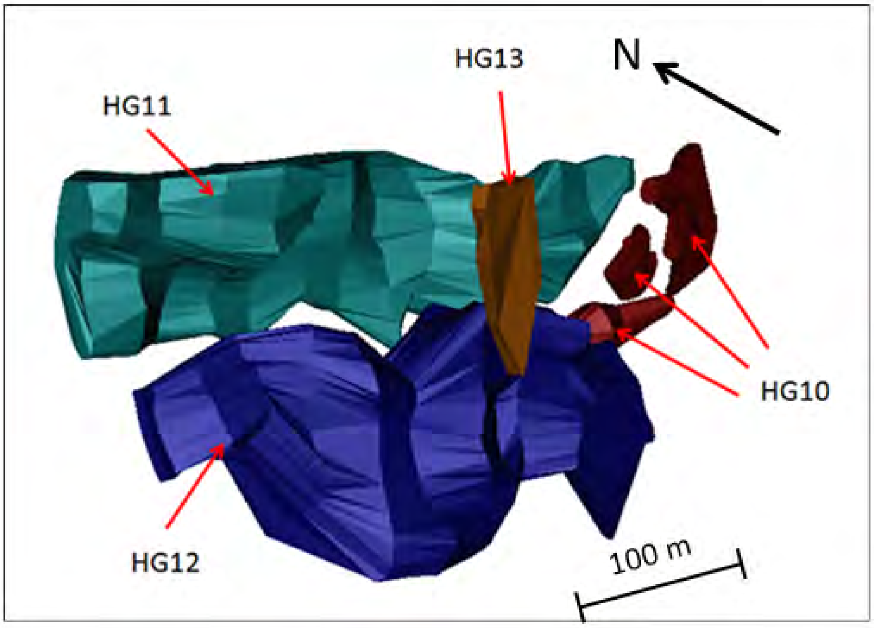

Figure 14.22 – Tridimensional view looking northeast showing high grade zones HG11, HG12, and HG13

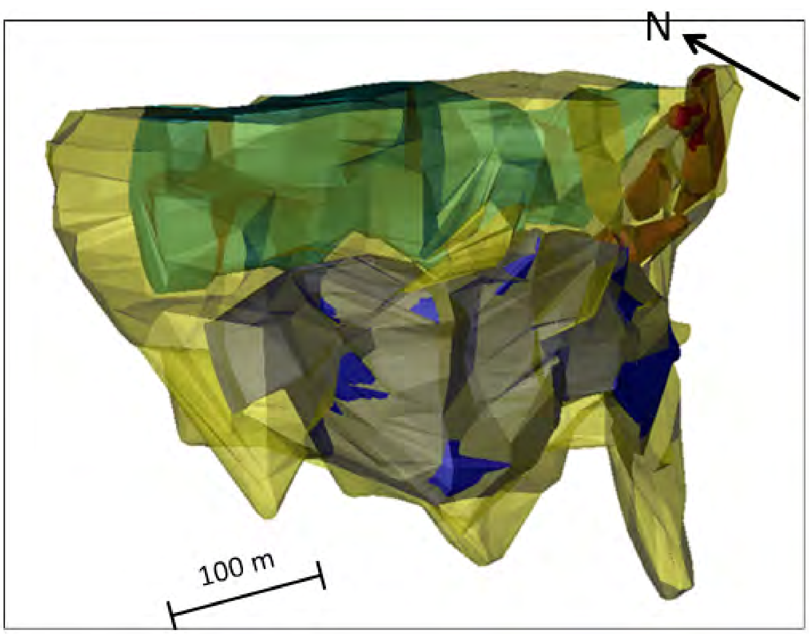

Figure 14.23 – Tridimensional view looking northeast showing the low grade envelope enclosing HG11, HG12, and HG13

14.2.5 Western Porphyry Zone

The Western Porphyry Zone is located approximately 1 km northwest of the Canadian Malartic mine. Among the Cadillac Fault, the mineralization is essentially contained within a porphyritic unit injected through barren basalts (Fig. 14.24). Three porphyritic units (Porph_1, Porph_2, and Porph_3) were modelled (Fig. 14.25) prior to modelling the mineralized zones. These three solids were used as a lithological envelope and also as geological domains to control interpolation. Porph_1 is generally oriented north-south while Porph_2 and Porph_3 are generally oriented N310.

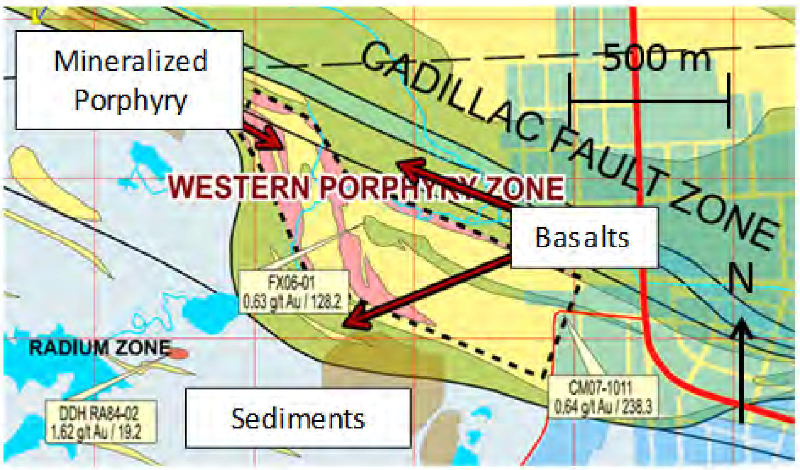

Figure 14.24 – Geological context of the Western Porphyry Zone

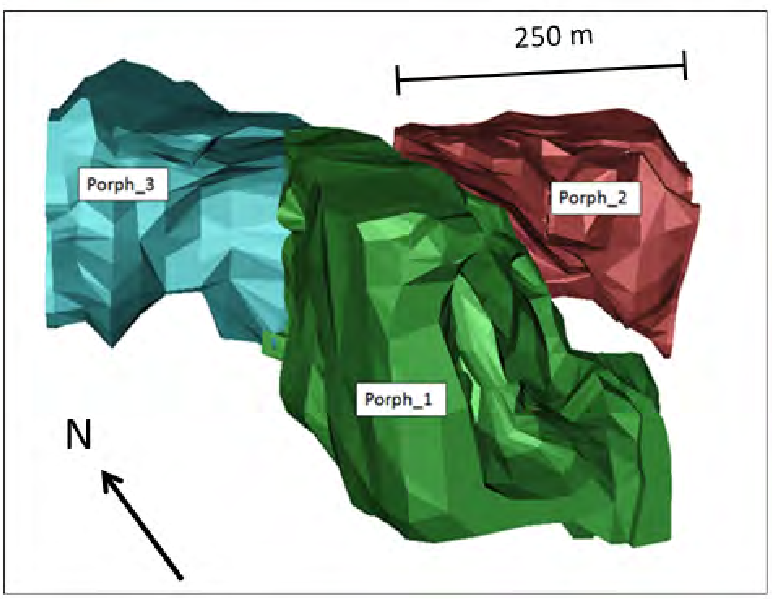

Figure 14.25 – Tridimensional view looking northeast showing the porphyritic intrusions

Additionally, four high grade domains (HG10, HG11, HG20, and HG30) were modelled within the porphyritic units (Fig. 14.26). These solids were used to limit the high grade influence within high grades pockets found in the porphyritic units. HG10 and HG11 are located within Porph_1 while HG20 and HG30 are located within Porph_2 and Porph_3, respectively. High grade solids generally share the same orientation as their respective porphyritic unit.

Finally, a barren ultramafic xenolith located within HG11 was modelled in order to be excluded from interpolation and to increase the density precision of the block model.

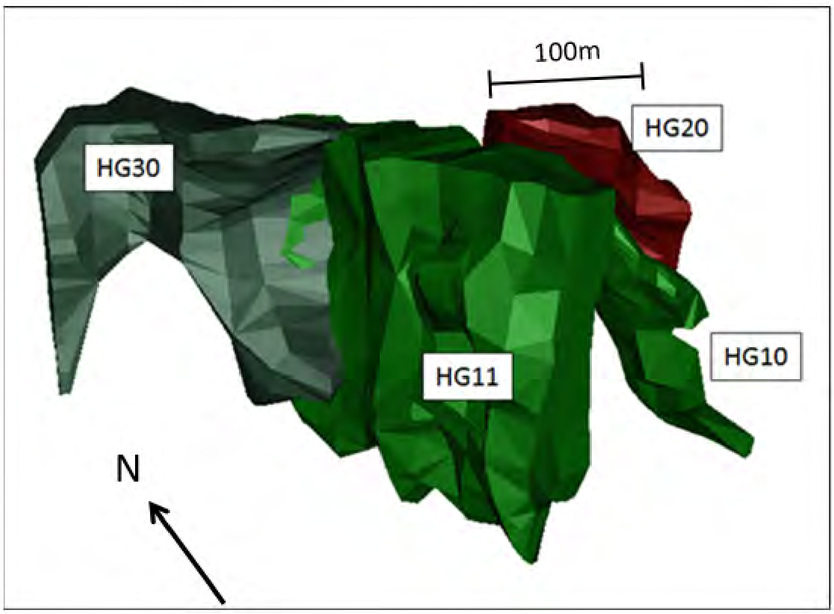

Figure 14.26 – Tridimensional view looking northeast showing high grade zones HG10, HG11, HG20, and HG30

14.2.6 Surface Topography and Overburden

For the current resource estimate, a surface status map was used that includes all mining that has taken place as of June 15, 2014.

A 3D surface was also generated to define the interpreted base of the overburden in the area. Despite the fact that the overburden base was logged in the database (based on drill casing length), this surface is considered much more interpretative since the surface cannot be seen and there can be more than 50 metres between the points in some areas, especially outside the geological modelling. Nevertheless, the uncertainty is not considered material for this study.

14.3 Underground Development and Stoping

Development and stoping occurred at the former Canadian Malartic Barnat, Sladen and East Malartic mines (see Figs. 14.27 and 14.28). The most recent model was reviewed and compared with the surrounding drill hole information, especially where recent Osisko surface drilling intercepted open stopes. Generally, the openings seem to fit reasonably well with the recent drilling (see Figs. 14.29 to 14.32).

It can be observed that the vast majority of the underground hole collars are located within drives and stopes.

It should be noted that some stopes (in the East Malartic mine area) are modelled from the longitudinal section of the mine and that the width of these stopes are estimated to be close to the full width of the mineralization. There are, of course, some uncertainties associated with these stopes but it is not considered material for the estimate since the width of the stopes covers almost all the width of the zone.

The expanded void model, to which field scans (CALS) were added, was used to deplete the resource model. For future estimates, should the mineralization model be extended, further investigation is required to confirm that all of the underground stopes and developments have been identified and adjusted with new drill hole information.

Based on the compilation of the % model in GEMS, the total volume of the excavations is 5.8 million cubic meters within the pit design and 12.1 million cubic meters overall.

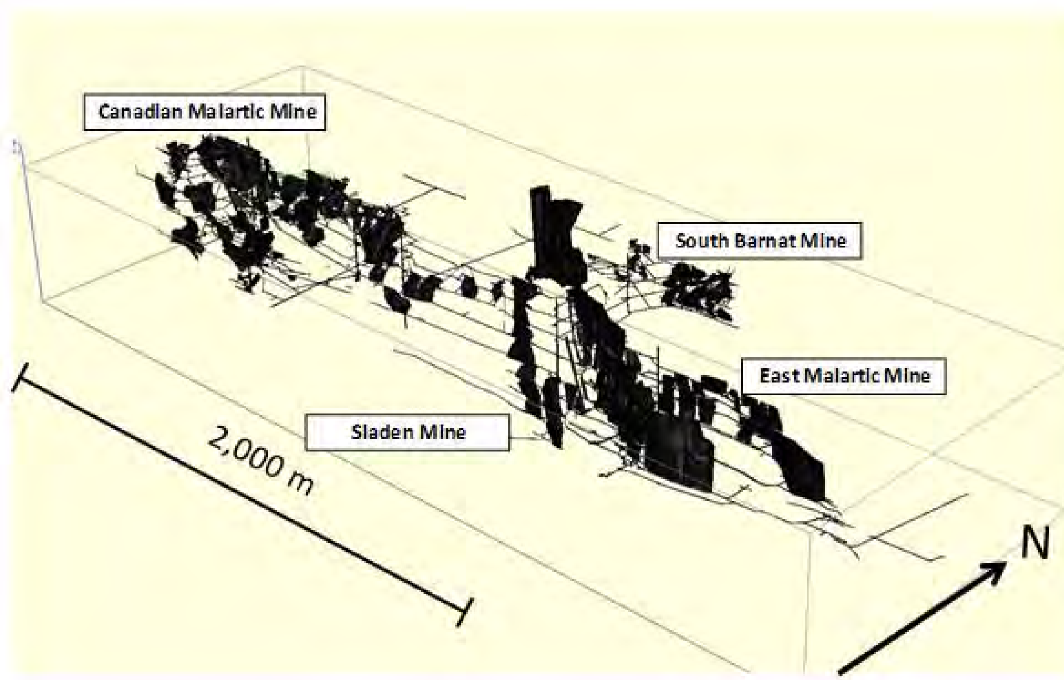

Figure 14.27 – Isometric view of the underground void model

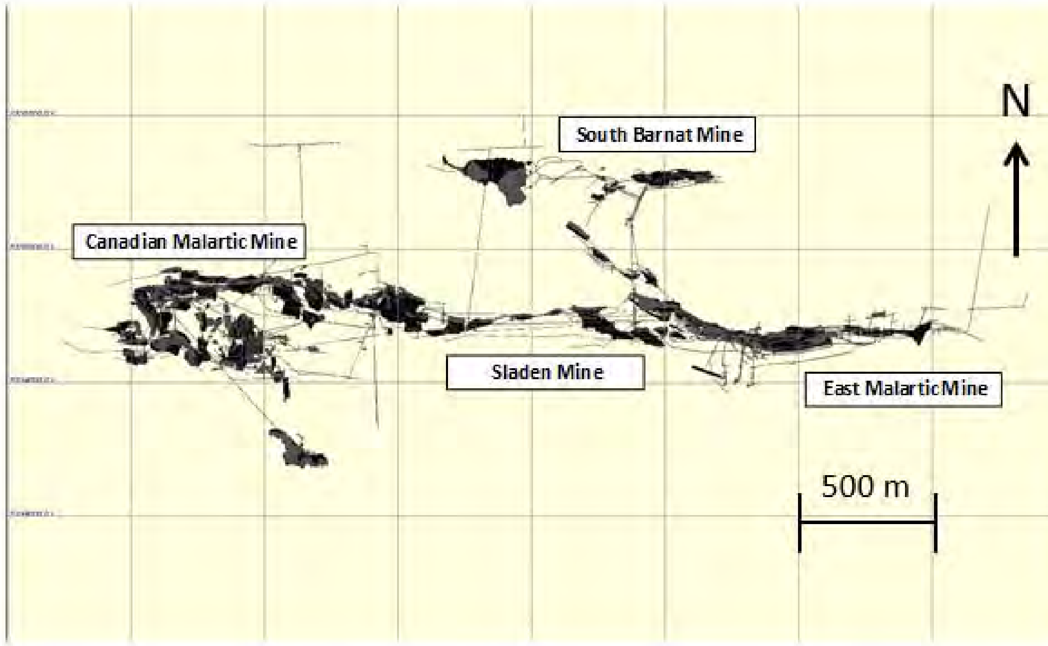

Figure 14.28 – Plan view of the underground void model

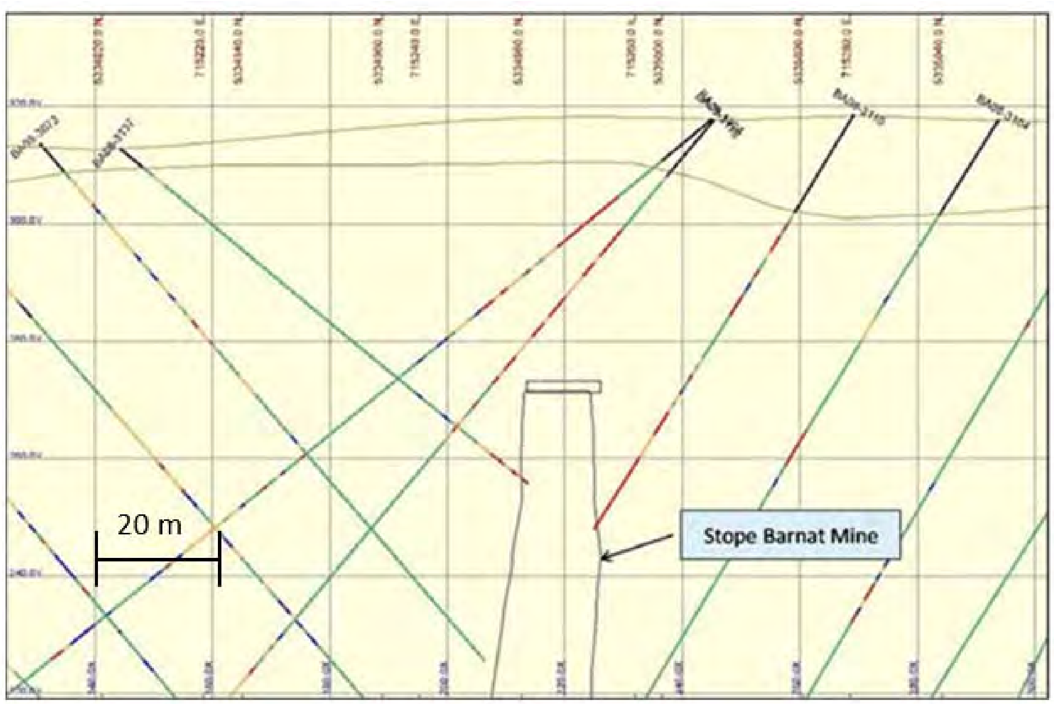

Figure 14.29 – Section 300NE showing recent drilling intersecting old workings (Barnat mine)

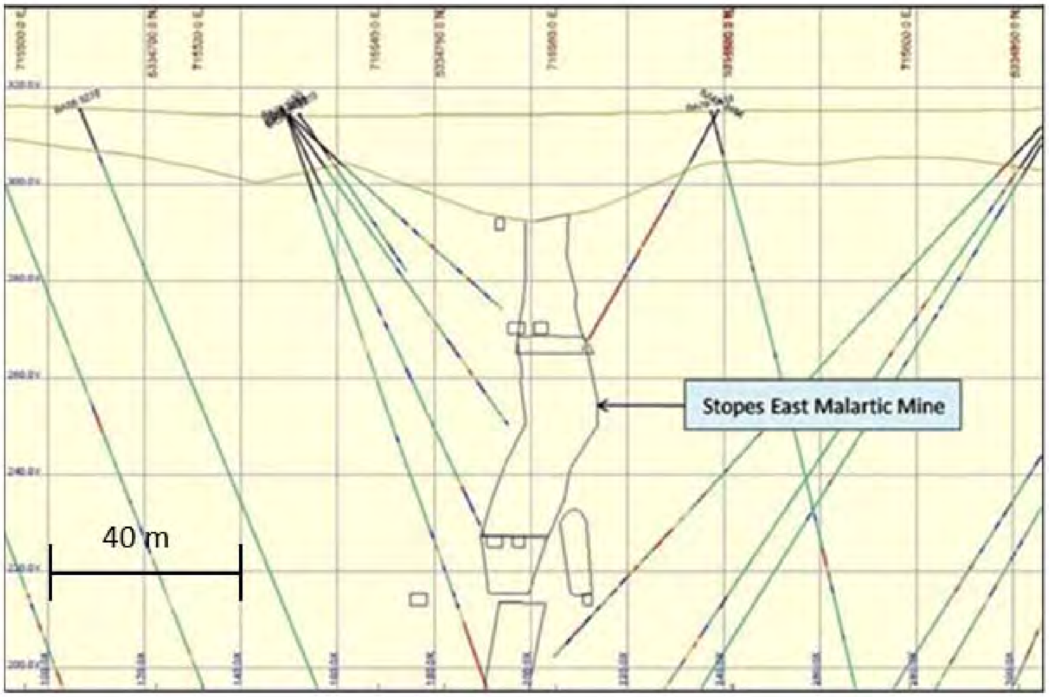

Figure 14.30 – Section 675NE showing recent drilling intersecting old workings (East Malartic mine)

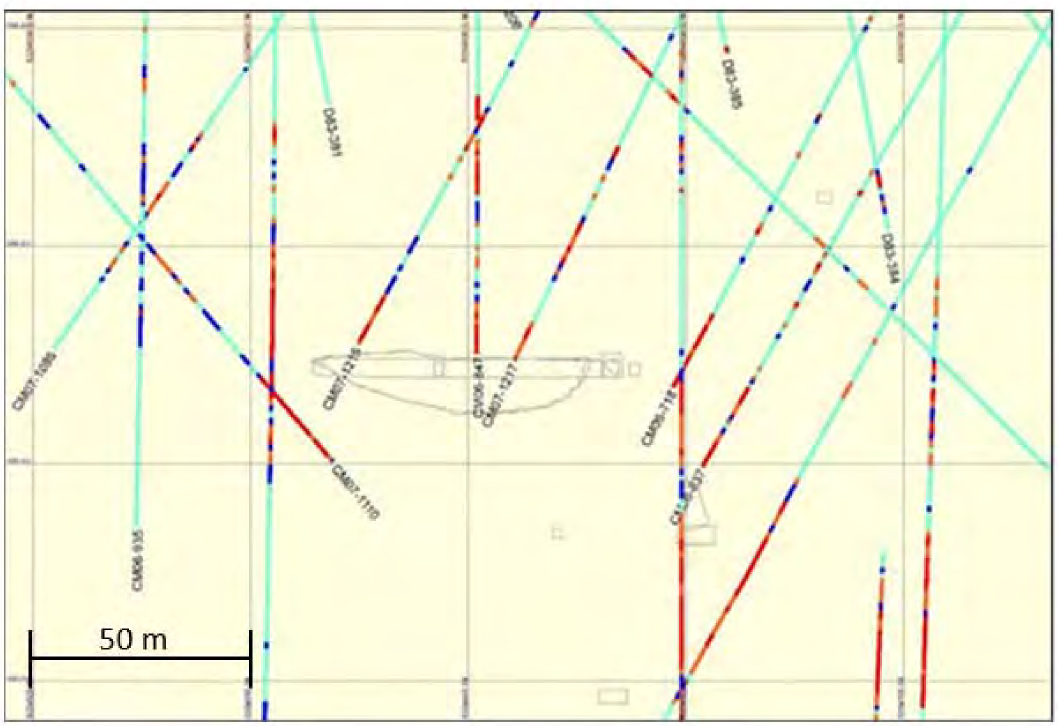

Figure 14.31 – Section 713725E showing recent drilling intersecting old workings of the Canadian Malartic mine

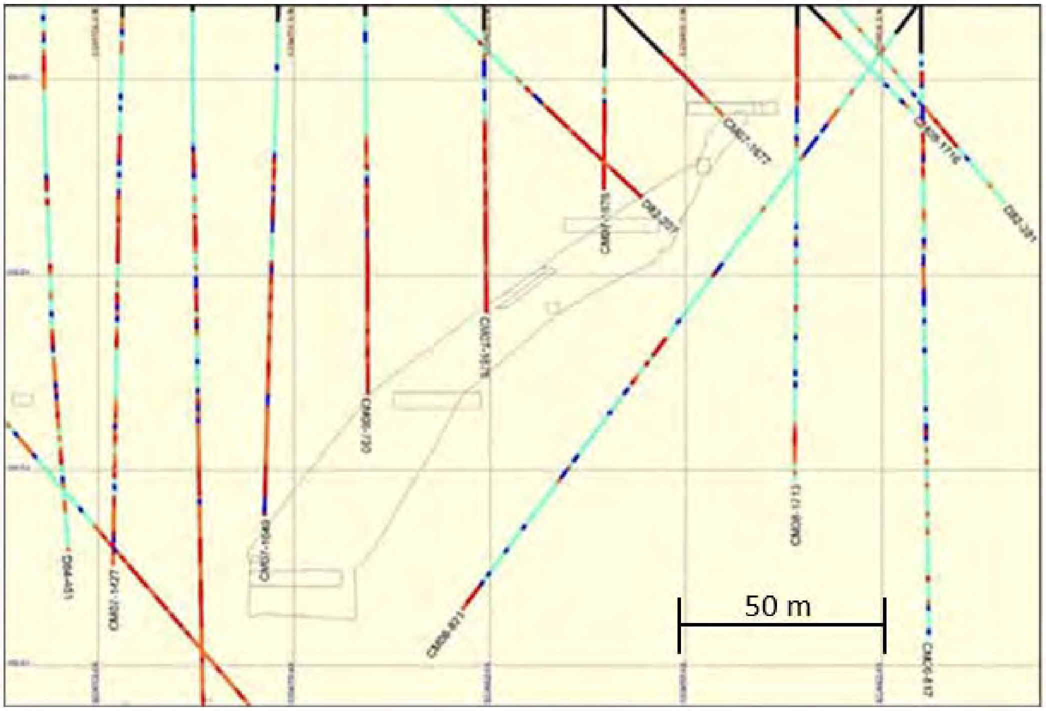

Figure 14.32 – Section 714460E showing recent drilling intersecting old workings of the Canadian Malartic mine

14.4 Statistical Analysis

14.4.1 Statistics of Original Assays

Drill hole assay intervals intersecting interpreted domains were coded in the database and used to analyze sample lengths and generate statistics, composites and variography.

The capping of the high assays represents an apparent loss between zero and 14.8% of the gold content depending on the zone (Tables 14.2 to 14.4). The level of capping was based on the study of the effect of the high grade values on the mean and standard deviation along with probability and histogram plots. Refer to Appendix III for details of the histograms.

Table 14.2 – Summary statistics of the original assay samples for the Canadian Malartic and South Barnat deposits (including Gouldie)

Domain	Number	Max	Uncut Mean	C.V.	Upper Cut	Cut Mean	Cut C.V.	Nb Data cut	Apparent metal loss (%)
10 CM	84,093	102.00	0.25	3.46	15.0	0.24	2.63	25	1.80%
10 Barn	8,542	27.80	0.17	3.37	15.0	0.17	2.80	2	1.58%
21	38,286	119.64	1.95	1.29	35.0	1.93	1.09	23	0.88%
22	13,816	738.39	2.38	3.95	70.0	2.24	2.11	19	5.88%
30	2,969	18.68	1.87	1.10	-	1.87	1.10	0	0.00%
40	10,936	80.56	2.02	1.23	22.0	2.00	1.05	11	1.18%
51	2,406	37.37	1.53	1.18	15.0	1.52	1.08	3	0.77%
52	16,038	479.41	1.42	3.16	35.0	1.37	1.35	13	3.49%
60	3,781	36.60	1.59	1.38	16.0	1.56	1.22	11	1.79%
70 CM	19,779	62.30	0.64	1.61	15.0	0.63	1.34	6	0.89%
70 Barn	2,774	14.05	0.50	1.68	-	0.50	1.68	0	0.00%
71	18,969	41.10	0.74	1.69	15.0	0.74	1.49	22	0.56%
72	4,471	19.45	0.54	1.44	10.0	0.54	1.37	2	0.39%
73	1,816	25.60	0.87	1.64	10.0	0.85	1.45	8	2.23%
74	4,884	77.04	0.60	2.37	10.0	0.58	1.51	5	2.75%
75	1,437	13.70	0.52	1.59	10.0	0.52	1.53	1	0.50%
76	366	8.25	0.61	1.56	5.0	0.60	1.46	2	2.05%
77	997	9.02	0.70	1.02	5.0	0.70	0.98	1	0.57%
80 All	7,459	87.20	0.85	2.97	20.0	0.82	2.40	25	4.05%
11	10,192	48.2	0.15	5.93	5.75	0.13	3.32	18	8.00%
12	20,966	23.00	0.21	2.80	6.0	0.21	2.41	27	2.40%
201	20,722	437.00	1.79	3.50	60.0	1.71	2.37	27	4.01%
202	5,921	30.00	1.52	1.25	21.0	1.52	1.21	6	0.39%
204	2,385	95.20	1.11	3.07	18.0	1.01	1.83	9	9.13%
205	873	10.00	0.82	1.16	10.0	0.82	1.16	1	0.00%
206	1,678	37.60	1.36	1.42	15.0	1.34	1.22	6	1.87%
208	2,232	95.10	1.93	2.34	30.0	1.85	1.97	11	3.84%
209	2,130	339.00	1.78	4.68	25.0	1.52	2.04	11	14.49%
213	463	19.30	0.71	2.72	10.0	0.65	2.33	4	7.30%
214	2,218	85.00	1.66	1.71	17.0	1.58	1.16	7	4.70%
300	2,562	17.45	0.72	1.73	10.0	0.71	1.63	7	1.21%
301	2,194	17.6	0.89	1.65	7.0	0.86	1.49	16	2.80%
302	592	25	0.46	3.12	5.25	0.41	2.00	5	10.2%
97	851	187.00	6.11	1.44	35.0	5.80	0.96	9	5.03%

Table 14.3 – Summary statistics of the original assay samples for the Jeffrey Zone

Domain	Number	Max	Uncut Mean	C.V.	Upper Cut	Cut Mean	Cut C.V.	Nb Data cut	Apparent metal loss (%)
LG01	7,696	47.70	0.40	3.21	11.0	0.38	2.17	13	5.88%
HG11	2,310	66.10	0.98	2.22	11.0	0.92	1.56	11	5.52%
HG12	1,752	28.10	0.79	1.91	13.0	0.77	1.65	4	2.38%
HG10 + HG13	439	56.8	1.31	2.56	9.0	1.13	1.43	5	11.60%

Table 14.4 – Summary statistics of the original assay samples for the Western Porphyry Zone

Domain	Number	Max	Uncut Mean	C.V.	Upper Cut	Cut Mean	Cut C.V.	Nb Data cut	Apparent metal loss (%)
PORPH_1	3,337	37.30	0.27	3.32	3.25	0.24	1.56	17	9.87%
PORPH_2	1,263	18.60	0.39	2.48	3.00	0.34	2.88	14	10.31%
PORPH_3	285	5.72	0.39	1.95	3.00	0.37	1.81	3	3.35%
HG_10	827	25.80	0.80	1.41	3.00	0.74	0.76	10	6.56%
HG_11	6,733	76.10	0.53	3.29	10.0	0.49	2.04	20	7.10%
HG_20	1,290	96.10	1.08	3.02	4.5	0.91	1.10	19	14.8%
HG_30	693	14.60	0.78	1.48	4.5	0.75	1.23	9	4.58%

14.4.2 Compositing

The drill hole database coded within each interpreted zone was composited to achieve a uniform sample support. Because of the size of the current mining operation using 10 metre benches, it was decided to composite the data with a regular 5.0 metres run length (downhole) within each interpreted domain using the cut value of the original samples. Composites of less than 1.5 metres were excluded from the database. Samples below the detection limit (0.005 g/t) and unsampled intervals were given a value of 0.001 g/t Au.

14.4.3 Statistics of the 5m Composites

Descriptive and distribution statistics of the 5.0 metres (5m) composites were generated and grouped by mineralized domain (Tables 14.5 to 14.7). The grade datasets for the various estimation domains are characterized by a generally low to moderate coefficient of variation (CV) for a gold deposit, indicating that high grade values contribute moderately to the mean grades (compared to average gold deposits).

Table 14.5 – Summary statistics of the 5m composites by zone for the Canadian Malartic and South Barnat deposits (including Gouldie)

Domain	Number	Min	Max	Mean	Median	Std. Dev.	C.V.
10	27,558	0.00	8.36	0.23	0.11	0.41	1.81
11	3518	0.00	3.08	0.12	0.03	0.26	2.13
12	6384	0.00	5.84	0.21	0.07	0.35	1.69
21	11,887	0.00	18.42	1.82	1.49	1.40	0.77
22	3,296	0.00	31.16	1.91	1.40	2.10	1.10
30	821	0.00	10.25	1.86	1.48	1.45	0.78
40	3,051	0.00	16.32	1.96	1.55	1.58	0.81
51	746	0.00	8.96	1.50	1.21	1.22	0.81
52	4,459	0.00	21.88	1.34	1.07	1.17	0.87
60	1,123	0.02	10.73	1.55	1.20	1.32	0.85
70	6,048	0.00	11.51	0.63	0.49	0.58	0.92
71	5,368	0.00	10.75	0.73	0.52	0.77	1.06
72	1,327	0.00	6.77	0.54	0.40	0.56	1.03
73	569	0.01	8.25	0.85	0.60	0.91	1.07
74	1,477	0.00	7.31	0.59	0.40	0.64	1.08
75	465	0.00	4.87	0.51	0.36	0.54	1.08
76	111	0.01	2.26	0.57	0.44	0.53	0.93
77	301	0.00	2.78	0.68	0.62	0.49	0.72
80	361	0.00	15.57	1.24	0.36	2.26	1.82
81	61	0.00	6.30	0.44	0.19	0.90	2.06
82	135	0.00	3.13	0.43	0.19	0.58	1.36
83	1,248	0.00	8.90	0.68	0.36	0.97	1.41
84	272	0.00	13.29	0.72	0.44	1.12	1.55
85	66	0.00	2.09	0.51	0.47	0.43	0.85
86	46	0.00	6.61	0.54	0.28	1.05	1.93
87	123	0.00	7.35	0.55	0.09	1.27	2.31
97	291	0.00	28.29	5.60	4.54	3.77	0.67
201	5,983	0.00	60.00	1.74	1.00	2.69	1.55
202	1,759	0.00	14.12	1.53	1.16	1.37	0.90
204	691	0.00	10.86	1.03	0.69	1.15	1.12
205	270	0.00	3.51	0.81	0.66	0.66	0.81
206	515	0.00	12.97	1.31	1.07	1.22	0.93
208	658	0.00	26.00	1.81	0.95	2.63	1.45
209	650	0.00	15.55	1.45	0.71	2.12	1.46
213	129	0.00	4.61	0.64	0.25	0.92	1.43
214	720	0.00	10.14	1.53	1.32	1.14	0.75
300	768	0.00	5.55	0.70	0.48	0.78	1.12
301	656	0.00	5.25	0.85	0.57	0.85	0.99
302	230	0.00	8.78	0.85	0.35	1.41	1.66

Table 14.6 – Summary statistics of the 5m composites by zone for the Jeffrey Zone

Domain	Number	Min	Max	Mean	Median	Std. Dev.	C.V.
LG01	2,314	0.001	9.97	0.39	0.25	0.57	1.45
HG11	683	0.01	5.58	0.92	0.64	0.88	0.95
HG12	531	0.02	7.60	0.79	0.57	0.80	1.02
HG10 + HG13	136	0.06	6.91	1.14	0.77	1.01	0.88

Table 14.7 – Summary statistics of the 5m composites by zone for the Western Porphyry Zone

Domain	Number	Min	Max	Mean	Median	Std. Dev.	C.V.
PORPH_1	974	0.000	2.30	0.23	0.15	0.27	1.15
PORPH_2	375	0.000	2.70	0.34	0.24	0.36	1.05
PORPH_3	80	0.000	2.36	0.36	0.12	0.54	1.49
HG_10	251	0.01	2.19	0.75	0.70	0.41	0.55
HG_11	1,997	0.000	8.28	0.49	0.30	0.64	1.30
HG_20	382	0.01	3.92	0.91	0.77	0.57	0.62
HG_30	680	0.000	3.73	0.77	0.62	0.62	1.83

14.5 Bulk Density Data

14.5.1 Canadian Malartic and Gouldie Deposits

A total of 3,109 density measurements were done on core at ALS Chemex Laboratories from sample of the 2006 and 2007 drilling programs. For Gouldie a total of 307 density measurements were done on core at ALS Chemex Laboratories from samples of the 2010 and 2011 drilling programs.

Table 14.8 summarizes the statistics of the two main lithologies and all the others are regrouped. For the two main lithologies, the standard deviation and the coefficient of variation are very low. Based on these statistics, average densities of 2.75 t/m³ for all sediments, 2.69 t/m³ for Canadian Malartic porphyry, and 2.65 t/m³ for Gouldie porphyry were used to estimate the tonnage in the resource estimation.

Table 14.8 – Statistics of the density measurements by lithology

	CM Sediments (t/m³)	Gouldie Sediments (t/m³)	CM Porphyry (t/m³)	Gouldie Porphyry (t/m³)	CM Other (t/m³)
Number	2196	266	780	48	133
Mean	**2.75**	**2.75**	**2.69**	**2.65**	**2.80**
Minimum	2.54	2.59	2.52	2.60	2.65
Maximum	3.27	3.05	3.38	2.81	3.07
Median	2.75	2.75	2.69	2.65	2.80
Std dev	0.03	0.04	0.04	0.03	0.09
C.V.	0.01	0.01	0.02	0.01	0.03

14.5.2 South Barnat Deposit

A total of 400 density measurements were done on core at ALS Chemex Laboratories from samples from the 2008 drilling program.

Table 14.9 summarizes the statistics of the four main lithologies and all the others are regrouped. For the four main lithologies, the standard deviation and the coefficient of variation are very low. Based on these statistics, average densities used were 2.75 t/m³ for all undifferentiated blocks in the Pontiac Group (mostly sediments), and 2.83 t/m³ for all undifferentiated blocks in the Piché Group (mostly ultramafic, schist, and porphyry). Mineralized zones were attributed their own density (see below).

Table 14.9 – Statistics of density measurements by lithology

	Sediment s	Porphyr y	Ultramafic s	Schis t	Other (t/m³)
Number	46	184	125	15	30
Mean	**2.75**	**2.69**	**2.90**	**2.88**	**2.91**
Minimum	2.65	2.64	2.71	2.74	2.71
Maximum	2.96	2.88	3.00	2.97	3.03
Median	2.75	2.69	2.91	2.90	2.92
Std dev	0.05	0.03	0.06	0.06	0.08
C.V.	0.02	0.01	0.02	0.02	0.03

As the mineralized zones are not composed of only one rock type, a density is assigned to each sample (depending on its rock type) and the average of the zone is calculated. Table 14.10 presents the density used for each mineralized zone, based on the percentage of each rock type.

Table 14.10 – Average density used for each mineralized zone

Zone	11	12	97	201	202	204	205	206	208	209	213	214	300	301	302
Avg. Density (t/m³)	2.75	2.75	2.75	2.75	2.75	2.73	2.75	2.75	2.79	2.83	2.75	2.75	2.75	2.75	2.75

14.5.3 Jeffrey Zone

A total of 686 density measurements were done on core at ALS Chemex Laboratories for samples from the 2010-2011 drilling programs.

Table 14.11 summarizes the statistics of the two main lithologies and all the others are regrouped. Based on these statistics, average densities of 2.74 t/m³ for sediments, 2.67 t/m³ for porphyry and 2.88 t/m³ for ultramafics were used to estimate the tonnage in the resource estimation.

Table 14.11 – Statistics of the density measurements by lithology

	Sediments (t/m³)	Porphyry (t/m³)	Ultramafic (t/m³)	Other (t/m³)
Number	141	402	88	64
Mean	**2.75**	**2.67**	**2.88**	**2.90**
Minimum	2.57	2.50	2.50	2.67
Maximum	3.64	3.02	3.04	3.12
Median	2.74	2.68	2.89	2.89
Std dev	0.09	0.05	0.08	0.09
C.V.	0.03	0.02	0.03	0.03

14.5.4 Western Porphyry Zone

A total of 937 density measurements were done on core at ALS Chemex Laboratories for samples of the 2010-2011 drilling campaigns.

Table 14.12 summarizes the statistics of the two main lithologies and all the others are regrouped. Based on these statistics, average density of 2.88 t/m³ for ultramafics and 2.67 t/m³ for porphyry were used to estimate the tonnage in the resource estimation.

Table 14.12 – Statistics of the density measurements by lithology

	Ultramafic (t/m³)	Porphyry (t/m³)	Other (t/m³)
Number	378	238	12
Mean	2.88	2.65	2.83
Minimum	2.61	2.48	2.77
Maximum	3.09	2.93	3.00
Median	2.88	2.65	2.81
Std dev	0.04	0.03	0.07
C.V.	0.01	0.01	0.02

14.6 Variography

Grade variography was generated and modelled in preparation for the estimation of gold grades. The variography was completed based directly on the 5m downhole composite data.

A standard approach was used to generate and model the variography for each of the domains. The steps taken are summarized below:

- Examine the orientations and dips of the solids representing the domains to be studied to determine the axes of better continuity.
- Generate and model the downhole direction correlogram to determine the nugget effect (close-spaced variability).
- Calculate and model the major, semi-major and minor axes of continuity.

Correlograms were generated every 30° azimuth and at 15° dip increments for all the subdomains using Sage 2001 software, which uses regressions to determine optimal anisotropy directions. Similar approach using downhole and 3D variograms, defined with GEMS 6.3.1, was used for zone 11, 301 and 302 and all domains of Jeffrey and Western Porphyry zones.

All the variography was modelled with a nugget effect and two structures representing the larger scale spatial variability of the datasets.

The modelled correlograms for each of the domains are summarized in Tables 14.13 to 14.15. The rotation angles use the GEMS convention around the ZYZ axes based on the orientation of the block model used. The resulting orientations were visualized in GEMS to see if the directions of the axes were consistent with the solid orientations. The orientations generally fit pretty well with the general orientations of the interpreted zones. Note that some reported rotations have been adjusted on the basis of interpreted geological constraints. Generally, the nugget effect is low to moderate, between 10 to 30%. Correlogram graphs are also available in Appendix 4.

Table 14.13 – Variography for the Canadian Malartic and South Barnat deposits (including Gouldie) – Gold correlograms (5m composites)

		1st Structure				2nd Structure				Rotation		
Domain	Nugget	Sill	X	Y	Z	Sill	X	Y	Z	Z	Y	Z
10	0.30	0.58	10	30	17	0.12	30	150	100	84	-17	-13
11	0.23	0.048	20.6	20.6	4.3	0.11	49.5	49.5	10.25	110*	-44.9*	100*
12	0.30	0.45	5	40	15	0.25	25	90	150	-16	-37	65
21	0.20	0.65	18	22	20	0.15	60	150	100	40	60	30
22	0.20	0.58	10	12	25	0.22	40	30	60	-17	48	29
30	0.25	0.70	10	15	20	0.05	20	50	37	-52	75	-34
40	0.15	0.75	15	15	25	0.10	22	125	75	12	-50	18
51	0.10	0.85	15	15	20	0.05	20	30	40	90	-40	0
52	0.20	0.67	12	22	13	0.13	50	50	100	-60	-25	-11
60	0.20	0.50	10	25	30	0.30	20	40	60	-13	89	-41
70	0.25	0.60	15	25	15	0.15	45	70	100	30	35	34
71	0.25	0.56	20	40	15	0.19	80	150	50	59	39	10
72	0.25	0.40	30	70	10	0.35	120	120	25	72	87	0
73	0.25	0.65	25	30	30	0.10	50	60	60	19	1	-23
74	0.25	0.50	35	20	25	0.25	75	100	50	88	48	-61
75	0.20	0.78	15	40	40	0.02	30	75	75	90	-42	0
76	0.20	0.30	8	40	20	0.50	20	80	45	20	87	-34
77	0.20	0.65	10	6	8	0.15	50	20	70	-55	45	20
80	0.20	0.35	40	35	5	0.45	100	75	20	85	75	-5
81	0.20	0.35	40	35	5	0.45	100	75	20	80	65	-5
82	0.20	0.35	40	35	5	0.45	100	75	20	65	60	-5
83	0.20	0.35	40	35	5	0.45	100	75	20	78	70	-5
84	0.20	0.35	40	35	5	0.45	100	75	20	65	55	-5
85	0.20	0.35	40	35	5	0.45	100	75	20	90	50	-5
86	0.20	0.35	40	35	5	0.45	100	75	20	90	65	0
87	0.20	0.35	40	35	5	0.45	100	75	20	-85	-70	-5
97	0.25	0.70	10	5	20	0.05	25	10	40	50	-10	-50
201	0.20	0.70	8	15	15	0.10	30	120	150	0	13	65
202	0.20	0.60	30	5	6	0.20	120	25	40	-18	45	-1
204	0.30	0.60	15	5	25	0.10	30	10	100	-25	-60	5
205-6	0.10	0.70	15	15	5	0.20	35	100	15	22	58	67
208	0.20	0.25	23	18	30	0.55	70	30	100	-24	-26	-10
209	0.20	0.50	20	30	30	0.30	45	90	120	10	-7	-97
213	0.25	0.55	5	20	10	0.20	10	40	30	50	-50	0
214	0.25	0.55	10	20	30	0.20	15	40	75	10	22	80
300	0.25	0.60	10	20	25	0.15	20	50	60	90	-15	10
301	0.19	0.46	13.85	8.58	4.28	0.12	50.84	31.51	75.72	100*	-53*	299*
302	0.45	0.29	35.9	32.1	19.5	1.00	82	73.2	44.6	297*	-17.8*	238.1*

Rotation for domains 11, 301, and 302 are using GEMS convention Principal Az / Principal Dip / Intermediate Az

Table 14.14 – Variography for the Jeffrey Zone – Gold variograms (5m composites)

			1st Structure			2nd Structure			Rotation		
Domain	Nugget	Sill	X	Y	Z	X	Y	Z	Az	Dip	Az
LG01	0.216	0.27	89	71	56	-	-	-	293	8	72
HG10	0.16	0.63	14	10	7	33	23	17	248	26	296
HG11	0.473	0.66	34	22	14	62	39	25	263	-1	169
HG12	0.37	0.63	40	29	20	58	42	29	91	-45	311
HG13	0.16	0.63	14	10	7	33	23	17	248	26	296

Table 14.15 – Variography for the Western Porphyry Zone – Gold variograms (5m composites)

			1st Structure			2nd Structure			3rd Structure			Rotation		
Domain	Nugget	Sill	X	Y	Z	X	Y	Z	X	Y	Z	Az	Dip	Az
PORPH_1	0.02	0.06	41	31	23	100	74	66	-	-	-	190	7	278
PORPH_2	0.06	0.12	21	15	11	63	46	35	-	-	-	315	30	45
PORPH_3	0.03	0.37	6	5	3	18	15	10	-	-	-	310	-54	152
HG_10	0.06	0.19	17	13	10	44	34	25	-	-	-	203	-15	80
HG_11	0.18	0.41	27	20	17	52	38	33	-	-	-	283	-30	209
HG_20	0.19	0.29	18	16	11	46	40	28	-	-	-	315	36	6
HG_30	0.03	0.37	6	5	3	18	15	10	36	29	19	310	-54	152

Figures 14.33 and 14.34 show examples of search ellipse orientations based on variography (zones 21 and 214).

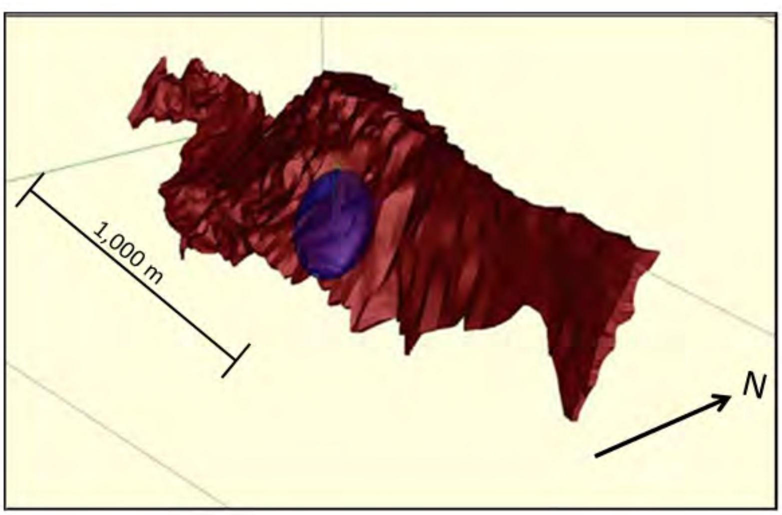

Figure 14.33 – Zone 21 (Canadian Malartic) search ellipse orientation based on variography

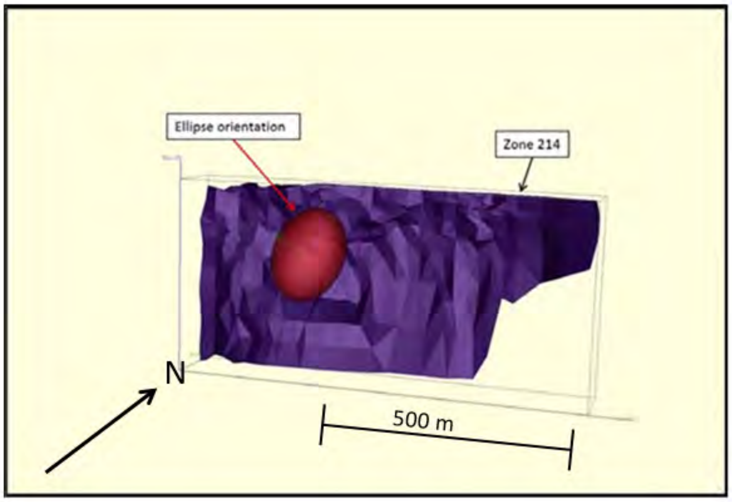

Figure 14.34 – Zone 214 (South Barnat) search ellipse orientation based on variography

14.7 Block Modelling

14.7.1 Canadian Malartic, South Barnat and Gouldie Block Model

A block model was constructed in February 2011 within the Canadian Malartic GEMS 6.2.4 database and locally updated on several occasions since then. The block model was designed to be large enough to facilitate pit optimizations and associated pit slopes for Canadian Malartic, South Barnat and Gouldie. Block model parameters are summarized in Table 14.16.

Table 14.16 – Canadian Malartic, South Barnat and Gouldie block model parameters

	East	North	Elevation
Minimum coordinates	712,700	5,333,400	-400
Maximum coordinates	717,200	5,335,800	360
Block size	20	10	10
Number of blocks	225	240	76
Rotation	0		

The block dimension (20 m X 10 m X 10 m) is based on the existing drilling pattern (30 m X 30 m) and the mine planning considerations (10 m benches).

The domain coding (rock type model) was based on the various wireframe constraints. Table 14.17 presents the domain coding of the various wireframes, solids and surfaces used in the block model.

Table 14.17 – Canadian Malartic, South Barnat and Gouldie block model coding

Type	Folder	Name 1	Name 2	Name 3	Description	Code
Surface	ArMonthEnd	Status	16juin14		Topo Surface Actual	
Surface	GeoRes2014	BEDROCK	OFFICIAL	2014	Overburden Surface	2
Geology	GeoOreZ_2014	10	Dec-13	CLIP	Mineralization Domain (Canadian Malartic)	10
Geology	GeoOreZ_2014	11	UPD-CLIP	Dec-12	Mineralization Domain (Canadian Malartic)	11
Geology	GeoOreZ_2014	12	Final	ClipFeb11	Mineralization Domain (Canadian Malartic)	12
Geology	GeoOreZ_2014	21	LF	CLIP	Mineralization Domain (Canadian Malartic)	21
Geology	GeoOreZ_2013	21	Final_PL	ClipCut	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	21
Geology	GeoOreZ_2014	22	LF	CLIP	Mineralization Domain (Canadian Malartic)	22
Geology	GeoOreZ_2013	22	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	22
Geology	GeoOreZ_2014	30	LF	CLIP	Mineralization Domain (Canadian Malartic)	30
Geology	GeoOreZ_2013	30	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	30
Geology	GeoOreZ_2014	40	LF	CLIP	Mineralization Domain (Canadian Malartic)	40
Geology	GeoOreZ_2013	40	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	40
Geology	GeoOreZ_2014	51	LF	CLIP	Mineralization Domain (Canadian Malartic)	51
Geology	GeoOreZ_2013	51	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	51
Geology	GeoOreZ_2014	52	LF	CLIP	Mineralization Domain (Canadian Malartic)	52
Geology	GeoOreZ_2013	52	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	52
Geology	GeoOreZ_2014	60	LF	CLIP	Mineralization Domain (Canadian Malartic)	60
Geology	GeoOreZ_2013	60	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	60

Type	Folder	Name 1	Name 2	Name 3	Description	Code
Geology	GeoOreZ_2014	70	LF	CLIP	Mineralization Domain (Canadian Malartic)	70
Geology	GeoOreZ_2013	70	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	70
Geology	GeoOreZ_2014	71	LF	CLIP	Mineralization Domain (Canadian Malartic)	71
Geology	GeoOreZ_2013	71	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	71
Geology	GeoOreZ_2014	72	LF	CLIP	Mineralization Domain (Canadian Malartic)	72
Geology	GeoOreZ_2013	72	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	72
Geology	GeoOreZ_2014	73	LF	CLIP	Mineralization Domain (Canadian Malartic)	73
Geology	GeoOreZ_2013	73	Clip_OVB	Final	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	73
Geology	GeoOreZ_2014	74	LF	CLIP	Mineralization Domain (Canadian Malartic)	74
Geology	GeoOreZ_2013	74	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	74
Geology	GeoOreZ_2014	75	LF	CLIP	Mineralization Domain (Canadian Malartic)	75
Geology	GeoOreZ_2013	75	UPD	CLIP	Mineralization Domain (Canadian Malartic) - UNDER 2014 UPD	75
Geology	GeoOreZ_2014	76	ClipOvb	Feb-11	Mineralization Domain (Canadian Malartic)	76
Geology	GeoOreZ_2014	77	UPD	CLIP	Mineralization Domain (Canadian Malartic)	77
Geology	GeoOreZ_2014	80	UPD	CLIP	Mineralization Domain (Gouldie)	80
Geology	GeoOreZ_2014	81	LF	CLIP	Mineralization Domain (Gouldie)	81
Geology	GeoOreZ_2013	81	UPD	CLIP	Mineralization Domain (Gouldie) - UNDER 2014 UPD	81
Geology	GeoOreZ_2014	82	LF	CLIP	Mineralization Domain (Gouldie)	82
Geology	GeoOreZ_2013	82	UPD	CLIP	Mineralization Domain (Gouldie) - UNDER 2014 UPD	82

Type	Folder	Name 1	Name 2	Name 3	Description	Code
Geology	GeoOreZ_2014	83	LF	CLIP	Mineralization Domain (Gouldie)	83
Geology	GeoOreZ_2013	83	UPD	CLIP	Mineralization Domain (Gouldie) - UNDER 2014 UPD	83
Geology	GeoOreZ_2014	84	LF	UNCLIP	Mineralization Domain (Gouldie)	84
Geology	GeoOreZ_2013	84	UPD	CLIP	Mineralization Domain (Gouldie) - UNDER 2014 UPD	84
Geology	GeoOreZ_2014	85	UPD	Aug-11	Mineralization Domain (Gouldie)	85
Geology	GeoOreZ_2014	86	UPD	Aug-11	Mineralization Domain (Gouldie)	86
Geology	GeoOreZ_2014	87	UPD	CLIP	Mineralization Domain (Gouldie)	87
Geology	GeoOreZ_2014	201	cut	ClipFeb11	Mineralization Domain (Barnat)	201
Geology	GeoOreZ_2014	202	Final_PL	CLIP	Mineralization Domain (Barnat)	202
Geology	GeoOreZ_2014	204	Final-09	ClipFeb11	Mineralization Domain (Barnat)	204
Geology	GeoOreZ_2014	205	Final	ClipFeb11	Mineralization Domain (Barnat)	205
Geology	GeoOreZ_2014	206	Clip202	ClipFeb11	Mineralization Domain (Barnat)	206
Geology	GeoOreZ_2014	214	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	214
Geology	GeoOreZ_2014	300	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	300
Geology	GeoOreZ_2014	301	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	301
Geology	GeoOreZ_2014	302	CLIP	DDH	Mineralization Domain (Barnat)	302
Geology	GeoOreZ_2014	208-10	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-11	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-12	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-13	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-14	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-15	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-3	Final_PL	Clip	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-4	Final	ClipFeb11	Mineralization Domain (Barnat)	208

Type	Folder	Name 1	Name 2	Name 3	Description	Code
Geology	GeoOreZ_2014	208-5	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-6	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-7	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-8	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	208-9	Final	ClipFeb11	Mineralization Domain (Barnat)	208
Geology	GeoOreZ_2014	209-1	Final	ClipFeb11	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-2	Final	ClipFeb11	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-3	Final	ClipFeb11	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-4	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-5	UPD	Oct-11	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-7	Final	ClipFeb11	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	209-8	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	209
Geology	GeoOreZ_2014	213-1	Final	ClipFeb11	Mineralization Domain (Barnat)	2013
Geology	GeoOreZ_2014	97	UPD-CLIP	Dec-12	Mineralization Domain (Barnat)	97
Geology	GeoOreZ_2014	97_INT	UPD-CLIP	Dec-12	Mineralization Domain (Barnat) - For DDH intercept creation only	97
Underground workings	GeoVoid	multiple			Undergrounf voids	99

Also, within the block model project, a series of models were incorporated for recording the different attributes assigned and calculated in the block model development. The attributes of the block model project are listed in Table 14.18.

Table 14.18 – Block model attributes

Model Name (Resource_OFF)	Description
Rock Type	Subdomain coding
Density	Specific gravity
Out_Void	% of the block outside voids
Au_OK	Ordinary kriging Au (cut)
CLASS	Classification
NB_PTS	Number of composites used for estimation
Closest	Distance of the closest composite from centre of block
VAR	Kriging variance of the estimate

14.7.2 Jeffrey Block Model

A block model was constructed in January 2012 within the Jeffrey GEMS 6.3.1 database. The block model was designed to be large enough to facilitate pit optimizations and associated pit slopes. Block model parameters are summarized in Table 14.19.

Table 14.19 – Jeffrey block model parameters

	East	North	Elevation
Minimum coordinates	717 000	5 334 200	-40
Maximum coordinates	717 800	5 334 950	360
Block size	20	10	10
Number of blocks	40	75	40
Rotation	0		

The block dimension (20 m X 10 m X 10 m) is mostly based on the mine planning considerations (10 m benches) that are currently underway at the Canadian Malartic mine.

The domain coding (rock type model) was based on the various wireframe constraints. Table 14.20 presents the domain coding of the various wireframes, solids and surfaces used in the block model.

Table 14.20 – Jeffrey block model coding

Type	Folder	Solid or Surface Name	Description	Code
Surface	Others	TOPO / COLLAR+ / Status	Topographic Surface	0
Surface	Others	OVB / Bottom / PL	Bedrock Surface	2
Geology	Others	Porphyry / Jeffrey / PL	Geology Solid	90
Geology	Others	Sediment / Jeffrey / PL	Mineralization Domain	80
Geology	ORE_SOLIDS	HG10 / PL / FINAL	Mineralization Domain	10
Geology	ORE_SOLIDS	HG11 / PL / FINAL	Mineralization Domain	11
Geology	ORE_SOLIDS	HG12 / PL / FINAL	Mineralization Domain	12
Geology	ORE_SOLIDS	HG13 / PL / FINAL	Mineralization Domain	13
Geology	ORE_SOLIDS	LG01 / PL / FINAL	Mineralization Domain	1

Also, within the block model project, a series of models were incorporated for recording the different attributes assigned and calculated in the block model development. The attributes of the block model project are listed in Table 14.21.

Table 14.21 – Block model attributes

Model Name (Jeffrey_OFF)	Description
Rock Type	Subdomain coding
Density	Specific gravity
Au_OFF	Ordinary kriging Au (cut)
CLASS_OFF	Classification

14.7.3 Western Porphyry Block Model

A block model was constructed in January 2012 within the Western Porphyry GEMS 6.3.1 database. The block model was designed to be large enough to facilitate pit optimizations and associated pit slopes. Block model parameters are summarized in Table 14.22.

Table 14.22 – Western Porphyry block model parameters

	East	North	Elevation
Minimum coordinates	712 400	5 335 315	-100
Maximum coordinates	713 218	5 336 392	350
Block size	10	10	10
Number of blocks	70	100	45
Rotation	-7.056		

The block dimension (10 m × 10 m × 10 m) is mostly based on the mine planning considerations (10 m benches) that are currently underway at the Canadian Malartic mine.

The domain coding (rock type model) was based on the various wireframe constraints. Table 14.23 presents the domain coding of the various wireframes, solids and surfaces used in the block model.

Table 14.23 – Western Porphyry Block model coding

Type	Folder	Solid or surface name	Description	Code
Surface	SURFACES	TOPO / CLIP	Topographic surface	0
Surface	SURFACES	OVB_BOT / CLIP	Overburden surface	99
Surface	LITHO_TRI	UM / OFF	Ultramafic solid	100
Geology	ORE_ZONE	Porph_1 / CLIP / OFF	Porphyry solid 1	1
Geology	ORE_ZONE	Porph_2 / CLIP / OFF	Porphyry solid 2	2
Geology	ORE_ZONE	Porph_3 / CLIP / OFF	Porphyry solid 3	3
Geology	ORE_ZONE	HG_10 / OFF	High Grade solid 10	10
Geology	ORE_ZONE	HG_11 / CLIP / OFF	High Grade solid 11	11
Geology	ORE_ZONE	HG_20 / CLIP / OFF	High Grade solid 20	20
Geology	ORE_ZONE	HG_30 / CLIP / OFF	High Grade solid 30	30

Also, within the block model project, a series of models were incorporated for recording the different attributes assigned and calculated in the block model development. The attributes of the block model project are listed in Table 14.24.

Table 14.24 – Western Porphyry Block Model attributes

Model Name (Barnat+CM)	Description
Rock Type	Subdomain coding
Density	Specific gravity
AU	Ordinary kriging Au (cut)
CAT	Classification

14.8 Grade Estimation Methodology

Grade estimation was done using Ordinary Kriging (OK) as the official method while Inverse Distance Squared (ID2) was used for comparison. GEMS 6.2.4 software was used for the initial estimates on Canadian Malartic, South Barnat and Gouldie while subsequent versions were used for local updates as well as for Jeffrey and Western Porphyry.

The grade estimates were generated using the cut 5m composites. The blocks that are included in one particular domain are estimated only with the composites coded within this domain (hard boundary). For Zone 301 and Zone 302, as well as all Jeffrey and Western Porphyry domains, these were interpolated using only the second and the third passes. The entire resource from Western Porphyry was categorized as Inferred. The two estimates (OK and ID2) have been done using a similar sample search approach as summarized below:

- First pass: minimum of 5 and maximum of 16 composites with data in a minimum of four octants within the search ellipse (Canadian Malartic only). The search ellipse corresponds to the ranges of the first structure identified by variographic studies (generally around 30 m for the major axis). A maximum of two composites per drill hole could be used for any block estimate.
- Second pass: minimum of 3 and maximum of 16 composites with data in a minimum of three octants within the search ellipse (Canadian Malartic only). The search ellipse corresponds generally to two thirds of the range identified for the second structure by variography (generally less than 100 m for the major axis). A maximum of two composites per drill hole could be used for any block estimate.
- Third pass: minimum of 1 and maximum of 16 composites within a search ellipse corresponding to the range identified for the second structure by variography. A maximum of two composites per drill hole could be used for any block estimate.

The minimum data in 4 and 3 octants for the first and second pass (with a maximum of 4 composites per octants) were used to help to fragment the data in the high grade zones of the Canadian Malartic Deposit, especially for underground drilling where fans of drilling are often present. Using maximum composites per octants will limit the weight given to underground holes that are often in fans from drive levels.

Also, it must be noted that for some low grade domains, a high grade distance restriction was applied to restrict composite data higher than a determined value to a search distance corresponding to half the search ellipse dimension. Even if it is arbitrary, this measure is judged prudent since the continuity of high grade values is very limited in the low grade domains and this restricts the extrapolation of the higher grade composites within these zones.

Search ellipses parameters are described in Table 14.25 for Canadian Malartic, South Barnat, and Gouldie, while tables 14.26 and 14.27 describe search ellipse parameters for Jeffrey and Western Porphyry, respectively.

Table 14.25 – Sample search parameters for Canadian Malartic, South Barnat, and Gouldie

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data	Maximum samples per octant	High grade restriction
			Z	Y	Z	X	Y	Z	Min	Max	Max per hole			
10_1	10	1	84	-17	-13	10	30	17	5	16	2	4	4	Yes
10_2	10	2	84	-17	-13	15	80	60	3	16	2	3	4	Yes
10_3	10	3	84	-17	-13	20	125	80	1	16	2	-	-	Yes
11_1	11	1	85	60	-10	25	20	20	5	16	2	4	4	No
11_2	11	2	85	60	-10	75	25	15	3	16	2	3	4	No
11_3	11	3	85	60	-10	125	40	20	1	16	2	-	-	No
12_1	12	1	-16	-37	65	5	40	15	5	16	2	-	-	No
12_2	12	2	-16	-37	65	15	60	75	3	16	2	-	-	No
12_3	12	3	-16	-37	65	25	90	120	1	16	2	-	-	No
21_1	21	1	40	60	30	18	22	20	5	16	2	4	4	No
21_2	21	2	40	60	30	40	100	67	3	16	2	3	4	No
21_3	21	3	40	60	30	60	150	100	1	16	2	-	-	No
22_1	22	1	-17	48	29	10	15	25	5	16	2	4	4	No
22_2	22	2	-17	48	29	30	20	40	3	16	2	3	4	No
22_3	22	3	-17	48	29	40	30	60	1	16	2	-	-	No
30_1	30	1	-52	75	-34	10	15	20	5	16	2	4	4	No
30_2	30	2	-52	75	-34	15	35	30	3	16	2	3	4	No
30_3	30	3	-52	75	-34	20	50	40	1	16	2	-	-	No
40_1	40	1	12	-50	18	15	15	25	5	16	2	4	4	No
40_2	40	2	12	-50	18	15	85	50	3	16	2	3	4	No
40_3	40	3	12	-50	18	22	125	75	1	16	2	-	-	No
51_1	51	1	90	-40	0	15	15	20	5	16	2	4	4	No
51_2	51	2	90	-40	0	20	30	40	3	16	2	3	4	No
51_3	51	3	90	-40	0	25	50	50	1	16	2	-	-	No
52_1	52	1	-60	-25	-11	12	22	13	5	16	2	4	4	No
52_2	52	2	-60	-25	-11	35	35	67	3	16	2	3	4	No
52_3	52	3	-60	-25	-11	50	50	100	1	16	2	-	-	No
60_1	60	1	-13	89	-41	10	25	30	5	16	2	4	4	No
60_2	60	2	-13	89	-41	20	40	60	3	16	2	3	4	No
60_3	60	3	-13	89	-41	25	75	100	1	16	2	-	-	No
70_1	70	1	30	35	34	15	25	15	5	16	2	4	4	No

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data	Maximum samples per octant	High grade restriction
			Z	Y	Z	X	Y	Z	Min	Max	Max per hole			
70_2	70	2	30	35	34	30	45	67	3	16	2	3	4	No
70_3	70	3	30	35	34	45	70	100	1	16	2	-	-	No
71_1	71	1	59	39	10	20	40	15	5	16	2	4	4	No
71_2	71	2	59	39	10	55	100	35	3	16	2	3	4	No
71_3	71	3	59	39	10	80	150	50	1	16	2	-	-	No
72_1	72	1	72	87	0	30	60	15	5	16	2	4	4	No
72_2	72	2	72	87	0	80	80	20	3	16	2	3	4	No
72_3	72	3	72	87	0	120	120	25	1	16	2	-	-	No
73_1	73	1	19	1	-23	25	30	30	5	16	2	4	4	No
73_2	73	2	19	1	-23	35	40	40	3	16	2	3	4	No
73_3	73	3	19	1	-23	50	60	60	1	16	2	-	-	No
74_1	74	1	88	48	-61	35	20	25	5	16	2	4	4	No
74_2	74	2	88	48	-61	50	67	35	3	16	2	3	4	No
74_3	74	3	88	48	-61	75	100	50	1	16	2	-	-	No
75_1	75	1	90	-42	0	15	40	40	5	16	2	4	4	No
75_2	75	2	90	-42	0	20	50	50	3	16	2	3	4	No
75_3	75	3	90	-42	0	30	75	75	1	16	2	-	-	No
76_1	76	1	20	87	-34	8	30	20	5	16	2	-	-	No
76_2	76	2	20	87	-34	15	60	40	3	16	2	-	-	No
76_3	76	3	20	87	-34	20	80	50	1	16	2	-	-	No
77_1	77	1	-55	45	20	10	6	8	5	16	2	-	-	No
77_2	77	2	-55	45	20	50	20	70	3	16	2	-	-	No
77_3	77	3	-55	45	20	50	20	70	1	16	2	-	-	No
80_1	80	1	85	75	-5	20	15	5	5	16	2	-	-	No
80_2	80	2	85	75	-5	50	40	10	3	16	2	-	-	No
80_3	80	3	85	75	-5	75	50	15	1	16	2	-	-	No
81_1	81	1	80	65	-5	20	15	5	5	16	2	-	-	No
81_2	81	2	80	65	-5	60	40	20	3	16	2	-	-	No
81_3	81	3	80	65	-5	125	100	35	1	16	2	-	-	No
82_1	82	1	65	60	-5	20	15	5	5	16	2	-	-	No
82_2	82	2	65	60	-5	50	40	10	3	16	2	-	-	No
82_3	82	3	65	60	-5	100	75	20	1	16	2	-	-	No
83_1	83	1	78	70	-5	40	35	5	5	16	2	-	-	No

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data	Maximum samples per octant	High grade restriction
			Z	Y	Z	X	Y	Z	Min	Max	Max per hole			
83_2	83	2	78	70	-5	65	50	15	3	16	2	-	-	No
83_3	83	3	78	70	-5	150	125	60	1	16	2	-	-	No
84_1	84	1	65	55	-5	30	20	10	5	16	2	-	-	No
84_2	84	2	65	55	-5	60	45	10	3	16	2	-	-	No
84_3	84	3	65	55	-5	100	75	20	1	16	2	-	-	No
85_1	85	1	90	50	-5	20	15	5	5	16	2	-	-	No
85_2	85	2	90	50	-5	50	40	10	3	16	2	-	-	No
85_3	85	3	90	50	-5	100	75	20	1	16	2	-	-	No
86_1	86	1	90	65	0	20	15	5	5	16	2	-	-	No
86_2	86	2	90	65	0	50	40	10	3	16	2	-	-	No
86_3	86	3	90	65	0	100	75	20	1	16	2	-	-	No
87_1	87	1	-85	-70	-5	20	15	5	5	16	2	-	-	No
87_2	87	2	-85	-70	-5	50	40	10	3	16	2	-	-	No
87_3	87	3	-85	-70	-5	100	75	20	1	16	2	-	-	No
97_1	97	1	50	-10	-50	10	5	20	5	16	2	-	-	No
97_2	97	2	50	-10	-50	20	15	30	3	16	2	-	-	No
97_3	97	3	50	-10	-50	40	25	70	1	16	2	-	-	No
201_1	201	1	0	13	65	8	15	15	5	16	2	-	-	No
201_2	201	2	0	13	65	20	80	100	3	16	2	-	-	No
201_3	201	3	0	13	65	30	120	150	1	16	2	-	-	No
202_1	202	1	-18	45	-1	30	5	6	5	16	2	-	-	No
202_2	202	2	-18	45	-1	80	18	30	3	16	2	-	-	No
202_3	202	3	-18	45	-1	120	25	60	1	16	2	-	-	No
204_1	204	1	-25	-60	5	15	5	25	5	16	2	-	-	No
204_2	204	2	-25	-60	5	20	7.5	65	3	16	2	-	-	No
204_3	204	3	-25	-60	5	30	10	100	1	16	2	-	-	No
205_1	205	1	22	58	67	15	15	5	5	16	2	-	-	No
205_2	205	2	22	58	67	22	65	10	3	16	2	-	-	No
205_3	205	3	22	58	67	35	100	15	1	16	2	-	-	No
206_1	206	1	22	58	67	15	15	5	5	16	2	-	-	No
206_2	206	2	22	58	67	22	65	10	3	16	2	-	-	No
206_3	206	3	22	58	67	35	100	15	1	16	2	-	-	No
208_1	208	1	-24	-26	-10	20	18	30	5	16	2	-	-	No

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data	Maximum samples per octant	High grade restriction
			Z	Y	Z	X	Y	Z	Min	Max	Max per hole			
208_2	208	2	-24	-26	-10	40	20	60	3	16	2	-	-	No
208_3	208	3	-24	-26	-10	100	30	70	1	16	2	-	-	No
209_1	209	1	10	-7	-97	20	30	30	5	16	2	-	-	No
209_2	209	2	10	-7	-97	25	45	60	3	16	2	-	-	No
209_3	209	3	10	-7	-97	45	90	120	1	16	2	-	-	No
213_1	213	1	50	-50	0	5	20	10	5	16	2	-	-	No
213_2	213	2	50	-50	0	10	30	20	3	16	2	-	-	No
213_3	213	3	50	-50	0	15	45	30	1	16	2	-	-	No
214_1	214	1	10	22	80	10	20	30	5	16	2	-	-	No
214_2	214	2	10	22	80	15	30	50	3	16	2	-	-	No
214_3	214	3	10	22	80	50	100	150	1	16	2	-	-	No
300_1	300	1	90	-15	5	10	20	25	5	16	2	-	-	No
300_2	300	2	90	-15	5	15	35	40	3	16	2	-	-	No
300_3	300	3	90	-15	5	20	50	60	1	16	2	-	-	No
301_2	301	1	100	-53	299	38	24	12	3	16	2	-	-	No
301_3	301	2	100	-53	299	51	32	16	1	16	2	-	-	No
302_2	302	1	297	-18	238	54	48	29	3	16	2	-	-	No
302_3	302	2	297	-18	238	82	73	45	1	16	2	-	-	No

Table 14.26 – Sample search parameters for Jeffrey

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data	Maximum samples per octant	High grade restriction
			Principal azimuth	Principal dip	Intermediate azimuth	X	Y	Z	Min	Max	Max per hole			
01_UPD_2	1	1	292.5	7.5	71.9	50.8	42.6	33.3	5	16	2	2	5	Yes
01_UPD_3	1	2	292.5	7.5	71.9	89.127	70.958	55.549	3	16	2	-	-	No
10_UPD_2	10	1	247.5	26.428	296.013	24.707	17.459	13.083	3	16	2	2	5	No
10_UPD_3	10	2	247.5	26.428	296.013	32.943	23.278	17.44	1	16	-	-	-	No
11_UPD_2	11	1	262.5	-0.6	168.8	46.3	29.4	18.6	5	16	2	2	5	No
11_UPD_3	11	2	262.5	-0.6	168.8	61.776	39.138	24.74	1	16	-	-	-	No
12_UPD_2	12	1	91	-44.7	310.5	43.3	21.9	15.3	5	16	2	2	5	No
12_UPD_3	12	2	91	-44.7	310.5	57.7	29.3	20.4	1	16	-	-	-	No
13_UPD_3	13	1	247.5	26.428	296.013	32.943	23.278	17.44	1	16	-	-	-	No

Table 14.27 – Sample search parameters for Western Porphyry

Interpolation profile	Rock code	Pass	Rotation			Sample search			Sample			Minimum octants with data X	Maximum samples per octant Y	High grade restriction Z
			Principal azimuth	Principal dip	Intermediate azimuth	X	Y	Z	Principal azimuth	Principal dip	Intermediate azimuth			
1_OFF_2A	1	1	190	7.411	278.05	65.9	49.1	36.1	5	15	3	2	5	Yes
1_OFF_3A	1	2	190	7.411	278.05	99.9	74.4	54.7	3	15	-	-	-	Yes
2_OFF_2A	2	1	315	29.562	44.804	41.7	30.3	23.1	5	15	2	-	-	Yes
2_OFF_3A	2	2	315	29.562	44.804	63.162	45.9	35	3	15	-	-	-	Yes
3_OFF_3A	3	1	310	-54.264	152.453	35.7	28.8	19.1	3	15	-	-	-	Yes
10_OFF_2	10	1	202.5	-15.063	80.315	29.1	22.3	16.5	5	15	4	-	-	No
10_OFF_3	10	2	202.5	-15.063	80.315	44.1	33.8	25.1	3	15	-	-	-	No
11_OFF_2A	11	1	283	-30.302	209.259	34.3	25.3	21.4	5	15	3	2	5	Yes
11_OFF_3A	11	2	283	-30.302	209.259	52	38.3	32.5	3	15	-	-	-	Yes
20_OFF_2	20	1	315	35.868	6.005	30	26.6	18.2	5	15	4	-	-	No
20_OFF_3	20	2	315	35.868	6.005	45.5	40.3	27.6	3	15	-	-	-	No
30_OFF_2	30	1	310	-54.264	152.453	23.6	19	12.6	5	15	4	-	-	No
30_OFF_3	30	2	310	-54.264	152.453	35.7	28.8	19.1	3	15	-	-	-	No

14.9 Unclassified Global Estimate

The tabulated unclassified mineral resources for the Canadian Malartic Property are presented in Tables 14.28 to 14.30 for various cut-off grades and for the two grade interpolation methodologies. Note that these tables are for comparative purposes only, therefore open-pit depletion was not taken into account. Also note that a grade interpolation comparison was not performed for the current resource estimate for Canadian Malartic, Barnat, and Gouldie zones; since the core of the resource is mostly unchanged for these zones, Table 14.28 is borrowed from Belzile and Gignac (2011).

Table 14.28 – Unclassified mineral resources, Canadian Malartic, South Barnat and Gouldie (Belzile and Gignac, 2011)

	OK Model			ID2 Model		
Cut-off (g/t)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)
0.001	756.2	0.59	14.41	756.1	0.59	14.41
0.10	633.6	0.70	14.19	611.1	0.72	14.17
0.20	494.6	0.85	13.53	481.0	0.88	13.55
0.30	398.3	1.00	12.77	391.8	1.02	12.84

	OK Model			ID2 Model		
Cut-off (g/t)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)
0.40	333.9	1.12	12.05	330.0	1.15	12.15
0.50	281.7	1.25	11.29	279.3	1.27	11.42
0.60	239.1	1.37	10.54	238.0	1.40	10.69
0.70	205.2	1.49	9.84	205.0	1.52	10.00
0.80	179.4	1.60	9.22	179.0	1.63	9.38
0.90	158.6	1.70	8.65	158.7	1.73	8.83
1.00	141.2	1.79	8.12	141.3	1.83	8.30

Table 14.29 – Unclassified mineral resources, Jeffrey

	OK Model			ID2 Model		
Cut-off (g/t)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)
0.20	13.4	0.55	0.237	13.0	0.57	0.237
0.25	11.1	0.62	0.221	11.1	0.63	0.223
0.30	9.6	0.67	0.208	9.7	0.68	0.211
0.35	8.6	0.71	0.197	8.5	0.72	0.199
0.40	7.6	0.76	0.186	7.5	0.77	0.186
0.50	5.9	0.85	0.160	5.7	0.88	0.160
0.60	4.5	0.95	0.136	4.3	0.98	0.135
0.70	3.5	1.03	0.115	3.3	1.09	0.114
0.80	2.6	1.12	0.095	2.5	1.20	0.095
0.90	1.9	1.22	0.076	1.8	1.31	0.078
1.00	1.4	1.34	0.059	1.4	1.43	0.065

Table 14.30 – Unclassified mineral resources, Western Porphyry

	OK Model			ID2 Model		
Cut-off (g/t)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)	Tonnes (Mt)	Grade (g/t)	Ounces (M oz)
0.20	24.9	0.49	0.389	23.7	0.49	0.370
0.25	19.8	0.56	0.353	18.9	0.55	0.335
0.30	15.7	0.63	0.317	15.0	0.62	0.301
0.35	13.2	0.69	0.291	12.7	0.68	0.277
0.40	11.4	0.74	0.269	11.0	0.73	0.256
0.50	9.2	0.80	0.238	8.7	0.80	0.223
0.60	7.3	0.87	0.205	6.6	0.88	0.187
0.70	5.5	0.94	0.166	4.8	0.96	0.149
0.80	3.8	1.03	0.126	3.4	1.06	0.115
0.90	2.5	1.12	0.089	2.2	1.16	0.084

	OK Model			ID2 Model		
Cut-off (g/t)	**Tonnes (Mt)**	**Grade (g/t)**	**Ounces (M oz)**	**Tonnes (Mt)**	**Grade (g/t)**	**Ounces (M oz)**
1.00	1.6	1.22	0.064	1.4	1.28	0.059

As shown in the tables, the results are very comparable. The discrepancy is generally less than 2% in ounces for all cut-offs. The ID2 model shows generally less tonnage at higher grades for slightly more ounces. The comparison shows that the OK model smoothes the data slightly more than the ID2 Model.

14.10 Grade Estimation Validation

The block model mineralized zones, voids and drill hole database were sliced vertically on 15, 25 or 30-metre intervals (depending on the location) and horizontally on 10-metre intervals. The attributes of the block model (rock code, grade, % solid) were first visually compared with the source data throughout the strike length of the deposit. The block model reproduces the wireframes well and the OK-based resource estimate was found to provide an appropriate local estimate of drill hole grades.

14.10.1 Composites vs. Interpolated Block

A common way to validate global grade estimation is to compare the average grade of the composites used in the estimate with the estimated grade of the interpolated blocks. If the drilling pattern is regular (no clustering of the data) and there is no distortion in the grade distribution, the two populations should show about the same mean. Table 14.31 presents the average grade of the cut 5m composites and of the blocks interpolated for each individual zones of the Canadian Malartic Property. It should be noted that comparison for Canadian Malartic, Barnat, and Gouldie- was not updated since 2011. That is why the zone 301 and 302 are missing from the table. Note that this table is for comparative purposes only, therefore open-pit depletion was not taken into account.

Table 14.31 – Comparison between composites and interpolated blocks

Deposit	Zone	Tonnage OK Model	Grade Composites	Grade OK Model	Difference OK/Composite
Canadian Malartic	10	337,094,083	0.230	0.207	-10.00%
	11	12,543,841	0.265	0.216	-18.49%
	12	75,379,562	0.206	0.206	0.00%
	21	43,012,662	1.821	1.705	-6.37%
	22	8,956,621	1.910	1.791	-6.23%
	30	1,994,635	1.862	1.746	-6.23%
	40	8,655,439	1.956	1.855	-5.16%
	51	2,306,725	1.500	1.480	-1.33%
	52	11,952,037	1.336	1.298	-2.84%
	60	5,538,919	1.545	1.519	-1.68%
	70	59,332,089	0.625	0.624	-0.16%
	71	57,941,849	0.732	0.734	0.27%
	72	9,736,623	0.544	0.506	-6.99%
	73	5,906,999	0.855	0.861	0.70%
	74	10,752,782	0.587	0.556	-5.28%
	75	2,905,215	0.506	0.507	0.20%
	76	1,991,000	0.573	0.601	4.89%
	77	3,305,500	0.682	0.654	-4.11%
	Total CM	659,306,581	0.518	0.492	-4.93%
Gouldie	80	2,447,500	1.243	1.137	-8.53%
	81	2,205,500	0.435	0.451	3.68%
	82	2,387,000	0.430	0.382	-11.16%
	83	15,047,999	0.684	0.628	3.68%
	84	3,250,500	0.724	0.693	-4.28%
	85	951,500	0.508	0.445	-12.40%
	86	3,261,500	0.544	0.426	-21.69%
	87	1,111,000	0.550	0.683	24.18%
	Total Gouldie	30,662,499	0.670	0.618	-7.69%
South Barnat	97	769,440	5.595	5.623	0.50%
	201	29,502,326	1.737	1.667	-4.03%
	202	10,719,682	1.534	1.580	3.00%
	204	4,176,377	1.028	0.991	-3.60%
	205	2,189,000	0.813	0.849	4.43%
	206	2,879,884	1.306	1.116	-14.55%
	208	2,566,251	1.815	1.855	2.20%

Deposit	Zone	Tonnage OK Model	Grade Composites	Grade OK Model	Difference OK/Composite
(…suite) South Barnat	209	4,959,413	1.449	1.420	-2.00%
	213	679,120	0.645	0.484	-24.96%
	214	7,410,476	1.527	1.538	0.72%
	300	4,736,200	0.701	0.751	7.13%
	Total South Barnat	70,588,169	1.541	1.512	-1.84%
Jeffrey	LG01	11,083,254	0.39	0.34	-12.82%
	HG10	299,936	1.14	1.10	-3.51%
	HG11	2,153,632	0.92	0.94	2.17%
	HG12	1,997,908	0.79	0.76	-3.80%
	HG13	93,160	1.14	1.24	8.77%
	Total Jeffrey	15,627,890	0.6	0.5	-16.67%
Western Porphyry	PORPH_1	17,256,801	0.23	0.19	-17.39%
	PORPH_2	3,789,500	0.34	0.22	-35.29%
	PORPH_3	2,027,250	0.36	0.18	-50.00%
	HG_10	1,499,900	0.75	0.74	-1.33%
	HG_11	14,696,901	0.49	0.34	-30.61%
	HG_20	1,852,350	0.91	0.82	-9.89%
	HG_30	2,756,000	0.77	0.62	-19.48%
	Total Western Porphyry	43,878,702	0.51	0.32	-37.25%

From the table, one can see that the OK estimate is on average about -5.02% (lower) than the corresponding grade of the composites for the Canadian Malartic Deposit, -1.95% for the Barnat South Deposit, -7.76% for the Gouldie Deposit, -16.67% for the Jeffrey Zone, and -37.25% for the Western Porphyry Zone. In the case of the Canadian Malartic Deposit, this is something that can be expected for two main reasons.

The first reason is the fact that the drill hole data are clustered in some of the high grade zones because the historical underground drilling (by Canadian Malartic Mines) is concentrated in the highest grade portions of the deposits. The restrictions that are imposed in the resource estimate (maximum composites per octants) help to fragment the data. The weight of the underground drilling is consequently more pronounced in the average grade of the composites than in the OK estimate.

The second reason is because there is a distance restriction for the high grade values in the low grade zone during grade interpolation. Therefore the influence of these higher values is higher in the average grade composites than in the OK estimate.

For the South Barnat Deposit, the comparison is very good as the difference is only 1.95% between the composites and the OK estimate.

The discrepancy is greater for the Gouldie area, the Jeffrey Zone and the Western Porphyry Zone. These zones are generally smaller and the drill hole density not always well distributed, creating some distortion in the grade distribution.

14.11 Classification And Resource Reporting

14.11.1 Classification

The resource classification definitions used for this report are those published by the Canadian Institute of Mining, Metallurgy and Petroleum in their document "*CIM Definition Standards for Mineral Resources and Reserves*".

Measured Mineral Resource: that part of a Mineral Resource for which quantity, grade or quality, densities, shape, 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.

Indicated Mineral Resource: 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.

Inferred Mineral Resource: that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Resource classification for the Canadian Malartic Property is based on the robustness of the various available data sources including:

- Quality and reliability of drilling and sampling data

- Presence of RC and/or production drilling
- Distance between sample points (drilling density)
- Confidence in the geological interpretation
- Continuity of the geologic structures and continuity of the grade within these structures
- Variograms models and their related ranges (first and second structures)
- Statistics of the data population
- Quality of assay data
- Tonnage factor

Based on these criteria, resources have been classified according to the data search used to estimate each block and also on the type of data used for the estimate.

Measured resources are limited to the blocks estimated in the first estimation pass and only within mineralized zones for which the recent drilling represents a high majority of the data (>65%). Additionally, all material within 20 metres of reach of either RC drilling or blast holes for the Canadian Malartic and Gouldie deposits was also classified as Measured.

Indicated resources correspond to the blocks estimated in the second estimation pass + the blocks estimated in the first pass but not classified as Measured.

Inferred resources correspond to the blocks estimated in the third estimation pass. All blocks interpolated in the Western Porphyry Zone were reclassified as Inferred due to drill hole orientation with regard to the main trend of the ore zone. A better understanding of the geology is necessary to convert these resources to Indicated and/or Measured categories in this zone.

The classification model has been reviewed on each level plan and some minor manual adjustments were made where needed.

14.11.2 Global Resources

Table 14.32 provides the resource estimation tabulation by category at the official cut-off grades for the OK model (the official model used for reporting).

Based on economic parameters explained later in this report (see Item 15), it was calculated that the break-even cut-off grade for the Canadian Malartic Property is variable and ranges between 0.277 g/t and 0.349 g/t using a gold price of US$1,300/oz.

At these cut-offs, the global Measured + Indicated (M&I) mineral resources totals 314.2 Mt at a grade of 1.07 g/t Au, representing 10.80 Moz gold. The Inferred resources represent 46.5 Mt at 0.77 g/t Au for 1.14 Moz gold.

Table 14.32 – Resources for the Canadian Malartic Property (OK Model – Global Resources)

Canadian Malartic Project - JUNE 2014 MINERAL RESOURCE ESTIMATE (GLOBAL RESOURCE)					
Resource Class	Cut-off Grade (g/t Au)	Potential Material	Tonnes	Capped Au (g/t)	Contained Au (oz)
Measured	0.277 - 0.349	Global	56,802,700	0.98	1,786,098
Indicated	0.277 - 0.349	Global	254,928,200	1.09	8,974,593
Stockpiles (Classified as Measured)			2,485,100	0.51	40,747
Grand Total (Measured + Indicated)			**314,216,000**	**1.07**	**10,801,438**
Inferred	0.277 - 0.349	Global	46,469,300	0.77	1,144,544

**Due to rounding, number totals may not match exactly.*

Cautionary note:

- *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. Also, note that the global resource is not constrained by an optimized pit shell. Therefore, it cannot be assumed that all of the global resource can be considered as potentially extractable by open-pit even though cut-offs presented here are based on open-pit potential.*
- *This resource statement is exclusive of all material owned by a third party (Abitibi Royalties) via a mining option agreement and joint venture (30% of the CHL-Malartic claims).*

14.11.3 In-Pit Resources (Including Stockpiles)

Based on economic parameters explained later in this report (see Item 15), a Whittle optimized pit shell was generated on M&I resources only (Canadian Malartic, South Barnat and Gouldie) and compared to the current pit design. Variations were judged non-significant and therefore the current pit design was used to constrain In-Pit resources. A Whittle optimized pit shell was also prepared by the Canadian Malartic Technical team for the Jeffrey Zone. No resource is currently declared as In-Pit for the Western Porphyry Zone.

As mentioned previously, the break-even cut-off grade for the Canadian Malartic Property is variable and ranges between 0.277g/t and 0.349g/t using a gold price of US$1,300/oz. Table 14.33 presents the resource estimation tabulation by category at the official cut-off grades for the OK model (the official model used for reporting).

At these cut-offs the global In-Pit M&I mineral resources totals 250.8 Mt at a grade of 1.12 g/t Au, representing 9.03 Moz gold. The Inferred In-Pit resource represents 6.3 Mt at 0.80 g Au/t for 0.16 Moz gold.

The stated mineral resources are not materially affected by any known environmental, permitting, legal title, taxation, socio-economic, marketing, political or other relevant issues to the best knowledge of the author. There are no known mining metallurgical infrastructure or other factors that materially affect this mineral resource estimate at this time.

Table 14.33 – Resources for the Canadian Malartic Property (OK Model – In-Pit Resources)

Canadian Malartic Project - JUNE 2014 MINERAL RESOURCE ESTIMATE (IN PIT + STOCKPILE)					
Resource Class	Cut-off Grade (g/t Au)	Potential Material	Tonnes	Capped Au (g/t)	Contained Au (oz)
Measured	0.277 - 0.349	Open Pit	51,770,200	0.99	1,648,184
Indicated	0.277 - 0.349	Open Pit	196,502,200	1.16	7,344,556
Stockpiles (Classified as Measured)			2,485,100	0.51	40,747
Grand Total (Measured + Indicated)			**250,757,400**	**1.12**	**9,033,487**
Inferred	0.277 - 0.349	Open Pit	6,342,400	0.80	162,246

**Due to rounding, number totals may not match exactly*.

Cautionary notes:

- *Mineral resources are not mineral reserves as they do not have demonstrated economic viability.*
- *The quantity and grade of the reported Inferred resources in this estimate are uncertain in nature. There has been insufficient exploration to define these resources as Indicated or Measured and it is uncertain whether further exploration would result in upgrading any of the Inferred resource to an Indicated or Measured category.*
- *The mineral resource is presented inclusive of mineral reserves, meaning that mineral reserves were not subtracted from the resources presented herein.*
- *While the results are presented undiluted and in situ, the reported mineral resources are considered to have reasonable prospects for economic extraction.*
- *The number of metric tons was rounded to the nearest hundred. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.*
- *This resource statement is exclusive of all material owned by a third party (Abitibi Royalties) via a mining option agreement and joint venture (30% of the CHL-Malartic claims).*

15. MINERAL RESERVE ESTIMATES

15.1 Reserve Block Model

The Canadian Malartic and Gouldie pits were prepared from a block model updated on January 1, 2014. These resource models were supplied as a Gemcom project file with the block model containing the following items: geological rock code, in-situ gold grade, resource category, density, and percent solid value. The percent solid value represents the percentage of intact rock mass with the remaining percentage representing the proportion of void created by past underground workings.

From this block model, a reserve block model was developed to integrate additional parameters such as mill recovery, dilution, mining zones, royalties and mining cost.

15.2 Open Pit Optimization

Open pit optimization was conducted to determine the optimal economic shape of the open pit in three dimensions. This task was undertaken using Whittle software, which is based on the Lerchs-Grossmann algorithm. The method works on a block model of the orebody and progressively constructs lists of related blocks that should or should not be mined. The method uses the values of the blocks to define a pit outline that has the highest possible total economic value, subject to the required pit slopes defined as structure arcs in the software. This section describes all the parameters used to calculate block values in Whittle.

15.3 Pit Design

The results of the Whittle optimization served as the basis for the final pit designs The optimization took into account the space needed for ramps and the constraints related to the presence of old excavations. Figure 15.1 shows the locations of the pits.

15.4 Summary of Whittle Parameters

Table 15.1 presents a summary of the parameters used in the optimization process. The base case selling price for gold is US$1300/oz with a selling cost of US$4.25/oz. Metallurgical recoveries are applied to zones in the Canadian Malartic, Barnat and Gouldie deposits, and these recoveries are based on the latest recovery tests per zone and historical mill performance. The total ore-based cost, which includes costs related to processing, general and administration, rehabilitation and the sustaining capital provision, total US$10.74 per tonne for Canadian Malartic and Barnat, US$7.34 for Gouldie.

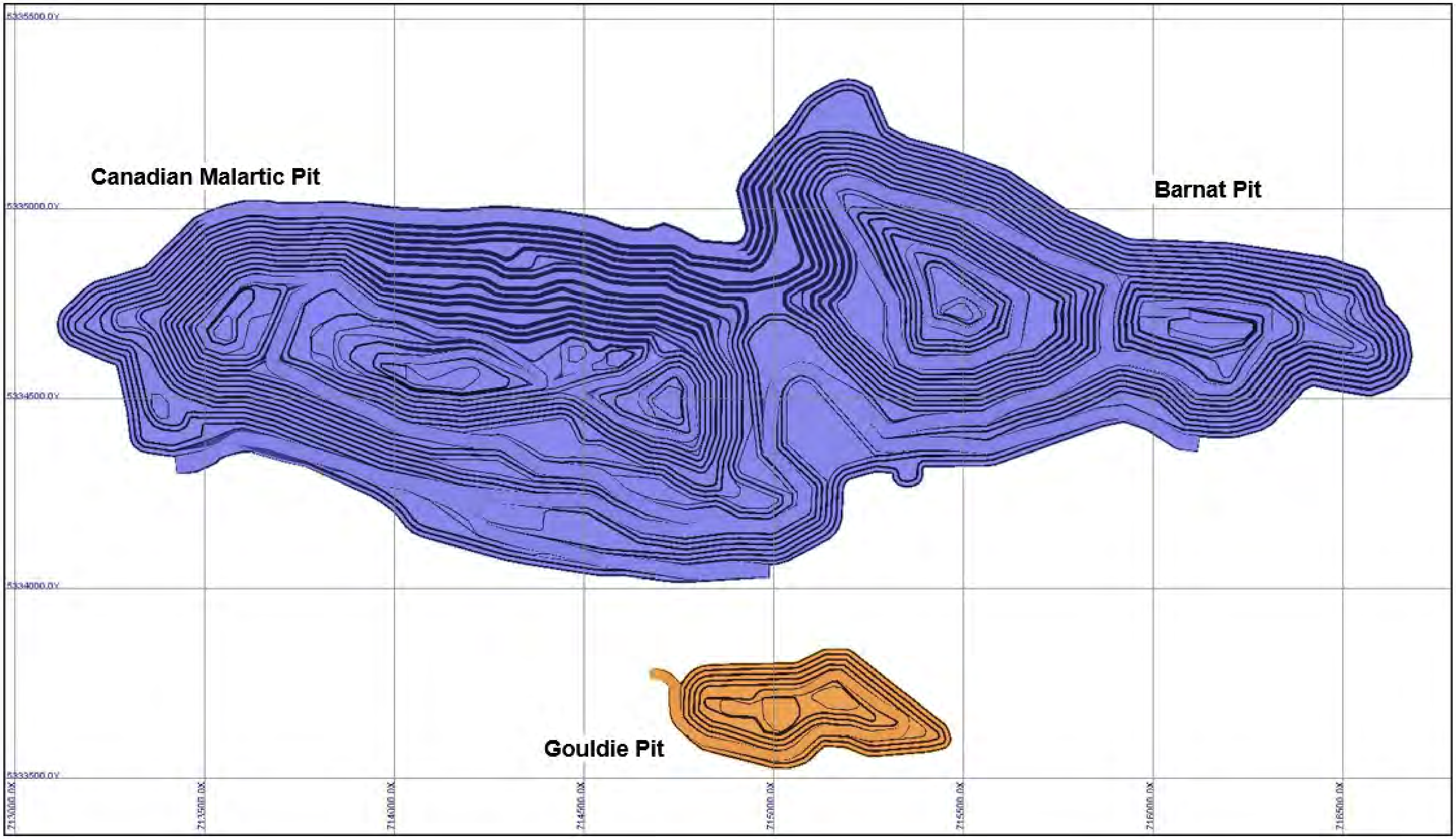

Figure 15.1 – Final pit design from the Whittle optimization showing the location of the pits

Table 15.1 – Summary of optimization parameters

Gold Price (US $/oz)	1300		
Exchange rate (CAD:USD)	1.10		
Selling cost (US $/oz)	4.25		
Royalties (%) Variable from 5% to 7.5%	Zone 0 = 0% Zone 1 = 1.5% when gold price higher than $350/oz Zone 2 = 2.0% Zone 3 = 2.0% Zone 4 = 1.5% Gross Overriding Metal Royalty Zone 5 = 1.5% Gross Overriding Metal Royalty All zones (0 to 5): 5% (Osisko Royalties Gold Ltd)		
Metallurgical recovery (%)	Barnat Piché Group: 0.0372 * LN(Au) + 0.9217, MAX (96.7%) Barnat Pontiac Group: 0.0265 * LN(Au) + 0.8846, MAX (92%) CM Zone 1 (West): 0.0495 * LN(Au) + 0.9184, MAX (93%) CM Zone 2 (East): 0.0358 * LN(Au) + 0.9052, MAX (91.5%) CM Zone 3 (South): 0.0465 * LN(Au) + 0.8778, MAX (89%) CM Zone 4 (North): 0.0575 * LN(Au) + 0.9149, MAX (92%) Gouldie: 0.0465 * LN(Au) + 0.8779, MAX (89%)		
	Barnat	***Canadian Malartic***	***Gouldie***
Milling (US $/t milled)	7.34	7.34	7.34
Additional transportation for ore (US $/t milled)	-	-	-
General & Admin. (US $/t milled)	2.12	2.12	0.00
Rehabilitation (US $/t milled)	0.00	0.00	0
Sustaining capital (US $/t milled)	0.81	0.81	0
Sustaining TMF (US $/t milled)	0.47	0.47	0
Total cost for processed tonnage (US $/t milled)	10.74	10.74	7.34
Average in-situ cut-off grade (g/t Au)	0.344	0.349	0.277
Average recovered cut-off grade (g/t Au)	0.298	0.298	0.226
Average metallurgical recovery (%)	90.1	89.1	81.9
Mining cost (US $/t mined)			
Zone 1 (US $/t):	4.69	4.69	
Zone 2 (US $/t):	4.13	4.13	
Zone 3 (US $/t):	3.32	3.32	
Zone 4 (US $/t):	2.67	2.67	
Zone 5 (US $/t):	2.28	2.28	
Contractor (US $/t):			2.68
Overburden (US $/t):	2.48	2.48	2.48
Incremental cost (US $/10m bench)	0.029	0.029	0.000
Mining dilution	8.00%	8.00%	8.00%
Mining loss	0.00%	0.00%	0.00%
Pit wall slope (Whittle)	Variable per geotechnical domain: Geotechnical zone 1:45 º Geotechnical zone 2.55 º Geotechnical zone 3.45 º Geotechnical zone 4.48 º Geotechnical zone 5.58 º(Gouldie)		

15.4.1 Hard Boundaries

A hard boundary was established to limit pit shell expansion towards the town of Malartic. The Canadian Malartic Project established an area in the southern part of the town that had to be relocated in order to allow for the development of the open pit. For this reason, a hard boundary was established by assigning arbitrarily high costs to blocks in a buffer zone to be created between the open pit and the town.

15.4.2 Pit Shell Results

Using the Whittle program, a series of potential pit shells were designed with different gold prices. The optimal pit shells produced with the Lerchs-Grossmann algorithm were used as a guideline for the pit design.

15.4.3 Selling Gold Price

A base case gold price of US$1300 per ounce at an exchange rate of 1.1 CAD/USD was used for pit optimization and for economic evaluation. However, a range of pit shells at various gold prices were generated and used to schedule the pit.

15.4.4 Selling Cost

Transportation costs from the Val-d'Or area to the refineries is US$4.25 per gold ounce for the Canadian Malartic Mine and all other deposits.

15.4.5 Royalties

Of the 208 mining titles comprising the Canadian Malartic Property, 101 are subject to royalties established either on a net smelter return (NSR) or a gross overriding metal royalty (GOMR). Mining titles subject to royalties are outlined in Table 15.2 and can be regrouped into five royalty packages. The royalty land packages are presented in Figure 15.2.

Table 15.2 – Mining claims subject to royalties

Mining Titles	Agreements and Encumbrances	Royalty Package
CM 226 CL 3941621 CL 3941633 CL 3941634 CL 3941635 CL 3950771 CL 3950772	- Titles are subject to a sliding 1% to 1.5% NSR payable to RG Exchangeco Inc. The royalty is tied to the price of gold, with the higher rate taking effect if the gold price is greater than $350/oz. - Titles are subject to a 5% NSR payable to Osisko Royalties Gold Ltd.	1
CL 5144234 CL 5144235 CL 5144236 CL 5144237 CL 5144238 CL 5144239	- Claims are subject to a 2% NSR payable to Mike Lavoie. The entire royalty may be purchased back by Canadian Malartic GP for $2 M. - Titles are subject to a 5% NSR payable to Osisko Royalties Gold Ltd.	2
CDC 72271	- Claim is subject to a 2% NSR payable to Abitibi Royalties Inc. - Titles are subject to a 5% NSR payable to Osisko Royalties Gold Ltd.	3
CDC 2000854 CDC 2000855 CDC 2000856 CDC 2000857 CDC 2000858 CDC 2000859	- Titles are subject to a 1.5% Gross Overriding Metal Royalty (GOMR) payable to Franco Nevada Corporation. - Titles are subject to a 5% NSR payable to Osisko Royalties Gold Ltd.	4
CDC 2001055	- Titles are subject to a 1.5% Gross Overriding Metal Royalty (GOMR) payable to Franco Nevada Corporation. - Titles are subject to a 5% NSR payable to Osisko Royalties Gold Ltd.	5

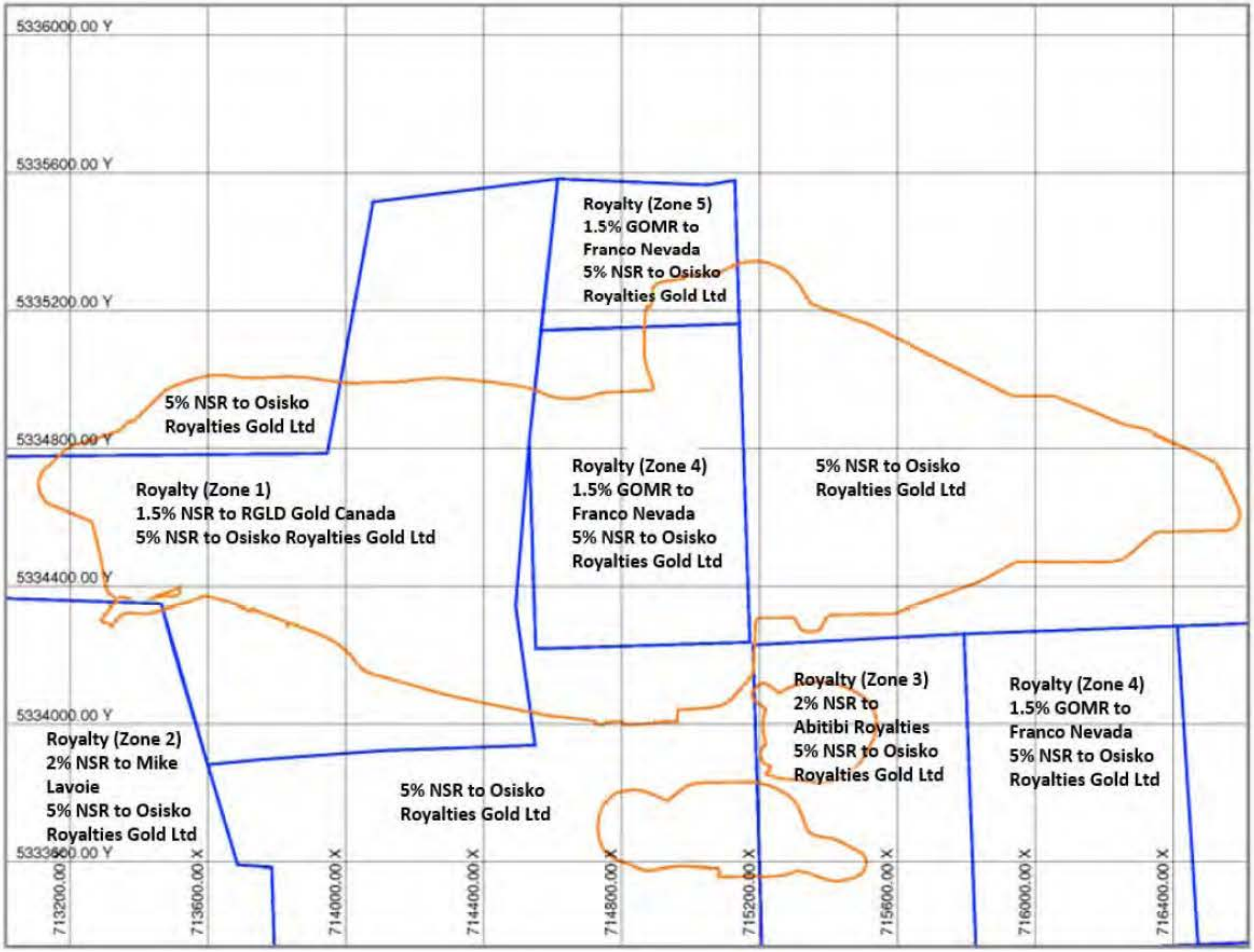

Figure 15.2 – Royalty zones, Canadian Malartic Property

15.4.6 Mill Recovery

Metallurgical recoveries have been established as a function of head grade and by domains in the pit based on extensive metallurgical testing and historical mill performance. Testwork results were analyzed based on the location of samples in the orebody, which led to the establishment of seven domains (Figure 15.3) characterized by metallurgical recovery equations as follows:

- Barnat Piché Group: 0.0372 * LN(Au) + 0.9217, MAX (96.7%)
- Barnat Pontiac Group: 0.0265 * LN(Au) + 0.8846, MAX (92%)
- CM Zone 1 (West): 0.0495 * LN(Au) + 0.9184, MAX (93%)
- CM Zone 2 (East): 0.0358 * LN(Au) + 0.9052, MAX (91.5%)
- CM Zone 3 (South): 0.0465 * LN(Au) + 0.8778, MAX (89%)
- CM Zone 4 (North): 0.0575 * LN(Au) + 0.9149, MAX (92%)
- Gouldie: 0.0465 * LN(Au) + 0.8779, MAX (89%)

The recovery equations were used to create a recovered gold grade model that was subsequently used during the optimization process.

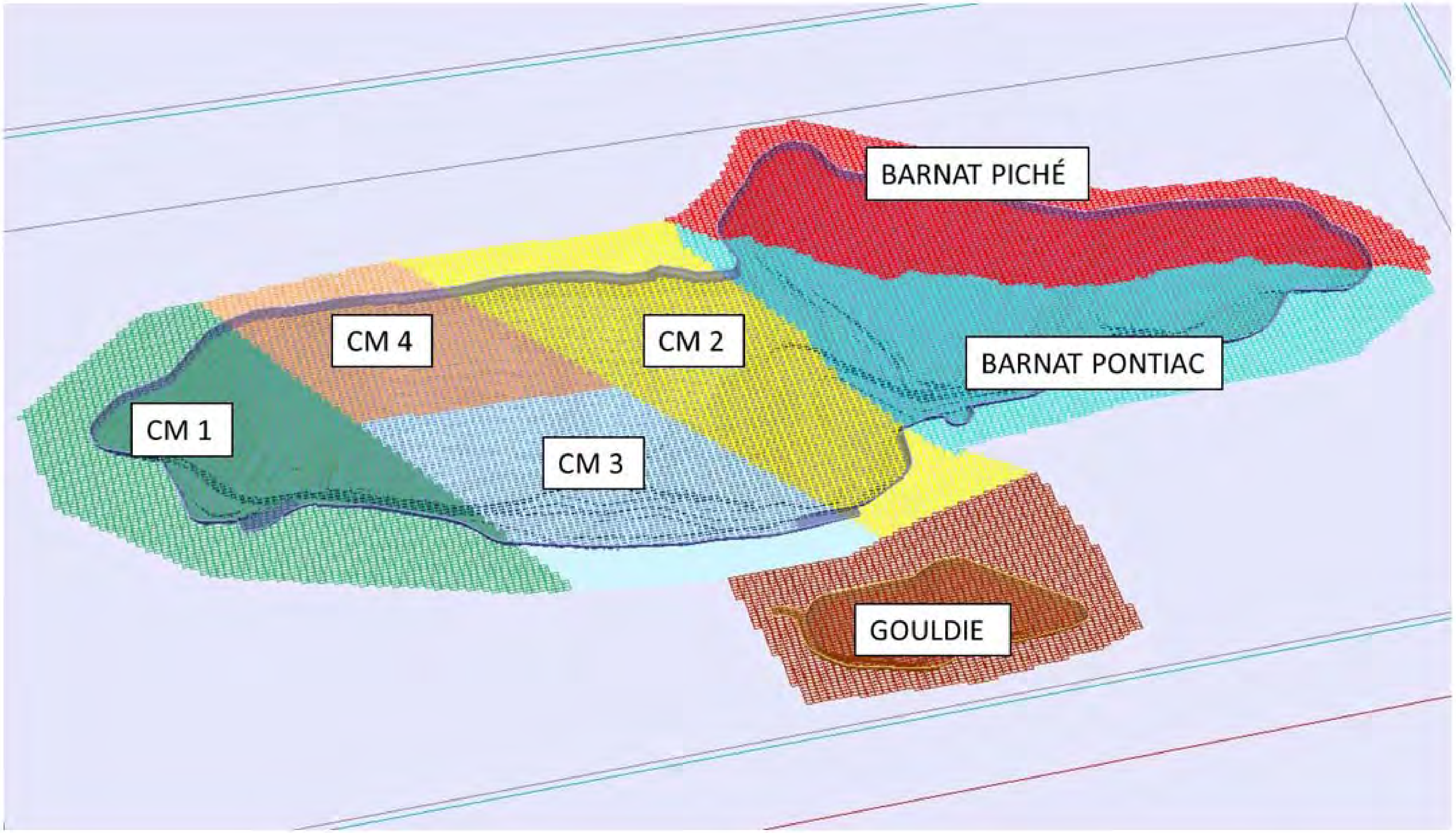

Figure 15.3 – Metallurgical domains modelled as optimization parameters

15.4.7 Processing Costs

Processing costs, including tailings management facility (TMF) costs, that were used for the pit optimization and cut-off estimation amount to US$7.34 per tonne milled based on a milling rate of 55,000 tpd.

15.4.8 General and Administration Costs

The general and administrative (G&A) costs for the pit optimization amount to US$2.12 per tonne milled based on actual annual expenses. The G&A costs include those associated with support functions such as purchasing and warehousing, accounting, environmental management, health and safety, human resources, insurance and general management.

15.4.9 Sustaining Capital

Included in the ore-based cost is the estimated sustaining capital provision of US$0.81 per tonne to maintain the operation (such as the purchase of replacement equipment) as well as a TMF sustaining capital cost of US$0.47 per tonne. These costs were considered in the optimization process for a total of US$1.28 per tonne milled.

15.4.10 Mining Costs

Detailed mining costs were estimated for all activities of the mining cycle. Drilling and blasting costs have been determined for certain zones of the pit to limit environmental nuisances. The reference mining cost is presented in Table 15.3. In addition to the reference hauling cost from the pit rim to the waste dump, an incremental haulage cost with depth has been estimated for ramping out of the pit. The incremental cost is estimated at US$0.029 per tonne mined, per 10-metre bench.

Table 15.3 – Reference mining cost per tonne mined (in US $)

Unit costs (US $/t)	Mining Zone 1	Mining Zone 2	Mining Zone 3	Mining Zone 4	Mining Zone 5	Mining Zone 6
	89 mm holes double deck	89 and 140 mm holes single or double deck	140 mm holes double deck	216 mm holes double deck	216 mm holes single deck	216 mm holes single deck
Drilling	1.091	0.855	0.673	0.264	0.218	0.218
Blasting	1.891	1.564	0.936	0.700	0.355	0.564
Loading, hauling and other	1.709	1.709	1.709	1.709	1.709	1.709
Total cost	**4.69**	**4.13**	**3.32**	**2.67**	**2.28**	**2.49**

A mining cost model was constructed in Gemcom that was subsequently exported for optimization in Whittle. The unit mining costs by elevation are presented in Table 15.4. Below the 260 level, blasting mats are no longer required thereby reducing the mining cost by US$0.38 per tonne.

Table 15.4 – Mine operating costs (US $/t mined) by surface reference level

Surface RL	Mining Zone 1	Mining Zone 2	Mining Zone 3	Mining Zone 4	Mining Zone 5	Mining Zone 6
320	4.69	4.13	3.32	2.67	2.28	2.49
310	4.72	4.16	3.35	2.70	2.31	2.52
300	4.75	4.18	3.38	2.73	2.34	2.55
290	4.78	4.21	3.40	2.76	2.37	2.58
280	4.81	4.24	3.43	2.79	2.40	2.61
270	4.83	4.27	3.46	2.82	2.43	2.63
260	4.86	4.30	3.49	2.84	2.45	2.66
250	4.51	3.95	2.50	2.31	2.31	2.31
240	4.54	3.98	2.53	2.34	2.34	2.34
230	4.57	4.01	2.56	2.37	2.37	2.37
220	4.60	4.03	2.59	2.40	2.40	2.40
210	4.63	4.06	2.62	2.43	2.43	2.43
200	4.66	4.09	2.65	2.46	2.46	2.46
190	4.68	4.12	2.67	2.48	2.48	2.48
180	4.71	4.15	2.70	2.51	2.51	2.51
170	4.74	4.18	2.73	2.54	2.54	2.54
160	4.77	4.21	2.76	2.57	2.57	2.57
150	4.80	4.23	2.79	2.60	2.60	2.60
140	4.83	4.26	2.82	2.63	2.63	2.63
130	4.86	4.29	2.85	2.66	2.66	2.66
120	4.88	4.32	2.88	2.68	2.68	2.68
110	4.91	4.35	2.90	2.71	2.71	2.71
100	4.94	4.38	2.93	2.74	2.74	2.74
90	4.97	4.41	2.96	2.77	2.77	2.77
80	5.00	4.44	2.99	2.80	2.80	2.80
70	5.03	4.46	3.02	2.83	2.83	2.83
60	5.06	4.49	3.05	2.86	2.86	2.86
50	5.09	4.52	3.08	2.89	2.89	2.89
40	5.11	4.55	3.11	2.91	2.91	2.91
30	5.14	4.58	3.13	2.94	2.94	2.94
20	5.17	4.61	3.16	2.97	2.97	2.97
10	5.20	4.64	3.19	3.00	3.00	3.00

Surface RL	Mining Zone 1	Mining Zone 2	Mining Zone 3	Mining Zone 4	Mining Zone 5	Mining Zone 6
0	5.23	4.67	3.22	3.03	3.03	3.03
-10	5.26	4.69	3.25	3.06	3.06	3.06
-20	5.29	4.72	3.28	3.09	3.09	3.09
-30	5.32	4.75	3.31	3.12	3.12	3.12
-40	5.34	4.78	3.33	3.14	3.14	3.14
-50	5.37	4.81	3.36	3.17	3.17	3.17
-60	5.40	4.84	3.39	3.20	3.20	3.20
-70	5.43	4.87	3.42	3.23	3.23	3.23
-80	5.46	4.89	3.45	3.26	3.26	3.26

15.4.11 Mining Dilution and Ore Losses

A routine was used to estimate mining dilution by first tagging all blocks achieving their specific cut-off grade in the 3D block model. Then, any ore blocks that do not touch at least one other ore block are considered waste. If a block that has not been tagged as ore is surrounded by ore blocks, it is tagged as ore and considered as internal dilution. This routine only assesses neighbouring blocks on a bench and does not consider the bench above or below. Once all the ore blocks have been tagged, a routine is developed to consider a 1-metre dilution along the ore-waste contacts.

The calculated dilution using this method is 8%. This estimate provides a reasonable evaluation across the bench.

Mining of the orebody will have to contend with the voids left from past underground mines. Mining of the crown pillars above the open stopes will occur during open pit mining where blasted mineralization will fall into the open stopes. Unlike the 2013 reserves, the January 2014 reserves include the pillars of crowns that are now considered recoverable based on mining experience gained in 2013. No additional mine recovery factors were applied. The mineral reserve estimate does not consider mining loss.

15.4.12 Overall Slope Angles

Golder Associates provided feasibility-level pit slope design criteria for the Canadian Malartic and Barnat pits. The geotechnical domains are presented in Figure 15.4.

Structural data is favourable to the excavation of moderately steep to steep slopes in all other areas except the northeast sector of Canadian Malartic. A pre-split would enable the development of steeper slopes with a designed 8.5 m catch bench, 20 m intervals, 75° bench face angle for an inter-ramp angle of 55° for all sectors of Canadian Malartic except the northeast sector. In the northeast sector, with a pre-split, the slope is designed with an 8.0 m catch bench, 20 m final bench height, 60° bench face angle for an inter-ramp angle of 46°.

Since the feasibility study of December 2008, Golder Associates has completed another feasibility pit slope study for the Barnat deposit. Two geotechnical domains were identified with respective geotechnical recommendations. The slope profile for the zone of the Cadillac Fault consists of a 9.5 m catch bench, 20 m final bench height, 70° bench face angle for an inter-ramp angle of 50°. The slope profile for the remaining sectors of the Barnat deposit consist of a 8.5 m catch bench, 20 m final bench height, 75° bench face angle for an inter-ramp angle of 55°. This slope profile is identical to that of Canadian Malartic, excluding its northeast sector.

The overall slope angles used in the optimization allow for inclusion of the ramp system. The overall slope angles used are presented in Table 15.5.

Table 15.5 – Overall slope angles

		Golder	2013	2014
Canadian Malartic	Northeast	46°	45°	45°
	Other areas	55°	55°	55°
Barnat	Cadillac Fault	50°	43°	45°
	Other areas	55°	47°	48°
Gouldie	All areas		45°	48°

- *Geotechnical Zone 1: 45°*
- *Geotechnical Zone 2: 55°*
- *Geotechnical Zone 3: 45°*
- *Geotechnical Zone 4: 48°*
- *Geotechnical Zone 5: 48° (Gouldie Zone)*

The northeast sector of Canadian Malartic was extended into the northwest sector of Barnat, up to the Cadillac Fault.

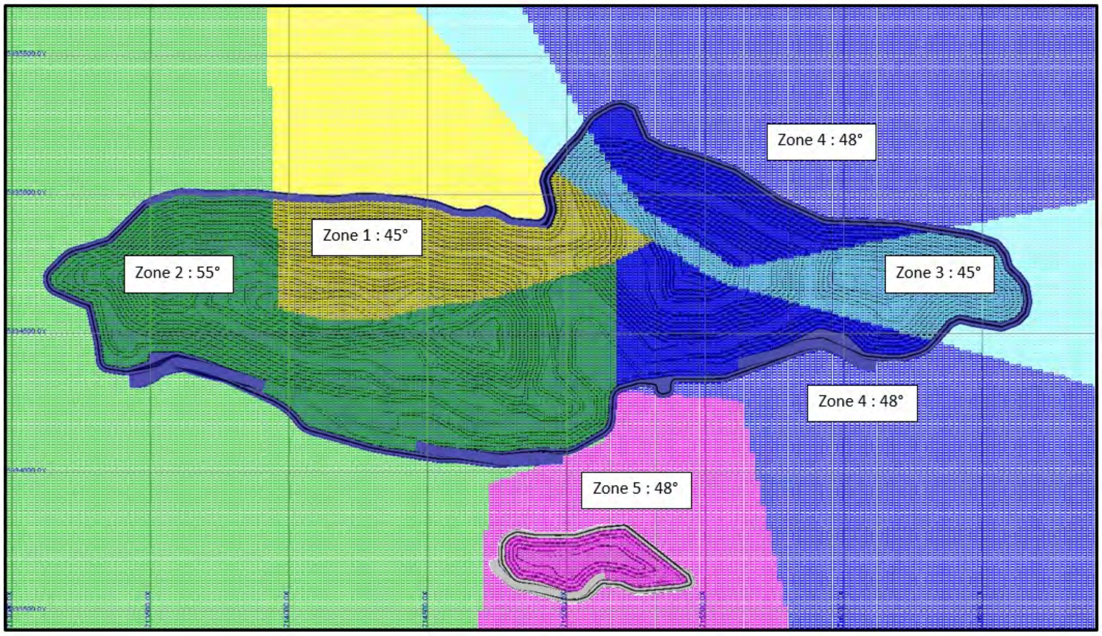

Figure 15.4 – Geotechnical domains of the Canadian Malartic, Barnat and Gouldie pits

15.4.13 Cut-Off Grades

Each cut-off grade (CoG) is calculated using parameters described in the above sections and presented in Table 15.6. The CoG is calculated on the basis of after-mining costs. The CoG is that grade where revenue from produced gold equals the cost of treating the ore, refining and selling the gold. It is defined as follows:

$$g = \frac{Cp + Ca + Cr + Com + Cscap + Cmc}{r * (P - Cs)}$$

g	Cut-off grade (g/t Au)
r	Metallurgical recovery (%)
P	Price of gold $/oz
Cs	Cost of selling (including royalties) $/oz Au
Cp	Total cost of processing $/t milled
Ca	Administration and services cost $/t milled
Cr	Re-handling cost $/t milled
Com	Additional ore mining cost $/t milled
Cscap	Sustaining capital in $/t milled
Cmc	Closure cost during life of mine in $/t milled

Using the pit optimization inputs, the pit discard (or incremental) cut-off grade for material that must be removed from the pit is 0.349 g/t Au (Canadian Malartic).

The CoG is variable depending on the applicable royalty rate. The in-situ CoG based on the above ore-based cost structure and gold price assumption varies between 0.28 to 0.35 g/t Au, as shown in Tables 15.1 and 15.6.

Table 15.6 – Cut-off grade (CoG) calculation parameters

Parameter	Units	CoG		
		Barnat Average	Canadian Malartic Average	Gouldie Average
Gold price	US $/oz	1300	1300	1300
Royalty	%	6.5%	6.5%	6.5%
Royalty	US $/oz	84.50	84.50	84.50
Refining cost	US $/oz	4.25	4.25	4.25
Cost of selling	US $/oz	88.75	88.75	88.75
Processing fixed cost	US $/t milled			
Processing consumables	US $/t milled			
Processing power	US $/t milled			
Total processing cost	US $/t milled	7.34	7.34	7.34
Metallurgical recovery (at cut-off value)	%	86.6%	85.4%	81.8%
Mining dilution	%	8.0%	8.0%	8.0%
Ore premium mining cost	US $/t milled	-	-	-
Tailings capital	US $/t milled	0.47	0.5	-
General % administration	US $/t milled	2.12	2.12	-
Rehabilitation	US $/t milled	-	-	-
Stay-in-business capital	US $/t milled	0.81	0.81	0.81
Total ore-based cost	US $/t milled	10.74	10.74	8.16
CoG	g/t Au	0.344	0.349	0.277
Recovered CoG	g/t Au	0.298	0.298	0.226

15.5 Mineral Reserves

The Canadian Malartic Property mineral reserve estimate includes open pit and stockpile reserves. The Mineral Reserves for the surface mine design are reported according to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) standards. As laid out in these standards, resource model blocks classified as Measured and Indicated are reported as Proven and Probable reserves, whereas

Inferred resources cannot be included in reserve estimates and therefore have not been included in the LOM schedule.

The ore outlines include a 1-metre dilution envelope around economic ore blocks and also enclose marginal material surrounded by economic mineralization. The dilution envelope and enclosed waste in most cases is mineralized, with an associated dilution grade. The ore tonnes and grades reported in the following tables include dilution as estimated from the detailed mining shapes. Dilution is estimated at 8.0%.

The total Proven and Probable mine reserves as of June 15, 2014 are estimated at 263.2 Mt at 1.06 g/t Au for 8,943,552 ounces (Table 15.7). The majority of the reserve tonnage (78.1%) is in the Probable category. The reserves include 2.5 Mt of stockpiled ore at an average grade of 0.51 g/t Au for 40,747 ounces.

Table 15.7 – Mineral reserve by category (June 15, 2014)

Sector	Tonnes (M)	Grade (g/t)	Au (M oz)
Canadian Malartic			
Proven Reserves	38.0	0.82	1.06
Probable Reserves	136.6	1.04	4.56
Proven and Probable Reserves	174.6	0.99	5.56
Barnat			
Proven Reserves	11.6	1.37	0.51
Probable Reserves	67.0	1.23	2.65
Proven and Probable Reserves	78.6	1.25	3.16
Gouldie			
Proven Reserves	5.5	0.71	0.13
Probable Reserves	2.0	0.83	0.05
Proven and Probable Reserves	7.5	0.74	0.18
Stockpiles			
Proven Reserves	2.5	0.51	0.04
Probable Reserves			
Proven and Probable Reserves	2.5	0.51	0.04
Total			
Proven Reserves	57.6	0.91	1.69
Probable Reserves	205.6	1.10	7.26
Proven and Probable Reserves	263.2	1.06	8.94

The reader should note that resources corresponding to the 70% interest in the CHL property have not been transferred to the Canadian Malartic GP. This 70% interest is held by Canadian Malartic Corporation (the successor to Osisko Mining Corporation), as Abitibi Royalties Inc. claims that its right of first refusal has been triggered (refer to section 24 for more details about this litigation). These resources, representing 0.12 Moz, may never be included in the mining plan by Canadian Malartic GP and thus cannot be considered as reserves.

15.5.1 Change from Last Reserve Estimate

In comparison with the estimation made in February 2014, there is a total depletion of 0.43 Moz. The differences can be explained by the extraction of 0.25 Moz from January to mid-June 2014 and the cut-off grade increase following the addition of the new 5% royalty. The new royalty caused the cut-off to be increased to 0.344 and 0.349 g/t at Barnat and Canadian Malartic respectively, compared to 0.327 and 0.332 g/t in February 2014. This represents a decrease of about 0.06 Moz compared to the January 2014 reserve estimation.

In addition, all of the reserves, representing 70% of interest, from the Jeffery Pit (3.20 Mt @ 0.69 g/t Au; 0.07 Moz) and a portion of the reserves from the NE portion of the Barnat Pit (1.46 Mt @ 0.99 g/t Au; 0.05 Moz) have been removed from the reserve category and reclassified as resources as these ounces are the subject of on-going litigation that could render them valueless depending on the outcome of the legal dispute.

15.5.2 Reserve Sensitivity

Sensitivity of the Proven and Probable reserves to gold price has been estimated using Whittle pit shells and lower cut-off grades. The results of the sensitivity analysis are presented in Table 15.8. Sensitivity was calculated using the surface and Whittle pit shells of January 1, 2014.

Table 15.8 – Reserve sensitivity

Gold Price (US $)	Cut-off Grade (g/t)	Average Grade (g/t)	Ore Tonnage (Mt)	In-Situ Ounces (M)	Difference vs. $1300 (M oz)	Difference vs. $1300 (%)
1000	0.45	1.23	203.7	8.03	-1.30	-14.0%
1100	0.41	1.14	236.7	8.69	-0.64	-6.9%
1200	0.38	1.10	255.8	9.02	-0.31	-3.3%
1300	0.35	1.06	274.2	9.34	0.00	0.0%
1400	0.32	1.02	291.8	9.64	0.30	3.3%
1500	0.30	1.00	305.2	9.83	0.50	5.3%

15.5.3 Tonnage and Grade Reconciliation

Tonnage and grade reconciliation between mineral reserves and production balanced with the mill is carried out by Canadian Malartic personnel on a monthly basis with an annual compilation. Table 15.9 presents the annual results since the start of production in 2010 up to May 2014. On an annual basis, the variance between mill production and mineral reserves, based on contained gold, has ranged from 3.4% to +6.1% with an average over the entire life of mine of +3.2% (including results as of May 2014). Although some variation occurs on a monthly basis, which is common in many operations, the overall reconciliation demonstrates good representativity of the block model and the production parameters used for the mineral reserves.

The 2013 reconciliation reveals a significant difference between reserves and production results, showing a gain of 6.1% in ounces. This gain is mainly explained by the fact that crown pillar ounces were not included in the reserves as it was thought that ore above the historical underground open stopes would not be recovered. In 2013, the Canadian Malartic operation established techniques to recover the ore that falls in the stopes. Since January 2014, crown pillars have been included in the reserves.

Grade control procedures, including sampling, assaying, ore limit determinations, estimation of blast movements, shoveling, and monitoring of ore/waste management, all follow industry standards. Protocols and procedures for the entire grade control and reconciliation aspect are well documented and easy to consult. Training of the technical staff as well as the operators follows that documentation.

The author is of the opinion that there is good reconciliation between mineral reserves and actual production results, and the records maintained by Canadian Malartic allow the changes in reconciliation to be studied over time. Based upon the reconciliation results, the author is of the opinion that the Mineral Reserve Estimation is reliable and can be used for mine planning in the short, medium and long term.

Table 15.9 – Annual Reconciliation Between Mineral Reserves and Production Balanced with Milling Results

Canadian Malartic Global Reconciliation	MINED				RESOURCES M + I	RESERVES P+P						
HG and LG Ore Balanced	Low Grade TONNES Au g/t	High Grade TONNES Au g/t	TOTAL TONNES Au g/t	Dil	TOTAL TONNES Au g/t	TOTAL TONNES Au g/t	Dil BM	Dil Diff Calc. Rsv vs Rsr	Production from the pit Oz	Reserves Oz	Gain/Lost vs reserve Oz %	Gain/Lost vs reserve Oz
2010	707 710	532 142	1 239 852	21%	1 184 866	1 279 656	8.0%	8%	32 115	32 319	-0.6%	(204)
	0.53	1.17	0.81		0.85	0.79						
2011	4 483 857	4 578 890	9 062 746	15%	7 910 591	8 895 231	7.2%	14%	233 950	225 922	3.6%	8 028
	0.54	1.06	0.80		0.88	0.79						
2012	7 273 417	8 403 934	15 677 352	14%	15 860 714	16 546 300	7.7%	5.4%	461 554	477 945	-3.4%	(16 391)
	0.56	1.22	0.92		0.99	0.90						
2013	4 983 862	12 040 257	17 024 119	9%	15 515 095	16 218 466	7.5%	4.6%	519 835	489 974	6.1%	29 861
	0.48	1.14	0.95		1.03	0.94						
JANUARY 2014	377 008	1 300 787	1 677 796	7.7%	1 244 601	1 317 633	6.4%	5.9%	60 424	47 082	28.3%	13 342
	0.49	1.30	1.12		1.17	1.11						
FEBRUARY 2014	221 675	1 068 340	1 290 016	8.5%	1 084 438	1 140 708	6.2%	5.2%	46 024	41 791	10.1%	4 233
	0.47	1.24	1.11		1.20	1.14						
MARCH 2014	394 649	1 094 025	1 488 674	9.0%	1 334 268	1 417 820	7.2%	6.3%	54 107	54 262	-0.3%	(156)
	0.50	1.36	1.13		1.26	1.19						
APRIL 2014	562 855	954 395	1 517 250	8.8%	1 259 774	1 360 676	7.7%	8.0%	42 780	41 161	3.9%	1 619
	0.44	1.13	0.88		1.00	0.94						
MAY 2014	344 027	1 117 815	1 461 842	10%	1 267 604	1 337 420	7.5%	6%	54 219	47 470	14.2%	6 748
	0.52	1.35	1.15		1.17	1.10						
TOTAL 2014 Year to date	1 900 214	5 535 363	7 435 576	8.8%	6 190 684	6 574 257	7.0%	6.2%	257 554	231 766	11.1%	25 787
	0.48	1.28	1.08		1.16	1.10						
Oz	29 354	228 200	257 554		230 879	231 766						
Gain/Lost vs Reserves			111.1%									
Life of Mine	19 349 060	31 090 585	50 439 645	12%	46 661 949	49 513 909	7.5%	7.0%	1 505 008	1 457 927	3.2%	47 081
	0.53	1.18	0.93		1.00	0.92						
Oz	327 867	1 177 141	1 505 008		1 504 234	1 457 927						
Gain/Lost vs Reserves			103.2%									

Crown pillars are excluded from Reserves until January 2014

16. MINING METHODS

Open pit optimization was conducted to determine the optimal economic shape of the open pit in three dimensions. This task was undertaken using Whittle software based on the Lerchs-Grossmann algorithm. The method works on a block model of the orebody and progressively constructs lists of related blocks that should or should not be mined. The method uses the values of the blocks to define a pit outline that has the highest possible total economic value, subject to the required pit slopes defined as structure arcs in the software. This section describes all the parameters used to calculate block values in Whittle.

16.1 Geotechnical Assessment

A pit slope design evaluation was completed by Golder Associates ("Golder") in 2012 to provide pit slope design recommendations for the expended pit (Golder, 2012c).

The formulated pit slope recommendations are based on:

- Geotechnical logging and core orientation using the Ace Core Tool (ACT II) of an estimated 670 m of NQ-3 diamond drill core from two boreholes;
- Televiewer surveying and reconciliation of the televiewer images with the core;
- Point load testing of the core;
- Laboratory testing if the rock differs from rock characterized for the previous geotechnical investigations;
- Documentation and assessment of geotechnical conditions.

16.1.1 Previous Feasibility Studies

Golder completed feasibility-level geotechnical investigations in support of feasibility studies for the Canadian Malartic pit (Golder, 2008a) and the Barnat pit (Golder, 2010b). The investigations included drilling geotechnical core holes in the vicinity of the final pit walls and geotechnical logging, sampling, and point load testing of the core. The core was oriented, and the core holes were also surveyed using optical and acoustic televiewers to obtain structural orientation data. The samples were sent to the Queen's University rock mechanics laboratory in Kingston, Ontario for strength testing.

The studies concluded that there appears to be little potential for rock mass or structural control of overall or inter-ramp slope angles, and that achievable pit slope angles will be determined by the bench configurations that can be safely developed and maintained. Recommended slope designs in bedrock include inter-ramp slope angles of 50° that should be readily achievable with good buffer blasting or 55° for slopes that warrant the care and cost of an effective pre-split, such as final pit slopes, except for the Northeast Sector of the Canadian Malartic pit and the Cadillac Fault Zone in the Barnat pit.

16.1.2 Canadian Malartic Pit

Differences between the previous combined pit and the revised expanded combined pit are generally minor in the Northwest Sector, the West Sector, and the west part of the South Sector of the Canadian Malartic pit, with changes consisting mostly of the walls moving in approximately 10 m or being pushed back 30-50 m (with respect to the map view location of the previous pit wall), and deepening of the pit by about 10-20 m locally (Figure 16.1).

In the Northeast Sector and the west part of the South Sector, the revised expanded pit pushes the benches back approximately 30-40 m except for the upper benches in the Northeast Sector, which move in about 20 m, and deepens the pit by about 10-20 m. The current design incorporates a geotechnical stability bench with a minimum width of 20 m into this slope at elevation 160 m to limit unbroken slope heights to a maximum of about 160 m.

The East Sector is the most changed, with the east wall being pushed to the east up to 280 m and the pit bottom deepened by about 60 m.

16.1.3 Canadian Malartic Extension in Barnat Zone

The revised expanded Canadian Malartic pit design widens the pit in all directions and deepens the pit by 50 m (Figure 16.1). Pit sectors are defined based on pit geometry, with additional sectors defined along the Cadillac Fault.

The crest of the central North Sector and the Northeast Sector walls have been pushed to the northeast approximately 70 m. At the northwest end of the North Sector, there is a “horseshoe” extension of the pit that pushes the crest a maximum of 150 m northeast of the previous design. The northwest end of the Cadillac West Sector is constrained so that the pit wall does not intersect the Dumas collapse zone, which is located immediately northwest of the sector.

In the east part of the Northeast Sector, the crest has been pushed about 120 m to the northeast, while the easternmost crest has been extended approximately 400 m to the east along the Cadillac Fault East Sector.

The wall in the South Sector is pushed back about 35 m.

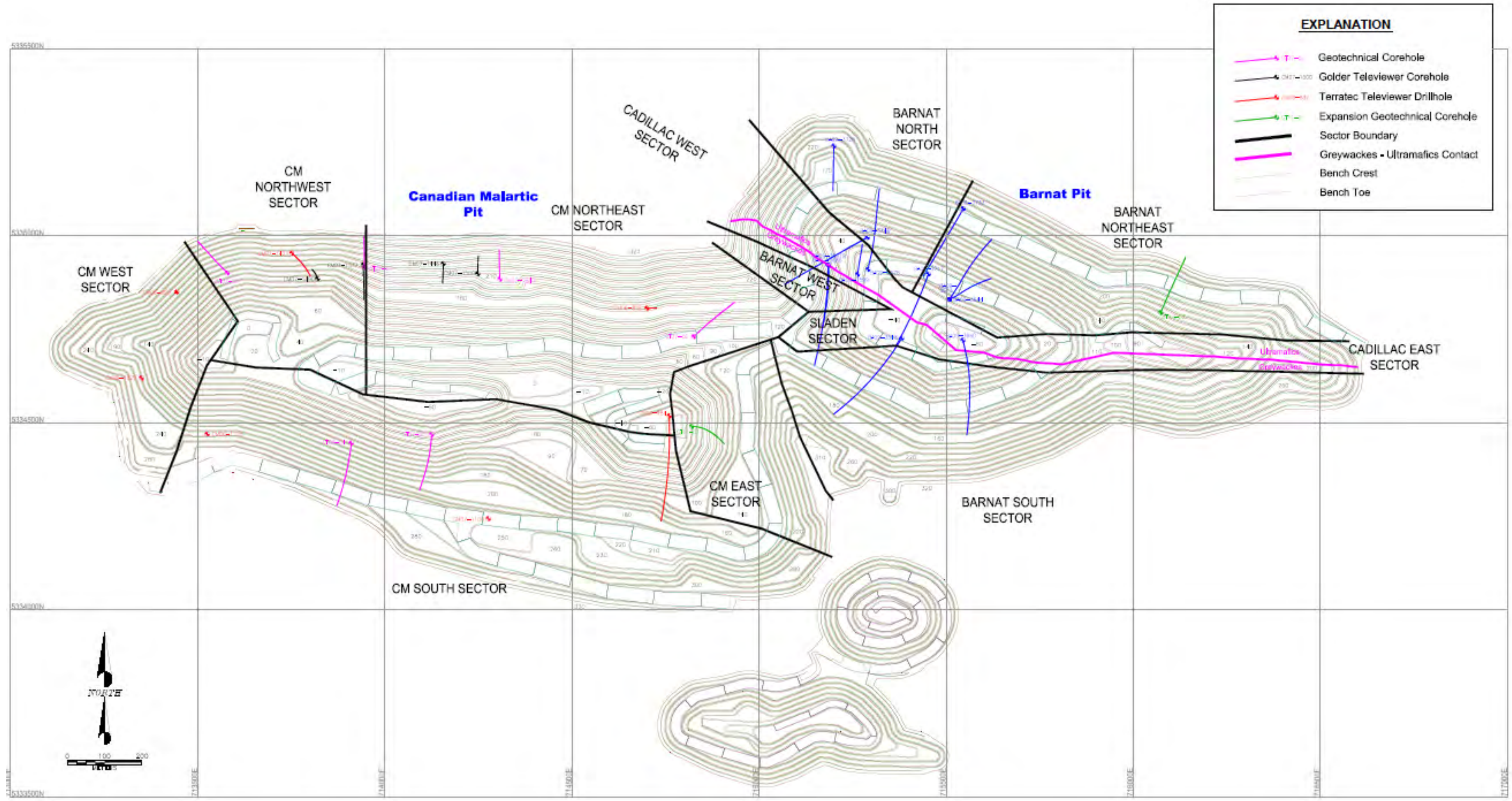

Figure 16.1 – 2012 revised expanded combined pit design showing drill hole and sector locations used by Golder (2012c)

16.1.4 2012 Pit Slope Design

Rock mass quality as indicated by the new geotechnical core holes in the expansion areas is at least as high as in the pit wall areas of the original pit designs. Laboratory UCS testing indicates the rock units encountered in the core holes classify as Strong Rock (R4) or stronger. Rock strength and rock mass quality are therefore not anticipated to limit pit slope angles in the expansion areas.

The structure encountered in the new geotechnical core holes is favourably oriented for the development of steep, stable pit slopes. In most sectors of the revised expanded combined pit, the dip directions of the pit slopes have not changed enough to warrant changes to Golder's previous recommendations in 2008 and 2010.

In the revised expanded combined pit design, the northwest wall of the Barnat pit has been constrained so that it does not intersect the Dumas collapse zone. This will preclude the need for a careful program of investigation and monitoring that would be required in combination with detailed operating plans to ensure the safety of operations and facilities within or immediately adjacent to the collapse zone. Investigation can now be limited to confirming that the collapse zone does not extend to the pit.

16.1.5 Northeast Sector Design Recommendations

Kinematic stability analyses indicate the potential for significant structurally-controlled planar failures along moderately south-dipping structures in the Northeast Sector. The Sladen fault/greywacke-porphyry contact dips 60° south in this sector. For this reason, it is recommended that bench faces in this sector be designed at 60° to reduce back-break and allow for the development of effective catch benches. A double bench configuration is suggested with 8 m catch benches at 20 m intervals, for an inter-ramp slope angle of 46°.

16.1.6 Remaining Sector Design Recommendations

Structural data is favourable to the excavation of moderately steep to steep slopes in all other areas except the Northeast Sector. Two slope profiles are recommended depending on the implementation of an effective pre-split or not. A design recommended with only buffer blasting would include a 9 m catch bench at 20 m intervals (double bench) and designed bench face angles of 69° for an inter-ramp slope angle of 50°. A pre-split would enable the development of steeper slopes with a designed 8.5 m catch bench at 20 m intervals and a 75° bench face angle for an inter-ramp angle of 55°. The implementation of a pre-split is the preferred approach to pit slope development. The recommended slope configurations to be implemented are presented in Figure 16.2.

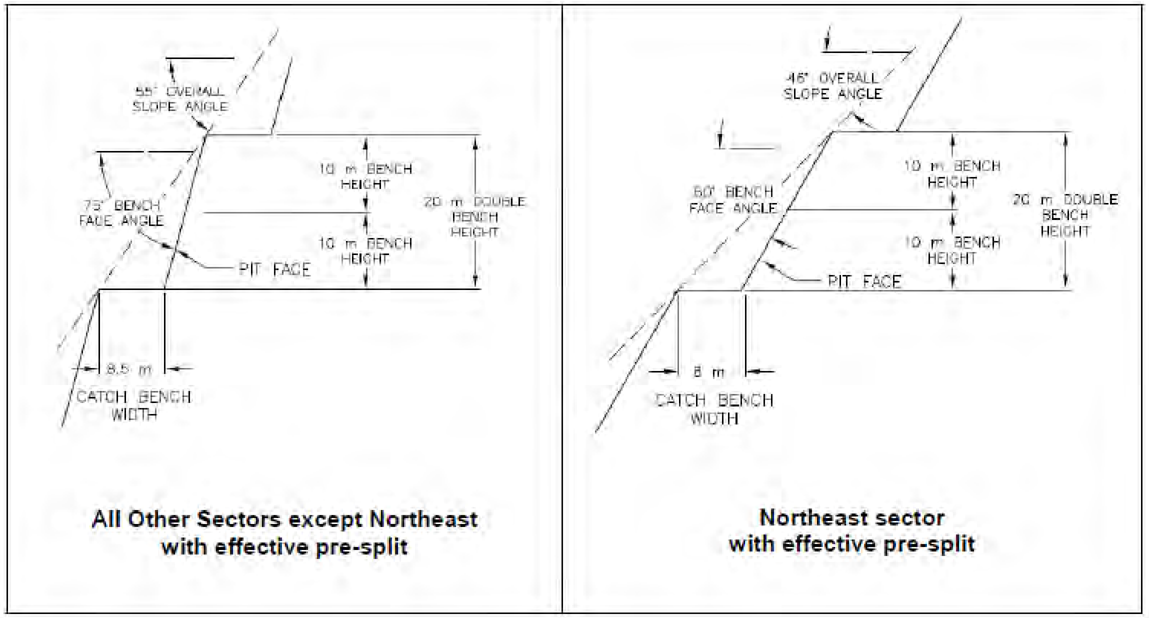

Figure 16.2 – Slope configurations (Source: Golder Associates)

16.2 Mine Design

The optimal pit shells produced with the Lerchs-Grossmann algorithm were used as a guideline for the pit design. The pit design process consists of designing ramp accesses to the bottom of the pit using the geotechnical recommendations guiding the bench geometry.

The shell selection process involves analyzing a series of graphs, tables and figures generated from Whittle and Gemcom. The NPV graphs generated from Whittle have distinct characteristics showing major changes to the economics of the pit.

The Whittle shells selected are further analyzed in Gemcom to address mining practicalities of the selected shells such as the distances from the underground openings.

16.2.1 Bench Geometry

The 2012 pit plan and design sectors are shown in Figure 16.1. According to Golder, the pit design is based on double benching of 10 m high production benches resulting in 20 m vertical spacing between catch benches. Where there is no identified structural control of bench stability that would result in bench face angles flatter than 75°, the design inter-ramp slope angle of 55° is an aggressive slope design based on the assumption of an effective pre-split to develop stable bench faces and effective catch benches. The recommended design inter-ramp slope angle is 5° flatter in these sectors with favorable structural conditions if an effective pre-split is not implemented.

Potential structural control of bench stability is identified only in the Northeast Sector, where the Sladen Fault dips at moderate angles to the south and fault-parallel structures are indicated to be a potential control of stability. Flatter design bench face angles and inter-ramp slope angles are incorporated into the design to account for this potential structural control of stability, resulting in a design inter-ramp angle of 46°. Slope design criteria are summarized in Table 16.1.

Table 16.1 – Canadian Malartic pit slope design criteria

Sector	Operating Practices	Bench Configuration and Height (m)	Catch Bench Width (m)	Bench Face Angle (°)	Inter-Ramp Slope Angle (°)
Northeast	Effective Pre-Split	Double Bench 2 x 10 m 20 m between catch benches	8	60	46
All Sectors Except Northeast	Effective Pre-Split to Break Along Structure	Double Bench 2 x 10 m 20 m between catch benches	8.5	75	55

The pit plan as of July 2012 is shown in Figure 16.3. The South Ramp has been developed in the South Sector with a final pit wall from the pit crest at approximate elevation 320 in the southwest corner of the pit to the current pit bottom elevation at the 280 Bench. The South Sector slope is generally at the final pit wall except at the east end. Final pit slopes have also been developed in the West Sector of the pit, although they are developed over significant heights only in the south portion of the sector. Only temporary slopes internal to the ultimate pit have been developed in the Northwest Sector. In the Northeast Sector, glacial deposits have been excavated to expose the underlying bedrock but there has been no slope development in rock in the vicinity of the ultimate pit slopes. All final pit walls are developed using a pre-split inclined at 75° and drilled to a double bench height of 20 m.

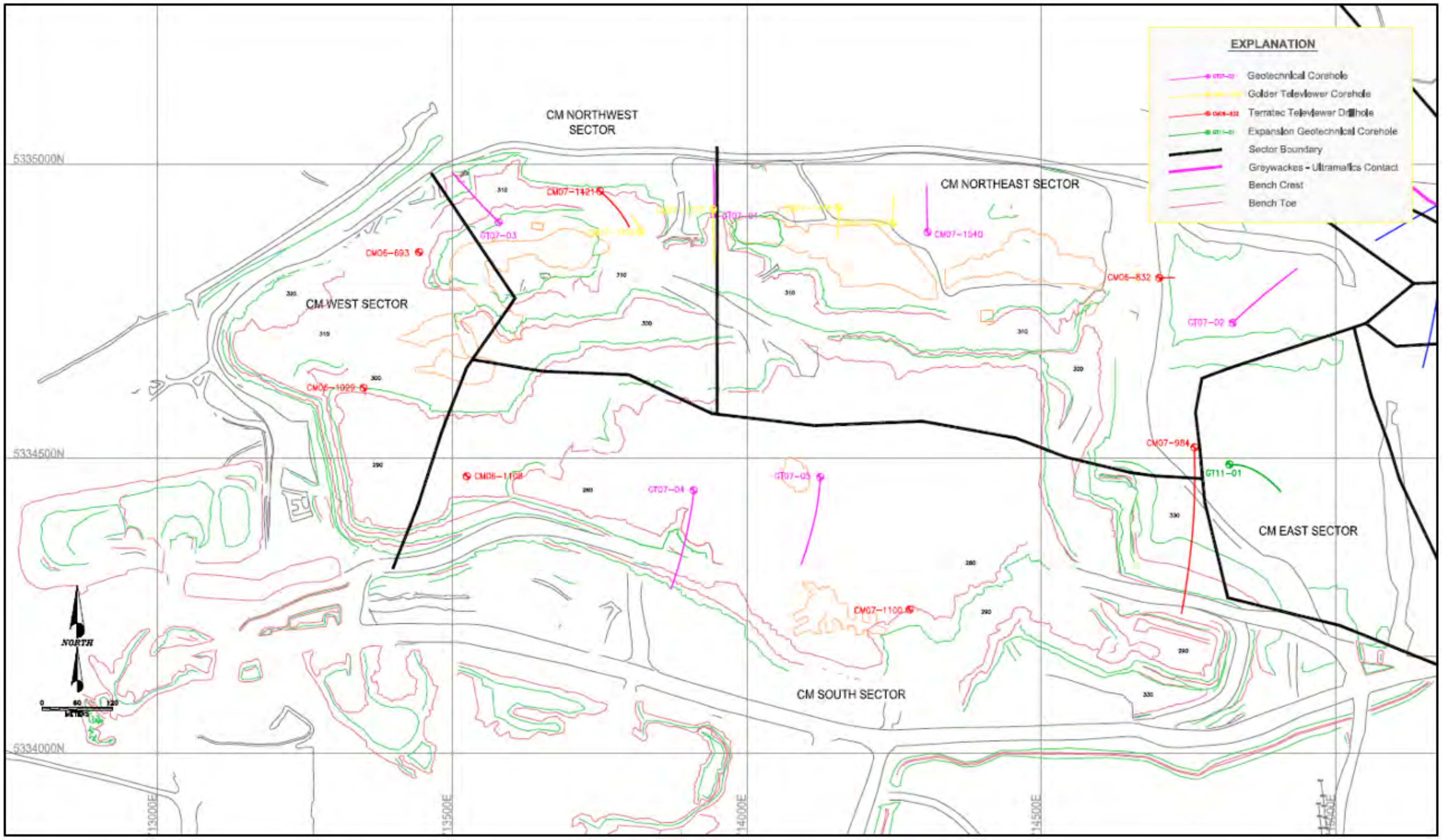

Figure 16.3 – Canadian Malartic pit plan as of July 2012 (Golder, 2012d)

16.2.2 Ramp and Haul Road Design

The ramps and haul roads are designed for the largest equipment being the Cat 793F haul truck. For double lane traffic, industry best-practice is to design a travelling surface of at least 3.5 times the width of the largest vehicle. Ramp gradients will be established at 10%.

A shoulder barrier or safety berm on the outside edge will be constructed of blasted rock to a height equal to the rolling radius of the largest tire using the ramp. The rolling radius of the Cat 793F tire (40R57) is 1.8 m. These shoulder barriers are required wherever a drop-off greater than 3 m exists and will be designed at 1.5:1 (H:V).

Ditches are planned on each side of the road to assure proper drainage of the running surface. The ditches along the ramp will be 2.0 m deep near the high wall and 1.75 m deep near the berm. To facilitate drainage of the roadway a 2% cross slope on the ramp is planned.

A summary of the ramp design parameters is presented in Table 16.2. Figure 16.4 presents an illustration of the in-pit haul road design.

Table 16.2 – Haulage road design parameters

Parameter	Dimension (m)
Design Vehicle Overall Width (227-tonne truck)	7.7
Rolling Radius of Tire (40.00R57)	1.8
Berm Height	1.8
Berm Width	4.0
Ditch Width	2.0
Double Lane High Wall Haul Road (no drop off)	31
Double Lane High Wall Haul Road (drop off)	35
Single Lane High Wall Haul Road	20

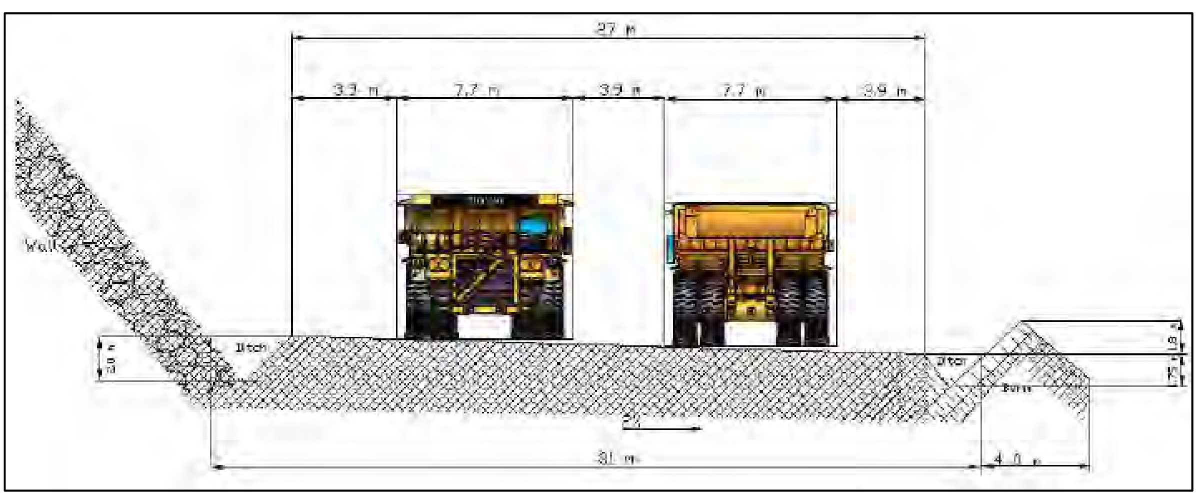

Figure 16.4 – In-pit haul road design

16.2.3 Pit Designs

Mining constraints in the North Sector due to the town's proximity and old underground openings make it impossible to divide the pit into phases. Instead, there are two areas, Canadian Malartic and Barnat, according to the permits obtained by Osisko and those still pending. The final mining pit is presented in Figure 16.5. Figures 16.6 and 16.7 illustrate the different profiles of the Whittle shell and final pit design.

16.2.4 Overburden

An overburden surface was created from the drill hole information which corresponds to the end position of drill hole casings as indicated on driller logs. The drill casings often extend into the bedrock and tend to overestimate the depth and therefore volume of overburden.

Some of the excavated overburden was used to construct a perimeter berm to serve as a visual barrier on the north pit rim (the linear park). The quantity of material required for this perimeter berm was estimated at 1.5 Mm^3 of fill material. The remaining overburden will be stockpiled on the outer edge of the planned waste dump such that this material can be used for future reclamation work if suitable on a progressive approach. The leftover material at the end of the mine life will be stored on the waste pile.

16.2.5 Stockpile Design

Two low grade (LG) stockpiles have been planned, one located to the west of the pit and the other one to the southwest of the pit (Fig. 16.8). Material below 0.8 g/t Au is stored in the LG pile. The stockpiles have a capacity of 3 Mt and a design height of 30 m and an angle of repose of 37°. There is a live high grade stockpile located at the crusher pad.

16.2.6 Waste Dump Design

Waste material was disposed initially as a berm north of the tailing facility. The waste pile serves to contain the thickened tailings. A total of 534 Mt of waste is to be placed on the waste pile. An in-situ compacted density of 1.96 t/m^3 was used to estimate the initial storage volume of 161 Mm^3.

The toe of the waste dump is located about 100 m from the pit crest. At the entrance of the waste dump, two ramps with a 10% gradient will be developed leading in opposite directions which will reduce haulage distances on the dump.

The dump will be constructed in 10 m lifts with 12 m terraces, or step-ins between lifts for an overall slope angle of 22° (2.4V:1H). A total of 10 lifts are required to store all waste material. The base of the waste dump is at about elevation 330 and reaches elevation 420 for a height of 90 m. The final waste dump design is illustrated in Figure 16.8.

16.2.7 Mine Production Schedule

The mine production schedule was developed to feed the mill at a nominal rate of 55,000 t/d. Tables 16.3 and 16.4 present the bench extraction schedule by period for the Canadian Malartic, Barnat and Gouldie pits between 2014 and 2027.

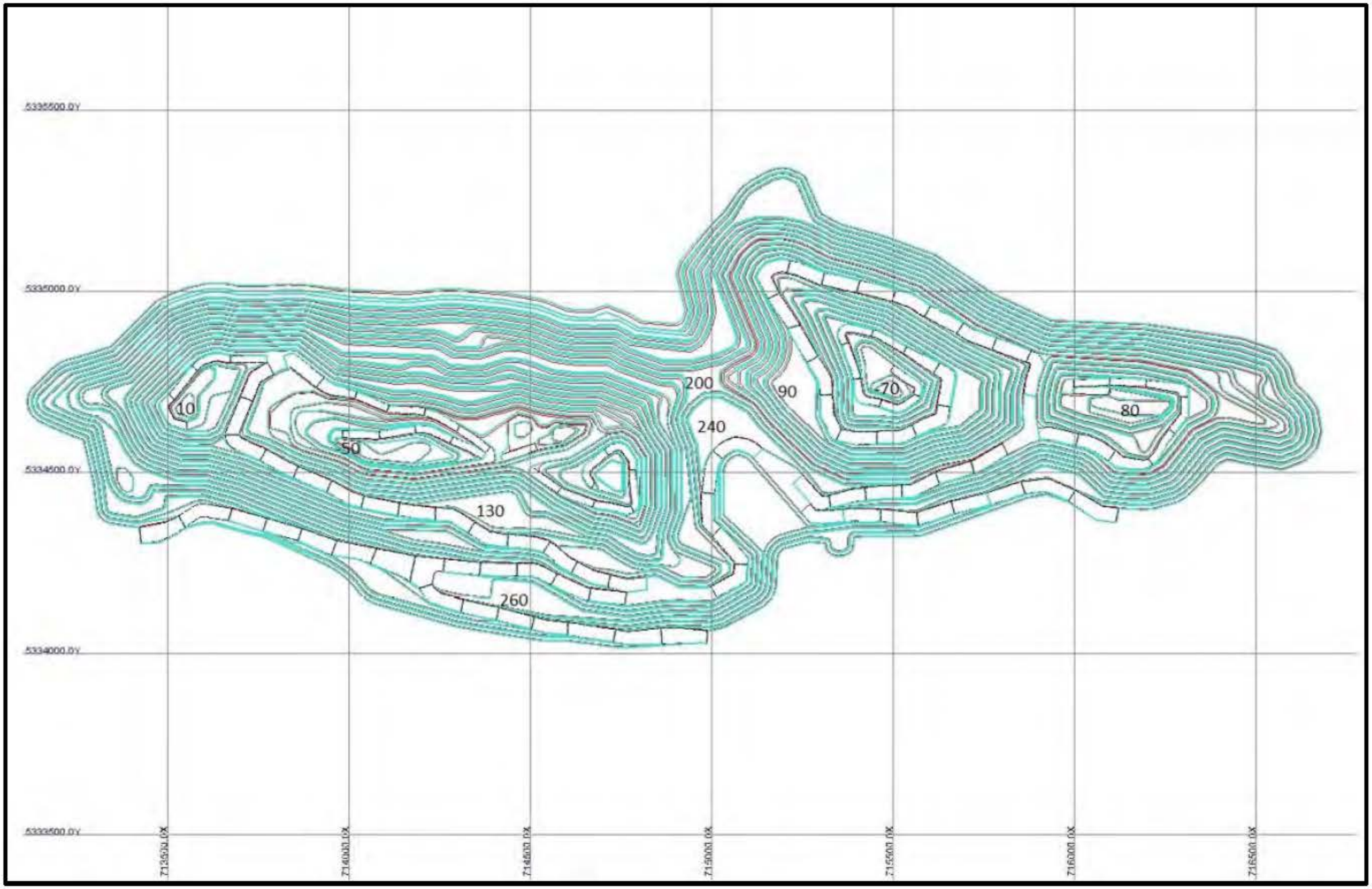

Figure 16.5 – Final mining phase (Canadian Malartic and Barnat pits)

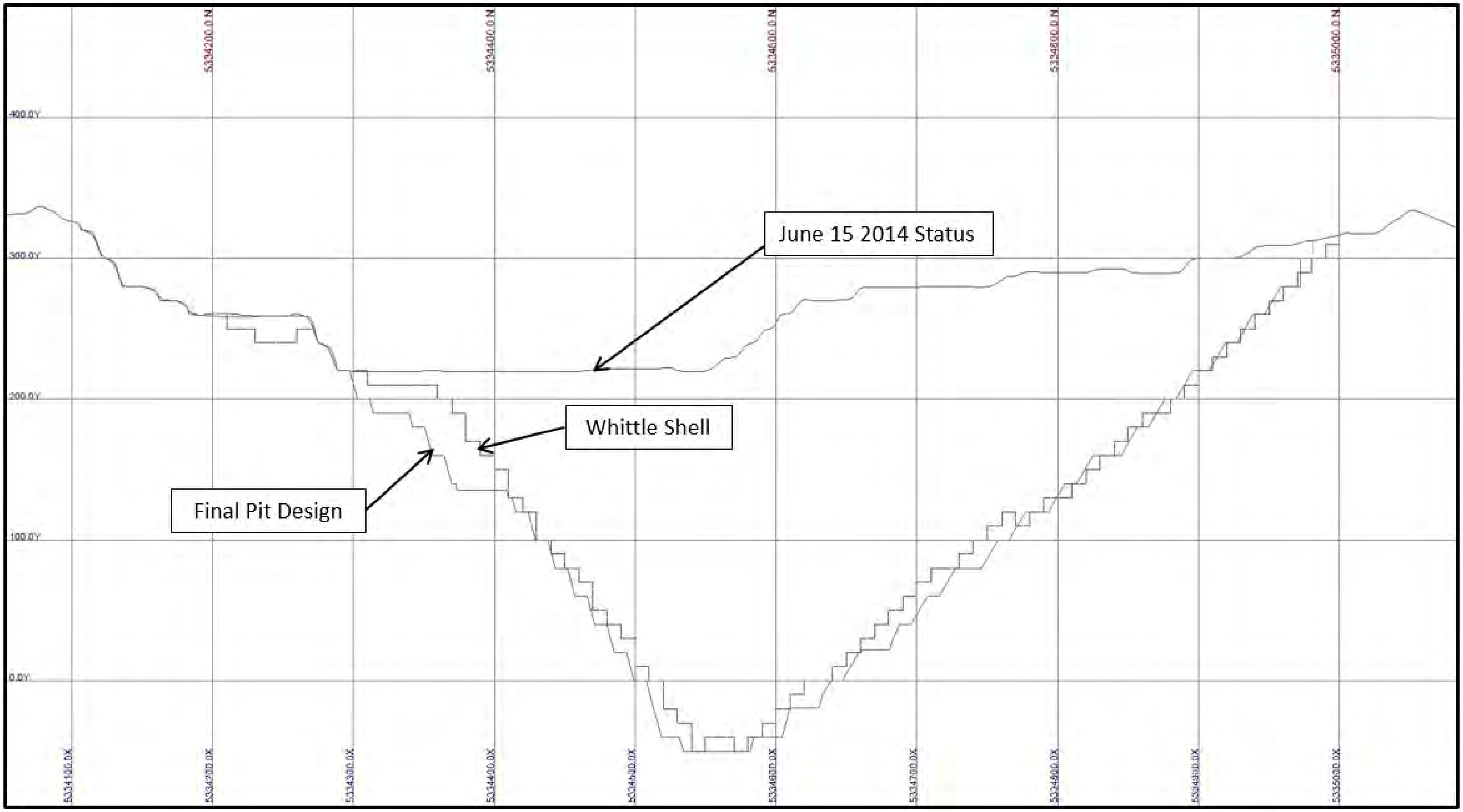

Figure 16.6 – Section 714190 (looking west) of the final pit design and optimal Whittle shell (Canadian Malartic pit)

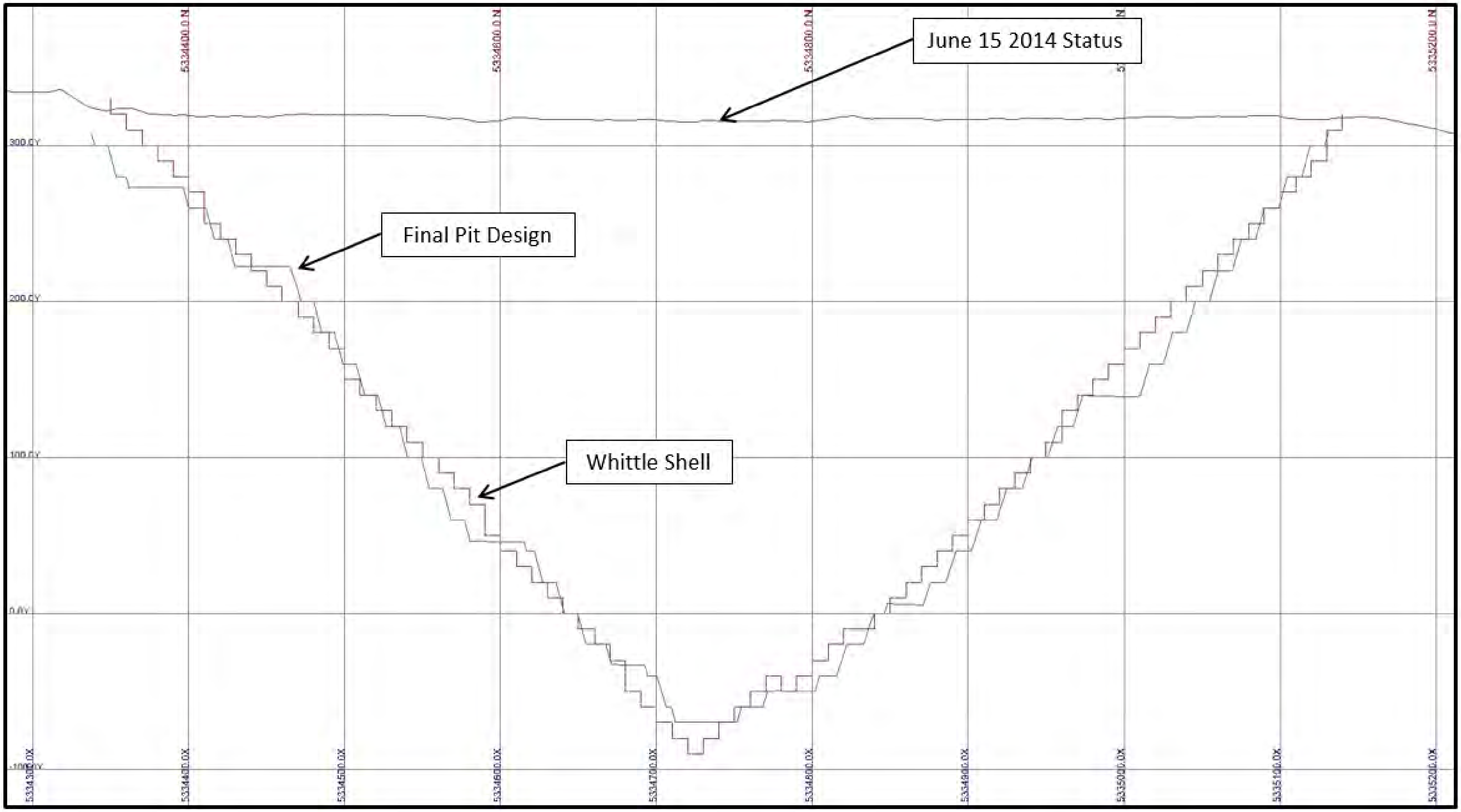

Figure 16.7 – Section 715495 (looking west) of the final pit design and optimal Whittle shell (Barnat pit)

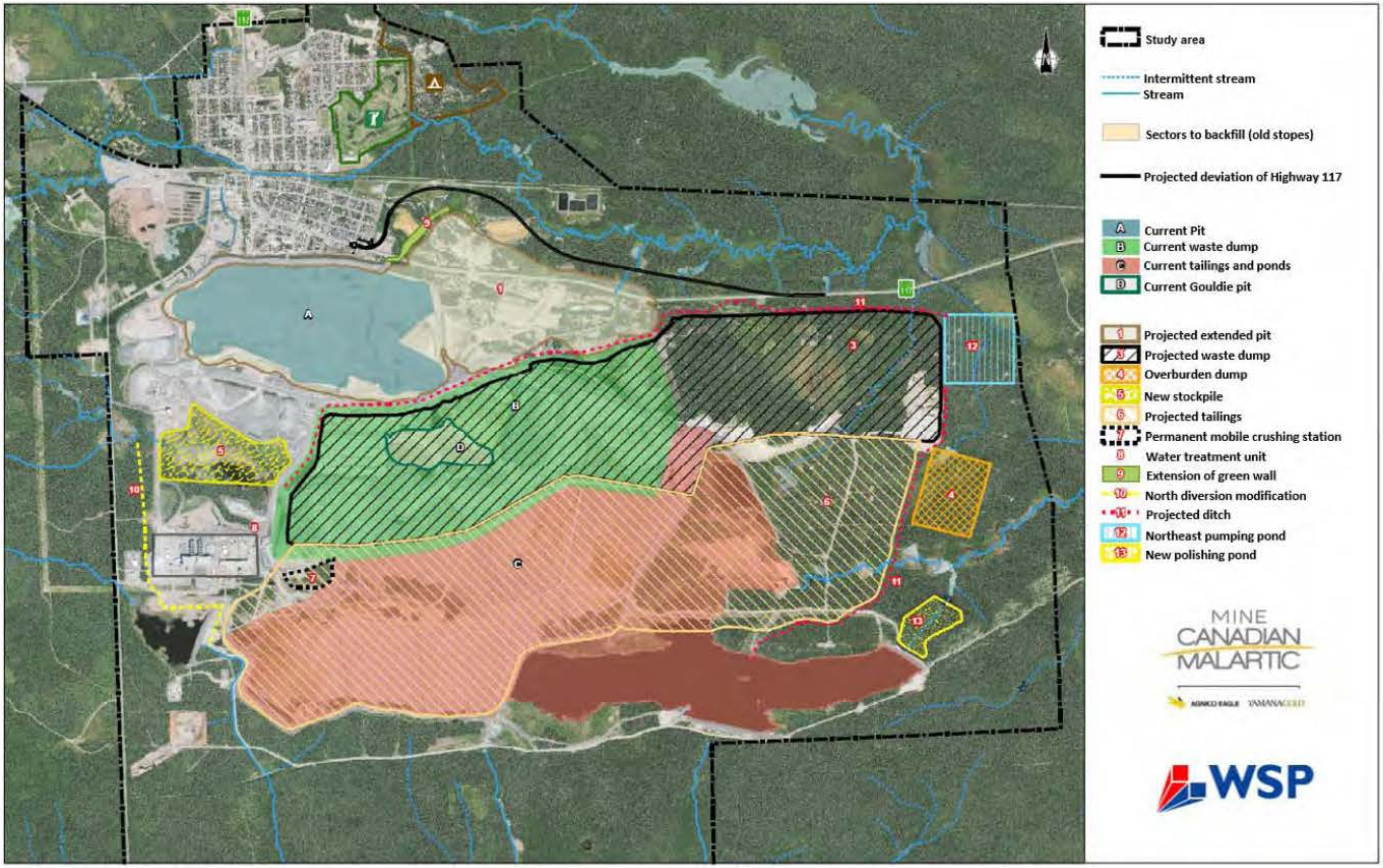

Figure 16.8 – Mine general arrangement with stockpiles and waste dump

Table 16.3 – Bench extraction schedule by period (Canadian Malartic and Canadian Malartic Extension)

	Bench	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Canadian Malartic	330	0	0	0	0	0	0	0	0	0	0	0	0	0
	320	0	0	0	0	0	0	0	0	0	0	0	0	0
	310	20 869	291 594	122 710	5 788	0	0	0	0	0	0	0	0	0
	300	153 320	2 706 365	7 124 148	6 479 087	1 079	0	0	0	0	0	0	0	0
	290	34 272	2 107 974	7 453 801	11 230 277	5 371 547	38 272	28 051	0	0	0	0	0	0
	280	817 803	0	3 331 875	7 257 767	8 640 706	6 176 614	1 550 480	463	0	0	0	0	0
	270	4 021 225	0	8 829	0	7 951 678	6 079 106	8 560 049	2 892 151	0	0	0	0	0
	260	13 925 546	181	0	0	3 363 813	2 546 021	7 779 276	10 380 927	1 272	0	0	0	0
	250	15 217 598	767 235	0	0	15 934	4 284 387	3 661 887	8 535 646	6 731 934	0	0	0	0
	240	13 502 880	3 646 082	0	0	104	3 827 218	1 157	3 932 851	14 598 811	567	0	0	0
	230	11 997 366	7 047 481	5 982	0	0	2 769 766	0	0	13 907 506	3 930 099	0	0	0
	220	7 432 491	11 315 888	1 337 735	0	0	2 745 531	0	0	4 505 753	12 925 324	0	0	0
	210	2 273 636	15 723 430	3 537 183	1 025	0	2 873 347	6 244	0	0	16 449 964	38 402	0	0
	200	0	14 585 836	6 661 128	418	0	2 294 949	430 574	0	0	13 356 274	2 394 886	0	0
	190	0	9 473 019	8 082 564	1 750 566	0	2 563 504	326 592	0	0	5 677 376	8 873 893	0	0
	180	0	3 261 042	11 558 520	3 255 300	758	5 982	2 848 147	0	0	3 141 221	10 374 177	0	0
	170	0	0	11 050 364	3 708 939	1 337 043	0	3 381 192	0	0	1 175 750	11 114 888	16 484	0
	160	0	0	7 397 523	3 724 362	4 039 508	58	3 490 559	0	0	0	10 528 716	936 226	0
	150	0	0	0	8 856 324	4 492 907	592 160	3 304 908	0	0	0	6 298 316	4 168 311	0
	140	0	0	0	6 742 222	3 558 005	2 890 100	3 154 894	0	0	0	1 708 064	8 056 143	0
	130	0	0	0	4 810 298	2 999 079	4 502 609	2 929 971	41 534	0	0	1 310 733	7 410 683	0
	120	0	0	0	4 117 716	1 715 473	5 154 968	280 138	3 014 171	0	0	1 043 341	6 976 519	0
	110	0	0	0	3 436 383	1 234 343	4 707 686	871 676	2 986 932	0	0	756 312	6 337 442	0
	100	0	0	0	0	3 880 582	4 133 418	1 618 549	3 022 311	0	0	591 513	5 909 657	0
	90	0	0	0	0	3 159 381	2 272 118	3 141 198	2 885 853	0	0	395 831	5 359 882	0
	80	0	0	0	0	2 601 368	1 110 124	4 346 173	2 801 780	0	0	214 876	4 532 013	431
	70	0	0	0	0	1 973 051	428	3 805 450	3 918 366	0	0	0	3 200 502	825 667
	60	0	0	0	0	1 687 625	0	2 940 903	4 341 745	179	0	0	2 668 436	1 013 139
	50	0	0	0	0	1 151 574	0	1 017 234	3 744 052	1 796 680	0	0	0	3 202 895
	40	0	0	0	0	957 697	0	0	2 599 310	3 466 892	0	0	0	2 875 081
	30	0	0	0	0	747 285	0	0	1 601 479	3 486 857	0	0	0	2 246 120
	20	0	0	0	0	502 880	0	0	1 287 142	3 166 097	0	0	0	1 971 588
	10	0	0	0	0	247 601	0	0	1 040 186	2 435 939	0	0	0	1 644 108
	0	0	0	0	0	190 242	0	0	862 037	1 962 154	0	0	0	1 423 755
	-10	0	0	0	0	60 829	0	0	643 381	1 314 902	0	0	0	1 130 102
	-20	0	0	0	0	0	0	0	510 738	1 033 920	0	0	0	957 579
	-30	0	0	0	0	0	0	0	288 321	713 803	0	0	0	695 147
	-40	0	0	0	0	0	0	0	204 007	574 818	0	0	0	543 773
	-50	0	0	0	0	0	0	0	112 136	230 322	0	0	0	363 225
	-60	0	0	0	0	0	0	0	0	30 108	0	0	0	130 497
	-70	0	0	0	0	0	0	0	0	0	0	0	0	53 922
TOTAL		**69 397 005**	**70 926 127**	**67 672 362**	**65 376 473**	**61 882 091**	**61 568 366**	**59 475 303**	**61 647 519**	**59 957 946**	**56 656 575**	**55 643 947**	**55 572 298**	**19 077 031**

Table 16.4 – Bench extraction schedule by period (Gouldie pit)

	Bench	2015	2016
Gouldie	330	26 953	0
	320	7 920	0
	310	733 847	0
	300	2 037 463	0
	290	2 930 999	7 059
	280	2 450 763	198 777
	270	915 506	1 295 162
	260	0	1 899 059
	250	0	1 538 422
	240	0	1 322 357
	230	0	858 596
	220	0	699 182
	210	0	445 964
	200	0	171 172
TOTAL		9 103 451	8 435 748

16.3 Mine Operations and Equipment Selection

16.3.1 Drilling and Blasting

Drill pattern design has been dictated by the need to control blast-induced vibrations and airblast overpressures on the neighboring town of Malartic. Ground vibrations and airblast overpressures are regulated by Directive 019 of the MDDELCC, Québec's ministry of sustainable development, environment and climate change[1]. The regulations of Directive 019 are highly influenced by research conducted by the US Bureau of Mines (USBM) on the effect of vibrations on residential buildings.

Figure 16.9 provides a threshold damage limit, defined as cosmetic damage (e.g. cracking) within the structure, categorized by both frequency ranges and particle velocity.

[1] MDDELCC : *Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques*. Formerly the MDDEFP.

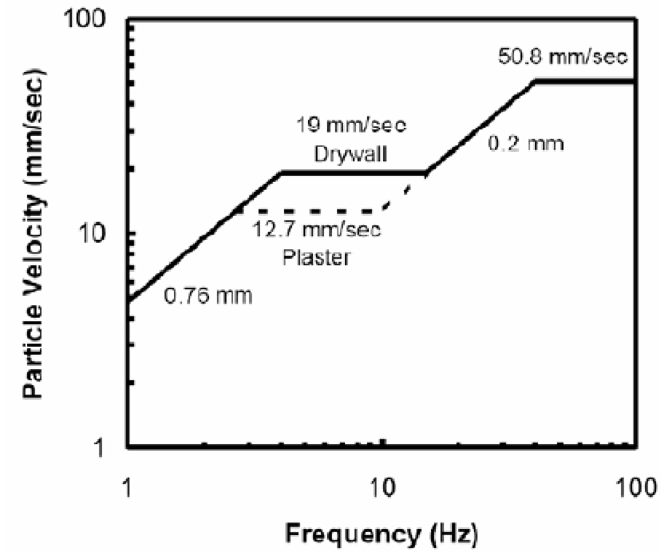

Figure 16.9 – USBM Vibration Criteria (after Siskind et al., 1980)

Directive 019 requires that the maximum particle velocity measured at the point of impact be less than 12.7 mm/s and that the maximum airblast overpressure be less than 128 dB. These levels can be maintained by limiting the amount of explosives detonated per delay interval.

A study conducted by Géophysique GPR International Inc. as part of the Environmental Impact ssessment (EIA) has provided guidelines as to the permissible amount of explosives per delay in order to meet the criteria of Directive 019.

16.3.1.1 Production Blast Patterns

Five zones have been designated based on the distance from the nearest houses where the drill pattern provides a suitable explosives charge. The distances of the blast zone limits from the town are presented in Table 16.5 and the blast zone locations are shown in Figure 16.10.

Table 16.5 – Blast zones and properties

Blast Limit	Distance (m)	Hole Diameter (mm)	Bench Height (m)
Zone 1	134	89	10
Zone 2	156	114	10
Zone 3	235	140	10
Zone 4	337	216	10
Zone 5	>337	216	10

All blast zones are developed with 10 m bench heights and multiple explosives decking technique to control vibrations and airblasts. Blast zone 1 is further limited with the use of 89 mm diameter holes which increase to 114 mm for zone 2 and 140 mm for zone 3. Blast zones 4 and 5 see the implementation of the larger 216 mm production blast holes.

The blast pattern designs and explosives column height results in a powder factor ranging from 0.30 to 0.37 kg/t of rock.

16.3.1.2 Drilling

Drill rig requirements were established from the yield per metre drilled (from the pattern), the pure penetration rates, and the actual drilling time described by an overall drilling factor. The instantaneous penetration rate is a function of the bit size and the rock mass unconfined compressive strength. An average value of 175 MPa was assumed to estimate the instantaneous penetration rates.

The drilling cycle includes the time for drilling the hole, retracting the drill steel and tramming and levelling between holes. Other factors affect drilling efficiency such as reaming the hole, waiting on patterns to be laid out, moving between patterns, bit changes, walk around inspections and moving in and out for blasting. Weighing all these factors, and comparing with other operations, drill productivity is captured by the overall drilling factor to arrive at an overall penetration rate that is achievable over the long term.

Typically, the longer the drill hole the greater the overall drilling factor (or time spent drilling). The overall drilling factor ranges from 48% to 60% depending on the drill pattern.

16.3.1.3 Blasting

A high-energy bulk emulsion explosive specifically developed for surface mines is used in wet or dry conditions. The bulk emulsion consists of a 70% emulsion, 30% ANFO blend with an in-hole average density of 1.18 g/cm³. Initiation of the bulk emulsion requires direct contact with a 400 g booster.

A different type of more viscous emulsion can be used for smaller diameter hole zones and where there is fractured ground.

Production blasting uses a system of electronic detonators which are more precise and allow for a better control of ground vibrations.

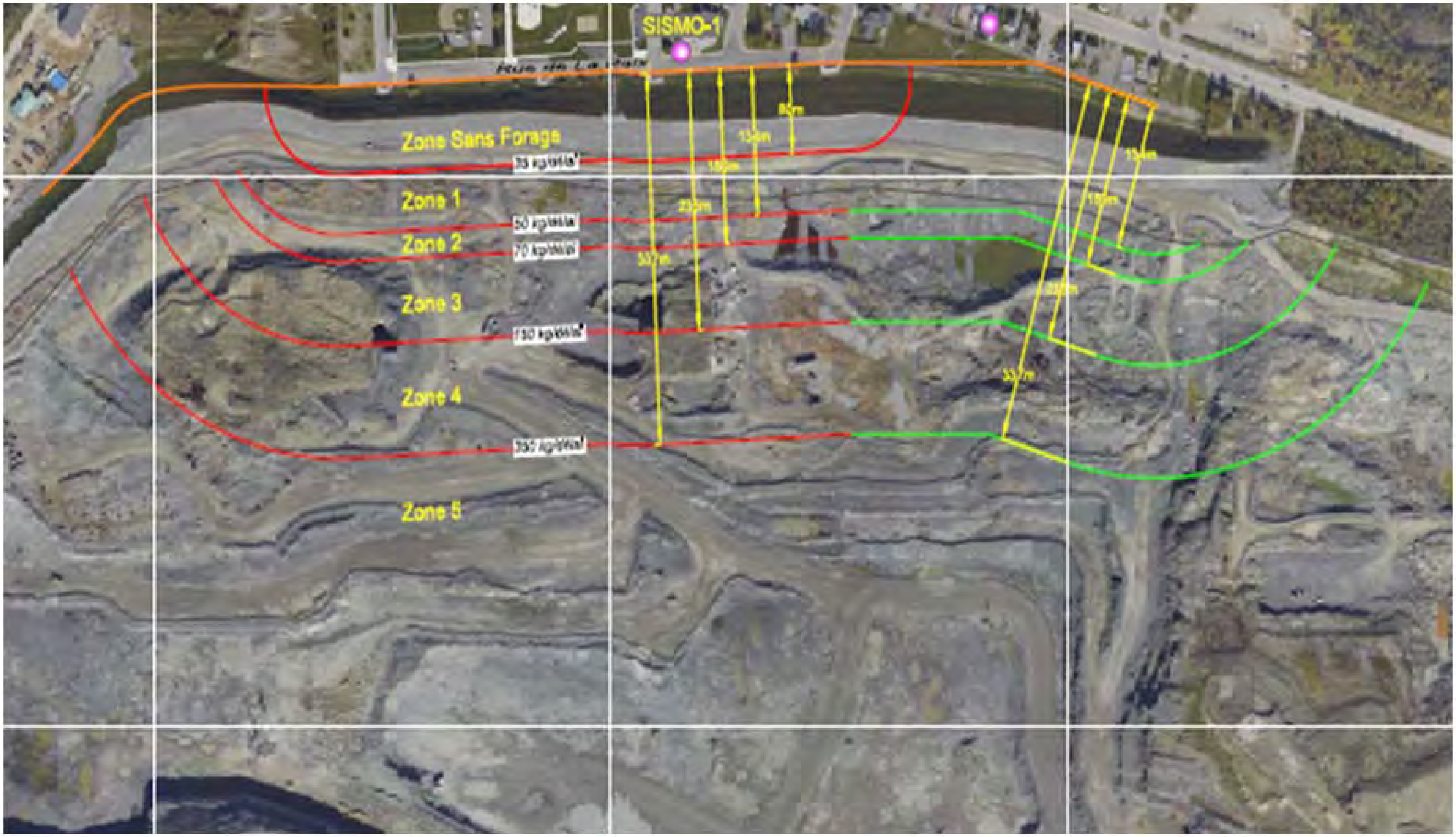

Figure 16.10 – Plan view of blasting zones

16.3.2 Ore Control

The ore control program will consist of establishing ore/waste boundaries in the field to guide loading unit operators. This information can be relayed to the digital screens placed in the shovels which indicate bucket location with respect to the digging packets.

Moreover, all blast of ore (or ore & wastes) are monitored in term of blast movement using the BMM electromagnetic balls (Blast Movement Monitors). This displacement is used to locate the final position of ore after blasting.

Information for the establishment of this ore control program would be provided from blast hole cuttings. Pre-engineered patterns will be relayed to the drills. Ore control methods are designed for simplicity, low cost, and adaptability. This method is recognized as having the lowest direct cost, allowing single-pass, dual-use holes (sampling and blasting) in a mine that will need to advance through up to six 20 m benches per year to maintain production schedules. Although this drill method is unable to identify vertical grade boundaries, the ability to maintain a one-week cycle-time between drill / assay / blast / design / load is considered critical.

Single samples will be taken per blast hole via a mechanical or manual sample collector/splitter or from drill cuttings collected in a sample pan placed beneath the hood.

Samplers will supervise and control the sampling operation. A minimum sample of 5 kgis send to the laboratory. Gold fire assays performed at the mill laboratory will determine gold content. Sampler duties will be to record the sample and document the sample locations (sample ID, drill hole, depth, etc) as well as ensuring that the retained sample is put into a labelled polyethylene sample bag and placed beside the drill pads for collection. They will also be required to clean the hood between holes as required.

16.3.3 Loading and Hauling

The primary loading tools consist of hydraulic excavators, with wheel loaders added as a secondary loading tool. The hydraulic excavator model selected is the O&K RH340-B with an operating weight of 567 t and is fitted with a 28 m^3 heavy-duty rock bucket. This heavy-duty rock bucket is specified for a maximum loose density of 2.2 t/m^3 according to O&K datasheets. The normal rock bucket has a heaped capacity of 34 m^3, specified for a maximum loose density of 1.8 t/m^3. The unit is electrically driven as opposed to diesel driven, given the availability of low-cost electric power and the large size of the open pit.

One Caterpillar 994F HL, two L-1850 front-end wheel loader (FEL) and one CAT6050 shovel complement the primary loading fleet. Should ore feed from the pit be interrupted for extended periods, the plant will be fed solely from stockpiled ore on the ROM pad by a FEL.

A fleet of Caterpillar 793F rigid trucks with a 227t payload has been selected to provide a good pass-match with the O&K RH340-B shovels. The RH340-B requires 4 passes on average which is dependent on the bucket fill factor and swell factor.

The FEL is configured in a high lift arrangement in order to clear the sideboard of the 227t class truck. The FEL is equipped with a 15-m^3 bucket requiring 8 passes to load the trucks to capacity. The number of passes required is more than is typically considered ideal, but other factors favoured this model such as having a sole provider of major mining equipment. Table 16.6 provides the tonnage loaded by period per loading unit.

The swell factor used to determine loose density is an important factor in estimating loading unit productivities. A typical swell factor for rock of 40% has been assumed for determining loading cycles. Loose density information verified through testing would be required to validate this important assumption. However, 40% is thought to be a conservative estimate.

Table 16.6 – Tonnage loaded by period by loading unit

Model	Cat 6060		Cat 6050		LeTourneau L-1850				
Type	Front shovel		Backhoe		Front loader				
Units	3		1		2				
	Ore	Waste	Ore	Waste	Ore	Waste	Total from pits	Rehandling	Total moved
2014	11,850,518	30,933,643	1,507,220	3,934,327	5,124,548	13,376,710	66,726,966	2,217,874	68,944,840
2015	14,077,106	30,417,744	1,790,411	3,868,712	6,087,397	13,153,619	69,394,990	2,634,590	72,029,579
2016	14,915,108	30,560,189	1,896,993	3,886,828	6,449,777	13,215,217	70,924,112	2,791,425	73,715,537
2017	13,914,161	29,128,725	2,260,440	3,336,710	7,685,495	11,344,814	67,670,345	2,863,211	70,533,556
2018	13,846,756	28,085,372	2,272,755	3,151,710	5,343,497	12,674,364	65,374,455	2,575,561	67,950,016
2019	16,461,695	23,272,062	2,958,597	2,439,922	6,029,438	10,718,357	61,880,072	3,053,968	64,934,040
2020	12,715,216	26,360,945	821,970	3,494,960	7,051,704	11,121,551	61,566,346	2,470,667	64,037,012
2021	12,804,795	31,466,781	1,318,267	4,258,994	3,071,665	6,552,781	59,473,282	4,943,641	64,416,922
2022	18,769,196	27,319,365	3,201,864	2,797,752	1,647,340	7,909,979	61,645,497	2,834,208	64,479,705
2023	15,083,114	29,451,744	3,882,664	2,126,325	2,024,431	7,387,645	59,955,923	2,518,825	62,474,748
2024	10,622,464	31,549,977	1,351,029	4,012,716	2,296,749	6,821,617	56,654,551	7,572,187	64,226,738
2025	10,924,595	30,494,067	1,389,456	3,878,419	2,362,075	6,593,312	55,641,922	7,160,010	62,801,933
2026	11,024,172	30,341,155	1,402,120	3,858,970	2,383,605	6,560,250	55,570,272	7,042,291	62,612,563
2027	5,538,721	8,605,748	1,930,709	2,999,825	0	0	19,075,004	13,501,902	32,576,905
2028	0	0	0	0	0	0	0	3,594,219	3,594,219

Fleet productivity and unit requirements were estimated by using the Fleet Production and Costing (FPC) software developed by Caterpillar. Haulage profiles and fleet productivities were estimated by elevation in the pit (Tables 16.7 and 16.8). The ore haul distance on the upper bench is 2.1 km and increases with the deepening of the pit to a distance of 4.9 km. The waste haul on the upper bench is

2.0 km and increases to a distance of 5.74 km at the bottom of the pit. The cycle times gradually increase with the deepening of the pit with the ore haul ranging from 10 minutes to 41 minutes (Table 16.8) and between 11 and 49 minutes for the waste haul (Table 16.10). The number of haulage hours increases over time as the haulage cycle increases with a total of 29 trucks required by 2015 (table 16.9).

Table 16.7 – Average haulage distances per year

	Canadian Malartic		Barnat	
	Waste	Ore	Waste	Ore
	(m)	(m)	(m)	(m)
2014	5650	4005		
2015	8542	6677		
2016	7817	5746		
2017	7418	5946	4885	7472
2018	7528	5988	6465	8234
2019	8589	6672	6910	8115
2020	10248	6038	6398	6094
2021	11161	7613	6490	6116
2022	12935	8401	7685	6522
2023	12583	8260	7066	6164
2024			5905	7379
2025			6033	8407
2026			6578	9405
2027			5213	11471

Table 16.8 – Average haulage cycle times per year (minutes)

	RH340		Cat 6050		L-1850	
	Ore	Waste	Ore	Waste	Ore	Waste
2014	25.0	26.2	30.7	35.0	24.3	27.0
2015	23.5	30.7	31.2	37.2	24.8	31.9
2016	22.5	29.4	29.8	35.5	23.7	30.5
2017	22.1	24.9	28.8	33.2	23.8	28.6
2018	23.9	25.9	29.6	34.2	24.7	25.7
2019	27.5	30.6	36.1	42.1	27.0	29.1
2020	25.3	28.8	28.9	25.9	27.5	34.3
2021	32.3	26.7	28.5	28.6	31.8	38.8
2022	30.3	36.6	39.3	48.8	24.5	25.1
2023	27.6	30.9	39.8	49.2	25.3	25.7
2024	27.8	22.4	33.6	28.6	29.0	23.4
2025	31.9	24.0	37.5	29.3	33.1	25.2
2026	35.0	25.7	40.6	31.6	36.1	26.9
2027	41.2	22.9	48.5	29.3	0.0	0.0

Table 16.9 – Equipment requirements

	Production				Rehandling			Total				
	793 trucks	RH 340	Cat 6050	L-1850	793 trucks	Cat 994	L-1850	793 trucks	RH 340	Cat 6050	L-1850	Cat 994
2014	24.2	3	1	2	0.4	1	0	25	3	1	2	1
2015	28.1	3	1	2	0.4	1	0	29	3	1	2	1
2016	27.4	3	1	2	0.4	1	0	28	3	1	2	1
2017	23.4	3	1	2	0.4	1	0	24	3	1	2	1
2018	23.0	3	1	2	0.4	1	0	24	3	1	2	1
2019	25.2	3	1	2	0.4	1	0	26	3	1	2	1
2020	24.3	3	1	2	0.4	1	0	25	3	1	2	1
2021	25.8	3	1	1	0.8	0	1	27	3	1	2	0
2022	28.2	3	1	1	0.4	0	1	29	3	1	2	0
2023	24.5	3	1	1	0.4	0	1	25	3	1	2	0
2024	19.1	3	1	1	1.3	0	1	21	3	1	2	0
2025	20.6	3	1	1	1.2	0	1	22	3	1	2	0
2026	22.3	3	1	1	1.2	0	1	24	3	1	2	0
2027	8.5	1	0	0	2.3	0	2	11	1	0	2	0

16.3.4 Mine Dewatering

The open pit dewatering requirements were investigated by Golder. The strategy consist of using the underground openings and the connectivity of the past underground mines (Canadian Malartic, Sladen, Barnat and East Malartic) to keep the water level 50 m below the working benches. A numerical model was created by Golder to simulate the underground water flows.

One pumping stations is proposed at the following locations with the estimated minimum and maximum pumping rates:

- Pumping station in the East Malartic No. 3 shaft (545 m deep)
  - 1,800 to 7,300 m^3/day (330 to 1300 usgpm).

The distribution of pumping rates at the pumping station is based on the connectivity of the underground workings and may vary over time with the deepening of the pit. Water pumped from the underground workings is used in the process plant.

Pumping at the bottom of the Canadian Malartic pit is done using two 150 hp pumps (600m3/h). Water is pumped from a sump at the bottom of the ramp to another sump located on bench 250 near the main ramp. From there, the water is pumped to the surface and sent to the collector ditch. Sometimes the water is pumped from the bottom of the pit into an open stope to be returned underground.

16.3.5 Mine Maintenance

The maintenance department has been structured to fully manage this maintenance and repairs for the mobile equipment fleet, performing maintenance planning and training of employees. However, the Canadian Malartic Project relies on dealer and manufacturer support for major components.

The maintenance department requires specialized tools for the specific equipment models on site such as diagnostic tools, pin pullers, hydraulic torque wrenches and general shop tools such as presses, nitrogen charging kits, air tools, lift stands and kidney looping machines.

16.4 Mine Equipment

Table 16.10 shows the equipment requirements to support the extraction schedule presented in Tables 16.3 and 16.4

Table 16.10 – Equipment requirements

Equipment	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Major Equipment																	
Rotary Drill (216 mm.)	7	7	7	7	7	7	7	7	7	7	7	7	7	2	0	0	0
Rotary Drill (140 mm.)	5	5	5	5	5	5	3	2	1	1	1	1	1	0	0	0	0
Shovel (RH340)	3	3	3	3	3	3	3	3	3	3	3	3	3	1	0	0	0
Wheel Loader (994)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
Wheel Loader (L1850)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	0	0
Shovel (RH200)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Haul Truck (240t. class)	25	29	28	24	24	26	25	27	29	25	21	22	24	11	2	0	0
Grader (16' blade)	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2	0	0
Water Truck (76kl)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Track Dozer (580 hp)	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	0	0
Track Dozer (525 hp)	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	0	0
Support Equipment																	
Excavator (2.1 m3) (Rock Breaker)	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Excavator (2.1 m3)	4	4	4	4	4	4	4	4	4	4	3	3	2	2	2	2	2
Wheel Loader (5.5 m3)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Articulated Trucks (40t.)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Track Dozer (200 hp)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Grader (14' blade)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Compactor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Small Loader (Hole Stemming)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Boom Truck (22t.)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Tool Carrier	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Service Truck	6	6	6	6	6	6	6	6	6	6	6	6	6	4	3	2	2
Fuel/Lube Truck	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Lowboy & Tractor Head (150t.)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pick-up Truck	67	67	67	67	67	67	67	67	67	50	50	50	35	35	30	15	15
Pit Busses	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2
Lighting Towers	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	10	10
Mob. Welding mach.	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mobile compressors	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Dewatering	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0	0
Dispatch System	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Emulsion Plant Infrastructures	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Blasting Mats	1200	1200	1200	1200	1200	1200	1200	1200	1200	600	600	250	0	0	0	0	0
Tools for Maintenance Shop	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Spare Bucket for Shovel	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	0	0

Generator	19
Remote Control Cabinet	5
Mobile Remote Control Cabinet	1
Loader Spare Bucket (994)	1
Loader Spare Bucket (LT-1850)	1

17. RECOVERY METHODS

17.1 Plant Design Criteria

Table 17.1 lists a summary of the principal design criteria established for the Canadian Malartic Mill project. The process design criteria are based on a processing plant of 55,000 tpd capacity and a plant design utilization of 92%. At the time of writing, the throughput is limited in the range of 50,000 tpd. A project study to increase average throughput to 55,000 tpd is under review. The basis for the plant design assumed a head grade of 1.2 g/t Au and a gold recovery of 86%.

Table 17.1 – Summary of the principal design criteria

Description	Units	Average Value
Nominal annual throughput	t/y	20,075,000
Process Plant Utilization	%	92.0
Crusher Plant Utilization	%	70.0
Nominal Daily Throughput	t/d	55,000
Average Hourly Crusher Throughput	t/h	3,275
Average Hourly Mill Throughput	t/h	2,491
Gold Content in Ore	g/t Au	1.07
Silver Content in Ore	g/t Ag	1.69
Grind P_{80}	microns	64
Average leach time	h	28
Gold Recovery	%	85.9
Silver Recovery	%	69.3
Annual Gold Production	oz/y	590,975
Annual Silver Production	oz/y	753,000
Carbon Loading	g/t Au	2,520
Weight of Carbon Stripped/day	t/d	20

17.2 Process Description Overview

The process design criteria are based on a processing plant with 55,000 tpd capacity and a plant design utilization of 92%. At the time of writing, the throughput is limited to about 50,000 tpd. A project study to increase average throughput to 55,000 tpd is under review. The basis for the plant design assumed a head grade of 1.2 g/t Au and a gold recovery of 86%.

Run of mine ore is transported to the gyratory crusher. From the primary crusher, material is conveyed to a secondary crushing plant. The crushed ore feeds a conveyor to transport the ore to the covered stockpiled. The ore is reclaimed from the pile in an underground reclaim tunnel and is conveyed to feed the primary grinding SAG mill in the concentrator. The SAG mill is in a closed circuit with scalping screens and two pebble crushers. The SAG circuit product is fed to the two secondary grinding ball mills which feed the one tertiary grinding ball mill to produce a final product size suitable for feeding the leach circuit. Each of the two secondary ball mills are close-circuited with one cluster of hydro-cyclones while the tertiary grinding ball mill requires two clusters of hydro-cyclones due to a higher slurry volume to handle.

The slurry is brought to a pH of around 11 with lime added to the SAG mill feed. Cyanide is added to the grinding circuit to start the leaching process of gold from the ore to the solution phase. The ground slurry passes through linear screens, before the thickener, to screen out any organic material and any other tramp material that has come into the mill with the ore. The slurry is then thickened to 50% solids before being fed to the leach tank circuit.

The leach tanks are located outside and consist of four series of five tanks in parallel with agitators. Oxygen is added to raise the oxygen level in the solution phase, in order to maintain the leach kinetics. From the leach tanks, the slurry flows by gravity to the activated carbon recovery circuit. The circuit is composed of two parallel sets of Kemix CIP pump cell carousel systems. The loaded carbon is pumped from the first stage in the carousel circuit to a loaded carbon screen where the loaded carbon is separated from the slurry. The loaded carbon transfers into the stripping vessels by gravity.

The zadra process is used to extract the gold from the loaded carbon. The caustic solution is heated to about 140° Celsius and is then passed through the pressurized stripping vessel, stripping the gold from the loaded carbon back into the solution. The solution is sent to the electrowinning (EW) circuit where gold is precipitated onto stainless steel cathodes in the form of sludge.

The gold precipitate is pressure washed from the cathodes and then filtered, dried and sent to a refining furnace where the gold is poured into gold doré bars. The gold bars contain a significant amount of silver as the silver in the ore leaches and is stripped along with the gold and eventually recovered in the EW cells. The stripped carbon is transferred to the carbon reactivation kilns where it is reactivated by heating to about 800° Celsius in a reducing atmosphere. The carbon is then re-used in the CIP circuit. Fresh carbon is regularly added to make up for attrition losses. The activated carbon is pumped to the empty tank in the CIP circuit to start a new tank in the carousel. Before being added to the last tank in the carousel series, the carbon is screened to ensure that no fine particles of carbon are introduced into the circuit.

The slurry flowing from the last tank in the series in the carousels is barren in gold and is considered as final process tailings. This slurry is discharged over linear safety screens as an insurance against coarse carbon losses from the circuit. Any oversize from the linear safety screens is fed to a carbon catch screen (ongoing project). The oversize from the carbon catch screen is returned to the circuit via the carbon sizing screen and the underflow is directed to the carbon settling tank to remove as much carbon as possible. This settled carbon material is collected in bags and sold to the smelter for its gold and silver content. The tailings slurry is thickened to approximately 60% solid. Studies to increase the tailing percent solid are ongoing. The thickened tailings slurry is pumped to the detoxification plant where the cyanide content is reduced to less than 20 ppm using the combinox process (sulfur dioxide and hydrogen peroxide). Copper sulphate is also used as a catalyst to the reaction. A project study to convert the cyanide destruction process to Caro's acid (sulphuric acid and hydrogen peroxide) is ongoing. The detoxified slurry is subsequently pumped to the tailings retention pond where most of the water drains out to be reclaimed back to the process.

Sampling of the various process streams is carried out to be able to both quantify the plant performance on a shift and daily basis and to be able to control areas of the process on a continuous/semi-continuous basis.

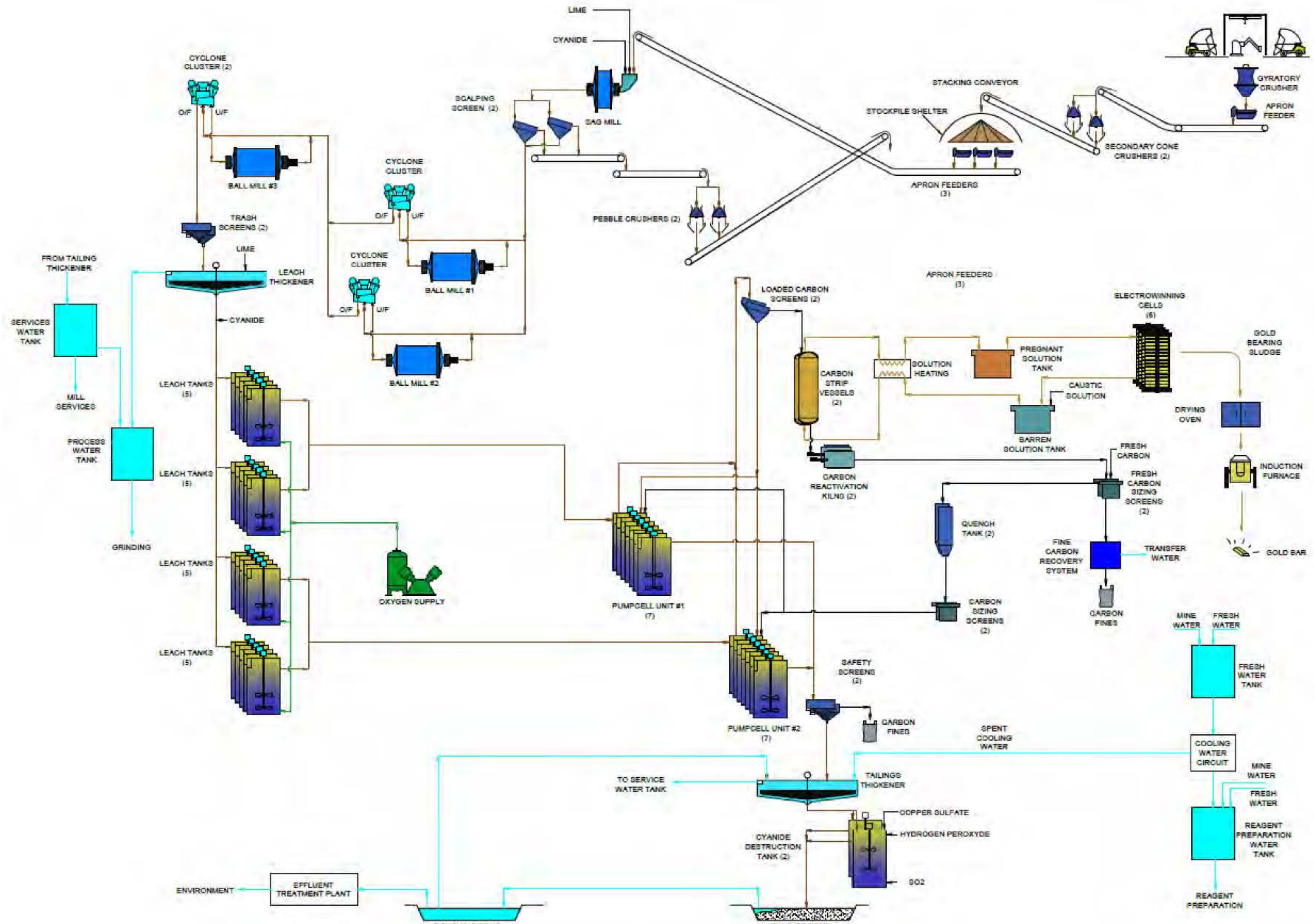

Figure 17.1 – Process Flow Diagram

17.3 Plant Facilities Description

Figure 17.2 shows an aerial view of the process facilities of the Canadian Malartic mine.

Figure 17.2 – Aerial view of the process facilities

17.3.1 Primary Crushing, Conveying and Stockpiling

The primary crusher is a 60" x 89" gyratory crusher with an 800 hp drive motor. The crusher is designed to crush at an average rate of 3275 tph at a product size of P80 = 175mm. The dump pocket is designed with two dumping points for dumping 217t mine haul trucks and has a live capacity of 440 t or the capacity of two trucks. The control room for the crusher station is located to allow the operator to look directly over the dump pocket and to be able to operate the hydraulic boom/rock breaker to manipulate the dumped ore in the pocket to assist the flow of run of mine ore into the crusher cavity. From time to time, the hydraulic rock breaker will be used to break oversized rocks in the dump pocket.

The crusher building will contain the dust collection system as well as the air make-up equipment to maintain a safe and clean working environment inside the crusher building. The building is designed with a surge pocket under the crusher with a live capacity of 400 t. A 2.1 m wide x 7.0 m long apron feeder extracts crushed ore from the surge pocket under the crusher to feed the crushed ore conveyor at an average

rate of 3,275 tph. The apron feeder is equipped with a 150 hp variable speed drive which will control the loading on the crushed ore conveyor.
A secondary crushing plant has been installed in 2012. The primary gyratory crushed ore is crushed to 55 mm by two crushers driven by 2500 hp motor. The dust is caught by the bag house located in the same building. All the crushed material is conveyed to the ore stacking conveyor.

The covered stockpile has a live capacity of 11,000 t, which represents approximately 5 hours of operation of the process plant. The total live plus dead storage capacity in the crushed ore stockpile is approximately 55,000 t, which represents approximately 24 hours of process plant operation.

The stockpile is covered for dust containment from dust that is generated when the crushed ore conveyor is discharging onto the stockpile. The dust containment enclosure is a space-frame type structure that is independent of the crushed ore stacking conveyor structure. The structure has openings at the bottom to allow mobile equipment to enter inside.

Figure 17.3 illustrates the general arrangement of the primary crusher.

Figure 17.3 – Primary crusher, isometric view

17.3.2 Ore Reclaim and SAG Mill Feed Conveyor

Crushed ore will be reclaimed from the crushed ore stockpile by three apron feeders located in a reclaim tunnel under the stockpile. Each apron feeder have the full capacity to feed the SAG mill at an average rate of 2,491 tph. The apron feeders discharge onto the SAG mill feed conveyor. Each feeder is driven by a 150 hp variable speed drive. The variable speed of the apron feeders varies the SAG mill feed rate in response to the control loop demand.

The mill feed conveyor is approximately 240 m long and conveys the ore from the stockpile reclaim apron feeders to the SAG mill feed chute.

The SAG mill feed conveyor and the recirculating load (pebble crusher) conveyor are both equipped with weigh scales.

17.3.3 Grinding Circuit

The overall grinding circuit consists of the SAG mill circuit and three ball mills with their respective equipment as described below. The ball mills are configured as a two-stage circuit with two secondary grinding ball mills and one tertiary grinding ball mill.

The SAG mill circuit consists of a single 26,000 hp gearless drive SAG mill, 38 ft in diameter X 21 ft long (EGL), and two 12 ft x 24 ft vibrating scalping screens, recirculating load conveyors, and two 1200 hp pebble crushers. The SAG mill is fitted with pebble discharge grates and allows a discharge of a top size on the order of 50 to 60 mm. The mill discharge chute directs slurry to two scalping screens. The undersize material from the scalping screens, minus 12 mm material, discharges into a pump box which serves as a SAG mill discharge pump box as well as a discharge pump box for the two primary ball mills. The recirculating load conveyors receive the scalping screen oversize and transfer this material (pebbles) to feed the two pebble crushers. The recirculating load circuit includes three self-cleaning belt magnets to remove tramp material to protect the pebble crusher from tramp metallic materials. It also includes a metal detector ahead of the pebble crusher which will actuate the crusher feed gates to divert feed from the pebble crusher to the discharge conveyor of the pebble crusher when metal is detected on the crusher feed belt. The crushed product from the pebble crusher ($P80<12.5$ mm material) is conveyed to the SAG mill feed conveyor.

The final product from the SAG circuit is the feed to the two secondary grinding ball mills and has a product size of approximately $P80 = 3$ to 4 mm.

Each of the two secondary grinding ball mills is 16,000 hp, 24 ft diameter X 36.5 ft long (EGL) and each mill is close-circuited with cyclones to produce a secondary grinding ball mill product size of $P80 = 135$ microns. Each mill is driven by two 8,000 hp synchronous motors, each through air clutches to drive a pinion connected to the mill bull gear. The primary ball mill cyclone overflows are the new feed to the single tertiary grinding ball mill. Each secondary grinding ball mill discharges into the SAG mill discharge pump box thus using a common discharge/cyclone feed pump box. There are three secondary grinding ball mill cyclone feed pumps connected to this pump box, two main operating pumps, one for each ball mill cyclone cluster feed, and one standby pump. Each secondary grinding ball mill cyclone cluster feed pump is a 3000 hp, 28 X 26 horizontal slurry pump. The pumps are variable speed. There is one cyclone cluster for each secondary grinding ball mill which consists of eleven 33-inch diameter cyclones (9 operating and 2 spares).

The single tertiary grinding ball mill is 16,000 hp, 24 ft diameter X 36.5 ft long (EGL) which is close-circuited with cyclones to produce a final product size of P80 = 65 microns. The mill is driven by two 8,000 hp synchronous motors, each through air clutches to drive a pinion connected to the mill bull gear. The tertiary grinding ball mill cyclone overflow is the final product of the overall grinding circuit and this product is the feed to the leach circuit. The tertiary grinding ball mill circuit includes three 2500 hp horizontal slurry pumps, 28 X 26 (2 operating and 1 standby) to feed two cyclone clusters. The pumps are variable speed. There are two cyclone clusters for the single tertiary grinding ball mill circuit, each consisting of fifteen 26-inch diameter cyclones (12 operating and 3 standbys).

The product from the grinding circuit (secondary and tertiary grinding ball mill cyclone overflows) is sampled with in-line samplers and the sample stream flows to an on-line particle size monitor. The information from the on-line particle size monitor is used to control the grind size of the product from the milling circuit (leach circuit feed).

The grinding circuit is shown in isometric view in Figure 17.4.

Figure 17.4 – Grinding circuit, isometric view

17.3.4 Leach Feed Thickener

The ground ore from the SAG/Ball mill circuit flows from the cyclone clusters by gravity to two linear trash screens for removal of organic materials, metal and any other miscellaneous tramp materials. The underflow from the two trash screens flows by gravity to the leach feed thickener. The leach feed thickener is a high-rate thickener and will control the feed density to the leach circuit to 50% solids (w/w).

The two linear trash screens are 32 m^2 in size and are equipped with a cloth. The two screens are fed in parallel from the tertiary grinding ball mill cyclone overflows.

The thickener is a 65 m diameter thickener with a two-slope bottom (7.1° and 10°) and an auto-diluting feed well. The thickener underflow pumps are located in a pump room under the thickener. There are three thickener underflow pumps, 600 hp, 16 X 14 each (2 running and 1 standby). The pumps are variable speed. The pump speed is varied to be able to control the solids density of the feed to the leach circuit.

The thickener overflow flows by gravity to the process water tank dedicated to this thickener.

17.3.5 Leach Circuit and CIP Circuit

The two leach feed thickener underflow pumps feed two leach tank groups. There are a total of 20 agitated leach tanks arranged in four rows of 5 tanks in parallel. Two stage samplers are installed at each of the two leach feed lines.

The leach circuit is designed to provide a leach residence time of approximately 28 hours. Each tank is equipped with a 200 hp double impeller agitator mounted on the superstructure on the top of each tank. Slurry flows by gravity from tank to tank in each of the four 5-tank series. The tanks are 18 m diameter and vary in height from 22 to19.2 m for each row of 5 tanks. Each tank can be bypassed by manually operated valves which will direct the flow through a bypass line traversing the tank. Each of the leach tanks is equipped with a gas sparger, china-hat style for injection of oxygen into the slurry to be able to maintain the oxygen level in the solution required for the process kinetics. The discharges of the leach tanks feeds the two carousel-type CIP circuit. There are two carousel-type CIP circuits, each fed by one group of 10 leach tanks

The CIP circuit is configured as two parallel carousel-type arrangements. Each tank is equipped with a pump cell/agitator unit. All of the tanks are at the same height. The carbon remains in each tank and the slurry is pumped from tank to tank using the pumping screen mounted on the agitator drive. Each CIP carousel group has 7 tanks arranged in a series flow arrangement. Each tank has approximately 330 m^3 of usable volume and contains approximately 20 t of carbon. One tank per carousel arrangement is emptied every two days and the slurry/carbon mixture is pumped to the loaded carbon recovery screen ahead of the stripping circuit. The loaded carbon recovery screen is a 20 m^2 linear screen. There is one loaded carbon recovery screen feed pump per CIP carousel unit. Each pump is a 75 hp, 8 x 6, horizontal slurry pump. The slurry from the loaded carbon recovery screen (screen undersize) returns to the carousel slurry feed launder by gravity and the loaded carbon is charged directly into the strip vessels from the loaded carbon screen. Loaded carbon screening is located directly above the strip vessels.

The barren slurry from the two CIP carousel units flows continuously by gravity to a single tailings transfer pump box where it is pumped to two linear safety screens. There are two tailings transfer pumps, 1 running and 1 standby. Each pump is a 600 hp, 26 x 22 horizontal slurry pump. The main pump has a variable speed fluid drive and the standby pump is fixed speed. The two linear safety screens are fed in parallel and are each 20 m^2 in screening area with 700 micron (24 mesh) filter cloths. From the linear safety screen the tailings slurry flows by gravity to the tailings thickener where the slurry is thickened to 60% solids before being pumped to the detoxification plant for disposal to the tailings retention area. The leaching circuit is shown in isometric view in Figure 17.5.

Figure 17.5 – Leaching circuit, isometric view

17.3.6 Tailings Thickening

The tailings thickener is a high-wall thickener 65 m in diameter with a two-slope bottom (7.1° and 10°), an auto-diluting feed well, and a high torque rake/rake drive system. An emergency escape route is provided for by a ladder which is located in a dry well inside the rake mechanism tower. The thickener underflow pumps are located in a pump room under the thickener center column. The pump room is accessed through a tunnel under the thickener which exits outside of the thickener tank wall. There are two 700 hp thickener underflow pumps, 20 X 18 each (1 running and 1 standby). Both pumps are variable speed and they are both equipped with variable speed fluid coupling drives. The pump speed is varied to be able to control the solids density of the feed to the detox plant.

The thickened tailings at 60% solids (w/w) is pumped to the detox plant for cyanide content destruction. The treatment of the slurry in the detox plant reduce the cyanide content of the tailings slurry down to 20 ppm of cyanide or less. The plant makeup water from the reclaim water pond will enter the process, to the maximum extent possible, through the tailings thickener feed. This flow arrangement minimizes the impact on the environment by helping to reduce the cyanide content of the final slurry. In addition, by adding water to the tailings thickener feed, a maximum of chemicals are recirculated in the circuit and treatment cost for tailings detox is minimized. The tailings thickener overflow discharges into a process water tank dedicated to this thickener and this water is re-used throughout the process.

17.3.7 Stripping Circuit

The slurry containing the loaded carbon from the CIL carousel tank is pumped to the loaded carbon recovery screens located above the stripping vessels. The screened (washed) carbon from the linear screen falls through a chute into one of the two 10 t strip vessels. The slurry from the CIP carousel circuit that was in the feed to the loaded carbon recovery screens flows through the screen deck, is collected in the screen undersize launder, and flows back to the CIP carousel circuit feed launder by gravity.

Carbon stripping is accomplished with Zadra pressure stripping technology. The circuit consists of a barren solution tank, two strip vessels, a natural gas-fired strip solution heating system, a complete heat exchanger system circuit, and 6 electrowinning cells. The pregnant solution is cooled and then flows directly to the electrowinning cells located in the gold room. Stripped carbon is then pumped from the strip vessel to the carbon reactivation area.

In the carbon reactivation circuit, the carbon is first screened and dewatered. The screen discharge is directed to a kiln feed hopper. Additional dewatering is accomplished by a static drain screen at the bottom of the feed hopper at the screw feeder. Two natural gas-fired rotary reactivation kilns, each having a capacity of 10 tpd, are provided for carbon reactivation. The activated carbon exits the kiln and falls by gravity into a quench tank. The quenched carbon is then transported to the sizing screen. Fresh carbon is also added to the circuit via the carbon sizing screen, to replace the carbon lost as fine carbon that leaves the circuit either in the tailings slurry stream or the fine carbon that is filtered from the carbon transport water. The water used to transport carbon is collected in a transport water recovery tank and is re-used as transport water in a closed circuit. The carbon that settles out in this tank is pumped from time to time to a filter press that recovers the fine carbon. This carbon is then collected and sold to the smelter for its gold content. The fresh carbon that is added to the circuit is first scrubbed in an agitated tank to liberate fine carbon and then the carbon/water mixture is pumped to the carbon sizing screen.

This carbon that has been screened is added to the CIP carousel tank. Carbon is transferred using recessed impeller-type pumps to minimize the generation of carbon fines. A carbon transfer water system is provided to conserve water and to recover the fine carbon particles which contain residual gold. A central tank is used to collect all transport water used in carbon movement after each cycle of use. The tank is designed to allow the fine carbon to settle. This water, with the addition of make-up water is used only for the transporting of carbon. Periodically the carbon fines are pumped from this central tank, filtered and then put in super sacs and transport to the smelter. Credit is given for any residual gold and silver values in the fine carbon.

17.3.8 Gold Electrowinning and Refining

The electrowinning (EW) cells are fed directly from the strip vessels. There are 6 electrowinning cells of 3.5 m^3 each. The cells are cleaned periodically to recover gold from the cathodes washed in place with a high pressure washer. The sludge is transferred by sludge pumps to a filter feed pump box and pumped to a pressure filter. The filter cakes are dried prior to being melted in the refining furnace.

For refining, a 125 kW, 2.2 ft^3 induction furnace is used. A wet scrubber collects the fumes from the furnace. Refined gold is poured into a series of molds.

The gold recovery circuit, including CIP, stripping, carbon regeneration and gold room, is shown in Figure 17.6.

Figure 17.6 – Gold recovery, isometric view.

18. PROJECT INFRASTRUCTURE

The main infrastructure includes the administration/warehouse building, the mine office/truck shop building, the process plant, and the crushing plant. Figures 18.1 and 18.2 show an aerial view of the infrastructure of the Canadian Malartic mine. A high-resolution satellite image of the Canadian Malartic mine taken on June 16, 2014 is presented as Figure 18.3.

18.1 Electrical and Communication

18.1.1 120 kV Electrical Transmission Line

The electrical power for Canadian Malartic is supplied from the existing Hydro-Québec 120 kV Cadillac main substation. A 120 kV electrical transmission line approximately 19 km long was built. Power demand for the entire project is about 85.3 MW including all mill and mine support facilities.

The 120 kV electrical transmission line is of single circuit type consisting of one circuit of three conductors. Most of the towers are wooden pole structures, while angle and anchor supports are galvanized steel towers. The average distance between towers is 200 m. The width of the right of way for the deforestation of the new transmission line is 46 m.

18.1.2 Main Substation

The plant main substation is located next to the process electrical room, close to the biggest loads, the SAG mill and ball mill motors.

The main substation includes all the equipment required by Hydro-Québec to connect the Canadian Malartic complex to the local grid. Loads are distributed to each of the three transformers at an average of 28 MW each. If a transformer failure occurs or if maintenance of one of the transformers is required, the load will be redistributed to the two available transformers in order to guarantee continuity of production.

The main substation includes a ''prefab'' building for the 120kV and 13.8 kV distribution to the entire site. Major loads are controlled from this building.

Figure 18.1 – Aerial view of the infrastructure of the Canadian Malartic mine (looking north)

Figure 18.2 – Aerial view of the infrastructure of the Canadian Malartic mine (looking east)

Figure 18.3 – High-resolution satellite image of the Canadian Malartic mine on June 16, 2014

18.1.3 Site Power Distribution

One large electrical room located in the process plant has been included for process and service loads. This electrical room includes transformers and distribution equipment for the 13.8 kV, 5 kV and 600 V loads in many different areas.

Adjacent to this electrical room, located on the ground floor, are many smaller electrical rooms, including one for the three ball mill where the excitation and control system is installed for each set of ball mill motors. Furthermore there are three smaller distribution electrical rooms, one at one end and two at the other end of the concentrator, to feed all the small loads located in those areas.

For the mine loop, three other 25 kV transformers have been included for the electrical power feed to the open pit (shovels, pumping station, lighting, etc.). Local secondary substations consisting of pad-mounted and mobile sub-units have been considered for the open pit operation.

A 15-km-long 25 kV electrical distribution network covering the site is also required to feed the following areas:

- Crushing plant
- Reclaim water pumping system
- Effluent treatment plant
- Fresh water pumping system
- Explosives plant

18.1.4 Emergency Generators

Seven emergency generators of different power and voltage are installed at strategic locations to feed the loads requiring power during a power outage or during maintenance on the 120 kV line. Emergency power will be required for a minimum amount of building lighting and heating as well as selected process equipment requiring electrical power at all times.

One emergency generator of 2.5 MW at 4.16 kV is installed close to the concentrator to keep the leach tank agitators in service.

A second unit of 1.5 MW at 600 V is installed close to the concentrator to maintain the services of the thickener rake drive mechanism, the reagent mixing tank agitators, the gold room equipment and to keep some sump pumps running.

A third unit of 250 kW at 600 V is installed close to the crusher building to secure this area during an electrical outage or maintenance.

One other unit of 250 kW at 600 V is located at the Johnson basin to guarantee water supply during fire inside buildings.

One other unit of 1 MW at 600 V is located in the south part of tailing pond to maintain water supply to the concentrator.
A unit of 1MW at 600 V is located at the Southeast Pond to maintain water supply to the effluent treatment plant (ETP). The ETP is under construction at the time of writing this report.

A last unit of 250 kW at 600 V is located north of the administration building. This unit will supply the administration building in case of power failure.

18.1.5 Communication Systems

The plant area telephone network is connected by optical fiber to the Malartic telephone exchange and will be used for telephone, fax and computer by IP telephone, etc.

The radio phone system includes a main repeater station with the main antenna located close to the administrative office area and a second antenna located at the mine pit. A third antenna has been installed in 2014 for the tailing pond coverage. This network has several channels, each dedicated to the following departments:

- Mine Operations
  - Technical Services
  - Exploration
- Mine Maintenance
- Process Plant Operations
- Process Plant Maintenance
- General Services (Warehouse/Surface Maintenance)
- Environment
- Site Security

18.2 Green Wall (linear park)

A buffer zone 135 m wide has been developed along the northern limit of the open pit to mitigate the impacts of the mining activities on the Malartic citizens.

Inside this buffer zone, a landscaped ridge is built mainly made of rock and topsoil from the pre-stripping work.

The height of the landscaped ridge is 15 m where the concentration of residents is higher and 5 to 6 m in non-resident sectors. A security fence has been erected at the bottom of the ridge on the urban side to restrict access to the property. Soil and organic matter cover the surface, planted with different types of vegetation such as shrubs trees and grasses.

18.3 Site Roads

On-site roads provide access to the following areas:

- Process plant

- Crushing plant
- Administration/mining building
- New polishing pond area
- Effluent treatment plant
- Explosives plant

On average, the roads are 10 m wide and constructed with granular material from the site borrow pit. In total, approximately 12 km of roads have been constructed.

18.4 Main Security Control Gate

A control gate building at the main entrance of the site allows personnel to supervise the entrance and the transport of merchandise. An automatic control gate system is installed.

Security personnel are responsible for visitor registration and individual safety equipment distribution.

Furthermore, a fire protection system panel and a surveillance camera are connected to the main control gate.

A parking lot that can accommodate 400 vehicles was built in front of the main control gate.

18.5 Administration/Warehouse Building

The administration/warehouse building has two floors, each of which has 1,300 m^2 of space. On the ground floor, there is a warehouse with shelving to maximize storage space. The warehouse has an interior door access to communicate with the mine's heavy equipment maintenance shop. Furthermore, an outside warehouse facility consists of two mega-dome buildings of 800 m^2 each.

On the second floor of the administration building are the following departments or services:

- Management
- General Administration, Accounting
- Geology
- Engineering
- General Services, Surface Support
- Environment, Health and Safety
- Human Resources
- Information Technology (IT), Telecommunications.

This building has been designed with a light structural steel frame with steel siding, flat insulated roofing and conventional interior finishing. The administration/warehouse building is protected by a fire protection sprinkler system.

18.6 Mine Office/Truck Shop Building

Mine operations and maintenance personnel are assigned to a building that is joined to the truck shop facilities. The mine office is 3,000 m^2 and includes the following services:

- Mine maintenance staff office
- Mine maintenance personnel dispatch center
- Contractor offices
- Data room
- Medical center
- Training and conference room
- Mine maintenance lunch room/dry

The capacity of the mine dry accommodates 865 workers for the mine operations and maintenance department. This building is also protected by a fire protection sprinkler system.

The truck shop facility is 4,000 m^2 and is used for the maintenance of heavy mining equipment. A total of 10 bays were retained for the design as follows:

- One dedicated wash bay (equipped with a specialized heavy mining equipment washing system and water/oil separator)
- One dedicated welding bay
- Three preventive maintenance bays (lube bay)
- Two major repair and tire handling bays
- Two mine support equipment maintenance bays
- One mechanical shop

This building is designed with a light structural steel frame with steel siding, flat insulated roofing and conventional interior finishing.
This building is equipped with two overhead cranes for the following specific uses:

- 30 t / 10 t capacity for heavy mining equipment maintenance
- 10 t capacity for the mechanical shop.

A tool crib, lube/oil distribution system and air compressor are also installed in the truck shop.

18.7 Process Plant Offices, Dry and Lunch Room

Located adjacent to the concentrator building, on the southwest corner, is the administrative and general service facility, which includes administration offices, change rooms, toilets and showers, lockers, cafeteria, first aid stations and laboratories.

This facility is a 3-story structure with a total floor area of roughly 1,900 m^2 and a height of 14 m.

The ground floor houses the metallurgical laboratory and has an area of 1,016 m^2 with a 3,000 mm interior height clearance. The laboratory is fully equipped with pressure filters, grinding simulation equipment, flotation cells, leaching test equipment and other miscellaneous laboratory equipment as required.

The dry (wet & dry lockers, showers, toilets and cafeteria) is located on the second floor and has an area of roughly 442 m^2.

The third floor also has an area of 442 m^2 and houses the administrative offices (13 closed offices, 2 open area work stations, 1 conference room, toilets and a small coffee and lunch room).

All of these floors are directly connected to the operating floors in the concentrator by two service staircases that also serve as emergency exits for both facilities.

This steel structure is clad with preformed insulated steel panels on the exterior and offer extensive windows for day-lighting and natural ventilation in living and working spaces. Complete mechanical and electrical systems provide for heating, air conditioning, ventilation, sanitary and lighting requirements.

18.8 Fire Protection

The fire protection systems provide protection for all of the plant's various areas according to their specific requirements.

18.8.1 Crusher

The crusher is protected by a 1-1/2 inch fire hose system. In addition, the crusher conveyor is protected by a dry-type sprinkler system and the lube and hydraulic units by dedicated sprinkler heads.

18.8.2 Stockpile Tunnel

The stockpile tunnel and stockpile tunnel conveyor are protected by a dry-type sprinkler system.

18.8.3 Concentrator

The concentrator does not require sprinklers. Instead, 1-1/2 inch fire hoses are located so that all areas of the mill can be reached by firefighting personnel.
Certain specific areas of the concentrator require additional fire protection: conveyors, lubrication units and hydraulic units require local wet-type sprinklers. The SAG feed conveyor is protected by a dry-type sprinkler system.

18.8.4 Offices, Dry Facilities, Cafeterias and Control Rooms

All the offices, mine dry facilities, cafeterias and control rooms are protected by wet-type sprinkler systems as well as by 1-1/2 inch fire hoses. Sprinkler head density is higher in the dry facilities.

18.8.5 Laboratory

The laboratory is protected by sprinklers and 1-1/2 inch fire hoses.

18.8.6 Electrical Rooms

The electrical rooms do not require fire protection. Manual extinguishers are installed in all electrical rooms.

18.8.7 Transformer Rooms

The main transformer room requires wet-type sprinkler protection.

18.8.8 Water Supply and Plant Area Protection

The fire protection water supply provides 340 m^3/h for two hours. An underground loop supplies water to fire hydrants spaced at 100 m from one another. In the concentrator, fire water booster pumps provide 65 psi at the top of the highest riser. A jockey pump is also installed.

18.9 Process Automation and Telecommunication Systems

18.9.1 Process Control system

The Canadian Malartic Project has adopted PLC industrial human machine interface (HMI) for its local operator stations and SCADA software to implement overall process control operations.

Sectors of the plant are fully automated with operation controlled from two control rooms and minimum operator involvement locally.

Expert system software is used to improve production and stability of the PID loops of the process. An expert system software is a computer program that solves problems using information and reasoning techniques normally associated with a human expert. The expert system is linked to the process control I/O system and allows control room operators to diagnose and respond to unusual disturbance operating conditions. More specifically, in a 55,000 tpd grinding circuit, an expert system helps maximize throughput and stabilize the control of product particle size, which is of great importance for the recovery of fine gold particles. A better control of the grinding circuits results in significant savings by improving liner protection thus extending the life of the liners.

18.9.2 Phone System

The phone system is based on Ethernet using Voice Over IP. Each phone has two (2) Ethernet ports. The phone system is hosted on a dedicated server complete with extension management and voice mail.

18.9.3 Access System

A computer-based access system is used to monitor and grant access to the site using electronic ID cards.

18.9.4 Camera System

The camera system is web-based using MPEG2 format. The cameras are connected to the plant LAN. Cameras are 8 mm color CCD with 480 line horizontal resolution and electronic sensitivity enhancer-type cameras.

18.9.5 Telecommunication Network System

The fiber optic network is used to link, through Ethernet, the different control systems and all auxiliary systems.

The fiber optic network is installed across the plant facilities to integrate the different required systems. Fiber optic cables are run in cable trays for locations close to the concentrator (crusher, administrative building and garage) while a messenger installed in the various overhead lines enables the fiber optic to reach the more remote locations (pump houses, tank farm and entrance gate).

Where communication links share the same telecommunication equipment, a dedicated VLAN is used for each type of telecommunication link. The network is configured for packet priority in order to optimize the available bandwidth.

18.10 Process Plant Workshop

The mill workshop is located on the ground floor in the southeast corner of the process building. The workshop is 12m x 30m and is serviced with two 10 t overhead cranes. The shop contains mechanical maintenance equipment such as drills, lathes, burning and welding equipment, a pipe shop and specific tools for equipment component repair.

A tool crib for storage of field repair equipment, rigging equipment, etc. is also provided. An office and reference area for equipment manuals and drawings is incorporated into this space for technical reference information required for the shop repairs.

18.11 Water/Sewage Infrastructure

The Canadian Malartic mine is connected to the sewage and potable water systems of the town of Malartic. The sewage is collected at the mine site and pumped in a 200 mm diameter buried high-density polyethylene (HDPE) line to connect to the municipal grid located in the industrial park. The potable water is also connected to the municipal potable water network. The 150 mm potable water line is buried and follows the routing of the sewage line.

18.12 Plant Water Systems

The plant water systems consist of the process water system which is supplied principally from the plant thickener overflows, the fresh water system which is supplied from the old underground mine dewatering system, the reagent preparation water system, the gland water distribution system and the reclaim water from the Southeast Pond area. The different water systems are used in the plant as described in the following sections:

18.12.1 Process Water

Process water supplied to the process is made up of two systems, the tailings process water system and the leach process water system. The two process water systems each have their separate tanks and pumping systems but are connected to the same process distribution headers. The source of water for the leach process water tank comes from the leach feed thickener overflow. The tailings process water tank receives its water from the tailings thickener overflow. The common process water header provides water principally to the SAG and Ball mill circuits. The principal users of process water are the SAG mill feed, the ball mill cyclones feed dilution, the scalping screens spray water, floor wash-down, and other miscellaneous users.

Each of the process water tanks has a retention time of approximately 10 to 15 minutes under average flow conditions. The leach process water flow is the larger of the two and water is supplied by three horizontal water pumps, two running and one standby; each pump is 750 hp, 18” x 16”. The tailings process water flow is supplied by two horizontal water pumps, one running and one standby; each pump is 750 hp, 18” x 16”.

The principal make-up water to the process water systems is recirculated water from the tailings pond. This water is added to the process water system as make-up water, mainly to for the tailings thickener feed (as previously described elsewhere). This make-up water contributes to reducing the cyanide content in the final tailings and hence ends up in the tailings process water tank as tailings thickener overflow.

18.12.2 Fresh Water

The fresh water system is mainly furnished from fresh water sources; that is, the old underground mine dewatering. This water is used principally for cooling water for the grinding mill drives and lube systems, the cooling water for variable speed fluid drives on pumps, for the strip solution heat exchanger, and for caustic reagent preparation. The fresh water network is supplied by two pumps, one running, and one standby. The pumps are fixed speed 150HP, 6” x 4” horizontal water pumps.

18.12.3 Reagent Preparation Water

Reagent preparation system water is supplied from the spent cooling water throughout the plant. The cooling water system, as described above, provides cooling water through a piping network and the spent cooling water from each user is piped to a collecting piping network. This spent cooling water is all piped to the feed of the reagent preparation water tank. The distribution of reagent preparation water is provided by two pumps, one running and one standby. These pumps are fixed-speed, 150 hp, 6” x 4” horizontal water pumps direct driven.

Fresh water from the fresh water system is bled to the reagent preparation tank if there are peak demands that cannot be met by the cooling circuit return water. Reagent preparation water is used for strip cooling, stripping area sprays, and stripping area make-up water in addition to reagent mixing/dilution for the following reagents: flocculent dissolution, lime slaking and copper sulphate mixing.

18.12.4 Gland Water

The gland water system water is supplied from the reclaim water pumps. The gland water network supplies all gland water to the gland seals for the slurry pumps in the process. The distribution of gland water is provided by two horizontal pumps, one running and one standby. These pumps are fixed speed 150 hp, 4” x 3” horizontal water pumps. Two additional 30 hp, 2” x 1.5” vertical pumps are integrated to the network to provide additional pressure to the secondary pumps glands of the multiple stage tailing system.

18.13 Reagent Preparation

The reagent preparation area includes receiving systems and mixing/preparation/metering systems for flocculent, caustic, cyanide, copper sulphate, nitric acid, anti-scalant and slaked lime. The mixing/preparation and dosing systems are all located at the east end of the process building and cover an area of approximately 18 m x 24 m with additional area for bulk storage tanks outside the building wall (lime silo, cyanide, nitric acid, peroxygen and liquid SO2). This area is easily accessed by transportation trucks delivering bulk and packaged reagents.

18.13.1 Flocculent

Flocculent is delivered to the plant in super sacs of 750 kg. Approximately 3 sacs per day are consumed at the process plant. The flocculent bags are stored indoors. A seven to ten day supply is kept in the mixing area. The sacs are lifted onto a platform over the hopper/feeder which feeds the patented wetting device which transfers the powder into solution. The solution is diluted and mixed in an agitated mixing tank and then transferred to a flocculent holding tank by a progressive cavity type pump.

From the storage tank the flocculent is metered to the two thickener feed wells by progressive cavity pumps, one pump per thickener with one standby pump for both. As the polymer is pumped by the metering pumps, it passes through flocculent dilution boards (static mixers), one per thickener, where it is diluted further for dissolution into the thickener feed slurry.

18.13.2 Caustic

Caustic soda is delivered in liquid form (50% concentration) in bulk transport trucks of approximately 35 t. At the process plant the caustic is unloaded into a storage tank which is equivalent to about 15 to 20 days storage. It is pumped to the barren strip solution tank where it is diluted with fresh water.

18.13.3 Cyanide

Sodium cyanide is delivered in liquid form (30% concentration) in bulk transport trucks of approximately 30 t. It is unloaded into an outside storage tank which is equivalent to about one day of average consumption. Three pumps meter cyanide to the SAG mill feed, ball mill feed, the leach feed thickener feed box and to the leach tanks area. The pumps are stainless steel chemical pumps and each of the 3 metered feed lines is equipped with in-line flow meters.

18.13.4 Lime Slaking and Distribution

Quick lime is delivered in bulk carriers containing roughly 33 t, equipped with pneumatic unloading systems. The lime is unloaded from the trucks into the 300 t capacity silo. The silo is equipped with dust collection and a pneumatic unloading system and an unloading hopper at the bottom. Screw feeders at the bottom of the silo convey the quick lime to two lime slakers where water is added and the quick lime dissolves in the water. The lime slurry flows from each slaker to an agitated storage tank from where the lime is distributed to three different distribution loops. Each distribution loop has two horizontal slurry pumps, one operating and one standby, which feed the loop. From each distribution loop the lime slurry is metered into its usage point by an automated valve. The unused flow in each loop is piped back to the agitated storage tank forming a close circuit minimizing line plugging occurrences.

The lime slurry distribution loops are piped to the SAG mill area, the leach tank area and to the detox plant.

18.13.5 Copper Sulphate

At the process plant, copper sulphate is delivered in 1250 kg super sacs transported in batches of 30 t per truck load. The super sac is lifted onto the feed bin of the agitated tank and the copper sulphate powder discharges into the water that has been metered into the tank. The mixture is then transferred by a chemical pump to a storage tank from where it is pumped to the Detox plant via a metering chemical pump.

At the effluent treatment plant copper sulfate is delivered in the same bags and mixed with water in a mechanically agitated tank to a solution strength of 20%. The copper sulfate solution is metered from a storage tank to the reactor tankage.

18.13.6 Nitric Acid

Nitric acid is delivered in a 30 t tanker truck and transferred to the nitric acid storage tank which contains approximately 50 t of acid. The nitric acid is used in the stripping circuit for acid washing and cleaning of lines and vessels/heat exchangers in this area. The acid is diluted to 7 to 9% strength in a mixing tank before using.

18.13.7 Anti-Scalant

Anti-scalant is used in the process water reservoir and in the stripping circuit to minimize scale build-up. Each area has its own anti-scalant metering pump. Anti-scalant is delivered in 20 t tankers and stored inside in a 34 t reservoir.

18.13.8 Sulfur Dioxide (SO2)

SO2 is delivered in liquid form by tanker truck of approximately 25 t and stored in an 80 t horizontal storage tank. The storage tank comes with a pressure regulator to regulate the pressure of the SO2 gas added to the reactor tank for the detox plant.

18.13.9 Peroxide

At the process plant and for the detox plant, peroxide is delivered in liquid form by tanker trucks of 15 t and stored in a 30 t vertical outside storage tank. Hydrogen peroxide at 50% is used in summer time as compared to 50% in wintertime. A system of pumps made from stainless steel deliver the hydrogen peroxide to a dosing tank with level control. The dosing tank has two functions: first of all to prevent liquid running back from the process point to the storage tank and secondly to build up pressure for the downstream dosing pump.

18.14 Service Air Compressors

Plant air is required principally for continuous instrument air consumption and for short-term demand for pneumatic tools during maintenance activities. Three air screw compressors, two operating and one standby, are installed for this purpose. One hundred percent of the air is dried so that only one distribution loop is required in the process plant to provide both instrument air requirements and air for pneumatic tools. This air is also used for the air clutches for the ball mill drives. One main air receiver is required at the compressor location and two other air receivers for the distribution loop to minimize pressure drops on the compressed air network during peak loads. In addition, each ball mill has its own air receiver.

The crusher area has a system that is independent from the process plant. The crusher is equipped with an air compressor with 100 cfm capacity at 100 psi. The compressor is a reciprocating type with its own control system and air receiver. The compressor is located in the mechanical room where the crusher lube oil cooling radiators are located (at ground level).

18.15 Oxygen Plant

A liquid oxygen supply tank with vaporizer and pressure regulator is installed to provide oxygen (bulk delivery). The liquid oxygen storage tank is replenished from time to time by liquid oxygen supply trucks as required.

The oxygen is distributed to the leach tank oxygen spargers through a piping network internal to each tank using an inverted cone-type sparger.

18.16 Explosives Plant and Depot

The explosives plant is sized to produce the required quantity of explosives for the mine estimated at about 22,000 t of emulsion per year. The explosives depot include a magazine for the storage of 40,000 kg of 1.1D class explosives (pre-split packaged explosives and boosters) and another magazine for the storage of 20,000 detonators classified 1.1B.

18.17 Fuel Storage Facilities

The fuel storage facilities have 250,000 litres of storage capacity and are located northeast of the truck shop. The system includes the following items:

- Five 50,000 litre capacity fuel ISO tank;

- One 10,000 litre capacity gasoline ISO tank;
- One concrete pad equipped with a transfer pump system to unload supplier fuel trucks;
- Two fuel distribution points with electronic control card access systems for heavy mining and support equipment built on a concrete pad;
- One gasoline distribution point with electronic control card access system for small vehicles built on a concrete pad;
- Lubricant product storage facilities for all mining equipment equipped with fire protection sprinkler systems.

18.18 Monitoring/Weather Station

A weather station is installed and connected to the Canadian Malartic mine environmental department monitoring system in order to register climate data and to produce historical surveys.

From the meteorological station, the following information will be available on a daily basis:

- Temperature
- Air humidity
- Wind speed
- Wind orientation
- Atmospheric pressure
- Precipitation

18.19 Deviation of Highway 117

Canadian Malartic GP is planning an extension of its Canadian Malartic mine, in particular the expansion of the existing open pit in the Barnat sector.

The reserve estimates assume that all necessary authorizations will be obtained in order to begin mining activities on the South Barnat portion of the deposit. The current mining permit does not include South Barnat, nor does it include authorization to deviate Highway 117 (Fig. 18.4). Canadian Malartic GP continues to work with Québec’s Ministry of Transport and the Town of Malartic on the deviation of the highway to gain access to the higher grade Barnat deposit. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014 and a request for public hearings will be made. It is expected that the Barnat deposit will provide higher ore grade mill feed. Although Canadian Malartic GP has taken all possible measures to ensure majority community support for the deviation of Highway 117, there is no guarantee that the Partnership will obtain permits for the project.

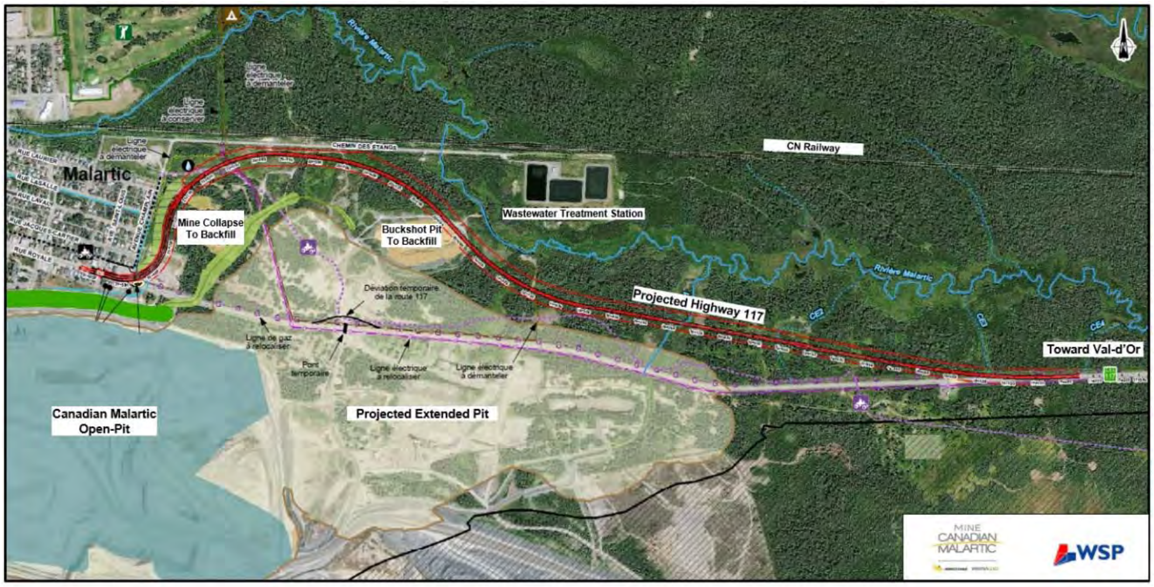

Figure 18.4 – Projected deviation of Highway 117

18.20 Workforce

18.20.1 Mine and Process Plant workforce

The mining and milling manpower requirements are presented in Tables 18.1 and 18.2.

The operations team is responsible for achieving production targets in a safe manner. The engineering and geology team provide support to the operations team by providing short-term and long-term planning, grade control, surveying, mining reserves estimation and all other technical functions. Operating costs for this group includes salaries, office supplies, and survey and grade control supplies.

Mine crews work 12-hour shifts on a 5 day / 4 off / 4 night / 5 off schedule. Four crews are required to operate 24 hours per day all year round. This is a common schedule used in the region and results in 2,190 scheduled hours of work per year excluding vacation time.

Mine technical staff work on a standard office schedule consisting of a 5-day work week.

The explosives plant would operate 7 days a week on 12-hour shifts. The explosive plant requires 1 operator working on the same schedule as the blasting crew and a supervisor plus a mechanic working on a 5 days on, 2 days off schedule, for a total of four employees.

The manpower requirements for the process plant facilities are presented in Table 18.2. In general, the operations personnel work 12-hour shifts to provide 24-hour coverage. The maintenance crew normally work on a day shift with some sub-groups allocated to emergency repairs and on-demand requirements.

18.20.2 General Services and Administration (G&A)

The General Services and Administration (G&A) group includes all personnel relating to senior management, accounting, payroll, human resources, surface support, health and safety, environment and telecommunication. All the departments and sectors not directly related to operations are included in the G&A.

The G&A manpower requirements are presented in Table 18.3.

The procurement and logistics group is responsible for sourcing suppliers, organizing transportation of all the supplies and goods, managing site inventory, negotiating prices and delivery conditions.

The human resources department is responsible for all aspects pertaining to employee fringe benefits, recruitment, discipline management and labour agreements.

The administration sector includes senior management, accounting, public communication and community relations personnel.

IT and telecom are responsible for computer maintenance, networking and all communication systems as well as all radio maintenance, and the mine dispatch system.

The G&A labour breakdown is presented in Table 18.3. In general, the management and administrative staff will work on a 40-hour per week basis, day shift only.

Security and warehousing typically work a 12-hour shift schedule covering 24 hours per day as part of the support to the operations.

Table 18.1 – Mining manpower summary

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administration	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**0**	**0**
Secretary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Clerk (Invoicing)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Geology	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**0**	**0**
Office Clerk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Clerk (Technical Services)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Sampler	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	0	0
Project Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Mine Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mine Geologist	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Resources Geologist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Sampling Employee	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Technician (Grade Control)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Technician (Geological)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Technician (BBM Geological)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Engineering	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**32**	**2**	**2**
Land Surveyor	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2
Coordinator (Survey)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Draftsman	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Draftsman	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Junior Engineer	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0
Junior Engineer (Geotechnics)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Main Engineer (Planning)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Main Engineer (Production)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Engineer (Continuous Improvement)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Engineer (Drilling Blasting)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Senior Engineer (Geotechnics)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Engineer (Geotechnics)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Project Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Engineering)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mining Technician	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Technician (Drilling Blasting)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Technician (Drilling Blasting)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Technician (Geotechnics)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Technician (Planning)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Senior Technician (Planning)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Mine Maintenance	**117**	**119**	**119**	**119**	**119**	**119**	**119**	**119**	**119**	**119**	**119**	**119**	**117**	**95**	**80**	**23**	**23**
Senior Foreman (Maintenance)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Foreman (Maintenance)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	2	2
Electromechanical Engineer	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	2	2
Mechanical Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Labourer	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2
Specialized Labourer (Maintenance)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Mechanic (Diesel)	67	69	69	69	69	69	69	69	69	69	69	69	67	45	30	12	12
Employee (Equipment)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Employee (Lubrication)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	2	2
Welder	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	2
Superintendent (Maintenance)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Special Projects	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mine Planning	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**1**	**1**
Main Planner (Maintenance)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Planner (Maintenance)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Planner (Maintenance)	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	1
Mine Production	**261**	**277**	**273**	**257**	**257**	**265**	**253**	**253**	**261**	**245**	**229**	**233**	**241**	**156**	**103**	**68**	**68**
Helper (Operations)	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
General Foreman (Drilling Blasting)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
General Foreman (Mining Operations)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Foreman (Drilling Blasting)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Foreman (Production)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Foreman (Operations Support)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Junior Engineer (Mining Operations)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Labourer	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	8	8
Operator (Production Truck)	96	112	108	92	92	100	96	104	112	96	80	84	92	40	8	0	0
Operator (Service Truck)	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Operator (Production Loader)	12	12	12	12	12	12	12	8	8	8	8	8	8	8	4	4	4
Operator (Auxiliary Equipment)	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	32	32
Operator (Drill)	46	46	46	46	46	46	38	34	34	34	34	34	34	8	0	0	0
Operator (Production Shovel)	16	16	16	16	16	16	16	16	16	16	16	16	16	9	0	0	0
Dispatcher	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Superintendent (Mining Operations)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Grand Total Mine Department	**443**	**461**	**457**	**441**	**441**	**449**	**437**	**437**	**445**	**429**	**413**	**417**	**423**	**316**	**248**	**93**	**93**

Table 18.2 – Milling manpower summary

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administration	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Secretary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Secretary (Document Management)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Electrical	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	0	0
Foreman (Electric and Instrumentation)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Foreman (Electric and Mechanical, Buildings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Electrician	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0	0
Engineer (Automation and Control)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Electric Engineer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Mechanical Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Technician (Automation)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Technician (Instrumentation and Control)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	0	0
Technician (Industrial Networking)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mechanical	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	21	21
Project Manager	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Foreman (Maintenance)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Foreman (Mechanical)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Coordinator (Equipment)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mechanical Engineer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Industrial Mechanic	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	18	18
Crushing Mechanic-Diesel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Senior Mechanical Planner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Electrical Planner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Mechanical Planner	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Superintendent (Maintenance and Buildings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Metallurgical	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	0	0
Coordinator (Metallurgical)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Metallurgist	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Refiner	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Technician (Metallurgical)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Planning	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Senior Planner	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Technician (Predictive Analysis)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Operation	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	4	4
Helper (Operation)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Helper (Operation, Secondary Crusher)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
General Foreman (Production)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Foreman (Production)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Foreman (Auxiliary Services)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Trainer (Mill)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Auxiliary Labourer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Crusher Labourer	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Specialized labourer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Crusher Labourer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Grinding Operator	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
CEP Operator	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
Crusher Operator	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Secondary Crusher Operator	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Operator	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	0	0
Control Room Operator	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Solutions Operator	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0
Planner Supervisor (Auxiliary Services)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Production Superintendent	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Grand Total Mill Department	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**138**	**25**	**25**

Table 18.3 – Service workforce summary

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Administration	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**0**	**0**
Executive Secretary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Communication Secretary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Public Councillor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Accounts Department	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**8**	**4**	**4**
Clerk (Payable Accounts)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1
Clerk (Payroll Department)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Controller	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Accountant	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Environment	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**	**25**
Foreman (Environment and Tailings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
General Foreman (Environment and Tailings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Coordinator (Instruments and Data Analysis)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Coordinator (Control Follow-up and Soil)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Labourer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Specialized Labourer	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Specialized Labourer (Environment)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Assistant Superintendent (Environment and Tailings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Superintendent (Environment and Tailings)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Superintendent (Environment and Control Follow-up)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Senior Technician (Projects and Database)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Technician (Environment)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
General	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**
Coordinator (Infrastructures)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Infrastructures)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Computing	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**3**	**3**
System Administrator	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Coordinator (Telecommunications)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Computing and Telecommunications)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Technician (Computing)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Technician (Telecommunications)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Human Resources	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**3**	**3**
Human Resources Officer	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Councillor (Formation)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Councillor (Human Resources)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trainer (Mining Operations)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Human Resources)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Superintendent (Human Resources and Training)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Health and Safety	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**6**	**6**
Clerk (Gate)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Councillor (Health and Safety)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Councillor (Health and Safety) and Hygienist	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Coordinator (Industrial Safety)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Nurse	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Worker Representative	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Superintendent (Urgent Measures)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Health and Safety)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
General Administration	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**7**	**7**
Senior Buyer	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1
Analyst (Inventory)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Specialized Clerk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Clerk (Purchases)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Clerk (Warehouse)	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	4	4
Delivery Person	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Coordinator (Warehouse)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0
Superintendent (Purchases Warehouse)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Grand Total Services Department	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**77**	**49**	**49**

19. MARKET STUDIES AND CONTRACTS

19.1 Market

The gold produced at the Canadian Malartic mine is refined to market delivery standards by the Royal Canadian Mint in Ottawa. The gold is sold to various banks at market prices. Canadian Malartic GP believes that, because of the availability of alternative refiners, no material adverse effect would result if Canadian Malartic GP lost the services of its refiner.

19.2 Material Contracts

The Canadian Malartic mine has signed contracts which are directly associated with operations. The contracts amounting to more than C$5 million per year are listed in Table 19.1.

Table 19.1 – Material contracts more of C$5 million/year at Canadian Malartic mine

Supplier	Product	2014 estimated contracts (C$ millions)	Comments
Orica Canada Inc.	Explosives	$35.3	Contract to be re-negotiated in 2016
Hewitt Equipment Ltd	Heavy machinery components	$31.0	13-year contract agreement
Hydro-Québec	Electricity	$29.1	Agreement with Hydro-Québec
Imperial Oil (FUEL)	Fuel & lubricant	$20.5	New contract
Cyanco Canada Inc.	Cyanide	$19.1	Contract to be re-negotiated in 2015
Magotteaux Ltée	Ball mills	$14.8	
MOLY-COP CANADA	Ball mills	$11.0	
FLSmidth Salt Lake City Inc.	Parts of crushers and cone crushers	$10.9	
Castonguay Blasting Ltd	Production drilling	$10.7	
9097-3868 Québec inc (Transp CJFS)	Snow clearance and other work	$10.0	Workforce and equipment rental
L. Fournier & Fils Inc.	Mining production at Gouldie pit and blasting mats	$10.0	Ongoing Gouldie mining production contract
Construction Norascon Inc.	Tailings dam	$9.7	Tailings dam maintenance
Soudure DuFer	Bucket repair and powderman	$8.0	Powderman helper contract
Sandvik Mining and Construction Canada	Rock tools	$7.1	Supplier of rock tools and technicians
Bridgestone Canada Inc.	Tires	$6.9	
Béton Barrette inc.	Crushers	$6.1	Crushing on the mine site
Quadra Chemicals Ltd	Reagents	$5.0	Supplier of five reagents

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

20.1 Environmental Studies

20.1.1 Study Area

The main components of the project (open pit mine, process plant, tailings facility and waste rock dump) are located within the urban and peri-urban perimeter of the town of Malartic. The area had a long history of mining and industrial activities, and it was recognized that some of the infrastructures left behind on the property by previous owners could have negative effects on the environment, notably on water quality. Among those are a tailings pond, settling and polishing ponds, and a mining complex (the East Malartic mine site) that included an ore processing plant that was totally dismantled shortly after production at the CM pit started.

The study area for the project covered approximately 24 km2 (Fig. 20.1). It was defined by taking into account the potential impacts on the surrounding population, and on living organisms inhabiting the land and waterways. The boundaries of the study area are Concession Road No 6 (6e Rang; Rivière-Héva) to the south, the Malartic town limit to the north, the boundary between the municipalities of Rivière-Héva and Malartic to the west, and the limit of the Canadian Malartic Property to the east.

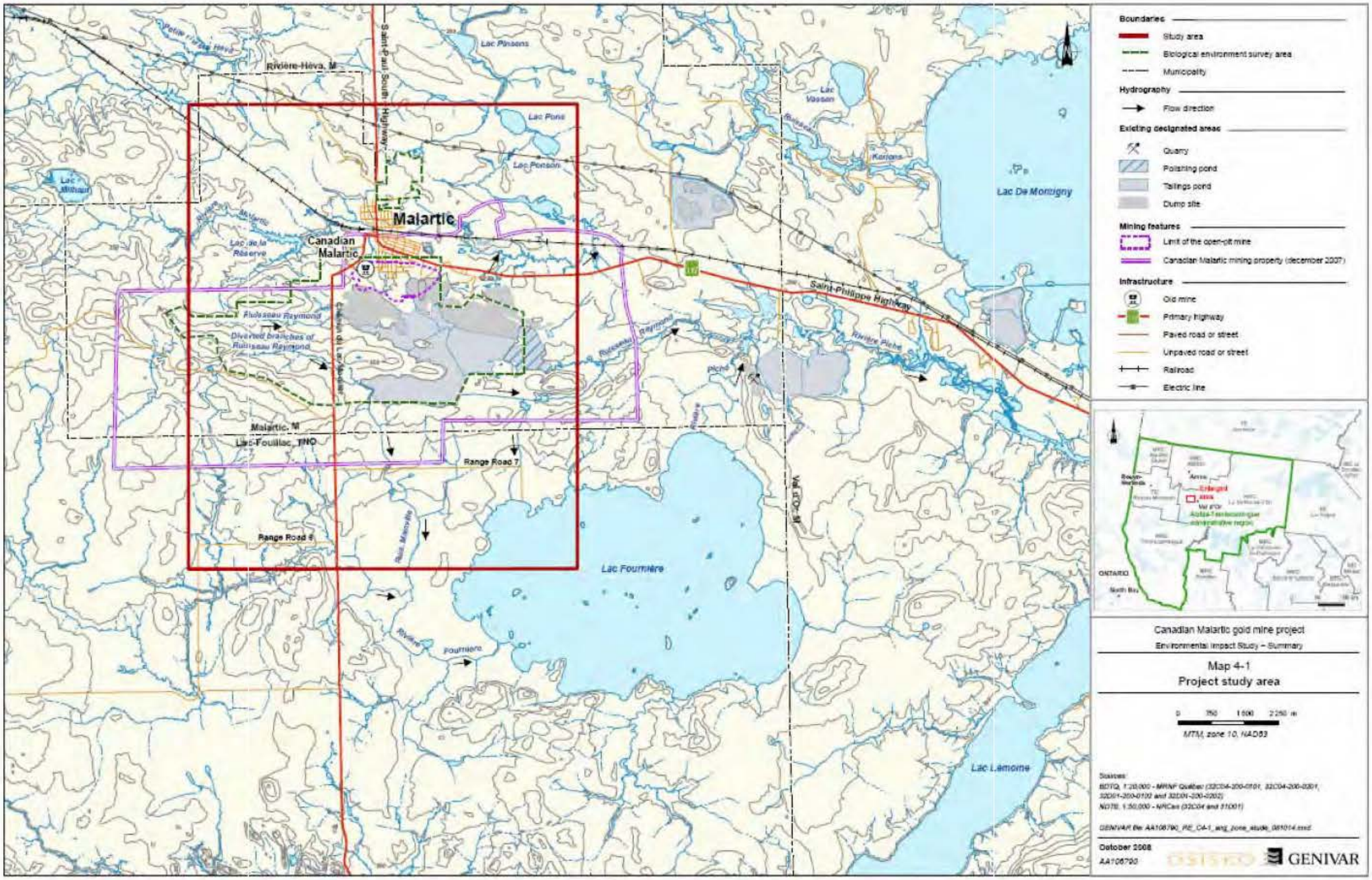

Figure 20.1 – Map of Canadian Malartic Project study area

20.1.2 Fauna

A wildlife survey was conducted to evaluate the different species present in the environment surrounding the Canadian Malartic project. Fourteen (14) different species of fish were captured during the wildlife survey, none of which are endangered. Six are of interest for sport fishing, notably walleye, sauger, yellow perch and northern pike. During this survey, fish in Lake Fournière and the Piché river, had a markedly diverse collection of species. Lake Fournière is more vulnerable to potential disruption because there is no upstream migration of fish. Possible spawning grounds were identified, one of which would be for yellow perch in the Piché river, whereas other habitats that would be favourable for northern pike reproduction were found in the Fournière river.

The common garter snake was the only grass snake species observed during the survey. Host green frogs and northern spring peepers, as well as wood frogs and American toads were found in the forest. Several marshes were also located in close proximity to the project site where several amphibian species were observed as well as 55 species of birds (mostly sparrows and waterfowl). The landform depressions created by former mining operations served as interesting habitats for waterfowl and waders (shorebirds), particularly the smaller pits to the west. Bigger mammals were also observed during the surveys. These included black bears, moose, wolves, Canadian lynx, red foxes and the American marten. Other small animals, both carnivores and herbivores, were also present in the surveyed area.

None of the wildlife species observed during the survey are designated as threatened, vulnerable or at risk. Present numbers would also suggest that such designations are unlikely in the near future.

The primary impacts to wildlife as a result of the project include loss of habitat, noise disturbances, and the risk related to contamination of the environment during the operating phase. The residual impacts will be low to very low because development of the area west of Chemin du Lac-Mourier is avoided, the tailings are disposed on top of the restored East Malartic tailings pond reducing the footprint to a minimum, continuous restoration of the disturbed sites is planned, and adapted mitigation measures are applied to restore as much biodiversity as possible (such as using a top soil cover, planting indigenous species, etc). Existing biodiverity is low in the area, and critical habitats will not be affected by the footprint of the mine. During the closure phase, the reclamation of the area by wildlife and the creation of new habitats will represent a positive impact.

20.1.3 Water and Sediments

20.1.3.1 Hydrological Regime

As shown in Figure 20.1, the hydrographic network of the study area consists of small meandering, slow-flowing streams and includes Lake Fournière. The final effluent of the old East Malartic site discharges eastward into Raymond Creek and the Piché river. The Piché river represents the outflow of Lake Fournière, and its hydrological regime is influenced by variations in the lake water level. Mainville creek runs south into Lake Fournière and receives a flow of natural water from the southern diversion ditch in the western part of the mine site. The Malartic river is a stream which passes through the town of Malartic in the northern part of the study area.

The hydrological regime of the project area is not in its original natural state as a result of previous mining activities and is instead determined by the existing water management infrastructure. The Canadian Malartic Project was designed to limit any impacts on the hydrological regime by building new mining infrastructure almost directly on top of the footprint that was left behind by the closure of the old East Malartic mine site by MERN (Ministère de l'Energie et des Ressources)[2] . Moreover, the Canadian Malartic Project re-uses part of the MERN's drainage and water management infrastructure.

The impact on the hydrological regime is considered low for all phases of the project (operations and closure phases). It is expected that modifications to the topography, watershed surface areas and soil cover will affect the rate of surface runoff, infiltration and evapotranspiration.

The new infrastructure for the Canadian Malartic Project mostly overlies land that was previously disturbed or that became disturbed during the MERN's closure work. The only natural land that was disturbed by the construction phase is at the sites for the processing plant and the open pit mine. Soil compaction and the removal of vegetative cover around these areas will reduce the amount of infiltration and increase the amount of surface runoff. However, resulting modifications to the hydrological regime are local and minor.

Revegetation will be a focus of the closure phase. Vegetative cover will help retain some rainfall and snow melt, the remaining water will become involved in the runoff, infiltration and evapotranspiration processes. Surface runoff over the entire site will continue to drain into the polishing pond, which will be modified to retain any particles accumulated during mining as well as promoting the settling of new sediments carried into the pond by runoff. Water quality will be verified periodically, and if necessary, the water will be treated as required until the Directive 019 discharge criteria are met.. Outflow will be directed to Raymond Creek, which was already receiving the effluent from the original East Malartic site.

20.1.3.2 Quality of Surface Water and Sediments

Surface water in the study area is characterized by slight cloudiness, coolness (even in summer), and a slightly acidic pH. It is well oxygenated and its overall productivity is relatively high. It is also well mineralized and slightly hard.

The impact on the quality of surface water and sediments is considered low for all phases of the project. The MERN's drainage system for the old East Malartic mine site was collecting surface water from watersheds that overlapped the mine site infrastructure. The MERN's drainage network will be re-used and completed during the course of the Canadian Malartic Project, allowing all the water in the project area

[2] Formerly the MRNF.

to be diverted to the Southeast Pond. Most of this water is reintroduced into the processing plant as process make-up water. Any excess water from the Southeast Pond will be treated at an effluent treatment plant and discharged into the polishing pond to ensure that the quality of the discharged water meets applicable effluent discharge limits.

During site closure, the placement of top soil cover and revegetation will limit soil erosion from runoff, promote evapotranspiration and reduce infiltration. The physical properties of the thickened tailings will also ensure lower infiltration.

20.1.3.3 Groundwater Quality and Levels

The reference study on groundwater quality (Golder, 2009b) and subsequent sampling programs conducted before the start of mining operations demonstrate that past mining activities had an impact on groundwater quality. For this reason, the analytical results are compared to MDDEFP criteria for illustrative purposes only In terms of heavy metals, the concentrations of copper, lead, nickel and zinc exceeded the drinking water and surface water resurgence criteria . It should be noted that no petroleum hydrocarbons or cyanides were detected in any of the samples. In addition more than twenty residential wells were sampled in 2007 and 2008 and water quality was found to meet the drinking water criteria.

During the operating phase, there is a potential risk of groundwater contamination as a result of infiltration of contaminated surface water (i.e., surface water affected by secondary products and accidental spills). It is expected, however, that, with the application of best practices, any impact would be minor. Moreover, no deterioration of water quality is expected compared to the current situation in which groundwater has already been affected by previous mining activities. In addition, the low permeability of soils will limit the infiltration of any contaminated surface water. The impact of lowering the water table by pumping of the old underground workings will be comparable to the current situation since the dewatering process will be conducted in the same way as it was in the past.

There is also an additional risk of low contamination by leached metals from the ore, waste rock and tailings. The surface underlying these materials was designed with A-level groundwater protection. In addition, during operation of the mine, dewatering of the open pit will limit the flow of contaminants into subsurface waters. The pumped water will be sent to the Southeast Pond and then reintroduced as processing water in the process plant. To cover the risk of excessive drawdown of the water table caused by pumping from the pit, monitoring of groundwater levels will provide a window of opportunity in which to react and put into operation a contingency plan. The degree of disturbance to the level and quality of groundwater is considered to be moderate given the expected level of drawdown for the study area.

During site closure, pumping from the open pit will stop, thus creating a moderate adjustment to original groundwater levels as drawdown and its related effects gradually diminish.

20.1.4 Climate and Hydrology

The climate in the project area is characterized by long, cold winters and relatively short summers. Total precipitation reaches 914 mm. Winds generally blow from the south or southwest from June through January and are mainly from the northwest from February through May. Evaporation amounts to 652 mm per year, most of which occurs during the summer season when the water balance experiences an average deficit.

The major watercourses potentially affected by the project are the Malartic river to the north and the Piché river to the east; the surface areas for their respective watersheds are 28.5 km2 and 194.8 km2.

20.1.5 Ambient Air Quality

The results of the ambient air study conducted as part of the Environmental Impact Assessment (EIA) indicate that the air in the town of Malartic is of very good quality and representative of a rural town with few active industrial activities.

During operations, concentrations of dust and other airborne contaminants are expected to be higher than pre-project levels. To evaluate the potential impact, the EIA took into account the reduction in airborne particles generated by the closure of the old East Malartic mine. At the time of the study, the site generated significant quantities of particles, but the Canadian Malartic operation has now completed covering the old tailings with thickened tailings and has an extensive program to reduce the dust creation from mobile equipment.

Modelling results had indicated that the level of fine particulate matter in the atmosphere may possibly from time to time exceed the limits outlined in the “Projet de règlement sur l’assainissement de l’atmosphère” (PRAA; Québec’s project on air quality regulations). It is worth noting that the results of monitoring of fine particulate matter (<2.5µm) do not agree with this prediction and show no exceedance.

The application of mitigation measures (such as the use of water trucks to spray roads, low speed limits on roads, etc.) is aiding in minimizing the potential for airborne particulates.

The impact on ambient air quality during the closure phase of the mine should result in only minor impacts.

20.1.6 Background Noise and Vibrations

20.1.6.1 Background Noise

An analysis of background noise in the study area focused on two main areas: the urban part of Malartic and in the vicinity of Concession Rd No 7 (7e Rang), south of Malartic. The stations recorded minimum sound levels of 42 to 51 dBA during the day and 21 to 43 dBA at night. The main source of noise was traffic, particularly on Highway 117. The other identified sources were mechanical in origin (local road and air traffic, ATVs), natural (rustling leaves, songbirds, etc.) or the result of human activity (property maintenance).

The projected impact from the project to background noise was assessed to be low during all phases of the project, due mostly to the way in which the project was designed and as a result of the mitigating measures that will be implemented. Furthermore, traffic conditions will change significantly at the Royale/Lasalle/Lac Mourier intersection. In addition, a permanent linear park, which has been built between the mine site and the urban centre, will act as a noise reduction barrier and a buffer zone.

During the operations phase, the main noise disturbances will be from mining operations and an increase in traffic through the town. It is worth noting that monitoring results show that the noise levels resulting from operating the Canadian Malartic mine are within the limits established by the Malartic municipal noise bylaw limit. Mitigation measures are in place to reduce the noise levels. As the pit will get deeper, noise level reductions in the community are expected.

During the closure phase of the mine, the expected noise impact will be similar or lower to that of the construction and operation phases.

20.1.6.2 Vibrations

The environmental assessment predicted a moderate impact from vibration from blasting operations during the operating phase of the project. The concerns are related to damage to structures (due to vibrations and air overpressures) and disturbances to the residents in the part of town just north of the open pit. In addition possible projection of fly rock and other debris from the pit during blasting could constitute a safety hazard.

It is worth noting that a series of mitigation measures were put in place to keep the vibration levels well below the regulatory limit of 12.7 mm/s. The overpressure limit of 128 dBA was exceeded several times and each occurrence is investigated to eliminate re-occurrence. When weather conditions are not favourable, blasting is postponed. The risk fly rock projection during blasting will be eliminated by proper design and planning, as well as the use of blast mats.

Considering all the protective measures put into place, the Malartic living environment will not be at risk, nor will the nearest residences. The anticipated risk with respect to structural damage would be very low.

The impact related to vibrations during the closure phase of the mine will be similar to the period during construction but without the inconveniences caused by blasting because it will not be needed. Activities generating vibrations will once again be focused at the plant site, quite far from the nearest residential areas. A very low level of impact is anticipated for this phase.

20.1.7 Vegetation and Wetlands

The area covered by the biological survey can be broken down as follows: 52% land vegetation, 9% wetlands, 33% watercourses, and 6% unnatural (modified by humans). Black spruce and aspen stands are the most important vegetative cover in terms of surface area. Other types of vegetation are fallow zones, mixed forest, white birch, other softwoods and fir, in addition to a logging area with protection of regeneration. The wetlands are distinguished by alders, ponds, marshes, wooded bogs and peat-bogs. Note, however, that the natural environment at the Canadian Malartic site has likely been affected by past mining operations, particularly along the east side of Chemin du Lac Mourier.

None of the plant species present in the surveyed area are considered threatened, vulnerable or at risk. Furthermore, the study area as a whole does not have the potential to harbour any plant species at risk.

The initial project was to take place on both sides of Chemin du Lac-Mourier. The risk of infringing upon valued ecosystem components west of the road (forested areas, wetlands, watersheds, etc.) has led Canadian Malartic to participate in the closure of the old East Malartic mine and to superimpose its tailings facility on top of the restored tailings dump at the old mine site. Canadian Malartic has chosen to adopt a technology that allows disposed tailings to be piled higher rather than over a wider area. These two factors significantly reduce the impacts on vegetation by considerably limiting the area affected by waste disposal. In addition, progressive rehabilitation work can be conducted, without compromising the operations.

The construction phase of the project resulted in a loss of terrestrial vegetation and wetlands. However, none of the plant groupings or species are particularly notable in the area. The impact is considered to be low. With regards to wetlands, an equivalent area will be established in compensation.

Revegetation efforts during mining and the recovery of vegetation by the end of operations will represent gains in terms of the area's plant coverage.

20.1.8 Soils

Human activities, mainly related to previous mining activities, have affected the entire Canadian Malartic site. These activities have significantly modified the countryside over several decades, and have produced considerable quantities of tailings. Some of the tailings from milling ore from other mines in the region were contaminated and stored in the original East Malartic tailings ponds.

Any potential impact on soils during the operating phase of the Canadian Malartic mine would be related to the potential risk of contamination by metal leaching from the ore or by accidental spills. However, the new mining facilities were built on land that was previously disturbed (old tailings, settling and polishing ponds) and which will be progressively restored, thus limiting the impact on previously undisturbed soils. Furthermore, re-using part of the drainage infrastructure left by the MERN's during the closure of the old East Malartic mine is helping control surface runoff water. The application of best practice in the operation and maintenance area is expected to minimize any impact on soil.

Once the mine site closes, the potential impact will be comparable to that during the operations phase – thus low – until the time of final rehabilitation. After the site is restored, the potential impact will be virtually zero since contaminated soils will have been removed from the site during restoration. The tailings pond and waste dump will be covered by a layer of vegetation that will limit the amount of surface runoff.

20.1.9 Geochemistry

According to the classification scheme in Directive 019, a significant proportion of the ore, waste rock and tailings classify as potentially acid-generating or leachable. This and the fact that the tailings contain cyanide mean that the tailings and waste rock storage areas need to be designed with A-level groundwater protection. The existing areas have been designed with that level of protection and the proposed plan for the mine expansion project, also satisfies the criteria for A-level groundwater protection.

In order to determine if the potential for acid mine generation is real, humidity cell tests are underway on 15 samples of waste rock, 3 samples of ore, and 2 samples of tailings. The samples were selected from the 2012-2013 sample set, with a focus on samples with above-median sulphur contents, as well as leachable samples with above-average concentrations of the parameters of interest.

The primary objective of these complementary tests is to obtain a better understanding of the long-term chemical behaviour of samples that could be applied to the closure of the accumulation areas.

Based on the long term behaviour of historical tailings coming from similar lithologies and geochemical settings at the site, the results of these studies are not expected to show that acid mine drainage will be a problem in the long term. This will therefore not change the planned mode of closure, which is simply vegetative cover.

20.2 Impact and Site Monitoring

20.2.1 Monitoring Plan

In 2011, a detailed plan was developed to manage hazardous materials, assess infrastructure safety, and monitor the following:

- Noise
- Vibrations
- Air quality
- Dust fallout (2011-2012 only)
- Atmospheric emissions
- Effluent quality
- Groundwater
- Surface water

The monitoring of each of the above items is well defined in terms of applicable performance criteria, location and number of measurement points, methodology, control measures, frequency, and required reports. Table 20.1 presents the 2013 reporting table for these items.

Table 20.1 – 2013 reporting table for detailed monitoring around the Canadian Malartic mine

Item	Sampling Points	Frequency	No. of samples
Noise	4	Continuous	-
Vibrations	7	As per blasting schedule	-
Air Quality	2	Continuous	-
Effluent	1	Continuous	-
		Every 3 days	156
		Weekly	52
		Monthly	12
		Quarterly	4
		Annually	1
Groundwater	30	Twice a year	60
Surface water (2013 only)	2	Monthly	16

20.2.2 Hazardous Waste

The main hazardous residual substances (HRS) generated by the ore processing plant include:

- absorbing materials or dirty containers that contained waste oil or any other HRS;
- aerosols (such as lubricants, paint);
- batteries;
- reagent product packaging (such as copper sulfate);
- waste oils;

- waste oil filters;
- solvents, antifreeze or other corrosive waste products;
- fluorescent bulbs, halogen bulbs.

The management of hazardous residual waste is done as per the Quebec regulations.

20.2.3 Vibrations

A vibration and air overpressure monitoring program was implemented to verify compliance with project standards during the mine operation period.

Seven (7) sampling ground vibration and air pressure monitoring stations have been installed in the town of Malartic to properly monitor the activity (Fig. 20.2).

Since 2009, 52 notices of infraction have been received by Canadian Malartic for non-conformance to prescribed limits regarding blasting operations. An action plan was put in place to improve the process and avoid any non-conformance

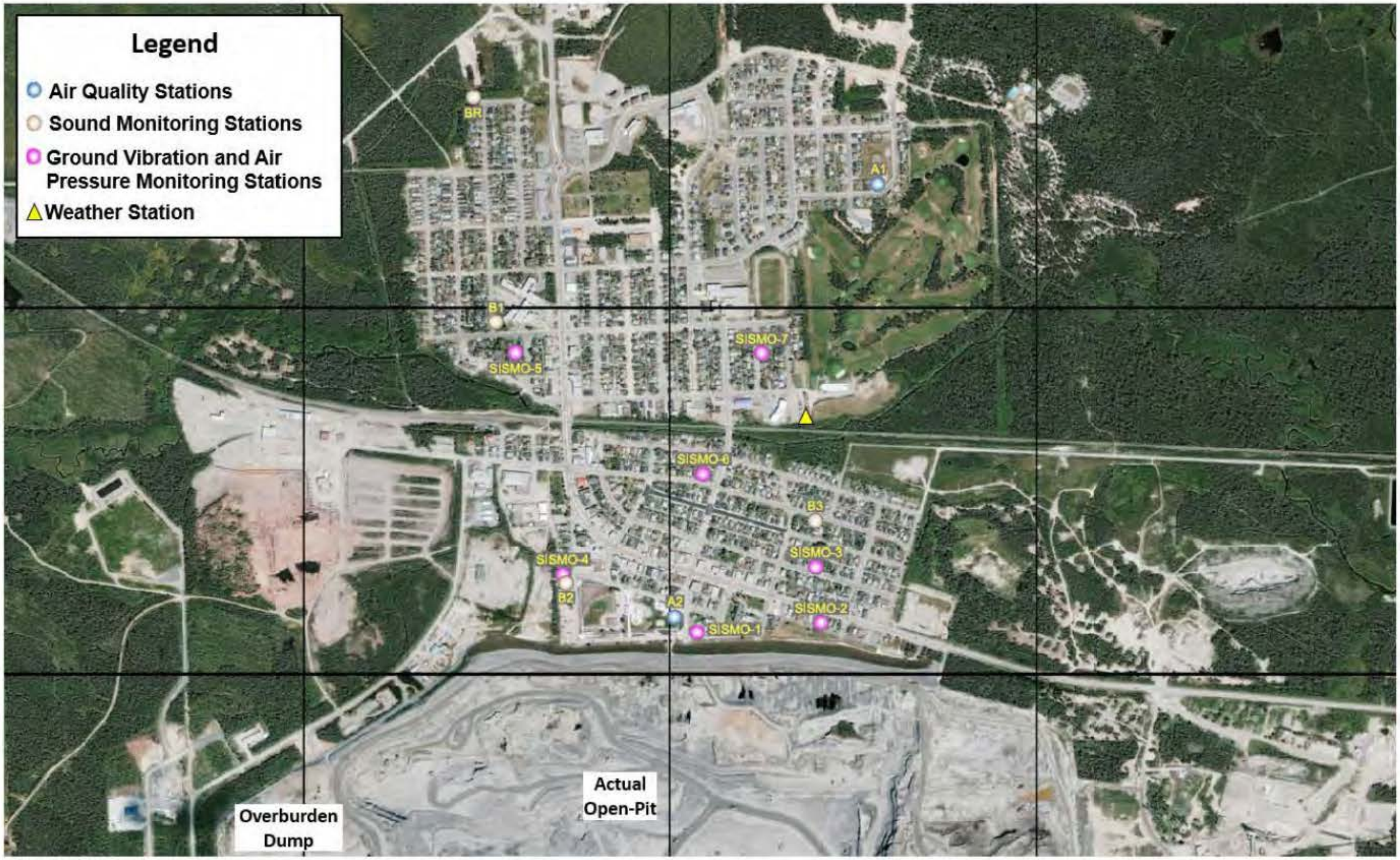

Figure 20.2 – Location of air quality, sound monitoring, and ground vibration and air pressure monitoring stations

20.2.4 Noise

An ambient noise monitoring program was implemented to verify compliance with standards.

The sound contribution of mining activities is monitored continuously, 24-7. To do so, four (4) sound monitoring stations were installed in town. One station measures the residual noise, while the three (3) other stations measure the ambient noise. The location of each of these stations was set by the MDDELCC.

Sound monitoring of the mine is done by a consulting firm in acoustics. Each month, 21 reports are sent to the regulator.

Since 2009, 46 notices of infractions have been received by Canadian Malartic for noise. An action plan has been put in place to reduce and then eliminate occurrences of non-conformance.

20.2.5 Air Quality

An air quality monitoring program was implemented to verify compliance with standards.

Figure 20.2 shows both sectors where sampling stations are installed. One station is located in the northern district (Stoykovitch Park), while the other one is located in the southern district (Belvédère Park). These stations continuously measure the total particulate count, fine particulates, and nitrogen dioxide. In addition, the southern station has a high volume sampler (Hi-Vol) used to measure the air concentration of total particulates and metals (As, Be, Cd, Cu, Cr, Ni, Pb, V, Zn) and crystalline silica. A weather station is located in the town near the parking lot of the golf course. The measurements taken by the weather station include temperature, barometric pressure, humidity, wind speed, wind direction and precipitation.

Exceedances have been measured for total particulate concentration in the atmosphere. Each occurrence is investigated and mitigation is included in an action plan. Nitrogen dioxide concentrations measured during blasting by continuous analyzers are well below the regulatory standards.

Since 2009, the Canadian Malartic mine has received 12 infraction notices for dust and air quality. An action plan was put in place to improve the process and reduce the number of non-conformitance cases.

20.2.6 Final Effluent

The existing sampling station (E1) located at the polishing pond exit (Fig. 20.3) is used to measure the flow rate and pH, and to take samples to measure concentrations of prescribed parameters..

Since 2009, the Canadian Malartic mine has received four (4) non-conformance notices for water quality (surface and final effluent). Each occurrence is investigated and Mitigations measures put in place to improve the process the number of non-conformance cases.

Figure 20.3 – Existing sampling station (E1) located at the polishing pond exit

20.2.7 Surface and Groundwater

20.2.7.1 Surface Water

In accordance with condition 4 of decree 914-2009, Canadian Malartic must prove, by comparing the quality of water upstream of the site with the quality at release point, that water from the northern diversion of Raymond Creek was not contaminated while crossing the mine site before flowing into the Malartic River. Monitoring of surface water took place from May 2011 to October 2013.

On October 1, 2013, the northern diversion was deviated towards the Mammouth pit following the Ministry’s recommendations.

20.2.7.2 Groundwater

The groundwater monitoring program has two focus: one local in the vicinity of the mine infrastructure and one regional.

The rock aquifer has been classified as belonging to Class II. Consequently, groundwater quality monitoring results need to be compared to drinking water and surface water resurgence criteria.

Location of monitoring wells for the local groundwater monitoring network was determined based on the location of the areas with potential risk for groundwater contamination. These are presented in Table 20.2. A total of thirty (30) wells were installed around the existing infrastructure.

Regional groundwater monitoring aims at determining the effect of the mine on the regional groundwater level, both in the esker that supplies the city of Malartic and in surface rock. Seven (7) wells are used for the regional monitoring of groundwater levels. Both types of monitoring are performed twice a year, namely in spring time and at the end of the summer.

Table 20.2 – Monitoring of groundwater quality and potential risks

<table>
<tr><th>Potential risks</th><th>Monitoring of groundwater quality</th><th>Number of upstream wells</th><th>Number of downstream wells</th></tr>
<tr><td>Southeast pond</td><td rowspan="2">Bicarbonates (HCO_3^-)
Total cyanide Conductivity
Metals and metalloids (As, Cu, Fe, Ni, Pb, Zn, Na+, Mg2+, K+, Ca2-)
pH
Sulfates (SO_4^{2-})</td><td>2</td><td>2</td></tr>
<tr><td>Tailings and waste dump</td><td>1</td><td>8</td></tr>
<tr><td>Process Plant

Reservoirs of chemicals</td><td>Bicarbonates (HCO_3^-)
Total cyanide Conductivity
Metals and metalloids (As, Cu, Fe, Ni, Pb, Zn, Na+, Mg2+, K+, Ca2-)
pH
Sulfates (SO_4^{2-})</td><td rowspan="2">1</td><td rowspan="2">8</td></tr>
<tr><td>Process Plant

Reservoirs of petroleum products</td><td>BTEX (benzene, toluene, ethylbenzene, and xylene) Bicarbonates (HCO_3^-)
Total cyanide Conductivity
Petroleum hydrocarbons (C10-C50)
Metals and metalloids (As, Cu, Fe, Ni, Pb, Zn, Na+, Mg2+, K+, Ca2-)
pH
Sulfates (SO_4^{2-})</td></tr>
<tr><td>Low grade stock pile</td><td rowspan="2">Bicarbonates (HCO_3^-)
Total cyanide Conductivity
Metals and metalloids</td><td>1</td><td>2</td></tr>
<tr><td>High grade stock pile</td><td>1</td><td>2</td></tr>
<tr><td>Pit</td><td>(As, Cu, Fe, Ni, Pb, Zn, Na+, Mg2+, K+, Ca2-) pH
Sulfates (SO_4^{2-})</td><td colspan="2">2</td></tr>
</table>

20.3 Waste Rock Management

The waste rock will be managed in conjunction with the tailings. Figure 20.4 presents the modelled final configuration of waste rock and tailings.

The original design of the waste rock pile was developed to accommodate approximately 326 Mt of mechanically placed waste rock requiring a total storage volume of 161 Mm^3. The waste pile is located northwest of the TMF and is planned as confinement for the tailings as well.

Some aspects of the Canadian Malartic plan have been modified since the mine tailings site and waste rock pile development plan was elaborated. For example, the Gouldie reserve was recently added to the operating sequence of the mine. The expected footprint of this pit is presented in Figure 20.4.

The operation of the Gouldie pit is located in the center of the initially planned footprint of the waste rock pile. Given this location, the mine had to review the waste rock piling sequence in order to allow production from the Gouldie pit. The waste rock pile expansion remained inside the waste rock pile and tailings facility footprint, its stability verified and the surface water management plan reviewed.

Figure 20.4 shows a plan view of the site, including the authorized waste rock heap configuration as well as the contour of the Canadian Malartic and Gouldie pits.

The expanded waste rock pile covers cells 1 and 2 and is limited to the west by the presence of the Gouldie pit to the north and to the east by the footprint of the mining activities and to the south by the TMF and in heigh to 110 metres.

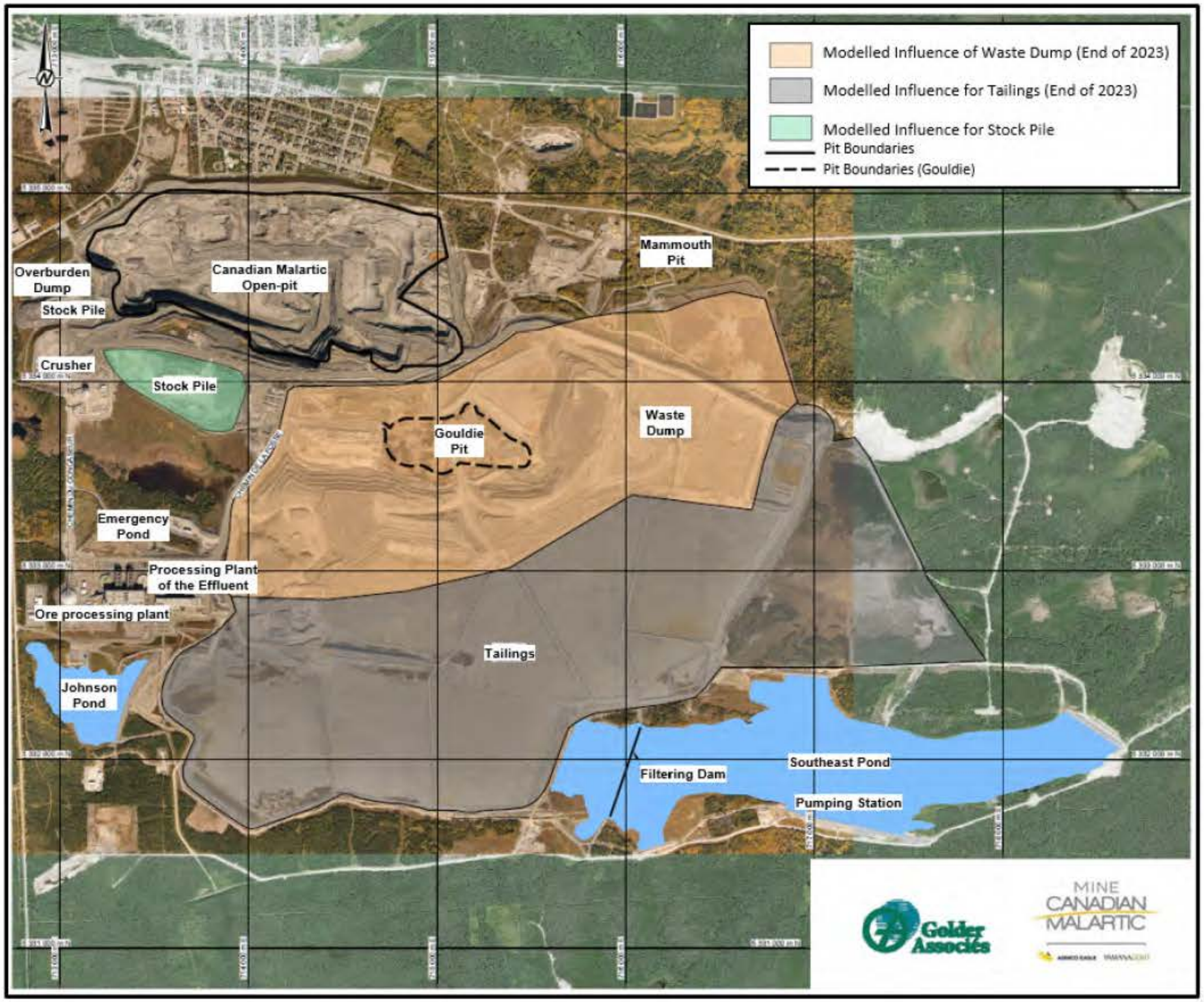

Figure 20.4 – Configuration of tailings, waste rock and water networks

The pile was designed using the following parameters:

- Waste rock placement at the angle of repose (1.35H:1V);
- 10 metre high benches with an 11.5 metre setback
- Final overall pile slope of 2.5H:1V;

From a geotechnical point of view, these overall slopes should provide favourable long-term safety factors against failure. A 2.05 t/m^3 bulk density was used to develop the piling sequence.

The waste dump slope is presented in Figure 20.5.

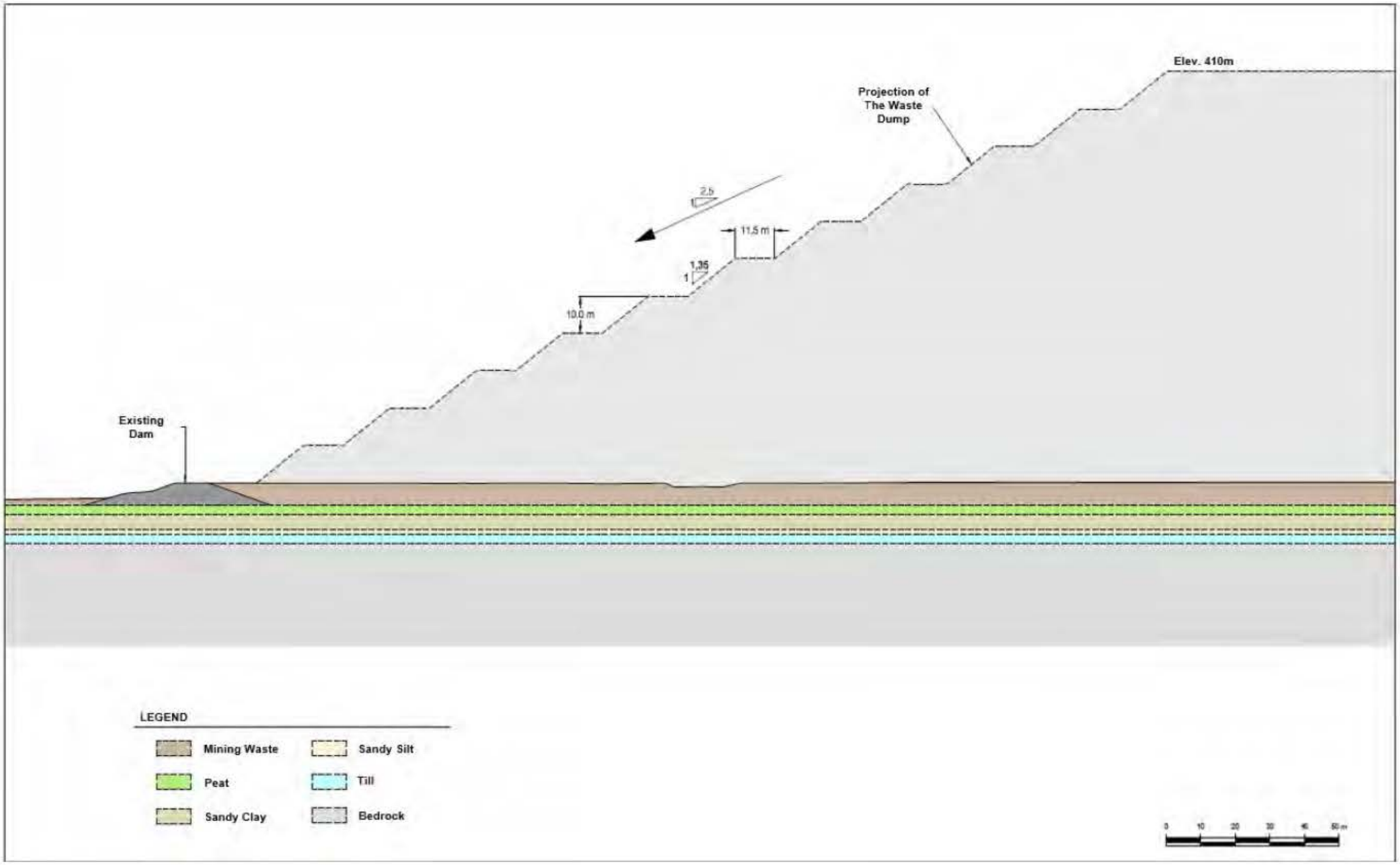

Figure 20.5 – Waste dump cutaway

20.4 Tailings Management

20.4.1 General

The Tailings Management Facility (TMF) design was originally developed to accommodate 183 Mt of tailings during the mine life. Tailings from the milling process would be deposited over a period of approximately 10 years at an average production rate of 55,000 tpd. The original tailings storage capacity would accommodate the 183 Mt assuming a settled dry density of 1.5 t/m3 for a total of 122 Mm3.

In order to reduce the footprint and simplify tailings water management the thickened tailings disposal technology was selected as the preferred tailings disposal approach.. Among its key advantages, this method provides for better water management with non-segregated tailings that exhibit more homogenous properties, reducing the need for confining structures and simplifying the rehabilitation process during site closure.

20.4.2 Key Design Assumptions

The original design density for the tailings was 68% solid. Currently the tailings are thickened to about 57% to 62% solids content using high performance thickeners.

As mentioned in Section 20.1.9, the tailings and waste rock storage areas have been designed with A-level groundwater protection. For the mine expansion project, the proposed plan also satisfies the criteria for A-level groundwater protection.

20.4.3 Site Selection

All available zones in the surrounding area of the mine site were reviewed to identify sectors that could provide the required capacity for tailings deposition. Given the expected volumes of tailings to be produced and the well-developed land use in the area, it was determined that it would be a challenge to find zones that meet the required capacity without significantly impacting existing land uses.

A site location that was originally considered by Canadian Malartic is to the west of Chemin du Lac Mourier, a few kilometers away from the plant location and immediately upstream of the existing East Malartic tailings pond. This site, which offers advantageous characteristics in terms of topographical confinement, is characterized by little land use and would have been able to provide the required capacity. Upon review, it was nevertheless felt at an early stage that there would be significant environmental benefits to using the existing East Malartic tailings pond footprint as the basis of the TMF instead of developing a new area on previously unused lands. An aerial view of the site is presented in Figure 20.6.

Figure 20.6 – Canadian Malartic mine site in 2006

The East Malartic tailings pond site, was the property of the Government of Québec following the bankruptcy of McWatters Mining Inc. in the early 2000s. This site contained two types of tailings. Tailings from the original East Malartic mine that did not exhibit any acid generation behaviour since their deposition and tailings from milling the Doyon and Bousquet ores, known to have a high acid generation potential. The rehabilitation of the East Malartic tailings area was the responsibility of the Government of Québec.

It was determined that using the footprint of East Malartic tailings as a basis for the Canadian Malartic TMF would provide the following advantages:

- It allowed the rehabilitation of one of the largest orphan sites in Québec by placing non-acid generating tailings on top of acid generating material.
- It minimized the footprint of zones impacted by the tailings placement in the Malartic area by concentrating all tailings in one location.
- It offered a location close to the mine and at a satisfactory distance from the town.
- It did not infringe upon non-impacted watersheds.
- It allowed a better control of water quality.
- It was in line with the sustainable development policy of Osisko (now Canadian Malartic GP) and of the Government of Québec.

The TMF footprint including the waste rock dump will entirely cover the existing cells and ponds of the East Malartic tailings facility, including the old sedimentation and polishing ponds.

Given the location of the open pit and the available space, it was decided to locate the waste rock dump on the site of the East Malartic tailings facility in order to minimize further land impact and the haulage distance. The waste rock dump was positioned between the TMF and the open pit. This allows tailings and waste rock to be managed at one location throughout the mine life.

20.4.4 Tailings deposition

Thickened tailings are delivered to the TMF as approximately 57% to 62% solids by weight. The deposition plan requires that tailings be deposited from different peripheral points forming gentle slopes. The whole area will be developed by sectors using a pre-defined placement sequence.

Tailings is discharged through a spigoting process to reduce energy at placement and promote uniformity in layer thickness. This method of placement produces beaches that are relatively uniform.

Tailings are contained at the boundaries of the TMF by starter perimeter berms built with waste rock. These berms and peripheral ditches will allow the collection and management of run-off water that would otherwise accumulate on tailings surface.

20.4.5 Conceptual Details

The tailings deposition plan was developed using Walace software as well as the Surpac platform as a visualizing tool. Table 20.3 presents the tonnage and volumes that have been modelled.

Table 20.3 – Design parameters

Tailings production	
Daily production	55,000 tonnes
Tailings physical properties	
% solids (by weight)	68%
Average dry density	1.5 t/m^3
In situ void ratio	0.85
Specific Gravity	2.8
Saturated water content (by weight)	30%

20.4.6 Final topography of TMF

The deposition plan has been developed so that the final topography of the tailings facilities will closely match that of the natural environment. The final elevation of the TMF is expected to be between 349.0 m and 365.0 m representing a maximum height gain of approximately 38 m above the initial ground.

The plan currently consists in covering all external slopes in areas that have reached the final configuration, such as sectors downstream of each raise. This approach allows different revegetation methods to be tested and will allow a progressive closure of the facility. At the end of the mine production process, the rest of the surface will also be restored through revegetation.

From a geotechnical point of view, these overall gentle slopes should provide very favourable long-term safety factors against failure.

20.4.7 Geotechnical Investigation for the TMF Area and the Southeast Pond

An extensive geotechnical investigation has been completed in order to confirm foundation conditions of the Southeast Pond, the tailings deposition area, the waste rock pile, and the mill complex. Based on results from this investigation, the design for the South East Pond and the TMF has been adjusted.

20.4.8 Overall Stability of the Tailings Impoundment

The stability assessment of the tailings stack was carried out in order to confirm some key design elements such as berm spacing, the need for additional stabilization, and the overall stability of the TMF. These analyses were carried out for the final modelled configuration of the TMF.

Stability analyses were carried out in static and pseudo-static conditions using a bedrock acceleration coefficient of 0.054 g corresponding to the PGA (peak ground acceleration) with a probability of 10% in 50 years (1 in 476 years). This acceleration is believed to be adequate at this stage. Analyses were also carried out for the entire tailings site. All calculated safety factors meet current design practices at this stage of the design process.

20.4.9 Current Operation of the TMF

Since operations have begun, the solids content in thickened tailings is less than the while the deposition slope observed on location is relatively flat. The actual solids 68% design value with content usually varying between 50% and 62%, while it is on average between 57% and 62%. The average deposition slope is 0.22% on the site. These observations required some modifications to the TMF deposition plan.

The site was divided in four separate areas, namely:

- site PR1, which covers the old tailings site of the East Malartic mine;
- site PR2, which covers the old sedimentation basin of the East Malartic mine;
- site PR3, which covers the old cell II of the tailings site of the East Malartic mine;
- site PR4, which covers the actual polishing basin.

Figure 20.7 shows the deposition areas described above and their footprint on the waste rock piles and on the tailings site used for modelling purposes.

Figure 20.7 – Current Canadian Malartic Site as of June 16, 2014, showing deposition areas

20.4.9.1 Containment structures

The TMF is contained by the waste rock piles to the north and by a series of rock startup berms built on land or on tailings site dikes and on cells of the old East Malartic mine. Site development consists at the base of rock startup berms, followed by a series of upward raises that will add up to the required tailings storage capacity.

20.4.9.2 Waste rock piles

For modelling purposes, it was considered that waste rock piles would always provide the necessary support to develop the tailings site. It was considered that lateral escarpments would have a global slope of 2.5H/1V and that the site would be built on a series of 10-m high benches with a slope of 1.35H:1V. Each bench comes with a landing approximately 10 m wide.

Following the reorganization of the storage areas to allow for the Gouldie pit production, cells 1 and 2 that were initially supposed to be part of the long-term tailings site were assigned to the placement of waste rock. Waste rock piles will thus border upon the whole northern section of the tailings site.

20.4.9.3 Waste rock inclusions

In order to ensure an optimum distribution of tailings throughout the entire available area, tailings cells were created within the TMF. This network, is built from waste rock walls also called 'inclusions'. The deposition process alternates from one cell to the next to allow the consolidation of tailings before building upstream elevations.

For modelling purposes, a crest width of 10 m was used to simulate inclusions.

20.5 Water Management

20.5.1 Site Water Management - General

Figure 20.8 shows a simplified water management diagram of the Canadian Malartic mine site:

- Collecting ditches surround the waste rock piles and the tailings site, except for part of the tailings site that drains directly towards the Southeast Pond. Runoff and water from tailings consolidation are collected in ditches before reaching the Southeast Pond or the underground pumping site through the old Mammouth open pit. Water flows by gravity or, when land topography does not allow it, by pumping through intermediate ponds.
- Underground water and runoff collected in the Canadian Malartic open pit are pumped either towards the plant to be used as process water or towards the Southeast Pond.
- The Southeast Pond is the main collection pond for used mining water on location. The pond provides most of the process water that is needed to operate the ore processing plant. If its quality so allows, excess water is pumped towards the polishing pond. A water treatment plant is under construction in order to treat water pumped from the Southeast Pond before it

is discharged into the polishing pond. Following verification of the water quality, if it complies with regulatory requirements, water is then discharged into the environment through Raymond Creek.

- Water management structures divert non-contact water away from the mine site. The southern diversion ditch drains water from the Johnson Pond and from the natural drainage upstream towards Mainville Creek where it flows into Lake Fournière.

Water management structures were designed to limit the area impacted by mining activities. Water flows by gravity, which is more reliable and therefore less risky priority. Process water recirculation was maximized; recirculated process water is used to process ore and almost no freshwater from outside the mine site is required

20.5.2 Water Management Concepts for Specific Mine Site Areas

Figure 20.9 shows the configuration of the mine site and approximate positions of water management structures.

20.5.2.1 Johnson Pond and southern diversion

To the south of the mine site, the Johnson Pond is a clean water pond used as a water reserve in case of fire and should any occasional supply problem occur at the ore processing plant. During normal operations, water from the 2.9 km^2 drainage pond leaves the Johnson Pond through a free profile weir and flows into the southern diversion ditch towards Mainville Creek and then into Fournière Lake.

20.5.2.2 Open ditches

Surface runoff water must be managed within the Canadian Malartic ditch itself and areas surrounding the ditch. Runoff resulting from direct precipitation and from snow melt infiltrates partly through the ditch surface and reaches underground openings.

Water located in underground openings is pumped towards the ore processing plant where part is used as process water, while the other part is sent towards the Southeast Pond through pumping.

Regarding the operation of the Gouldie open pit, surface runoff of the Gouldie ditch is pumped towards the Southeast Pond.

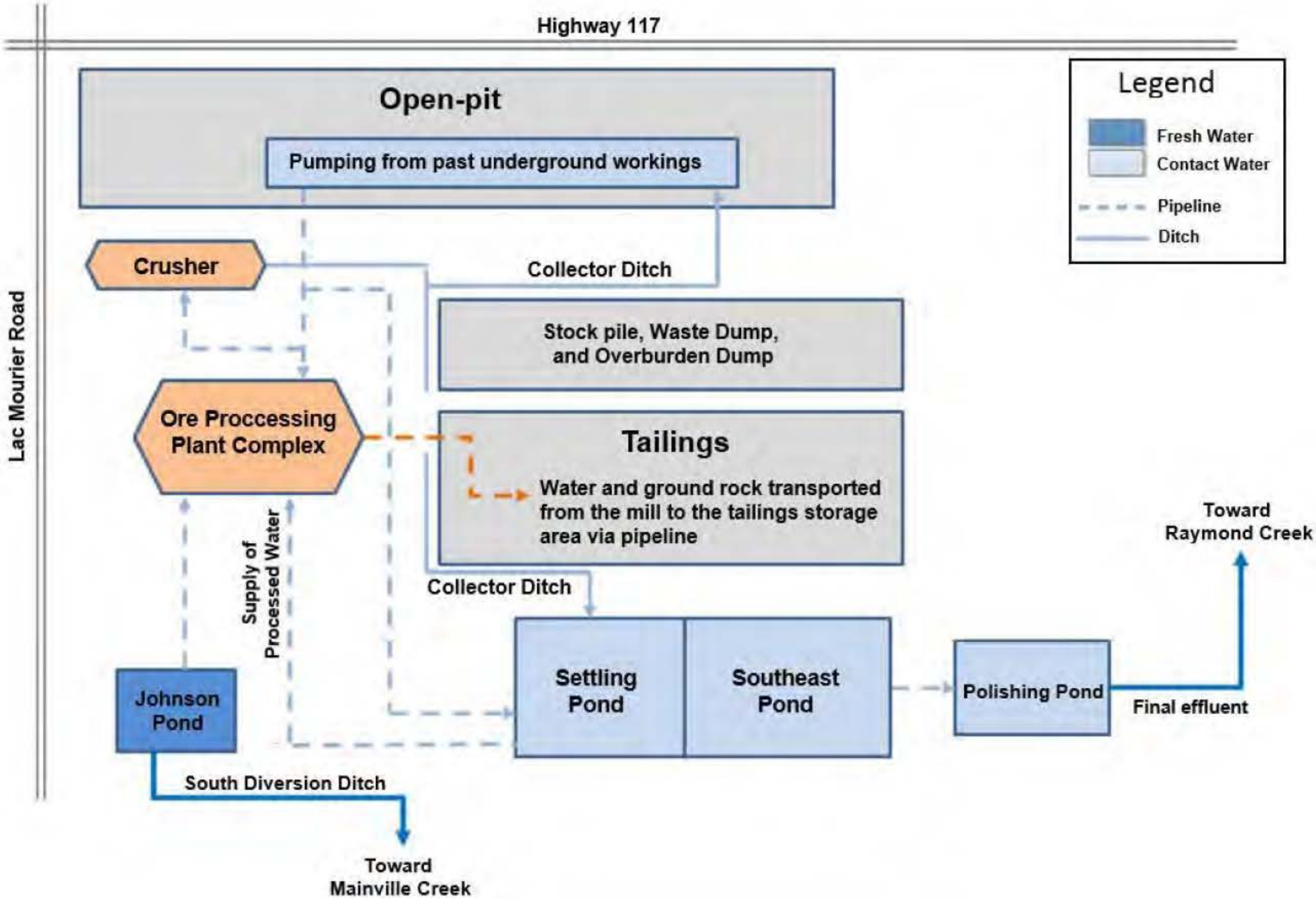

Figure 20.8 – Simplified diagram showing water management at the Canadian Malartic mine site

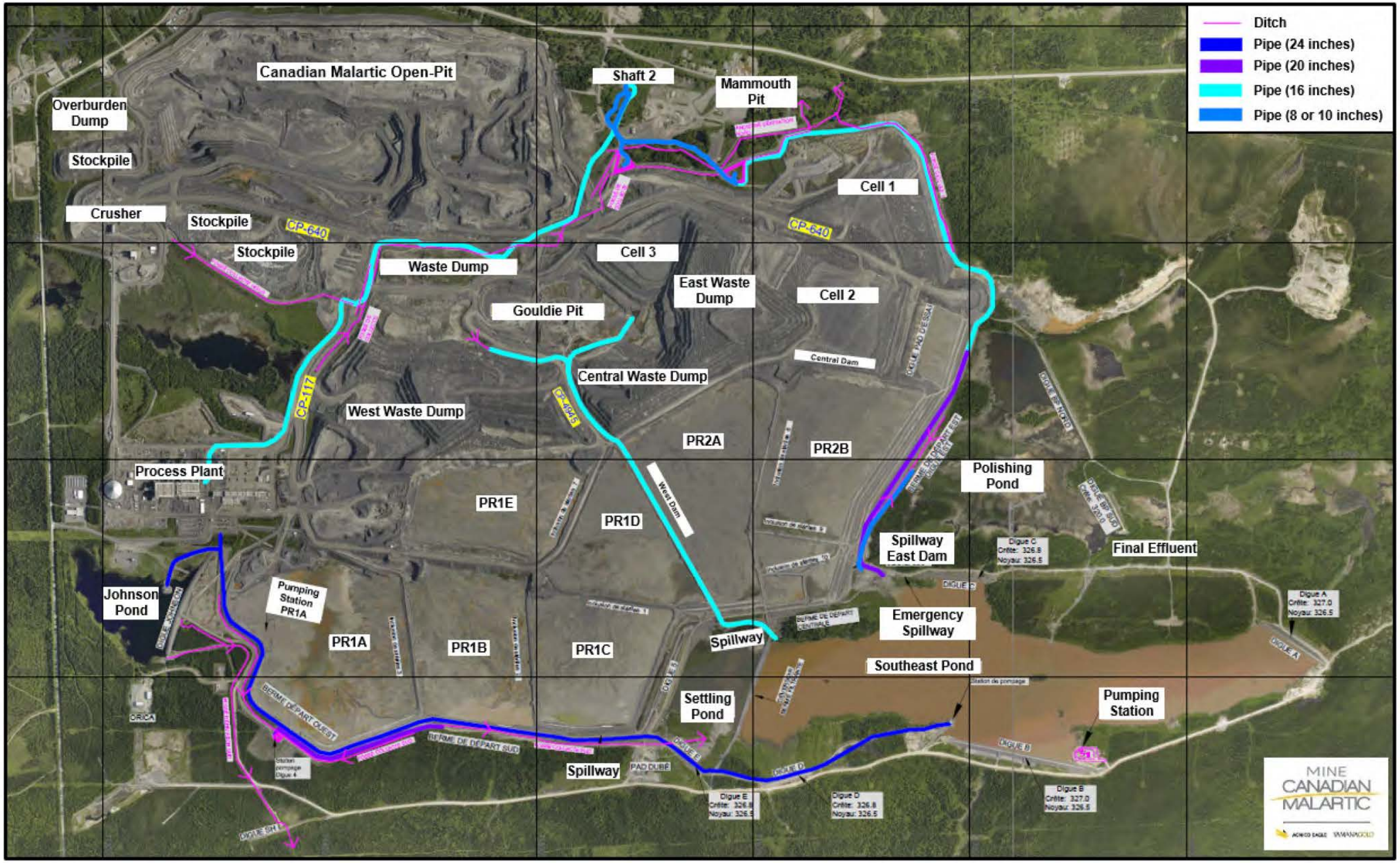

Figure 20.9 – Water management for the different areas of the mine site

20.5.2.3 Ore processing plant

The ore processing plant drains to the north towards a small emergency pond, so named because it acts as a discharge water collecting point should a plant process tank fail. During normal operations, water collected in the emergency pond (0.36 km^2) is pumped towards the ore processing plant.

20.5.2.4 Tailings site water

The tailings site is limited to the north by the waste rock pile, to the southeast by the Southeast Pond, and to the west, east and south by startup (peripheral) berms and by water management structures (ditches). The tailings beach slope usually causes runoff and consolidation water resulting from tailings deposition to flow towards these structures as follows:

- To the southeast, collecting ditches carry water towards the southwest pumping pond and it is then pumped towards the southern collecting ditch. In order to increase system reliability and to add a new barrier between tailings and the environment, an internal ditch located within the tailings site diverts water from the southwest section of the site directly towards the collecting ditch located to the south. Collecting ditches located to the west thus collect only runoff that comes from their drainage pond and exfiltration downstream of tailings site berms.
- To the south, the southern collecting ditch collects runoff and consolidation water from the whole sector to the west of the tailings site either directly or through pumping. The collecting ditches flow by gravity into the Southeast Pond.
- Central and eastern sectors of the tailings site drain directly through gravity towards the Southeast Pond. In fact, the tailings deposition process aims at directing surface and consolidation water to the south in order to facilitate its transfer towards the Southeast Pond.
- To the east due to the gradual migration of tailings deposition.

The tailings site water collection system collects water over an area of approximately 4.0 km2.

20.5.2.5 Water management for the waste rock pile, overburden pile H2, and ore stockpiles

To the north of the tailings site, the waste rock pile extends from the anthropogenic wetland to the west and up to the collecting ditch to the east. An ore stockpile is located to the east of the crusher road

Runoff from the waste rock pile usually flows to the north where it is collected by the northern collecting ditch that takes it up to Mammouth ditch. Further upstream, the same collecting ditch also collects runoff from overburden pile H2, from the low grade ore stockpile and water that comes from the crusher platform. Before water reaches the Mammouth pit, a pumping unit pumps part of the collecting ditch water to the north directly towards the Southeast Pond without sending it into the Mammouth pit. The total drained surface covers an area of approximately 3.5 km^2.

20.5.2.6 Southeast pond, sedimentation pond, water processing plant and polishing pond

The Southeast Pond is the main mining wastewater retention pond on the Canadian Malartic mine site. The southwest pond serves only as a transfer structure (through pumping) and remains empty outside of flood periods. The polishing pond is another mining wastewater retention pond the quality of which should generally comply with standards governing discharge into the environment.

Runoff that comes from different areas of the mine site is pumped towards the Southeast Pond, as well as water pumped from underground that is not used directly by the ore processing plant. Finally, the Southeast Pond also collects runoff and water that results from the consolidation of mine tailings once deposited in the tailings site.

In 2014, Canadian Malartic GP created a primary sedimentation pond on the west end of the Southeast Pond by using a limited section of the actual Southeast Pond to build a semi-permeable structure in order to send and keep contact water before it reaches the rest of the Southeast Pond. This structure will allow sedimentation and slow down water transfer towards the Southeast Pond.

The Southeast Pond is the main source of process water. The water volume in this pond is managed to ensure that, when winter ends, the water level is low enough to provide the capacity needed to manage spring floods.

Water collected in the Southeast Pond is:

- pumped as process water towards the ore processing plant; or
- pumped towards the polishing pond, if its quality is up to standards.

In the future, water collected in the Southeast Pond could also be processed in a water treatement plant, if necessary, before being released into the polishing pond.

20.5.2.7 Crusher area water

The crusher and small temporary ore and overburden dumps H1 (total area of 0.33 km^2) are located in the northwest section of the mine site. Most of these areas will drain through gravity towards the north collecting ditch.

20.5.3 Hydrological Balance

This section describes the annual hydrological balance of the mine site in operating conditions for an average climatic year (in terms of precipitation). The hydrological balance provides a yearly estimation of water volumes that must be managed in the different areas and structures on the Canadian Malartic mine site during an average climatic year (in terms of precipitation). Therefore, this model does not take into account extremely wet or dry conditions.

The hydrological balance model was based on the water management approach described in the water management plan presented in section 20.5.1.

20.5.4 Model parameters and hypotheses

Daily historical climatological data from 1954 to 2012, as measured at the Environment Canada station located in Val-d'Or (EC, 2013), were used to determine an average precipitation year. The year 1970 is most representative of yearly average precipitation for the Val-d'Or station with total precipitation of 908 mm.

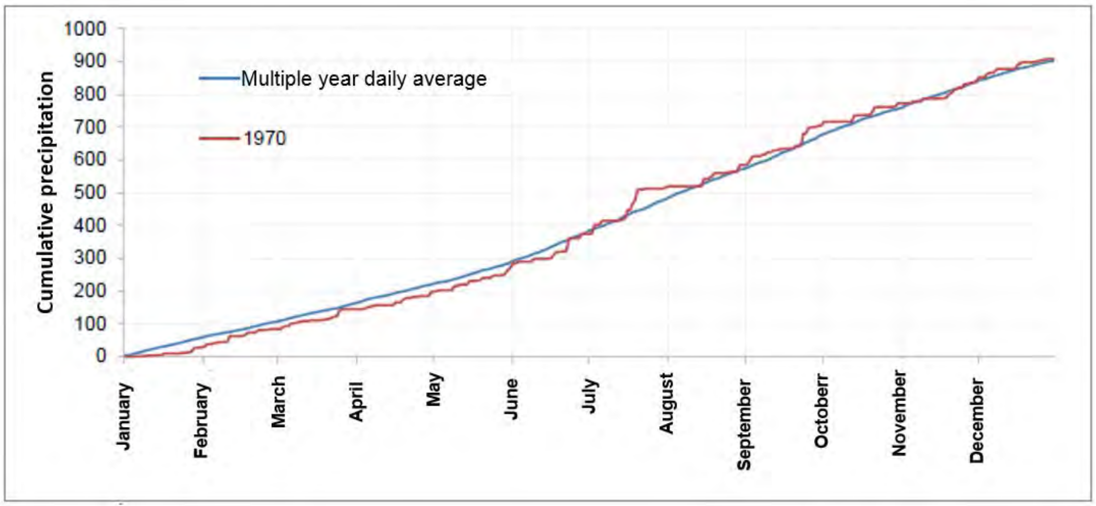

Figure 20.10 – Cumulative precipitation (Val-d'Or station)

Annual volumetric runoff coefficients were used to calculate annual surface runoff in the different areas of the mine site. Natural land runoff coefficients for the wetland and the forest were calibrated respectively for the northern diversion ditch and southern Raymond Creek using flow rates measured by Osisko throughout the years 2009 and 2010. Estimated annual volumetric flow from the mine (shown in Table 20.4) were also used in the water balance.

Table 20.4 – 2012 water balance data and 2013 pumping data

Origin / Source	Destination	Volume (Mm^3/year)
Water infiltrating into drifts	Shafts and drifts	2.55
Water level decrease	Shafts and drifts	0.50
Tailings water (at pipe outlet)	Tailings site	13.40
Water retained inside tailings	Tailings site	7.77
Shafts and drifts	Crusher	0.18
Shafts and drifts	Ore processing plant	1.75
Johnson Pond	Ore processing plant	0.04
Water contained in ore (humidity)	Ore processing plant	0.40
Shafts and drifts	Watering of roads	0.20
Collector Ditch	Southeast pond	1.50

The expected mine site configuration for 2014 was taken into account when delineating drainage ponds in each area of the mine site. The hydrological balance is based on an average production of 55,000 tpd.

20.5.4.1 Hydrological balance results

Annual calculated volumes flowing through the site for an average year are as follows:

- the polishing pond to Raymond Creek (final effluent): 3.4 Mm^3/year;
- from underground openings towards the Southeast Pond: 3.1 Mm^3/year, and towards the ore processing plant: 1.8 Mm^3/year; and
- from the Southeast Pond towards the ore processing plant: 11.2 Mm^3/year.

Table 20.5 shows the water volume that was used in 2013 for mining operations. Water pumped from the Johnson Pond represents surface water fed to the plant. Water must be pumped from shaft No. 2 to allow mining operations to be performed dry. Rainwater in the plant area is collected in the emergency pond and pumped towards the process location. Part of the northern water diversion has been pumped towards the Southeast Pond rather than letting it flow into underground openings.

Table 20.5 – Freshwater volume used in 2013 for mining operations

Water source (name)	Yearly volume of freshwater used on the mine site (m^3)
Johnson Pond	68,292
Well 2	5,540,946
Northern diversion	218,522
Total (Volume)	5,827,759

Table 20.6 breaks down the water volume that is recirculated towards the ore processing plant from the tailings site and the Southeast Pond.

Table 20.6 – Water volume recirculated towards the ore processing plant in 2013

Water source	Yearly volume of mining water reclaimed on the mine site (m^3)
TMF	978,759
Southeast pond (BSE)	10,271,340
Total (Volume)	11,250,099

Total water consumption by the mine in 2013 amounted to 17,077,858 m^3, including 11,250,099 m^3 of recirculation water. Therefore, the water recirculation rate amounts to 66%. The total volume diverted into the environment, i.e. the final effluent, in 2013 was 3,382,221 m^3.

20.5.5 Hydrological Balance Results

The 2013 hydrological balance (Fig. 20.11) provides an estimation of annual water volumes that must be managed by the different structures of the water management system of the Canadian Malartic mine site during an average climatic year (in terms of precipitation).

It shows, for an average climatic year, in terms of precipitation, an eventual water excess in the Southeast Pond that will need to be pumped to the polishing pond and ultimately released into the environment. The water treatment plant under construction will ensure that, in the medium term, the water meets quality requirements at all times.

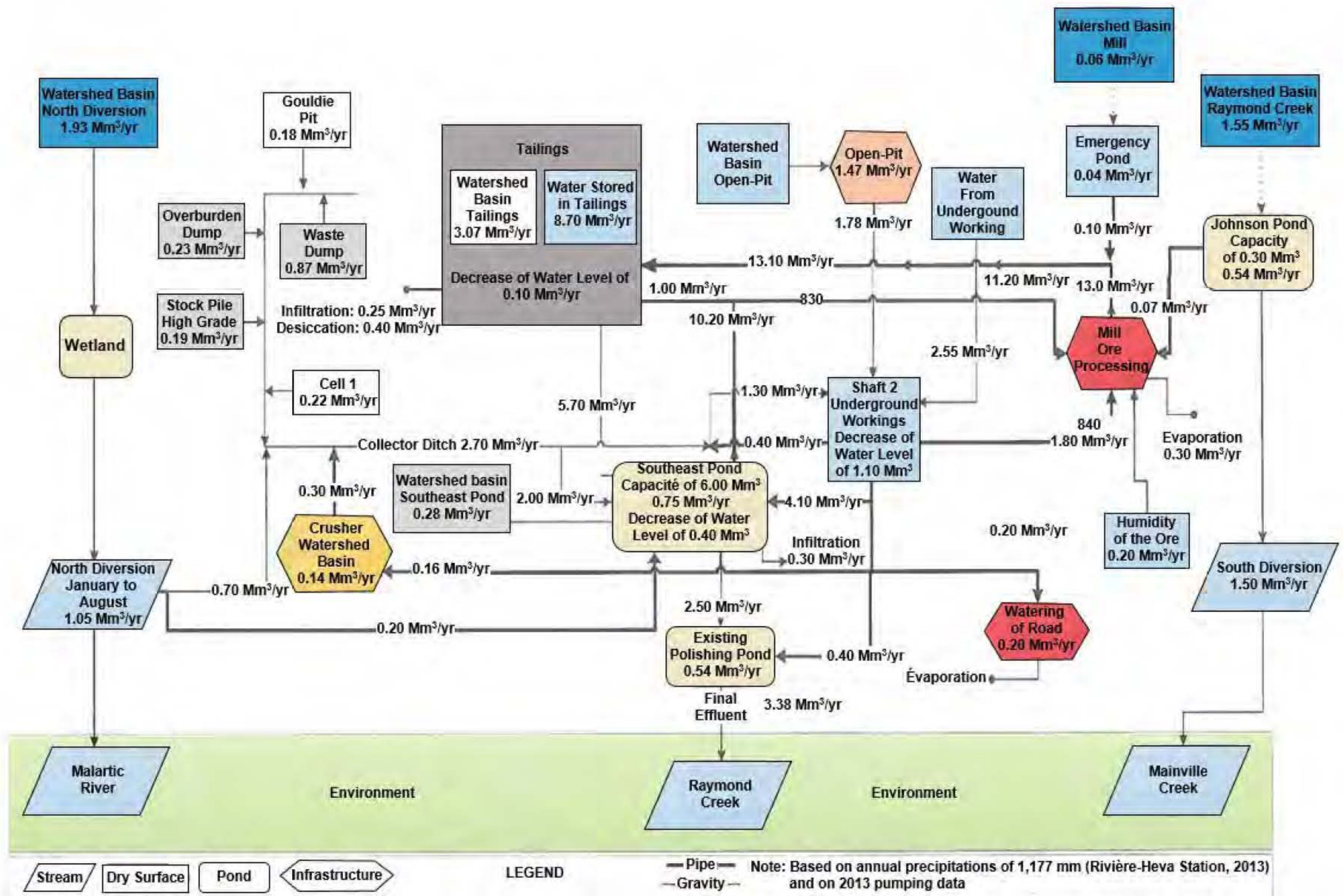

Figure 20.11 – 2013 Canadian Malartic mine site hydrological balance

20.6 Permitting

Environmental baseline environmental data collection and assessment started in June 2007 and was completed in February 2008. The results of the study were published in the EIA, which was completed in August 2008.

In September, 2008, Osisko filed the EIA for the Canadian Malartic Project with the MDDELCC. The EIA study was reviewed and accepted by Québec governmental authorities who established its compliance with MDDELCC guidelines. The formal process of the Bureau d'audiences publiques sur l'environnement (BAPE) commenced on March 9, 2009 and, on July 9, 2009, the MDDELCC published the report on the public inquiry and hearings. The report concluded that the Canadian Malartic Project could be authorized under certain conditions including (i) certain monitoring programs; and (ii) the deposit of financial guarantees sufficient to ensure that the Canadian Malartic Project could be carried out in a sustainable development perspective. On August 20, 2009, the Conseil des ministres du Québec approved the order in council (Decree No. 914-2009) authorizing the construction of the Canadian Malartic mine.

As of December 31, 2010, the Canadian Malartic mine had received all formal governmental permits required for its construction and related activities, with the exception of the mill and mine operations authorization. The official mill/operations certificate of authorization was granted on March 31, 2011, at which point the Canadian Malartic mine was fully permitted.

20.6.1 Notices of Compliance

Given the proximity of the mine site to the residents of Malartic, mining operations at the Canadian Malartic mine are subject to an extensive monitoring program prescribed by regulatory authorities. Since the mine start-up the mine has experienced a number of difficulties in meeting its permit conditions and had to develop additional mitigation measures to gain control of the operations regarding compliance.

Table 20.7 provides an overview of environmental compliance and efforts of the Canadian Malartic mine to minimize the impact of its activities on the environment and more particularly on the town of Malartic:

In 2013, the Canadian Malartic operation has received 41 notices of non-compliance. It received two administrative monetary penalties (each of $2,500) for surface water and final effluent non-compliance as well as 27 statements of offences relating to the construction of the "green wall" and which, if uncontested, would total approximately $389,000 in regulatory fine (being contested) In 2013, 206 complaints/inquiries were also raised by residents of Malartic, a reduction when compared to the 457 complaints in 2012. As of June 30th 2014, 67 complaints were received, showing a further reduction. The notices of non-compliance and the complaints/inquiries mainly relate to noise, dust, blast suppressions and vibrations, and NOx emissions during blasting. All notices of non-compliance are investigated and formal responses are filed with the regulatory agency. Periodically, environmental monitoring results are reviewed with the Monitoring Committee (comité de suivi) and the community.

Table 20.7 – Notices of non-compliance

<table>
<tr><th></th><th>Notice of non-compliance (2014)</th><th>Notice of non-compliance in 2013</th><th>Notice of non-compliance (from 2009 to 2012)</th><th>Administrative monetary penalties (from 2009 to 2013)</th><th>Statements of offence (from 2009 to 2013)</th></tr>
<tr><td rowspan="2">BLASTING (including surpassing limits for over pressure and vibrations, NOx emissions and/or blasting parameters)</td><td>7</td><td>16</td><td>29</td><td>0</td><td>0</td></tr>
<tr><td colspan="5">MAIN MITIGATION MEASURES SINCE BEGINNING OF OPERATIONS
• Execution of blasting activities only when the wind is not from the south (140 and 220 degrees) (i.e., in the direction of the town of Malartic);
• Testing of alternative blasting methods and explosive products that may be more effective from an environmental point of view, and
• Regular meetings with the contractor in charge of the execution of blasting activities for environmental improvement purposes.

OTHER RELEVANT INFORMATION
Fourteen (14) notices of non-compliance received by Osisko in 2012 were related to interpretation issues between Osisko and the MDDELCC regarding blasting operations. These interpretation issues were at the heart of the searches conducted by the MDDELCC at the Canadian Malartic mine during the second half of 2012 and explain the delay to proceed with a special blast of approximately 940,000 tonnes over previously mined-out areas that would provide access to the higher-grade zones of the main deposit (the "Special Blast"). The Special Blast was eventually authorized on October 18, 2012 by the Government of Quebec, pursuant to an order in council ("Decree No. 964-2012") modifying Decree No. 914-2009. On February 13, 2013, the Government of Quebec approved another order in council (Decree No. 98-2013) modifying the operating parameters of Decree No. 914-2009 and allowing Osisko greater access to the northern portion of the Canadian Malartic mine and to improve the framework for the execution of its blasting operations. Decree No. 98-2013 resolved most interpretation issues with the MDDELCC regarding blasting operations.

The notices of non-compliance received by Osisko with respect to NOx emissions were issued on the basis of assessment by the MDDELCC of the color of emissions released during blast activities. It is important to note that the NOx approved sensors installed by Canadian Malartic in the town of Malartic have never detected concentrations of NOx equal or greater than the limit permitted by the regulations. In fact, the concentrations measured in town have always been well below this threshold.</td></tr>
<tr><td rowspan="2">DUST</td><td>2</td><td>6</td><td>4</td><td>0</td><td>0</td></tr>
<tr><td colspan="5">PRINCIPAL MITIGATION MEASURES SINCE BEGINNING OF OPERATIONS
• Enclosure of buildings where dust is generated;
• Use of dust suppressant systems on roads;
• Establishment of an early warning system and modulation of activities ;
• Establishment of an internal committee to find more effective technical solutions; and
• Test of alternative dust suppressant products and methods that may be more effective from an environmental point of view.</td></tr>
<tr><td>DUST</td><td colspan="5">OTHER RELEVANT INFORMATION
Health authorities have conducted studies on dust emissions in the town of Malartic. No major health issues were identified in their conclusions, and the health authorities are continuing their studies to further inform the local residents.</td></tr>
<tr><td>NOISE</td><td>7</td><td>14</td><td>25</td><td>0</td><td>0</td></tr>
</table>

<table>
<tr><th></th><th>Notice of non-compliance (2014)</th><th>Notice of non-compliance in 2013</th><th>Notice of non-compliance (from 2009 to 2012)</th><th>Administrative monetary penalties (from 2009 to 2013)</th><th>Statements of offence (from 2009 to 2013)</th></tr>
<tr><td></td><td colspan="5">PRINCIPAL MITIGATION MEASURES SINCE BEGINNING OF OPERATIONS

Modification of the equipment fleet, addition of newly developed "quiet packages" on the Caterpillar 240-ton truck fleet, noise reduction measures on the drilling equipment, and implementation of a research and development noise reduction plan for mobile equipment;
Relocation of an additional 41 houses from an area adjacent to the “Green Wall”, thereby increasing the buffer zone between mining operations and the residents;
Modulation of mining activities during night operations to comply with noise standards; and
Installation of insulated walls (containers) along ramp.

OTHER RELEVANT INFORMATION
On April 13, 2011, the Conseil des ministres du Quebec approved an order in council (Decree No. 405-2011) modifying the operating parameters of Decree No. 914-2009. The new decree was granted in connection with the increased buffer zone and a municipal zoning by-law proposal for the future recreational park area, which was adopted by the town of Malartic on July 12, 2011. Together, Decree No. 405-2011 and the new zoning by-law increased the noise parameters under which the mine can operate to 50 dBA at night and 55 dBA during the day. However, the MDDELCC is of the opinion that noise parameters in certain sectors of the town of Malartic remain lower (40/45 dBA at night and 45/50 dBA during the day). Legal opinions obtained by Osisko on the interpretation of Decree No. 405-2011 differ from this point of view and consider that the current noise parameters under Decree No. 405-2011 are 50 dBA at night and 55 dBA during the day. Accordingly, since the issuance of Decree No. 405-2011, the notices of non-compliance related to noise have essentially reported "noise exceedances" below the 50/55 dBA parameters.</td></tr>
<tr><td rowspan="2">WATER</td><td>0</td><td>4</td><td>0</td><td>2</td><td>0</td></tr>
<tr><td colspan="5">PRINCIPAL MITIGATION MEASURES SINCE BEGINNING OF OPERATIONS

Use of an $S0_2$ cyanide detoxification system to reduce levels in the tailings prior to discharge to the tailings containment facility;
Constant monitoring of water bodies and closing of final effluent discharge when any contaminants levels may exceed regulatory limits; and
Use of sprinklers to facilitate the degradation of cyanide.

OTHER RELEVANT INFORMATION
In 2013, Osisko received two administrative monetary penalties (each of $2,500) for surface water and final effluent non-compliance.</td></tr>
<tr><td>OTHERS</td><td>2</td><td>1</td><td>12</td><td>2</td><td>27</td></tr>
</table>

	Notice of non-compliance (2014)	Notice of non-compliance in 2013	Notice of non-compliance (from 2009 to 2012)	Administrative monetary penalties (from 2009 to 2013)	Statements of offence (from 2009 to 2013)
	PRINCIPAL MITIGATION MEASURES SINCE BEGINNING OF OPERATIONS The notices of non-compliance that do not relate to noise, dust or blasting activities generally focus on specific issues, which have been resolved by implementing appropriate corrective measures. **OTHER RELEVANT INFORMATION** On November 28, 2013, Osisko received 27 statements of offence relating to construction activities carried out in 2010 in connection with the construction of the “Green Wall” in the town of Malartic. Uncontested, the statements would total approximately $389,000 in imposed fines. On November 29, 2013, the Corporation appeared and pleaded not guilty to all charges, stating that it firmly believes that all construction activity related to the Green Wall was carried out under best practices to minimize the impact of the construction on the residents of Malartic. In 2014, the Partnership received 2 administrative monetary penalties; one related to the extraction of tailings of Barnat-Sladen without a certificate of authorization (5 000$) and the other related to the non-respect of the operating conditions at Gouldie (2 500$).				

20.6.2 Permits and Authorizations

Tables 20.8 to 20.13 show the list of permits and authorizations obtained for the Canadian Malartic mine and those still pending.

On February 26, 2014, the Government of Québec adopted a decree authorizing the mining of the Gouldie deposit, which allowed pre-stripping to commence.

Table 20.8 – List of authorization (MDDELCC) required for operating the Canadian Malartic mine

	Reference Number	Date	Subject
A-1	7610-08-01-70167-48 400898292	February 22, 2012	Operation of a secondary crusher
A-2	7610-08-01-70167-50 400979230	November 14, 2012	Operation of a pebble crusher
A-3	7610-08-01-70167-58 401078081	October 22, 2013	Disposal of mining waste on cell 1
A-4	7610-08-01-70167-59 401118008	March 25, 2014	Storage of mine waste on cell 2
A-5	7610-08-01-70167-54 401116619	March 25, 2014	Construction and operation of an effluent treatment plant
A-6	7610-08-01-70167-60 401110528	February 25, 2014	Construction of a filtering dam in the southeast pond
A-7	7610-08-01-70167-52 401007507	February 14, 2013	Works to secure the old tailings of Barnat-Sladen mine sector
A-8	7610-08-01-70167-53 401041103	June 21, 2013	Operation of a temporary mobile crusher
A-9	7610-08-01-70167-21 200214395	October 6, 2008	Operation of the sand pit (Zone 1)
A-10	7610-08-01-70167-23 200214399	September 26, 2008	Operation of the sand pit (Zone 2)
A-11	7610-08-01-70167-20 200214399	September 26, 2008	Operation of the sand pit (Zone 3)
A-12	7610-08-01-70167-22 200214399	September 26, 2008	Operation of the sand pit (Zone 4)
A-13	7610-08-01-70167-24 200231637	November 3, 2009	Operation of the sand pit (Zone 5)
A-14	7610-08-01-70167-25 200254208	October 29, 2009	Operation of the sand pit (Zone 6)
A-15	7610-08-01-70167-26 200262243	February 15, 2010	Operation of the sand pit (Zone 7)
A-16		Pending	Modification of the mobile crusher
A-17		Pending	Use of Caro’s acid
A-18		Pending	Certificate of purification

Table 20.9 – List of certificates of authorization required for the operation of the Canadian Malartic mine

	Reference Number	Date	Objet
AC-1	CA-16	March 31, 2011	Production of Canadian Malartic gold mining project
AC-2	CA-16 M2	February 21, 2013	Modification of CA-16
AC-3	CA-16 M3	March 27, 2014	Modification of CA-16
AC-4	CA-5	January 26, 2010	Construction of southeast pond
AC-5	CA-6	December 18, 2009	Establishment of an oil storage depot
AC-6	CA-9	February 9, 2010	Establishment of the service building's mechanical shop facilities
AC-7	CA-10	April 13, 2010	Construction of the dam and priming of Johnson pond
AC-8	CA-15	November 3, 2010	Construction of an emergency pond
AC-9	CA-11	April 16, 2010	Construction and development of a "green wall" and linear park
AC-10	CA-16 M1	Pending	Modification of CA-16 (noise)
AC-11	CA-4	Pending	Development of the mining project (wetland)

Table 20.10 – List of of decrees

Reference Number	Date	Subject
914-2009	August 19, 2009	Canadian Malartic gold mining project
405-2011	April 13, 2011	Modification of decree 914-2009
964-2012	October 18, 2012	Modification of decree 914-2009
98-2013	February 13, 2013	Modification of decree 914-2009
171-2014	February 26, 2014	Modification of decree 914-2009
Pending	March 2013	Modification of decree 914-2009 (Phase II)
Notice of proposed	December 2013	Extension of Canadian Malartic gold mining project and deviation of Highway 117

Table 20.11 – Permits with the Centre d'expertise hydrique du Québec (CEHQ)

	Reference Number	Date	Subject
Decree	617-2010	July 7, 2010	Dam (Raymond Creek)
Authorization	X2117777 300577505	June 4, 2010	Construction of a dam on Raymond Creek

Table 20.12 – List of mining rights and surface rights (MERN)

MERN			
Mining leases			
	Date	**Reference No.**	**Subject**
CM Pit	November 25, 2009	892	Ore mining
CM Pit	April 11, 2011	1007	Ore mining
CM Pit	June 17, 2011	1011	Ore mining
CM Pit	December 6, 2012	CM 226	Ore mining
Gouldie Pit	March 3, 2014	1020	Ore mining
East Amphi	March 24, 1999	848	Ore mining
Surface rights			
	Date	**Reference No.**	**Subject**
# 1	August 26, 2009	822597 00 000	Industrial purposes
# 2	August 31, 2009	823099 00 000	Industrial (tailings facility)
# 3	December 8, 2008	820083 00 000	Industrial (tailings facility) (East Amphi)
# 4	October 12, 2011	819694 00 000	Industrial purposes (East Amphi)
Miscellaneous			
	Date	**Reference No.**	**Subject**
East-Malartic Rehabilitation	January 16, 2009		MRNF-Osisko (East-Osisko Project) Framework Agreement
CM Rehabilitation Plan	To send before June 16, 2014		Revision of rehabilitation costs
Financial guarantees			Rehabilitation Plan and Borrow pits

20.6.3 Permitting for the CM extension

Canadian Malartic GP is planning an extension of its Canadian Malartic mine in particular the expansion of the existing open pit in the Barnat sector. The final design and mine plan have been completed, the EIA for the project is expected to be submitted to the authorities in the fourth quarter of 2014 and at that time, a request for public hearings will be made by the Canadian Malartic GP.

20.6.3.1 Deviation of Highway 117

Expanding the Canadian Malartic open pit in the Barnat sector will require to deviate a portion of Highway 117 at the eastern entrance of Malartic. The GP continues its cooperation with Québec's Ministry of Transport and the town of Malartic on this project.

20.6.3.2 TMF expansion

From May 2011 to June 2014, 50 Mt of tailings from the process plant were deposited on the footprint of the old tailings of the East Malartic mine and its settling pond.. As of June 2014, the available space in the TMF is about 100 Mt, corresponding to nominal production of 20.075 Mt per year from the process plant. The remaining TMF capacity thus represents 5 years based on the current footprint.

The existing polishing pond, adjacent to the cells and located east of the TMF, is contained within the current authorized footprint of the TMF. This pond will be later used as a cell to store tailings. Before using this pond, the Canadian Malartic mine plans to build a new polishing pond east of dam A of the Southeast Pond. The polishing pond, converted into a cell, will be the 8th cell of TMF with an estimated capacity of 48 Mt corresponding to 2.5 years of life. From July 2014 to the end of the life of the tailings from the recent proposed tailings management, total capacity is estimated at 148 Mt for a minimum period of 7.5 years. The total capacity of the current TMF is therefore estimated at 198 Mt.

The expansion of the open-pit, with the production of the Barnat pit, will increase to 342 Mt the total amount of tailings to manage, a difference of 144 Mt compared to the revised tailings management proposal. The mine plans to store tailings in an extended tailings site and in the Canadian Malartic pit at the end of its operations. According to the mining plan at the end of mine life, 50 to 100 Mt of tailings will be deposited in the pit. The rest of the tailings, a minimum of 59 to a maximum of 109 Mt, will be deposited in the extended tailings site.

The proposed project to dispose of tailings in the Canadian Malartic pit and expand the current authorized surface tailings footprint are subject to an EIA, BAPE public hearing process, and authorization from the MDDELCC. The EIA is underway. Golder Associates is designing the extension of tailings and is preparing a hydrogeological study to demonstrate that the Canadian Malartic pit will function as a hydraulic trap that would contain tailings without environmental risk.

Using the pit as a waste rock and tailings storage area has several advantages; namely:

- reducing the size of the surface accumulation areas dedicated to waste rock (in piles) and tailings (TMF), thereby minimizing the use of natural environments (wooded areas, wetlands, etc.) and the visual impact of mine site components;
- reducing the transport distance for waste rock during mining operations by transporting it directly to the pit, thereby lowering greenhouse gas emissions and dust particles generated by waste rock transport;
- minimizing the potential environmental impacts and risks associated with catastrophic events;
- considerably lowering the demand for borrow materials that are required for landscaping and rehabilitating the surface accumulation areas, thereby also reducing the amount of borrow pit mining;

- shortening the time to flood the pit at mine closure by reducing the volume to fill.

Hydraulic containment in the mine pit could be carried out by stabilizing the water level at mine closure to a final elevation of 308.5 m. This water level would be maintained by developing a spillway at the pit crest that would allow water to flow by gravity to waterway 1, a tributary of the Malartic River.

20.7 Social and Community Impact

20.7.1 Communication and Consultation

Since the project was first announced, various communication and consultation activities have taken place within the community and with municipal and regional representatives. These activities can be grouped into three distinct themes: communication activities organized by Osisko, those organized by the Monitoring Committee (formerly the Community Consultation Group), and consultations and surveys conducted within the context of the Environmental Impact Assessment study.

20.7.1.1 Osisko's Communication and Community Development Activities

Since the project was first announced, various communication and consultation activities have taken place within the community and with municipal and regional representatives.

As it developed and carried out the Canadian Malartic Project, Osisko maintained an active stakeholder program to secure and retain its social licence to operate. The program hinged on maintaining active dialogue with the various parties and participating in community social and economic development projects, as well as funding various initiatives in health, education, sport and culture.

In terms of communication, Osisko conducted numerous activities in the project area with the objective of informing people and gaining insight about their concerns and expectations regarding the project. The main activities were:

- Meetings with elected officials and representatives of the area's organizations
- Public presentations within the community
- Meetings with residents who were to be relocated by the project
- Meetings with suppliers
- Presentations given to various chambers of commerce in the region.

Osisko also implemented measures for disseminating information about the project, including:

- The Community Relations Centre in downtown Malartic
- A corporate internet site, which is largely dedicated to the Canadian Malartic Project
- A news column called "Osisko Vous Informe", published twice a month in local newspapers

- The Monitoring Committee website
- Information brochures about the project and various information bulletins and announcements in the local media.

20.7.2 Community Investment

Osisko created the “Fonds Essor Malartic Osisko” (FEMO), a non-profit sustainable development fund for the town of Malartic. The fund will finance economic development and community initiatives that will improve the quality of life for Malartic residents. Scholarships and other investments in education will also have an important impact.

In September 2012, Osisko completed the construction of a park facility in the south neighborhood in Malartic. Expenses incurred for that project amounted to approximately C$5.0 million and include a multi-service building, a playground, a skate park as well as volleyball and soft ball grounds. Not only a community development initiative, this new park is also part of mitigation measures taken by Osisko to reduce the project’s impact on the community, in this case by increasing the buffer zone between the mine and the residents.

In 2013, Osisko committed $500,000 to the expansion of the day-care center in Malartic (Centre de la Petite Enfance Bambin & Calin), $450,000 for the construction of affordable housing, $250,000 for the celebrations of the 75th anniversary of the town of Malartic, and $206,000 to FEMO for several local and regional projects. In addition, Osisko, in collaboration with the town of Malartic, participated in the establishment of a regional training site for first responders.

20.7.2.1 Community Consultation Group and Monitoring Committee

A Community Consultation Group (CCG) was put in place in 2006 to provide a link between the residents of Malartic, the town of Malartic, and Osisko. It was formed by representatives from all three of these groups. The role of the CCG was to act as a consulting body to direct communications, to address requests and complaints, to draft the relocation process and review urban planning relocation designs. The CCG provided support for the effective communication necessary to enable the operations of the exploration team to allow, for example to receive the necessary approval from the population to allow exploration drilling to proceed in the urban area of Malartic during 2006 and 2007. In 2010, the CCG became the Monitoring Committee.

The Monitoring Committee (comité de suivi) is a key link between residents and the management team of the Canadian Malartic mine and its role is to monitor compliance to commitments and provide a formal vehicle for dialogue between the parties. In 2012, the committee’s mission was reviewed. A consultant provided a plan and participated in the selection of a new president and the appointment of six new members. In addition, new non-voting members were appointed from the town of Malartic, various governmental agencies, and the Canadian Malartic mine. Several meetings were held by the new committee and tree public meetings were held to discuss the deviation of Highway 117, groundwater and various health concerns with the regional health authorities and the residents.

20.7.2.2 Consultations and Surveys of the Area within the Context of the Environmental Assessment

The environmental assessment of the project involved the consultation of organizations in the area from June 2007 to March 2008. In all, 35 interviews took place with representatives of various government ministries, regional and local organizations, recreational and tourism organizations, and private businesses. The objective was to gather concerns and opinions about the project and to determine the psychological and social effects that could arise as the project advances. A survey has been done every two years since 2010 using questionnaires provided to all the residents of Malartic.

20.7.3 Main Concerns Related to the Canadian Malartic Project

The information herein is based on the results of several surveys over the years of residents and businesses in Malartic and the surrounding areas.

The project has generated and is expected to continue to generate significant employment and economic benefits for Malartic, including the arrival of new residents and the opening of new commercial and industrial enterprises as well as new services that improve the tax base for the town, but some citizens have reservations about sustainability and the true growth potential given the proximity of the project to Val-d'Or and the mobility of the regional workforce. Many people believe that the subcontracting needs of the project should continue to be met locally as much as possible, however the reality is that this may be influenced by the limited amount of qualified workers in the immediate areas, especially given the current high demand in the mining sector. One particular area of concern for the residents and businesses of Malartic is to ensure that the continued economic diversification of Malartic is not significantly hampered by the project in order to ensure a sustainable economy following mine closure.

On a social level, some people feel that one of the most likely benefits of the project will be the retention of current Malartic residents, whereas others expect a number of residents to leave due to environmental inconveniences. Some see the arrival of new residents as an opportunity to make the community more dynamic as well as a chance to improve the social fabric and living conditions. Others, however, are concerned about the potential shortage of housing, possible rent increases, and the potential deterioration in the quality of life due to noise and dust.

People have also expressed their concerns about the potential risks associated with mining. These included the risks associated with blasting, increased traffic on the municipal road network, and the possible contamination of underground water sources by hazardous materials and mining waste.

20.7.4 Social Acceptability and Cohesion

The results of a survey of the region conducted in late 2007 revealed that in terms of social acceptability, the project received a very strong show of support from both citizens (84% in favour) and the business community (96% in favour). The risks of conflict and division within the community are thus considered extremely low.

A principal reason for the continued low risk to the social cohesion of the region is the fact that most jobs have been filled by people from Malartic and the Abitibi region. However, despite the high number of jobs created, it is expected that the population of Malartic will stabilize or increase only moderately. The reason is the close proximity of neighbouring urban centres such as Val-d'Or, Amos and Rouyn-Noranda from which workers commute to the Canadian Malartic work site.

It is very unlikely that the eventual mine closure will lead to significant social divisions, and will thus have a low impact on social cohesion. Efforts to diversify the economy and prepare the community for closure of the mine site will ease the social impacts during this stage.

20.7.5 Land Planning and Management

Operations of the mine had a positive impact on land planning and development. The project favours many of the directions outlined by the Regional County Municipality's strategy and Malartic's urbanisation plan, including the recognition of the area as one of the province's centres of excellence for mining. In addition, the project allowed for the rehabilitation of the tailings pond at the old East Malartic mine, and is resolving the safety problem related to zones of land subsidence in the southern part of Malartic. In the past, land subsidence and old dump sites for mine waste, both products of past mining operations, have created land use problems in the area. The rehabilitation of the East Malartic tailings pond and the relocation of the southern Malartic neighbourhood constituted a real improvement over the previous situation.

20.7.5.1 Residential, Commercial, Institutional and Industrial Land Use

The project required the relocation of some 205 private residential buildings and a dozen municipal lots in the southern Malartic neighbourhood. The loss of this residential sector has been compensated by the development of a new neighbourhood northeast of the current urban centre. This resettlement program also created more space to accommodate future residential development.

New municipal infrastructure for the water and sewage collection systems has been constructed to serve the new neighbourhood. The infrastructure was designed to accommodate 210 additional lots to satisfy future needs for residential space, which allows the town to proceed with residential development at relatively low cost.

The southern Malartic neighbourhood included public service institutions (elementary school, adult education centre, childhood centre, long-term care facility and retirement home, and community centre and auditorium). Osisko constructed new buildings for these institutions, which continue to benefit the community.

20.7.6 Landscape Components

The Canadian Malartic Project has brought many changes to the southern part of Malartic. The project's basic components (processing plant, tailings pond, open pit, etc.) have modified the landscape, however other components help minimize this impact (linear park, wooded buffer zones, etc.).

During operations and closure activities, the project's impacts will vary from negligible to moderate according to the type of landscape: industrial, built, recreational or forested. The linear park provides a visual barrier between the mining operation and the town site, campground and golf course, and the project's overall impact in terms of industrial landscape is thus low. However, the waste rock dump is visible from the west end of Rue Royale and constitutes a moderate impact. Moreover, progressive build-up of the waste rock dump site will result in a temporary loss of forest. To lessen its impact, Canadian Malartic GP will revegetate the waste rock dump site and build a wooded buffer zone. Once the waste rock dump is revegetated, its impact will evolve from moderate to low as the plants grow. Once the wooded area of the buffer zone is established, the waste pile will not be visible.

20.7.7 Quality of Life

20.7.7.1 Physical Well-Being of the Population

An assessment of the potential risks of the project on human health was conducted.. Based on the results of this assessment, the project poses no threat to the health of the surrounding population in terms of airborne metal emissions. Ongoing measurements support this finding.

Dismantling of facilities during the closure phase is likely to generate some noise disturbance as well as dust particle emissions. The impact will be minor, however, since mitigation measures similar to those of the construction phase will be applied.

20.7.7.2 Community Services

The economic spin-offs and population growth during the mining phase have brought about the creation of new commercial and community services and have improved the services currently offered. In addition, the municipality's real estate tax base has increased. Additional income is available to improve municipal infrastructure and services and accordingly the quality of life for the citizens. The population is also benefiting from the improved services provided by the new public institutional buildings built by Osisko as part of the resettlement program for the southern neighbourhood.

During the closure phase of the project, a reduction in community services due to economic slowdown is expected. The significance of this impact on the quality of life is deemed moderate and will vary according to the proportion of local jobs dependant on the Canadian Malartic Project. Efforts undertaken by the municipality with the help of the FEMO fund should help reduce the impact of the mine closure on local community services.

20.7.7.3 Economic Impact

The construction and operational phases of the project have improved economic returns for the population of Malartic by creating jobs, directly or indirectly (through subcontracting and commercial revitalization), and by establishing an above-average salary base for those employed at the mine. There remains, however, the fact that lower-income or fixed-income residents have or may experience economic difficulties due to rent increases. The vacancy rate for rental units is very low in the region.

A moderate impact is expected during the closure phase. This impact will be the result of a reduction and potential deterioration of the job market, local economy, demographics or the value of homes. This situation could reduce the economic value of households, their consumption levels, and thus their quality of life. Offsetting this, rent prices could decrease, which could benefit lower-income or fixed-income residents. As for community services, the significance of the impact will depend on the economic diversification of Malartic at that time. Diversification efforts undertaken by the municipality with the help of the FEMO fund should help reduce the impact of the mine closure on the local economy.

20.7.7.4 Workforce Employability

The operations phase has improved workforce employability for Malartic and the Abitibi-Témiscamingue region, resulting in a positive impact. Many employees came from other industry sectors, particularly forestry. Osisko offered training programs that teach mining and ore processing procedures and safety measures applicable to mining operations. This improves the workers' employability given their newly acquired skills and experience. Moreover, job opportunities related to the Canadian Malartic Project, the generally booming mining sector, and attractive salaries should convince many young people in Malartic and the surrounding region to pursue their studies. In addition, the stronger economic health of Malartic will have a positive impact on the school success rate as well as on the employability of newcomers to the job market.

20.7.8 Community Resettlement

20.7.8.1 Neighbouring Community and Adjacent Urban Properties

The Canadian Malartic property is located in the vicinity and directly underneath the southern portion of the town of Malartic. During the planning stages, the area influenced by the Canadian Malartic open pit mine involved approximately 700 residents who were directly affected and another 500 residents of the town who were indirectly affected.

The original definition of the impacted area (March 2006) was restricted to the area south of Rue Frontenac, a block to the south of the dashed red line indicated in Figure 20.12. This area did not include the institutional buildings of de la Paix Street. In November 2006, Osisko announced to the institutional building owners that due to positive exploration results, the company would propose building new facilities for them in the northern part of town.

The area of impact was revised in June 2007 when the residences along the eastern end of Rue de la Paix were included in the resettlement at their request, to ensure that they did not live in dwellings that faced the Canadian Malartic Project.

The resettlement project initially involved 205 residential properties and 5 institutional buildings. In 2011, another 40 houses were relocated in order to build a park close to the Green Wall. Houses were not moved physically like in the first resettlement. Exchanges of houses within Malartic were offered to these residents or they could sell to Osisko.

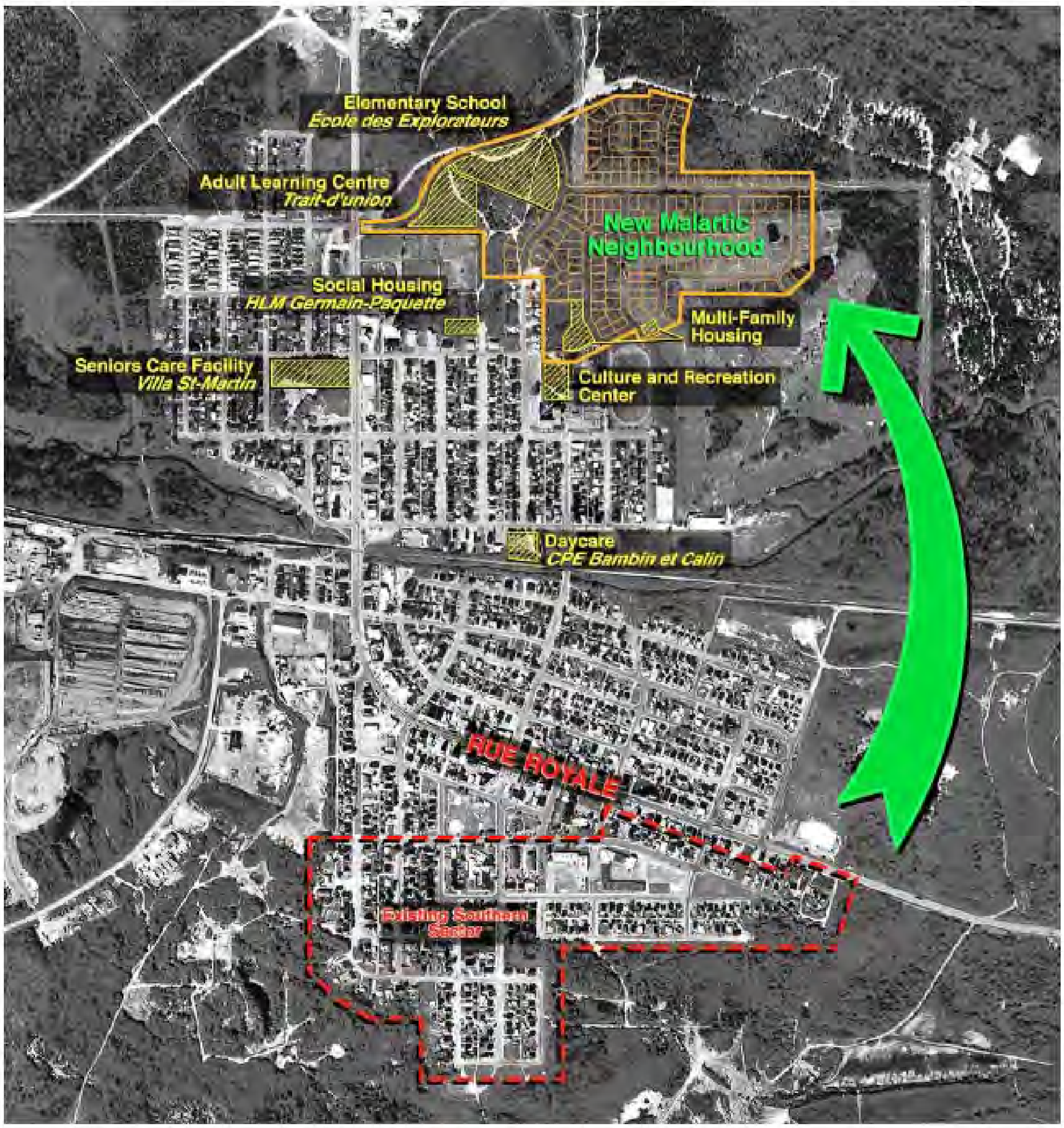

Figure 20.12 – Integration of the new neighbourhood into the existing town

20.8 Closure and Reclamation Planning and Costs

20.8.1 Remediation plan objectives

The objective of the remediation plan is to return the land to a condition that limits any risk to public health and safety and to the environment, while meeting the requirements of the Québec Government's decree authorizing the Canadian Malartic gold mine project. The closure plan was prepared in accordance with requirements presented in the MERN document titled "Guidelines for Preparing a Mining Site Rehabilitation Plan and General Mining Site Rehabilitation Requirements" (MRN, 1997). This plan does not include the additional reserves of Barnat, and will thus be reviewed to take these reserves into account and obtain the corresponding permits.
The following objectives were defined:

- Develop a remediation plan based on techniques that are environmentally adapted to required closures;
- Ensure that public health and safety risks are limited by performing work such as:
    - demolishing buildings, ducts and electrical lines if they cannot be transferred;
    - sealing and stabilizing all surface mine openings, such as wells, gates, working sites and ventilation shafts, if applicable;
    - removing machinery, equipment, storage containers and construction debris;
    - safely removing and disposing of chemicals, petroleum products and other dangerous waste;
    - complete rehabilitation of the tailings site and waste rock piles;
    - follow-up of the physical integrity and chemical stability of premises following closure; and
    - preparing a report on site conditions once work has been completed.

Figure 20.13 shows a projected plan view of the site following the remediation process to be used as a reference when reading this section on remediation.

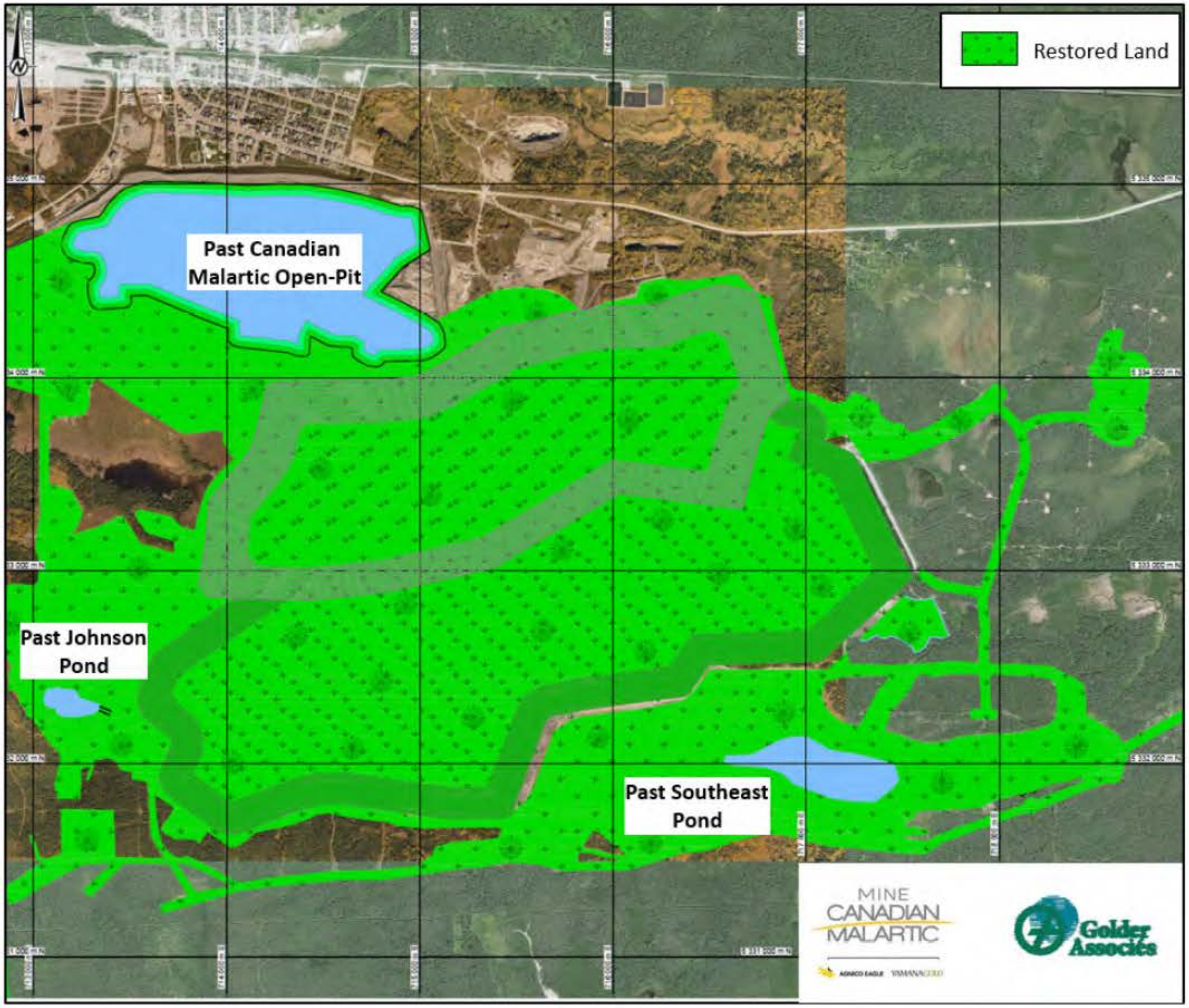

Figure 20.13 – Projected plan view of the site following the remediation process

20.8.2 Remediation plan

20.8.2.1 Site safety

Access roads leading to Canadian Malartic pit will be condemned and a fence will be installed in accordance with applicable standards, while a ditch will be excavated in front of the fence. Before determining the fence location, a geotechnical study shall confirm the stability of pit walls and determine the safe distance between pit limits and the fence. On the northern site of the pit, the Green Wall that will still exist at time of closure will act as an additional protection measure. The Gouldie pit, which is smaller, will be filled and covered with waste rock piles, thus avoiding the need to install a fence.

20.8.2.2 Buildings, infrastructures and equipment

Given the relatively urban location of the mining site, it may be possible to use the buildings for another purpose. If buildings cannot be transferred, reused by Canadian Malartic, or sold at the end of mine life, Canadian Malartic will dismantle them and the waste will be sold or recycled. In the case of the ore processing plant, it will be dismantled and equipment having an economic value will be sold. The footprint of all dismantled buildings will be vegetated.

Buried support infrastructures will be left untouched, unless the future mission of the site prevents it. However, lines that were used to carry dangerous materials will be removed and managed in accordance with applicable regulations when ceasing activities. All surface support infrastructures will be dismantled and removed from premises in accordance with applicable regulations when ceasing activities.

Transportation infrastructures are limited to roads and paths that were built on location. All these roads will be restored (scarified and vegetated) as soon as they will no longer be required for operating, remediation, follow-up or maintenance activities (Fig. 20.13).

Upon ceasing activities, equipment, heavy machinery, storage containers and construction debris will be sold to third parties, eliminated with local recuperation companies or sent to waste. Finally, the 25 kV electrical line that was installed on premises will be dismantled when remaining work will not require any electrical supply.

Soils will be sampled and decontaminated if required in accordance with applicable standards upon ceasing activities.

20.8.2.3 Water management infrastructure

During remediation activities, runoff water on the whole site, including on the tailings site and in waste rock piles, will still be diverted towards the southeast basin. While remediation work is taking place and once water quality complies with applicable standards, surface runoff in some areas may be diverted into the environment and it will then become possible to gradually dismantle water management structures as described below.

Water management infrastructures include clean water diversion ditches, contact water collection ditches, the soutwest pumping basins, the Johnson basin, the southeast basin and the polishing basin. The actual polishing basin will be used as a deposition cell well before the end of life of the mine and this is why a new polishing basin will be needed in the future.

All ditches and culverts that will no longer be required will be restored. Culverts will be removed and discarded in an authorized location. Ditches will be left as is or filled up with materials from roads and other areas that they served. The northern diversion path will be modified in order to supply water to the Canadian Malartic pit and thus contribute to its flooding. The sediments at the bottom of pumping basins will be characterized and if they are not contaminated they will be left on location. Otherwise, they will be excavated and carried, if possible, into the pit or on the tailings site. Basins will then be dismantled and their footprint will be reforested.

Following the dismantling of mine infrastructure, the Johnson basin where clean water accumulates will no longer be needed. As a result, the water level inside the basin will be lowered to create a path inside the dam and thus let the water flow naturally (Fig. 20.13). The footprint will then be reforested.

If its quality so allows, the southeast basin water will be pumped directly into the pit for a period of approximately two years in order to fill it up more rapidly. The southeast basin will be dismantled only when water on the site will comply with applicable criteria.

Once the southeast basin has been dismantled, sediments found in its bottom will be characterized. If they are not contaminated, they will be left on location. Otherwise, they will be excavated and carried, if possible, onto a small section of the tailings site that has not yet been restored. A breach will be made in dike A to restore the natural flow of water (Figure 20.13). The footprint will be reforested. Should any other dike in the southeast basin prevent water from flowing naturally, a breach will be made to allow water to flow.

20.8.2.4 Pits

The Canadian Malartic pit remediation concept is based on the redevelopment of its outside slopes and on pit flooding. Once the Canadian Malartic and Gouldie pits are no longer operated, pumping equipment will be removed and the Canadian Malartic pit will be naturally flooded. Water coming from the following will fill up the pit:

- Annual runoff from pit drainage basins;
- Precipitation;
- Groundwater;
- Water pumped from the southeast basin over a two-year period; and
- Diversion of the north Raymond Creek towards the pit.

Based on this scenario, it was estimated that some 40 years would be needed to fill the pit.

Effluent control will be done through the Mammouth pits where an underground hydraulic connection between the Mammouth pits and the Canadian Malartic pit controls the water level. Once the site is closed, a spillway will be built on the eastern site of the Canadian Malartic pit to control the effluent in addition to a water outlet leading to Rivière Malartic in case of failure of the underground hydraulic connection (gallery collapse).

The outer slopes of the pit have already been the object of redevelopment work, including subgrade stabilization through a grading or smoothing process in a ratio of 2H:1V. At the time of closing, these slopes will be reforested. Work also includes the protection of surface soil against waves by building a wall made of low-risk waste rocks. Development work of the main access ramp might begin in order to create an environment conducive to fish spawning.

The mine now operates the Gouldie pit located to the south-east of the Canadian Malartic pit. This pit has a 179,000-m^2 footprint. It is surrounded by waste rock piles and will be operated until 2016. Once its operation has ended, the Gouldie pit will be completely filled with rock waste and its surface will be covered with a layer of low-permeability natural soil (Golder, 2012b). Waste rock piles will then cover the Gouldie pit entirely.

20.8.2.5 Mine tailings site

The geochemical characterization of tailings now under progress will allow to better understand their long-term behaviour. Although the tailings site footprint has slightly increased, the original remediation concept remains adequate and unchanged compared to the one presented in 2009 (Golder, 2009a).

Regarding the development of waste rock piles and of the tailings site in the Canadian Malartic mine area and based on the current development of the mine, modelling studies performed by Golder (Golder, 2009b and 2010a) reveal compliance with groundwater protection objectives described in Directive 019.

Planned remediation work for the tailings site consists of a series of activities that will take place progressively. The tailings site is built either from an existing dike or from a startup berm made of waste rock and periodically increased upstream using waste rock berms. As berms advance, sections that are no longer modified may be restored. The surface of each landing between berms, which is made of riprap, will be rapidly covered with a layer of overburden, modified if necessary before being revegetated. This vegetation will control water and wind erosion, if necessary.

Once operations have ended, the last landing made up of tailings will be restored. Tailings will be covered with a layer of overburden, modified if necessary before being revegetated. Developments have been implemented in order to control drainage and allow vegetation to grow as quickly and as efficiently as possible.

Stability analyses that were presented in the first version of the remediation plan are still relevant. Recent in-situ tailings characterization work has been performed that will help confirm some of the assumptions used in the analysis. The stability analysis are being updating using that data.

20.8.2.6 Waste rock piles

Waste rock geochemical characterization has been performed on all types of waste rock from the Canadian Malartic pit. Kinetic tests are underway to provide a better understanding of the long-term chemical behaviour of waste rock. Results of these tests are not expected to affect, the remediation concept and it remains adequate and identical to the one presented in 2009 (Golder, 2009a) and updated in 2011 (Golder, 2011a).

Groundwater quality monitoring in the area of the Canadian Malartic mine will help validating numerical model predictions and protect long term groundwater use.

The progressive remediation scenario of waste rock piles provides for the reforestation of access roads and flat surfaces, as well as for the hydroseeding of waste dump slopes. In the case of flat surfaces, planned work will consist of applying a layer of overburden, modified if necessary, and planting rapidly growing shrub species. When growing, trees will help the dump integrate rapidly into the landscape. Dump slopes will be vegetated and a layer of overburden, modified if necessary, will be applied followed by a hydroseeding process.

In order to ensure access to the surface for seeding purposes and to trigger the remediation process as early as possible, the seeding of slopes and horizontal surfaces will begin only once the first banks of the dump have been completed and provided that they can be accessed safely.

Stability analyses that were presented in the first version of the remediation plan remain relevant. However, the analysis is currently being updated to reflect the reorganization of accumulation areas (waste rock vs. tailings) in some sectors.

20.8.2.7 Low grade ore piles

Three low grade ore piles have been planned and one of them (low content) is now inserted in the waste rock pile and will be gradually replaced with waste rocks. Upon proceeding with the remediation process, both remaining piles will no longer contain ore. These piles are located on waste rock platforms and their footprint will be characterized before proceeding with reforestation.

20.8.2.8 Overburden piles

Two overburden piles are now planned. Besides the one located originally to the north of the crusher, a second one can be found in the western section of the waste rock pile. The material of this pile will be used gradually during progressive remediation activities and the location will be filled with waste rock. Once the mine life is over, the remaining area of the overburden pile will be reforested.

20.8.2.9 Emergency basin

Upon proceeding with remediation, the emergency basin footprint will be covered with a layer of overburden that will be modified if necessary before being reforested.

20.8.2.10 Progressive remediation

As mentioned previously, outside slopes of the pit have already been the subject of redevelopment work, including soil stabilization through grading or through a softening process that produced a 2H:1V slope.

A few localized and progressive remediation activities have begun in 2013 in the tailings site, in the southeast basin and in the Zone 5 borrow pit (ASB 1260). Although restored areas are limited (131,000 m^2), these activities are performed within the framework of a research and development project and will optimize the efficiency of any future remediation work.

More specifically, research work under progress (Larchevêque et al., 2012 and 2013) will help evaluate the efficiency of different types of fertilizers which, if used during remediation work, will allow a rapid growth of shrub species. It is already possible to anticipate that the amount of overburden or any other available substrate at the mine site may not be sufficient to restore all surfaces upon closing the mine. Until then, Canadian Malartic will strive to identify different potential sources of fertilizers that may be added to the overburden during the site remediation process.

20.8.2.11 Work integrity

Once the remediation process has been completed, only the tailings site, the waste rock pile and the pit should remain visible on the site. The effluent processing plant and tailings site control structures will be operated until MDDELCC criteria have been complied with. These structures will then be dismantled.

The work integrity follow-up program will include a follow-up of the stability of structures remaining after the site remediation process, including:

- the waste rock piles;
- the Canadian Malartic pit; and
- tailings site berms.

A regular inspection will allow evaluation of the condition of structures. This inspection will be performed by a geotechnical engineer from a consulting engineering firm jointly with a person in charge at Canadian Malartic. This inspection will consist of visiting each structure. All observations will be recorded in a site report, pinpointed on a plan and photographs will be taken. Inspections will be performed in springtime once the snow has melted, but before the minimum flow period.

Visual inspections should detect any abnormal surface phenomena that reveal anomalies in work behaviour. If unusual conditions are observed during the inspection process, they will be recorded in the inspection report and a follow-up will be done. Should corrective actions be necessary to ensure safety of the population or the quality of the environment, such actions will be taken as soon as possible.

In addition, the effluent processing plant will be inspected on a regular basis in order to ensure its good operating condition. This inspection will take place during the monthly equipment maintenance process.

Following each monthly inspection, a report will be prepared including a summary of observations that were made, an analysis of piezometric surveys as well as recommendations.

20.8.2.12 Environmental monitoring

The main objectives of the environmental monitoring will consist of following up on the evolution of a few sensitive environmental aspects and identifying trends or impacts resulting from project activities. This follow-up will continue for at least ten years and until results of the last five consecutive years comply with detailed conditions listed in Directive 019.

Special attention will be paid to water quality in effluent discharge areas and to the quality of groundwater surrounding the Canadian Malartic pit, the waste rock pile and the tailings site. This program will be elaborated in accordance with provincial and federal requirements in force at the time of mine closure.

20.8.2.13 Agronomic monitoring

The agronomic follow-up process will check on the recovery of vegetation on the site and to take any corrective action that may be required. This agronomic follow-up will be performed once a year in summer time during the five first years following mine closure. If reforestation and seeding results are considered positive, the agronomic follow-up will end after the fifth year. Otherwise, follow-ups will be performed until we get three consecutive positive years are attained.

20.8.3 Closure Costs

Reclamation and closure costs have been estimated for rehabilitating the TMF and waste dump, vegetating the surrounding area, dismantling the plant and associated infrastructures, and performing environmental follow-up for a period of 10 years. The reclamation and closure cost is estimated at $51.5 million and includes the following (all amounts in Canadian dollars):

• TMF and waste dump	$31.45 M
• Water management facilities	3.22 M
• Contaminated soil and pit closure	7.87 M
• Dismantling of complex	4.92 M
• Environmental monitoring and inspection	4.04 M
Total	**$51.50 M**

This closure plan does not include any provision for the additional material coming from the pit expansion with the Barnat deposit and the Jeffrey pit. Permitting and official approvals are required.

The plan will be renewed on an on-going basis. In October 2011 and 2012, Osisko respectively deposited the amounts of $22.1 million and $12.7 million with the Government of Québec to cover the entire estimated future cost of rehabilitating the Canadian Malartic mine site, which amounts to $46.4 million.

On July 5, 2013, Canadian Malartic deposited $11.6 million with the Government of Québec, representing the balance of the total guarantee required to cover the entire future costs of rehabilitating the Canadian Malartic Mine site. Aggregate deposits for the Government of Québec amount to $46.4 million.

21. CAPITAL AND OPERATING COSTS

21.1 Capital Cost Estimates

Estimated capital costs to the Canadian Malartic mine essentially correspond to sustaining capital for mine and development costs, as well as construction costs during the deviation of Highway 117 (table 21.1).

For mine operations, capital costs in the near term include an estimate for the purchase of new equipment of $16 million in 2015. For the processing plant, capital costs in the near term include an estimate for improvement costs of approximately $16 million in 2015.

Canadian Malartic GP plans to extend the Canadian Malartic mine by enlarging the existing open pit in the Barnat sector. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014. If the Canadian Malartic GP obtains all necessary permits and authorizations for the construction of the Highway 117 deviation, the work could start in 2014. The estimated cost of the construction work is $60.3 million and it is expected to take three years.

Table 21.1 – Canadian Malartic mine 3-year capital cost forecast (in $M)

CAPITAL COST (C$)	2014	2015	2016
Sustaining Cost	$ 54.8	$ 44.5	$ 57.1
Development Cost	$ 65.6	$ 75.1	$ 54.1
Deviation of Highway 117	$ 5.4	$ 30.8	$ 25.1
TOTAL CAPITAL COST	**$ 125.8**	**$ 150.4**	**$ 136.3**

21.2 Mine Operating Cost

Estimated operating expenditures at the Canadian Malartic open pit mining and milling operations are presented in Table 21.2.

Operating costs consist of annual expenditures incurred at the Canadian Malartic mine to extract ore and waste rock and to process the ore. The mining consumables are based on the costs and contracts and the costs for future operation consumables, such as mill reagents, grinding media, etc., are based on recent supplier quotations, general and administrative (G&A) costs, and transport and refining costs.

Table 21.2 – Canadian Malartic mine 3-year operating cost forecast (in $M)

OPERATING COST (C$)	2014	2015	2016
Projected processed tonnes	18,533,000	20,075,000	20,130,000
Projected gold ounces recovered	532,000	591,600	630,900
Mining Cost ($M)	$ 180.8	$ 198.1	$ 188.6
Processing Cost ($M)	$ 158.4	$ 162.2	$ 162.7
General and Administrative (G&A) ($M)	$ 43.5	$ 43.5	$ 43.5
Transport and Refining ($M)	$ 1.6	$ 1.8	$ 1.9
TOTAL OPERATING COSTS ($M)	**$ 384.3**	**$ 405.7**	**$ 396.6**
TOTAL OPERATING COSTS/TONNES	**$ 20.74**	**$ 20.21**	**$ 19.70**

22. ECONOMIC ANALYSIS

Under NI 43-101 rules, producing issuers may exclude the information required for economic analysis on properties currently in production, unless the technical report includes a material expansion of current production.

Canadian Malartic GP, being a producing issuer, is not required to include information under Item 22. There is currently no firm plan to expand the current Canadian Malartic mine production of 55,000 tonnes per day (tpd).

23. ADJACENT PROPERTIES

In the area surrounding the Canadian Malartic Property, several exploration properties at different stages of exploration are controlled by several owners (Figure 23.1). Recently, NI 43 101 resource estimates have been published on three of the properties as described below.

NioGold Mining Corporation owns the Marban Block Property where the Marban, Kierens and Norlartic deposits contain a total measured and indicated resource of 32,127,000 tonnes grading 1.48 g/t Au and a total inferred resources of 16,478,000 tonnes grading 1.13 g/t Au (Gustin and Ronning, 2013).

NSR Resources Inc. published a resource estimate on the Rand Malartic Property where Zone 67 contains indicated resources of 641,115 tonnes grading 2.96 g/t Au and inferred resources of 288,317 tonnes grading 1.84 g/t Au, while Zone 39 contains inferred resources of 2,815,269 tonnes grading 2.28 g/t Au (Wahl and Burt, 2011).

Northern Star Mining Corporation Inc. published a resource estimate on the Malartic-Midway Project. The gabbro-type mineralization on the project contains indicated resources of 930,108 tonnes grading 5.83 g/t and inferred resources of 572,412 tonnes grading 6.561 g/t Au, while the porphyry-type mineralization contains indicated resources of 1,509,732 tonnes grading 2.40 g/t Au and inferred resources of 1,469,795 tonnes grading 2.40 g/t Au (Larouche, 2008).

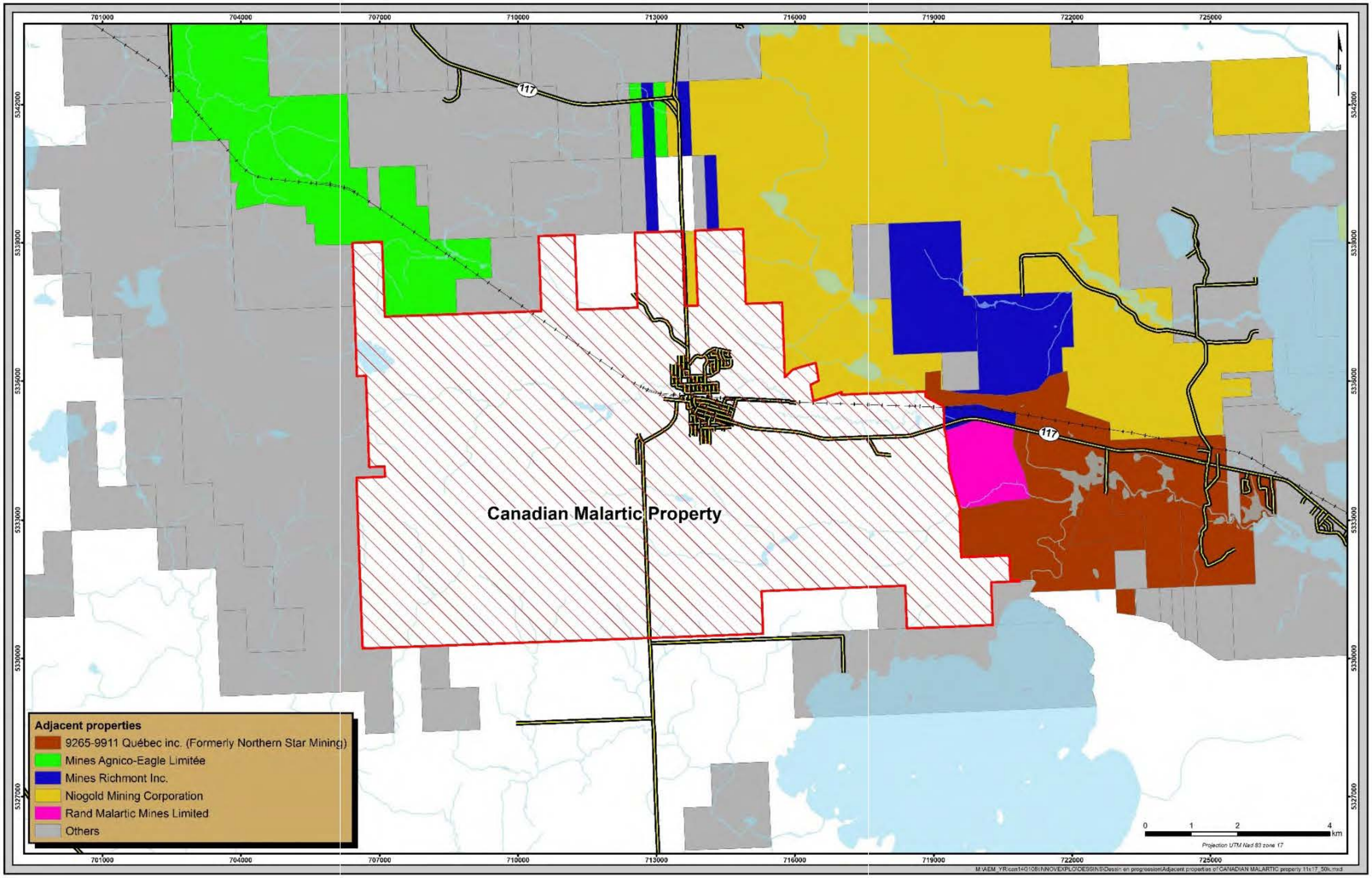

Figure 23-1 – Canadian Malartic Property and adjacent properties

24. OTHER RELEVANT DATA AND INFORMATION

On May 28, 2014, Abitibi Royalties instituted proceedings seeking a provisional, interlocutory and permanent injunction ordering Osisko not to transfer its interest in the CHL property to Canadian Malartic GP. Abitibi Royalties further asserted that as a result of an internal reorganization contemplated in connection with the plan of arrangement pursuant to which Osisko was indirectly acquired by Yamana Gold Inc. and Agnico Eagle Mines Limited, a right of first refusal had been triggered allowing it to acquire Osisko's interest in the CHL property. On May 30, 2014, the plan of arrangement was amended to clarify that Osisko's interest in the CHL property would not be transferred to Canadian Malartic GP. Nevertheless, Abitibi Royalties continues to assert that its right of first refusal has been triggered. On June 13, 2014, the Superior Court of Québec dismissed Abitibi Royalties' proceedings based on an arbitration provision contained in the relevant agreement. Abitibi Royalties is appealing this judgment. Canadian Malartic is of the view that Abitibi Royalties' claim is without merit.

In addition, material terms of the joint venture agreement between Abitibi Royalties and Canadian Malartic Corporation remain to be agreed upon. There is no assurance that an agreement can be reached on terms which would make the joint venture financially viable.

As a result of the above, the resources associated with Canadian Malartic's interest in the CHL property may never be mined and therefore cannot be considered as reserves.

25. INTERPRETATION AND CONCLUSIONS

25.1 Property Description and Location

The Canadian Malartic property hosts the Canadian Malartic mine, Canada's largest gold mine, which will produce on average approximately 600,000 ounces of gold a year for the next 14 years. The mine was commissioned just six years after the first exploration drill holes were completed in 2005. The first gold pour was in April 2011 and commercial production began in May 2011.

The Canadian Malartic property is located approximately 25 km west of Val-d'Or and 80 km east of Rouyn-Noranda, on Highway 117. The property lies within the Municipality of Malartic. It straddles the townships of Fournière, Malartic and Surimau.

The Canadian Malartic Property represents the amalgamation of the East Amphi property of Richmont Mines, the CHL Malartic property of Abitibi Royalties and Osisko, and the Canadian Malartic property of Osisko. The Canadian Malartic property consists of a contiguous block comprising 1 mining concession, 5 mining leases, and 208 mining claims covering an aggregate area of 8,735.9 hectares.

25.2 Geological Setting and Mineralization

The Canadian Malartic property lies within the Abitibi Subprovince (Abitibi Greenstone Belt) of the Archean Superior craton, eastern Canada, along the Cadillac–Larder Lake Fault Zone. The rocks in the Canadian Malartic property are predominantly composed of metavolcanic rocks, metasedimentary rocks, and related intrusions.

Mineralization in the Canadian Malartic deposit occurs as a continuous shell of 1 to 5% disseminated pyrite associated with fine native gold and traces of chalcopyrite, sphalerite and tellurides. The gold resource is mostly hosted by altered clastic sediments of the Pontiac Group (70%) overlying an epizonal dioritic porphyry intrusion. A portion of the deposit also occurs in the upper portions of the porphyry body (30%).

Alteration in the metasediments consists of biotite-sericite-carbonate (potassic alteration) overprinted by cryptocrystalline silica-carbonate. Carbonates include calcite and minor ankerite. Highly silicified zones adopt a "cherty" texture and are commonly brecciated. Potassic alteration in the porphyry consists mostly of alkali-feldspar replacement of plagioclase that is contemporaneous with minor quartz veining. Cryptocrystalline quartz replacement with minor carbonate also overprints potassic alteration in the porphyry. Late, coarse-grained, quartz-feldspar-muscovite veins mineralized with native gold form relatively small, higher grade stockworks along the northern edge of the deposit.

25.3 Deposit Type

Before the acquisition of the property in 2004 by Osisko, several models were proposed by various authors to explain the origin of the gold deposits in the Malartic camp. Among the proposed models are an epigenetic model with structural and lithological control, an orthomagmatic-origin porphyry-related model, a porphyry gold model, and a disseminated-stockwork zone model centered on felsic porphyry intrusions.

In 2004, Osisko's personnel adopted the porphyry gold model as a tool to drive exploration on the property. More recently, a new model was proposed to define the deposit type explaining the gold mineralization of the Canadian Malartic mine. It represents a magmatic-hydrothermal model that calls for the exsolution of an ore fluid from monzodioritic magma at mid-crustal levels. During its ascent, this fluid potassically altered, carbonated, sulphidized and locally silicified the host rocks and deposited gold. The porphyritic rocks that host some of the mineralization were thus not the source of the fluids. Rather, their contacts with Pontiac greywacke and Piché mafic and ultramafic rocks provided the competency contrasts that helped focus the mineralizing fluids.

25.4 Data Verification

The available data from the QA/QC programs for the Canadian Malartic, Jeffrey and Western Porphyry databases show overall acceptable results.

The statistics of the Certified Reference Materials (standards) are considered within industry-accepted limits of accuracy.

The level of contamination appears to be low as the blank samples do not display evidence of significant contamination.

The samples sent to an external laboratory do not show any significant bias as the global average is about the same and the coefficient of correlation between the two populations is higher than 98%.

It is the author's opinion that Osisko ran an industry-standard QA/QC program for its insertion of control samples into the stream of core samples.

For reference standard samples, the control charts produced by Osisko consist of the assay results for each standard plotted on the y axis against time on the x axis. Superimposed on this chart are five horizontal reference lines representing the accepted value for the standard, the accepted value +2SD and +3SD (standard deviations), and the accepted value -2SD and -3SD. An analysis of a standard is considered a QA/QC failure if the result comes back outside of the ±3SD lines. Such charts can also show trends of drift over time indicating problems with calibration of instruments.

It is recommended that re-numbered rejects be submitted to the primary laboratory to complete the QA/QC program.

Diamond drilling and reverse circulation (RC) drilling were used equally during interpolation over a portion of the Canadian Malartic deposit. Although the RC portion represents less than 10% of the entire tonnage (22.6 Mt over 245.9 Mt), it would be worthwhile to run a comparative study to confirm that no bias exists between both drilling and sampling methods although good reconciliation during recent mining activities suggest that no bias is to be expected.

The Canadian Malartic, Jeffrey and Western Porphyry drill hole databases are considered robust and suitable enough for use in mineral resource estimation studies.

25.5 Mineral Processing and Metallurgical Testing

25.5.1 Canadian Malartic Deposit

Canadian Malartic ore is composed of four main lithologies (CPO, SPO, CGR and SGR) spread throughout the deposit in an average ratio of 10%, 20%, 28% and 42%. The deposit was studied (metallurgical testwork) along three axes: east-west, north-south and depth. The main parameters studied were hardness and abrasion variability, reagent consumption and gold recovery.

The Canadian Malartic ore has been subjected to a full drop weight test program over the last 2 years to study hardness. The conclusion of the testwork is that the materials' Axb values range from 17 to 45 with an average of 26.8, which justifies the need for extra crushing capacity, installed after initial startup, due to the very competent nature of the ore; in fact, this constitutes the characteristic of the ore that limits the capacity of the process plant throughput.

The deposit was split into four zones (West, North, East and South) based on similar metallurgical behaviour. Recovery curves (recovery vs. head grade) were generated based on the years of operation to date.

All reagent consumptions are based on the years of operation to date and should remain in the same range based on the fact that the deposit shows similar consumptions throughout all sections of the pit.

Gold deportment and diagnostic leach tests demonstrated that the residual gold, after the leach process, is encapsulated mainly in pyrite. The significant proportion of the gold remaining in the tailings after the leach process was characterized as very fine. It was demonstrated that gravimetric processes are inefficient due to the small grain size. The grind of the leach feed is the most important parameter observed, especially for the gold encapsulated in sulphide. The finer the grind, the higher the recovery, especially for the gold in sulphide.

25.5.2 Barnat deposit

The Barnat deposit, located northeast of the Canadian Malartic deposit, straddles the Cadillac Fault with the Pontiac Zone is on the south side the Piché Zone on the north. The Pontiac Zone, including 30% of Barnat total tonnes and 25% of the total ounces, is mainly composed of sedimentary material (GR) and has very similar characteristics as the Sladen extension of the Canadian Malartic deposit (east portion).

The Piché Zone contains 70% of Barnat total tonnes and 75% of the total ounces. The ore is mainly composed of porphyry (PO) and the waste is ultramafic (UM) material.

The bond work index of the Barnat material is 14.8 kWh/t. Gold recoverable by gravimetry (GRG) on the PO lithology (Piché) is 54%, which is much higher than the GRG obtained for the Canadian Malartic ore (18%).

The lime consumption for the Barnat ore is 0.23 kg/t and the cyanide consumption is 0.45 kg/t.

Gold recoveries are higher in the PO versus the GR by 2% to 3% on average.

25.6 Mineral Resource Estimates

The Canadian Malartic Property mineral resource estimate includes the Canadian Malartic deposit, South Barnat deposit, Gouldie Zone, Jeffrey Zone and Western Porphyry Zone. Resource classification is based on the robustness of the various available data sources including:

- Quality and reliability of drilling and sampling data
- Presence of RC and/or production drilling
- Distance between sample points (drilling density)
- Confidence in the geological interpretation
- Continuity of the geologic structures and continuity of the grade within these structures
- Variogram models and their related ranges (first and second structures)
- Statistics of the data population
- Quality of assay data
- Tonnage factor

Based on these criteria, resources have been classified according to the data search used to estimate each block and also on the type of data used for the estimate.

Measured resources are limited to the blocks estimated in the first estimation pass and only within mineralized zones for which the recent drilling represents a high majority of the data (>65%). Additionally, all material within 20 m of reach of either RC drilling or blast holes for the Canadian Malartic and Gouldie deposits was also classified as Measured.

Indicated resources correspond to the blocks estimated in the second estimation pass plus the blocks estimated in the first pass but not classified as Measured.

Inferred resources correspond to the blocks estimated in the third estimation pass. All blocks interpolated in the Western Porphyry Zone were reclassified as Inferred due to drill hole orientation with regard to the main trend of the ore zone. A better understanding of the geology is necessary to convert these resources to Indicated and/or Measured categories in this zone.

The classification model has been reviewed on each level plan and some minor manual adjustments were made where needed.

The OK (ordinary kriging) model is the official model used for the reporting of the mineral resource estimates.

25.6.1 Global Resources (including stockpiles)

Based on economic parameters, it was calculated that the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

At these cut-offs, the global Measured + Indicated (M&I) mineral resource totals **314.2 Mt at a grade of 1.07 g/t Au, representing 10.80 Moz gold**. The Inferred resources represent 46.5 Mt at 0.77 g/t Au for 1.14 Moz gold.

25.6.2 In-Pit Resources (including stockpiles)

Based on economic parameters, a Whittle optimized pit shell was generated on M&I resources only (Canadian Malartic, South Barnat and Gouldie) and compared to the current pit design. Variations were judged non-significant and therefore the current pit design was used to constrain In-Pit resources. A Whittle optimized pit shell was also prepared by the Canadian Malartic technical team for the Jeffrey Zone. No resource is currently declared as In-Pit for the Western Porphyry Zone.

As mentioned previously, the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

At these cut-offs, the global In-Pit M&I mineral resource totals 250.8 Mt at a grade of 1.12 g/t Au, representing 9.03 Moz gold. The In-Pit Inferred resource represents 6.3 Mt at 0.80 g Au/t for 0.16 Moz gold.

25.7 Mineral Reserve Estimates

The Canadian Malartic Property mineral reserve estimate includes open pit and stockpile reserves. Mineral Resources are converted to Mineral Reserves by applying mining cut-off grades, mining dilution, and mining recovery factors. Resource model blocks classified as Measured and Indicated are reported as Proven and Probable reserves.

Detailed mining costs were estimated for all activities of the mining cycle. Drilling and blasting costs are different forcertain zones of the pit given the requirements in some cases to limit noise and dust environmental nuisances. The mining costs vary from US$2.28 to US$4.69.

Processing costs used for the pit optimization and cut-off estimation amount to US$7.34 per tonne milled based on a milling rate of 55,000 tpd. The general and administrative (G&A) costs for the pit optimization amount to US$2.12 per tonne milled based on actual annual expenses.

The ore outlines include a 1-metre dilution envelope around economic ore blocks and also enclose marginal material surrounded by economic mineralization. The dilution envelope and enclosed waste in most cases is mineralized, with an associated dilution grade. Dilution is estimated at 8.0%.

Based on economic parameters, it was calculated that the break-even cut-off grade for the Canadian Malartic Property is variable and ranges from 0.277 g/t to 0.349 g/t using a gold price of US$1,300/oz.

The total Proven and Probable mine reserves as of June 15, 2014 are estimated at **263.2 Mt at 1.06 g/t Au for 8,943,552 ounces**. The majority of the reserve tonnage (78.1%) is in the Probable category. The reserves include 2.5 Mt of stockpiled ore at an average grade of 0.51 g/t Au for 40,747 ounces.

There is good reconciliation between mineral reserves and actual production results, and the records maintained by Canadian Malartic allow the changes in reconciliation to be studied over time. Based upon the reconciliation results, the Mineral Reserve Estimation is reliable and can be used for mine planning in the short, medium and long term.

25.8 Mining Methods

The Canadian Malartic mine is a large open pit operation comprising the Canadian Malartic, Barnat and Gouldie pits. In order to maximize productivity and limit the number of units operating in the pit, large scale equipment was selected for the mine operation. The primary loading tools are hydraulic excavators, with wheel loaders added as a secondary loading tool. The selected hydraulic excavator model is the O&K RH340-B with an operating weight of 567t fitted with a 28 m^3 heavy-duty rock bucket. One Caterpillar 994F HL, two L-1850 front-end wheel loaders (“FEL”) and one CAT6050 shovel complement the primary loading fleet. A fleet of Caterpillar 793F rigid trucks with 227t payloads provide a good pass-match with the O&K RH340-B shovels. The FEL is configured in a high-lift arrangement in order to clear the sideboard of the 227 t class truck.

The production rate was approximately 52,000 tpd in 2013. The mine production schedule was developed to feed the mill at a nominal rate of 55,000 tpd. The main highlights of the pit design are the following:

- Total amount of 817.5 Mt mined from the pit
- 263.2 Mt milled @ 1.06 g/t Au (average)
- In-situ gold content of 8.94 Moz
- Mine life of 14 years.

25.9 Recovery Methods

The process design criteria are based on a processing plant with 55,000 tpd capacity and a plant design utilization of 92%. At the time of writing, the throughput is limited to about 50,000 tpd. A project study to increase average throughput to 55,000 tpd is under review. The basis for the plant design assumed a head grade of 1.2 g/t Au and a gold recovery of 86%.

Run of mine ore is transported to the gyratory crusher. From the primary crusher, material is conveyed to a secondary crushing plant. The crushed ore is feed transported by a conveyor belt to the covered stockpiled. The ore is reclaimed from the pile in an underground reclaim tunnel and is conveyed to feed the primary grinding SAG mill in the concentrator. The SAG mill is in a closed circuit with scalping screens and two pebble crushers. The SAG circuit product is fed to the two secondary grinding ball mills which feed the one tertiary grinding ball mill to produce a final product size suitable for feeding the leach circuit. Each of the two secondary ball mills are close-circuited with one cluster of hydro-cyclones while the tertiary grinding ball mill requires two clusters of hydro-cyclones due to a higher slurry volume to handle.

The slurry is brought to a pH of around 11 with lime added to the SAG mill feed. Cyanide is added to the grinding circuit to start the leaching process of gold from the ore to the solution phase. The ground slurry passes through linear screens, before the thickener, to screen out any organic material and any other tramp material that has come into the mill with the ore. The slurry is then thickened to 50% solids before being fed to the leach tank circuit.

The leach tanks are located outside and consist of four series of five tanks in parallel with agitators. Oxygen is added to raise the oxygen level in the solution phase, in order to maintain the leach kinetics. From the leach tanks, the slurry flows by gravity to the activated carbon recovery circuit. The circuit is composed of two parallel sets of Kemix CIP pump cell carousel systems. The loaded carbon is pumped from the first stage in the carousel circuit to a loaded carbon screen where the loaded carbon is separated from the slurry. The loaded carbon transfers into the stripping vessels by gravity.

The zadra process is used to extract the gold from the loaded carbon. The caustic solution is heated to about 140° Celsius and is then passed through the pressurized stripping vessel, stripping the gold from the loaded carbon back into the solution. The solution is sent to the electrowinning (EW) circuit where gold is precipitated onto stainless steel cathodes in the form of sludge.

The gold precipitate is pressure washed from the cathodes and then filtered, dried and sent to a refining furnace where the gold is poured into gold doré bars. The gold bars contain a significant amount of silver as the silver in the ore leaches and is stripped along with the gold and eventually recovered in the EW cells. The stripped carbon is transferred to the carbon reactivation kilns where it is reactivated by heating to about 800° Celsius in a reducing atmosphere. The carbon is then re-used in the CIP circuit. Fresh carbon is regularly added to make up for attrition losses. The activated carbon is pumped to the empty tank in the CIP circuit to start a new tank in the carousel. Before being added to the last tank in the carousel series, the carbon is screened to ensure that no fine particles of carbon are introduced into the circuit.

The slurry flowing from the last tank in the series in the carousels is barren in gold and is considered as final process tailings. This slurry is discharged over linear safety screens as an insurance against coarse carbon losses from the circuit. Any oversize from the linear safety screens is fed to a carbon catch screen (ongoing project). The oversize from the carbon catch screen is returned to the circuit via the carbon sizing screen and the underflow is directed to the carbon settling tank to remove as much carbon as possible. This settled carbon material is collected in bags and sold to the smelter for its gold and silver content.

The tailings slurry is thickened to approximately 60% solid. Studies to increase the tailing percent solid are ongoing. The thickened tailings slurry is pumped to the detoxification plant where the cyanide content is reduced to less than 20 ppm using the combinox process (sulfur dioxide and hydrogen peroxide). Copper sulphate is also used as a catalyst to the reaction. A project study to convert the cyanide destruction process to Caro's acid (sulphuric acid and hydrogen peroxide) is ongoing. The detoxified slurry is subsequently pumped to the tailings management facility where most of the water drains out to be reclaimed back to the process.

Sampling of the various process streams is carried out to be able to both quantify the plant performance on a shift and daily basis and to be able to control areas of the process on a continuous/semi-continuous basis.

25.10 Project Infrastructure

The main infrastructure includes the administration/warehouse building, the mine office/truck shop building, the process plant, and the crushing plant. The workforce requirement is 658 employees to support the proposed mine nominal throughput rate of 55,000 tpd.

A buffer zone 135 m wide is developed along the northern limit of the open pit to mitigate the impacts of the mining activities on the citizens of Malartic. Inside this buffer zone, a landscaped ridge was built mainly using rock and topsoil produced during the pre-stripping work. The height of this landscaped ridge is 15 m where the concentration of residents is higher and 5 to 6 m in non-resident sectors.

The electrical power for the Canadian Malartic Project is supplied from the existing Hydro-Québec 120 kV Cadillac main substation. A 120 kV electrical transmission line approximately 19 km long was built. Power demand for the entire project is about 85.3 MW including all mill and mine support facilities and a long term contract is in place to deliver power to the mine.

The plant water systems consist of the process water system which is supplied principally from the plant thickener overflows, the fresh water system which is supplied from the old underground mine dewatering system, the reagent preparation water system, the gland water distribution system, and the reclaim water from the Southeast Pond area. The Canadian Malartic mine is also connected to the Malartic municipal sewage and potable water systems.

The fuel storage facilities have 250,000 litres of storage capacity and are located northeast of the truck shop.

Canadian Malartic GP continues to work with Québec's Ministry of Transport and the town of Malartic on the deviation of Highway 117 to gain access to the higher grade Barnat deposit. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014 and a request for public hearings will be made.

25.11 Environmental Studies, Permitting and Social or Community Impact

25.11.1 Environment

The main components of the Canadian Malartic mine (open pit mine, process plant, tailings facility and waste rock dump) are located within the urban and peri-urban perimeter of the town of Malartic. Before the construction of the mine, an environmental study area, covering approximately 24 km^2, was defined by taking into account the probable range of the project's impacts on the social, physical and biological environments as well as the area of influence of historical mining operations. Several components were identified as key subjects for study: fauna, water and sediments, climate and hydrology, ambient air quality, background noise and vibrations, vegetation and wetlands, soils, and net acid generation.

Since 2009, there have been 52 non-conformance blast notices, 46 non-conformance noise notices, 12 non-conformance notices for dust and air quality, 4 non-conformance notices for water quality (surface and final effluent) and 15 other non-conformance notices. In 2011, a detailed plan was developed by Osisko to manage hazardous materials, assess infrastructure safety, and monitor noise, vibrations, air quality, dust, atmospheric emissions, effluent quality, groundwater and surface water. Mitigations measures were put in place to improve the process and avoid any non-conformance. The mine's team of on-site environmental experts continuously monitor regulatory compliance in terms of approvals, permits, and observance of directives and requirements.

The original design of the waste rock pile was developed to accommodate approximately 326 Mt of mechanically placed waste rock requiring a total storage volume of approximately 161 Mm^3. Some aspects of the Canadian Malartic Project have been modified since the mine tailings site and waste rock pile development plan was developed. Most notably, the Gouldie reserve was recently added to the operating sequence of the mine. The Gouldie reserve is located in the center of the initially planned footprint of the waste rock pile, making it necessary to revise the waste rock piling sequence in order to keep the Gouldie pit area available for mining. Taking into account certain basic assumptions, the current waste rock pile development sequence should accommodate a total of 59.2 Mm^3 (121.3 Mt). From May 2011 to June 2014, 50 Mt of tailings from the process plant were deposited on the footprint of the old tailings of the East Malartic mine and its settling pond. For the Canadian Malartic mine operations, the former tailings and settling pond were divided using waste rock inclusions to form seven (7) cells and a polishing pond. As of June 2014, the available space in the Tailings Management Facility (TMF) is about 100 Mt, corresponding to 5 years of operation at a nominal production rate of 20.075 Mt per year.

The existing polishing pond, adjacent to the tailings cells and located east of the TMF, is contained within the current authorized footprint of the TMF. This pond will be later used as a cell to store tailings. Before using this pond, the Canadian Malartic mine plans to build a new polishing pond east of dyke A , the eastern limit of the Southeast Pond. The existing polishing pond, converted into a tailings cell, will be the 8th cell of the TMF with an estimated capacity of 48 Mt adding 2.5 years to the TMF capacity for a total of 148 Mt and 7.5 years of operation. The total capacity of the current TMF is therefore estimated at 198 Mt. The expansion of the open-pit, with the production of the Barnat pit, will increase to 342 Mt the total amount of tailings to manage, requiring an additioanl 144 Mt in tailings storage capacity. The plan is to store tailings in an extended tailings facility and in the Canadian Malartic pit at the end of its operations. According to the mining plan, at the end of mine life, 50 to 100 Mt of tailings will be deposited in the pit. The rest of the tailings, a minimum of 59 and a maximum of 109 Mt, will be deposited in the extended tailings facility.

Regulatory approval for the proposed tailings deposition in the Canadian Malartic pit and the expansion of the current authorized tailings area are part of the approval process for the Canadian Malartic pit extension (Barnat deposit) subject to the environmental impact assesssment (EIA) process of the Quebec Environmental Protection Act (section IV.1 of chapter 1).. The EIA is currently underway. Golder is designing the tailings extension component and is preparing a hydrogeological study to demonstrate that the Canadian Malartic pit would provide a hydraulic trap and contain the tailings with minimum environmental risk.

An annual hydrological site balance is maintained to provide a yearly estimation of water volumes that must be managed in the different structures of the water management system of the Canadian Malartic mining site during an average climatic year (in terms of precipitation). Results of this hydrological balance indicate that excess water from the Southeast Pond will eventually need to be released into the environment. A water treatment plant is currently under construction to ensure that in the short and medium term the water to be released to the environment will meet water quality requirements at all times. Moreover, adding a treatment plant will greatly reduce the risks associated with surface water management and will add flexibility to the system.

Reclamation and closure costs have been estimated for rehabilitating the tailings facility and waste dump, vegetating the surrounding area, dismantling the plant and associated infrastructure, and performing environmental inspection and monitoring for a period of 10 years. The reclamation and closure cost is estimated at $51.5 million and includes the following (all amounts in Canadian dollars):

- Tailings facility and waste dump $31.45 M
- Water management facilities $3.22 M
- Contaminated soil and pit closure $7.87 M
- Dismantling of complex $4.92 M
- Environmental inspection and monitoring $4.04 M

Total **$51.50 M**

25.11.2 Community

Since the project was first announced, various communication and consultation activities have taken place within the community and with municipal and regional representatives. These activities can be grouped into three distinct themes: communication activities organized by Osisko, those organized by the Monitoring Committee (”Comité de suivi``), and consultations and surveys conducted within the context of the EIA. Canadian Malartic GP will continue with these communication and consultation activities.

25.11.3 Permitting

Environmental baseline environmental data collection and assessment started in June 2007 to be used as a basis for the EIA. This process lasted until February 2008. The results of the study were published in the EIA study completed in August 2008.

In September, 2008, the Canadian Malartic filed the EIA for the Canadian Malartic Project with the MDDELCC. The EIA was reviewed and accepted by Québec governmental authorities who established its compliance with MDDELCC guidelines. The formal process of the Bureau d’audiences publiques sur l’environnement (“BAPE”) commenced on March 9, 2009 and on July 9, 2009, the MDDELCC published the report on the public inquiry and hearings. The report concluded that the Canadian Malartic Project could be authorized under certain conditions including the implementation of certain monitoring programs, and the deposit of financial guarantees sufficient to ensure that the Canadian Malartic project could be carried out in a sustainable development perspective. On August 20, 2009, the Conseil des ministres du Québec approved the order in council (Decree No. 914-2009) authorizing the construction of the Canadian Malartic mine.

As of December 31, 2010, the Canadian Malartic mine had received all formal government permits required for its construction and related activities, with the exception of the authorization for the mill and mine operations. The official certificate of authorization for the mill and operations was granted on March 31, 2011, at which point the Canadian Malartic mine was fully permitted.

On February 26, 2014 the Government of Québec adopted a decree authorizing the mining of the Gouldie deposit, which allowed pre-stripping work to proceed.

Canadian Malartic GP continues the collaboration with Québec’s Ministry of Transport and the town of Malartic on a project to deviate a portion of Highway 117 in order to gain access to the higher grade Barnat deposit, which is expected to provide mill feed for the continuation of the Canadian Malartic operation. The final design and mine plan has been completed, the EIA is expected to be submitted to the authorities in the fourth quarter of 2014, and at that time a request for public hearings will be made by the Canadian Malartic GP.

25.12 Capital and Operating Costs

25.12.1 Capital Cost Estimates

Estimated capital costs to the Canadian Malartic mine essentially correspond to sustaining capital for mine and development costs, as well as construction costs during the deviation of Highway 117 (table 25.1).

For mine operations, capital costs in the near term include an estimate for the purchase of new equipment of $16 million in 2015. For the processing plant, capital costs in the near term include an estimate for improvement costs of approximately $16 million in 2015.

Canadian Malartic GP plans to extend the Canadian Malartic mine by enlarging the existing open pit in the Barnat sector. It is now anticipated that the final layout and the environmental impact study will be completed by the fourth quarter of 2014. If the Canadian Malartic GP obtains all necessary permits and authorizations for the construction of the Highway 117 deviation, the work could start in 2014. The estimated cost of the construction work is $60.3 million and it is expected to take three years.

Table 25.1 – Canadian Malartic mine 3-year capital cost forecast (in $M)

CAPITAL COST (C$)	2014	2015	2016
Sustaining Cost	$ 54.8	$ 44.5	$ 57.1
Development Cost	$ 65.6	$ 75.1	$ 54.1
Deviation of Highway 117	$ 5.4	$ 30.8	$ 25.1
TOTAL CAPITAL COST	**$ 125.8**	**$ 150.4**	**$ 136.3**

25.12.2 Mine Operating Cost

Estimated operating expenditures at the Canadian Malartic open pit mining and milling operations are presented in Table 25.2.

Operating costs consist of annual expenditures incurred at the Canadian Malartic mine to extract ore and waste rock and to process the ore. The mining consumables are based on the costs and contracts and the costs for future operation consumables, such as mill reagents, grinding media, etc., are based on recent supplier quotations, general and administrative (G&A) costs, and transport and refining costs.

Table 25.2 - Canadian Malartic mine 3-year operating cost forecast (in $M)

OPERATING COST (C$)	2014	2015	2016
Projected processed tonnes	18,533,000	20,075,000	20,130,000
Projected gold ounces recovered	532,000	591,600	630,900
Mining Cost ($M)	$ 180.8	$ 198.1	$ 188.6
Processing Cost ($M)	$ 158.4	$ 162.2	$ 162.7
General and Administrative (G&A) ($M)	$ 43.5	$ 43.5	$ 43.5
Transport and Refining ($M)	$ 1.6	$ 1.8	$ 1.9
TOTAL OPERATING COSTS ($M)	**$ 384.3**	**$ 405.7**	**$ 396.6**
TOTAL OPERATING COSTS/TONNES	**$ 20.74**	**$ 20.21**	**$ 19.70**

25.13 Economic Analysis

Under NI 43-101 rules, producing issuers may exclude the information required for economic analysis on properties currently in production, unless the technical report includes a material expansion of current production.

Canadian Malartic GP, being a producing issuer, is not required to include information under Item 22 (Economic Analysis). There is currently no firm plan to expand the current Canadian Malartic mine production of 55,000 tonnes per day (tpd).

25.14 Risks and Opportunities

The Canadian Malartic mine operation is subject to a number of known and unknown risks, uncertainties, and other factors as presented in Table 25.3. The opportunities associated with the mine operation are presented in Table 25.4.

Table 25.3 – Risks associated with the Canadian Malartic Property

Risk	Potential Impact	Possible Risk Mitigation
Difficulty to increase the mill capacity of 55,000 tpd	Income will decline and process costs will increase	- Fragmentation improvement in the pit with new drilling patterns, reduced stemming height, modified hole diameters, and modified powder factors. Increasing the quantity of fines and more importantly inducing micro-fractures in the coarse portion to improve mill throughput. - The Barnat Zone is known to be much easier to grind to the required size fraction; this was confirmed by the original metallurgical lab tests but has not been tested in the current mill configuration. The improved throughput is dependent on the ratio of Barnat/CM in the feed. - Ore feed from another mine in the area could supplement mill feed and improve global throughput. That feed could be either easier to grind (higher Axb) or crushed to a minimum size fraction in order to “by-pass” the SAG. - Increasing crushing capacity to produce more fines will increase mill throughput. Gyratory product could be screened, fines reporting to the dome and coarse feeding the 2 current XL2000. Secondary crusher product could be screened, fines reporting to the dome and a portion of the coarse feeding one XL2000 producing fine particles. - Increasing grinding capacity to reduce pebble product size will increase mill throughput. Scats could also be managed in the extra pebble/rodmill equipment. Depending on the size and power of the designed mill, the C.S.S. of both gyratory and secondary crushers could be loosened up a bit to reduce maintenance costs. The pebble/rod mill should have a lengthy chamber to allow pebble breakage. It would be fed by a screened SAG discharge allowing for a redistribution of the pebble crushing power and C.S.S would also allow the BM scats to be managed.
The MDDELCC will not allow Canadian Malartic GP to put the tailings in the Canadian Malartic pit during the extraction of ore from the Barnat pit	Delay in mine production.	Plan an alternative by proposing an enlargement of the current authorized tailings to avoid delays in mine production.
The MDDELCC will not allow Canadian Malartic GP to proceed with the deviation of Highway 117	Loss of gold reserves in the Barnat pit.	Continue the negotiations and discussions with the local community and the MDDELCC in order to obtain authorizations.
Notices of non-compliance from the MDDELCC	Theses notices create a poor image of the Canadian Malartic mine operation in the public eye.	Continue to work towards reducing most of the environmental impacts, thereby improving public opinion.
Abitibi Royalties may be successful in its claim that it is entitled to acquire Canadian Malartic Corporation's mining titles in the CHL Property	Loss of gold resources in the Jeffrey Zone which are convertible to reserves (71 000 oz).	Pursue litigation and continue negotiations and discussions with the management of Abitibi Royalties.

Risk	Potential Impact	Possible Risk Mitigation
Gouldie is located inside the current waste dump footprint, limiting the tonnage that can be piled on the waste dump.	It may not be possible to mine the Gouldie pit.	Continue negotiations and discussions with the MDDELCC in order to obtain authorizations for an extension of the waste dump on the east side of the property or inside the current footprint of the property.
Results of detailed geochemical assays do not meet expectations	The gradual restoration of the waste rock dump and tailings would be compromised	Adapt the restoration plan .
The MDDELCC will not allow Canadian Malartic GP to move the polishing pond and extend the current tailings	Lack of space for tailings	Modify the tailings management plan to increase the height of the tailings
The mine's revenues from the sale of gold and silver are in US dollars	Any appreciation of the Canadian dollar compared to the US dollar could increase the cost of doing business.	Reduce operating costs. Managing operating costs will help deal with any changes in currency.
Lower gold price (impossible to know future price of gold)	A prolonged drop in the price of gold may have a negative impact on the mine.	Managing operating costs will help deal with any fluctuations in future gold prices.

Table 25.4 – Opportunities associated with the Canadian Malartic Property

Opportunity	Explanation	Potential benefit
The Canadian Malartic mine can stockpile lower grade material (below cut-off) and process it at the end of the mine life if the gold price allows	40 Mt to 50 Mt of low grade material (0.20 g/t Au cut-off grade) must be excavated to access higher grade ore over the course of the mine life	Additional income
Better metallurgical recoveries at the Barnat deposit	The metallurgical recoveries for Barnat based on an earlier study are higher than the actual recoveries for ore from the Canadian Malartic pit	A better recovery will increase the recovered ounces at the process plant.
Potential to develop other mineralized zones present on the property	The development of the East Amphi, Fourax and Western Porphyry zones could increase the mineral resources present on the property.	It will be possible to transfer mineral resource in mineral reserve, if a study will demonstrate that resources economically mineable.
Revenues from the sale of gold and silver are in US dollars	A depreciation in the Canadian dollar compared to the US dollar could decrease the cost of doing business	Increased revenues in Canadian dollar terms
Change in gold price	A prolonged rise in the price of gold would have a positive impact on the mine	Resources outside the current pits could potentially be converted to reserves

26. RECOMMENDATIONS

26.1 Process Plant Capacity of 55,000 tpd

There are many options under study to increase the throughput rate to 55,000 tpd from the current 51,500 tpd. It is recommended that these various options be analyzed based on cost and ability to execute. The options are described below.

- Fragmentation improvement in the pit

  The engineering department is overseeing a number of tests in the pit to improve fragmentation. New drill patterns, reduced stemming height, changes in hole diameter, and the powder factor are all being considered. Increasing the quantity of fines and more importantly inducing micro-fractures in the coarse portion will improve throughput in the process plant.

- Adding feed from an outside source

  Adding ore feed from another mine in the area could supplement the process plant feed and improve global throughput. The feed could be either easier to grind (higher Axb) or crushed to a minimum size fraction in order to "by-pass" the SAG.

- Crushing capacity

  Increasing the crushing capacity to produce more fines would increase mill throughput. The gyratory product could be screened, with fines reporting to the dome and the coarse fraction feeding the two current XL2000 cones. The secondary crusher product could be screened, with fines reporting to the dome and a portion of the coarse fraction feeding one XL2000 cone to produce fine particles. This should eliminate the recurring problems caused by muddy ore mainly in spring and fall. In addition, screening the feed of the two XL2000 cones could also lower the frequency of mechanical maintenance on the cones.

- Other scenarios

  Many other scenarios are possible using more crushing and screening capacity in which the increased throughput could surpass the target of 55,000 tpd. The economics of their implementation and the increase in the electrical power required for those projects have to be evaluated.

  Increasing the grinding capacity to reduce pebble product size will increase mill throughput, and scats could also be managed in the extra pebble/rod mill equipment.

  Depending on the size and power of the designed process plant, the close side setting (CSS) of both gyratory and secondary crushers could be loosened up a bit thereby reducing maintenance costs. The pebble/rod mill should have a lengthy chamber to allow pebble breakage. It would be fed by a screened SAG discharge allowing for a redistribution of the pebble crushing power and CSS, and also would allow the BM scats to be managed.

26.2 Pit operation optimization

Marginal material stockpiling should be considered to optimize revenues. Assuming around 40 Mt at a 0.23 cut-off grade, there is real potential to generate more revenue if the gold price is higher at the end of mining activities.

The pit sequence optimization can be reviewed when mining the Barnat pit to consider the possibility of feeding the mill with a mixture of hard rock (CM) and softer material.

The development of known resources elsewhere on the Canadian Malartic Property should also be considered to increase mine life. An exploration program should be prepared by geology department of Canadain Malartic mine.

26.3 Notices of non-compliance and complaints

The Canadian Malartic mine is now a mature operation and should demonstrate full control of the operation regarding compliances. A detailed action plan and dedicated resources are required to overcome the situation of multiple non-compliances and ensure the success of this task.

The action plan should specifically address every area where the operation is at risk of non-compliance and/or complaints. The relationship with the community and regulators will be positively affected. The plan should be transparent with the Monitoring committee (comité de suivi) and be based on a short (6 to 9 months if possible) execution schedule to demonstrate a strong commitment to correct the situation.

26.4 Water Monitoring

Water has always been a primary community concern. Multiple studies and monitoring programs have taken place since the initial project proposal and many recommendations have been proposed over the years.

Given the extremely fast pace of the operation and the fact that the physical state of the site changes almost every day, water management and monitoring requires special attention so that planning and forecasting are paramount and reactive scenarios are avoided. During the 2013 monitoring programs, concerns were raised over surface water contamination. It is essential that actions to mitigate, monitor and control surface water are documented. In the coming years with the likely addition of tailings in the pit, the full control and monitoring of underground water will be even more critical. A clear and robust plan is recommended.

26.5 Optimization of tailing thickener efficiency

The mine is currently considering several options to increase the percentage solid of the thickened tailings. The volume of water withdrawn of tailings could have several advantages, including better surface water management in the tailings, increasing of recirculation of reagents in the process plant and improving the safety of TMF

26.6 Water treatment plant

Monitoring of surface water shows an increase in concentrations of ammonia nitrogen, nitrite and nitrate in mine water. A new water treatment plant is under construction, but will not have the capacity to treat these contaminants. The option to treat these contaminants in the new water treatment plant could increase the number of days per year of discharge of the final effluent. This could provide more flexibility during the water management.

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APPENDIX I

UNITS, CONVERSION FACTOR, ABBREVIATION

Units

Units in this report are metric unless otherwise specified. Precious metal content is reported in grams of metal per metric ton (g/t Au or Ag) except otherwise stated. Tonnage figures are dry metric tons unless otherwise stated. The ounces are in Troy ounces.

Conversion factors for measurements

Imperial Unit	Multiplied by	Metric Unit
1 inch	25.4	mm
1 foot	0.3048	m
1 acre	0.405	ha
1 ounce (troy)	31.10348	g
1 pound (avdp)	0.454	kg
1 ton (short)	0.907	t
1 ounce (troy) / t (short)	34.286	g/t

Abbreviations

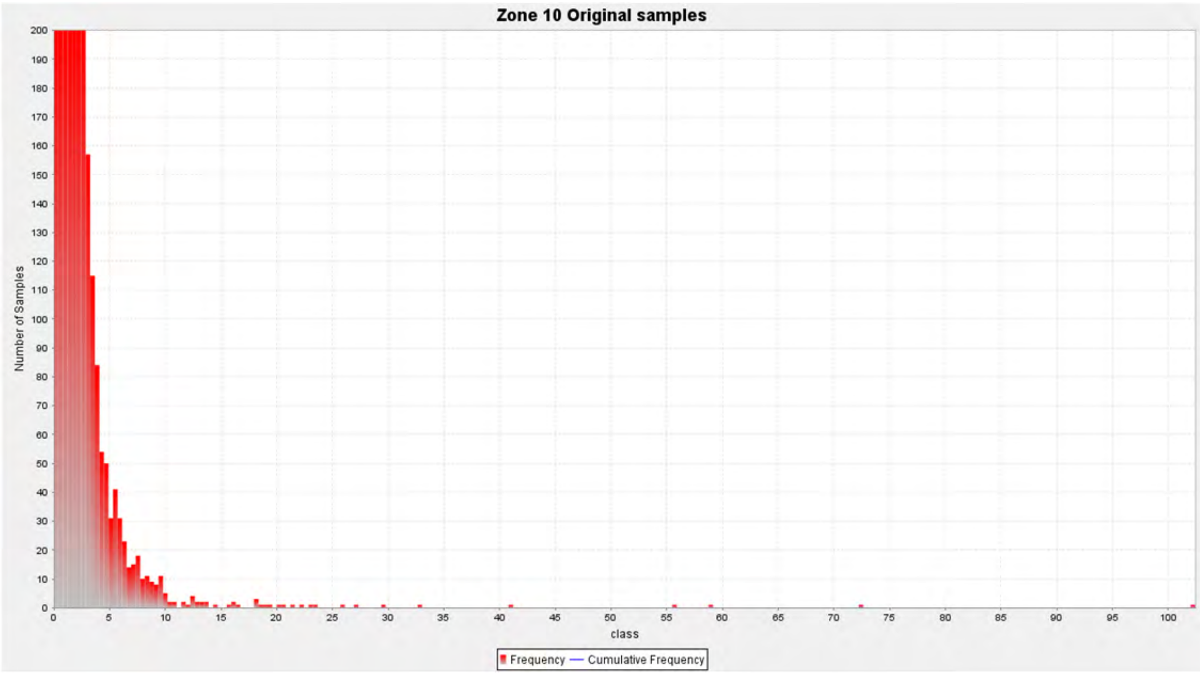
°C	degrees Celsius	oz	troy ounces
ha	hectares	avdp	avoirdupois pound
g	grams	st	short ton
kg	kilograms	oz/t	ounces per short ton
mm	millimetres	t	metric ton (tonne)
cm	centimetres	Mt	millions of tonnes
m	metres	t.milled	tonnes milled
km	kilometres	t.moved	tonnes moved
masl	metres above sea level	t.mined	tonnes mined
’ or ft	feet	tpd / tpy	metric tons per day/year
cfm	cubic feet per minute	g/t	grams per metric ton
m^3/min	cubic metres per minute	ppb	parts per billion
usgpm	US gallons per minute	ppm	parts per million
Mbs	megabytes per second	hp	horsepower
LOM	life-of-mine	MW	megawatts
$M	millions of dollars	kWh/t	kilowatt-hours per tonne
$ or C$ or CAD	Canadian dollars	kV/kVA	kilovolts/kilovolt-amps
US$ or USD	American dollars	kPa/MPa	kilo/mega pascals

Acronyms

BAPE	Bureau d’audience publique sur l’environnement (Québec)
CA or CofA	Certificate of authorization
EIA	Environmental impact assessment
MDDELCC	Ministry of Sustainable Development, Environment and Climate Change (Québec)
MERN	Ministry of Energy and Natural Resources (Québec)

APPENDIX II

HISTOGRAMS – UNCUT ORIGINAL ASSAYS BY ZONE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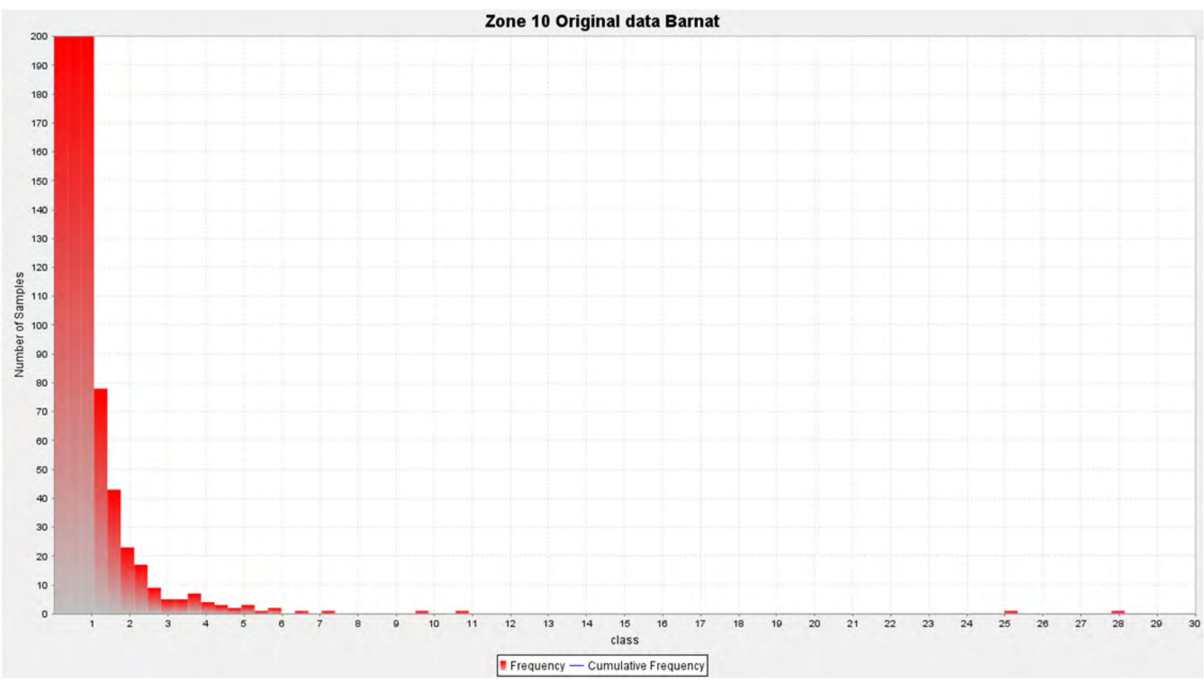
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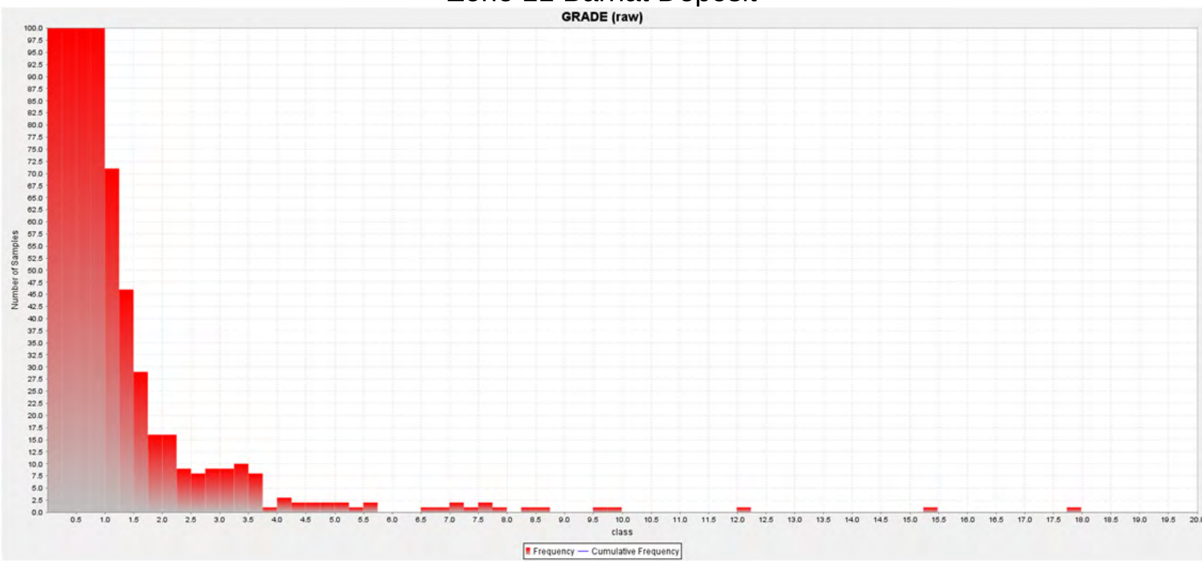

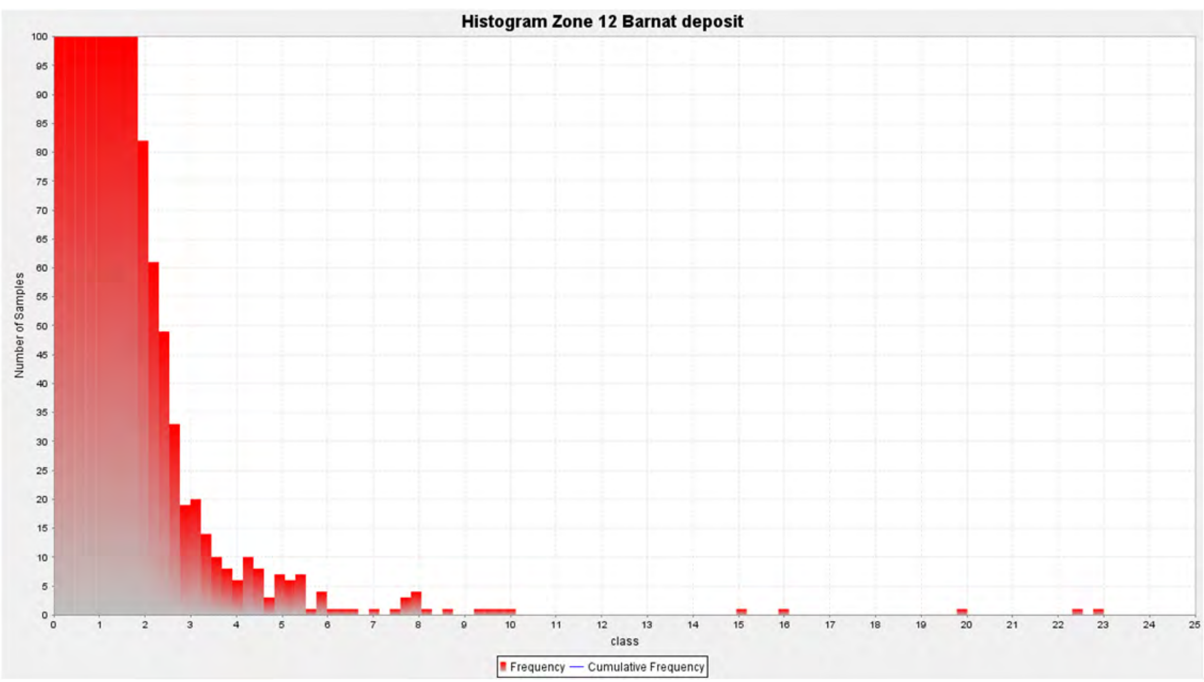

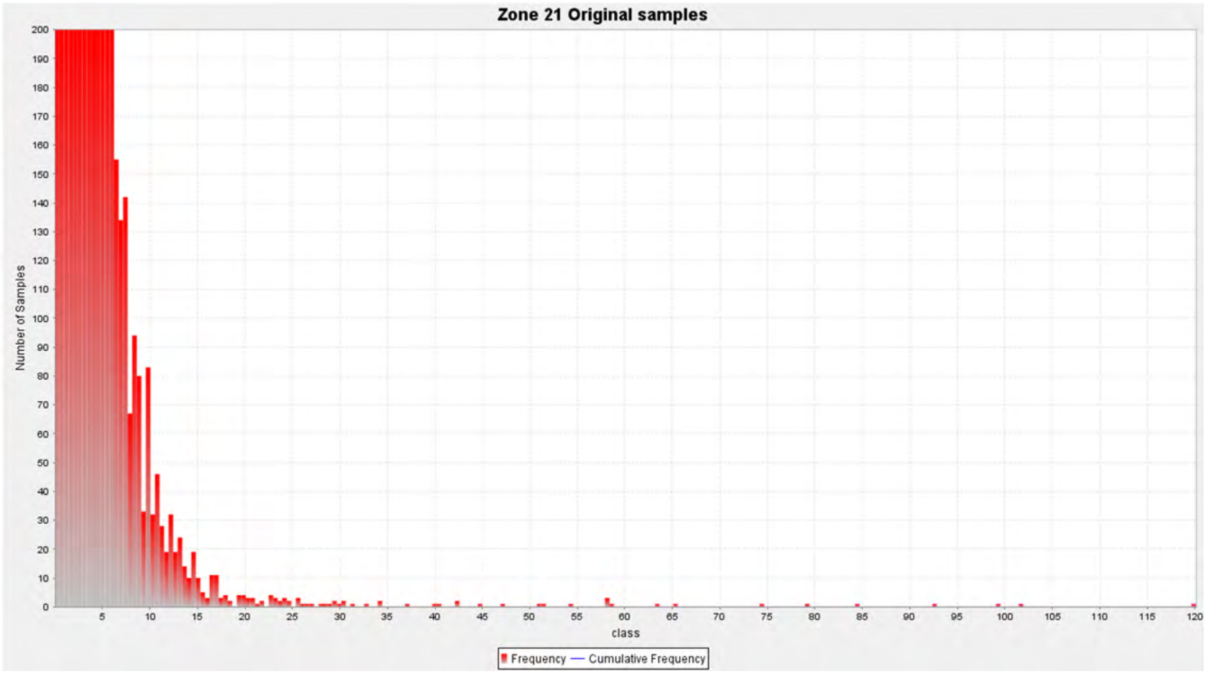
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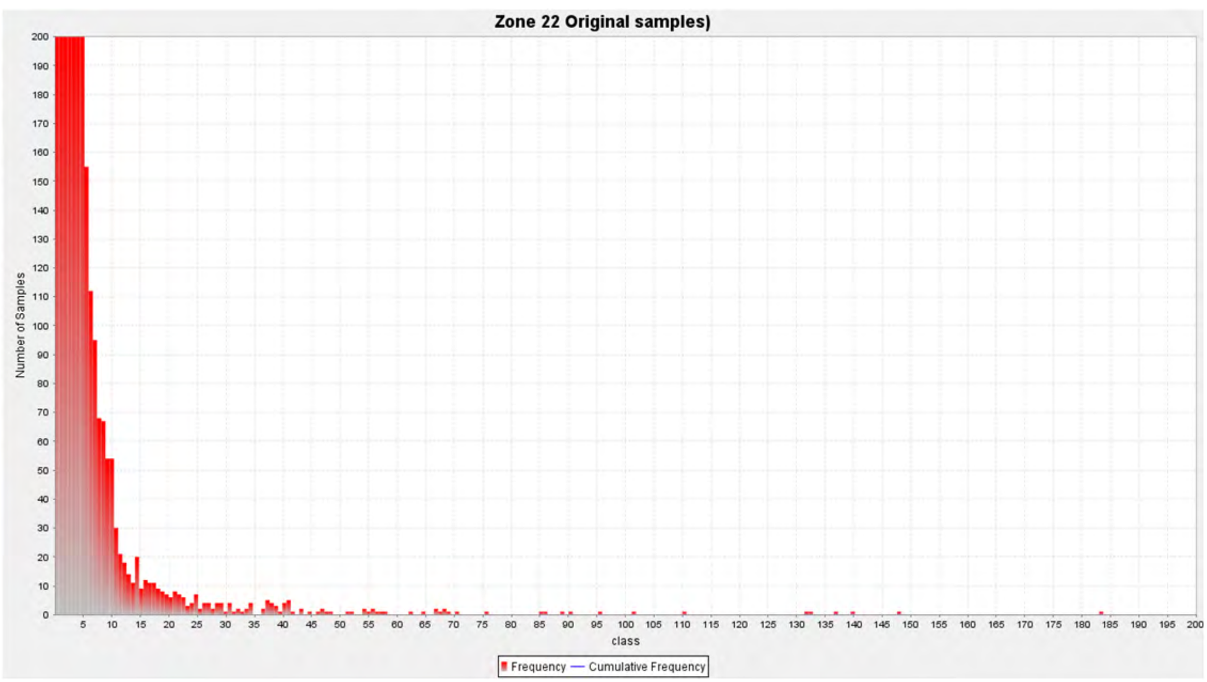
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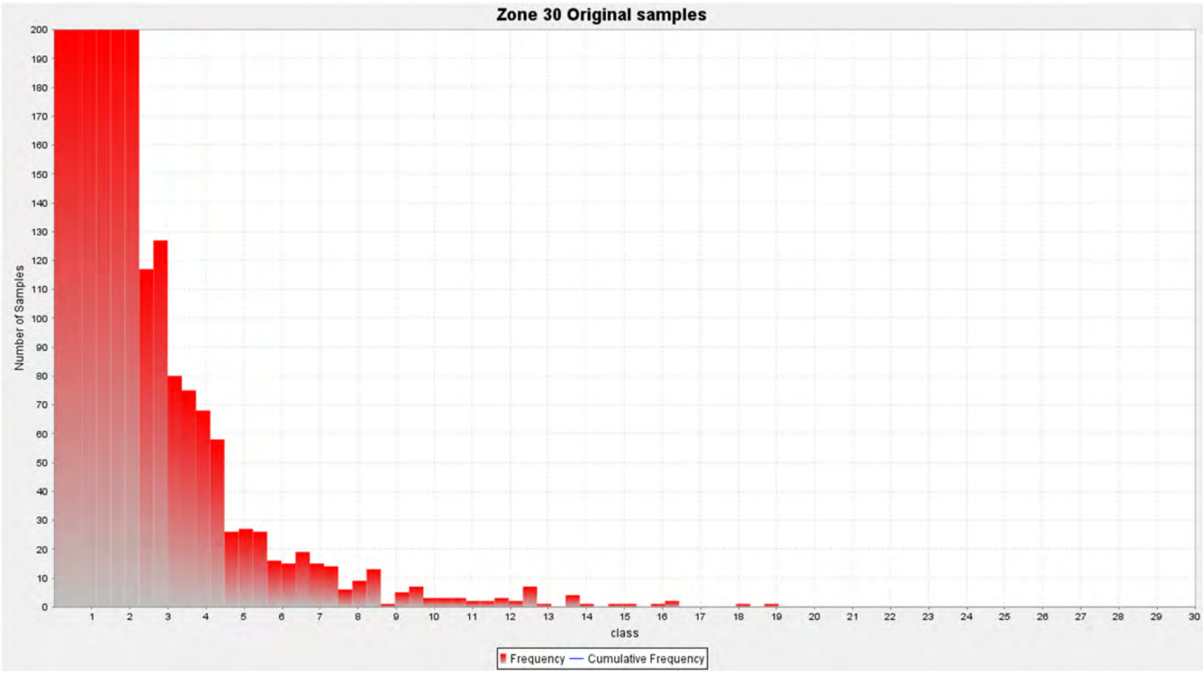

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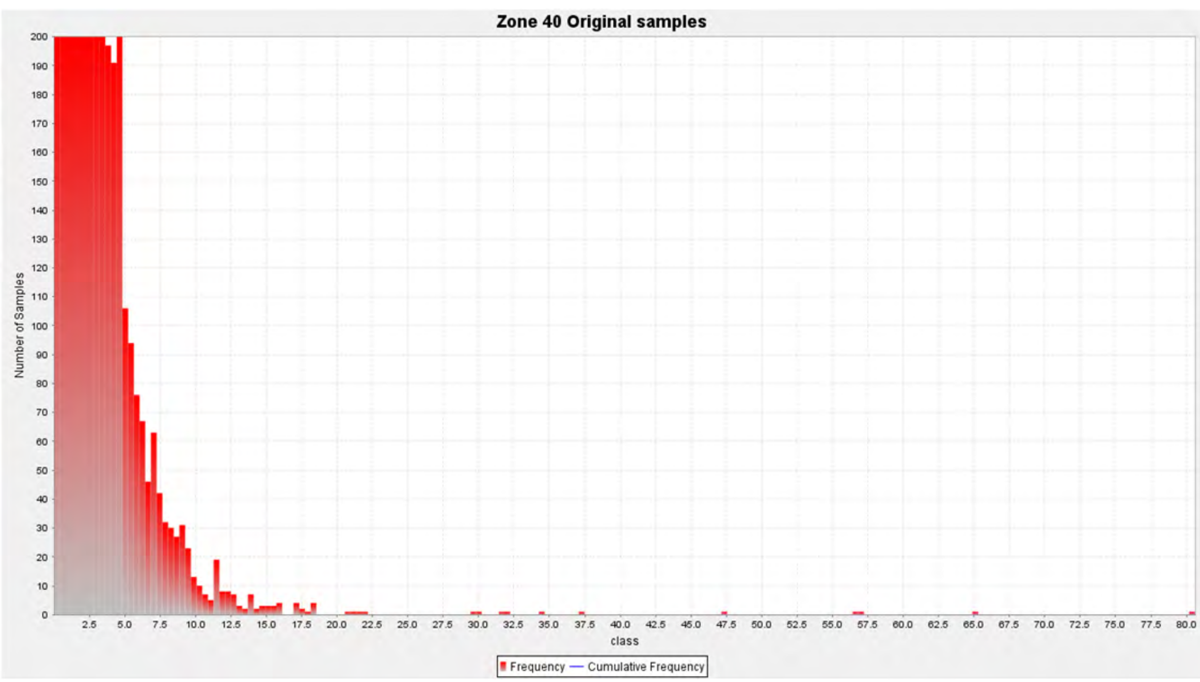

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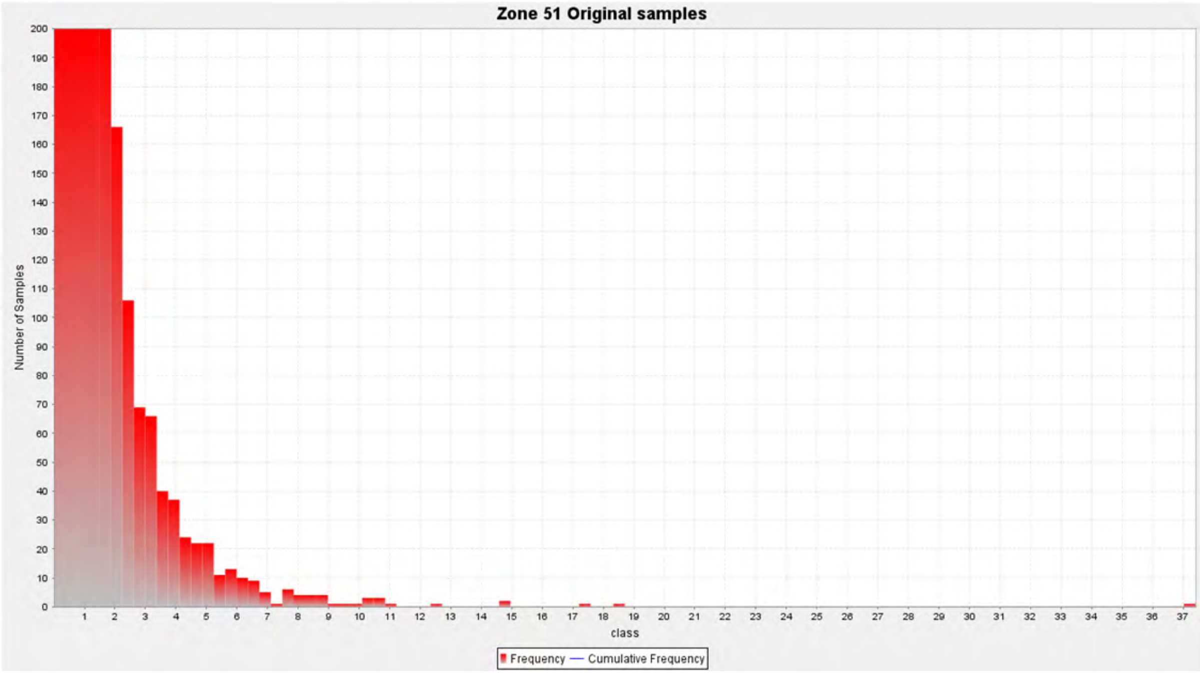
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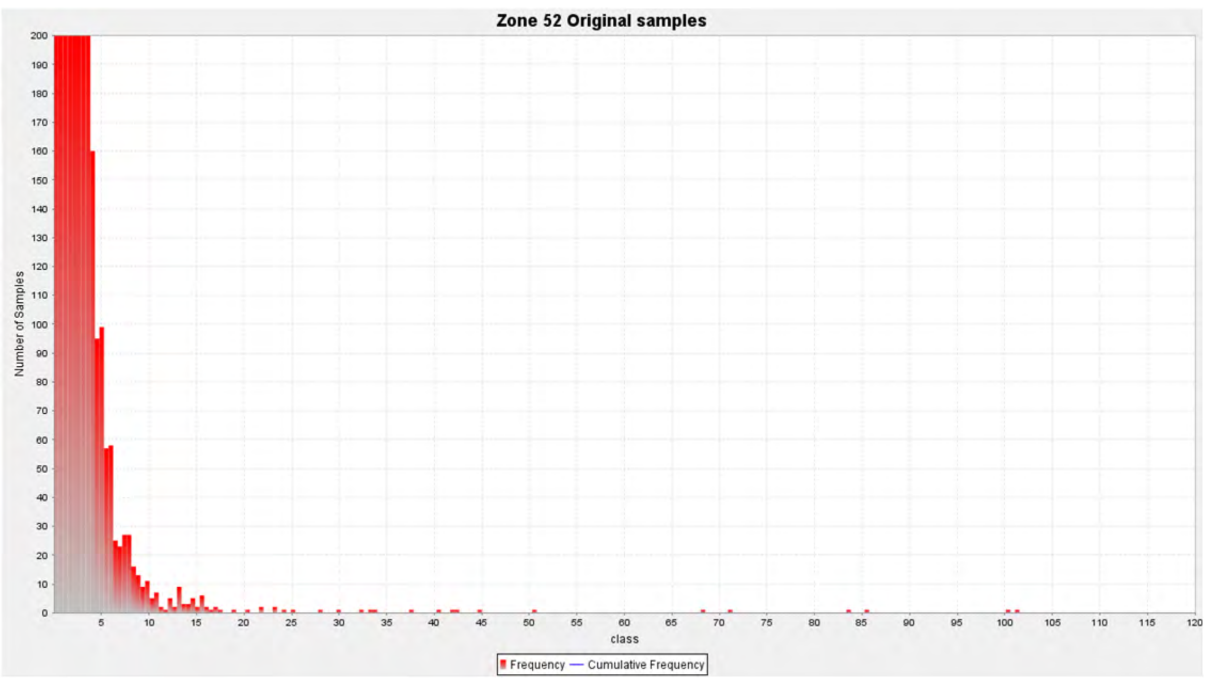
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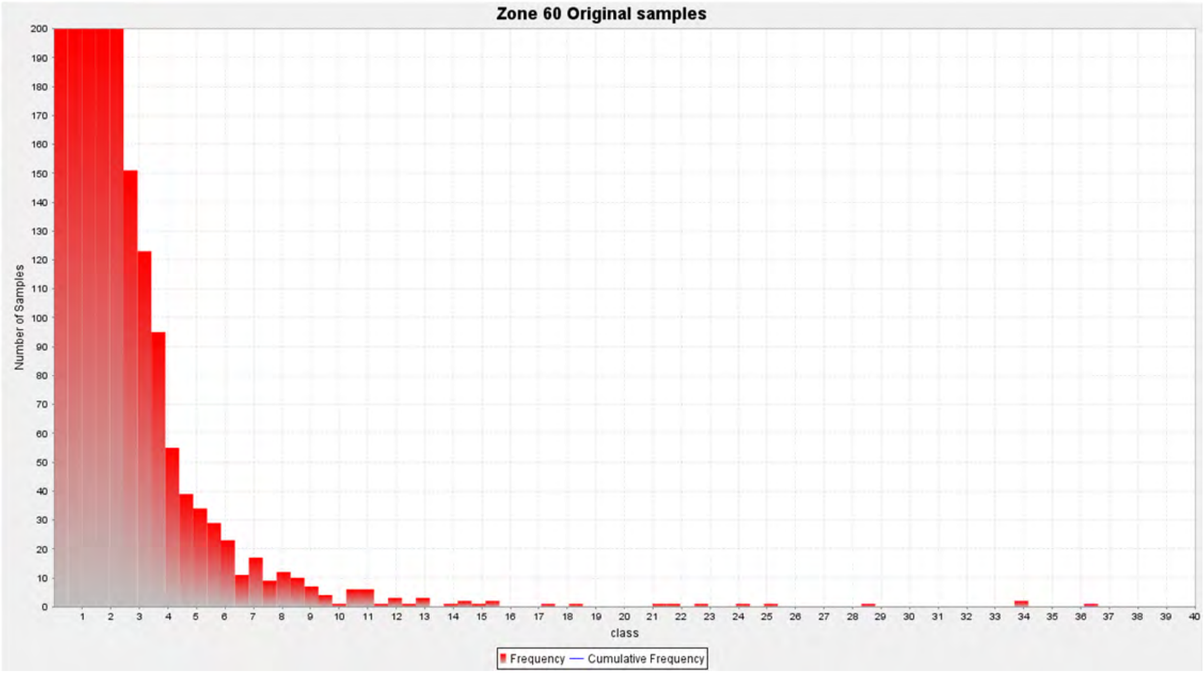
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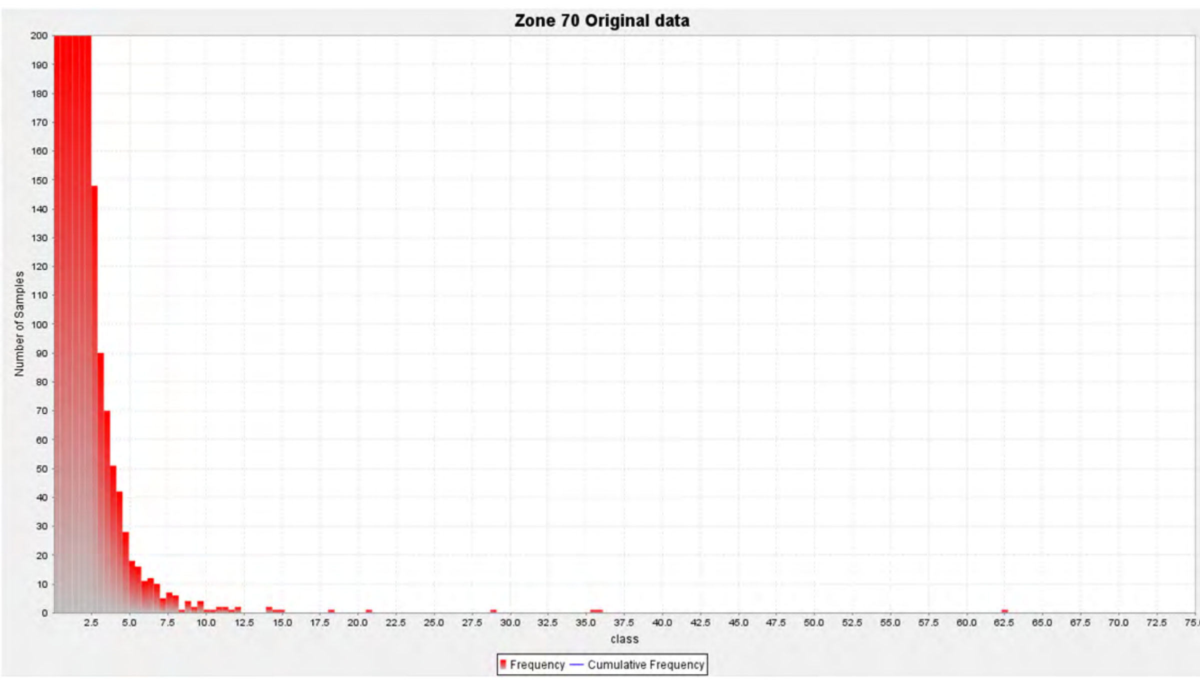
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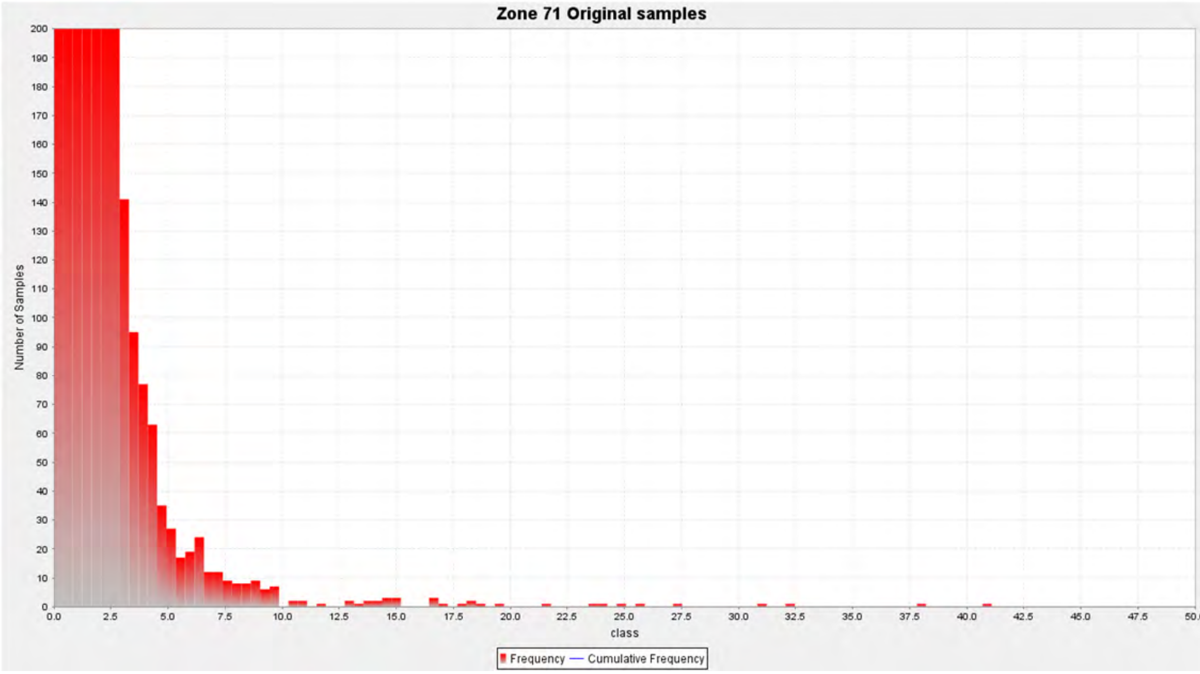
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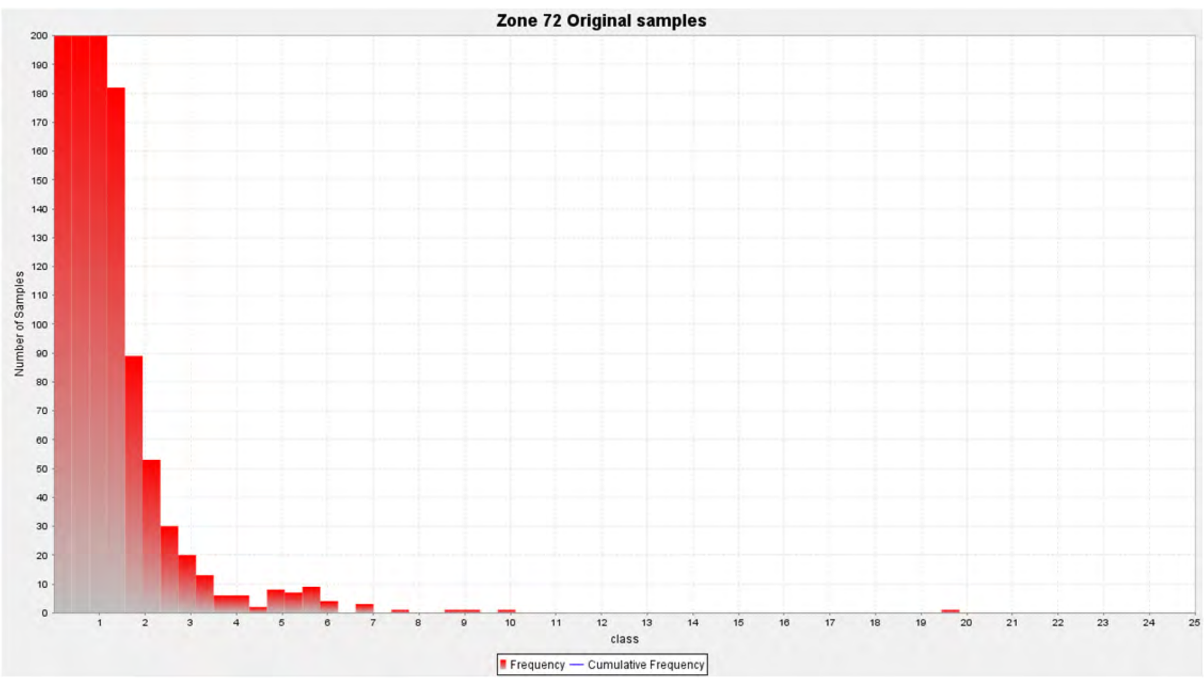
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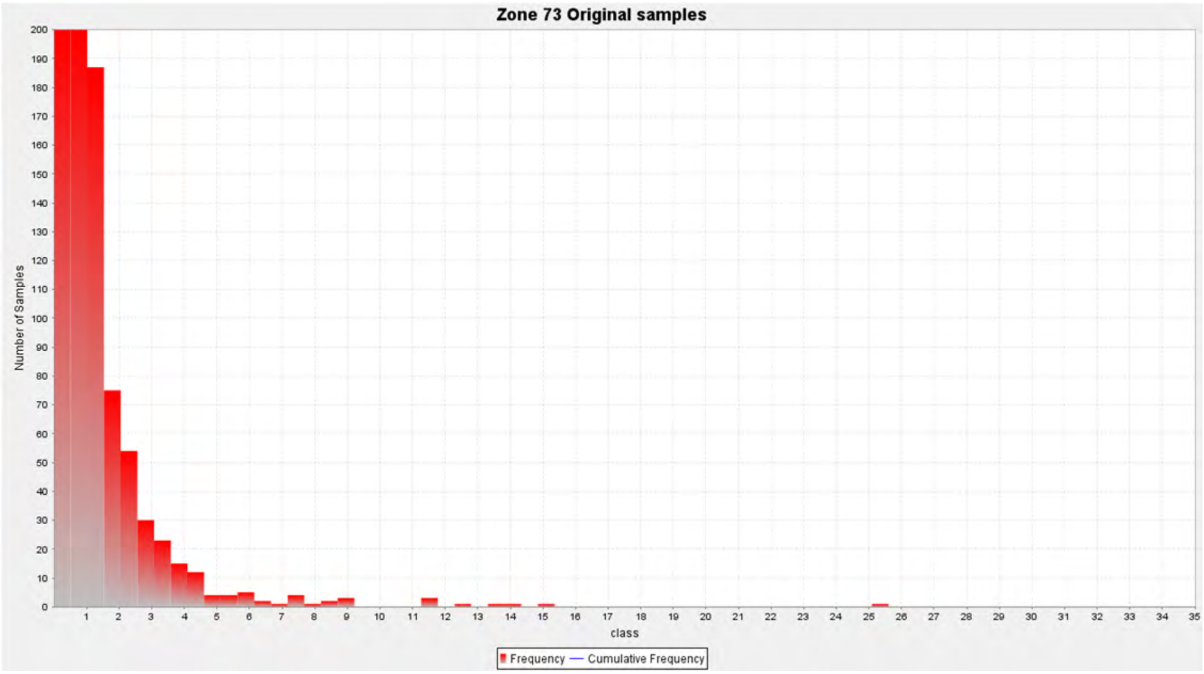

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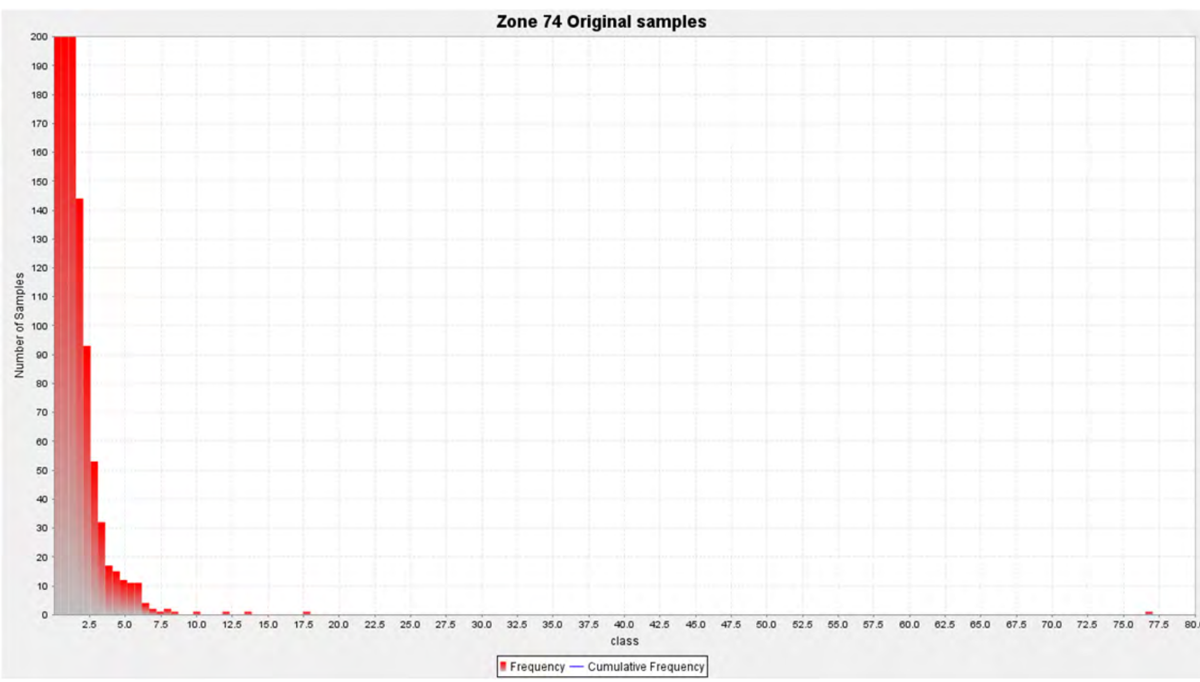

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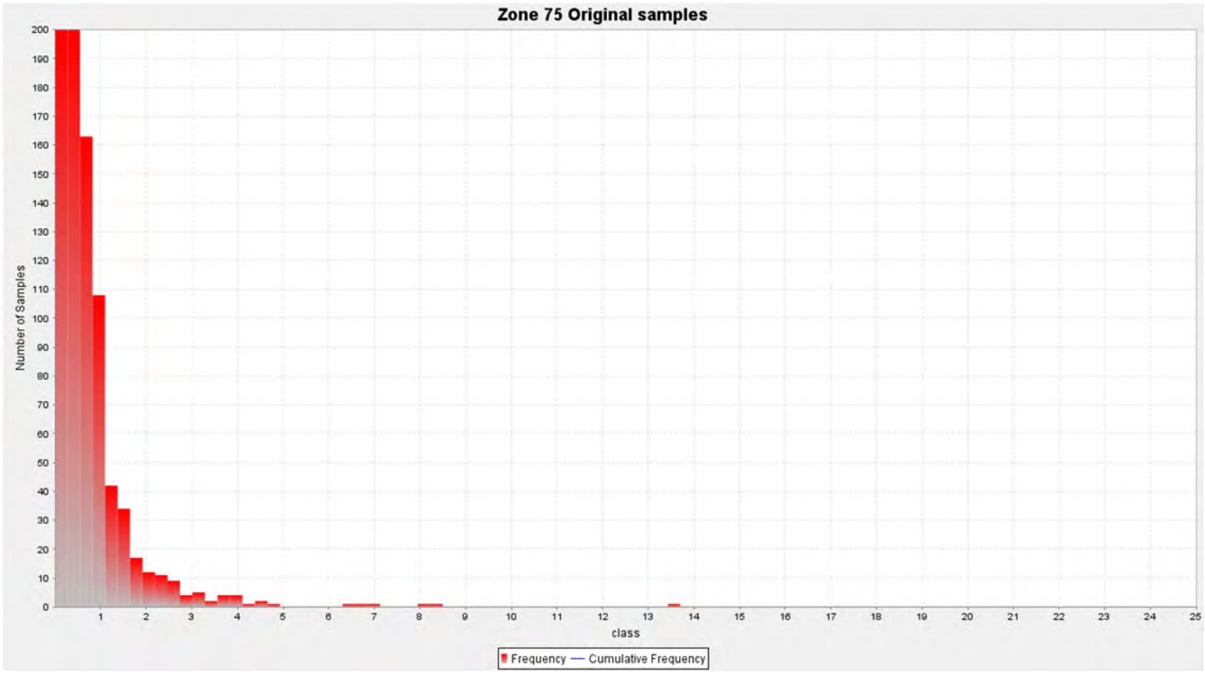
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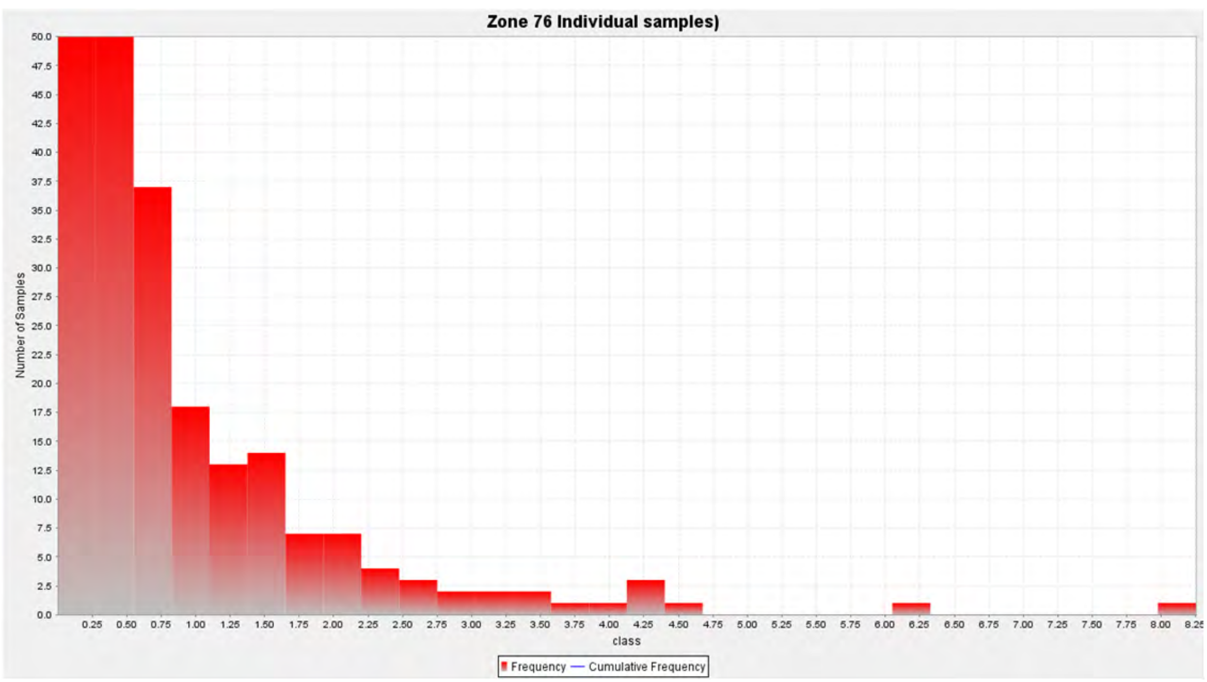
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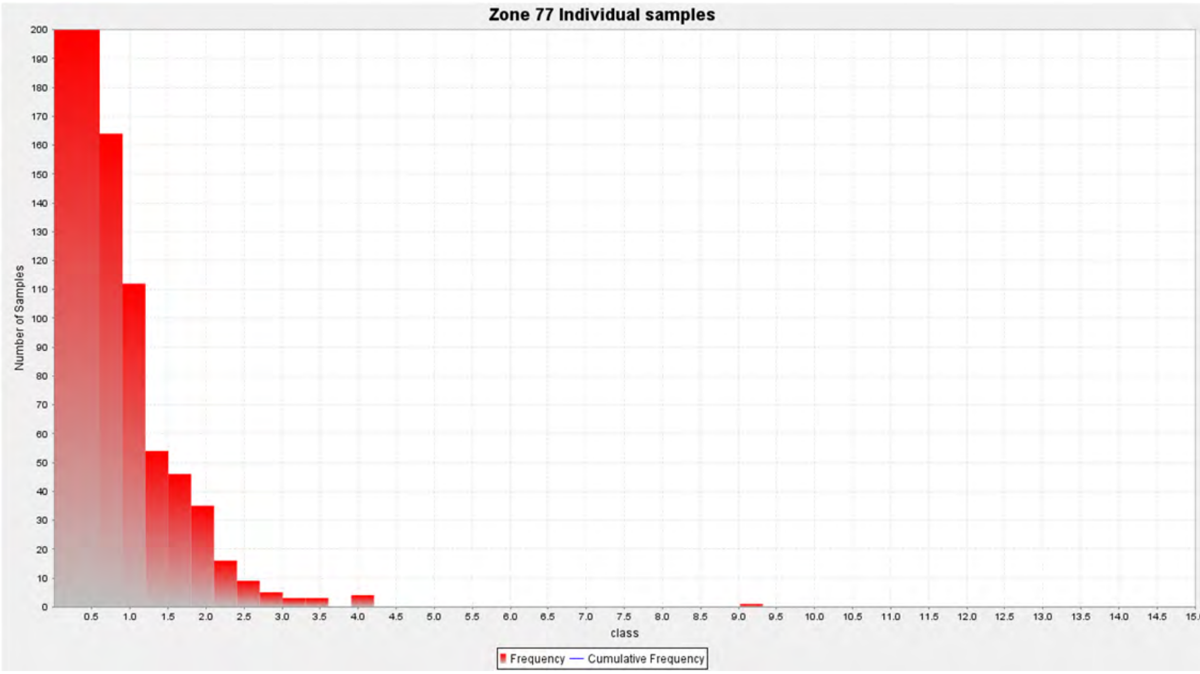
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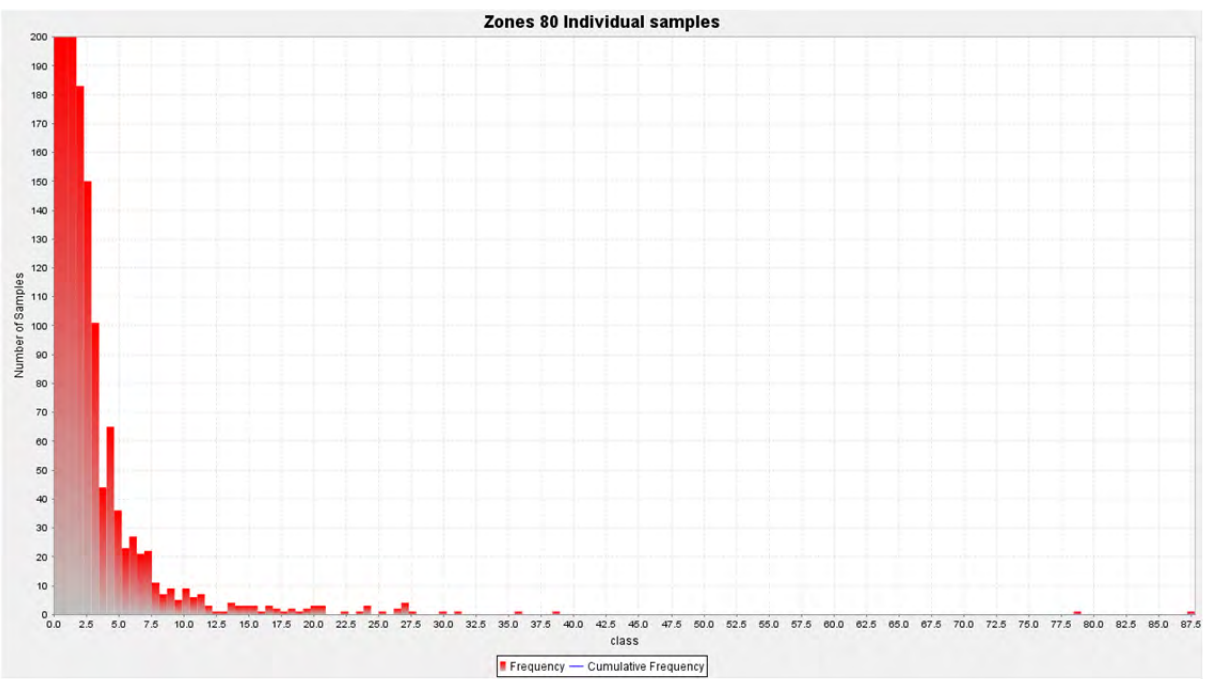
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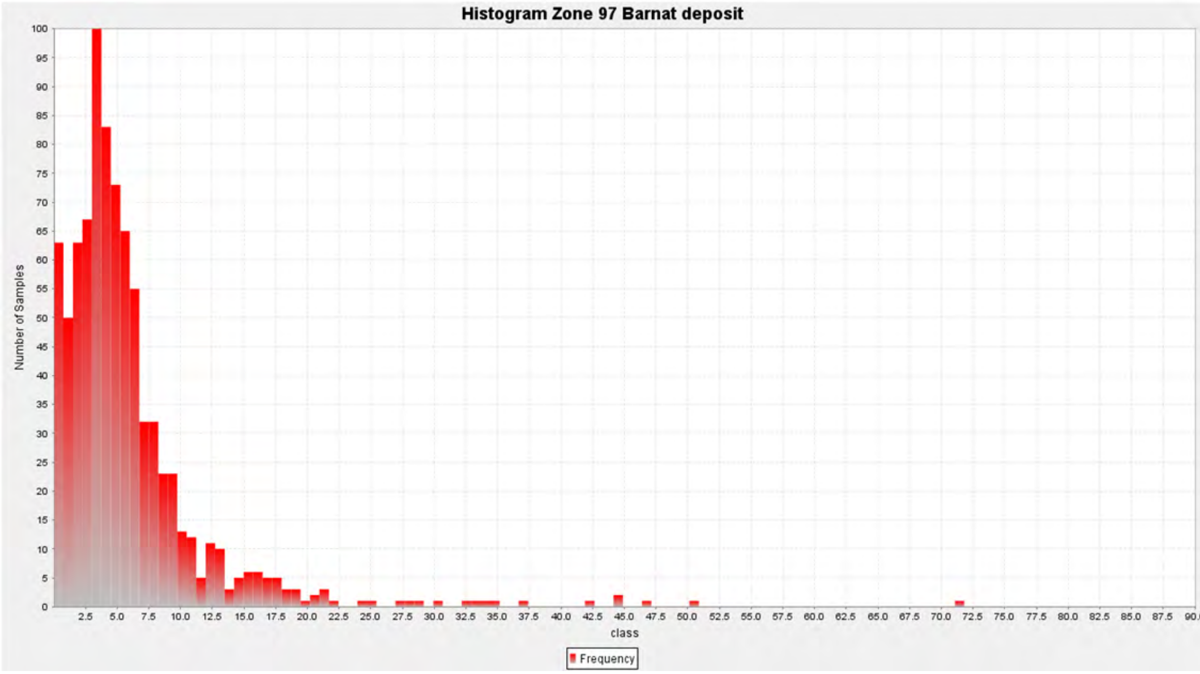
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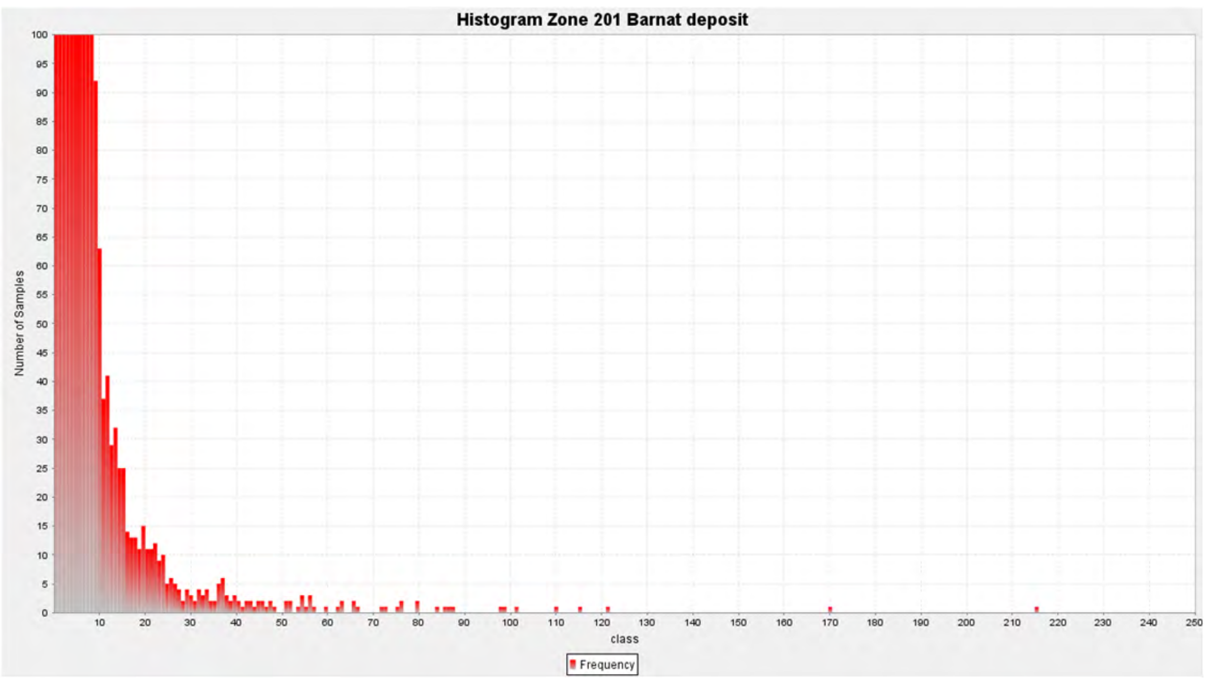
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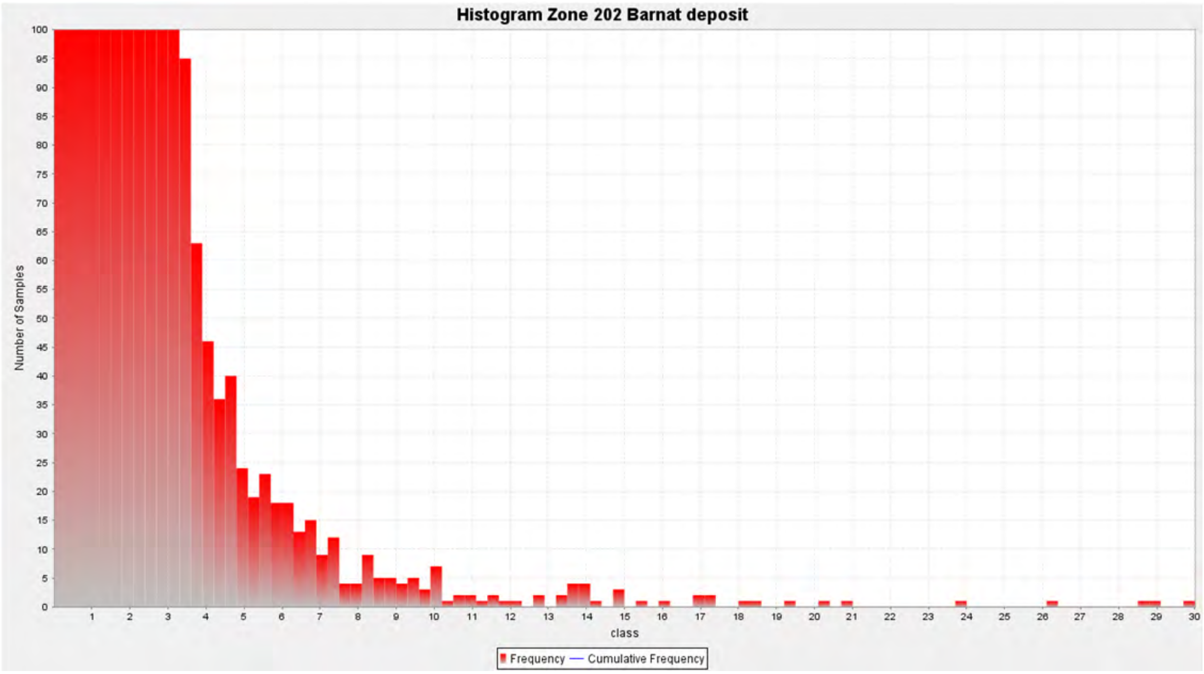
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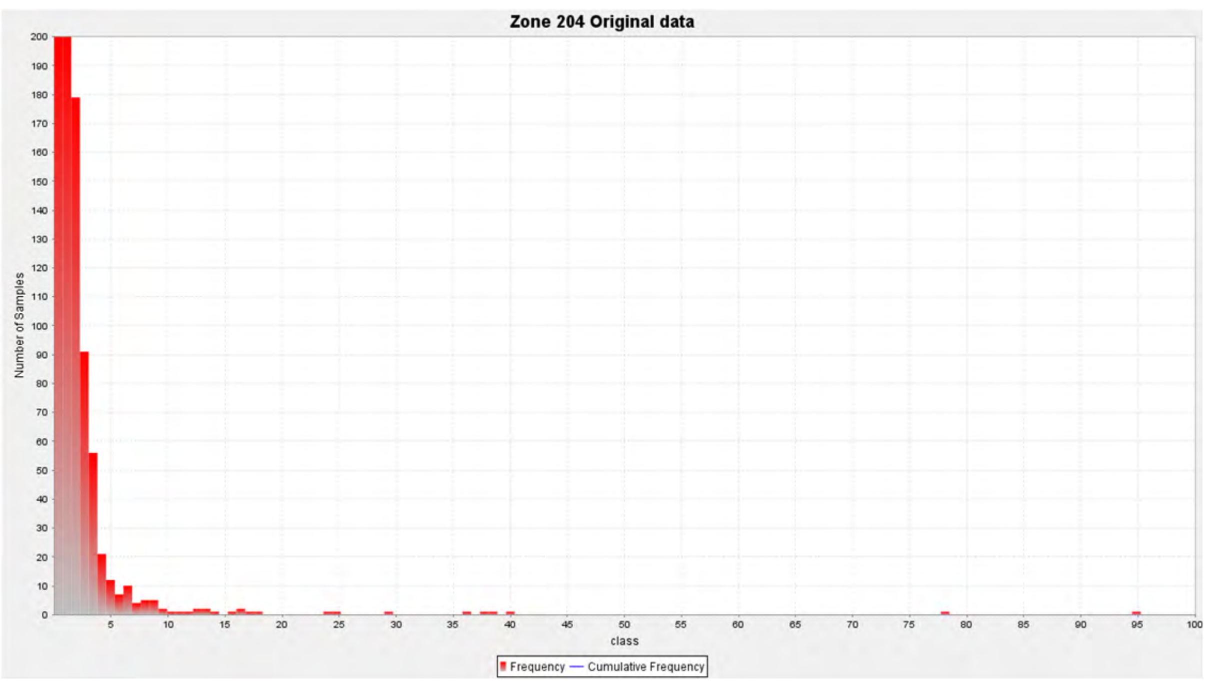
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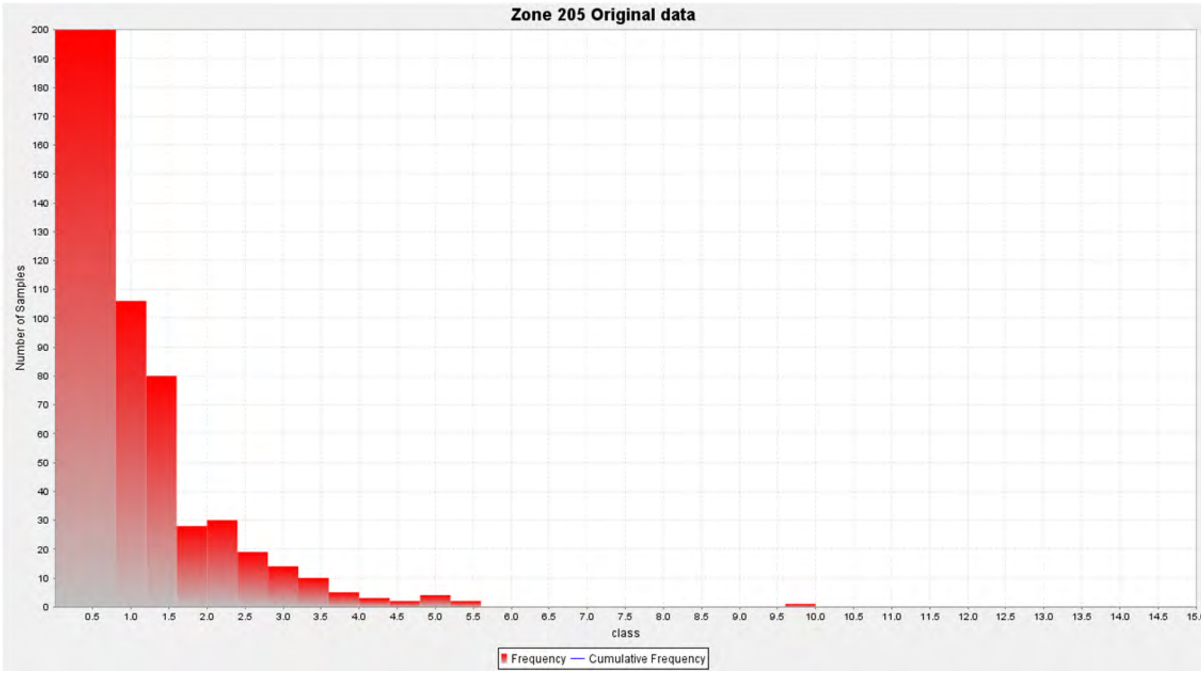
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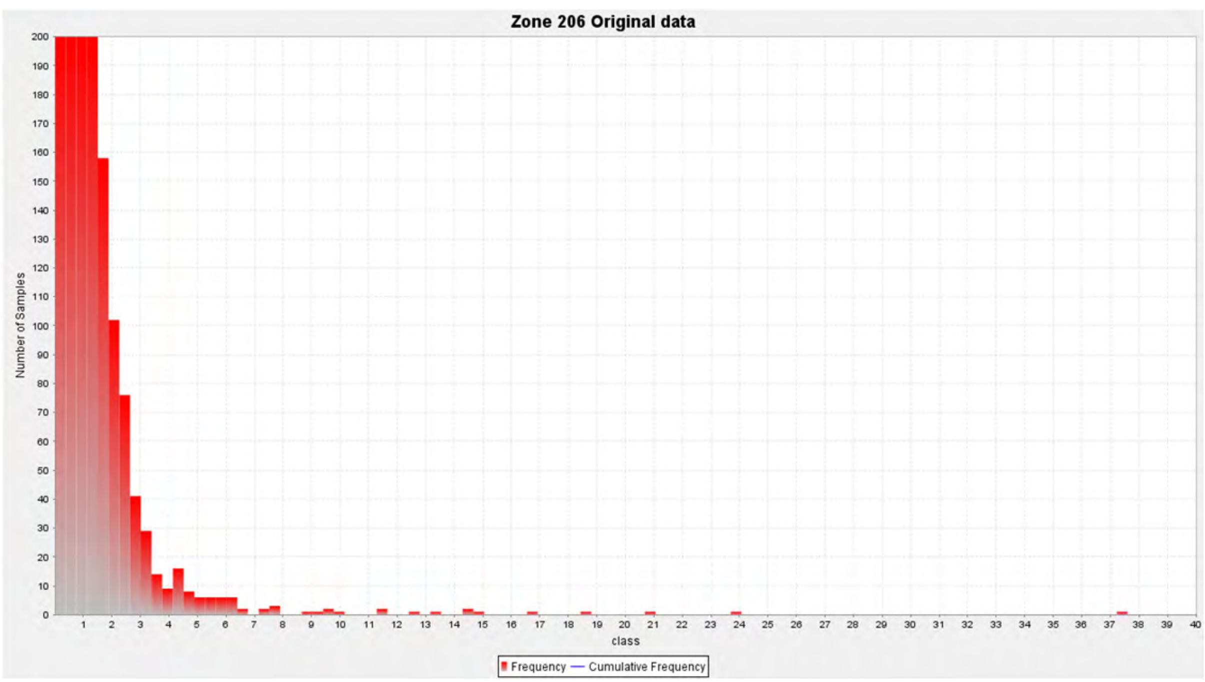
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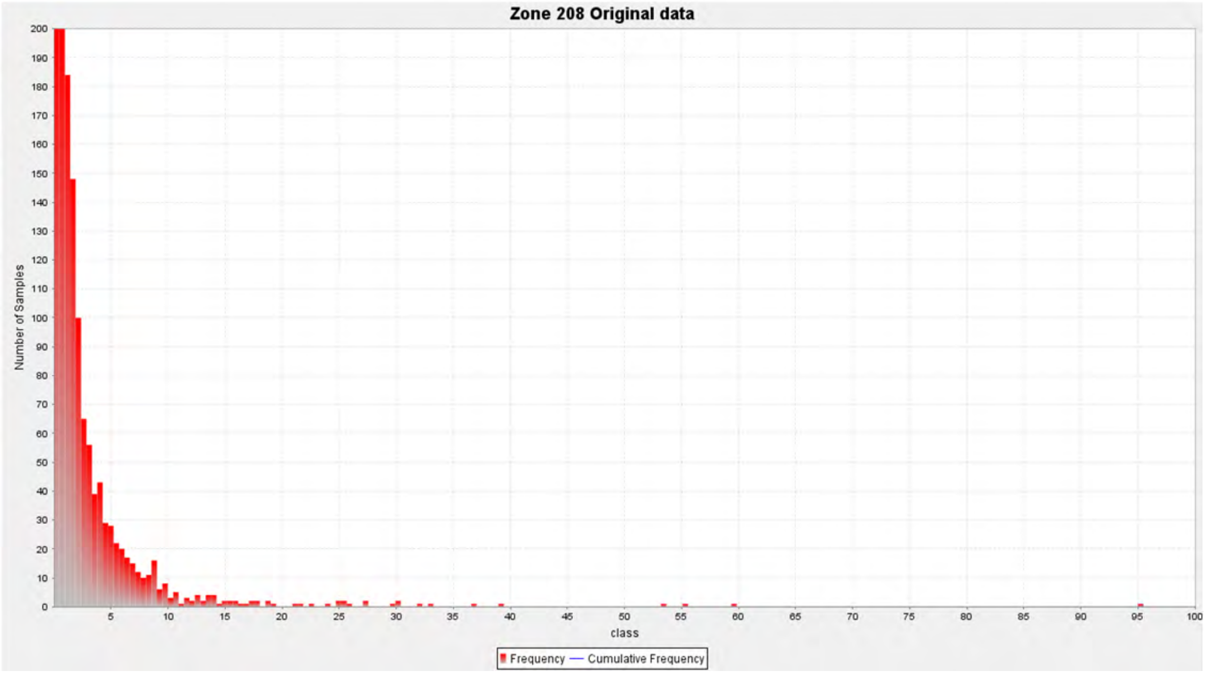
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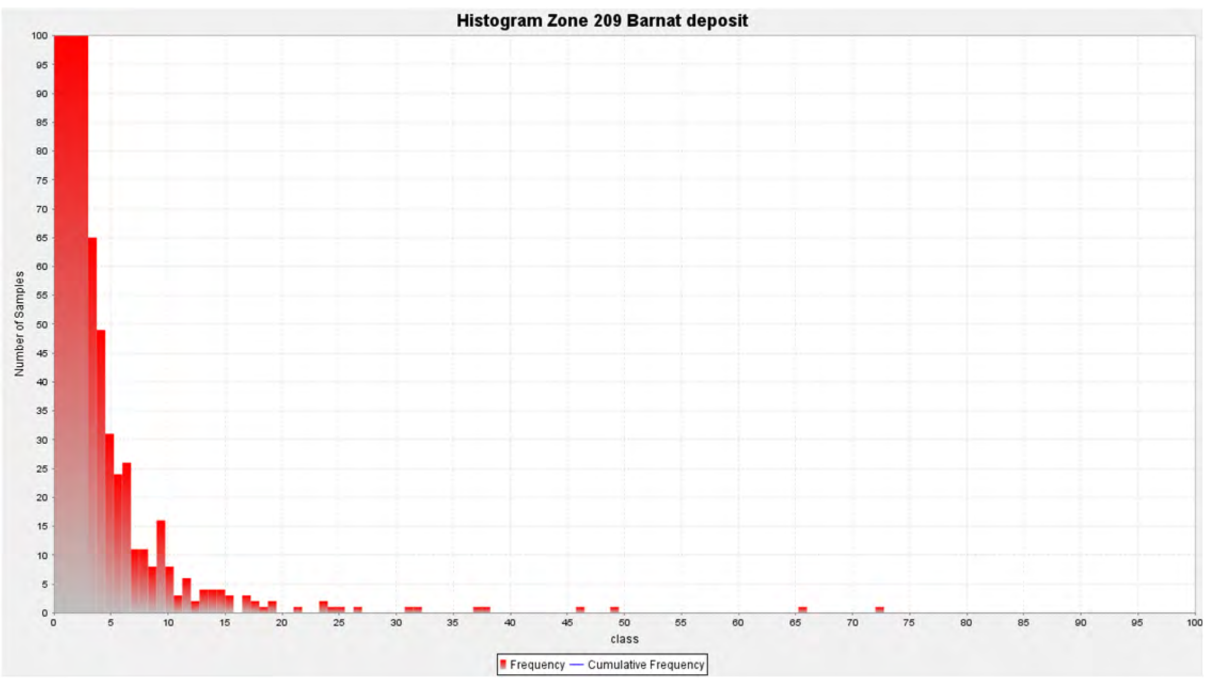
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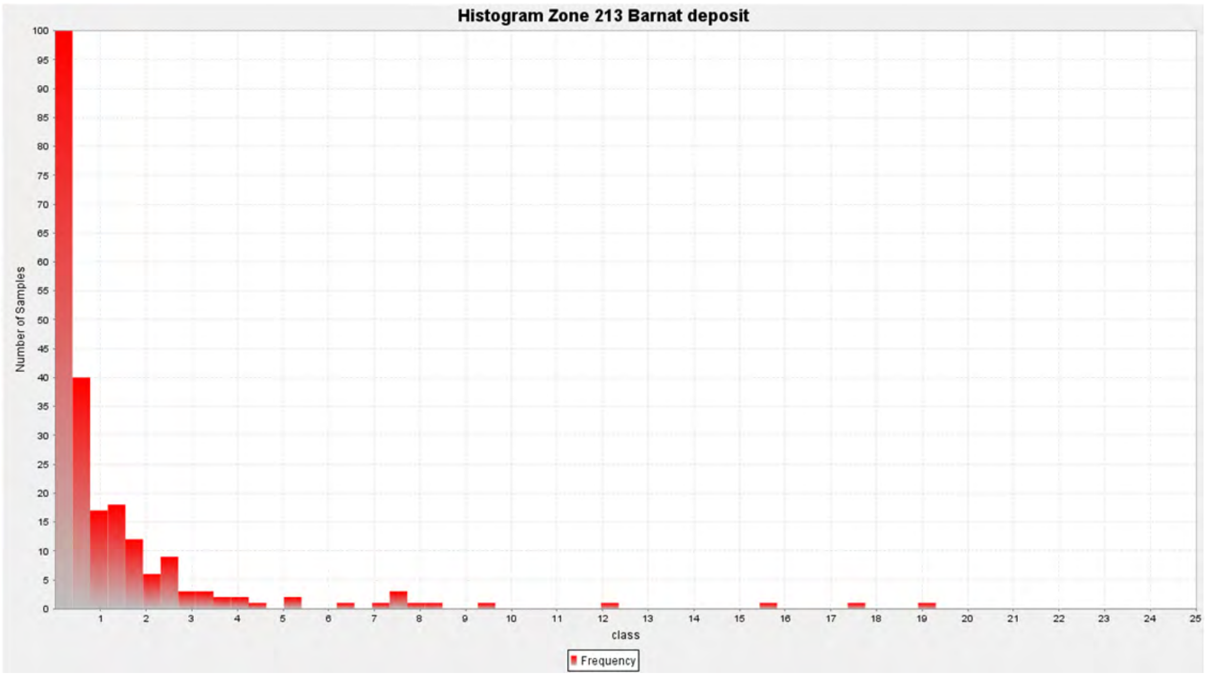
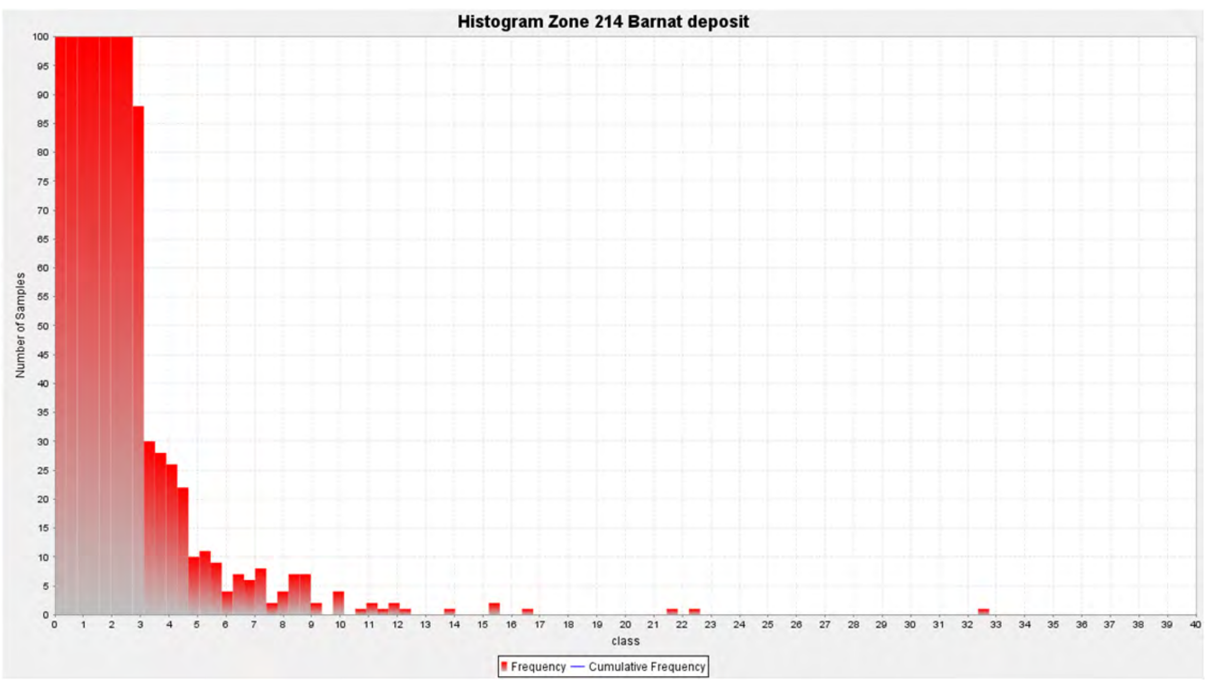
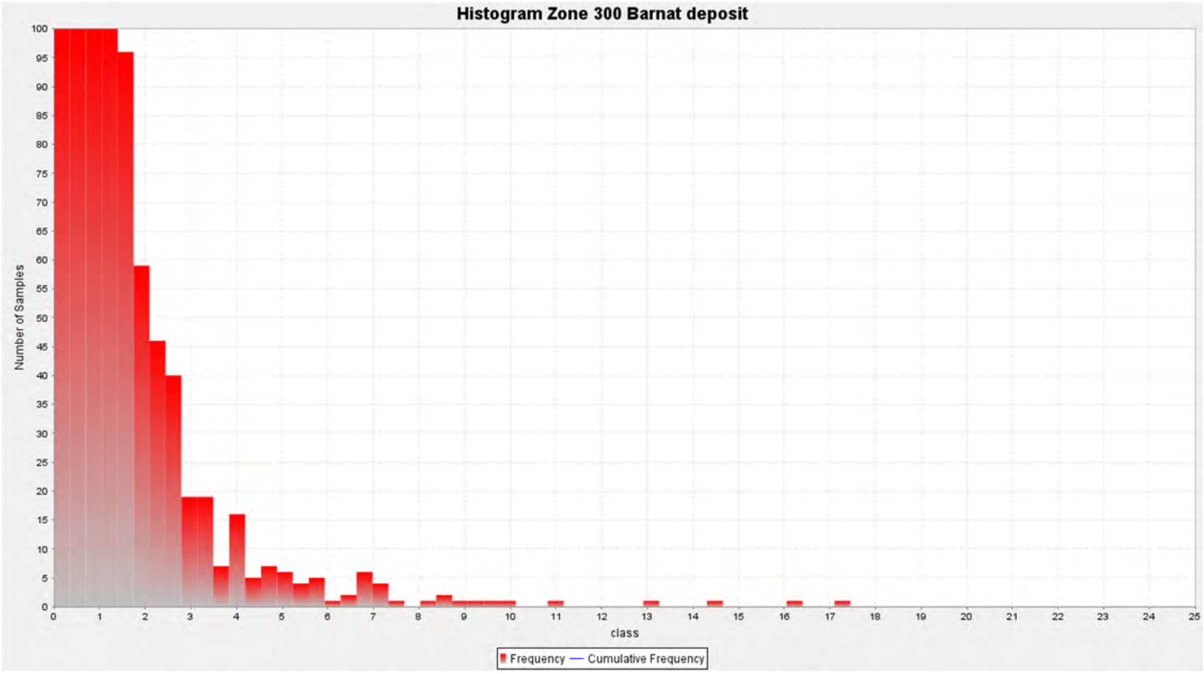
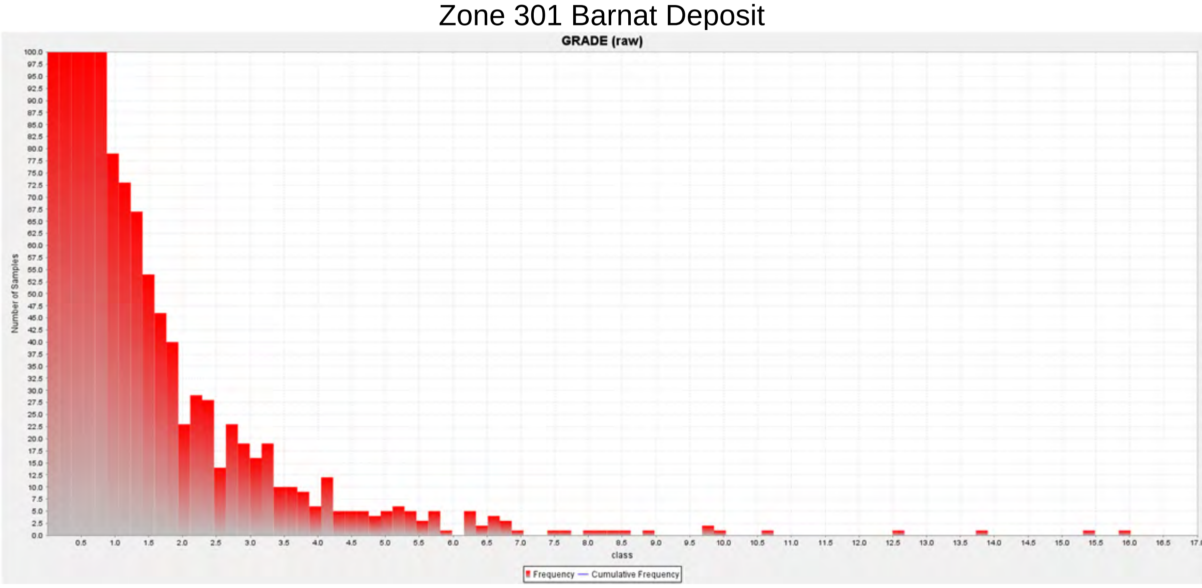
Frequency
Cumulative Frequency


Histogram Zone 213 Barnat deposit
Number of Samples
class
Frequency

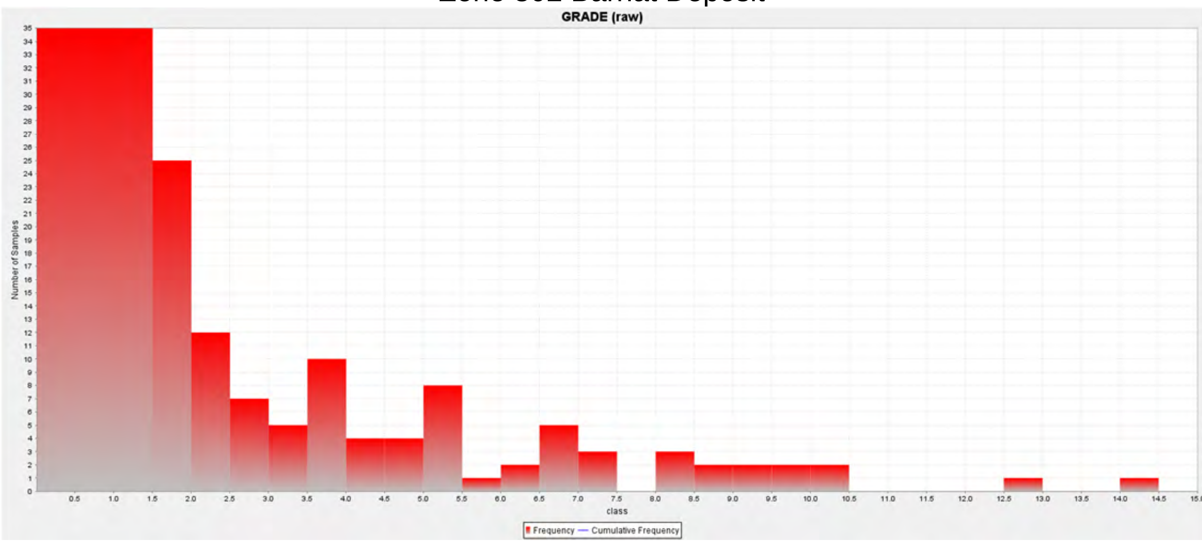

Histogram Zone 214 Barnat deposit
Number of Samples
class
Frequency
Cumulative Frequency



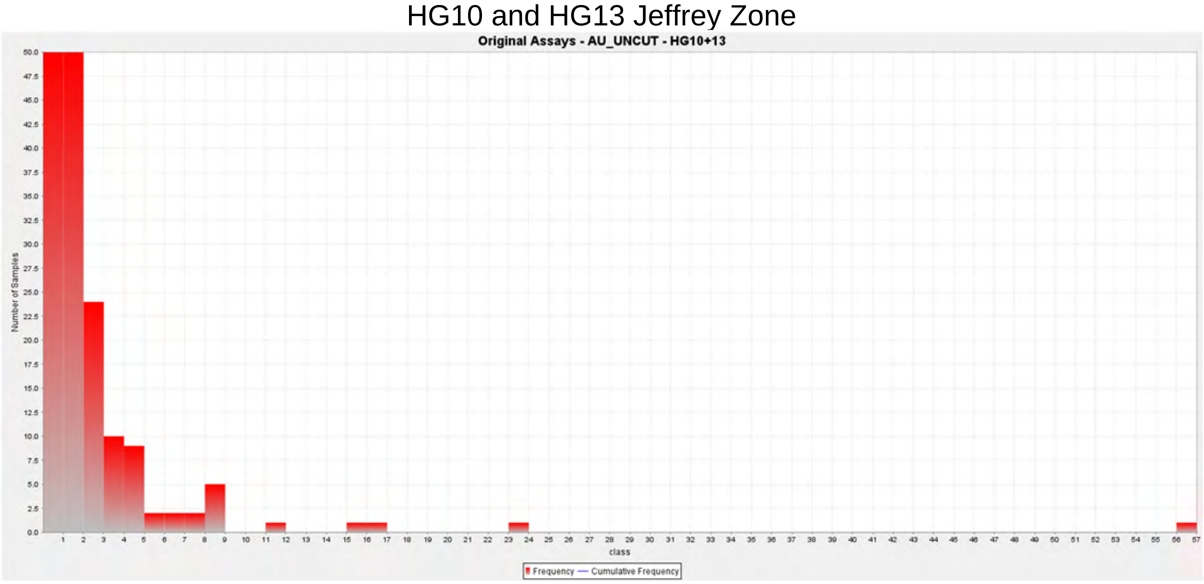
Zone 301 Barnat Deposit



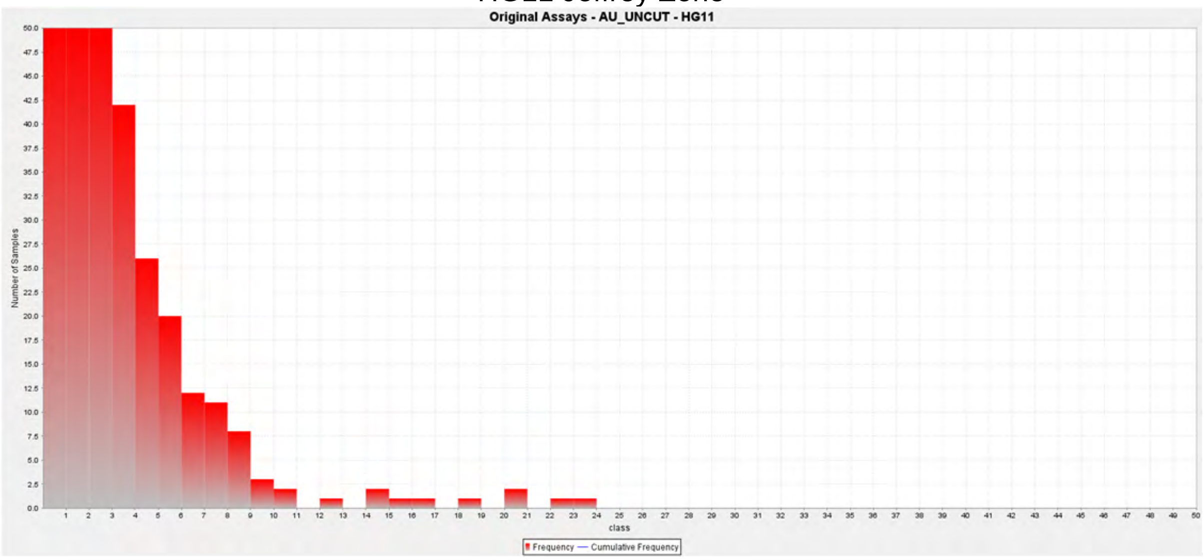
Zone 302 Barnat Deposit



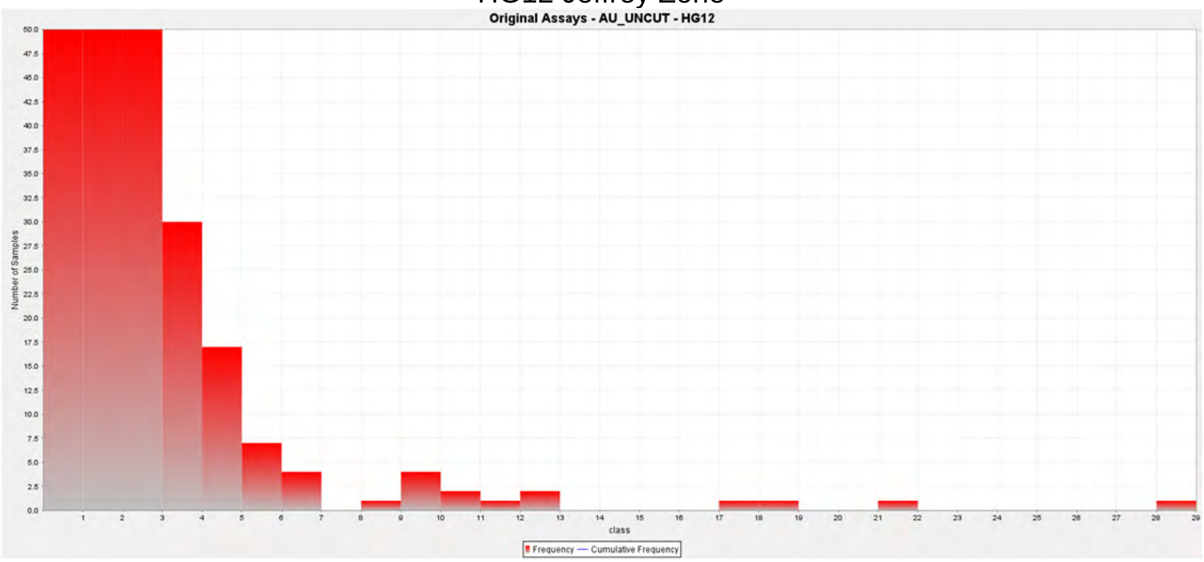
HG10 and HG13 Jeffrey Zone



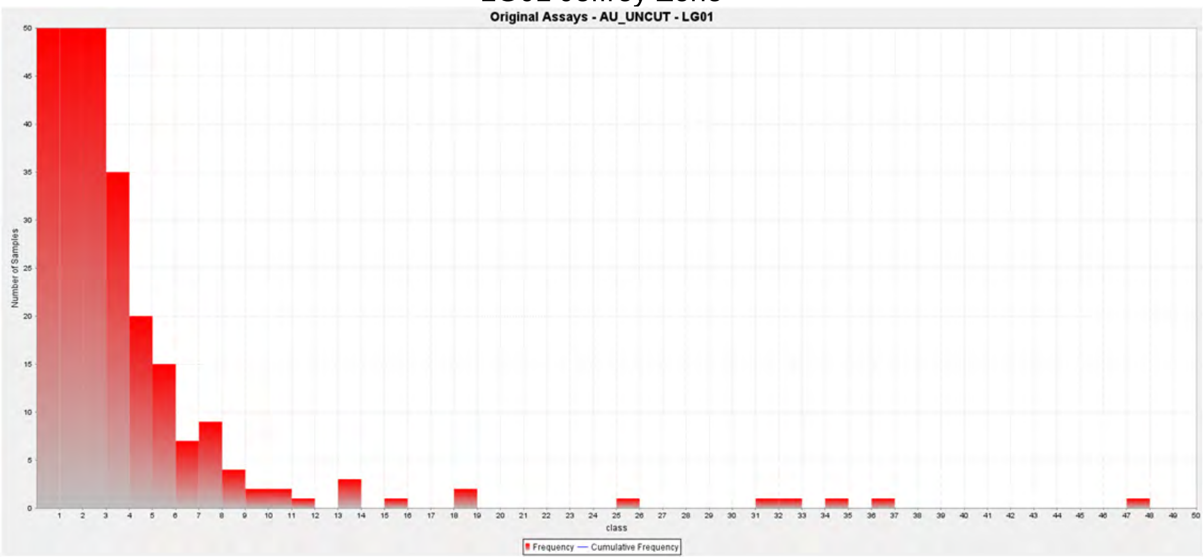
HG11 Jeffrey Zone



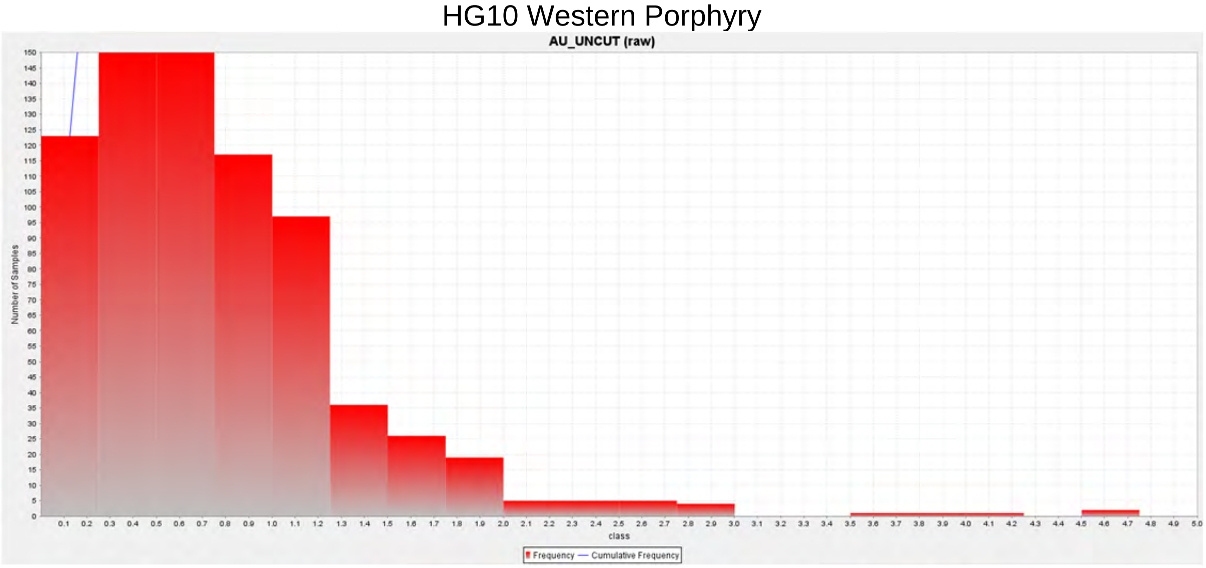
HG12 Jeffrey Zone



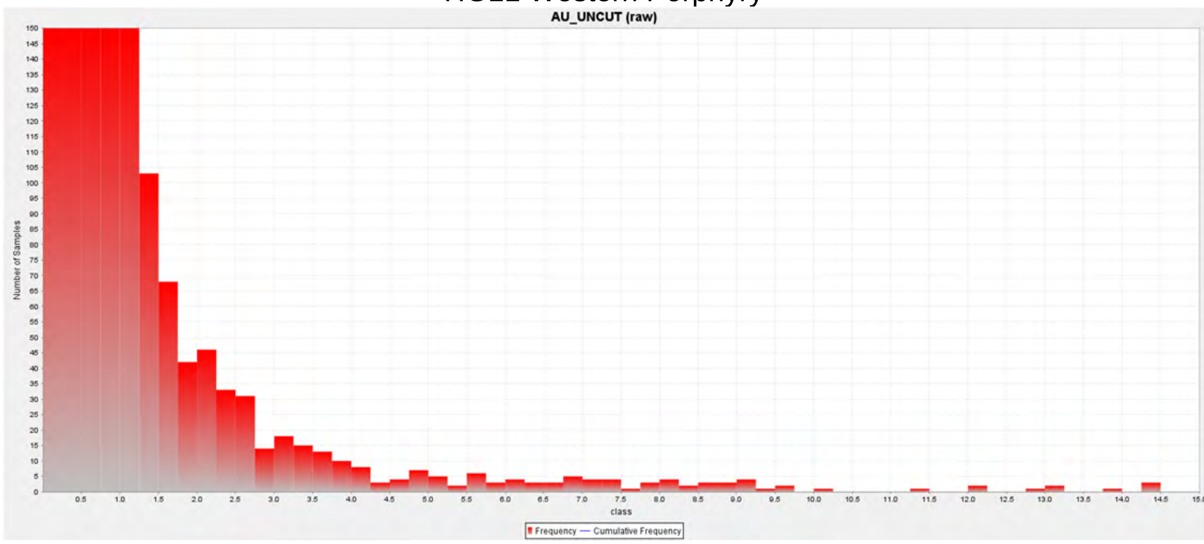
LG01 Jeffrey Zone



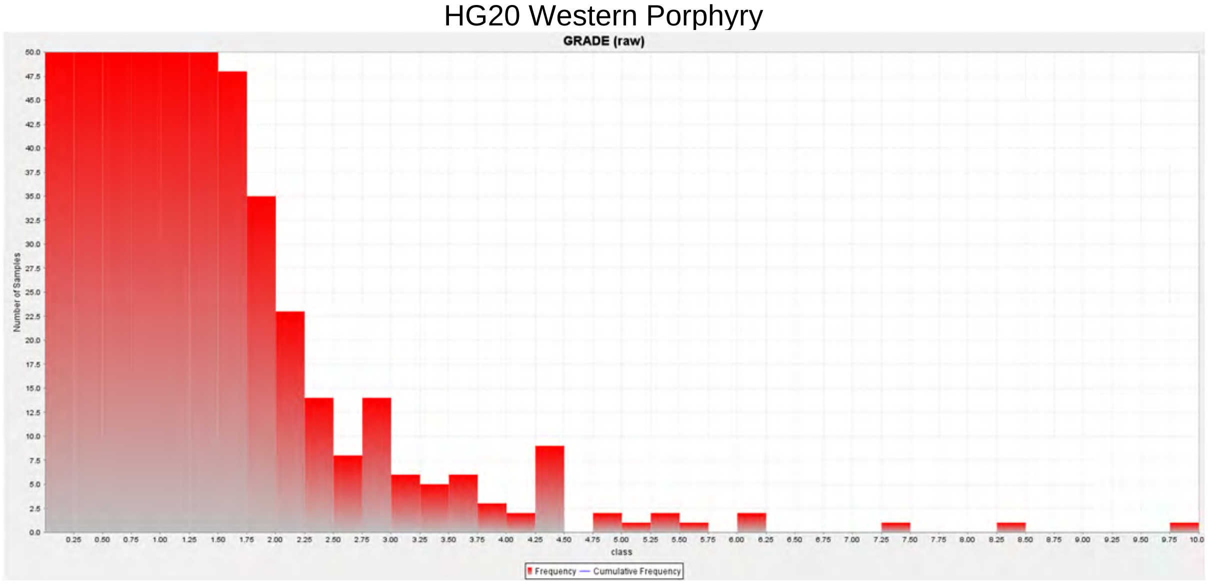
HG10 Western Porphyry



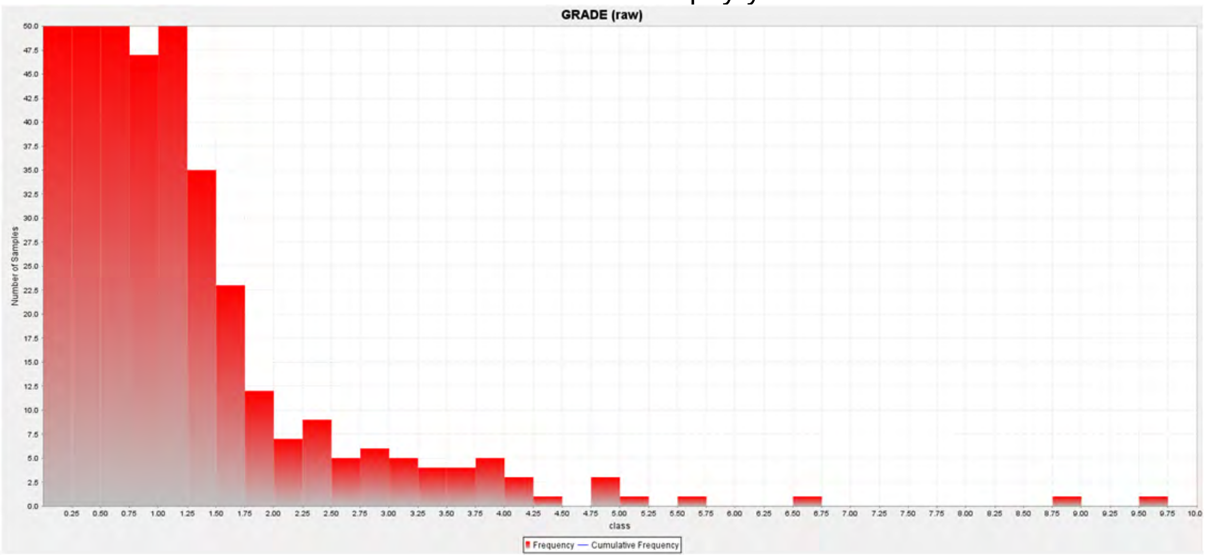
HG11 Western Porphyry



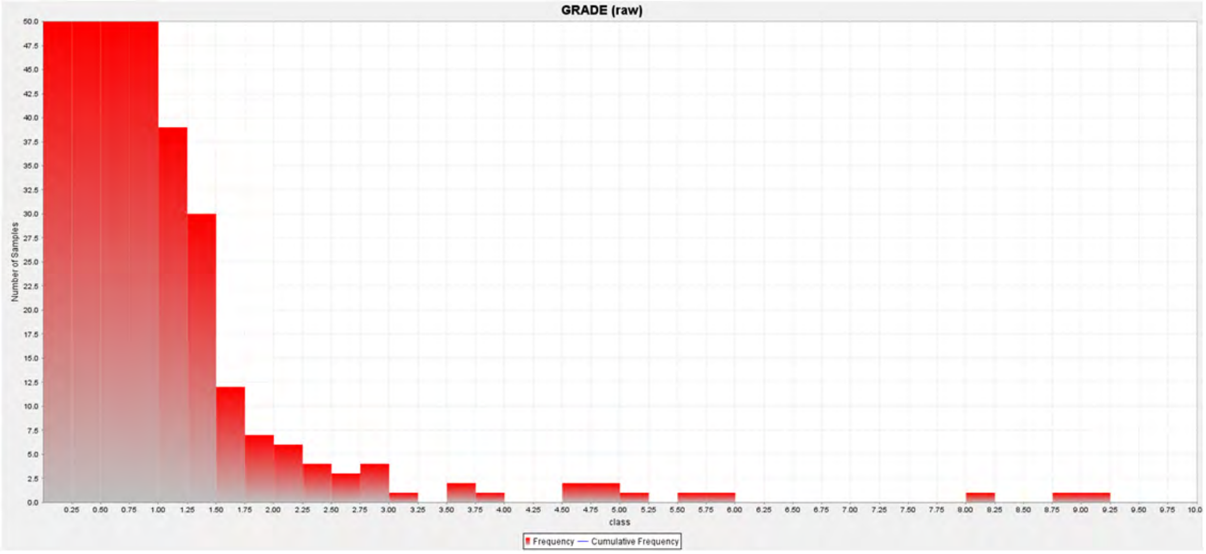
HG20 Western Porphyry



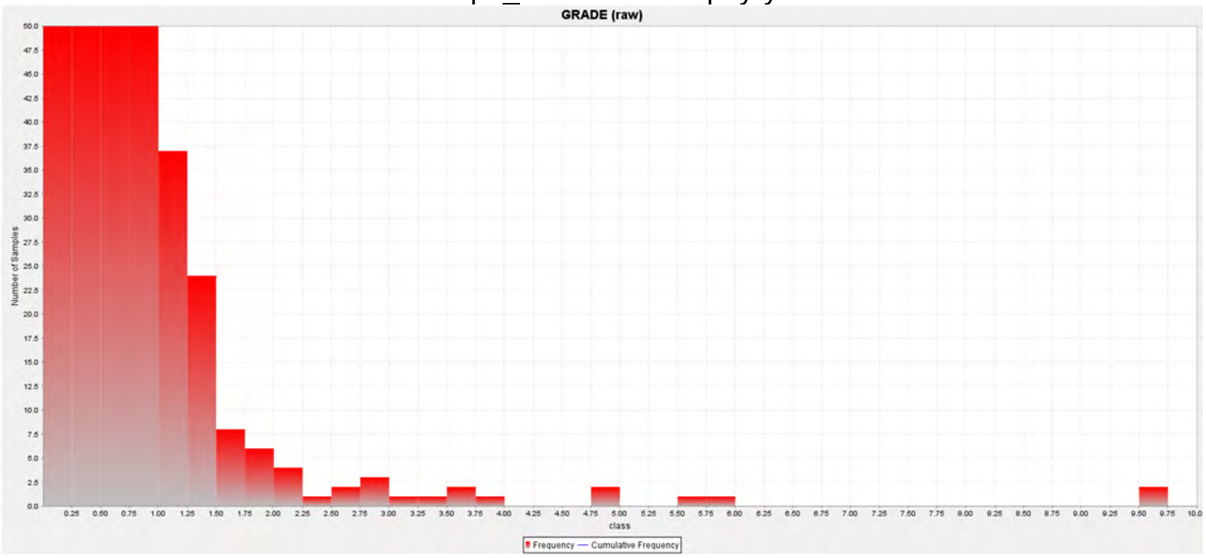
HG30 Western Porphyry



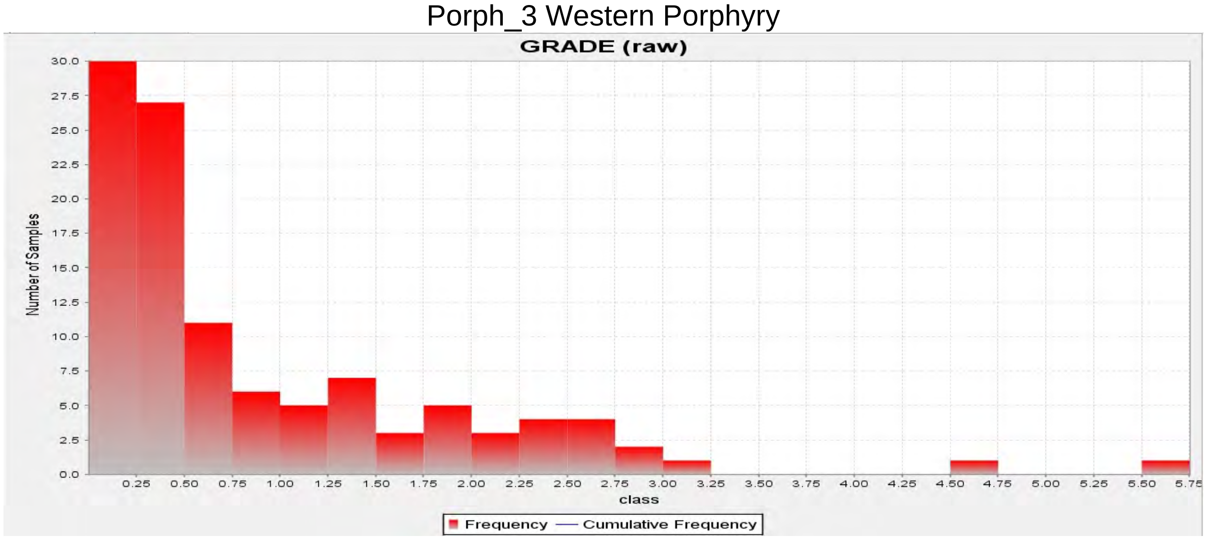
Porph_1 Western Porphyry



Porph_2 Western Porphyry

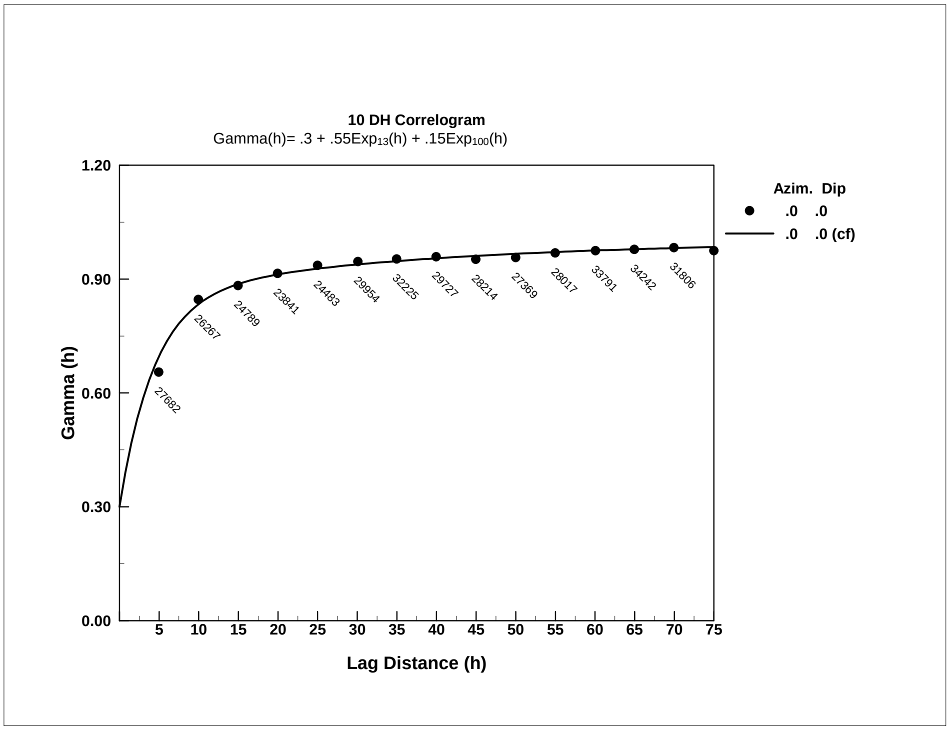


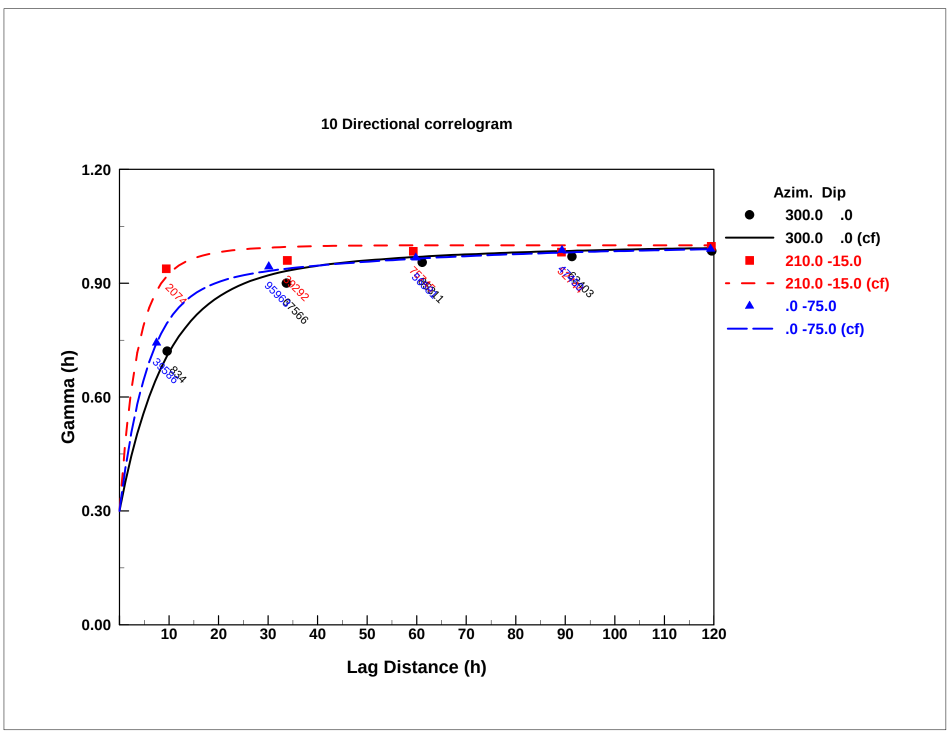
Porph_3 Western Porphyry

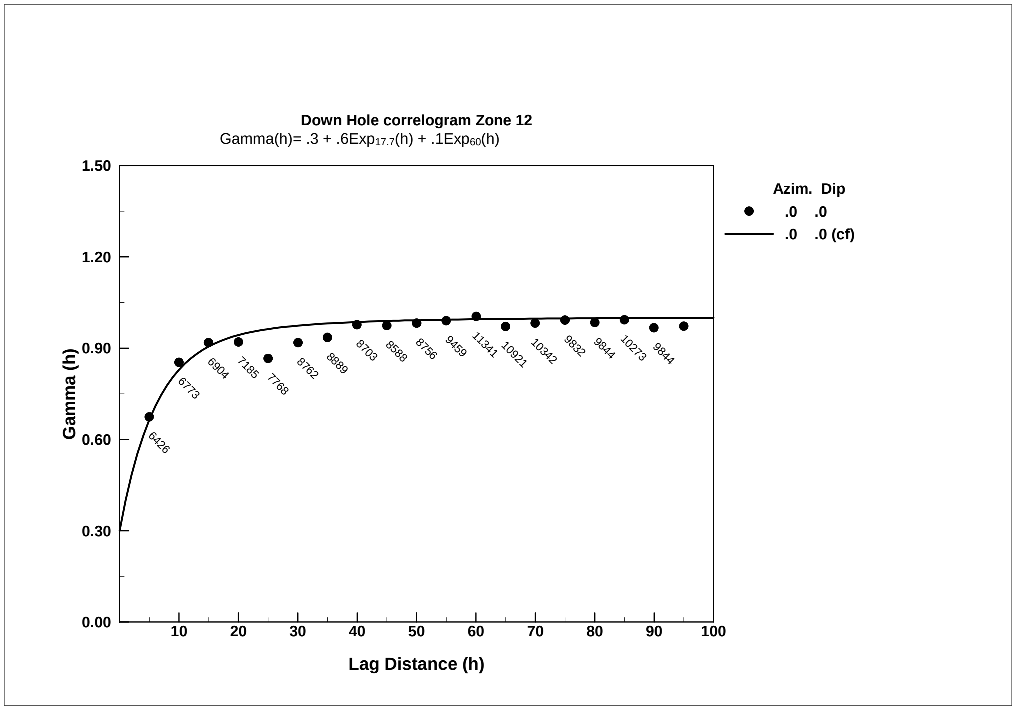


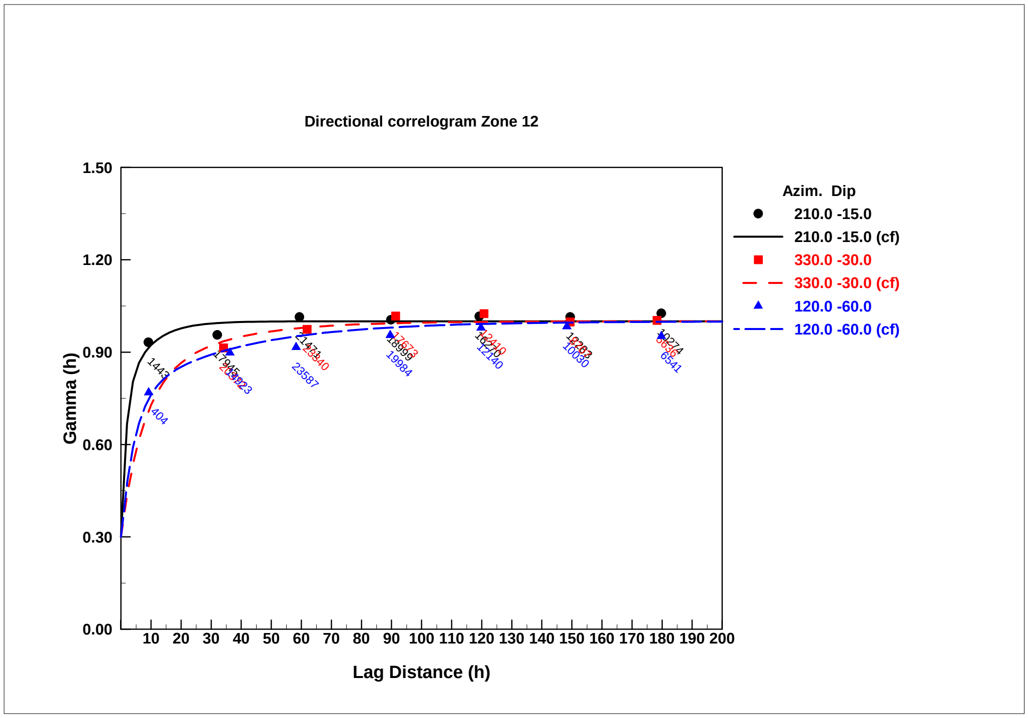
APPENDIX III

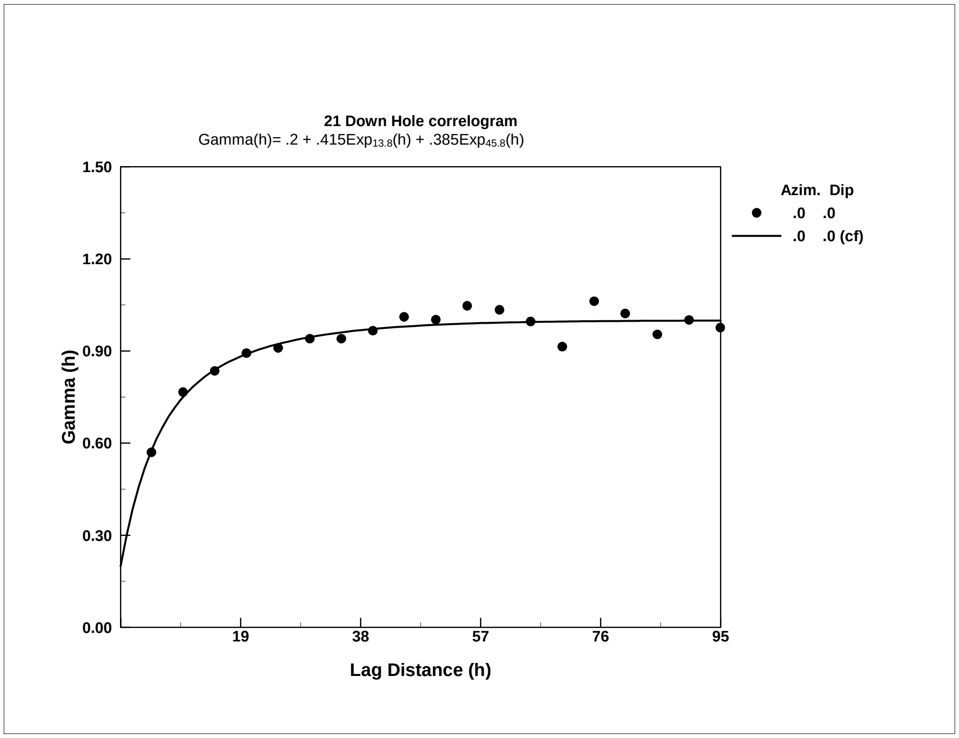
VARIOGRAPHY CORRELOGRAMS AND VARIOGRAMS BY ZONE

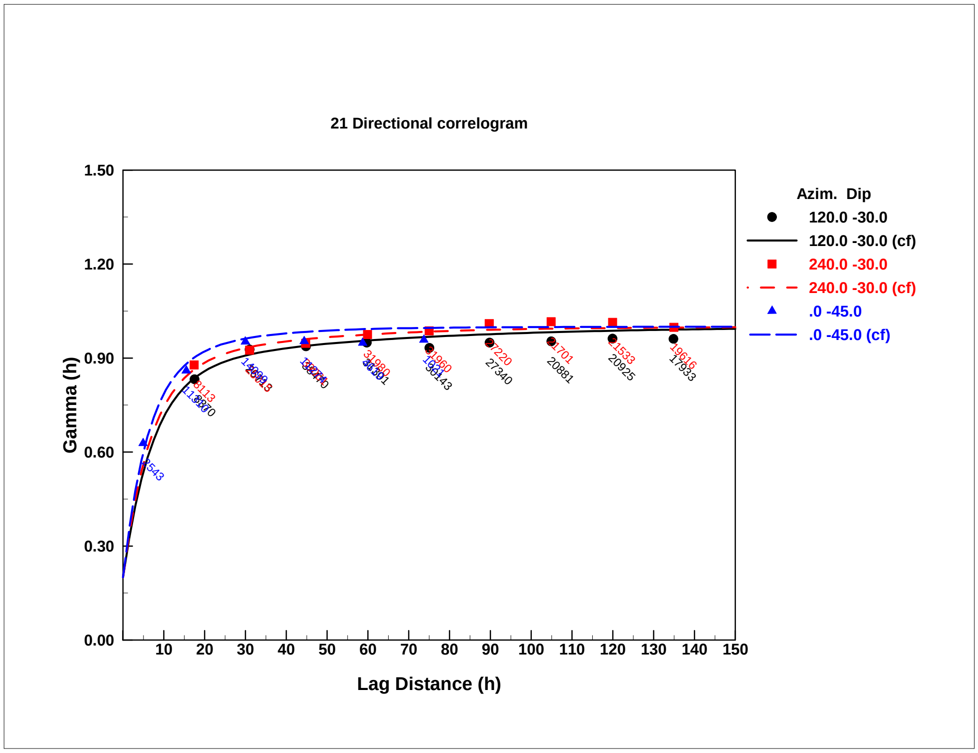

10 DH Correlogram
Gamma(h)= .3 + .55Exp13(h) + .15Exp100(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)
0.00
0.30
0.60
0.90
1.20
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
27682
26267
24789
23841
24483
29954
32225
29727
28214
27369
28017
33791
34242
31806

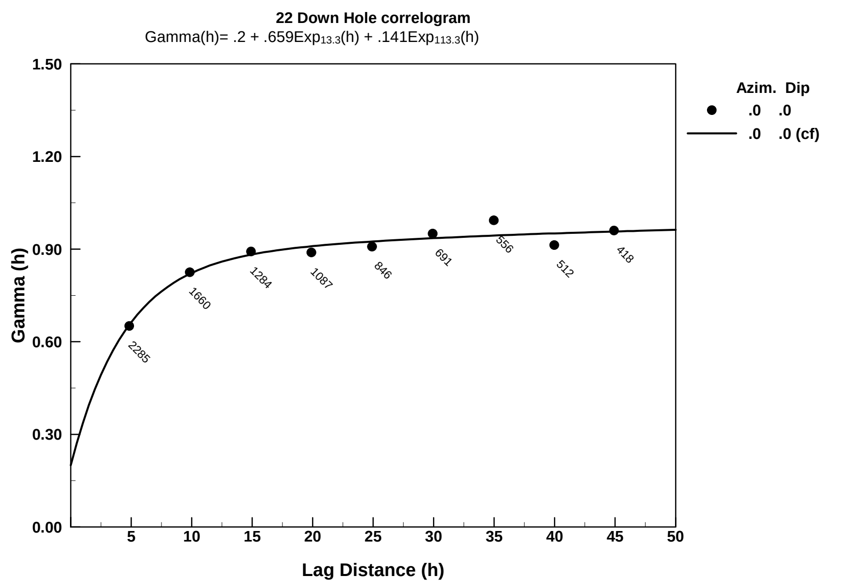

10 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
300.0 .0
300.0 .0 (cf)
210.0 -15.0
210.0 -15.0 (cf)
.0 -75.0
.0 -75.0 (cf)
0.00
0.30
0.60
0.90
1.20
10 20 30 40 50 60 70 80 90 100 110 120

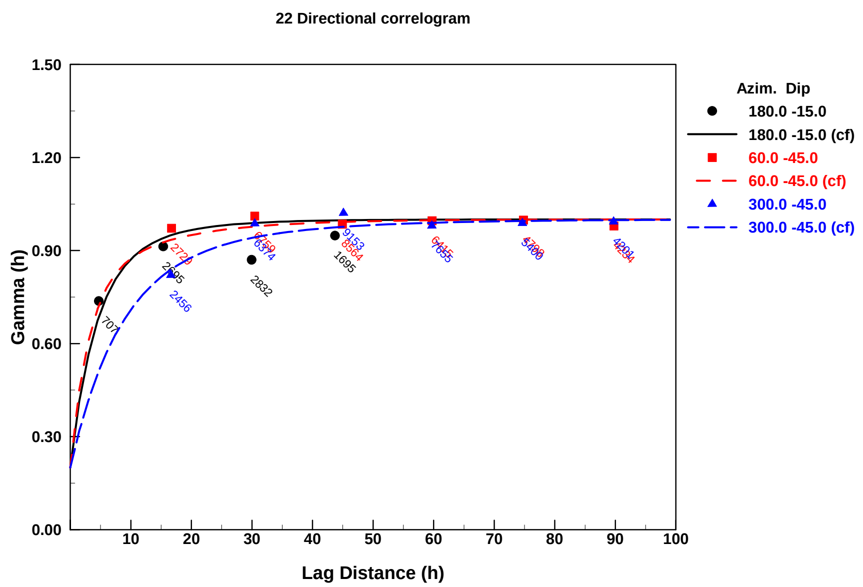

Down Hole correlogram Zone 12
Gamma(h)= .3 + .6Exp17.7(h) + .1Exp60(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

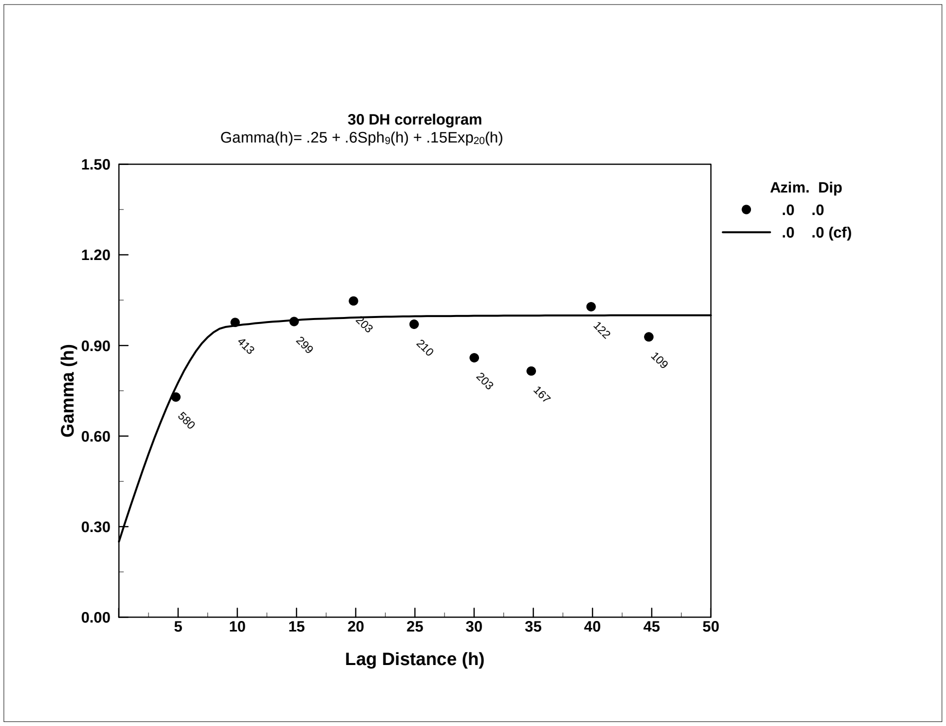

Directional correlogram Zone 12
Gamma (h)
Lag Distance (h)
Azim. Dip
210.0 -15.0
210.0 -15.0 (cf)
330.0 -30.0
330.0 -30.0 (cf)
120.0 -60.0
120.0 -60.0 (cf)

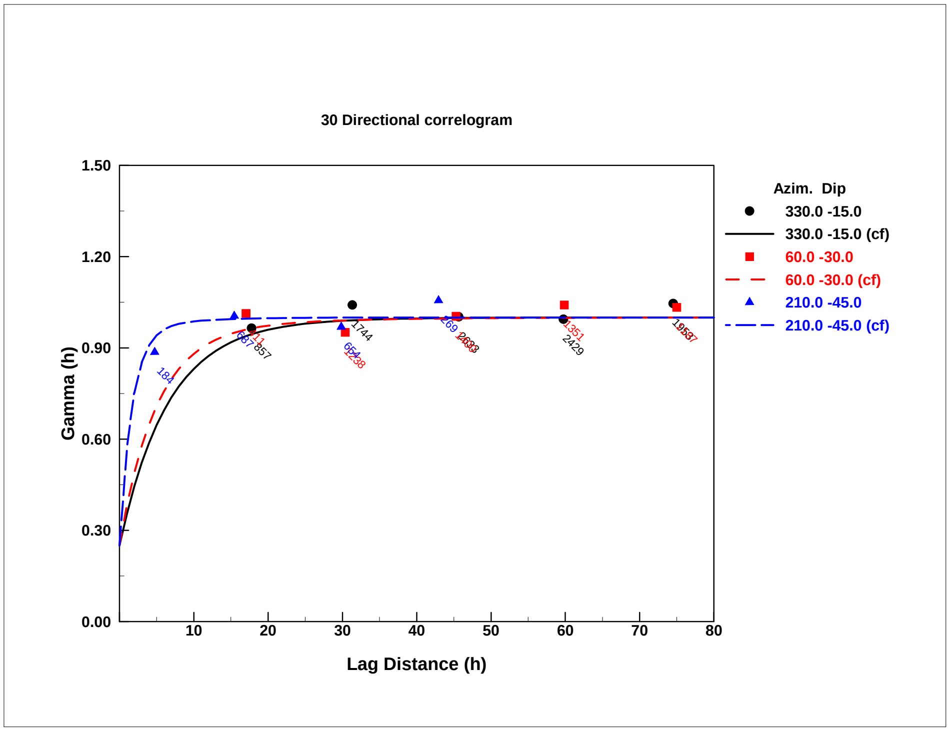

21 Down Hole correlogram
Gamma(h)= .2 + .415Exp13.8(h) + .385Exp45.8(h)
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
19
38
57
76
95
Azim. Dip
.0 .0
.0 .0 (cf)

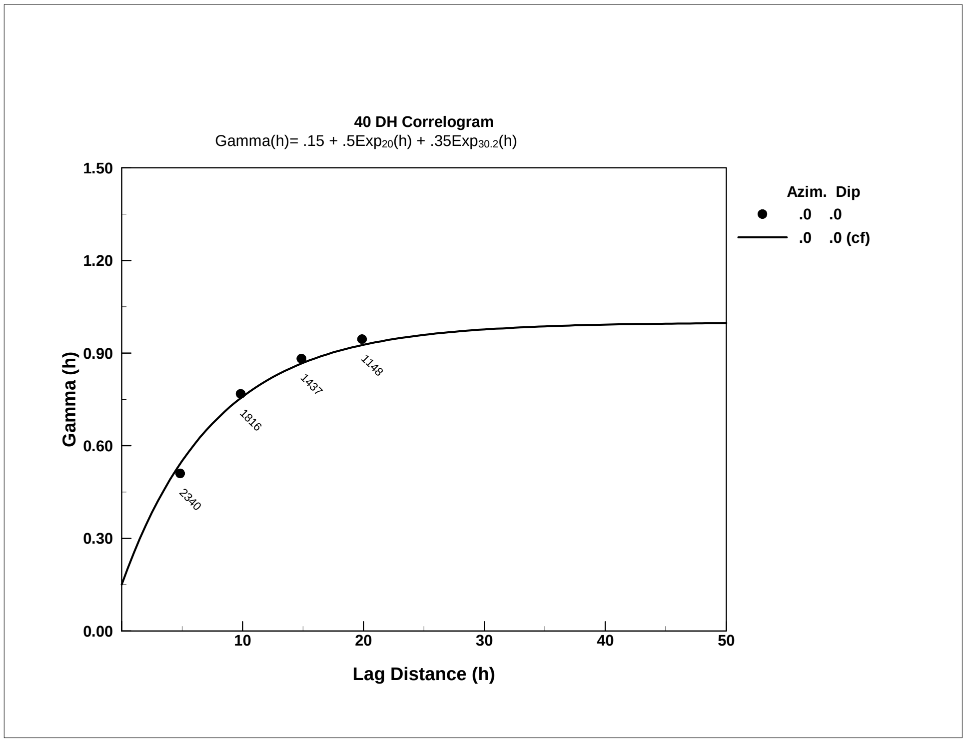

21 Directional correlogram
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
Azim. Dip
120.0 -30.0
120.0 -30.0 (cf)
240.0 -30.0
240.0 -30.0 (cf)
.0 -45.0
.0 -45.0 (cf)
27340
20881
20925
17933


22 Down Hole correlogram
Gamma(h)= .2 + .659Exp13.3(h) + .141Exp113.3(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

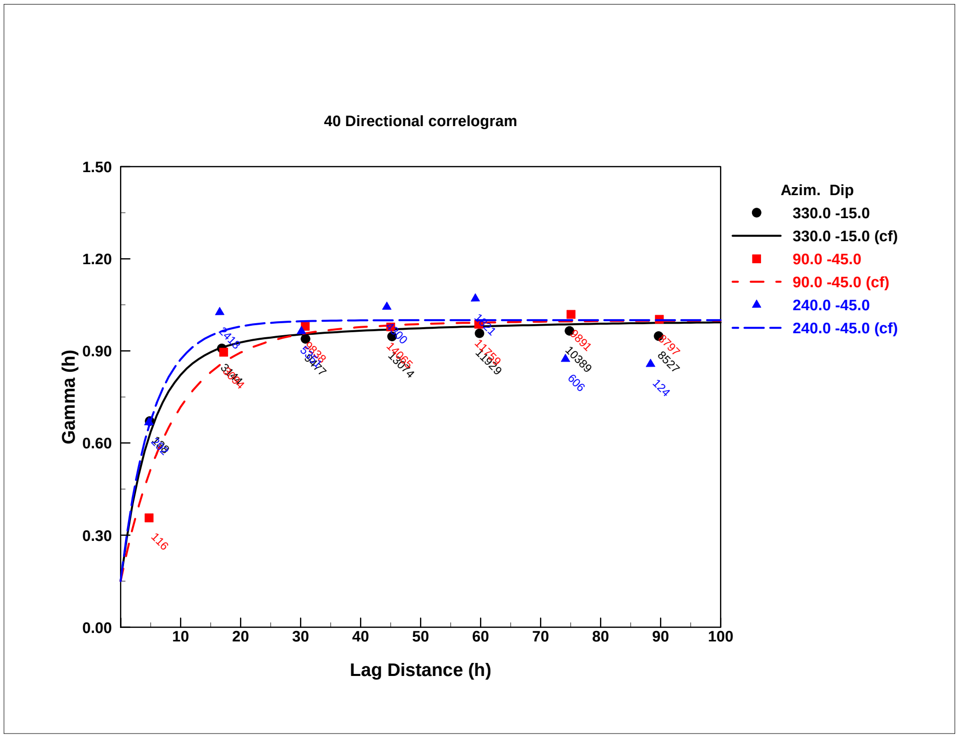

22 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
180.0 -15.0
180.0 -15.0 (cf)
60.0 -45.0
60.0 -45.0 (cf)
300.0 -45.0
300.0 -45.0 (cf)


30 DH correlogram
Gamma(h)= .25 + .6Sph9(h) + .15Exp20(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

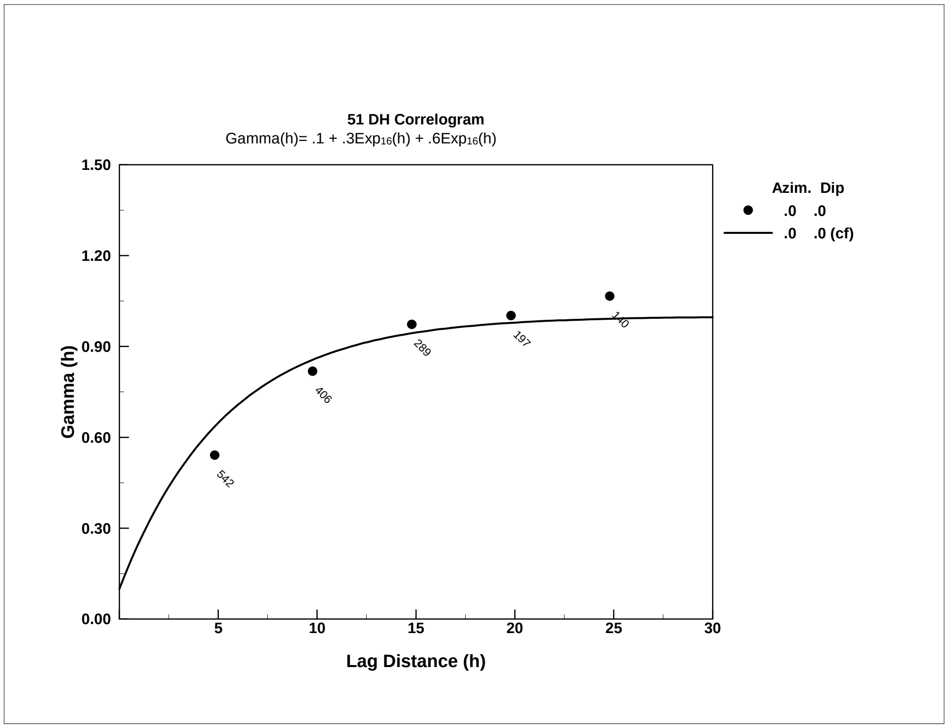

30 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
330.0 -15.0
330.0 -15.0 (cf)
60.0 -30.0
60.0 -30.0 (cf)
210.0 -45.0
210.0 -45.0 (cf)

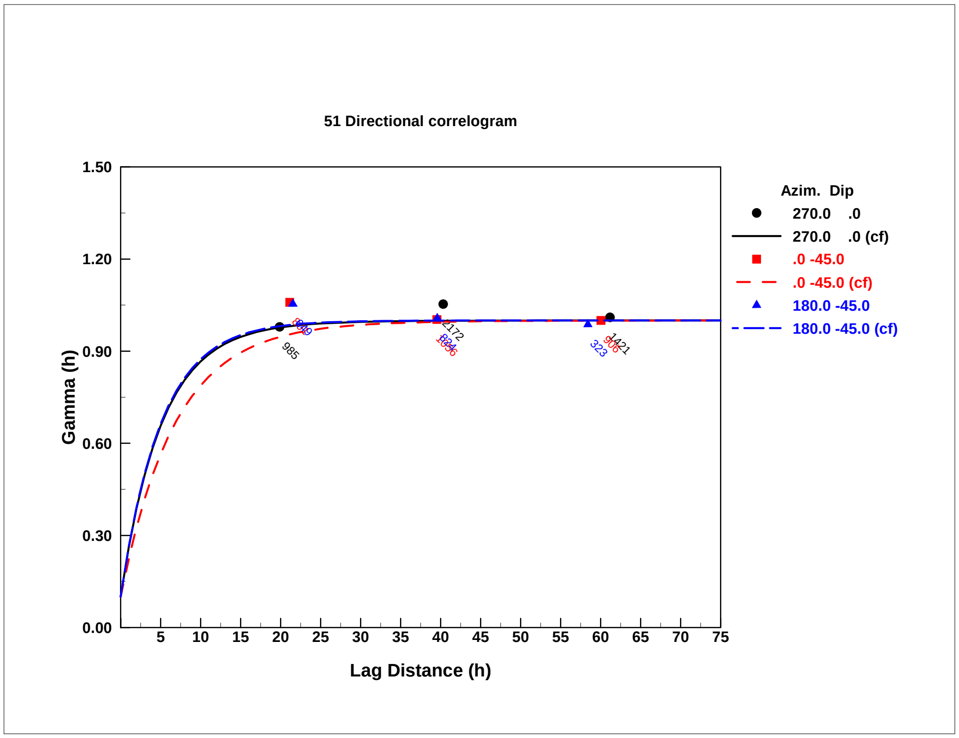


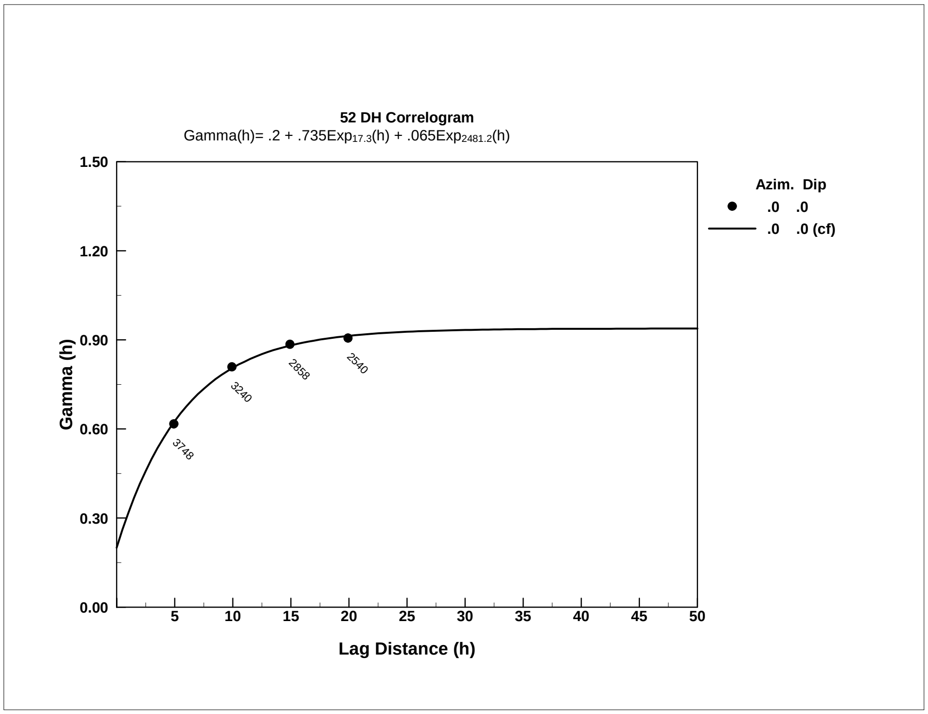
40 DH Correlogram
Gamma(h)= .15 + .5Exp20(h) + .35Exp30.2(h)
Azim. Dip
.0 .0
.0 .0 (cf)
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
2340
1816
1437
1148

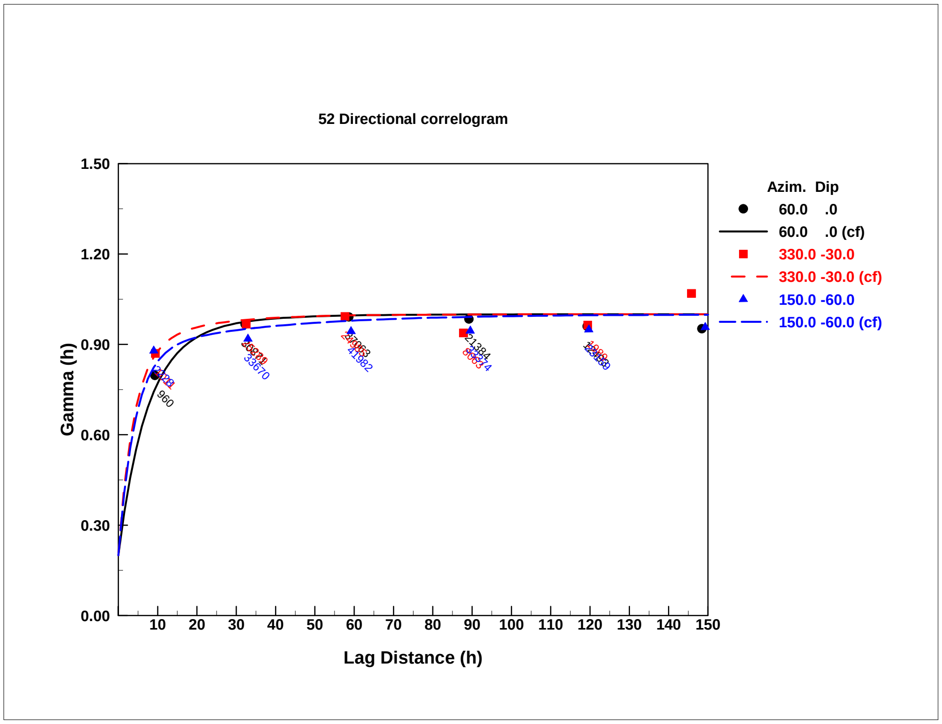


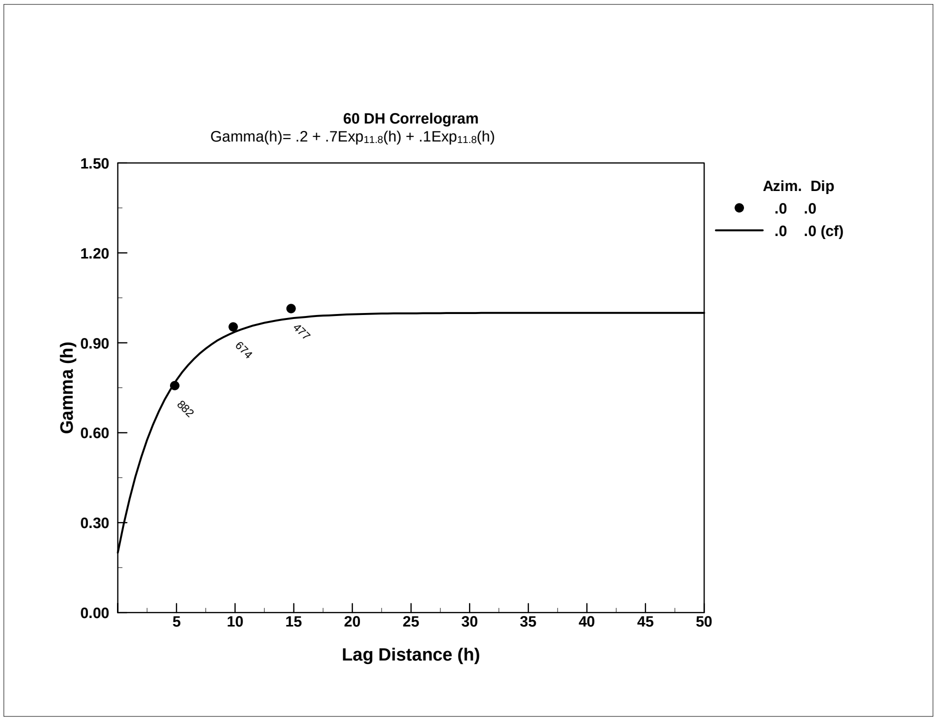
40 Directional correlogram
Azim. Dip
330.0 -15.0
330.0 -15.0 (cf)
90.0 -45.0
90.0 -45.0 (cf)
240.0 -45.0
240.0 -45.0 (cf)
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
80
90
100
116
10389
8527
606
124


51 DH Correlogram
Gamma(h)= .1 + .3Exp16(h) + .6Exp16(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)
542
406
289
197
140

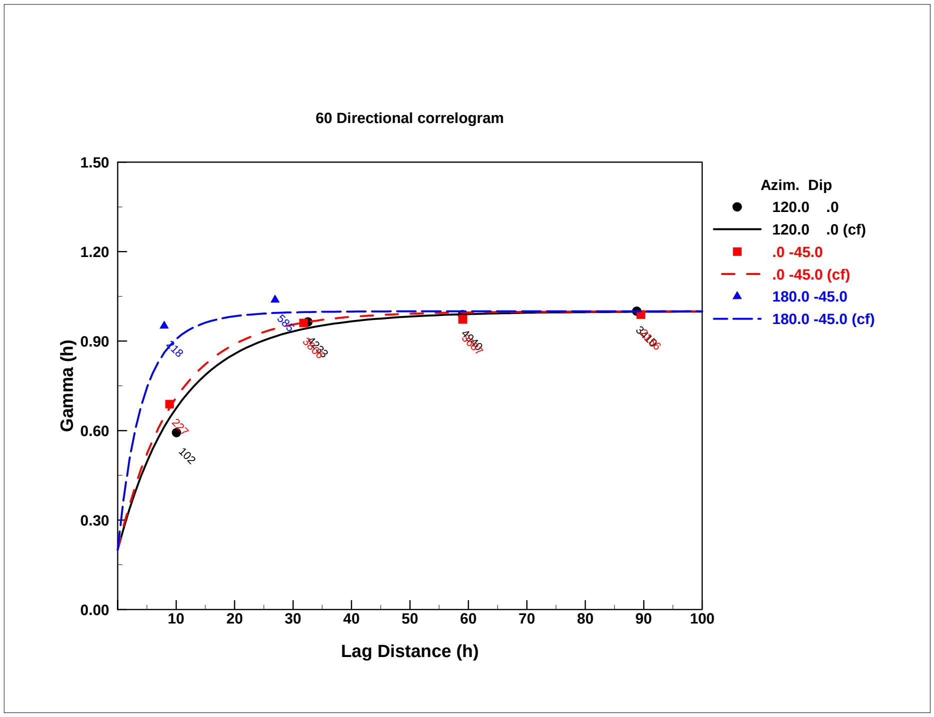

51 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
270.0 .0
270.0 .0 (cf)
.0 -45.0
.0 -45.0 (cf)
180.0 -45.0
180.0 -45.0 (cf)
985
2172
1421
323


52 DH Correlogram
Gamma(h)= .2 + .735Exp17.3(h) + .065Exp2481.2(h)
Gamma (h)
1.50
1.20
0.90
0.60
0.30
0.00
5
10
15
20
25
30
35
40
45
50
Lag Distance (h)
3748
3240
2858
2540
Azim. Dip
.0 .0
.0 .0 (cf)

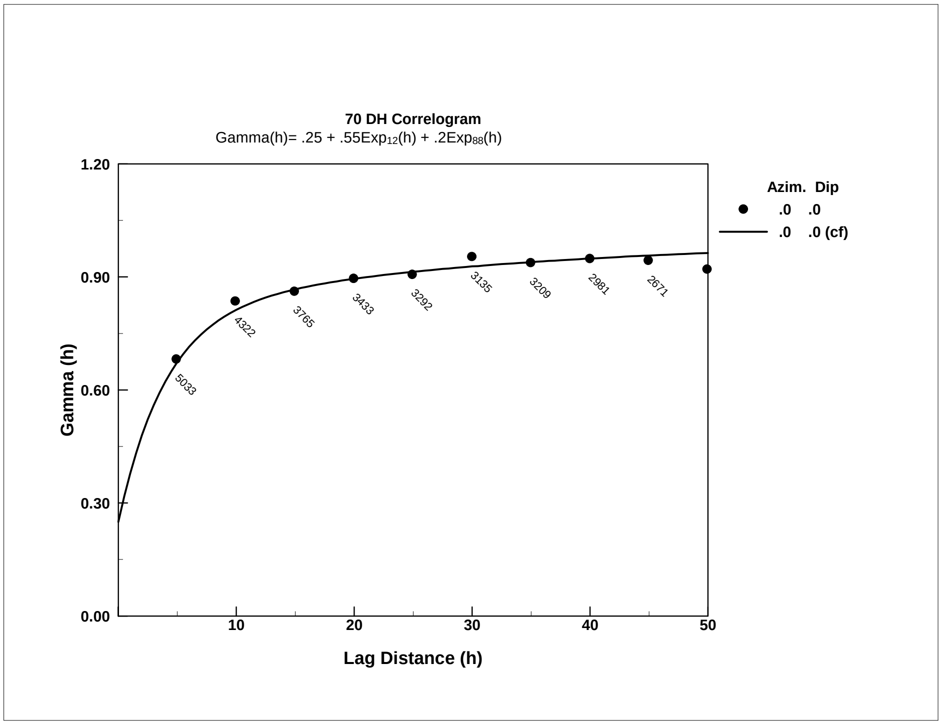

52 Directional correlogram
Gamma (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Lag Distance (h)
Azim. Dip
60.0 .0
60.0 .0 (cf)
330.0 -30.0
330.0 -30.0 (cf)
150.0 -60.0
150.0 -60.0 (cf)



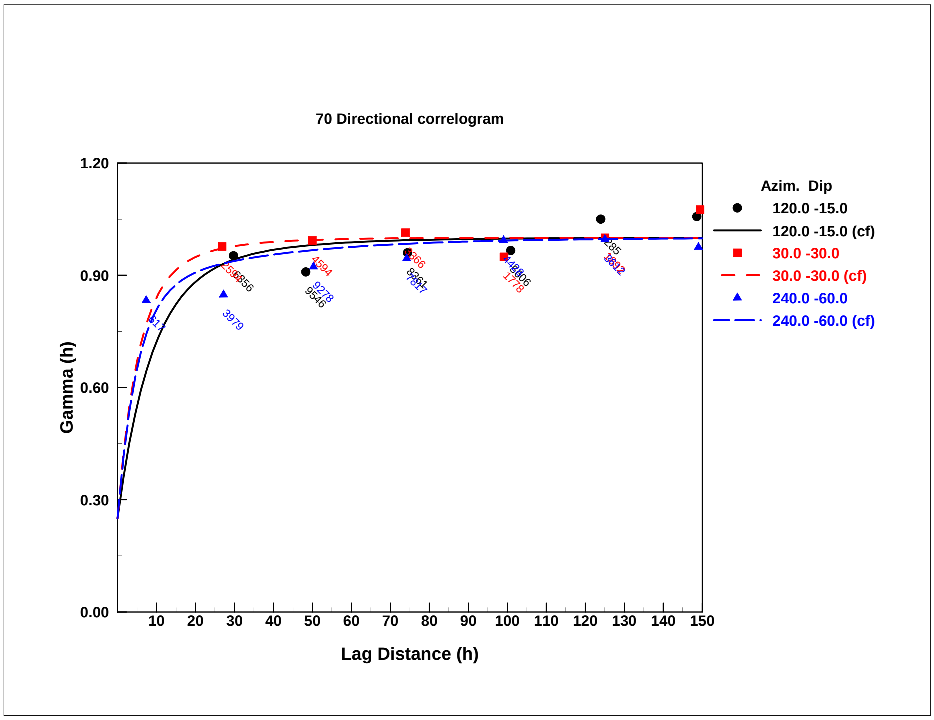
60 DH Correlogram
Gamma(h)= .2 + .7Exp11.8(h) + .1Exp11.8(h)
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
5
10
15
20
25
30
35
40
45
50
882
674
477
Azim. Dip
.0 .0
.0 .0 (cf)



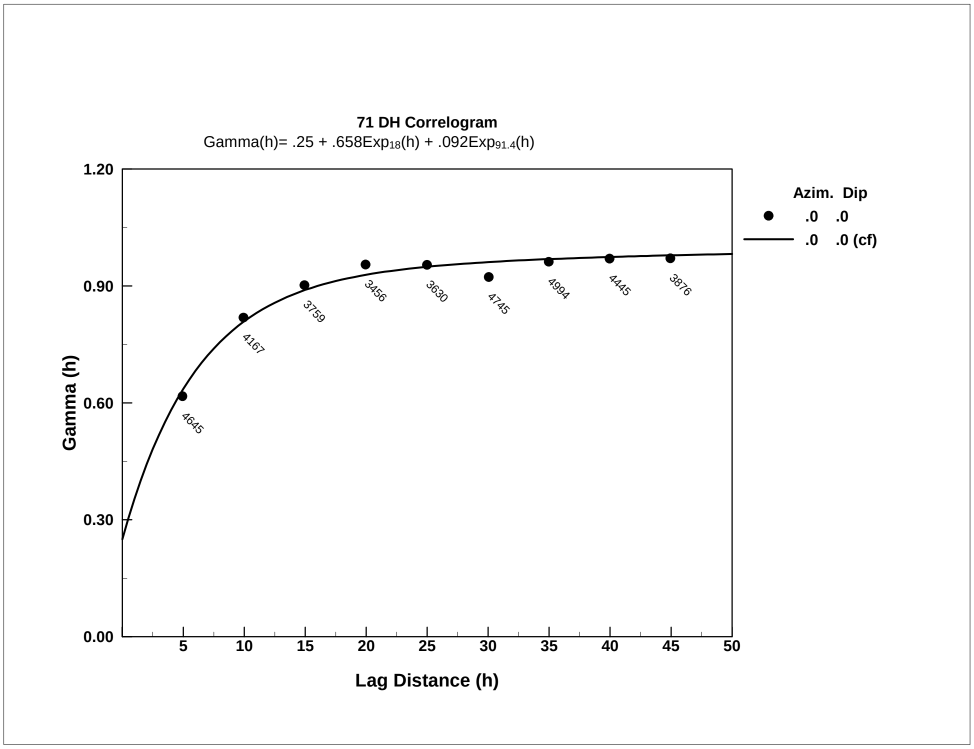
60 Directional correlogram
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
80
90
100
118
227
102
Azim. Dip
120.0 .0
120.0 .0 (cf)
.0 -45.0
.0 -45.0 (cf)
180.0 -45.0
180.0 -45.0 (cf)

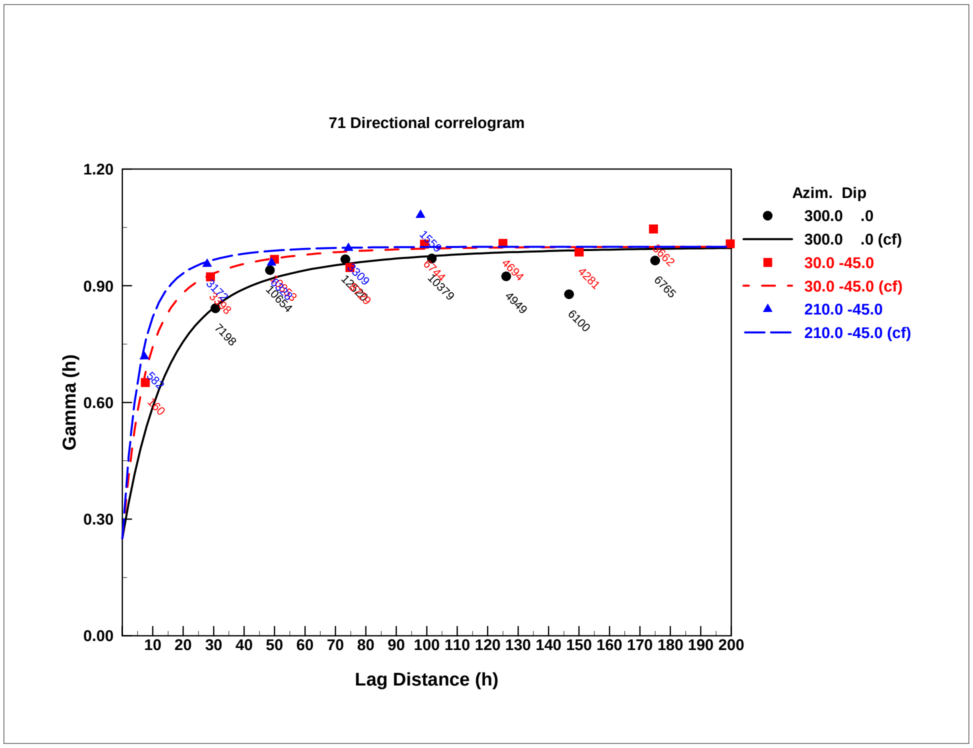


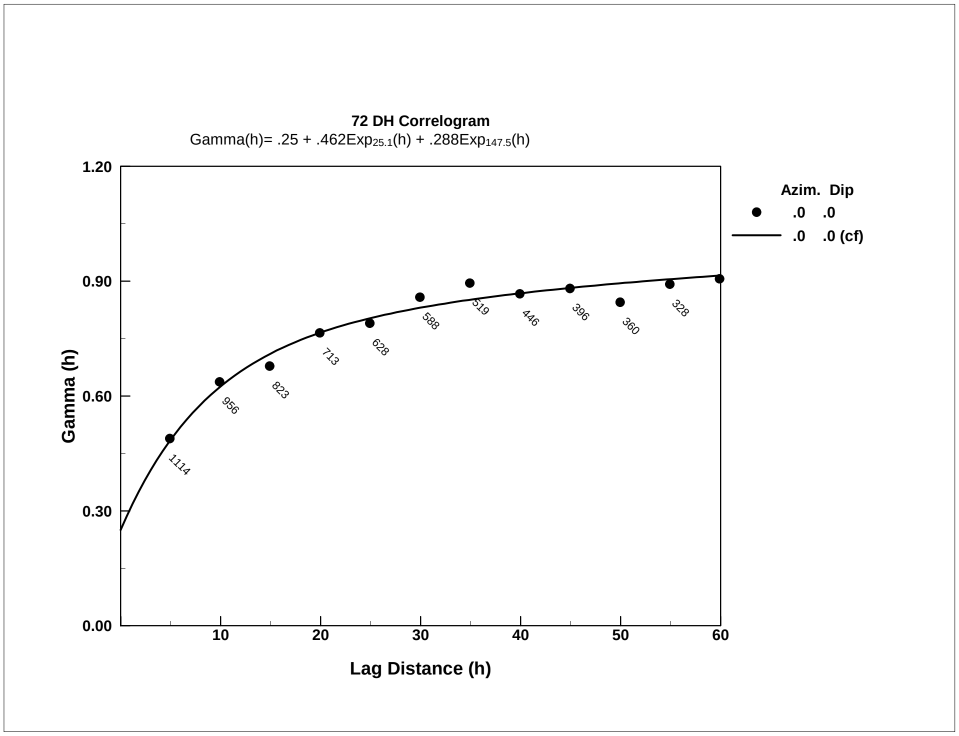
70 DH Correlogram
Gamma(h)= .25 + .55Exp12(h) + .2Exp88(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

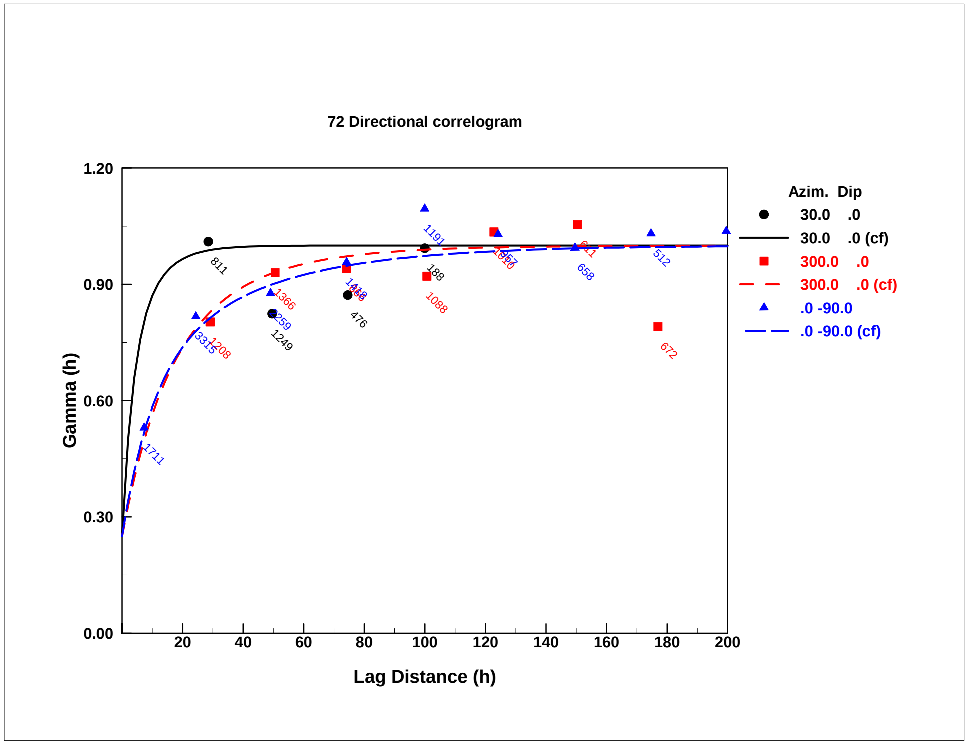


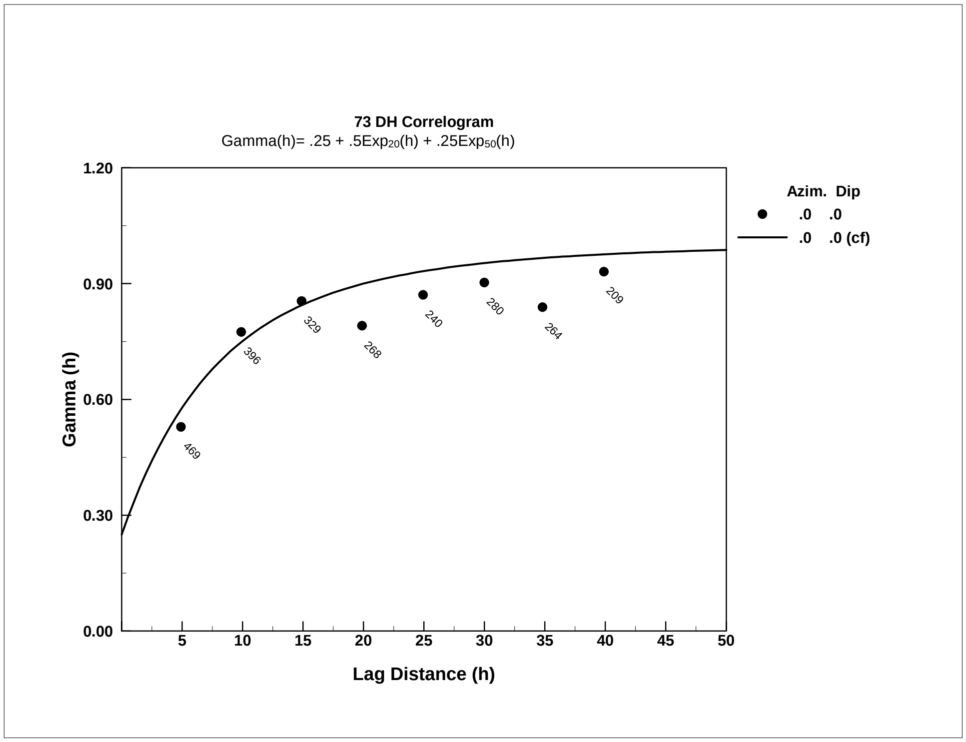
70 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
120.0 -15.0
120.0 -15.0 (cf)
30.0 -30.0
30.0 -30.0 (cf)
240.0 -60.0
240.0 -60.0 (cf)

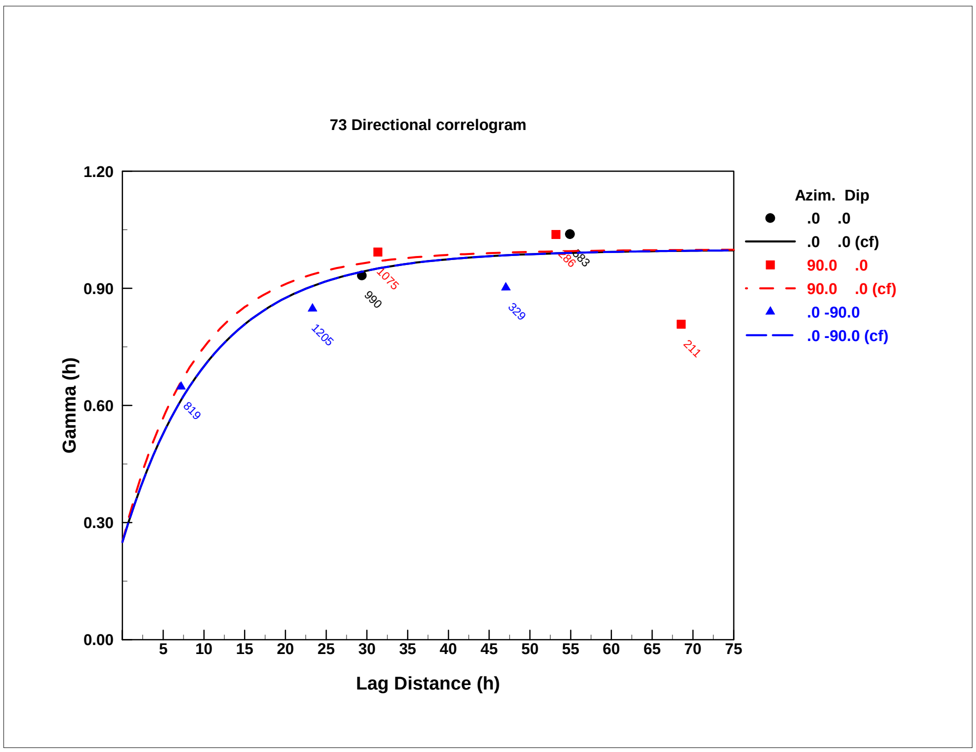

71 DH Correlogram
Gamma(h)= .25 + .658Exp18(h) + .092Exp91.4(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

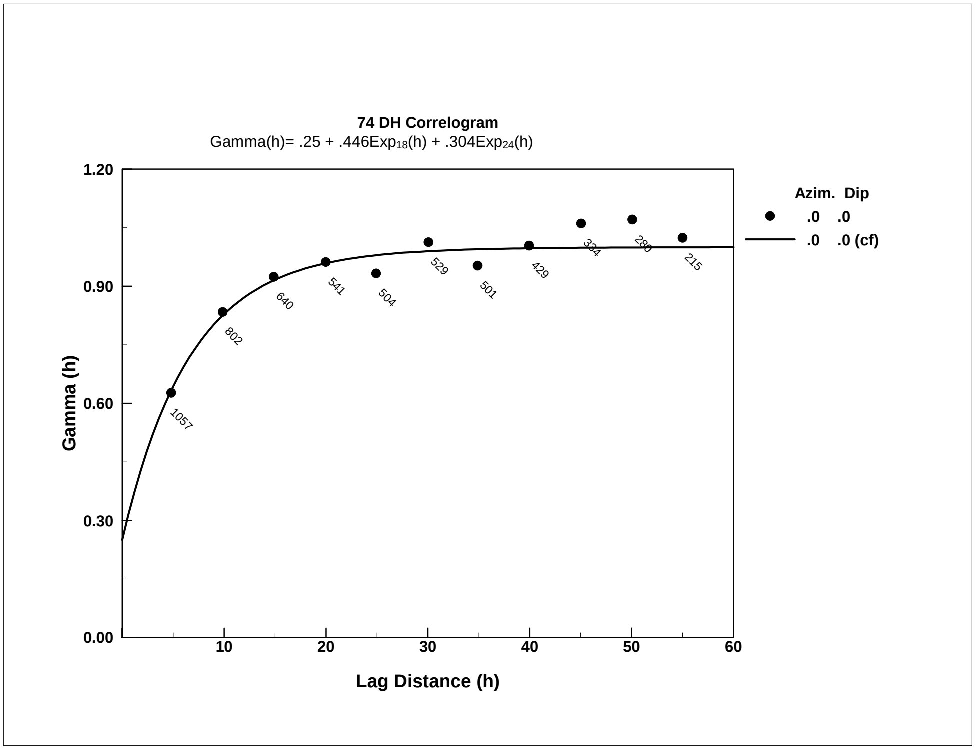

71 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
300.0 .0
300.0 .0 (cf)
30.0 -45.0
30.0 -45.0 (cf)
210.0 -45.0
210.0 -45.0 (cf)


72 DH Correlogram
Gamma(h)= .25 + .462Exp25.1(h) + .288Exp147.5(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

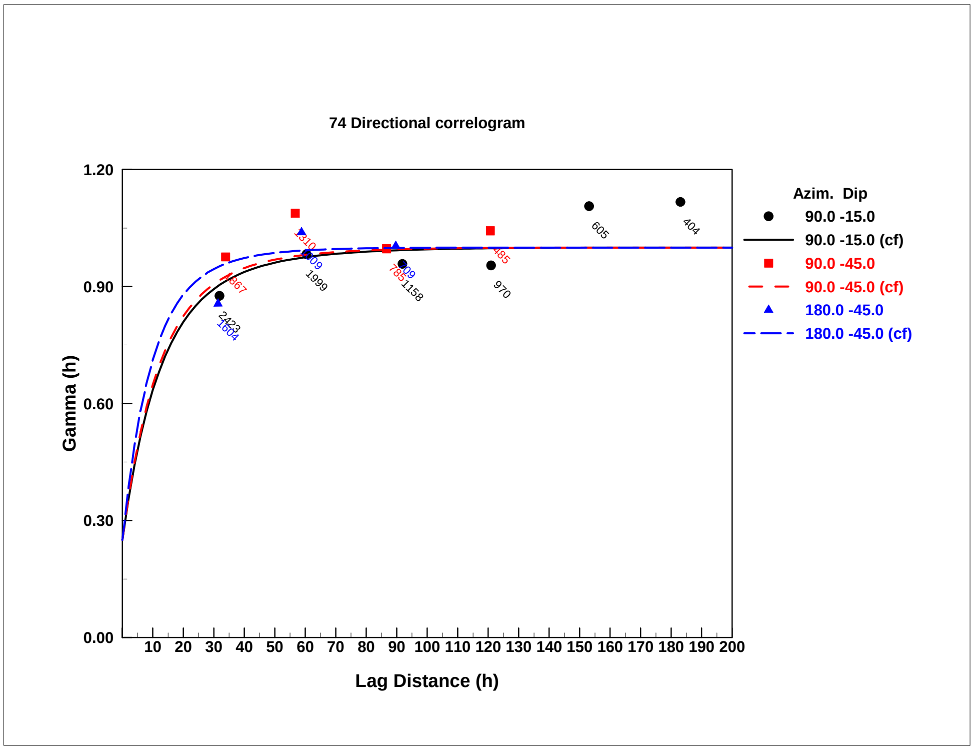

72 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
30.0 .0
30.0 .0 (cf)
300.0 .0
300.0 .0 (cf)
.0 -90.0
.0 -90.0 (cf)


73 DH Correlogram
Gamma(h)= .25 + .5Exp20(h) + .25Exp50(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)
1.20
0.90
0.60
0.30
0.00
5
10
15
20
25
30
35
40
45
50
469
396
329
268
240
280
264
209

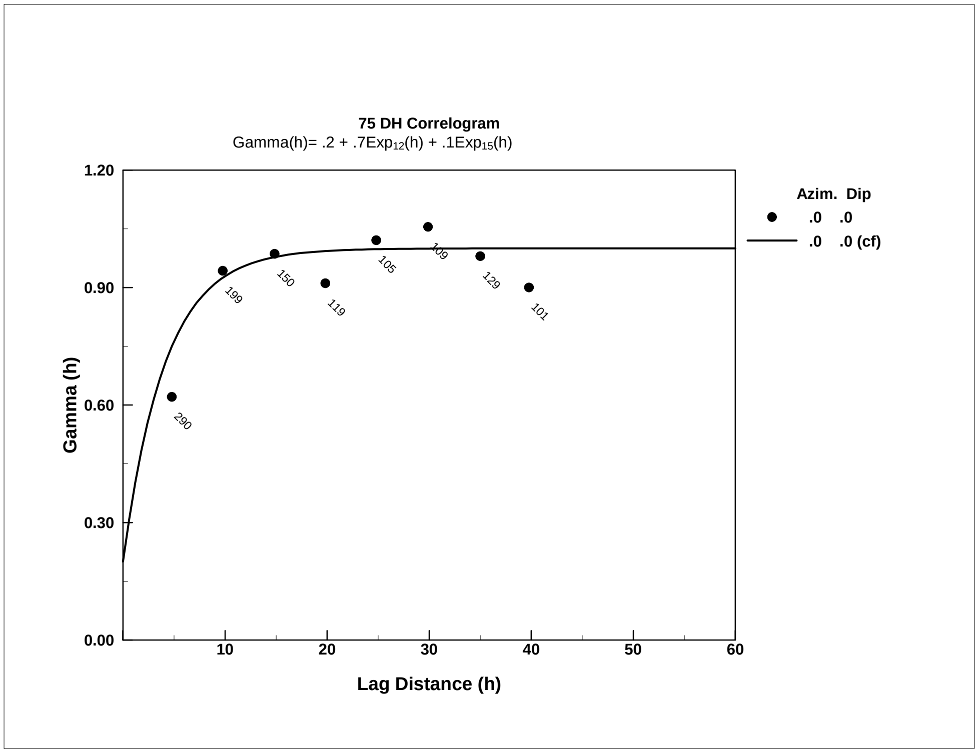

73 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)
90.0 .0
90.0 .0 (cf)
.0 -90.0
.0 -90.0 (cf)
1.20
0.90
0.60
0.30
0.00
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
819
1205
990
1075
329
211

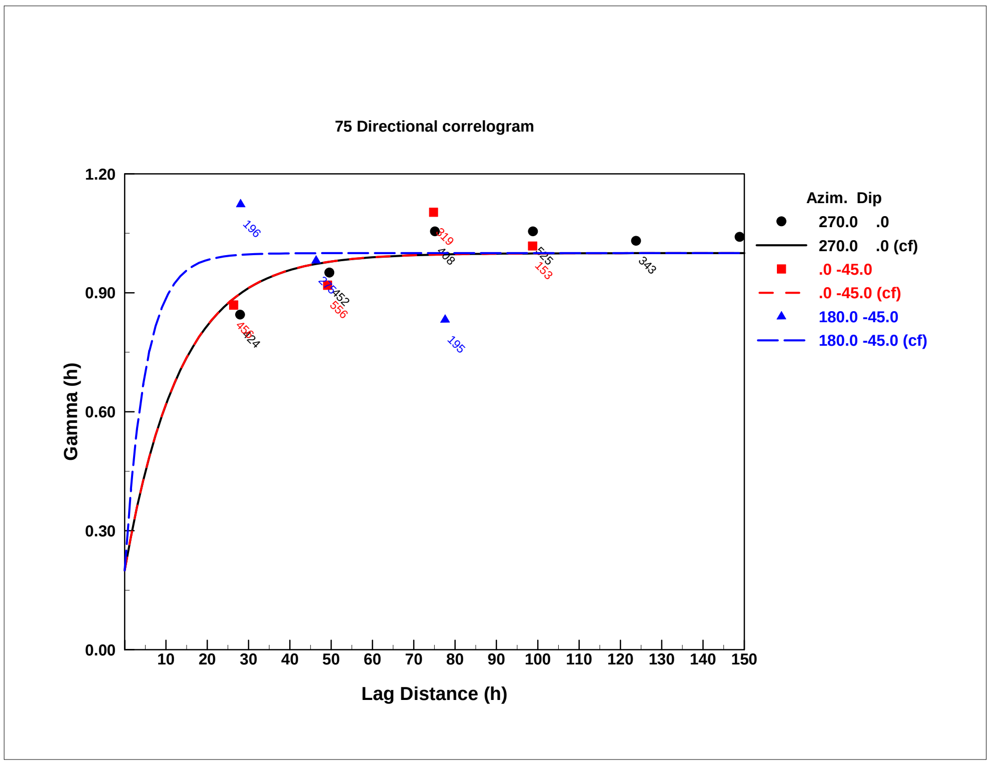


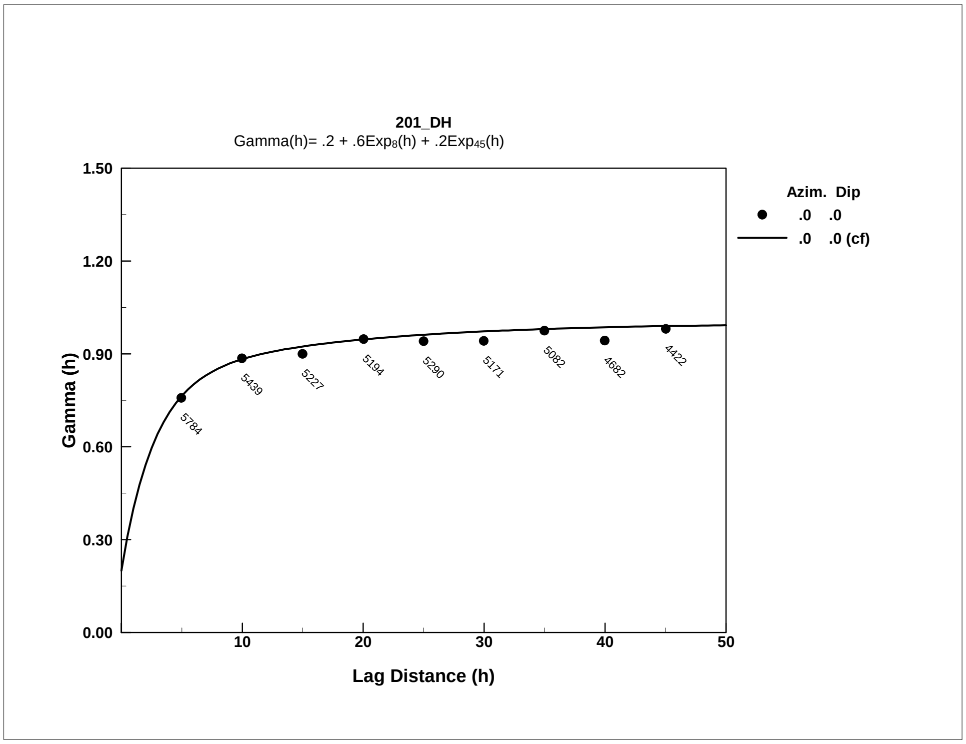
74 DH Correlogram
Gamma(h)= .25 + .446Exp18(h) + .304Exp24(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

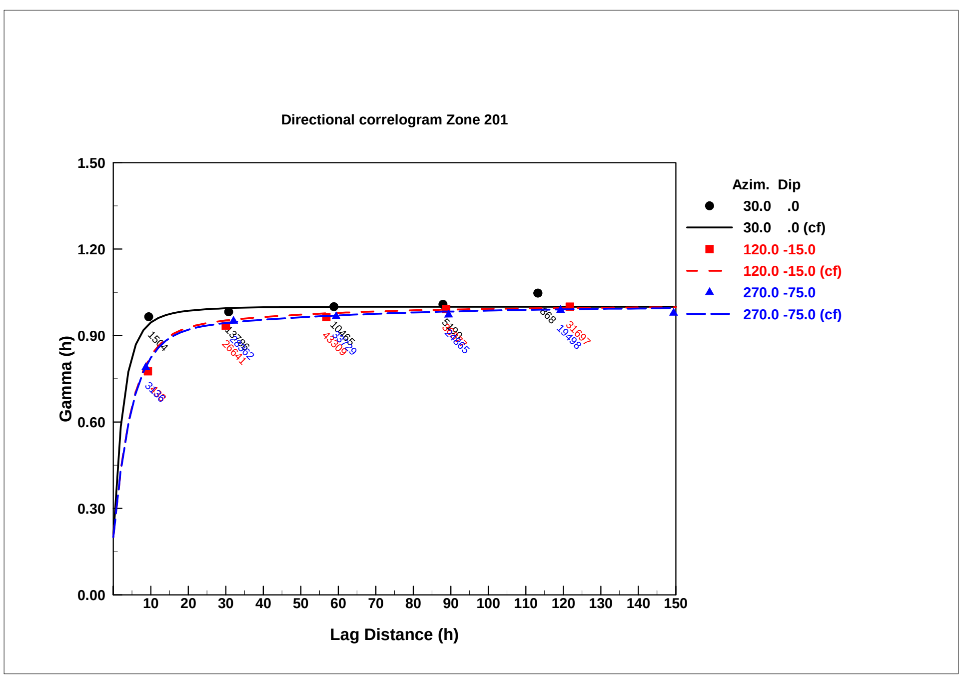


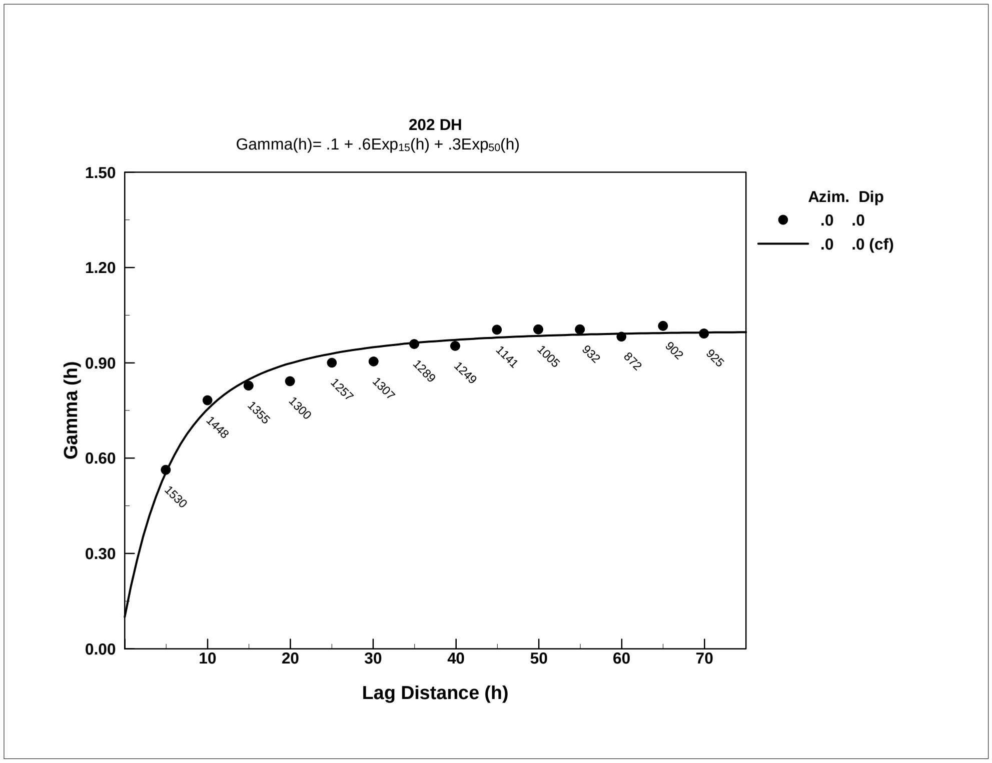
74 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
90.0 -15.0
90.0 -15.0 (cf)
90.0 -45.0
90.0 -45.0 (cf)
180.0 -45.0
180.0 -45.0 (cf)

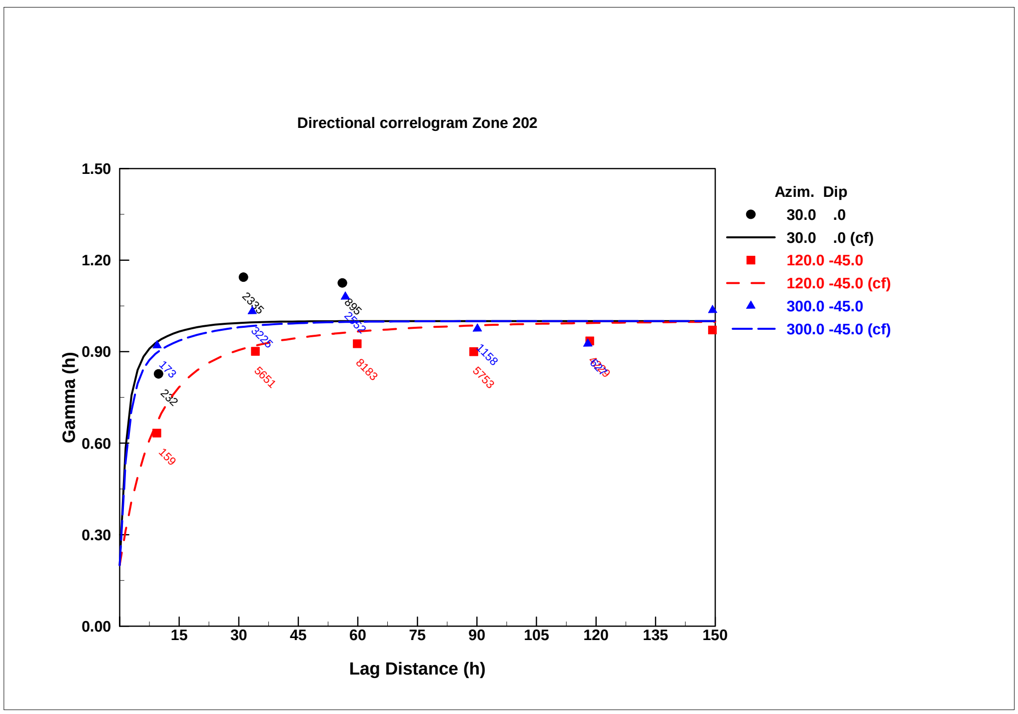

75 DH Correlogram
Gamma(h)= .2 + .7Exp12(h) + .1Exp15(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

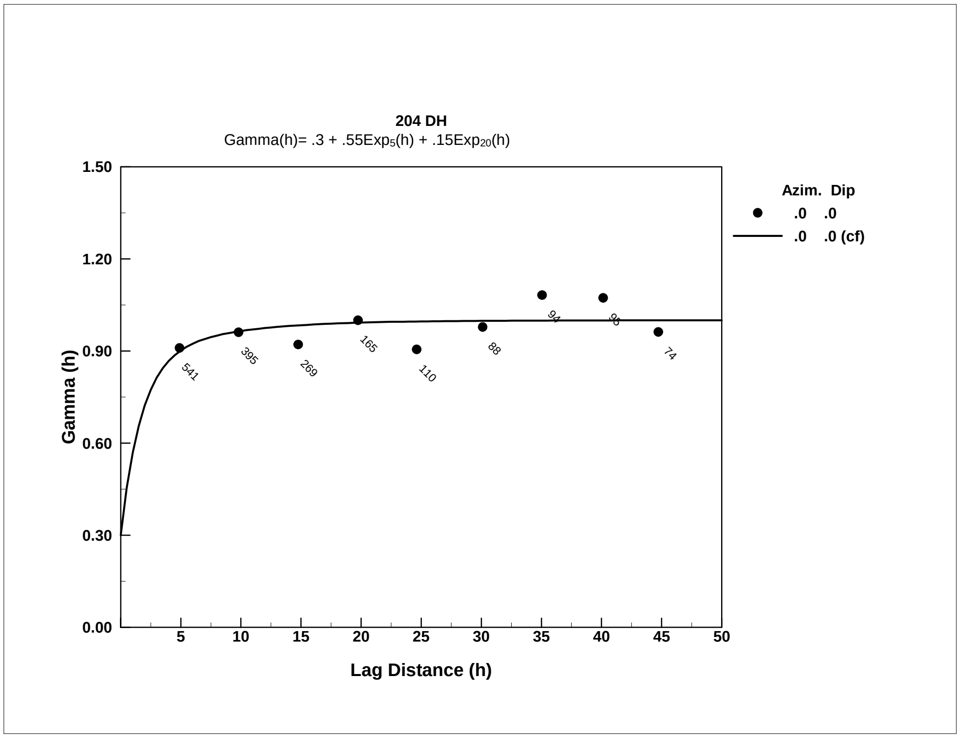

75 Directional correlogram
Gamma (h)
Lag Distance (h)
Azim. Dip
270.0 .0
270.0 .0 (cf)
.0 -45.0
.0 -45.0 (cf)
180.0 -45.0
180.0 -45.0 (cf)

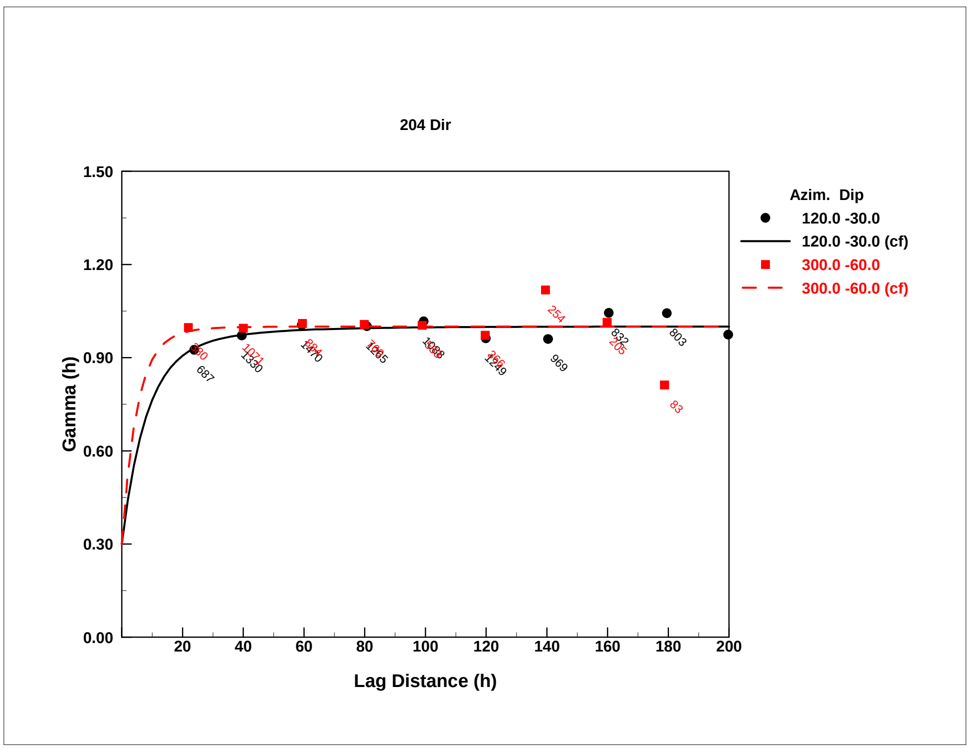

201_DH
Gamma(h)= .2 + .6Exp8(h) + .2Exp45(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

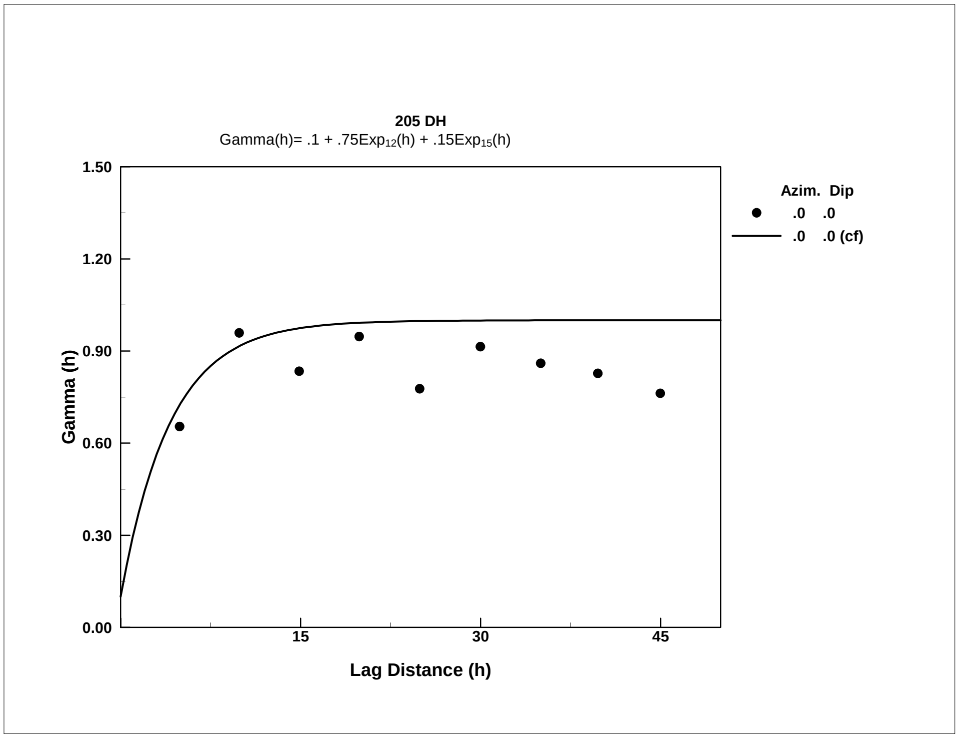

Directional correlogram Zone 201
Gamma (h)
Lag Distance (h)
Azim. Dip
30.0 .0
30.0 .0 (cf)
120.0 -15.0
120.0 -15.0 (cf)
270.0 -75.0
270.0 -75.0 (cf)


202 DH
Gamma(h)= .1 + .6Exp15(h) + .3Exp50(h)
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
Azim. Dip
.0 .0
.0 .0 (cf)
1530
1448
1355
1300
1257
1307
1289
1249
1141
1005
932
872
902
925

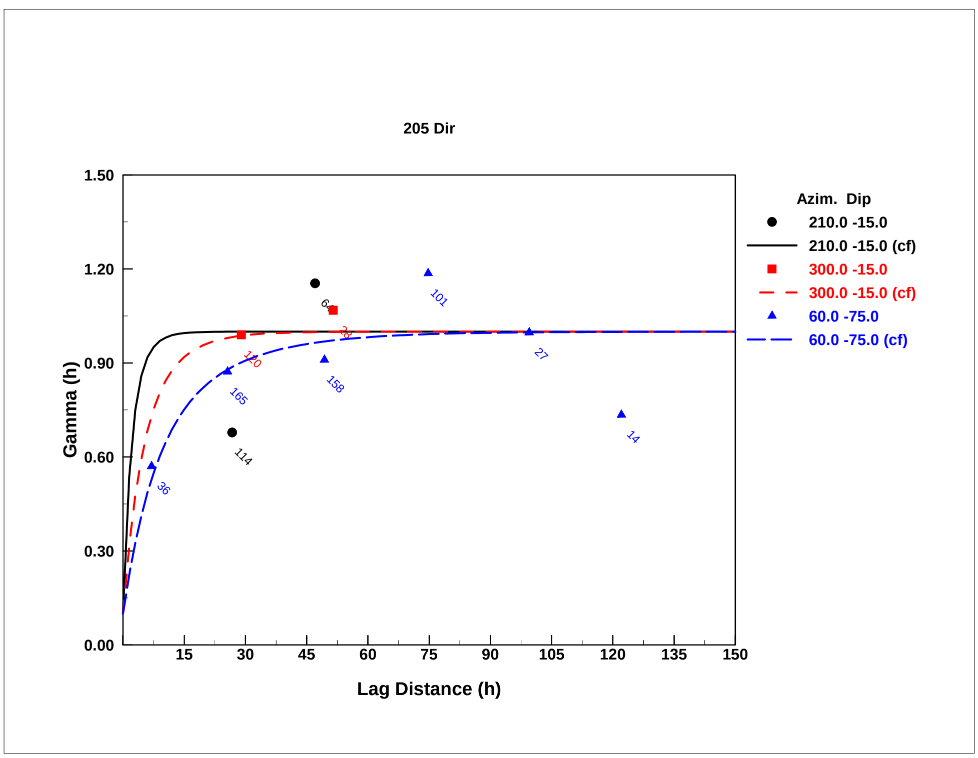

Directional correlogram Zone 202
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
15
30
45
60
75
90
105
120
135
150
Azim. Dip
30.0 .0
30.0 .0 (cf)
120.0 -45.0
120.0 -45.0 (cf)
300.0 -45.0
300.0 -45.0 (cf)


204 DH
Gamma(h)= .3 + .55Exp5(h) + .15Exp20(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)
0.00
0.30
0.60
0.90
1.20
1.50
5
10
15
20
25
30
35
40
45
50
541
395
269
165
110
88
94
95
74

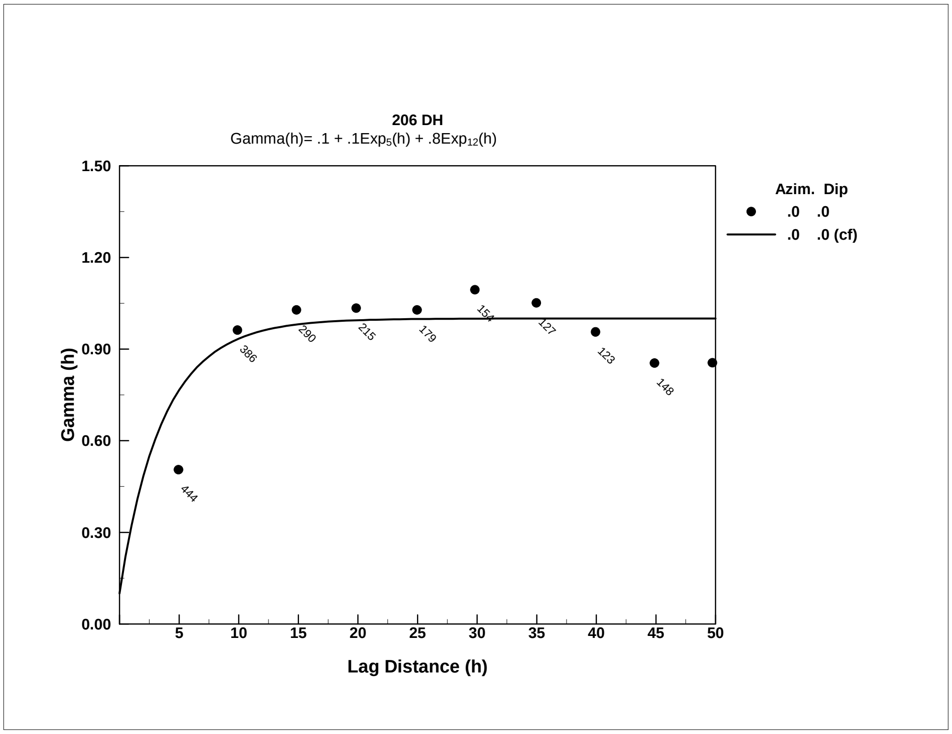

204 Dir
Gamma (h)
Lag Distance (h)
Azim. Dip
120.0 -30.0
120.0 -30.0 (cf)
300.0 -60.0
300.0 -60.0 (cf)
0.00
0.30
0.60
0.90
1.20
1.50
20
40
60
80
100
120
140
160
180
200
687
1330
1470
1265
969
832
803
254
205
83

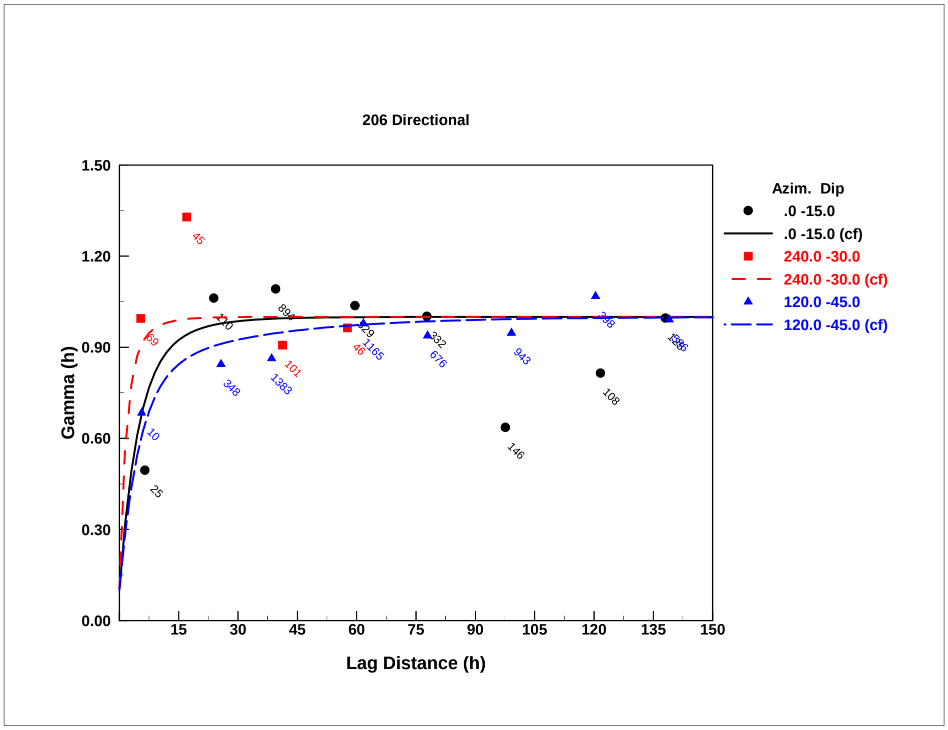


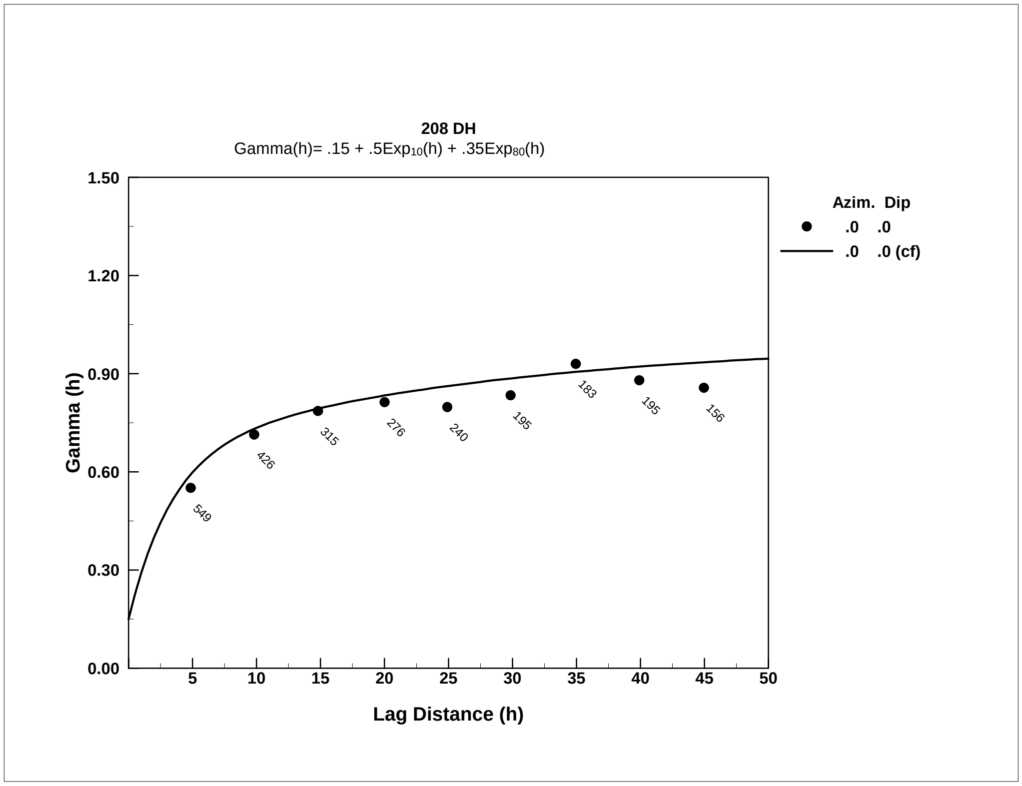
205 DH
Gamma(h)= .1 + .75Exp12(h) + .15Exp15(h)
1.50
1.20
0.90
0.60
0.30
0.00
Gamma (h)
15
30
45
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

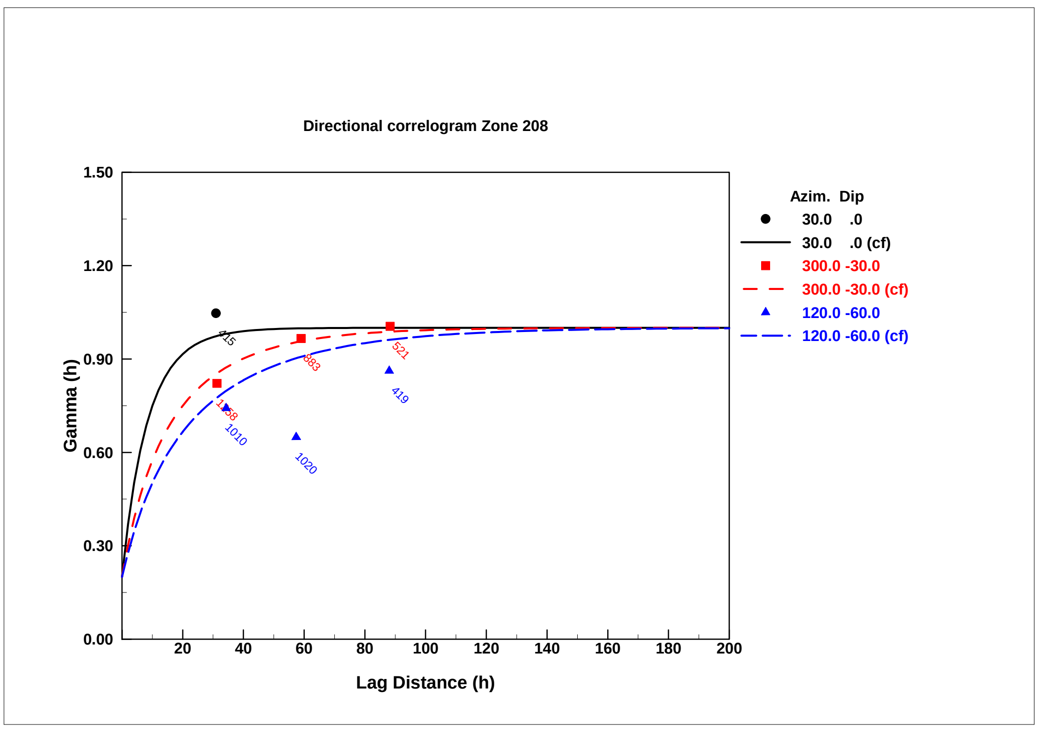


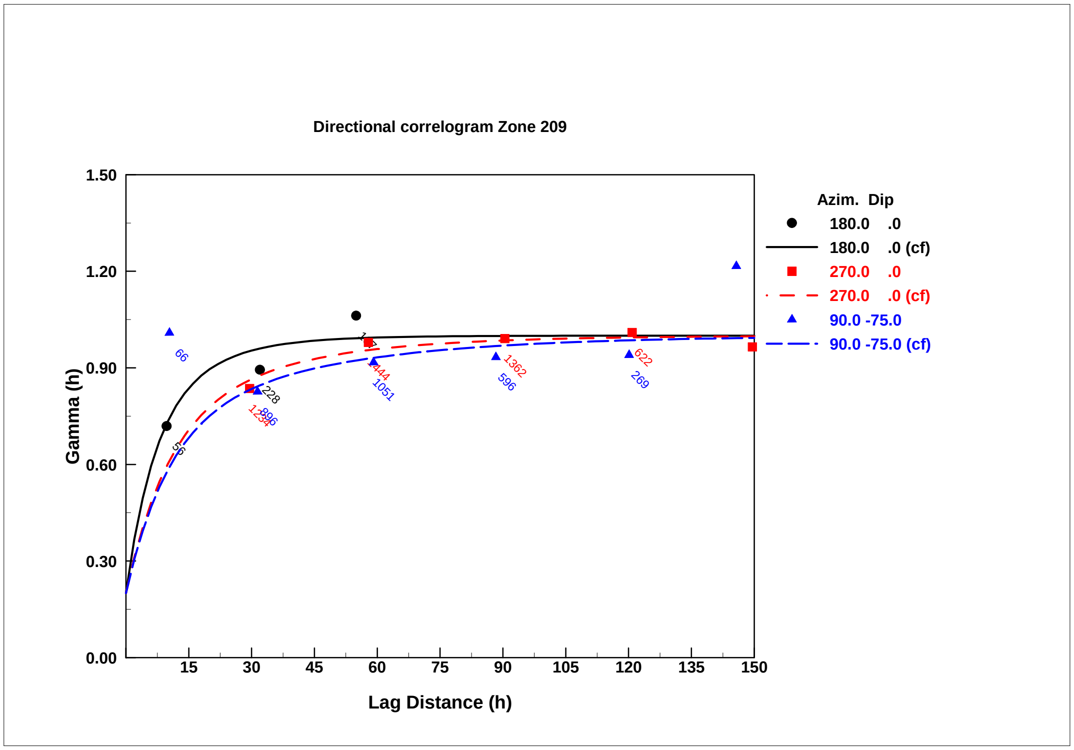
205 Dir
1.50
1.20
0.90
0.60
0.30
0.00
Gamma (h)
15
30
45
60
75
90
105
120
135
150
Lag Distance (h)
Azim. Dip
210.0 -15.0
210.0 -15.0 (cf)
300.0 -15.0
300.0 -15.0 (cf)
60.0 -75.0
60.0 -75.0 (cf)
101
165
158
27
14
114
36

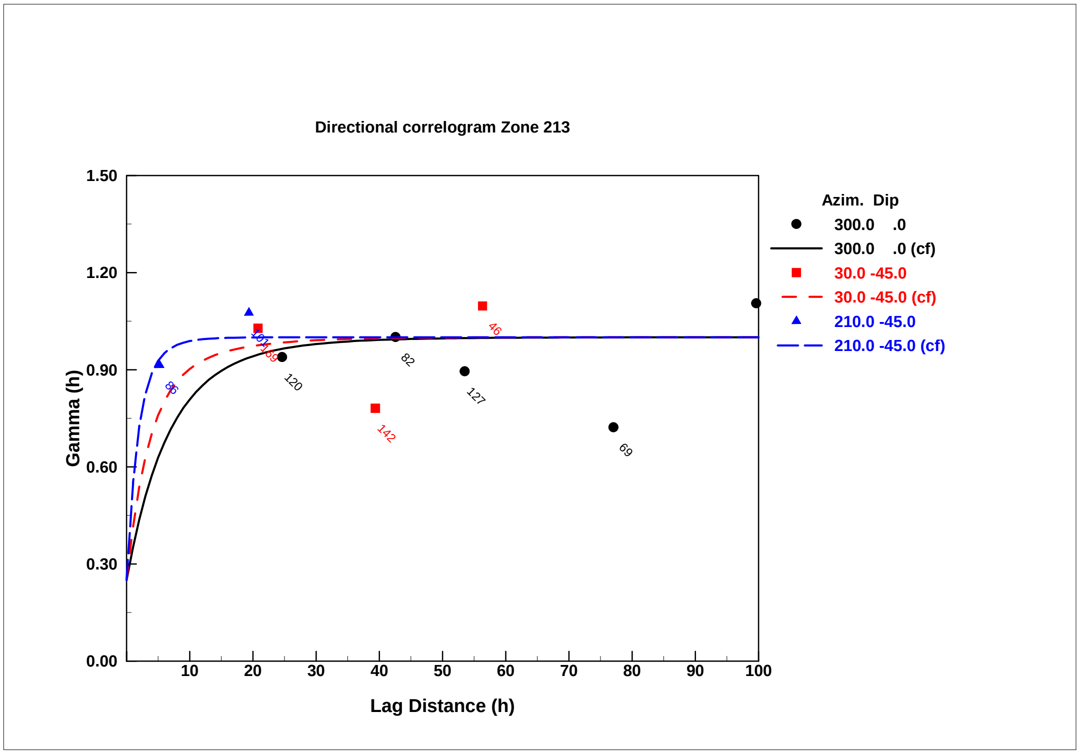

206 DH
Gamma(h)= .1 + .1Exp5(h) + .8Exp12(h)
Azim. Dip
.0 .0
.0 .0 (cf)
Gamma (h)
Lag Distance (h)

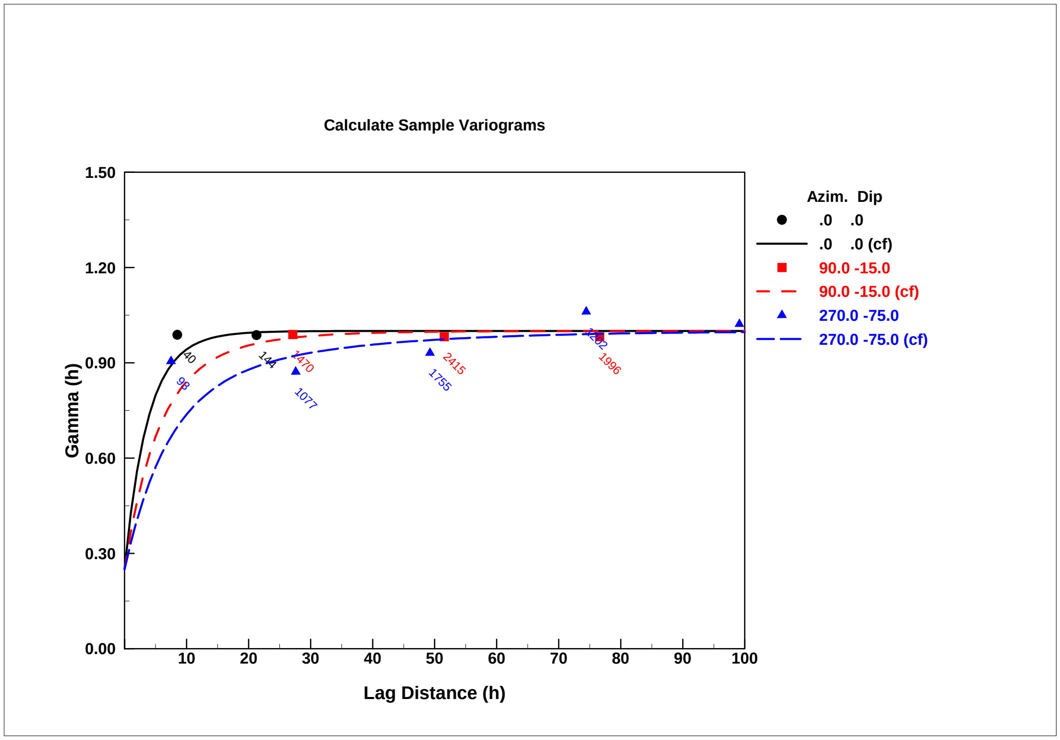

206 Directional
Azim. Dip
.0 -15.0
.0 -15.0 (cf)
240.0 -30.0
240.0 -30.0 (cf)
120.0 -45.0
120.0 -45.0 (cf)
Gamma (h)
Lag Distance (h)

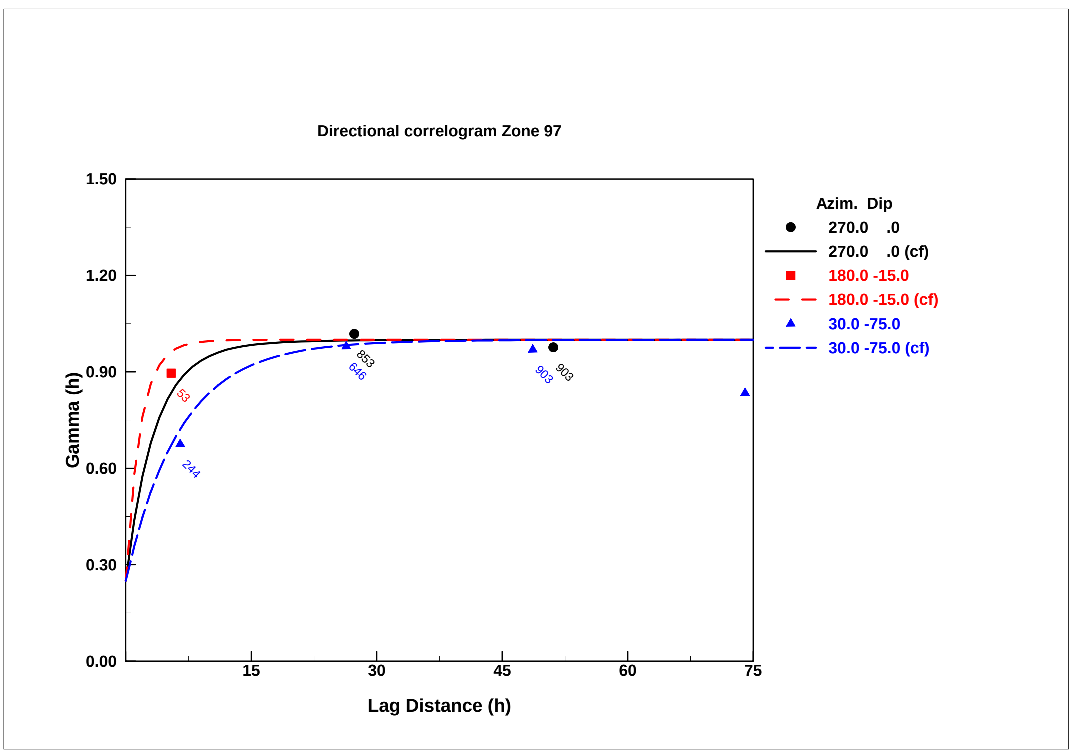

208 DH
Gamma(h)= .15 + .5Exp10(h) + .35Exp80(h)
Gamma (h)
Lag Distance (h)
Azim. Dip
.0 .0
.0 .0 (cf)

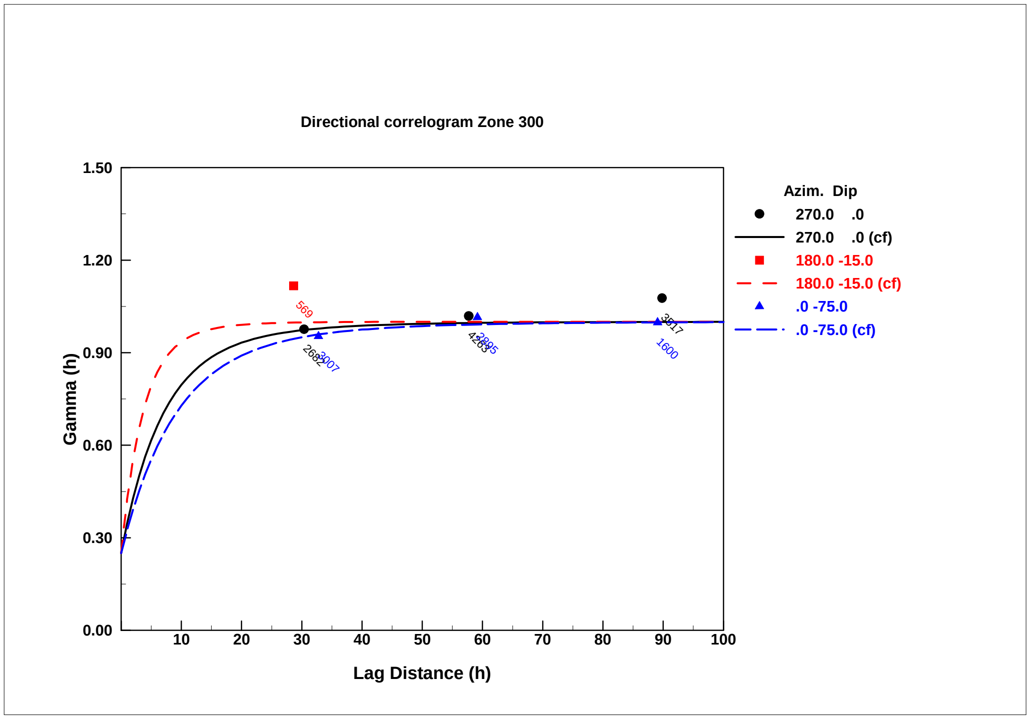

Directional correlogram Zone 208
Gamma (h)
Lag Distance (h)
Azim. Dip
30.0 .0
30.0 .0 (cf)
300.0 -30.0
300.0 -30.0 (cf)
120.0 -60.0
120.0 -60.0 (cf)


Directional correlogram Zone 209
Gamma (h)
Lag Distance (h)
Azim. Dip
180.0 .0
180.0 .0 (cf)
270.0 .0
270.0 .0 (cf)
90.0 -75.0
90.0 -75.0 (cf)

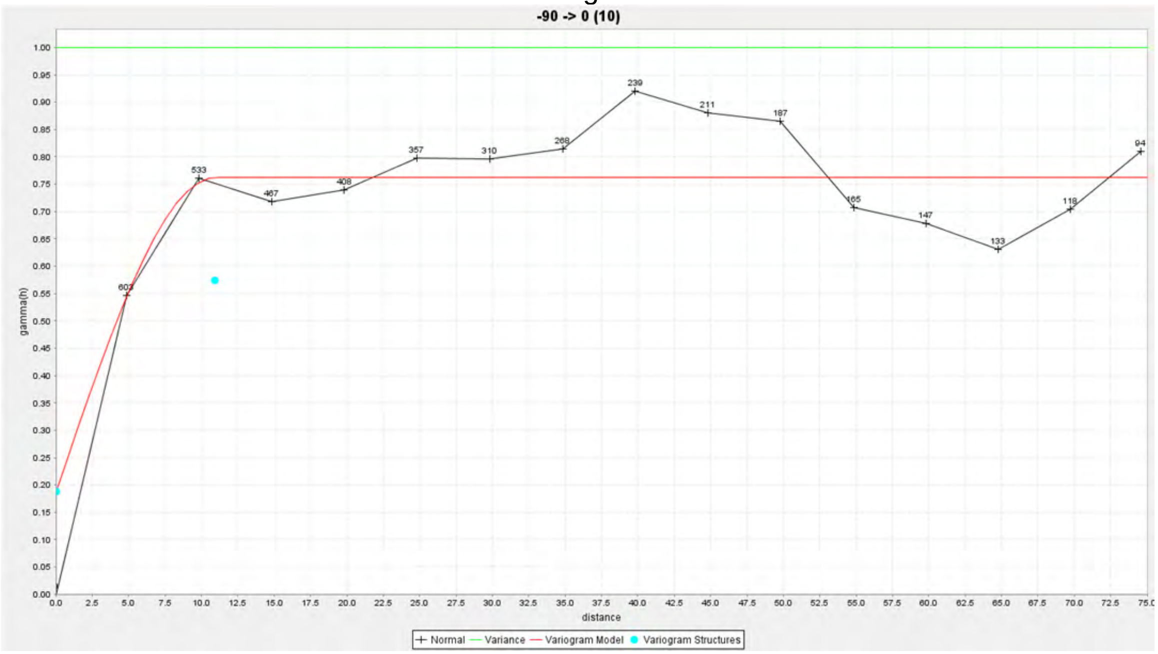

Directional correlogram Zone 213
Gamma (h)
Lag Distance (h)
Azim. Dip
300.0 .0
300.0 .0 (cf)
30.0 -45.0
30.0 -45.0 (cf)
210.0 -45.0
210.0 -45.0 (cf)


Calculate Sample Variograms
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
80
90
100
Azim. Dip
.0 .0
.0 .0 (cf)
90.0 -15.0
90.0 -15.0 (cf)
270.0 -75.0
270.0 -75.0 (cf)
40
98
144
470
1077
2415
1755
1996

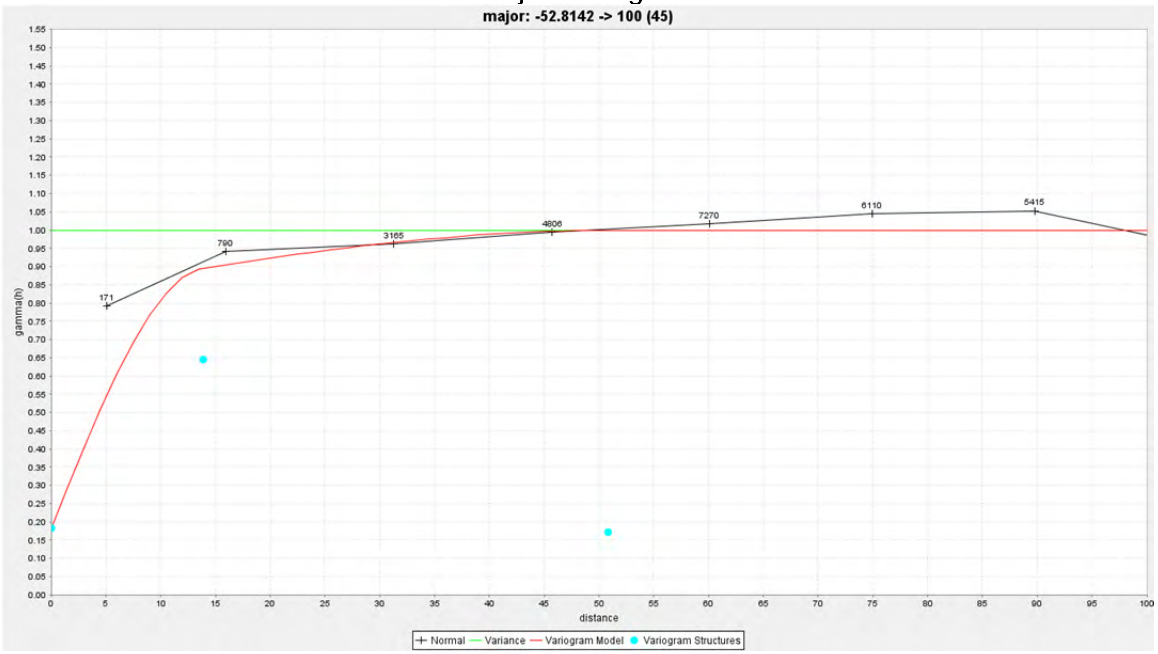

Directional correlogram Zone 97
Gamma (h)
Lag Distance (h)
1.50
1.20
0.90
0.60
0.30
0.00
15
30
45
60
75
Azim. Dip
270.0 .0
270.0 .0 (cf)
180.0 -15.0
180.0 -15.0 (cf)
30.0 -75.0
30.0 -75.0 (cf)
53
244
853
646
903
903


Directional correlogram Zone 300
Gamma (h)
1.50
1.20
0.90
0.60
0.30
0.00
10
20
30
40
50
60
70
80
90
100
Lag Distance (h)
Azim. Dip
270.0 .0
270.0 .0 (cf)
180.0 -15.0
180.0 -15.0 (cf)
.0 -75.0
.0 -75.0 (cf)
569
2682
3007
1600

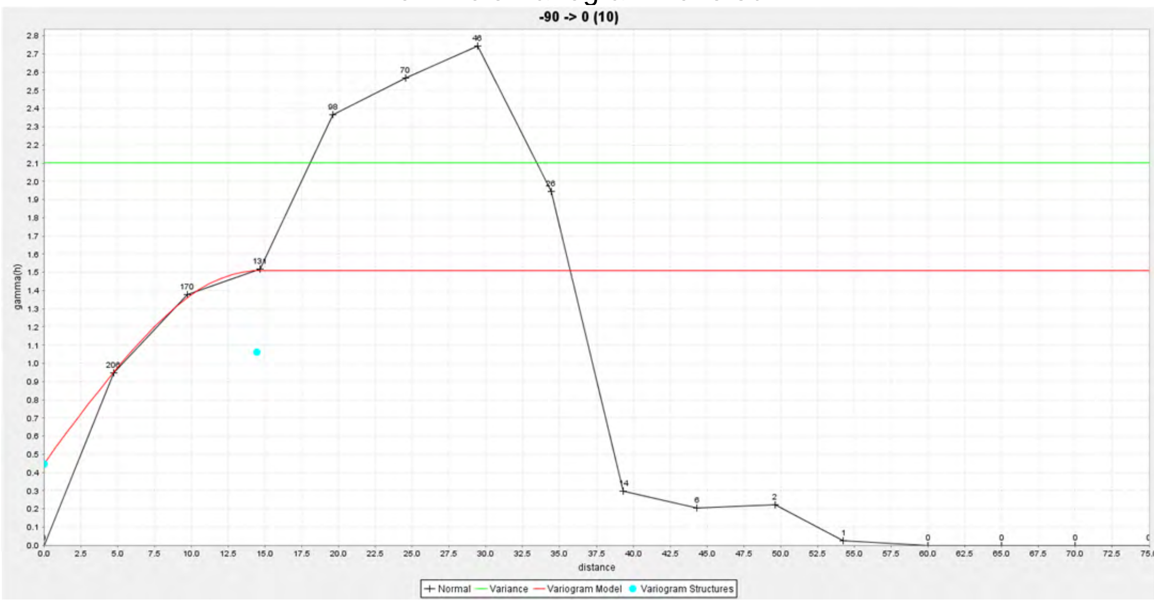
Downhole Variogram Zone 301



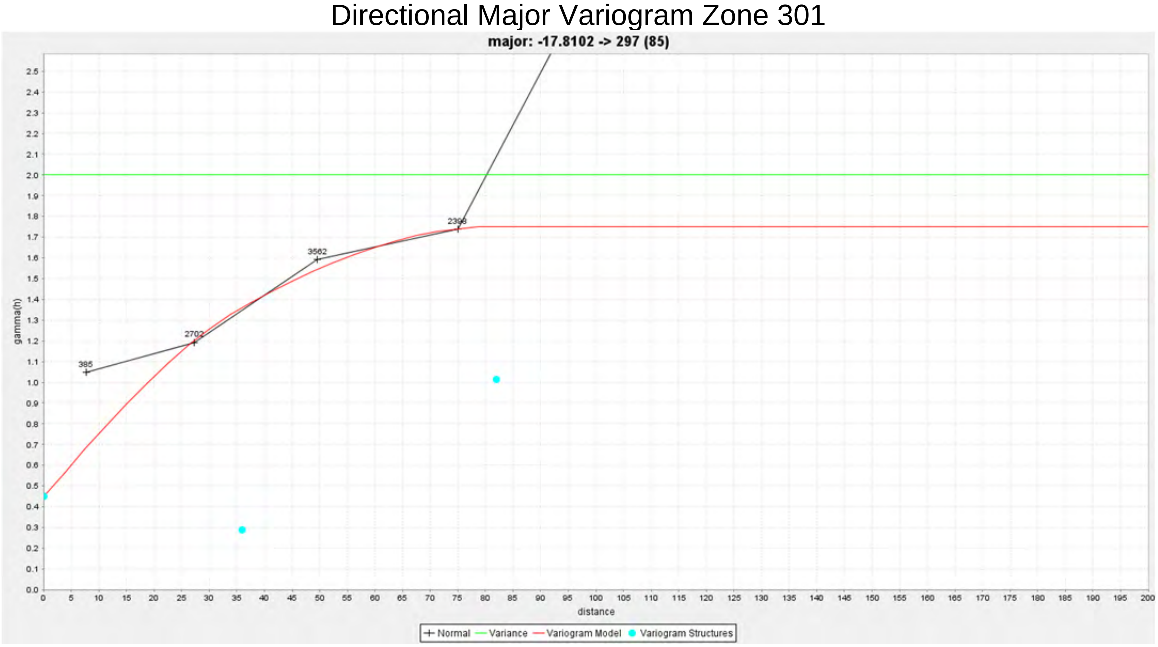
Directional Major Variogram Zone 301



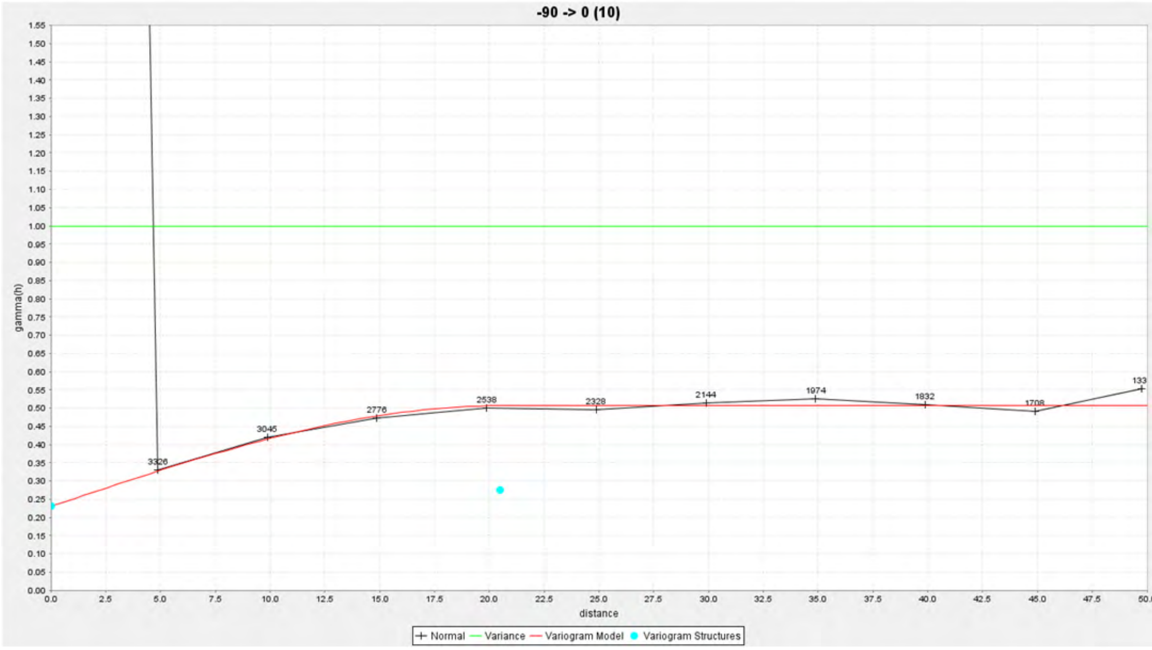
Downhole Variogram Zone 301



Directional Major Variogram Zone 301

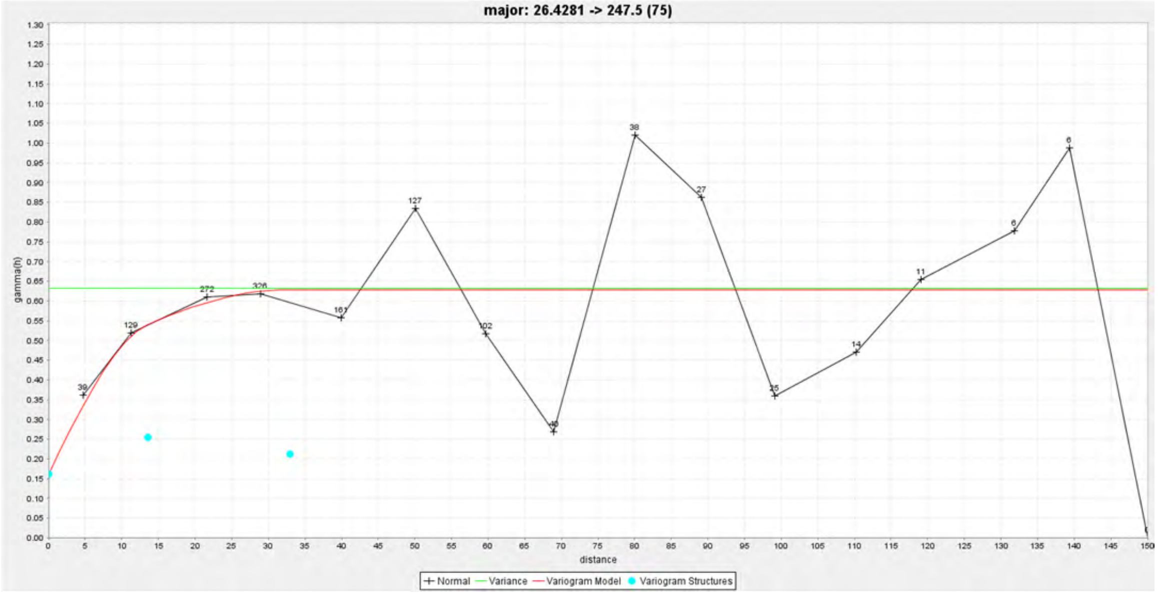


Downhole Variogram Zone 11

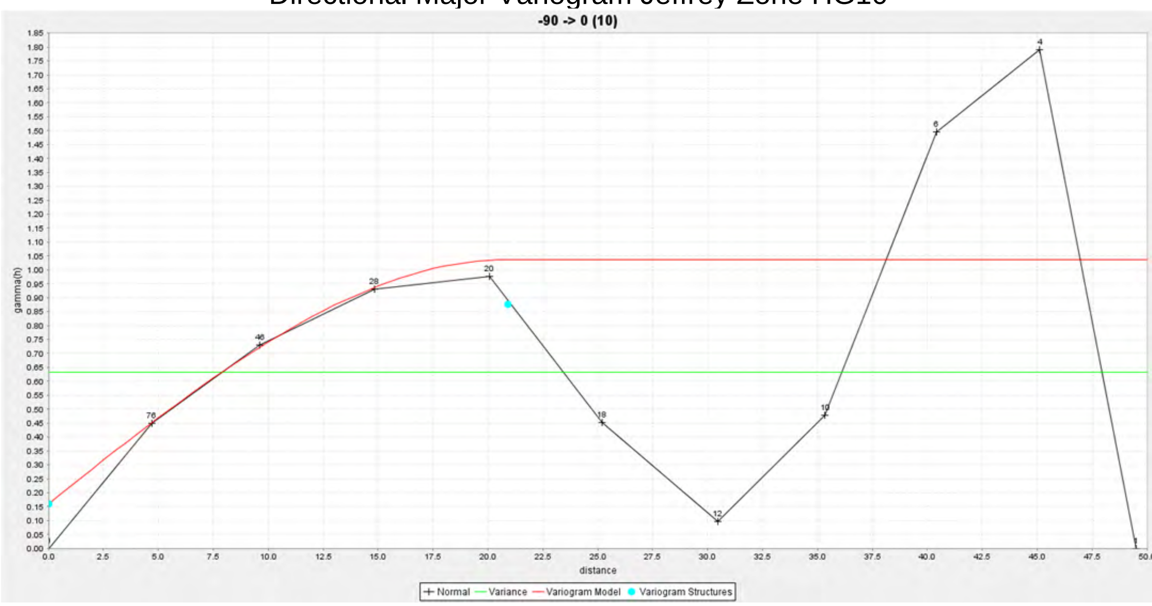


Directional Major Variogram Zone 11

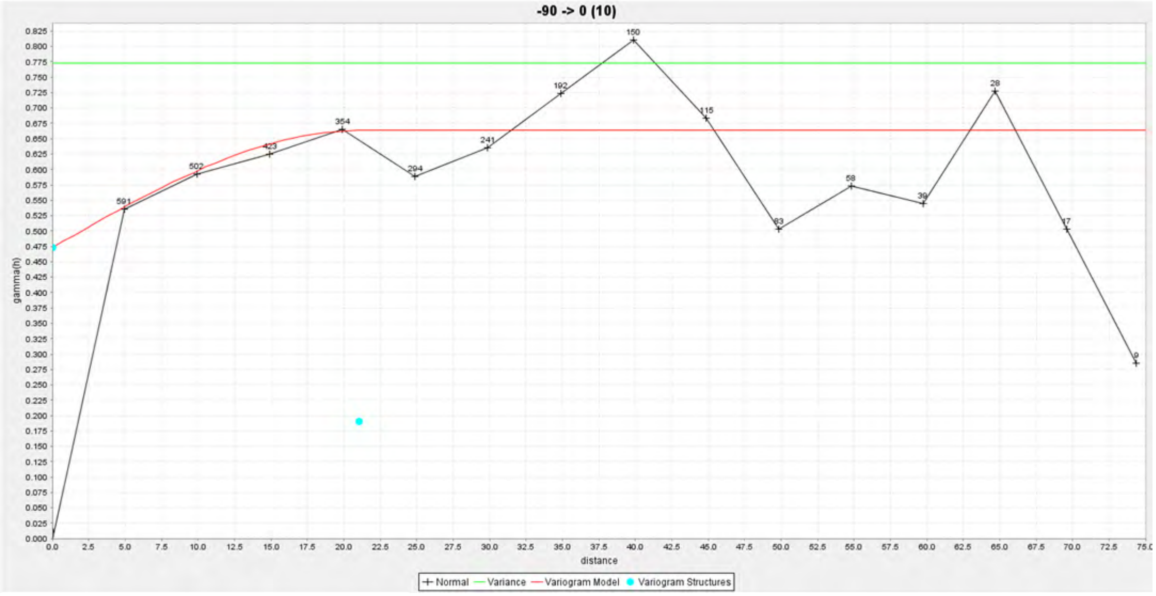
Downhole Variogram Jeffrey Zone HG10



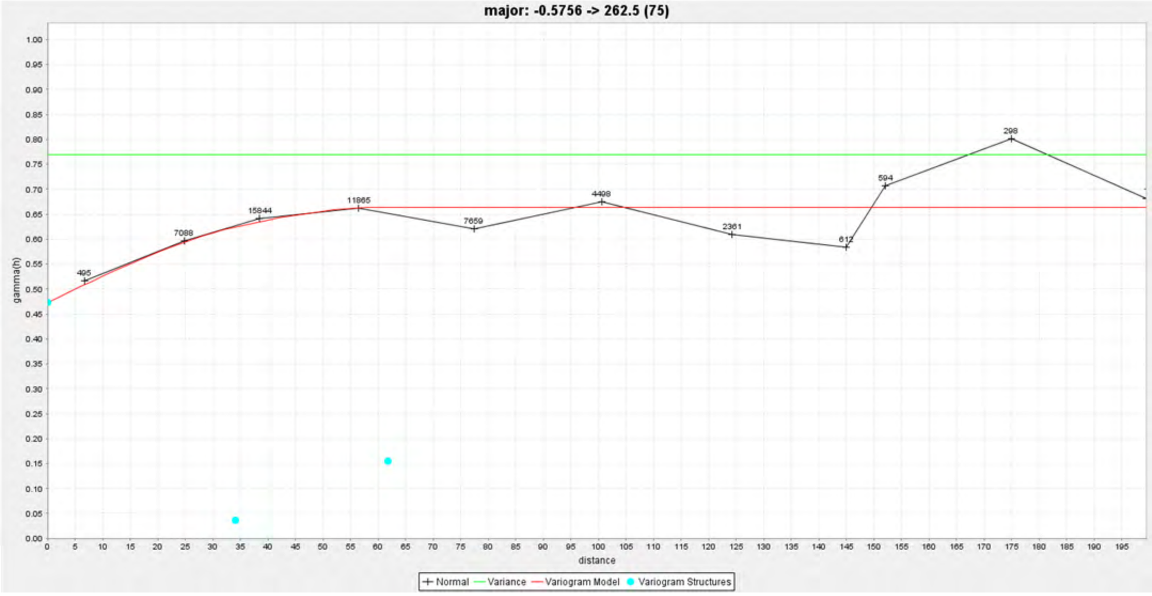
Directional Major Variogram Jeffrey Zone HG10



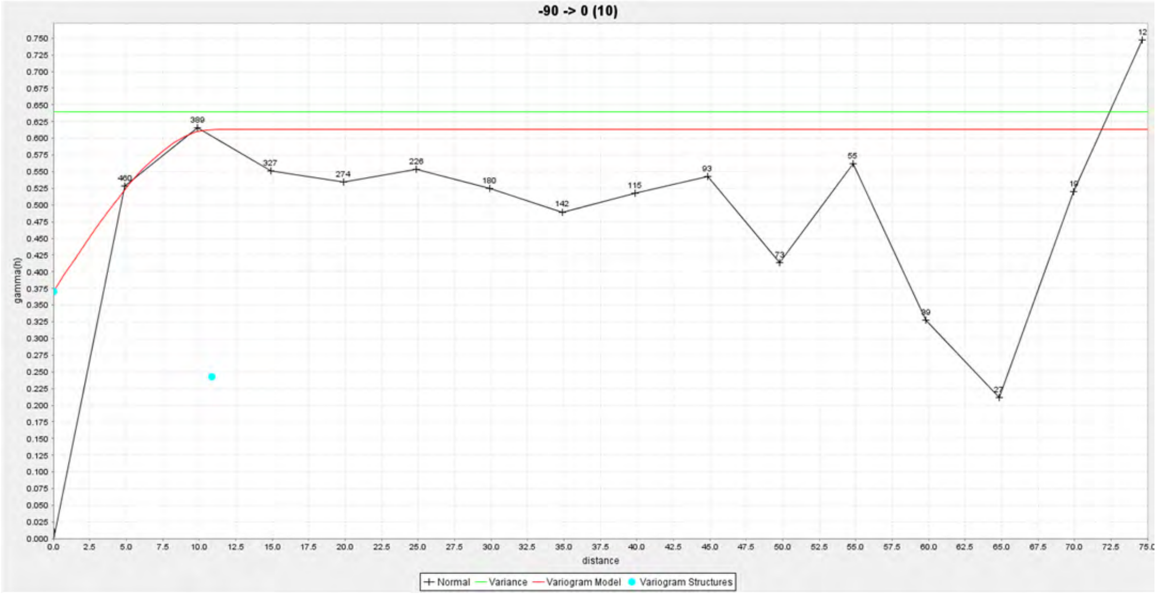
Downhole Variogram Jeffrey Zone HG11



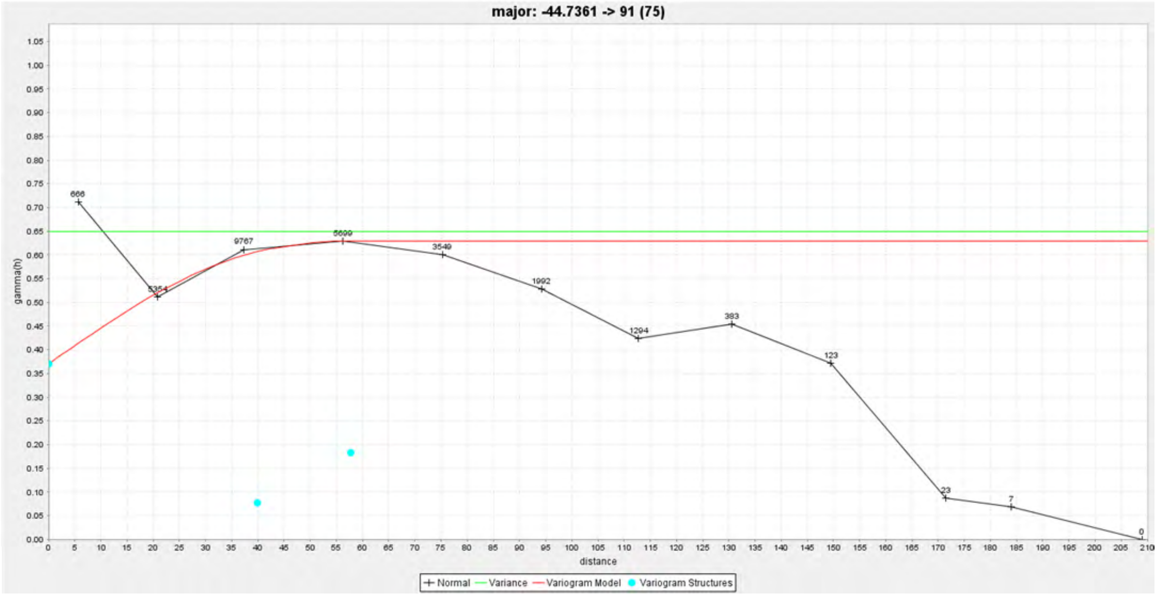
Directional Major Variogram Jeffrey Zone HG11



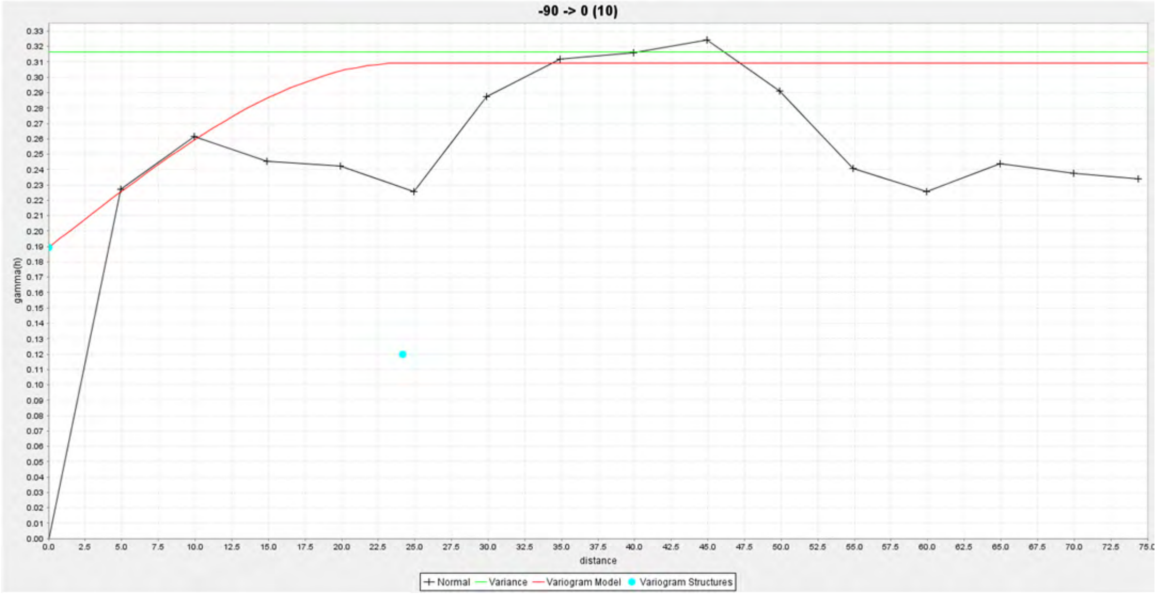
Downhole Variogram Jeffrey Zone HG12



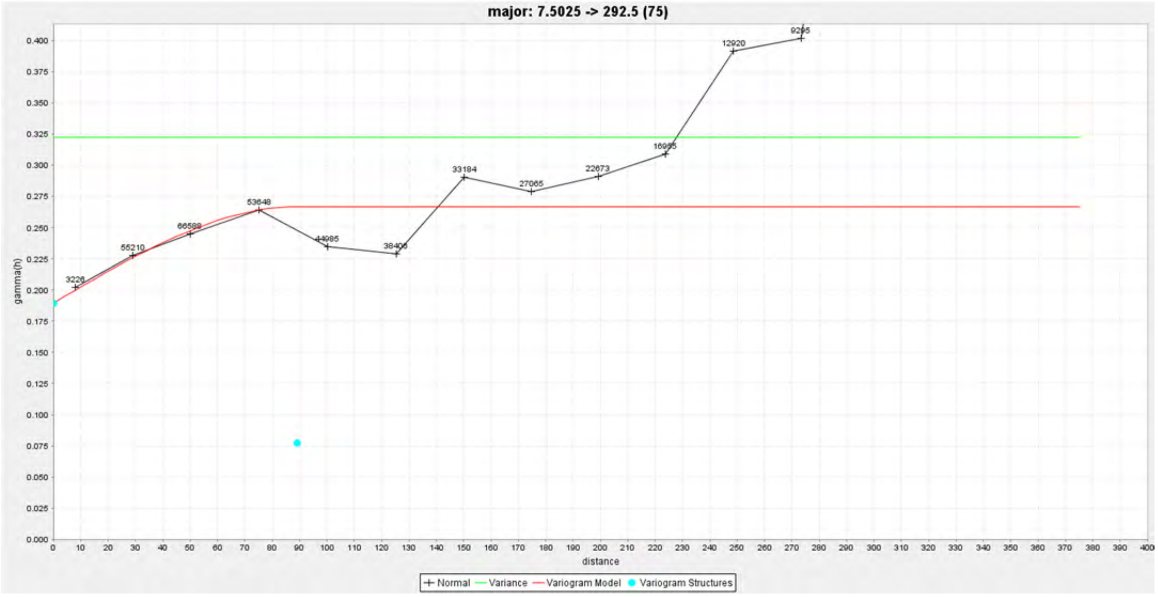
Directional Major Variogram Jeffrey Zone HG12



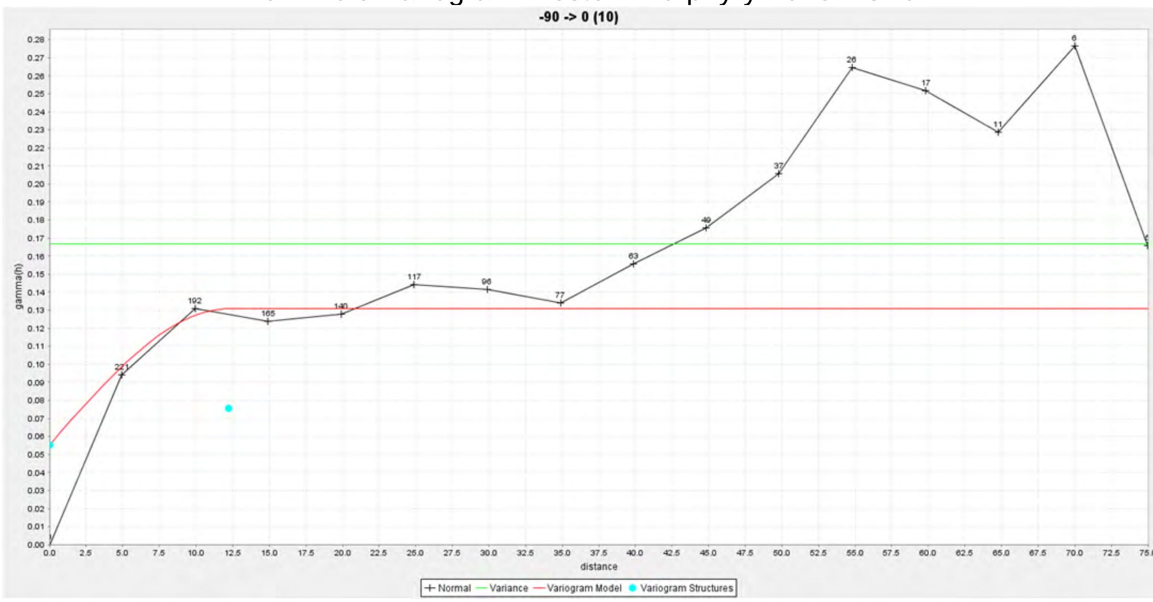
Downhole Variogram Jeffrey Zone LG01



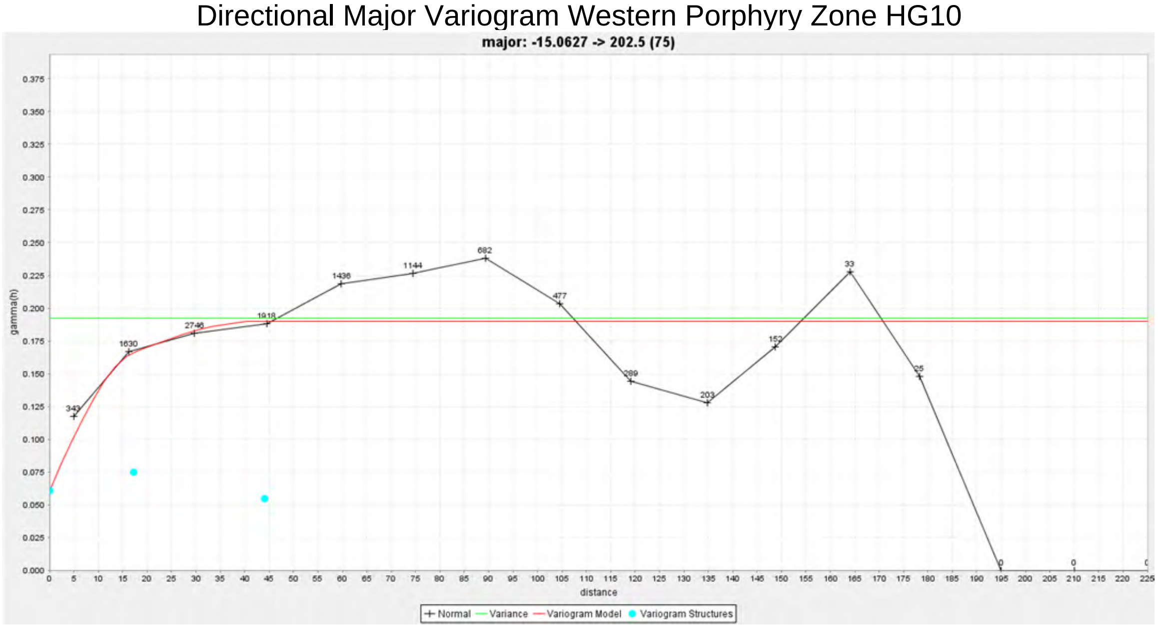
Directional Major Variogram Jeffrey Zone LG01



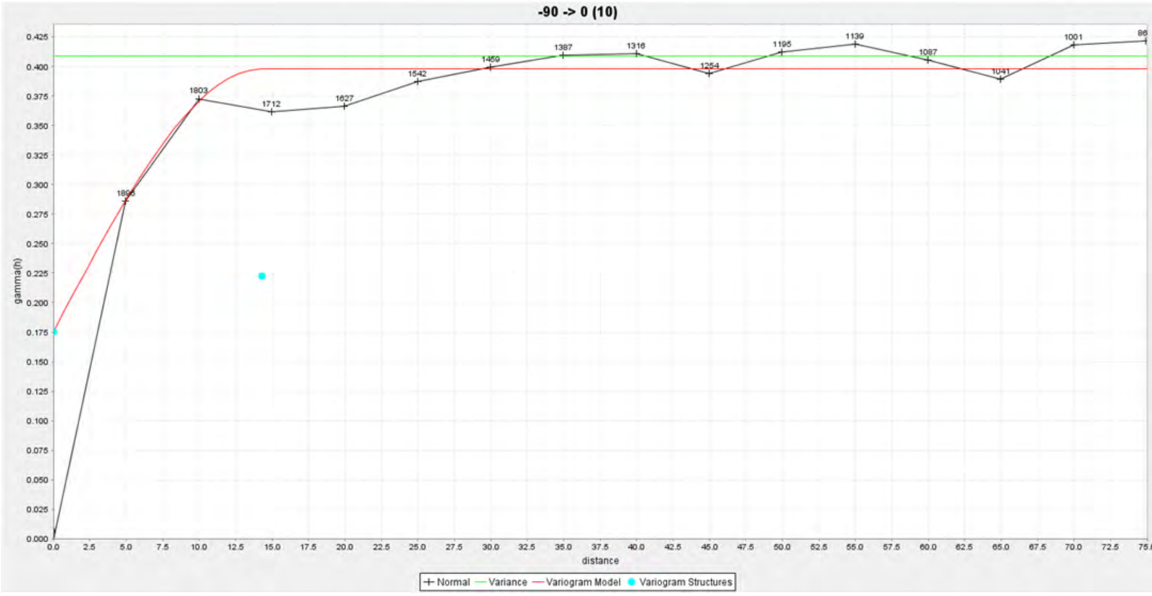
Downhole Variogram Western Porphyry Zone HG10



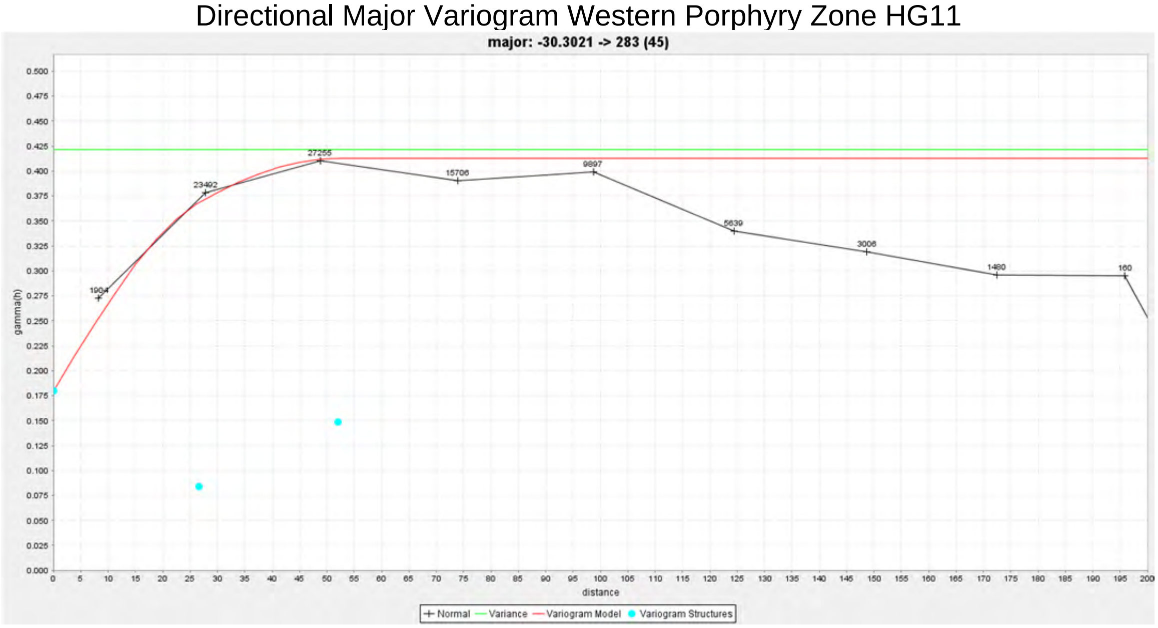
Directional Major Variogram Western Porphyry Zone HG10



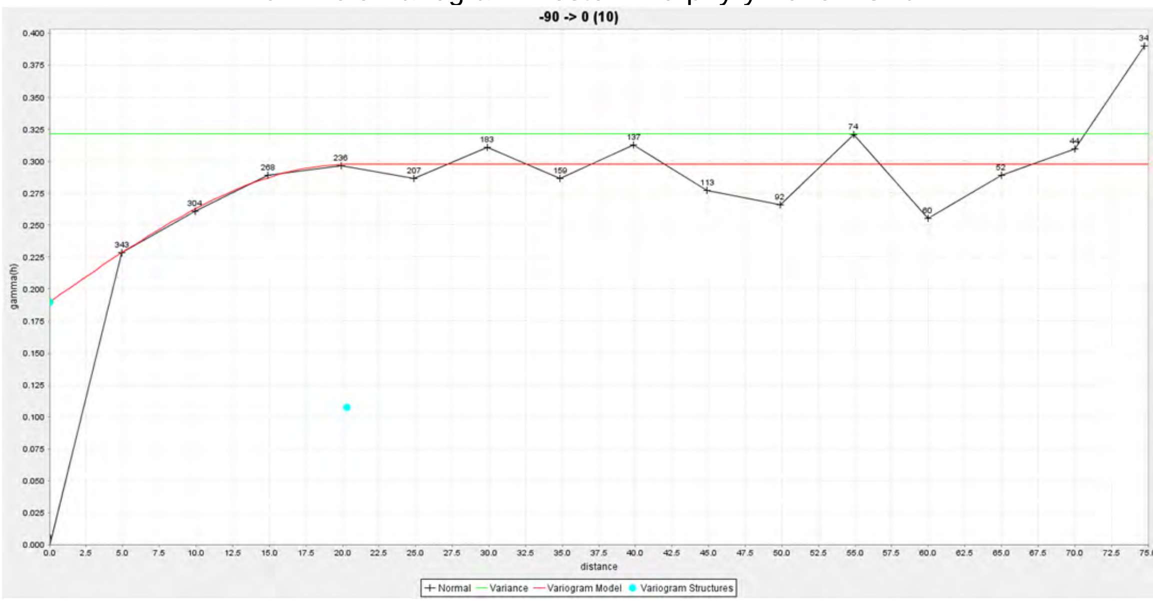
Downhole Variogram Western Porphyry Zone HG11



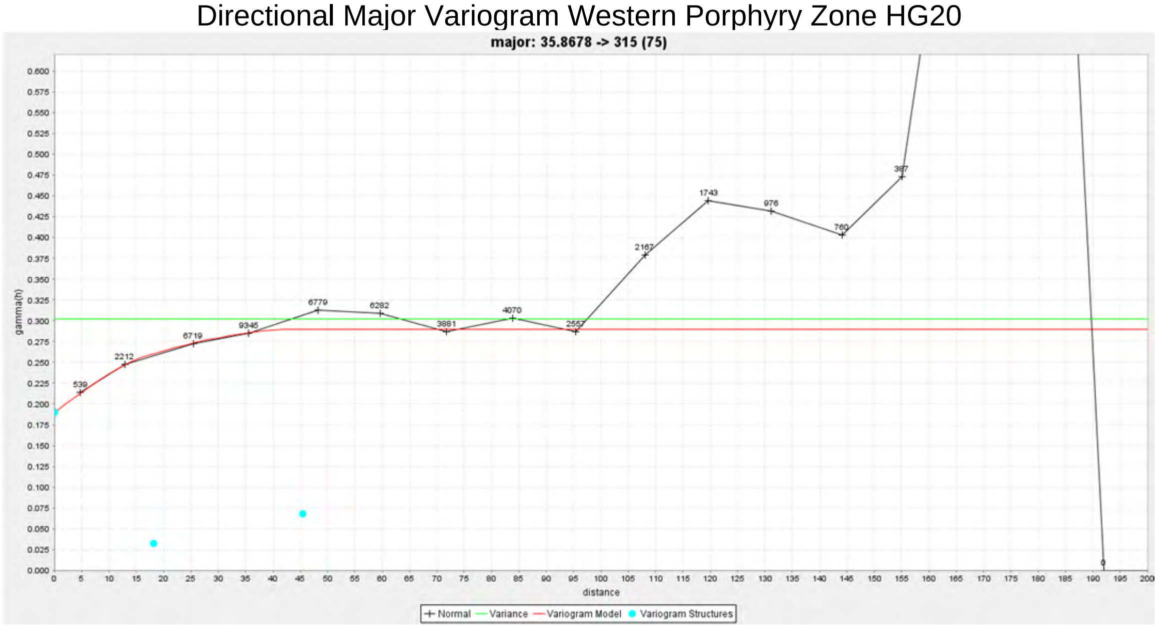
Directional Major Variogram Western Porphyry Zone HG11



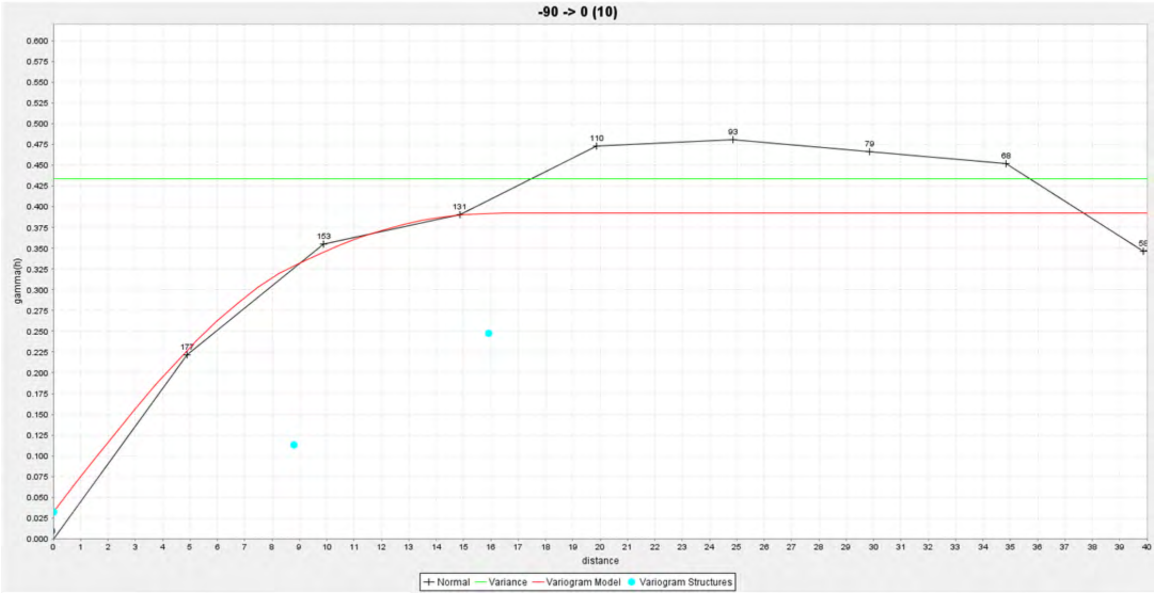
Downhole Variogram Western Porphyry Zone HG20



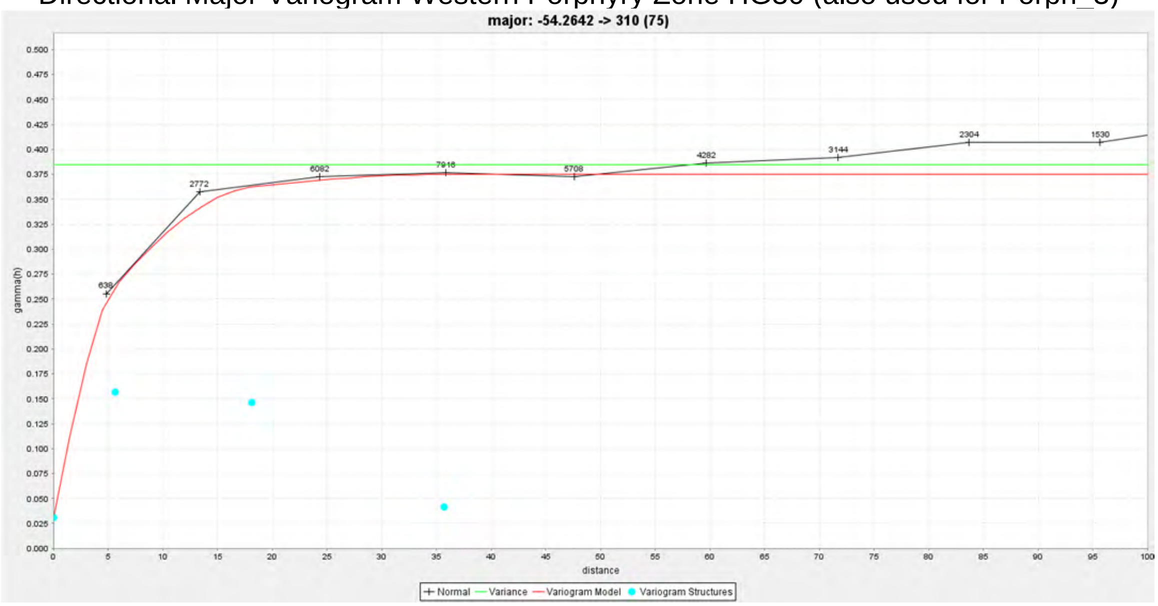
Directional Major Variogram Western Porphyry Zone HG20



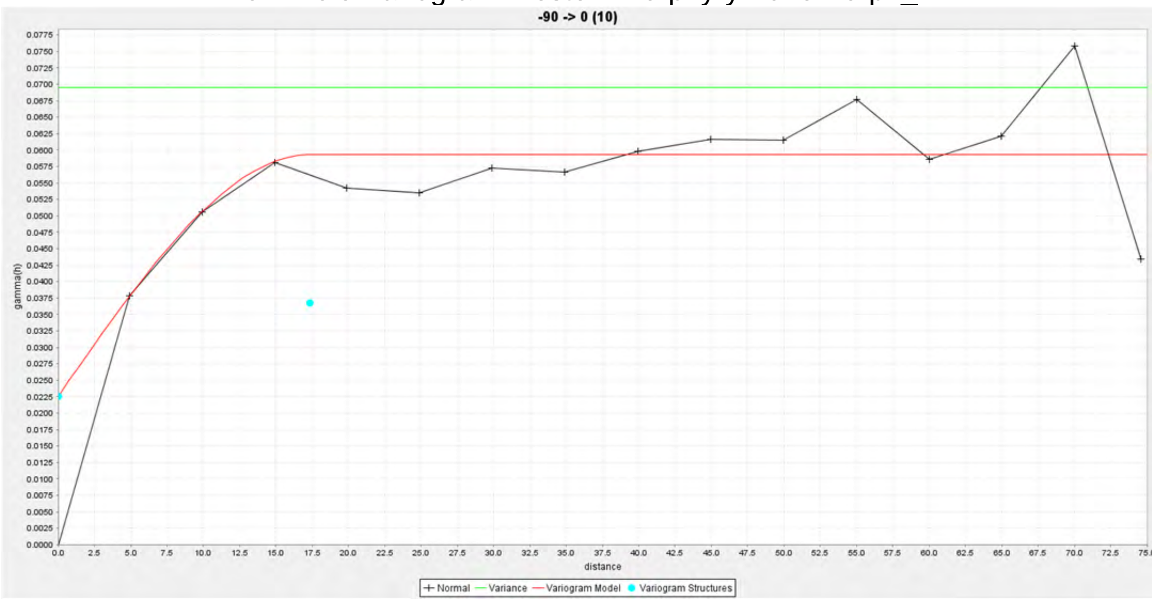
Downhole Variogram Western Porphyry Zone HG30 (also used for Porph_3)



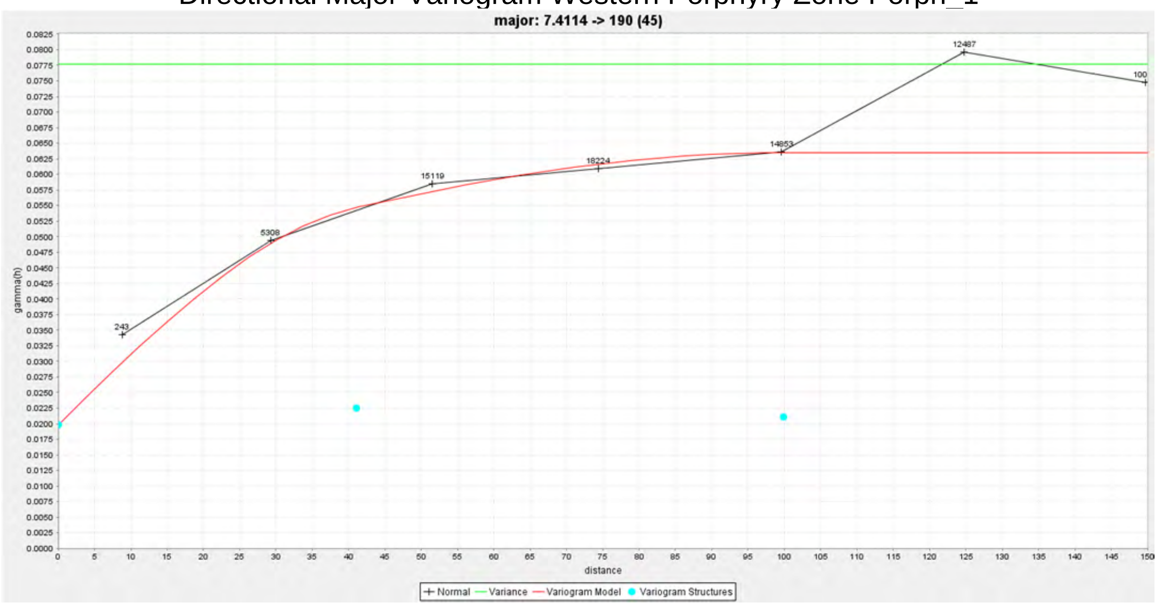
Directional Major Variogram Western Porphyry Zone HG30 (also used for Porph_3)



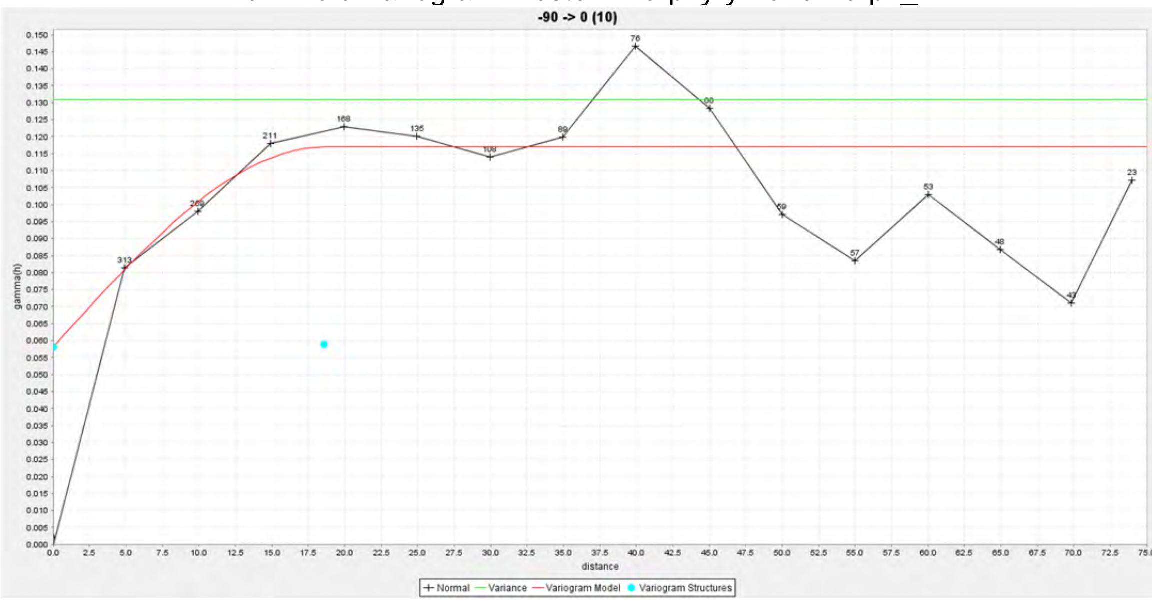
Downhole Variogram Western Porphyry Zone Porph_1



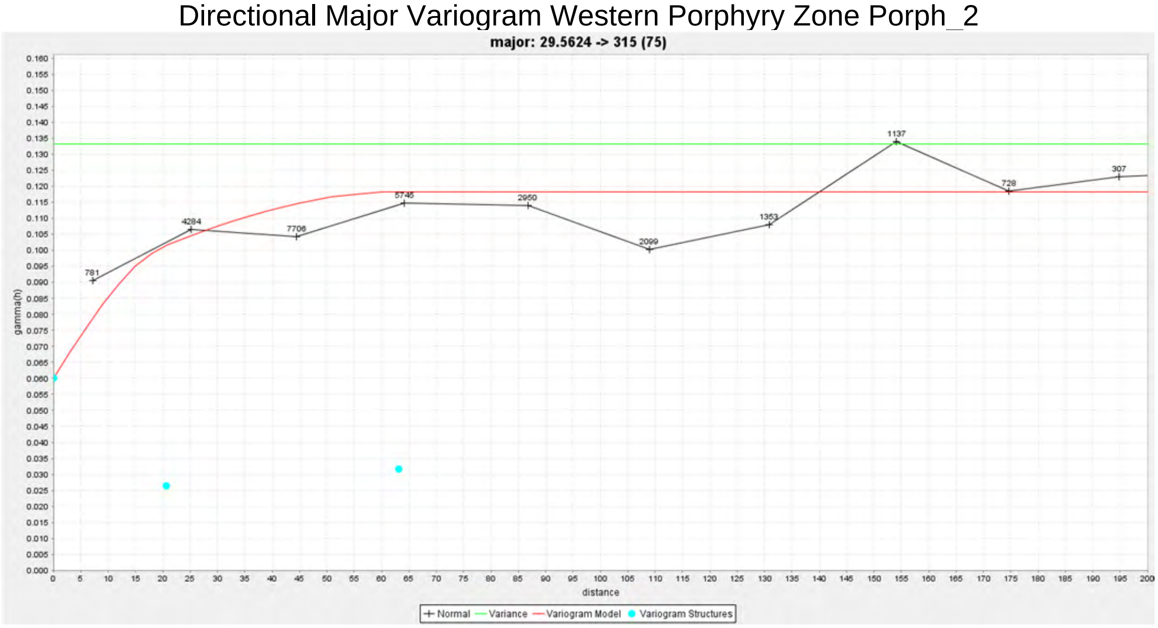
Directional Major Variogram Western Porphyry Zone Porph_1



Downhole Variogram Western Porphyry Zone Porph_2



Directional Major Variogram Western Porphyry Zone Porph_2



APPENDIX IV

DETAILED LIST OF MINING TITLES

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
BM	848	119.08	March 23, 2019	East Amphi	100% Canadian Malartic GP
CDC	48540	32.56	December 13, 2016	East Amphi	100% Canadian Malartic GP
CDC	48541	32.55	December 13, 2016	East Amphi	100% Canadian Malartic GP
CDC	48542	32.37	December 13,2016	East Amphi	100% Canadian Malartic GP
CDC	48543	32.22	December 13, 2016	East Amphi	100% Canadian Malartic GP
CDC	98071	62.47	November 6, 2017	East Amphi	100% Canadian Malartic GP
CDC	98072	42.47	November 6, 2017	East Amphi	100% Canadian Malartic GP
CDC	1106031	37.90	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106032	51.40	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106033	51.39	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106034	51.37	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106035	51.36	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106036	51.39	December 2, 2016	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	1106037	51.40	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106038	51.42	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106039	51.41	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106040	49.72	December2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106041	33.26	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106042	33.25	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	1106043	41.67	December 2, 2016	East Amphi	100% Canadian Malartic GP
CDC	2399891	43.30	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399892	21.13	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399893	43.27	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399894	21.83	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399895	28.10	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399896	57.49	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399897	50.30	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	2399898	15.90	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399899	10.50	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399900	21.55	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CDC	2399901	3.13	August 13, 2015	East Amphi	85% Corporation Canadian Malartic 15% Currie Mill's estate
CL	3351761	24.80	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351761	24.80	July 17, 2016	East Amphi	100% Canadian Malartic GP
CL	3351763	20.40	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351764	22.00	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351771	12.90	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351772	20.80	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351773	20.90	July 17,2015	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CL	3351774	33.30	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351781	20.00	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351782	12.50	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351783	4.30	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3351784	56.80	July 17, 2015	East Amphi	100% Canadian Malartic GP
CL	3665043	30.20	December 21, 2016	East Amphi	100% Canadian Malartic GP
CL	3665044	30.20	December 21, 2016	East Amphi	100% Canadian Malartic GP
CL	3665053	30.20	December 21, 2016	East Amphi	100% Canadian Malartic GP
CL	3665201	40.00	December 20, 2016	East Amphi	100% Canadian Malartic GP
CL	3665202	40.00	December 20, 2016	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CL	3665211	40.00	December 20, 2016	East Amphi	100% Canadian Malartic GP
CL	3718281	31.20	May 4, 2017	East Amphi	100% Canadian Malartic GP
CL	3718282	31.20	May 4, 2017	East Amphi	100% Canadian Malartic GP
CL	3718293	30.80	May 4, 2017	East Amphi	100% Canadian Malartic GP
CL	3887321	48.00	June 19, 2017	East Amphi	100% Canadian Malartic GP
CL	3887331	48.00	June 19, 2017	East Amphi	100% Canadian Malartic GP
CL	3924261	48.00	July 4, 2017	East Amphi	100% Canadian Malartic GP
CL	3924271	48.00	July 4, 2017	East Amphi	100% Canadian Malartic GP
CL	3924281	48.00	July 4, 2017	East Amphi	100% Canadian Malartic GP
CL	5086943	32.00	July 28, 2015	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CL	5086944	32.00	July 28, 2015	East Amphi	100% Canadian Malartic GP
CL	5086945	32.00	July 28, 2015	East Amphi	100% Canadian Malartic GP
CL	5098746	32.00	July 28, 2015	East Amphi	100% Canadian Malartic GP
CL	5098747	32.00	July 28, 2015	East Amphi	100% Canadian Malartic GP
CL	5114367	40.00	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114368	40.00	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114369	40.00	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114373	40.50	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114374	40.50	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114375	40.50	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5114376	40.00	September 10, 2015	East Amphi	100% Canadian Malartic GP
CL	5162706	33.00	September 13, 2014	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CL	5162707	33.00	September 13, 2014	East Amphi	100% Canadian Malartic GP
CL	5162708	33.00	September 13, 2014	East Amphi	100% Canadian Malartic GP
CL	5162709	33.00	September 13, 2014	East Amphi	100% Canadian Malartic GP
CL	5182646	54.00	November 1, 2014	East Amphi	100% Canadian Malartic GP
CL	5182647	54.00	November 1, 2014	East Amphi	100% Canadian Malartic GP
CL	5182648	54.00	November 1, 2014	East Amphi	100% Canadian Malartic GP
CLD	P139010	30.80	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139020	18.93	December 3, 2015	East Amphi	100% Canadian Malartic GP
CLD	P139030	13.78	December 3, 2015	East Amphi	100% Canadian Malartic GP
CLD	P139040	8.61	December 3, 2015	East Amphi	100% Canadian Malartic GP
CLD	P139050	6.60	December 3, 2015	East Amphi	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CLD	P139060	9.37	December 3, 2015	East Amphi	100% Canadian Malartic GP
CLD	P139070	12.42	December 3, 2015	East Amphi	100% Canadian Malartic GP
CLD	P139080	30.80	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139090	30.80	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139100	30.80	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139110	30.80	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139120	30.40	June 6, 2017	East Amphi	100% Canadian Malartic GP
CLD	P139130	30.40	June 6, 2017	East Amphi	100% Canadian Malartic GP
CM	226	62.53	NA	Canadian Malartic	100% Canadian Malartic GP
BM	892	188.41	November 24, 2029	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
BM	1007	10.08	April 10, 2031	Canadian Malartic	100% Canadian Malartic GP
BM	1011	1.83	June 16, 2031	Canadian Malartic	100% Canadian Malartic GP
BM	1020	65.70	February 17, 2034	Canadian Malartic	100% Canadian Malartic GP
CDC	50615	57.54	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	50616	57.54	February 14, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	56898	57.53	February 10, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	56899	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56900	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56901	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56902	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56903	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56904	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56905	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56906	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	56907	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56908	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56909	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56910	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56911	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56912	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56913	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56914	57.52	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56915	57.50	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56916	57.50	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56917	57.50	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56918	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56919	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56920	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	56921	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56922	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56923	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56924	57.53	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56925	57.51	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56929	13.93	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56930	13.99	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56931	14.04	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56932	14.09	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56933	14.13	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56934	14.17	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	56935	14.20	February 10, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61518	57.53	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61519	57,54	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	61520	57.52	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61521	56.61	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61522	35.35	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61523	57.27	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	61524	24.14	February 14, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	72271	25.71	April 10, 2020	Canadian Malartic	100% Canadian Malartic GP
CDC	73332	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73333	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73334	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73335	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73336	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73337	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73338	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73339	57.53	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	73340	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73341	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73343	39.98	October 17, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73344	6.94	October 17, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73349	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73350	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73351	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73352	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73353	57.52	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73357	13.49	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73358	27.93	December 27, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73359	6.16	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73360	7.50	December 27, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	73361	0.87	December 27, 2015	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	73362	0.33	June 5, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73383	57.52	June6, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	73384	57.52	June 6, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74682	57.53	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74683	57.53	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74684	57.53	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74685	57.53	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74686	57.54	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74687	57.54	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74688	57.54	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74689	57.52	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74690	57.52	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74691	57.51	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74692	57.51	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	74693	57.50	June 9, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	74694	57.50	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	74695	13.87	June 9, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2000854	3.35	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000855	44.19	February 14, 2018	Canadian Malartic	100% Canadian Malartic GP
CDC	2000856	7.71	September 6, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP
CDC	2000857	57.51	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000858	57.51	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000859	57.51	February 14, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP
CDC	2000910	57.11	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000911	34.76	February 14, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	2000912	57.50	February 14, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP
CDC	2000913	57.51	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000915	7.90	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000916	45.49	September 6, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP
CDC	2000917	57.51	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2000919	2.79	February 14, 2016	Canadian Malartic	100% Canadian Malartic GP
CDC	2001055	22.66	February 19, 2016 (Suspended)	Canadian Malartic	100% Canadian Malartic GP
CDC	2245189	1.45	December 27, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	2384761	0.01	April 30, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	2398785	42.93	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398786	57.51	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398787	57.27	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398788	57.52	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	2398789	9.34	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398790	57.52	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398791	57.52	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CDC	2398792	14.23	June 7, 2017	Canadian Malartic	100% Canadian Malartic GP
CL	3941621	0.07	October 6, 2015	Canadian Malartic	100% Canadian Malartic GP
CDC	72283	57.50	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72284	27.32	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72285	57.50	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72286	29.50	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72287	57.50	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72288	29.27	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties

Type	Title	Area (Ha)	Expiration Date	Historical Osisko Property	Registered Owner
CDC	72289	57.50	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72290	28.89	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72291	35.21	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties
CDC	72292	8.45	June 6, 2017	Malartic CHL	70% Corporation Canadian Malartic 30% Abitibi Royalties