Osisko Metals Incorporated

NI 43-101 Maiden Resource Estimate for the Bathurst Mining Camp, New Brunswick, Canada

Effective Date: February 20, 2019
Report Date: April 04, 2019

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Acronyms and Abbreviations

AGP Mining Consultants Inc.	AGP
ALS Chemex Labs	Chemex
Armour Transportation Systems	Armour
Atomic Absorption	AA
Average	avg.
Azimuth Pointing System	APS
Bathurst Mining Camp Project	BMC
Borehole EM	BHEM
Bowmore Exploration Ltd.	Bowmore
Canadian Institute of Mining	CIM
Canadian Standards Association	CSA
Certified Reference Materials	CRM
Chalcopyrite	Cp
Chief Executive Officer	CEO
Coefficients of Variation	CV
Coordinate Transformation Service	CTS
Copper Percent	Cu%
El Nino Ventures Inc.	El Nino
Electromagnetic Imaging Technology	EMIT
Electromagnetic	EM
Elevation	El.
Energy and Mines Division	EMD
Environmental Site Assessment	ESA
Ethylenediaminetetraacetic Acid	EDTA
Fire-Assays Gravimetric Finishes	FA-GRAV
Fire-Assay Atomic Absorption Spectroscopy	FA-AAS
Flame Atomic Absorption Spectroscopy	FAAS
Galena	Gn
GEMTEC Consulting Engineers and Scientists Limited	GEMTEC
Geographic Information New Brunswick	GeoNB
High Correlation Coefficient	R^2
Hunter Brook Holdings Ltd.	Hunter Brook

Inductively Coupled Plasma Optical Emission Spectrometry	ICP OES
International Electrotechnical Commission	IEC
International Organization for Standardization	ISO
Inverse Distance to the power of 2	ID^2
J.S. Redpath Limited	Redpath
Feasibility Study	FS
Key Anacon Main Zone East	KA-MZE
Key Anacon Main Zone	KA-MZ
Key Anacon Mines Ltd.	Key Anacon
Key Anacon Northwest Zone	KA-NW
Key Anacon Southeast Zone	KA-SE
Lead Percent	Pb%
Logan Drilling Group	Logan
London Metal exchange	LME
Massive Sulphide	MS
Metal Leaching/Acid Rock Drainage	ML/ARD
Mineral Resource Estimate	the 2019 MRE
Minerals & Metals Group	MMG
National Instrument 43-101	NI 43-101
Nearest Neighbour	NN
New Brunswick Department of Energy and Resource Development	NB DERD
New Brunswick	NB
New Larder "U" Island Mines Ltd.	Larder
Noranda Mining and Exploration Inc.	Noranda
Number	No.
Optical Televiewer	OTV
Ordinary Krige	OK
Osisko Metals Ltd.	Osisko Metals
Portable X-Ray Fluorescence Spectrometry	pXRF
Prefeasibility Study	PFS
Preliminary Economic Assessment	PEA
Pulse Electromagnetics	PEM
Pyrite	Py
Pyrrhotite	Po
Qualified Person	QP

Quality Assurance	QA
Quality Control	QC
Quality Control/Quality Assurance	QA/QC
Rio Algom Exploration Inc.	Rio Algom
Rock Quality Designation	RQD
RPC Science and Engineering	RPC
Semi-Massive Sulphide	SSM
Silver Percent	Agg/t
Specific Density	SG
Specific Gravity	SG
Sphalerite	Sp
Standards Council of Canada	SCC
Standard Deviation	Std. Dev.
Stantec Consulting Ltd.	Stantec
Three-dimensional	3D
Time Domain Electromagnetic Method	TDEM
TSX Symbol	OM
TSX Venture Exchange	TSXV
Unique Reference Number	URN
United States dollar	US$
Volcanic Sediment-Hosted Massive Sulphide	VSHMS
Volcanogenic Massive Sulphide	VMS
Volume-Weighted Average Price	VWAP
Zinc Equivalency	ZnEq
Zinc Percent	Zn%

Units of Measure

Grams per cubic centimetre	g/cm^3
Grams per cubic metre	g/cm^3
Grams per tonne	g/t
Grams	g
Hectares	ha
Kilometres	km
Metres	m
Micron	µm

Millimetre	mm
Million ounces	Moz
Million pounds	Mlb
Million tonnes	Mt
Million	M
Percent	%

1 SUMMARY

AGP Mining Consultants Inc. (AGP), was retained by Osisko Metals Ltd. (Osisko Metals), to prepare a Mineral Resource Estimate (the 2019 MRE) for the Bathurst Mining Camp (BMC) Project, and a supporting Technical Report in compliance with National Instrument 43-101 (NI 43-101) and Form 43-101F1. Osisko Metals is a Canadian publicly-traded company, listed on the TSX Venture Exchange (TSXV) under the trading symbol OM. Osisko Metals' head office is located at Suite 300, 1100 Avenue des Canadiens-de-Montréal, Montréal, Québec, H3B 2S2, Canada.

The Key Anacon property is recorded as the Key Anacon Mine mineral claim block 1837, a group of 51 claim units located approximately 20 kilometres (km) south-southwest of the town of Bathurst, in Gloucester County, NTS sheet 21P/05, New Brunswick, Canada.

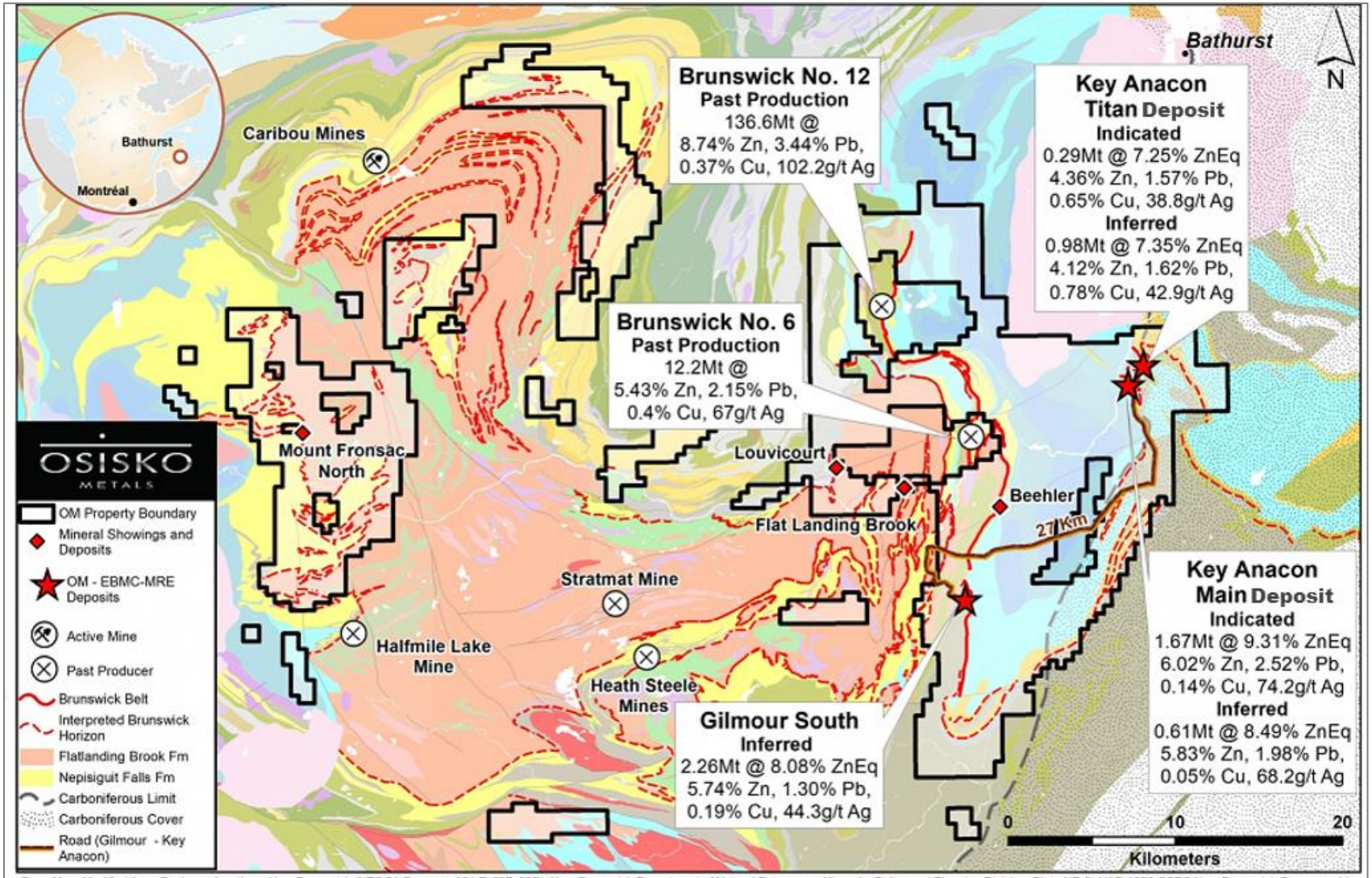
The Gilmour South property is recorded as the Gilmour South claim block 7964, consisting of 256 claim units, and the Gilmour West claim block 7958, consisting of 200 claim units, both located in Gloucester County, NTS sheet 21P/05, New Brunswick. The deposit is situated 35 km southwest of the town of Bathurst, with the bulk of the known mineral deposit within the Gilmour West claim block 7958 and the remaining part on the Gilmour South claim block 7964.

Osisko Metals (prospecting Licence Number 16336) owns 100% of the mineral claim block for both properties. The surface rights for the entire Key Anacon and Gilmour South properties are held as Crown Land.

Paved highways and secondary gravel roads provide good year-round, property-wide access. The entire area is covered by autochthonous forests in flat terrains, except for the Nepisiguit River, which crosses through the Key Anacon property. Brooks and large swampy areas are common. Glacial cover is thin but extensive, resulting in minimal bedrock outcroppings.

Key Anacon and Gilmour South are volcanogenic massive sulphide (VMS) mineral deposits, and share similarities to the former operating mines in the BMC. The BMC geology comprises basement rocks of the Miramichi Group overlain by the Bathurst Supergroup, which contains all the known VMS deposits. The massive sulphide deposits in the BMC occur in syngenetic horizons at several stratigraphic positions within the Bathurst Supergroup. The former producer, Brunswick No. 12 and Brunswick No. 6 mines lie within the Tetagouche Group, at or near the upper contact of the Nepisiguit Falls Formation felsic unit with the overlying Flat Landing Brook Formation. That stratigraphic position is known as the Brunswick Horizon (Figure 1-1).

Figure 1-1: Regional Geology Map



Base Map: Modified from Geology of northern New Brunswick (NTS 21 O, parts of 21 P, 22P, 22B). New Brunswick Department of Natural Resources; Minerals, Policy and Planning Division, Plate NR-3. NAD 1983 CSRS New Brunswick Stereographic
Brunswick 6 and 12 Mines past production statistics. Source: The Government of New Brunswick, Department of Energy and Resource Development, Energy and Mines Division Mineral Occurrence Database.

The property geology in the Key Anacon and Gilmour South area consists of the basement sedimentary rocks of the (Late Cambrian to Early Ordovician) Miramichi Group and the prospective volcanic and sedimentary rocks of the (Early to Late Ordovician) Tetagouche Group. Gilmour South and the two mineral deposits occurring within the Key Anacon property (the Key Anacon Main and Key Anacon Titan deposits) are both located at the Brunswick Horizon. On the Key Anacon property, the Brunswick Horizon is complexly folded due to the extent of polyphase deformation, and as a result good exploration potential exists along strike and at depth. At Gilmour South, the Brunswick Horizon is less deformed than at the Key Anacon deposits.

In September 2017, Osisko Metals announced plans for an aggressive Phase I exploration and drill program in the BMC. Since commencing work on both the Key Anacon and Gilmour South properties, Osisko Metals has employed a variety of exploration techniques, consisting of three-dimensional (3D) modelling studies, downhole pulse electromagnetics (PEM), portable X-Ray Fluorescence Spectrometry (pXRF), optical televiewer (OTV) logging, diamond drilling, and core logging.

Osisko Metals has completed 60 drill holes at the Key Anacon property during 2017 and 2018, for a total of 23,020 metres (m). Six drill holes were surveyed with downhole PEM. Portions of eight drill holes were logged with the OTV at Key Anacon: four at the Main Zone and four at the Titan Zone. For the Gilmour South property, Osisko Metals completed a total of 32 drill holes during 2017 for a total of 15,455 m; 2 drill holes were surveyed with downhole PEM. Portions of four drill holes were logged with the OTV.

Prior to commencing drilling on the Gilmour South and Key Anacon properties, Osisko Metals conducted a review of historical drilling. Previous operators on the properties had used grid coordinate systems; however, it was decided by Osisko Metals staff to move data from all projects into NAD83 NB Double Stereographic projection, which is the recommended coordinate system for the area, and the accepted coordinate system for the New Brunswick Department of Energy and Resource Development (NB DERD). WSP Consultants was engaged to survey current and historical drill holes at both the Gilmour South and Key Anacon deposits and convert the historical drill hole collars to the new coordinate system.

Based on the review of the Quality Control/Quality Assurance (QA/QC), data validation, and statistical analysis, the following conclusions were made:

- The regional geology, lithology, and structural controls on the mineralization at the Key Anacon and Gilmour South properties are well understood by Osisko Metals' exploration team.
- AGP has reviewed the methods and procedures to collect and compile geological, geotechnical, and assaying information for the BMC, and has found them to be suitable for the style of mineralization found on the property and to meet accepted industry standards.
- The mineralization on the BMC was sampled over the years in multiple campaigns of core drilling by various operators since the 1950s. The drill database is now a mix of historical data and more recent data collected by Osisko Metals in 2017 and 2018. Both data types were used in the resource estimate.

- The analytical laboratory used by Larder and Key Anacon Mines Ltd. (Key Anacon) prior to the 1992 drill campaign is unknown, and assays were recovered from historical drill logs. Rio Algom Exploration Inc. (Rio Algom) (1992–1993) used ALS Chemex Labs (Chemex), Noranda Mining and Exploration Inc. (Noranda) (1995 to 2011) used the Brunswick Mine Laboratory and X-Ray Assay Laboratories (XRAL). Hunter Brook Holdings Ltd. (Hunter Brook) and El Nino Ventures Inc. (El Nino) used the Brunswick Mine laboratory in 2007 and Actlabs 2015. AGP notes that, even though the laboratory used since 1992, not all laboratory certificates were available, and assays were often recovered from drill logs.
- Since 2017, Osisko Metals uses Actlabs, which is ISO/IEC 17025 and ISO 9001 accredited.
- Osisko Metals' drill core is analyzed for 36 elements using a four-acid "near total" digestion followed by ICP-OES. Samples that are over limits for copper, lead, and zinc are reanalyzed using a peroxide fusion digestion followed by ICP-OES. Samples that are over limits for silver are reanalyzed using fire assay with gravimetric finish.
- Prior to 1997, only a few QA/QC guidelines existed, and monitoring programs were not commonly conducted by mining companies; consequently, any QA/QC program for the historical drill holes is not known to exist, and has been assumed by AGP not to exist. In 2017, Osisko Metals implemented a QA/QC program consisting of blanks and Certified Reference Materials (CRMs). In 2018, the program was improved with the addition of quarter-core duplicates.
- Submission rates meet the industry accepted practices for each of the QA/QC types of samples. The sampling procedures, analytical methods, and QA/QC procedures undertaken by Osisko Metals indicate reasonable accuracy of the sample data, and no systemic cross-contamination at the sample preparation level.
- Examination of the QA/QC standards by AGP showed issues with two of the CRMs when the recommended values approach the upper detection limits of the elements analyzed. The remaining CRM results indicated good precision of the analytical data produced by Actlabs.
- Osisko Metals validated historical drill holes via twin drilling. Percentile charts indicated that, for all data compiled, comparison of the distribution between the twin drill hole assays and the historical assays is comparable up to the 75th percentile. Beyond the 75th percentile, the newer, twin drill holes are lower grade than those in the historical drilling. The paired assays show high variability in the individual pairs. From the data reviewed, AGP believes that the underground drill holes completed by Key Anacon in the 1950s are useable for resource estimation purposes, but with a restriction on the classification due to variability in the grade of the individual pairs, small core sizes, and long sampling intervals of the historical holes. The restriction imposed by AGP is not to assign Measured Resources.
- Osisko Metals does not resubmit pulps to an umpire laboratory, and AGP recommends the addition of this QA/QC protocol in future drill programs.

- Density measurements are carried out on site by Osisko Metals personnel, and a number of core samples were submitted to Actlabs as part of the QA/QC procedures for specific density (SG) measurements. This program was implemented to validate the in-house measurements. AGP notes that Actlabs results were slightly lower above the 3.0 g/cm^3 when compared with Osisko Metals' measurements. This minor density difference was attributed to the lower sample sizes used by Actlabs, which were only 20 g to 50 g, while Osisko Metals weighed the entire drill core sample interval.
- Through site visits in 2018 and 2019, AGP performed data verification, collection of independent characterization samples, and a database audit. The drill database was found to be error-free and suitable to be used for a resource estimate.
- Core handling, core storage, and chain of custody are consistent with industry best practices.
- Osisko Metals did not conduct any metallurgical or mineralogical testing on the mineralization of the Key Anacon or Gilmour South deposits.
- AGP believes that the exploration potential at the Key Ancon Main and Titan deposits remains high at the property scale, justifying compilation and target generation programs.
- The Key Anacon deposit hosts a number of mineralized intercepts outside the current MRE that merit follow-up work.
- AGP recommends drilling lateral extensions of the currently identified zones to expand the existing resources.

Based on the above conclusions, and effective February 20, 2019, AGP completed a Maiden MRE covering the Gilmour South, Key Anacon Main, and Key Anacon Titan deposits. The Mineral Resource presented herein is in conformance with the Canadian Institute of Mining (CIM) Mineral Resource definitions (2014), referred to in the NI 43-101 Standards of Disclosure for Mineral Projects.

The MRE considered 110 surface drill holes at Gilmour South, 92 surface drill holes at Key Anacon Titan, and 376 surface and underground drill holes at Key Anacon Main, for a total of 578 drill holes with an aggregated length of 156,453 m, and 10,465 assays. Of those, 340 holes intercepted mineralization in sufficient quantity to be included in the mineralized wireframes. The estimate considers all data that was available prior to January 14, 2019, the data cut-off date for the resources.

The estimate was completed based on the concept of a medium-sized underground operation, with three separate deposits feeding a single processing facility. This resource also assumes a certain degree of selectivity in order to separate the high-grade mineralized zones from the surrounding waste. AGP assumed this selectivity will be obtained via a comprehensive grade control program assisted by the use of a portable XRF unit. No other deposit in the BMC was evaluated.

To meet the CIM definitions of reasonable prospects of economic extraction, a cut-off of 5.5% zinc equivalency (ZnEq) was used for all three deposits, which are considered to be amenable to underground extraction. The determination of the cut-off grade was based on:

- Mining costs of US$45/t
- Total operating costs of US$70/t
- MRE based on prices of US$1.10/lb for zinc, US$0.90/lb for lead, US$2.72/lb for copper, and US$15.90/oz for silver, and a revenue factor of 1.1
- Recoveries of 84% Zn, 60% Pb, 52% Cu, and 65% Ag
- Smelter payables of 84% Zn, 96% Pb, 95% Cu, and 95% Ag.

ZnEq percentages are calculated using metal prices, forecasted metal recoveries, and smelter payables (ZnEq=Zn%+0.661*Pb%+1.749*Cu%+0.018*Ag g/t). Blocks above the 5.5% ZnEq were visually inspected in 3D, and the majority of the blocks were generally found to coalesce into bulk mineable shapes, with some exceptions.

The MRE presented herein is categorized as a mix of Inferred and Indicated resources. Measured resources were downgraded to Indicated in the Key Anacon Main Zone because of the heavy reliance on the historical underground drill hole data. The reported resources are expressed in tonnes. Metal contents are presented as in situ pounds or ounces.

At the greater than 5.5% ZnEq cut-off selected, all three models returned a total of 1.96 million tonnes (Mt) of Indicated Resources grading at 5.77% Zn, 2.38% Pb, 0.22% Cu, and 68.9 g/t Ag, containing 249.1 million pounds (Mlb) of zinc, 102.6 Mlb of lead, 9.3 Mlb of copper, and 4.3 million ounces (Moz) of silver. The model also returned an additional 3.85 Mt of Inferred Resources grading at 5.34% Zn, 1.49% Pb, 0.32% Cu, and 47.7 g/t Ag, containing 453.0 Mlb of zinc, 126.4 Mlb of lead, 27 Mlb of copper, and 5.9 Moz of silver in in situ metals (Table 1-1).

Table 1-1: Resource Estimate of the Bathurst Mining Camp Project

Zones	Class	Tonnes (M)	Grades (at 5.5 ZnEq Cut-off)					In-situ Metal			
			Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	ZnEq (%)	Zn (Mlb)	Pb (Mlb)	Cu (Mlb)	Ag (Moz)
Key Anacon Main Deposit	Indicated	1.67	6.02	2.52	0.14	74.2	9.31	221.0	92.5	5.1	4.0
Key Anacon Titan Deposit		0.29	4.36	1.57	0.65	38.8	7.25	28.2	10.1	4.2	0.4
Total Indicated at 5.5 ZnEq cut-off		**1.96**	**5.77**	**2.38**	**0.22**	**68.9**	**9.00**	**249.1**	**102.6**	**9.3**	**4.3**
Key Anacon Main Deposit	Inferred	0.61	5.83	1.98	0.05	68.2	8.49	77.7	26.5	0.6	1.3
Key Anacon Titan Deposit		0.98	4.12	1.62	0.78	42.9	7.35	89.5	35.2	17.0	1.4
Gilmour South		2.26	5.74	1.30	0.19	44.3	8.08	285.8	64.8	9.4	3.2
Total Inferred at 5.5 ZnEq cut-off		**3.85**	**5.34**	**1.49**	**0.32**	**47.7**	**7.96**	**453.0**	**126.4**	**27.0**	**5.9**

Notes: Cut-off determined by using a ZnEq grade of 5.5%. ZnEq grade calculated using prices of 1.21 US$/lb for zinc, US$0.99/lb for lead, US$2.99/lb for copper, and US$17.49/oz. for silver which includes a revenue factor of 1.1. Recoveries used were 84% Zn, 60% Pb, 52% Cu, and 65% Ag, and payables were 84% Zn, 96% Pb, 95% Cu, and 95% Ag. Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grades, and contained metals.

AGP is not aware of any information not already discussed in this report that would affect their interpretation or conclusions regarding the subject property. AGP is required to inform the public that the quantities and grades of Inferred Resources reported in this estimation must be regarded as

conceptual in nature, and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply, but not verify, geological grade or quality of continuity. For these reasons, an Inferred Resource has a lower level of confidence than an Indicated Resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. It is also noted that Mineral Resources are not Mineral Reserves, and do not have demonstrated economic viability. Lastly, rounding of values as required by the reporting guidelines may result in apparent differences between tonnes, grades, and metal contents.

1.1 Recommendations

After reviewing the BMC Project data, AGP makes the following recommendations:

AGP recommends continuing exploration and delineation drilling at the Key Anacon deposit. This additional drilling should be designed to expand and improve the quality of mineral resources presented in this report and to further the understanding of the geology, specifically the definition of the folded horizon that hosts massive sulphide deposits. A better understanding of geologic controls should help define drill targets for new massive sulphide discoveries. In consultation with Osisko Metals' exploration team, AGP recommends additional infill and step-out drilling at the Key Anacon Main deposit; a total of 16,450 m of drilling (at a cost of $2,533,300). A total of 750 m of drilling (at a cost of $115,500) is also recommended to add two additional twin drill holes to the Key Anacon Main Zone, thereby reducing the support from the historical Key Anacon Mine Ltd. drilling in the resource estimate.

For the Key Anacon Titan deposits, AGP recommends a total of 32,450 m of drilling (at a cost of $4,997,300) for Phase I, to explore the Titan Main Zone massive sulphides and the copper-rich stringer zone between the vertical depths of 200 m and 1,100 m. Dependent on the results from Phase I, an additional 21,050 m of drilling (at a cost of $3,241,700) is recommended for Phase II on the Titan copper-rich stringer zone.

An exploration program is recommended to further the understanding of the structurally complex geology of the Key Anacon deposit area and identify target areas that may host additional massive sulphide deposits. The work program entails a compilation of results from historical exploration programs, geological mapping, and an airborne gravity survey. The cost for this exploration program is estimated at $45,000.

AGP recommends a high-level scoping study for the Key Anacon deposits. The study should investigate the possibility of mining a portion of the deposit via open pit. The study cost is estimated at $3,000.

A preliminary program of metallurgical testwork is recommended for the Key Anacon Main and Titan deposits. The testing would provide initial estimates of metallurgical performance (concentrate quality and metal recovered), and information regarding reagent recipes and dosages. The recommended budget for a program of this nature is $100,000.

Table 1-2 shows a summary of the recommended budget.

Table 1-2: Recommendation Budget Summary

	No. of Drill Holes	Drilling Metres	Estimated Cost ($)
Diamond Drilling			
Key Anacon			
Diamond drilling	7	17,200	2,648,800
Titan Deposit			
Diamond drilling – Phase I	41	32,450	4,997,300
Diamond drilling – Phase II	27	21,050	4,997,300
Exploration			
Compilation and data assessment			45,000
Engineering			
Scoping study			3,000
Metallurgical testing			
Total	**75**	**70,700**	**12,691,400**

2 INTRODUCTION AND TERMS OF REFERENCE

Pierre Desautels, P.Geo., of AGP Mining Consultants Inc. (AGP), was retained by Jeff Hussey, CEO Osisko Metals Incorporated (Osisko), to prepare a Mineral Resource Estimate (the 2019 MRE) for the Bathurst Mining Camp Project (BMC, or BMC Project), and a supporting Technical Report in compliance with National Instrument 43-101 (NI 43-101) and Form 43 101F1.

The BMC includes the Key Anacon Main deposit, Key Anacon Titan deposit, and the Gilmour South deposit. The two Key Anacon deposits are located 20 kilometres (km) south of the Town of Bathurst, New Brunswick (NB), Canada. The Gilmour South deposit is located 37 km south-southwest of the Town of Bathurst, New Brunswick, Canada.

Key Anacon's Main and Titan Zone are located 1,500 metres apart. The area between the two deposits is poorly explored with limited drilling. Gilmour South is accessed by major forestry roads approximately 27 kilometres southwest of Key Anacon site (Figure 1-1).

Osisko Metals is a mineral exploration company focused on the acquisition, exploration, and development of base metal resource projects in Canada. The TSX Venture Exchange (TSXV) symbol is OM, and the headquarters are located in Montréal, Québec, Canada. AGP is an independent engineering and consulting firm with an office in Toronto, Ontario, Canada.

2.1 Report Naming Convention

This technical report is in support of a pre-release issued by Osisko Metals on February 20, 2019 announcing the 2019 MRE for the BMC Project. In the press release, Osisko Metals refers to the BMC Project, Key Anacon Deposits, and the Gilmour South Deposit, Key Anacon Main Zone and Key Anacon Titan Zone, which are occasionally referred to as the Main Zone and the Titan Zone. To avoid confusion while reading this report, AGP in consultation with Osisko Metals, adopted the following naming convention.

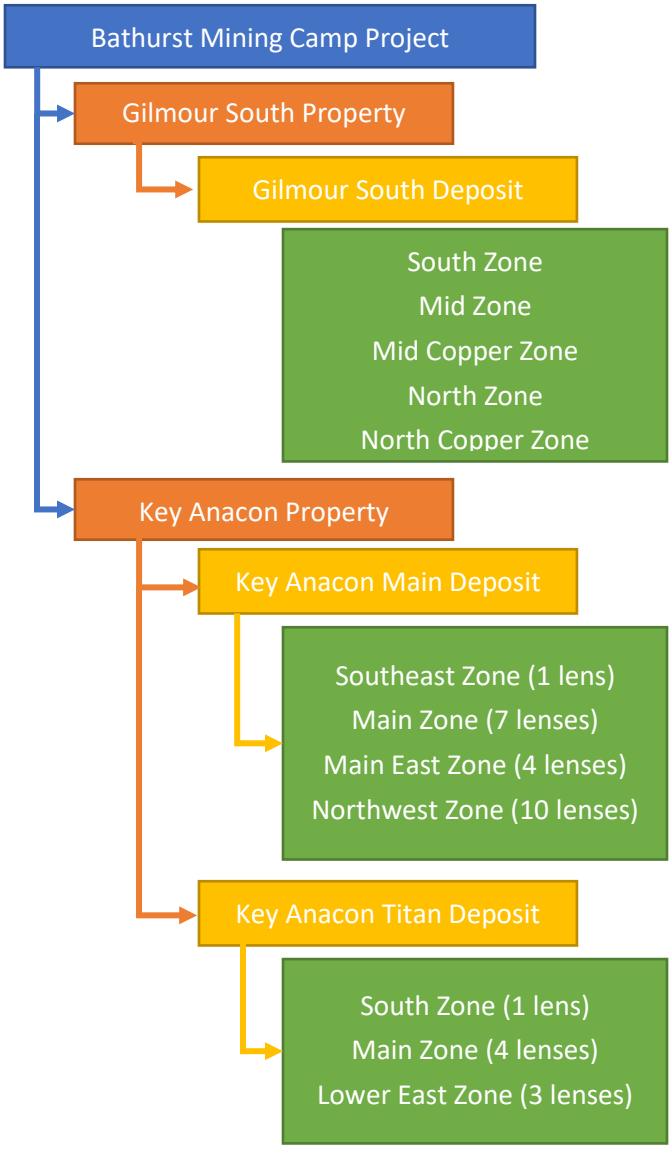
The BMC Project encompasses the Gilmour South property and the Key Anacon property.

The Gilmour South property is host to the Gilmour South deposit, which holds four separate zones namely, South Zone, Mid Zone with the adjoining Mid Copper Zone and the North Zone with the adjoining North Copper Zone.

The Key Anacon property is host to the Key Anacon Main Deposit and the Key Anacon Titan Deposit. The Key Anacon Main Deposit holds four mineralized zones, namely: the Southeast Zone, the Main Zone, the Main East Zone, and the Northwest Zone. Three of these zones have multiple mineralized lenses. The Key Anacon Titan Deposit hold three mineralized zones namely, the South Zone, the Main Zone, the Lower East Zone. Two of these zones have multiple mineralized lenses. Figure 2-1 displays the naming convention use throughout this report.

This study was conducted using mainly metric units following the International System of Units (SI) for unit terms and prefixes where possible. Unless otherwise specified, currency is in Canadian dollars ($) or United States dollars (US$).

Figure 2-1: Bathurst Mining Camp Naming Convention



2.2 Qualified Persons and Site Visit

This report was prepared under the direct supervision of the following Qualified Person (QP):

Pierre Desautels, P.Geo., Principal Resource Geologist with AGP, is a registered Professional Geoscientist in the Canadian provinces of Ontario, British Columbia, and New Brunswick.

Mr. Desautels visited the BMC on July 25 through 27, 2018, to review drill core logging and sampling procedures, collect representative characterization samples, verify drill hole collar locations, and gain knowledge of the geological setting of the deposit. A second visit took place on January 19 through January 22, 2019, primarily to present the three-dimensional (3D) wireframes for Gilmour South and Key Anacon and to discuss the upcoming resource estimate. Mr. Desautels is responsible for all sections of this report dealing with scientific and technical information. Mr. Desautels' responsibility excludes the portion of the report dealing with legal, political, environmental, and tax matters, as indicated in Section 3, "Reliance on Other Experts."

Osisko Metals Employees and Consultants contributed to and assisted in the revision of this Technical Report. Mr. J. Flight, P.Geo; Mr. D. Gracia, P.Geo.; Mr. J. Fisher, G.I.T.; Mr. E. Garcelon, G.I.T.; Mr. G. Graves, P.Geo.; Ms. S. Watters, P.Geo., Mr. R. Adair, P. Geo., Vice President Exploration; and Mr. R. Mann, P.Geo, all contributed to the regional, local geological, and historical information on the BMC Project, along with a portion of the text related to the drill program conducted by Osisko Metals, the analytical procedures and QC/QA program. Mr. C. Kodors, P.Geo assisted AGP in the recommendation section and provided a review of the information supplied by Osisko Metals' personnel and AGP.

All of the text provided to AGP by Osisko Metals was compiled (with edits) and was accepted by the QP.

AGP believes the information used to prepare this Technical Report and to formulate its conclusions and recommendations is valid and appropriate considering the status of the BMC Project and the purpose for which the report is prepared. The technical data are considered appropriate for producing a resource estimate for the BMC Project. The authors, by virtue of their technical review of the BMC Project's exploration potential, affirm that the work program and recommendations presented in the report are in accordance with NI 43-101 and Canadian Institute of Mining (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM Definition Standards).

2.2.1 Effective Dates

The Mineral Resources have an effective date of February 20, 2019, and drill data and information on the BMC Project is current to January 14, 2019.

2.3 Information Sources and References

No prior NI 43-101 report exists for the BCM; therefore, the text for Section 4 to Section 9 was derived by summarizing various reports quoted in the text and listed in the reference section of this report.

2.4 Introduction to the Deposits

2.4.1 Introduction to Key Anacon

The property (Key Anacon Main Zone) was discovered in 1953 by New Larder "U" Island Mines Ltd. (Larder), and a 457 m shaft was sunk in 1954. Eight levels were developed prior to shutdown in 1957. Further exploration occurred intermittently between 1964 and 2001.

Osisko Metals obtained the BMC Project by signing a Definitive Purchase Agreement to acquire a 100% undivided interest in the Key Anacon claims and surrounding area from Hunter Brook Holdings Ltd. (Hunter Brook), on December 27, 2017. The Key Anacon property includes 51 mineral claims covering 12.75 km. The property contains two known Bathurst-type volcanogenic massive sulphide (VMS) deposits containing zinc, lead, copper, and silver. The Key Anacon Main Zone and Key Anacon Titan Zone deposits are situated in the same stratigraphic horizon that hosted the Brunswick No. 12 and Brunswick No. 6 mines. Osisko Metals is using a combination of 3D data integration, innovative advanced technologies, new concepts, and diamond drilling to expand the current known tonnage along strike and at depth.

2.4.2 Introduction to Gilmour South

Exploration in the vicinity of the Gilmour South deposit was first reported in 1977 by Key Anacon Mines Ltd. (Key Anacon), where a 2.5 m wide vein of massive sulphide was located during a trenching program. Later exploration programs by Noranda Mining and Exploration Inc. (Noranda) carried out during the 1990s were followed-up by a 40-hole diamond drill program, completed in 2001, that located the deposit and defined a limited extent and grade.

Osisko Metals obtained the property by signing a Definitive Purchase Agreement to acquire a 100% undivided interest in the 3 Amigos property claims. The agreement defined in the "Second Amended and Restated Letter Agreement" is effective March 7, 2017, and comprises 55 claim units located within claim blocks 7443, 7445, 7958, 7959, 7960, 7961 (7961 which has been regrouped with another claim block), and 7964. The BMC Project includes 736 mineral claims covering 184 km^2. The property contains the Gilmour South Bathurst-type VMS deposit, containing zinc, lead, copper, and silver, and is situated in the same stratigraphic horizon that hosts the Brunswick No. 12 and Brunswick No. 6 mines. Osisko Metals is using a combination of 3D data integration, innovative advanced technologies, new concepts, and diamond drilling to expand the current known tonnage along strike and at depth.

3 RELIANCE ON OTHER EXPERTS

AGP has followed standard professional procedures in preparing the content of this resource estimation report. Data used in this report has been verified where possible, and the report is based upon information believed to be valid and appropriate at the time of completion considering the status of the BMC Project and the purpose for which the report is prepared.

The technical data are considered appropriate for producing a resource estimate for the BMC Project. The authors, by virtue of their technical review of the BMC Project's exploration potential, affirm that the work program and recommendations presented in the report are in accordance with the CIM Definition Standards for CIM Definition Standards referred to in the NI 43-101 regulations.

3.1 Mineral Tenure and Surface Rights

Osisko Metals supplied the information contained in Section 4 of this report regrading mining titles, option and royalty agreements, environmental liabilities, and permits.

While AGP consulted the New Brunswick Department of Energy and Resource Development (NB DERD) Mining Recorder's office online claim management system via: http://nbeclaims.gnb.ca/nbeclaims/page/home.jsf for the latest status regarding ownership and mining titles, the QP is not qualified to express any legal opinion with respect to property titles, current ownership, mineral rights, third-party agreements, surface rights, property agreements, royalties, or environmental status and possible litigations, and has relied on information provided on March 20, 2019, by Mr. Charles Kodors, P.Geo., Exploration Manager, Osisko Metals, and approved by Mr. Jeff Hussey, President and CEO of Osisko Metals on April 03, 2019.

As of the date of this Technical Report, Osisko Metals indicated that there are no known litigations potentially affecting the Key Anacon and/or Gilmour South deposits.

4 PROPERTY DESCRIPTION AND LOCATION

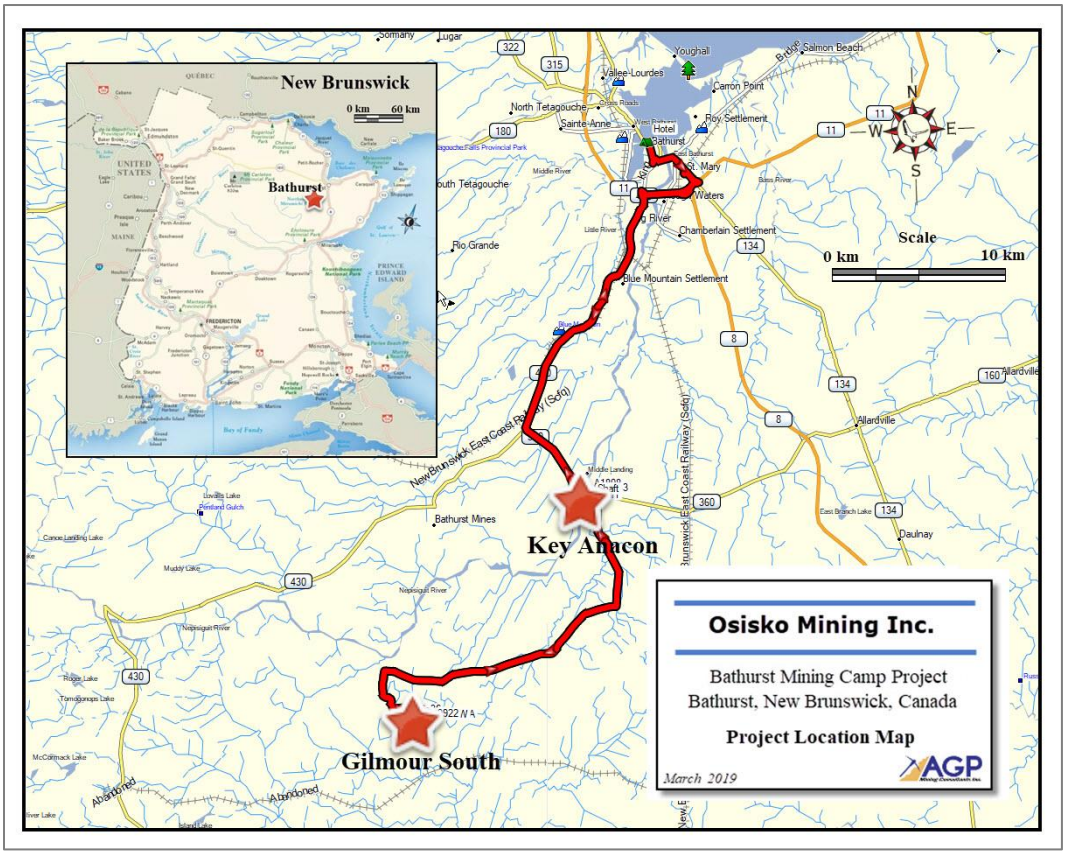
4.1 Location

The BMC is located south-southwest of the town of Bathurst, in Gloucester County, New Brunswick, NTS sheet 21P/05. All deposits are accessible year-round by paved and/or well-maintained gravel roads.

The Key Anacon property is located about 20 km south-southwest of the town of Bathurst, and is approximately centered at latitude N 47° 26' 08" and longitude W 65° 42' 55". The Gilmour South deposit is located 45 km to the south-southwest of the town of Bathurst, and is approximately centered at latitude N 47° 19' 16" and longitude W 65° 50' 05".

Access from the Osisko Metals field offices and warehouse, located on 755 Foley Avenue, Bathurst to the Key Anacon property is via NB-11 and NB-430S for 15 km, and NB-360E for an additional 5 km. From there the property can be accessed via a network of gravel roads and diamond drill trails. From the Key Anacon property, Gilmour South can be accessed via NB-360E for 2 km followed by a network of unnamed gravel roads for 24 km (Figure 4-1).

Figure 4-1: Property Location Map



4.2 Mineral Tenure and Agreements

4.2.1 Key Anacon Property

The property hosts the Key Anacon Main and Key Anacon Titan deposits, and is recorded as the Key Anacon Mine (claim block 1837), consisting of 51 claim units with a total surface area of 1,113.74 hectares (ha) (Table 4-1). The information presented in Table 4-1 was extracted from the NB DERD Energy and Mines Division (EMD), NB e-CLAIMS, on March 6, 2019, and describes the work requirements and fees needed to maintain the claim block.

Table 4-1: Key Anacon Claim Block 1837

Property Characteristic – Key Anacon		
Claim block number		1,837
Current term (years)		35
Number of units		51
Renewal fee per unit		$50.00
Work required to date		$1,241,350.00
Work applied to date		$1,649,349.00
Available credit excess	=	$407,999.00
Work expenditure required to renew	+	$40,800.00
Balance needed to renew	=	$0
Expiry date		28/10/2019

Table 4-2 summarizes the list of claim units within Block 1837. Osisko Metals' 2018 program maxed out the 10-year limit of work credits that can be applied to a claim block. Osisko Metals owns 100% of the property's mineral rights under the prospecting License Number 16336, whereas the Crown owns the surface rights.

Table 4-2: Key Anacon Claim Unit IDs, Block 1837

Key Anacon Claim Unit IDs, Block 1837						
1424067M	1424068D	1424068E	1424076D	1424076E	1424076F	1424076K
1424076L	1424076M	1424076N	1424076O	1424076P	1424077A	1424077B
1424077C	1424077D	1424077E	1424077F	1424077G	1424077H	1424077I
1424077J	1424077K	1424077L	1424077M	1424077N	1424077O	1424077P
1424078A	1424078B	1424078C	1424078D	1424078E	1424078F	1424078G
1424078H	1424086P	1424087A	1424087G	1424087H	1424087I	1424087J
1424087K	1424087L	1424087M	1424087N	1424088D	1424097O	1424097P
1424098A	1424098B					

4.2.2 Gilmour South Property

The bulk of the known mineral deposit lies on the West claim block 7958, with the remaining on the South claim block 7964 (**Error! Reference source not found.**).

The property recorded as the Gilmour West claim block 7958 consists of 200 claim units with a total surface area of 4,367.58 ha. The information presented in Table 4-3 was extracted from the NB DERD EMD, NB e-CLAIMS, on March 6, 2019, and describes the work requirements and fees needed to maintain the claim block.

Table 4-3: Gilmour West Claim Block 7958

Property Characteristics – Gilmour West Claim Block 7958		
Claim block number		7958
Current term (years)		3
Number of units		200
Renewal fee per unit		$10.00
Work expenses required to date		$50,000.00
Work expenses applied to date		$477,614.00
Available excess	=	$427,614.00
Work expenditure required to renew	+	$40,000.00
Balance needed to renew	=	$0
Expiry date		27/12/2019

Table 4-4 summarizes the list of claim units. Osisko Metals owns 100% of the property's mineral rights under the prospecting License Number 16336, whereas the Crown owns the surface rights. Gilmour South has excess credits for the next seven years.

Table 4-4: Gilmour West Claim Unit IDs, Block 7958

Gilmour West Claim Unit IDs, Block 7958						
1323021C	1323021D	1323021E	1323021F	1323021K	1323021L	1323021M
1323021N	1323022C	1323022D	1323022E	1323022F	1323022K	1323022L
1323022M	1323022N	1323031A	1323031B	1323031C	1323031D	1323031E
1323031F	1323031G	1323031H	1323031I	1323031J	1323031K	1323031L
1323031M	1323031N	1323031O	1323031P	1323032A	1323032B	1323032C
1323032D	1323032E	1323032F	1323032G	1323032H	1323032I	1323032J
1323032K	1323032L	1323032M	1323032N	1323032O	1323032P	1423012M
1423012N	1423013C	1423013D	1423013E	1423013F	1423013K	1423013L
1423013M	1423013N	1423014C	1423014D	1423014E	1423014F	1423014K
1423014L	1423014M	1423014N	1423015C	1423015D	1423015E	1423015F
1423015K	1423015L	1423015M	1423015N	1423016C	1423016D	1423016E
1423016F	1423016L	1423016M	1423019D	1423019E	1423019L	1423019M
1423021E	1423021F	1423021K	1423021L	1423021M	1423021N	1423021O

Gilmour West Claim Unit IDs, Block 7958						
1423022A	1423022B	1423022C	1423022D	1423022G	1423022H	1423022I
1423022J	1423022O	1423022P	1423023A	1423023B	1423023G	1423023H
1423023I	1423023J	1423023O	1423023P	1423024A	1423024B	1423024G
1423024H	1423024I	1423024J	1423024P	1423025I	1423025P	1423026A
1423026B	1423026P	1423027A	1423027H	1423027I	1423027K	1423027L
1423027M	1423027N	1423027O	1423027P	1423028A	1423028B	1423028C
1423028D	1423028E	1423028F	1423028G	1423028J	1423028K	1423028L
1423028M	1423028N	1423028O	1423028P	1423029A	1423029B	1423029C
1423029F	1423029G	1423029H	1423029I	1423029J	1423029K	1423029L
1423029M	1423029N	1423029O	1423029P	1423030C	1423030D	1423030E
1423030F	1423030K	1423030L	1423030M	1423030N	1423031A	1423031B
1423031H	1423031I	1423031P	1423032A	1423037N	1423037O	1423037P
1423038A	1423038B	1423038C	1423038F	1423038G	1423038H	1423038I
1423040A	1423040H	1423040I	1423040J	1423040K	1423040L	1423040M
1423040N	1423040O	1423040P	1523039P	1523040A	1523040G	1523040H
1523040I	1523040J	1523040O	1523040P			

The property recorded as the Gilmour South claim block 7964 consists of 256 claim units with a total surface area of 5,604.22 ha. The information presented in Table 4-5 was extracted from the NB DERD EMD, NB e-CLAIMS, on March 6, 2019, and describes the work requirements and fees needed to maintain the claim block.

Table 4-5: Gilmour South Claim Block 7964

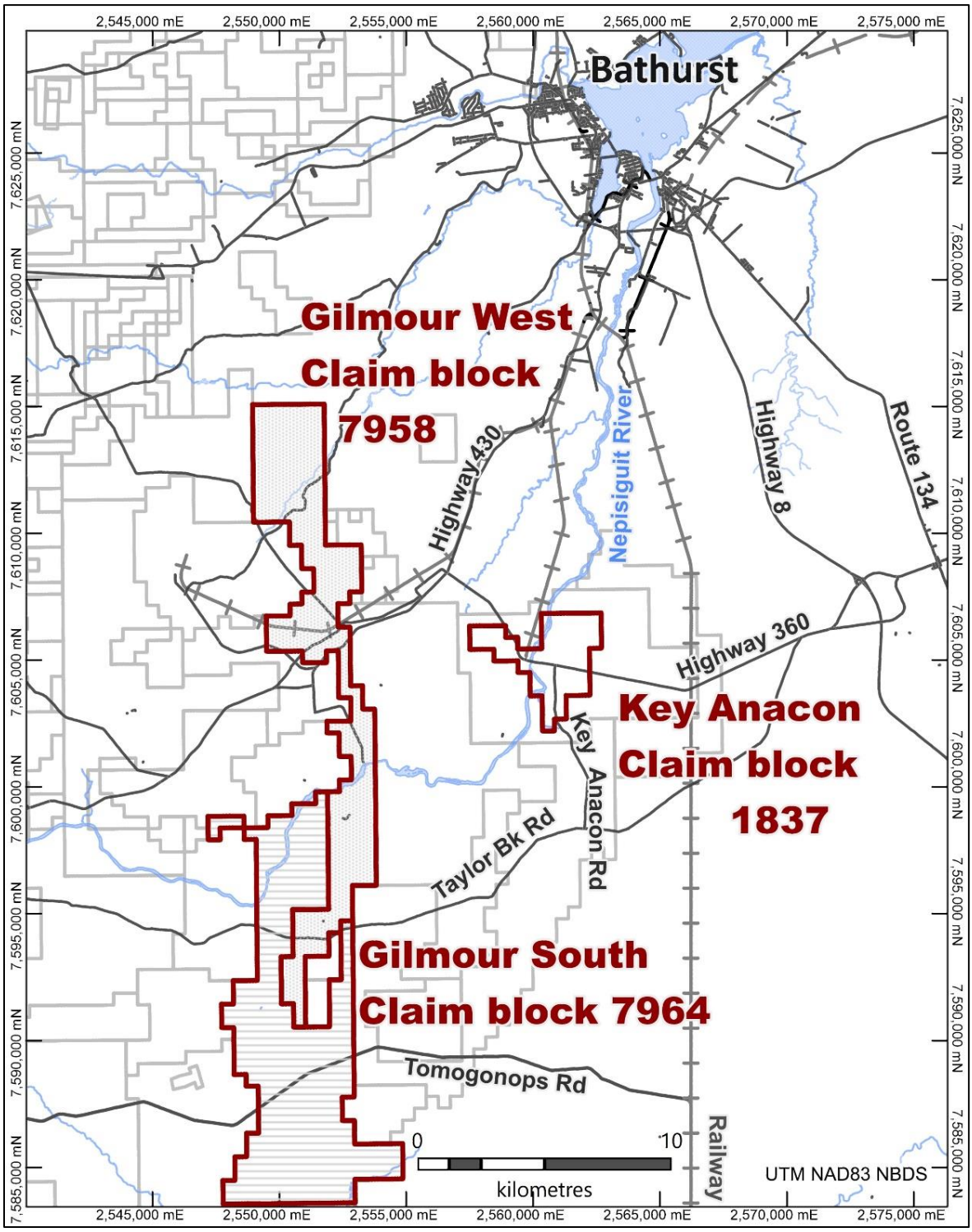
Property Characteristics		
Claim block number		7964
Current term (years)		3
Number of units		256
Renewal fee per unit		$10.00
Work expenses required to date		$64,000.00
Work expenses applied to date		$273,751.10
Available excess	=	$209,751.04
Work expenditure required to renew	+	$51,200.00
Balance needed to renew	=	$0
Expiry date		28/12/2019

Table 4-6 summarizes the list of claim units. Osisko Metals owns 100% of the property's mineral rights under the prospecting License Number 16336, whereas the Crown owns the surface rights. The Gilmour South property has excess credits for the next three years.

Table 4-6: Gilmour South Claim Unit IDs, Block 7964

Gilmour South Claim Unit IDs, Block 7964						
1423021A	1423021H	1423021I	1423021P	1423022E	1423022F	1423022K
1423022L	1423022M	1423022N	1423023C	1423023D	1423023E	1423023F
1423023K	1423023L	1423023M	1423023N	1423024C	1423024D	1423024E
1423024F	1423024K	1423031C	1423031D	1423031E	1423031F	1423031G
1423031J	1423031K	1423031L	1423031M	1423031N	1423031O	1423032B
1423032C	1423032D	1423032E	1423032F	1423032G	1423032H	1423032I
1423032J	1423032K	1423032L	1423032M	1423032N	1423032O	1423032P
1423033A	1423033B	1423033C	1423033D	1423033E	1423033F	1423033G
1423033H	1423033I	1423033J	1423033K	1423033L	1423033M	1423033N
1423033O	1423033P	1423034A	1423034B	1423034C	1423034H	1423043M
1423043P	1423044B	1423044C	1423044D	1523016I	1523016J	1523016K
1523016L	1523016M	1523016N	1523016O	1523016P	1523017A	1523017B
1523017C	1523017D	1523026A	1523026B	1523026C	1523026D	1523026E
1523026F	1523026G	1523026H	1523026I	1523026J	1523026K	1523026L
1523026M	1523026N	1523026O	1523026P	1523027A	1523027B	1523027C
1523027D	1523027E	1523027F	1523027G	1523027H	1523027I	1523027J
1523027K	1523027L	1523027M	1523027N	1523027O	1523028B	1523028C
1523028D	1523028E	1523028F	1523028G	1523028H	1523028I	1523028J
1523028K	1523028L	1523028M	1523028N	1523028O	1523028P	1523029A
1523029B	1523029C	1523029D	1523029E	1523029F	1523029G	1523029H
1523029I	1523029J	1523029K	1523029L	1523029O	1523029P	1523030A
1523030B	1523030G	1523030H	1523030I	1523030J	1523030P	1523036A
1523036B	1523036C	1523036D	1523036E	1523036F	1523036G	1523036H
1523036I	1523036J	1523036K	1523036L	1523036M	1523036N	1523036O
1523036P	1523037A	1523037B	1523037C	1523037D	1523037E	1523037F
1523037G	1523037H	1523037I	1523037J	1523037K	1523037L	1523037M
1523037N	1523037O	1523037P	1523038A	1523038B	1523038C	1523038D
1523038E	1523038F	1523038G	1523038H	1523038I	1523038J	1523038K
1523038L	1523038M	1523038N	1523038O	1523038P	1523039A	1523039B
1523039C	1523039D	1523039E	1523039F	1523039G	1523039H	1523039I
1523039J	1523039K	1523039L	1523039M	1523039N	1523039O	1523040B
1523040C	1523040D	1523040E	1523040F	1523040K	1523040L	1523040M
1523040N	1523046A	1523046B	1523046C	1523046F	1523046G	1523046H
1523046I	1523046J	1523046O	1523046P	1523047A	1523047H	1523048I
1523048O	1523048P	1523049A	1523049B	1523049G	1523049H	1523049I
1523049J	1523049N	1523049O	1523049P	1523050A	1523050B	1523050C
1523050G	1523050H	1523050I	1523050J			

Figure 4-2: Property Claim Map



4.3 Royalties and Encumbrances

4.3.1 Key Anacon Property

Under a purchase agreement dated December 21, 2018, Osisko Metals arranged to purchase the Key Anacon property from Hunter Brook for $1,500,000 in a combination of cash and shares over staged payments. The terms of the payment are outlined as follows:

- On the closing date, the Purchaser paid the Seller $1,000,000 as follows:
  - $750,000 was paid in cash immediately with available funds.
  - $250,000 was paid by the issuance of such number of Purchaser shares as was equal to the quotient derived by dividing $250,000 by the volume-weighted average price (VWAP) for the five consecutive trading days ending on the trading day immediately prior to the date of the public announcement by the purchaser of this agreement.
- On the second anniversary of the Execution Date (December 21, 2019), the Purchaser will pay to the Seller $500,000 by the issuance of such number of Purchaser shares as is equal to the quotient derived by dividing $500,000 by the VWAP for the 20 consecutive trading days ending on the trading day immediately prior to the Exchange in accordance with its policies.
- Additionally, if the Purchaser achieves Commercial Production on the Property, the Purchaser will pay to the Seller a Performance Payment of $500,000 in cash in immediately available funds within five Business Days of the Purchaser declaring Commercial Production.

4.3.2 Gilmour South Property

On March 7, 2017, Bowmore Exploration Ltd. (Bowmore) and predecessor of Osisko Metals Incorporated entered into an option agreement to acquire a 100% interest in the Gilmour South and Gilmour West properties as part of a larger land package deal referred to as "The 3 Amigos Property," by conducting exploration work and making payments to the vendors. Bowmore subsequently changed its name to Osisko Metals Incorporated, and the terms of the agreement have since been duly amended. The material terms of the option agreement are as follows:

- Make the following cash payments to the Optionees:
  - (A) Pay $7,000 to each Optionor within five days of receiving TSX Venture Exchange approval of this transaction (paid);
  - (B) Pay $10,000 to each Optionor on the first (Paid) and second anniversaries (Paid) of the Original Date; and
  - (C) Pay $15,000 to each Optionor on the third, fourth, and fifth anniversaries of the Original Date.
- Issue to each Optionor the following common shares of Osisko Metals:
  - (A) 8,333 common shares (post-Consolidation) to each Optionee within five days of receiving TSX Venture Exchange approval of the transaction (issued), and 8,333 common shares

(post-Consolidation) to each Optionee on the first anniversary of the Original Date (issued);

(B) 11,666 common shares (post-Consolidation) to each Optionor on the second (Issued), third, fourth, and fifth anniversaries of the Original Date;

(C) 16,666 common shares (post-Consolidation) to each Optionor within five days of the date on which Osisko Metals receives a positive preliminary economic assessment in respect of its properties within the Brunswick Belt; and

(D) 33,333 common shares (post-Consolidation) to each Optionor within five days of the date on which Osisko Metals receives a positive feasibility study in respect of its properties within the Brunswick Belt.

- Incur exploration work expenditures on the Property as follows:

(A) $50,000 on exploration work on or before the first anniversary of the Original Date;

(B) $100,000 on exploration work on or before each of the second, third, and fourth anniversaries of the Original Date; and

(C) $150,000 on exploration work on or before the fifth anniversary of the Original Date.

4.4 Surface Leases

Osisko Metals currently has no surface leases on the Key Anacon or Gilmour South properties.

4.5 Permitting

Osisko Metals' Work and Harvesting Permits for the Key Anacon Property expired on March 31, 2019. Osisko Metals' Work and Harvesting permits have also expired for the Gilmour South property. Osisko Metals is currently renewing their Work and Harvesting permits for the Key Anacon Property for future exploration activities.

4.6 Social and community Impact

Osisko Metals is actively consulting with local communities and First Nations to create positive and mutually beneficial relationships. Information regarding the exploration activities has been shared with interested parties, as well as with the local municipal governments and the New Brunswick Government.

4.7 Environmental Liability

Osisko Metals hired GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) to conduct a seasonal surface water and sediment quality sampling program as well as a Phase I Environmental Site Assessment (ESA) at the Key Anacon property. The surface water and sediment quality sampling program is ongoing and reports for the spring and summer of 2018 can be found in Appendix A. In

regards to environmental liabilities, please see the text quoted below from the discussion and recommendations section of the Phase 1 ESA at Key Anacon:

> *"During the Phase I ESA a number of environmental issues were identified at the Site associated with historical mining operations. It is understood that Osisko's entitlement to the Key Anacon property is currently limited to mineral rights, and as such it has no environmental liabilities or reclamation obligations that would be associated with surface ownership of the Site. "*
>
> *"If in the future, however, Osisko decide to acquire surface rights to the Site in support of mine development, the Site's historical environmental liabilities, including the waste rock pile and related ML/ARD impacts, as well as other potential sources of contamination identified as part of the Phase I ESA, will need to be considered both as part of acquisition negotiations with the Crown prior to transfer of surface rights to Osisko, as well as in subsequent mine development, operation and rehabilitation/closure planning."*

Osisko Metals does not own the surface rights and as such does not incur environmental liabilities at the Key Anacon property. The Phase 1 ESA can be found in Appendix A.

The most invasive exploration on the Gilmore South deposit to date has been diamond drilling, which has not necessitated formal environmental studies. Should the Project proceed to Preliminary Economic Assessment (PEA), it would be advisable to conduct a Phase I ESA.

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

5.1 Accessibility

The Key Anacon property is situated 20 km south of the city of Bathurst, New Brunswick. Bathurst is part of the Chaleur region, which hosts many smaller communities and towns. Larger cities located near the property include Miramichi (70 km), Moncton (210 km), and Fredericton (250 km), as shown on Figure 4-1.

The property can be accessed by travelling south of Bathurst 16 km along Highway NB-430, and 3 km southeast along Highway NB-360. Highway NB-360 bisects the property, with the Titan deposit occurring on the north side of the highway, and the Main Zone occurring to the south.

The Gilmour South property is located 27 km by road from Key Anacon, and covers 1.4 km^2 of the Brunswick Horizon. It is located 20 km south of the former Brunswick No. 12 mine, and 7 km south of the former Brunswick No. 6 Mine.

Access to the deposit can be achieved by travelling 21 km southwest of Key Anacon along the Taylor Brook Road. Near the 21 km marker on Taylor Brook Road, an unnamed auxiliary road provides access to the deposit, which is located 5 km south of the intersection.

Off-road access to all three deposits varies, depending on the season. The best access is in the summer and fall months, by pickup truck or all-terrain vehicle.

During the winter, access to the Titan deposit is shared with the Nepisiguit Snowmobile Club, limiting access to snowmobiles or tracked vehicles. Access to the Key Anacon Main deposit can be maintained throughout the winter season to allow access by pickup truck. Gilmour South can be accessed during the summer, winter, and fall months, as access is maintained along the Taylor Brook gravel road; however, additional snow clearing is required to maintain winter access to the deposit along the auxiliary roads.

Access to all three deposits is difficult during the spring months, as unpaved roads in the region become waterlogged due to poor drainage, and access is limited to all-terrain or track vehicles.

5.2 Climate

The BMC Project areas are in a region of humid continental climate, with mild warm summers and cold winters with heavy snow falls. The area is typically snow covered from December until April, with an average annual snowfall of 3.33 m. The average annual temperature is 10.2°C, with the hottest summer month (July) averaging 19.1°C, and the coldest winter month (January) averaging -10.8°C (Environment Canada).

5.3 Local Resources and Infrastructure

The town of Bathurst, with a population of approximately 12,275 residents, is located 16 km north of the northern boundary of the Key Anacon property. Bathurst is known as the business hub of Northeastern New Brunswick, and provides most major services, including an airport with scheduled service from Montreal, and a rail terminal that provides service to Quebec City, Miramichi, Moncton, and Halifax.

The village of Belledune, New Brunswick, with a population of approximately 1,550 residents, is located 62 km north of the Key Anacon Project along highways NB-360, NB-11, and NB-134. Belledune is the location of Glencore's lead and silver smelter, and supports a deepwater port facility from which barge traffic traverses Chaleur Bay.

5.4 Physiography

The Key Anacon property is typically flat, with an approximate average elevation of 60 m, hosting a gentle slope to the west towards the Nepisiguit River. Due to the flat topography and moderate till cover, bedrock exposure is minimal, with exposure limited to highway road cuts and the banks of the Nepisiguit River. This river traverses the west side of the property, creating a narrow, incised valley, and providing the only window to the surface geology.

The Gilmour South property is typically flat, with an average approximate elevation of 115 m. Much of the area proximal to the deposit is marsh covered. Due to the flat topography and moderate till cover, bedrock exposure is minimal.

6 HISTORY

The first significant sulphide discovery in the Bathurst Mining Camp occurred in 1907, when Drummond Iron Mine intersected mineralization in a massive sulphide deposit which would later be known as the Brunswick No. 6 Mine (Thomas et al., 2000). On closure, a total of about 12.2Mt grading 5.43% Zn, 2.15% Pb, 0.40% Cu and 67 g/t Ag had been mined (The Government of New Brunswick, Department of Energy and Resource Development Mineral Occurrence Database).

Since this first discovery, New Brunswick has developed into a world-class base metal mining district, hosting 45 volcanic sediment-hosted massive sulphide (VSHMS) deposits and 95 occurrences. The largest deposit was Brunswick No. 12, which opened in 1964 and closed on May 10, 2013, following 49 years of production. Total past production was 136.6 Mt grading 8.74% Zn, 3.44% Pb, 0.37% Cu and 102.2 g/t Ag (The Government of New Brunswick, Department of Energy and Resource Development Mineral Occurrence Database)

6.1 Key Anacon Deposit

Copper mineralization was first recognized in 1930 at Middle Landing, just south of the Allardville Road (now Route NB-360), but the area was not drilled until 1947, after having been staked by Mr. P. Leger. In 1952, Larder acquired the property to examine an aeromagnetic anomaly located southeast of the copper showing.

The Key Anacon deposit was discovered in 1953 during follow-up drilling of this electromagnetic anomaly. A total of 110 holes were drilled before the company was acquired by Anacon Lead Mines Ltd. in 1954. Subsequently, a 457 m shaft was sunk and 8 levels were developed prior to shut-down in 1957, however significant production was never achieved prior to shut down of the operation.

In 1964, Anacon Lead Mines Ltd. joined with Keymet Mines Ltd. to form Key Anacon Mines Limited (Key Anacon) and the mine was reopened (Assessment Report 471353). Work was once again suspended in July 1966, when the mine was closed before production started. Exploration resumed in 1973, with geophysical surveying and mapping until 1976. Sporadic exploration occurred between 1976 and 1990, consisting of 13 drill holes totalling 1,790 m.

J.S. Redpath Limited (Redpath) prepared a feasibility study (FS) in 1989 (Assessment Report 473774), and determined that the deposit was uneconomical at the metal prices of the day. Osisko Metals believes that no significant production occurred on the Project site, with the possible exception of bulk sampling to provide material for metallurgical testing to support a prefeasibility study (PFS) and a FS. AGP notes that the Redpath's FS was published as an internal report, and is no longer available for review. Osisko is not treating these historical estimates as current mineral resources or reserves and the QP has not undertaken any independent investigation of the resource estimates; therefore, the resource estimates in the J.S. Redpath report (if found) should not be relied upon. These historical

resource estimates are no longer current and have been superseded by the resource estimate described in Section 14 of this report.

Rio Algom Exploration Inc. (Rio Algom) optioned this property in 1992 from Key Anacon, and explored the depth and lateral extent of the mineralization. A Northern Miner press release (November 17, 1992) reported assays from two sulphide intersections: one from DDH 92-10, which cut 7.2 m grading 4.49% Pb, 6.22% Zn, and 253.7 g/t Ag, approximately 260 m beneath the old exploration workings; and the other from DDH 92-17, which intersected 14.3 m grading 4.62% Pb, 12.18% Zn, and 123 g/t Ag, about 450 m below surface in a new zone, located east of the main deposit (later named the Titan Zone deposit by Osisko Metals). Another Northern Miner press release (August 16, 93) reported an 83 m intersection of massive sulphides in hole KA93-42 that included a 19.9 m interval grading 0.33% Cu, 3.58% Pb, 7.86% Zn, and 78.08 g/t Ag. In January 1994, Rio Algom reported that it had terminated its option with Key Anacon.

The property was optioned by Noranda in December 2000. Noranda conducted geophysical surveys and diamond drilling on both the Main Zone and the East Zone throughout 2001. This program extended known mineralization on the Key Anacon property, but not significantly, according to their filed Assessment Report 475571.

On January 23, 2018, Osisko Metals announced the purchase of the Key Anacon property from Hunter Brook, and commenced an intensive drilling program with the objective of upgrading the Main Zone and further exploring the Titan Zone.

Table 6-1 summarizes the exploration history of the Key Anacon Deposit.

Table 6-1: Summary of Exploration for Key Anacon Deposit

Year	Description
1930	Tom LaFrance discovers chalcopyrite showing in the Middle Landing area
1945	Peter Leger rediscovers and grubstakes the area
1947	Under supervision of M.A. Cooper of James and Buffam Ltd., 14 diamond drill holes with total footage of 2,908 ft were drilled
1952	Larder acquires the property
1953	Vertical Loop EM surveys carried out by McPhar Geophysics and Sharpe Geophysics (Sharpe), with additional partial resistivity, magnetics, and gravity surveys
1954	Diamond drilling of 110 holes totalling 50,000 ft leads to the discovery of Key Anacon
1955	Anacon Lead Mines acquires all assets of Larder. by share exchange
1955	Mining plant installed and shaft sinking begins
1956	Shaft completed to 1,500 ft, with beginning of lateral work on six levels
1957	Underground work suspended after completion of 3,031 ft of drifts, 267 ft of ore-pass and 10,111 ft of underground drilling distributed over 23 drill holes (ddh)
1960	EM gun survey by Moreau, Woodard & Company
1961	Gravity survey on southern half of property by Sharpe
1961	Diamond drilling on two holes for a total of 1,600 ft
1964	Anacon Lead Mines Ltd. reorganizes as Key Anacon

Year	Description
1964	Underground work resumes, with drilling of 206 holes
1966	Mine is closed and allowed to flood
1973	Exploration resumes with magnetic survey, soil survey, and relogging of 65,000 ft of core
1974	Exploration continues with magnetics, EM-16, geochemical orientation survey, gravity, and geologic mapping from Key Anacon to Nepisiguit Falls
1976	Horizontal loop-EM survey by Geosearch
1976	Diamond drilling of two holes, with total footage of 654 ft
1981	Diamond drilling of seven holes, with total footage of 3,715 ft
1989	Redpath prepares a feasibility study
1990	Diamond drilling of four boles, with total footage of 1,506 ft
1992	Rio Algom options ground from Key Anacon. New 139 km metric grid installed, 122 km magnetic and MaxMin-EM surveying, 57 km gravity surveying, 31 ddh totalling 12,678 m, 8 holes surveyed with pulse electromagnetics (PEM)
1993	Rio Algom drills 36 ddh totalling 14,501 m, performs detailed line cutting on East Zone, surveys seven holes PEM. Rio Algom's two-year exploration expenditures total $2.3 million, they terminate option
2000	Noranda options property
2001	Geophysical grid work, VLF-EM, and MaxMin-EM performed by Quantec Geoscience; 17 ddh completed, totalling 16,040 m

AGP notes that some of the historical work described above is still relevant today, since results from the 1952 Larder drilling, the 1957 underground drilling by Anacon Lead Mines Ltd., the extensive underground drilling in 1964 by Key Anacon, the 1992–1993 Rio Algom drilling, and the 2001 Noranda drilling supports much of the MRE described in Section 14 of this report. Information on this historical drilling is described in Section 10 and analytical procedures are described in Section 11 of this report if it was available in the literature.

6.2 Gilmour South Deposit

Work in the vicinity of the Gilmour South VSHMS deposit was first conducted by Key Anacon Mines, which trenched 2.5 m of massive sulphides in 1977 (Assessment Report 472130). The bulk of the work on the property, including ground geophysical surveys and a 73-hole diamond drilling program, was conducted by Noranda from 1997 to 2001 (Assessment Report 475506). The program was designed to test the Ordovician bedrock for base metal mineralization. The showing was drill-tested to a vertical depth of 800 m over a strike length of 1,000 m. It was recommended that further exploration along the Gilmour South be undertaken because favourable stratigraphy resides farther south where the presence of altered Ordovician rock was indicated.

Xstrata Canada reported the results of soil geochemistry over this deposit and for some distance to the west and south (Assessment Report 477250). A couple of unexplained copper and lead anomalies were identified. A description of the geological setting of the Gilmour South deposit was presented by Walker, 2005; (*in Geological Investigations in New Brunswick for 2004*). An abstract from this paper is below:

Drilling in the Gilmour Brook area, located in the southeastern Bathurst Mining Camp, northern New Brunswick, has intersected a continuous stratigraphic section through the Tetagouche Group and into the underlying Miramichi Group. The Miramichi Group consists of interlayered black shale and grey, locally feldspar-rich wacke of the Patrick Brook Formation. The Tetagouche Group contains four formations. In ascending order, these are 1) the Nepisiguit Falls Formation, which comprises two facies: fine-grained volcaniclastic rocks and minor felsic flows of the Little Falls Member; and coarse-grained crystal-rich tuffs of the Grand Falls Member, 2) the Flat Landing Brook Formation, a thick sequence of grey to black, aphyric to sparsely feldspar-phyric rhyolites, 3) the Little River Formation, which comprises interbedded mafic volcanic and sedimentary rocks, and 4) the Tomogonops Formation, composed of interbedded calcareous shale and wacke.

The Gilmour South base-metal occurrence is hosted by a stratigraphic section similar to that of the Brunswick Horizon. Sulphide mineralization is commonly present as semi-massive to massive occurrences within, or at the top of, the Grand Falls Member of the Nepisiguit Falls Formation. The stratiform Pb–Zn mineralization has been intersected intermittently over a strike of 1,400 m and to vertical depths of 700 m. Unlike the Brunswick deposits located farther north, the Gilmour Brook South occurrence shows little evidence of a laterally extensive exhalite, as it lacks an Algoma-type iron formation. The absence of this iron formation suggests either that deposition of the host sequence occurred under persistent anoxic conditions or that a high sedimentation rate and rapid burial may have prevented development of an iron-rich exhalite.

7 GEOLOGICAL SETTING

The VSHMS deposits of the Bathurst Mining Camp (BMC) are hosted by the Cambrian-Ordovician aged and poly-deformed rocks of the Bathurst Supergroup. This consists of the following sequence; basement Miramichi Group, the Tetagouche Group, the California Lake Group, the Sheephouse Brook Group, and the younger Fournier Group. The Tetagouche, California Lake, and Sheephouse-Brook Groups host all of the known VMS deposits in the BMC. In particular, out of 46 known deposits in the BMC, the Tetagouche Group hosts 32 of them, and 24 of these deposits are hosted within the Nepisiguit Falls Formation.

7.1 Regional Geology

The Bathurst Supergroup is situated within Ganderia (a micro-continent also known as the Gander Terrane), at the central orogenic core of the Northern Appalachians. The Supergroup records the approach and collision history of Ganderia against the Laurentia craton (the present North American continent) associated with the Appalachian orogenic event. This history started with the subduction of Iapetus Oceanic crust under Ganderia, a tectonic setting that resulted in active volcanism and the formation of a series of (Cambrian–Ordovician) arc and back-arc terranes along the northern edge of Gander terrane and to the southeastern margin of the Iapetus Ocean. Specifically, the Popelogan-Victoria arc system (devoid of significant VMS deposits), and the juxtaposed Tetagouche-Exploits back-arc basin (host of numerous VMS deposits) constituted the settings leading to the tectonostratigraphy of the BMC.

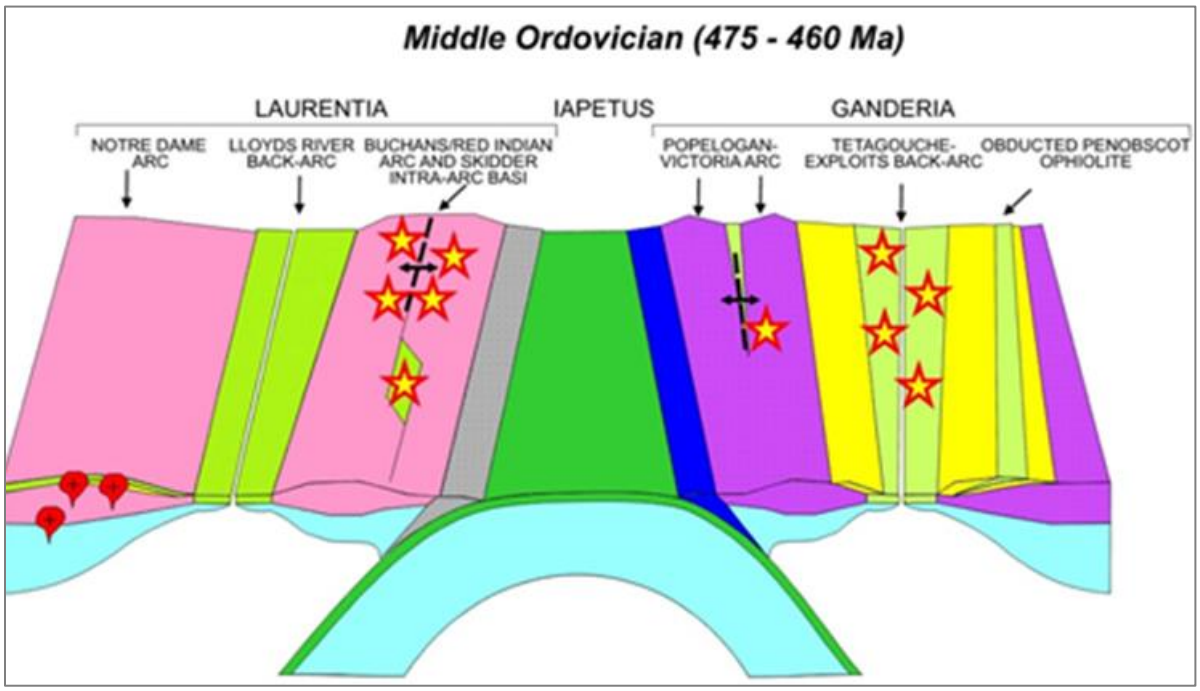
Rifting of the Popelogan arc started in the Early Ordovician and continued until the Middle Ordovician, forming the Tetagouche sedimentary basin where the volcano-sedimentary rocks of the Bathurst Supergroup were deposited (van Staal et al., 2003a). The Tetagouche-Exploits basin was a back-arc setting particularly conducive to produce large-scale and long-lived mineralizing hydrothermal systems, and thus hosted numerous VMS deposits. The BMC's mineralizing hydrothermal events are divided into four periods, spanning between 12 to 14 million years, known as the Chester (478 Ma), Caribou (472–470 Ma), Brunswick (469–468 Ma), and Stratmat (467–465 Ma).

The VMS deposits in the BMC formed in a single large basin in which periodic regional anoxic conditions alternated with well oxygenated conditions (Goodfellow et al., 2003). This type of extensional back-arc geodynamic setting is also favourable to form felsic-dominated bimodal volcanic sequences, i.e. predominantly felsic volcanic rocks intermixed with secondary volumes of sedimentary and mafic volcanic rocks, which in turn are linked to the type of metal endowment, i.e., the average zinc to lead ratio of VMS deposits in the BMC (avg. Zn/Pb = 2.44), which is comparable to many other VMS deposits hosted in felsic-dominated terranes worldwide (Franklin et al., 1981).

The rocks of the Bathurst Supergroup have undergone a complex tectonic history as a result of Ganderia drifting towards, and converging against, the Laurentia continent. The development of the

(accretionary prism) Brunswick Subduction Complex and the closing of the Tetagouche-Exploits basin, in the Late Ordovician to Early Silurian, led to the current polyphase-deformed and metamorphosed terrane of the Bathurst Supergroup (van Staal, 1994). Based on overprinting relationships, a total of five distinct camp-wide phases of deformation and three phases of metamorphism have been recognized throughout the Bathurst Supergroup. An overview of these is shown on Figure 7-1.

Figure 7-1: Middle Ordovician Tectonostratigraphic Setting of Major VMS Terranes in the Canadian Appalachians



Note: Modified from Rodgers et al., 2007 after van Staal.

7.1.1 Deformation History

In the deformation history of the BMC, the first and second deformation events (D1 and D2) produced mainly ductile-type faulting and strain, highly variable in intensity and understood to be responsible for most of the complex geometry in the BMC. They are also the most important controls on the present morphology and distribution of VMS deposits and their host rocks. In particular, D1 created shallow regional thrust faults and paralleling of layers with abundant sheath fold development, whereas D2 formed upright isoclinal folds (van Staal, 1985, 1994). These two phases of deformation have been interpreted by van Staal to reflect the oblique and sinistral convergence of Ganderia with the North American margin.

The D1 deformational event controlled most of the redistribution of sulphide mineralization; D2 also had a significant, but smaller influence (de Roo and van Staal, 2003). The D1 event started with the Bathurst Subduction Complex and the closure of the Tetagouche-Exploits back-arc basin, the tectonic environment that initiated the progressive and complex deformation history of dismembering the

BMC Groups and realigning them, juxtaposed to the accretionary prism (van Staal, 1994). Thrust detachment faults are recognized by high-strain zones, e.g., mylonites and phyllonites, separating similar lithostratigraphic repetitions (van Staal, 1985; van Staal and Williams, 1986). Major thrust faults developed together with penetrative S1 cleavage domains focused in thrust-related ductile shear zones, and generally at shallow angles, but highly variable in intensity. At least two generations of D1 folds have been identified, isoclinal to tight shaped, either cutting thrust faults or being cut by them. High pressure metamorphism typical of subduction settings accompanied this event.

D2 structures characteristically consist of asymmetrical upright folds and local narrow shear zones. In the east part of the BMC, the D2 event refolded the S1 foliations and produced asymmetric, tight to isoclinal, upright folds, as well as intense transposition of previous cleavage surfaces into the current subvertical S2 composite foliation. The morphology of the Brunswick No. 12 and No. 6 deposits were interpreted by van Staal (1984) to reflect the complex interference of D1 and D2 folds, with thickening of massive sulphides in the fold hinges. A second metamorphic event, low pressure and higher temperature, post-dated the D2 deformation event.

The two earlier structural domains were overprinted to various degrees by F3, F4, and F5 refolding. These vary considerably in their geometries and orientations on a regional scale, and include structures such as the Pabineau Antiform-Synform, the Nine Mile Synform, and the Tetagouche Antiform (Gower and McCutcheon, 1997). The D3 event is associated with open recumbent folding and kinks, which have overprinted D1 and D2 structures at variable penetrative intensities. D4 is the youngest penetrative deformation, and is associated with dextral transpression, thought to have produced brittle-ductile faults (van Staal et al., 2003). Historical records of S3, S4, and S5 structural data is scant, since these are rarely overprinted.

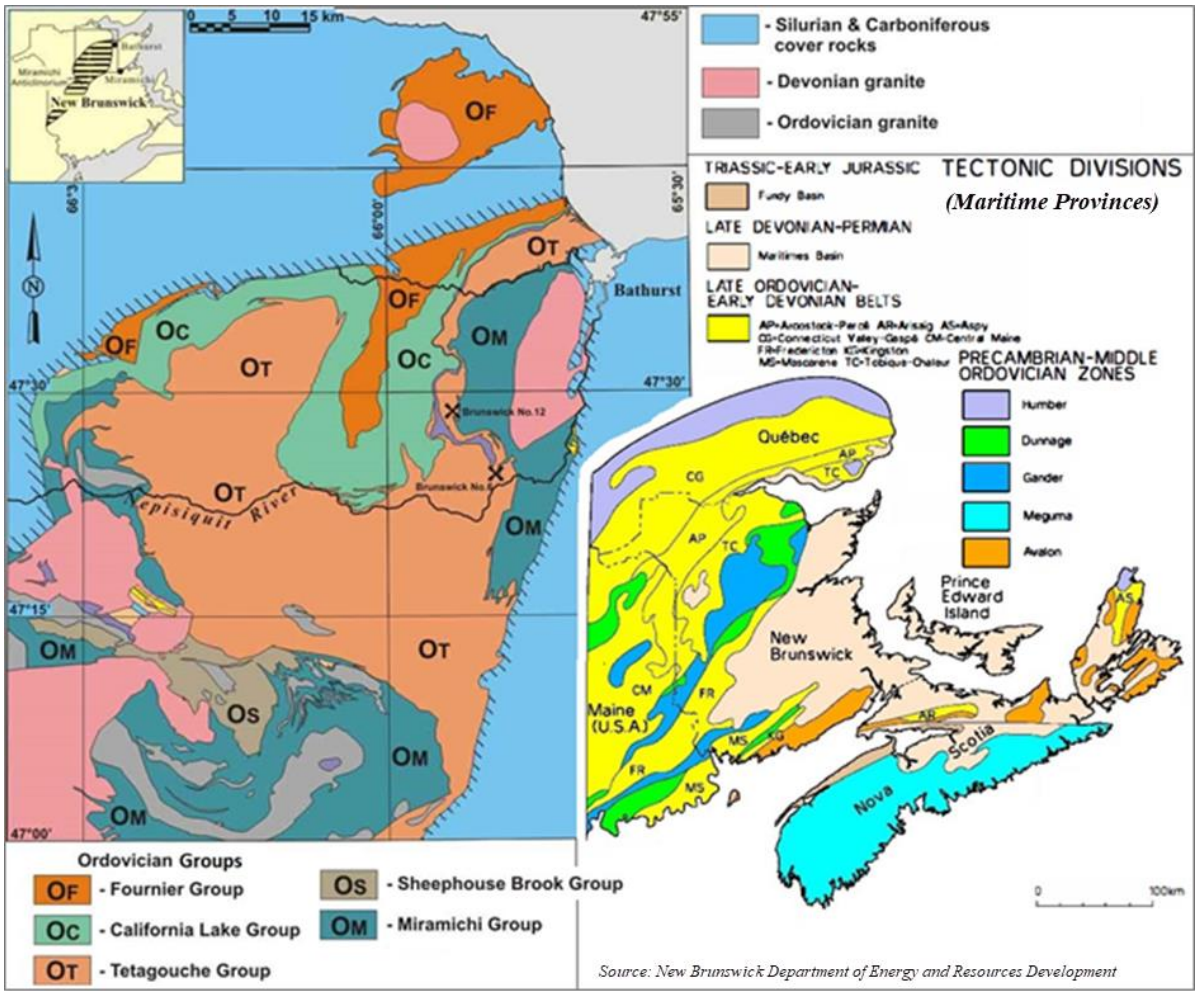
7.1.2 The Tectonostratigraphic Groups and Formations

The Bathurst Supergroup comprises five groups, in ascending order:

- Miramichi Group (deepwater sandstone and shale that is the basement to the BMC)
- Tetagouche Group
- California Lake Group
- Sheephouse Brook Group (three related but distinct volcano-sedimentary sequences in the back-arc setting)
- Fournier Group (mainly a remnant of the rifted back arc ocean floor).

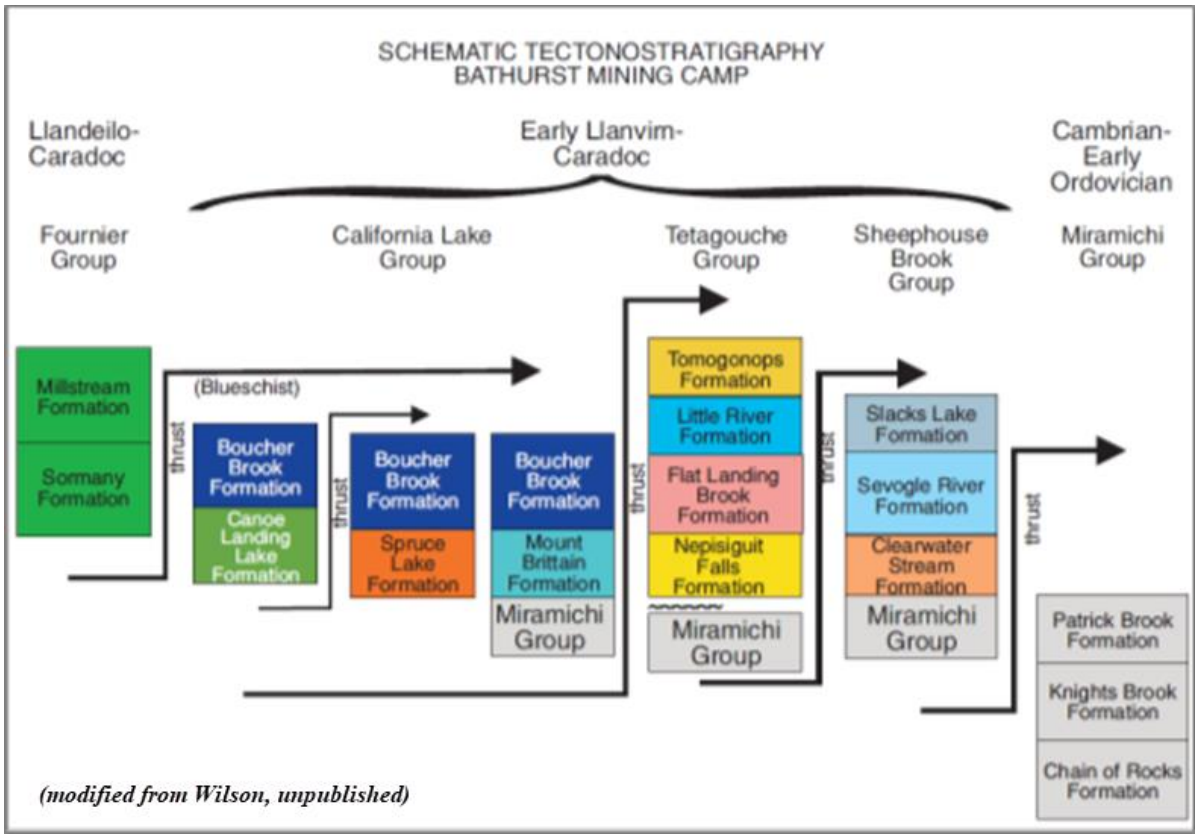
Figure 7-2 illustrates the positions of the surficial bedrock of BMC's tectonostratigraphic Groups, along with the major tectonic divisions of the Maritime Provinces. Part of the BMC's composition includes the Silurian sediments covering the northern edge of the BMC, large felsic Devonian intrusions, and the Carboniferous fluvio-alluvial sedimentary oxidized cover on the eastern edge of the BMC.

Figure 7-2: Surficial Bedrock of Bathurst Miming Camp's Tectonostratigraphic Groups



At surface, the outer limits of the Bathurst Supergroup cover an area of approximately 70 km by 60 km, and the limits are defined by major faults and younger sedimentary cover rocks. The easternmost part of the camp is unconformably overlain by a clastic sedimentary cover sequence of Carboniferous age. To the west, the Bathurst Supergroup rocks are variably faulted against, or unconformably overlain by, Siluro-Devonian sedimentary cover rocks. The original volcanic arc that rifted to form the back-arc basin is partly exposed in a small inlier within the Siluro-Devonian cover sequence to the west of the BMC (Popelogan Inlier). To the south, the Supergroup is a fault contact with Cambro-Ordovician rocks of the central Miramichi Highlands. A large Silurian-Devonian granite intrusion (Pabineau Granite) lies within the northeast quadrant of the camp, producing a late contact metamorphic overprint in the rocks of the Key Anacon area. Figure 7-3 shows the bedrock relationships in terms of tectonostratigraphic mineralized belts and BMC's groups.

Figure 7-3: Tectonostratigraphic Subdivisions of the Bathurst Mining Camp and Geological Age



The BMC's groups and certain formations of interest are described below. Further details on the geology of any group or formation in the camp can be found on the New Brunswick Department of Energy and Resource Development website.

The Fournier Group consists of mafic igneous rocks and sediment. The mafic igneous rocks include oceanic pillow basalt, synvolcanic gabbro, and minor serpentinite of the Sormany Formation. This is overlain by and locally interlayered with shale, sandstone, and minor limestone of the Millstream Formation.

The California Lake Group includes the volcanic-dominated Mount Brittain, Spruce Lake, and Canoe Landing Lake Formations. The Boucher Brook Formation conformably overlies each of these formations. The Mount Brittain and Spruce Lake Formations are dominated by dacitic to rhyolitic volcanic rocks, whereas the Canoe Landing Lake Formation contains more than 95% basalt (Rogers and van Staal, 2003). The Boucher Brook Formation consists of shale, siltstone, chert, and transitional to alkali basalt.

The Sheephouse Brook Group is restricted to the southern part of the BMC, and is in tectonic contact with both the California Lake and Tetagouche blocks. It comprises three formations that, in ascending stratigraphic order, are referred to as the Clearwater Stream Formation, the Sevogle River Formation, and the Slacks Lake Formation. The Clearwater Stream and Sevogle River Formations are dominated

by dacite feldspar porphyry volcanic rocks. The Slacks Lake Formation is dominated by transitional to alkali pillow basalt overlying maroon iron- and manganese-rich shale.

The Tetagouche Group deposited conformably on top of the Miramichi Group as the latter subsided to form the Tetagouche-Exploits back-arc basin. The basin filled with volcano-sedimentary sequences of the Tetagouche, California Lake, and Sheephouse Brook Groups, each interpreted to have likely formed in different sub-basins (van Staal et al., 2003). In all three groups, the massive sulphide deposits and iron formations are associated with felsic volcanic rocks. The Tetagouche Group hosts important massive sulphide deposits, including the Key Anacon and Gilmour South deposits. It comprises four formations, referred to, in ascending stratigraphic order, as the:

- Nepisiguit Falls Formation (mainly quartz-feldspar crystal tuff, lava-like crystal tuff, and greenish-grey, locally tuffaceous wacke and siltstone)
- Flat Landing Brook Formation (mainly massive rhyolite)
- Little River Formation (alkali basalt intercalated with red and green ferro-manganiferous mudstone and chert, and medium to dark grey wacke and shale)
- Tomogonops Formation (calcareous siltstone, shale, wacke, sandstone, and conglomerate deposited on top of the Accretionary Prism Formations).

These formations are described at claim block detail in the sections below.

The Miramichi Group is composed of a deepwater sedimentary sequence deposited in a passive margin setting where the back-arc basin was developed, and it is the basal sequence of the Supergroup, despite being also considered the basement rock. It is a thick Cambrian to Early Ordovician sequence fining upwards, fine to medium-grained, greenish to grey sediments, quartzose sandstone, shale, siltstone, and quartzose or feldspathic wacke. The Miramichi Group comprises three formations, from bottom to top:

- Chain of Rocks Formation
- Knights Brook Formation
- Patrick Brook Formation.

7.1.3 Formations of the Tetagouche Group

The Nepisiguit Falls Formation characteristically has quartz-feldspar-phyric felsic volcanic rocks of dacitic to rhyolitic composition. These porphyritic rocks have commonly been termed quartz-feldspar porphyries, or quartz-feldspar augen schists, by workers in the region. Texturally, the formation shares mixed pyroclastic and effusive characteristics (i.e., “tuff-lavas”) between clear crystal tuffs and intrusive-like textures. In most cases, an unknown amount of structural repetition, unexposed or tectonic contacts, and extensional thinning due to high strain impede reasonable estimates of thickness. These rocks, when intermixed with minor volumes of greenish grey siltstone, have been historically assembled into the Grand Falls Member (Langton and McCutcheon, 1993).

The Austin Brook Member forms part of both the Nepisiguit Falls Formation and the Brunswick Belt Horizon. It consists of a magnetite-hematite deposit with an underlying massive sulphide zone that is considered to be the distal exhalative body from the vents. Presently, it strikes for about 20 continuous km on the west limb of the Portage River Anticline, whereas the east limb is covered by Carboniferous rocks. However, the Tetagouche Group inlier seen in the Key Anacon area attests to the continuity of the Austin Brook Member under the Carboniferous cover from the nose of the anticline. Since this trend has been poorly explored in the past, high prospective potential exists along this 15 km long eastern limb and extrapolated trend.

The Flat Landing Brook Formation varies greatly volumetrically; abundant in the central part of the BMC, it pinches out to the east from the Brunswick No. 12 mine and toward the Key Anacon area. The rocks consist of rhyolite flows, either aphyric or sparsely feldspar- (and rarely quartz-) phyric.

The Little River Formation consists of transitional to alkalic pillow basalts and flows, with anomalously high iron content, plus associated dark grey shale and siltstone and chert (van Staal et al., 1991).

The Tomogonops Formation is a post-volcanic, upward-coarsening sequence of calcareous siltstone and fine-grained sandstone. Rocks in the upper part of the section are markedly less deformed than those near the lower contact. The total thickness of the unit is unknown, but in the Gilmour Brook area the drill-tested thickness is at least 700 m, and may be as great as 1.5 km (Walker, 2005).

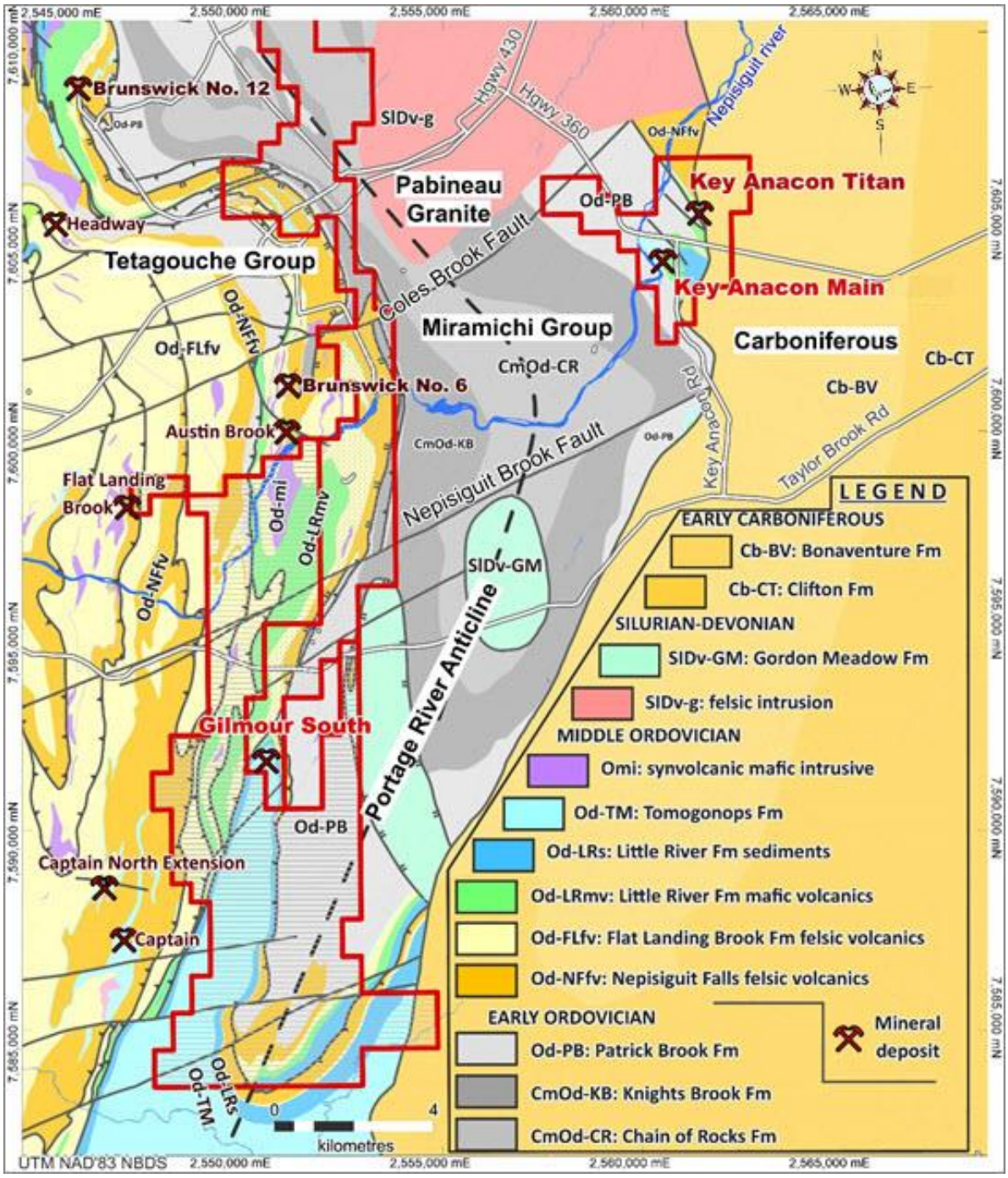
7.1.4 Formations of the Miramichi Group

The Patrick Brook Formation is the uppermost unit of the Miramichi Group (van Staal and Fyffe, 1991), and it represents a period of transition between the deposition of the underlying Miramichi Group and the overlying Tetagouche Group rocks. The rocks of the Patrick Brook Formation comprise graphitic slate, siltstone, and quartz wacke with vitreous volcanic quartz.

7.2 Property Geology

The Key Anacon property and the Gilmour South property are located on the eastern part of the BMC and underlain by the Tetagouche Group that contains the Brunswick Horizon, host to the massive sulphide deposits that are the subject of the 2019 MRE (Figure 7-4).

Figure 7-4: Property Geology Map



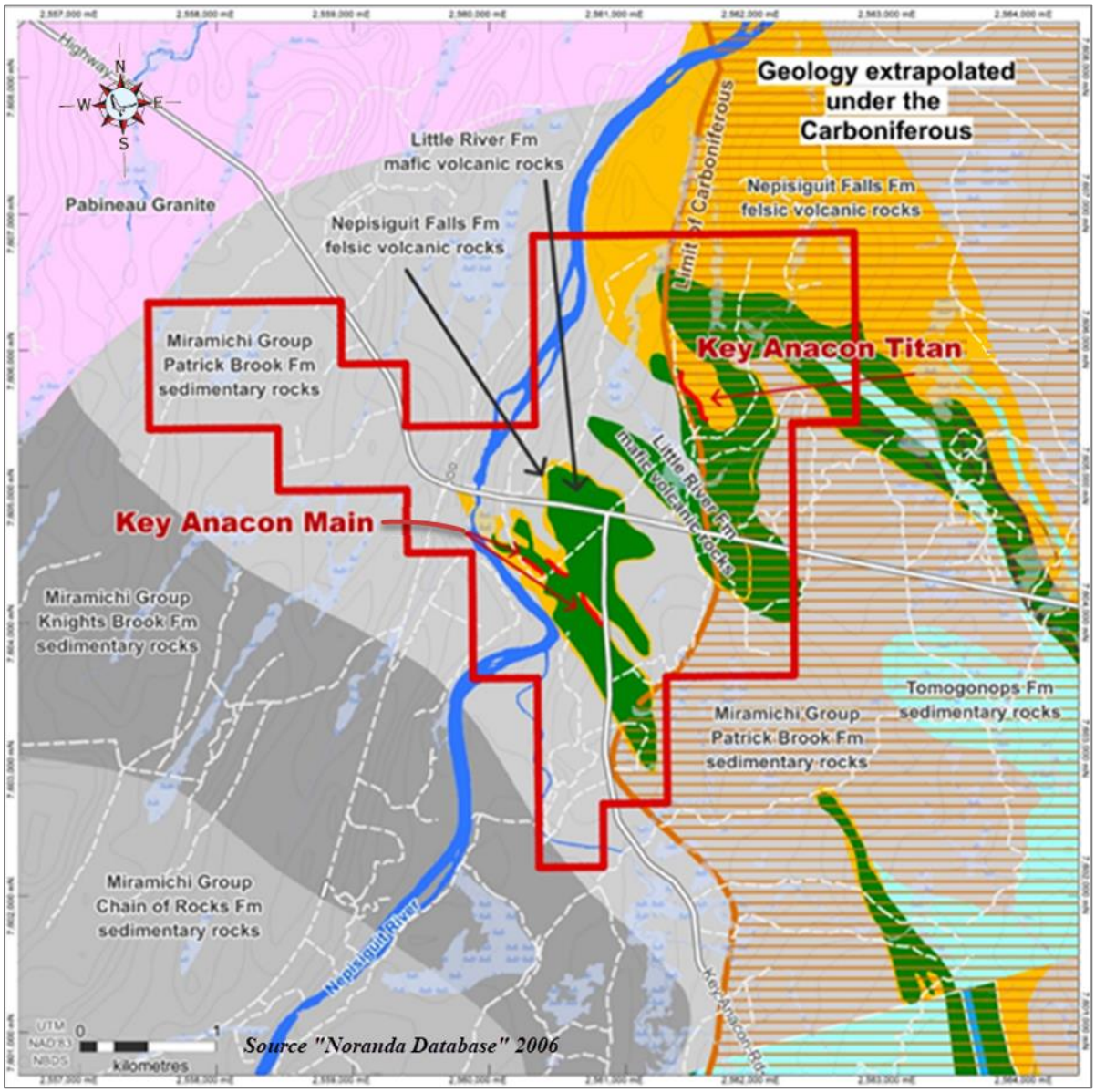
7.2.1 Key Anacon Mine Geology

The Key Anacon Mine property (claim block 1837) is host to two significant mineral deposits, namely the Key Anacon Main deposit, and the Key Anacon Titan deposit. The deposits are hosted within the bimodal volcanoclastic-sedimentary sequence of the Tetagouche Group, on the eastern side of the

Portage River Anticline (previously known as the Chain of Rocks antiform). The property is underlain by sedimentary rocks of the Miramichi Group, rocks of the Tetagouche Group, and sedimentary Carboniferous cover in the east. The Titan Zone deposit lies partly under the Carboniferous cover rocks to the east.

The bedrock geometry has been historically contentious because of the lack of outcrop, the lack of bedding and well-recognized and reliable marker horizons, and the paucity of drilling with respect to the structural complexity in the area. Several versions of surface geology have been interpreted over the years. The following Figure 7-5 was created from Noranda's 2006 interpretation, and it depicts the geology in the Key Anacon area and the extrapolated geology under the Carboniferous cover.

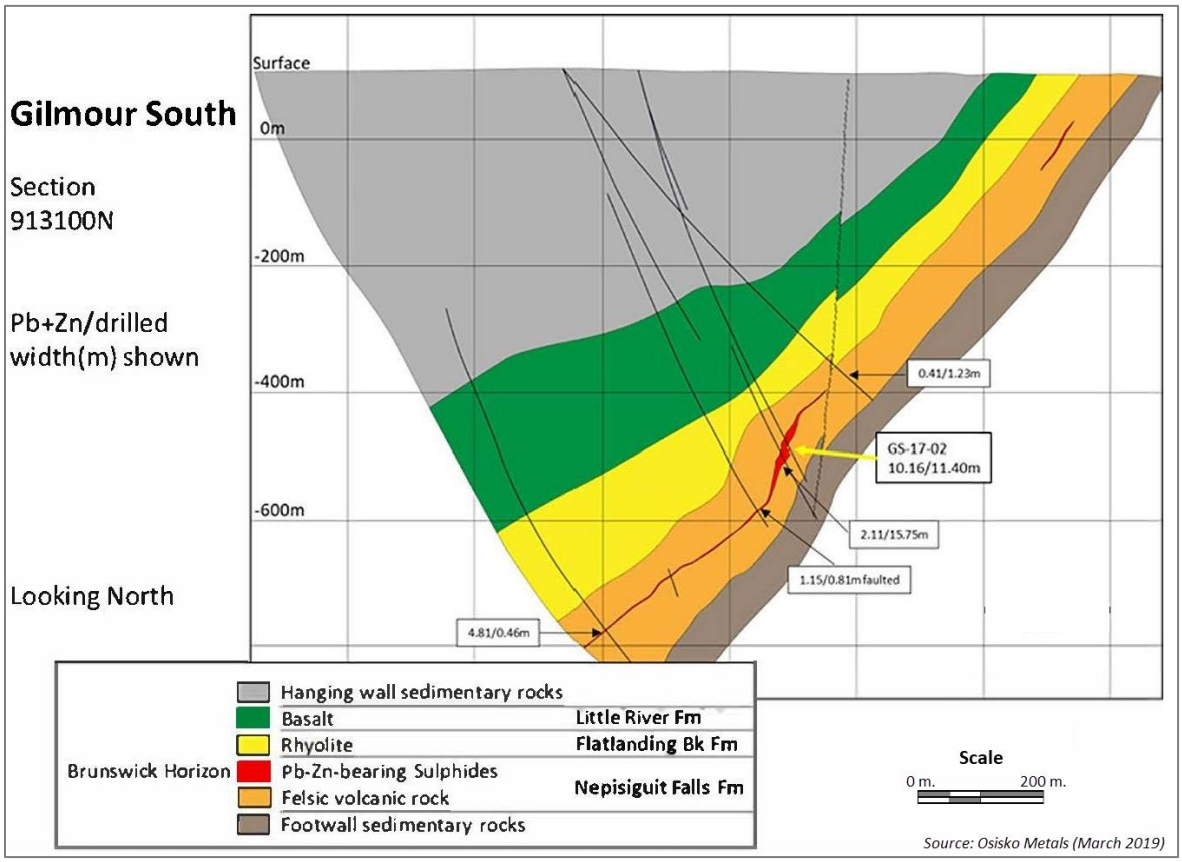
Figure 7-5: Key Anacon Geology (source Noranda Database)



7.2.2 Gilmour South Geology

Stratigraphy at Gilmour South features a complete section through the Miramichi Group and the overlying Tetagouche Group (see Figure 7-6). The section begins with the Patrick Brook Formation of the Miramichi Group, then passes conformably upward into the Nepisiguit Falls, Flat Landing Brook, Little River, and Tomogonops formations of the Tetagouche Group. The relatively thin accumulation of felsic volcanic (150 m to 400 m) and mafic volcanic (0 m to 160 m) rocks suggests that, from a paleogeographic standpoint, this area was probably peripheral to major volcanic centres that were presumably located along the axis of the Tetagouche-Exploits back-arc basin (Walker, 2005).

Figure 7-6: Geology Cross Section of the Gilmour South Deposit



7.3 Stratigraphy

7.3.1 Key Anacon Stratigraphy

The ***Patrick Brook Formation*** of the Miramichi Group forms the basement in the Key Anacon area, immediately underlying the Tetagouche Group rocks. The upper portions of the sequence locally contain intercalated felsic volcanic tuffs or reworked pyroclastic material. The contact with the

overlying Tetagouche volcanic package is unconformable and sharp, resulting in direct contact with the felsic footwall, and occasionally with the mafic hanging wall.

The ***Nepisiguit Falls Formation*** is characterized by fine-grained felsic volcaniclastic rocks, such as reworked pyroclastic rocks or tuffites containing quartz- and/or K-feldspar phenoclasts or phenocrysts. The fine-grained tuffs are interpreted to be distal volcanic pyroclastic material. The Key Anacon massive sulphides occur at or near the top of this volcaniclastic unit (Irrinki, 1992). Intense multi-phase deformation and hydrothermal alteration of the felsic rocks resulted in partial and locally complete replacement of primary textures and minerals by sericite, chlorite, calcite, and/or sulphides.

The ***Flat Landing Brook Formation,*** rhyolites are absent or only found locally, yet they are very common elsewhere in the BMC. The rocks are rhyolite flows and related breccias and hyaloclastites, characteristically aphyric to small (≤2 mm), poorly (≤3% by volume) feldspar-phyric. Clastic sedimentary rocks, ferro-manganiferous shale and chert, and ironstone are minor constituents.

The ***Little River Formation*** consists of highly altered alkali-basalts and related sedimentary rocks, which directly overlie rocks of the Nepisiguit Falls Formation in much of the area. It is common for the mafic volcanic rocks to have a magnetite-carbonate-epidote-chlorite banded texture and a pronounced magnetic signature, which prompted the original interest in this property. Although some magnetite may be primary, most of the magnetite is secondary and was probably released during breakdown of ferromagnesian silicates. The banded magnetite-carbonate-epidote-chlorite rock was initially mapped as iron formation, similar to the iron formation that extends along the Brunswick Horizon, but is in fact alteration related to the sulphide-generating hydrothermal system. The basalt in the upper part of the formation is more pristine, and interbedded with dark grey to green slates, phyllites, and siltstones that are commonly magnetic and locally contain manganiferous garnet zones, reflecting manganese enrichment. The latter is a potential marker horizon useful for structural interpretation.

The ***Tomogonops Formation*** has been recognized in the area as gray sediments (wacke, locally calcareous, siltstone, and shale).

Carboniferous rocks unconformably overlay the Tetagouche Group along the southeast edge of the property with a shallow eastern dip (≅2°). The Carboniferous sequence consists of the Clifton Formation and the overlying Bonaventure Formation. The former contains sandstone, conglomerates, and mudstone. The Bonaventure consists of red sandstone, granule to pebble conglomerate, and red and grey mudstone.

The rocks at the Key Anacon area have attained upper greenschist metamorphic grade to biotite grade (Irrinki, 1992). Metamorphic biotite and spessartine attest to the influence of the thermal aureole of the Pabineau Granite, located 3 km northwest from the mineral deposits. The metamorphic overprint at the Key Anacon area may be significantly affected by contact metamorphism rather than by regional metamorphism.

7.3.2 Gilmour South Stratigraphy

The following descriptions on stratigraphy and structure have been modified from Walker's 2005 paper on the Gilmour Brook South deposit.

The ***Patrick Brook Formation*** forms the basement, and consists of light grey sandstone and interbedded black (locally graphitic) shale. The sandstone beds are generally quartzose. Feldspar clasts are less abundant than a typical section, but can constitute up to 20% of the detritus in some core intervals. Shale beds average less than 10 cm thick. The sandstone-to-shale ratio varies considerably throughout the unit.

The ***Nepisiguit Falls Formation*** is thin, ranging from approximately 70 m to 120 m thick, and is dominated by fine-grained volcaniclastic rocks at the base of the sequence, and coarse-grained, crystal-rich rocks at the top.

The contact between the Nepisiguit Falls Formation and the overlying formation is variable in nature, either in sharp conformable contact between the two distinct felsic volcanics of each formation, or with black shale and fine-grained sandstone at the contact between the two units. Several core samples show the massive sulphides as being conformable on, and/or gradational into, the underlying Nepisiguit Falls Formation.

The ***Flat Landing Brook Formation*** consists of light grey to black aphyric rhyolite and minor pyroclastic rocks (ash and lapilli tuff). Less commonly, the rhyolite contains small (≤2 mm), scattered feldspar phenocrysts. Devitrification textures such as spherulites occur locally, as do amygdaloidal textures. Primary fragmental textures interpreted to represent carapace breccias or sole breccias have also been recognized in some locales. Thin, pyrite-bearing ash tuff horizons at the top of the Flat Landing Brook Formation are interlayered with, and gradational into, shale and/or basalt of the overlying Little River Formation. This transitional boundary marks the change from felsic-dominated to mafic-dominated volcanism recognized throughout the BMC (van Staal et al., 2003).

The Little River Formation in the Gilmour Brook area comprises black shale and subordinate medium grey wacke in its lower part, and is composed mainly of mafic volcanic rocks with local carbonate- and magnetite-rich zones in its upper part. The entire unit at surface likely does not exceed a thickness of 75 m; at depth, however, some drill holes have intersected up to 200 m of the formation. Mafic rocks occur in the northern part of the Gilmour Brook area, and are completely absent in the southern part.

The ***Tomogonops Formation*** consists of thin-bedded, buff calcareous sandstone, interlayered with grey-green, locally calcareous siltstone, wacke, and graphitic shale lenses. The base of the Tomogonops Formation is defined as the lower contact of the first calcareous sedimentary layer. The original thickness of the Tomogonops Formation is unknown, as its strata are truncated by a thrust fault to the west, and buried by Carboniferous rocks to the east, but it is at least 700 m, and may be as great as 1.5 km.

7.4 Lithology – Key Anacon and Gilmour South

The lithological legend used by Osisko Metals has been standardized for all deposits in the BMC, therefore the following lithological descriptions apply to both the Key Anacon and Gilmour South deposits. The main lithologies associated with mineralization, observed and recorded from bedrock mapping and diamond drilling, are described below.

2T2 – Cherty Tuff

Very fine-grained, medium grey to grey-green, compositionally banded sections of felsic tuffs to reworked and winnowed felsic tuffs. Locally siliceous, defined by the alteration of very fine-grained quartz phenocrysts.

2T5a – Quartz-Crystal Tuff

Very fine to locally coarse-grained, medium grey to grey-green, compositionally banded sections of felsic, bimodal, medium to coarse grained, sub-angular to sub-rounded, clear quartz phenocrysts, often poorly sorted.

5F2 – Flow-Banded Pillow Basalt

Very fine to fine-grained, pale green to drab grey-green banded sections, defined by vitric selvages of relic pillows. Unit hosts sections of mm- to cm-scale sheared bands of basalt, defined by an increased quartz-calcite-epidote veining. Local fine-grained, angular blebs of pyrite associated with mafic crystallization.

11 – Argillite

Very fine-grained, medium grey to dark grey, locally graphitic, feldspathic wackes, and quartz-rich psammitic metasedimentary rocks. Locally pyritic, associated with depositional environment.

7.5 Structure

7.5.1 Key Anacon Structure

The Key Anacon Main Zone and Key Anacon Titan Zone deposits lie on the eastern limb of the Portage River Anticline. At least four deformation phases are recognized in the Key Anacon area (and Gilmore South area), and are interpreted to correlate with those recorded elsewhere in the BMC. Effects of regional tectonic stress include the development of penetrative S1 and S2 schistosity planes, faults, drag folds, and isoclinal to asymmetrical folds thinned at the limbs and thickened in the hinges.

Deformation has distorted or obliterated original stratigraphic bedding features and contacts into pseudo-beds layering differentiation and transposition in the direction of the axial surfaces of F2 folds (Zulu, 2012). Penetrative foliation in the area usually represents the composite of S1 and S2 fabrics, which in turn transpose bedding features to the directions of early S1 and/or S2 cleavage domains,

except in the noses of F2 folds where S2 is at high angle to S1. The highly convoluted tectonostratigraphic relationships and cryptographic cross-cutting relationships amongst different types of oriented fabrics make it challenging to determine the geometry and continuity of horizons and markers.

The area is characterized by steep and tight F1 and F2 isoclinal folds and parasitic counterparts, all of which have complex internal stratigraphic repetitions and cut-outs. S2 fabrics strike south to south-southeast and it is sub-vertical to steeply dipping to the west. F2 fold axis inverts, from southwards plunge at shallow depths, to steeply northwards plunging at depth. This plunge-reversal is associated with F1/F2 fold closures found elsewhere in important mineral deposits (such as the Brunswick No. 6, Brunswick No. 12, Heath Steele, and Stratmat deposits).

7.5.2 Gilmour South Structure

The Gilmour South deposit lies on the western limb of an anticline (see Figure 7-4), and dips moderately to the west, approximately 45°, and locally up to 70°. The dominant structural fabric is interpreted to represent a combination of S0 and S1, whereas S2, despite being a less well-developed penetrative fabric is interpreted to be axial planar to F2 folds.

7.6 Mineralization – Key Anacon and Gilmour South

Mineralization at Key Anacon and Gilmour South consists of zinc, lead, copper, silver, and iron sulphides hosted in poly-deformed metavolcanic and metasedimentary sequences of the Brunswick horizon.

Sulphides consist chiefly of pyrite (Py) or pyrrhotite (Po), secondary volumes of sphalerite (Sp) and galena (Gn), and subordinate amounts of chalcopyrite (Cp). Pyrite is the most common and widespread of the sulphide minerals. Sphalerite is the chief mineral of interest; unfortunately, it is sometimes hard to recognize (or even invisible to the naked eye), because it occurs in a wide range of colours and rarely develops crystal habits. Galena accompanies sphalerite, and silver contents are accompanied by galena. Gold values are only present in very low concentrations.

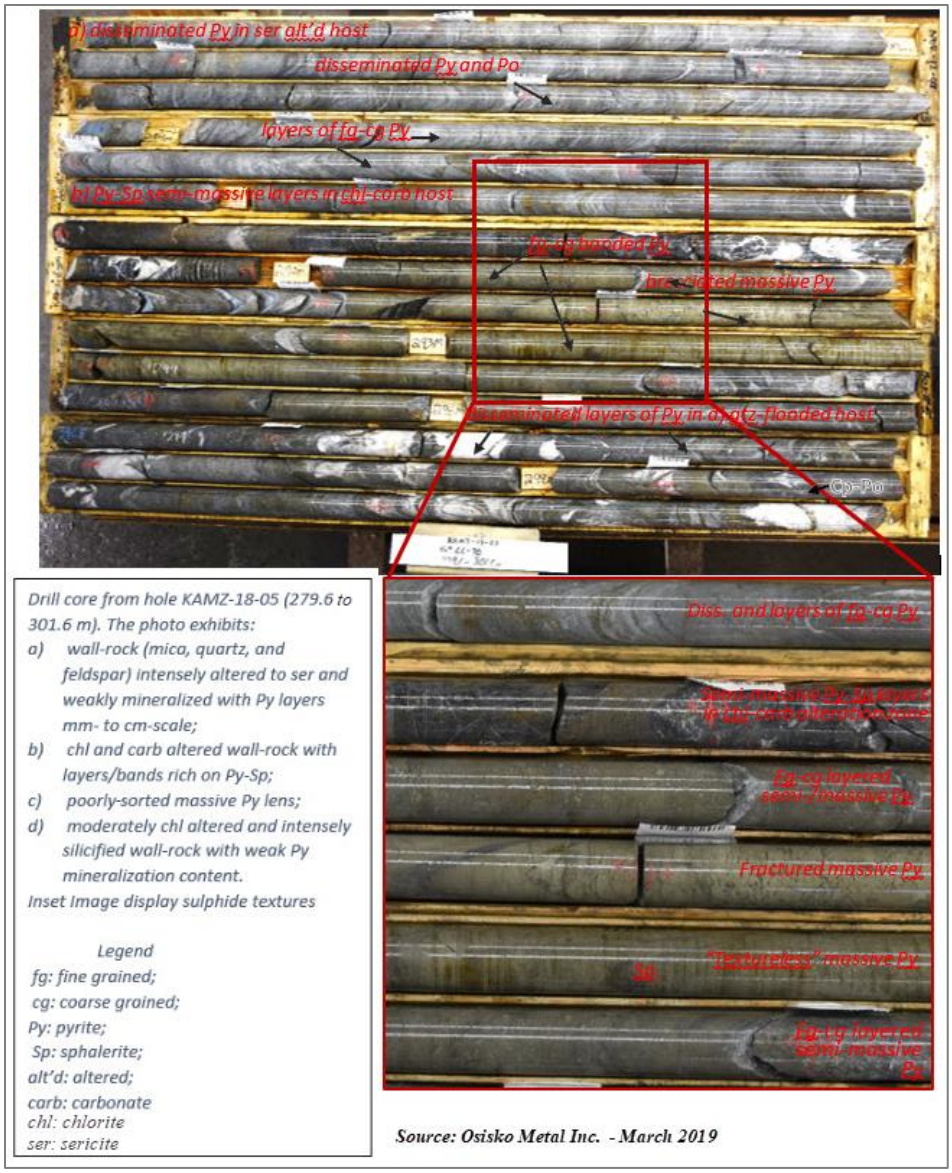
Sulphides occur in a range of textures and over a spectrum of concentrations, from small quantities of disseminated sulphides, through predominance of sulphide minerals over gangue minerals, all the way to rocks fully composed by sulphides. In this report, the term disseminated sulphides means concentrations of sulphides lower than 25% of rock volume (≤25% sulphides), semi-massive sulphides are 25% to 75% sulphides, and massive sulphide are 75% to full composition of the rock (≥75% sulphides). Sulphide mineralization generally occurs as fine grain sizes (or poorly sorted), with earlier textures obscured (e.g., clastic textures) as a result of overprinting tectonic fabrics. When massive, sulphide bodies most commonly exhibit homogeneous to banded textures, semi-massive sulphide often shows as layering to discontinuous wisps, whereas weak disseminations can spread evenly throughout the country rock or concentrate locally as patches of sulphides.

By far the most common texture in country rocks are strong foliations to banded flow-like fabrics and associated indicators of movement (e.g., rotated and/or elongated clasts). Gangue minerals primarily

consist of quartz, sericite, and/or chlorite, most often as alteration products, and secondary amounts of carbonate minerals. All of these can occur as weak disseminations, to a near complete replacement of the original rock.

The following drill core Figure 7-7 shows an example of a Key Anacon Main Zone massive Py lens, and diverse representative examples of sulphide concentrations and textural associations. On each side of the massive Py lens, the rocks are very strongly altered to chlorite and/or silicified, with minor amounts of stringer-like mineralization (i.e., Po±Cp stringer footwall-type), both of them giving indications of proximity to the central part of a feeder pipe. The sericitic alteration adjacent to it likely represents broader zones of sericite alteration and/or carbonate. Figure 7-7 shows a typical core box with annotation.

Figure 7-7: Drill Core from Hole KAMZ-18-05 (279.6 m to 301.6 m)



The mineralization code used by Osisko Metals has been standardized for all deposit in the BMC. In most instances the gangue lithology for the massive sulphide mineralization is no longer recognizable, therefore the massive sulphide is logged as a lithology. For the semi-massive mineralization, and especially for the disseminated material, in some instances it is logged as a lithology, while in other instances the information needs to be extracted from the description.

7.7 Mineralized Envelope

As stated earlier, the Key Anacon deposits (claim block 1837) host two significant mineral deposits, namely the Key Anacon Main deposit, and the Key Anacon Titan deposit.

In the text below, AGP would like to caution that the wireframes describing the mineralization were completed based on lithology and grade at a cut-off that is below the break-even cut-off as described in Section 14 of this report. As such, the mineralized envelope contain a significant volume of sub-economic mineralization, and one should not multiply the length by height by width and assume that the entire volume is potentially economic. Figures for the wireframes described below are available in Section 14 of this report, and Table 7-1 shows the Zones horizontal thickness statistics for all three deposits.

Key Anacon Main

The Key Anacon Main deposit generally strikes at between 310 and 320 degrees azimuth, with a near vertical dip of -85 degrees to the southwest. The deposit was subdivided into four zones during wireframing.

The Southeast Zone comprises a single lens, currently measuring 200 m along strike and 500 m down-dip, with horizontal thicknesses averaging 3.8 m. More drilling is required, but continuity appears reasonable with the data available.

The Main Zone comprises a total of seven lenses. While the size of individual lenses varies within the group, as a group the Main Zone measures approximately 150 m along strike and 500 m down-dip, and appears to exhibit a steep plunge to the southeast. The Main Zone mineralization is often trapped within fold noses in contact with the volcanic unit, and as such displays variable horizontal thicknesses ranging from 2.75 m to 5.48 m (25th and 75th percentile), and averaging 11.02 m.

The Main Zone East forms a package of four separate lenses located in close proximity to the east of the Main Zone. It was separated during wireframing simply because the lenses are generally further away in the footwall of the mafic volcanic, and folding is less intense. It is noted that this is just a matter of opinion, and the four lenses could easily be regrouped into the Main Zone. Again, while the size of individual lenses varies within the group, as a group the Main Zone East measures between 100 m to 150 m along strike and 500 m down-dip, and appears to exhibit a steep plunge to the southeast. Horizontal thicknesses averaged between 1.6 m and 6.07 m (25th and 75th percentile).

The Northwest Zone currently forms a package of 10 stacked individual lenses. The lenses were modelled as narrow veins of mineralization. Continuity seems reasonable; however, more drilling is

required in the Northwest Zone, and AGP expects that the current model will likely change with continued exploration. Again, while the size of individual lenses varies within the group, as a group the Northwest Zone measures about 200 m along strike and 650 m down-dip, and appears to exhibit a steep plunge to the southeast. Horizontal thicknesses averaged between 2.23 m and 6.03 m (25th and 75th percentile).

Key Anacon Titan

The Key Anacon Titan deposit comprises two zones, namely the South Zone and the Titan Main Zone. The Titan deposit exhibits more copper than the Key Anacon Main and Gilmour South deposits, a feature that needed to be considered while modelling. The Titan Main Zone is split into a sub-zone of Zn+Pb averaging 3.41% Zn+Pb, with copper mineralization grading 0.72%, and a sub-zone of copper mineralization grading at 0.55% that shows a depletion in the zinc and lead grades, averaging 1.20% Zn+Pb. While this is sometimes referred to as the copper zone, zinc and lead are not absent, but their grades are generally half those in the Titan Main Zone.

The Key Anacon Titan deposit generally strikes at between 325 and 335 degrees azimuth, with a dip of -77 degrees to the southwest. The deposit was subdivided into two zones during wireframing.

The Titan Main Zone comprises a total of four lenses. While the size of individual lenses varies within the group, as a group the Titan Main Zone measures approximately 250 m along strike and 650 m down-dip and appears to exhibit a steep plunge to the southeast. The Titan Main Zone Zn+Pb mineralization is folded, creating a pocket of mineralization near surface, with two or three narrow limbs continuing at depth. The copper rich sub-unit occurs in between the fold limbs, and often on the hanging wall, filling in the space left between the Zn+Pb mineralization and the volcanic unit. The horizontal thickness is variable, ranging from 3.94 m to 11.98 m (25th and 75th percentile), and averaging 7.05 m.

The Main Zone South comprises a single lens, currently measuring 150 m along strike and 500 m down-dip, with horizontal thicknesses averaging 11.13 m. The zone may be an extension of the Titan Main Zone separated by fault. More drilling is required, but continuity appears to be reasonable with the data available.

Gilmour South

The Gilmour South deposit generally strikes at between 340 to 350 degrees azimuth, with a near vertical dip of -60 degrees to the southwest. The deposit was subdivided into three zones during wireframing.

The South Zone comprises a single lens, currently measuring 300 m along strike and 400 m down-dip, with horizontal thicknesses averaging 4.67 m. More drilling is required, but continuity appears reasonable with the data available.

The Mid Zone comprises a single lens, currently measuring 301 m along strike and 580 m down-dip. The zone is currently characterized by a centrally located tight fold, which creates a pocket of

mineralization in the fold nose. With more exploration, the fold may in future be reinterpreted as a fault. Due to folding, the horizontal thickness is variable. The model shows a thickness ranging between 3.71 m and 12.93 m (25th and 75th percentile), and averaging 9.58 m. More drilling is required, but continuity appears reasonable with the data available.

The North Zone is elongated, measuring 1,000 m on strike and 250 m down-dip. A plunge is not obvious, and the mineralization is folded. Similar to the Mid Zone, the folding creates a pocket of mineralization, therefore the horizontal thickness is variable, ranging from 4.05 m to 14.43 m (25th and 75th percentile), and averaging 9.84 m.

Table 7-1: Horizontal Thickness

Deposit	Zone	Horizontal Thickness (m)			
		Average	25th	Median	75th
Key Anacon Main	Southeast Zone	3.8	2.1	3.62	4.97
	Main Zone	8.12	2.75	5.48	11.02
	Main Zone East	4.68	1.6	3.86	6.07
	Northwest Zone	5.25	2.23	3.52	6.03
Key Anacon Titan	Titan Main Zone	8.67	3.94	7.04	11.98
	Main Zone South	11.13	6.31	11.13	15.16
Gilmour South	South Zone	4.67	3.43	4.57	6.29
	Mid Zone	9.58	3.71	7.76	12.93
	North Zone	9.84	4.05	8.87	14.43

8 DEPOSIT TYPES

VMS deposits are base metal deposits (±precious metals), and are a major source of zinc resources worldwide (Goodfellow and Lydon, 2007). For over 60 years, the BMC, located in Northern New Brunswick (Figure 4-1), has been a major global supplier of zinc and lead with supplemental silver and copper. The BMC has helped develop models for VMS deposits and tested new exploration techniques. The archetype models of BMC's VMS deposits are applicable to the exploration and delineation of the deposits on both the Key Anacon and Gilmore South properties in the context of the numerous studies done at the Brunswick No. 6 and No. 12 deposits and the BMC in general.

8.1 VMS Deposit Type Model

Many different classification schemes have historically been proposed for VMS deposits, but are most often classified either by their dominant metal content or by their dominant host-rock lithology. The tectonic setting is the strongest geological factor controlling both the type of material deposited in the basins, how the deposition occurred, and the relationship to the type of metal endowment. The BMC has prime examples of zinc-rich VMS deposits hosted in felsic volcanic rocks, with subordinate amounts of bimodal volcanic rocks, epiclastic rocks and sedimentary rocks. These form a basin-fill sequence of dominantly felsic volcanic and volcano-clastic rocks with subordinate sedimentary rocks. As such, the BMC deposits are indicative of the felsic-siliciclastic-hosted type of massive sulphide deposit (Piercey et al., 2015). Table 8-1 compares different generic types of VMS deposits and common classification scheme for the different deposits.

Table 8-1: Classification of Base Metal VMS Deposits

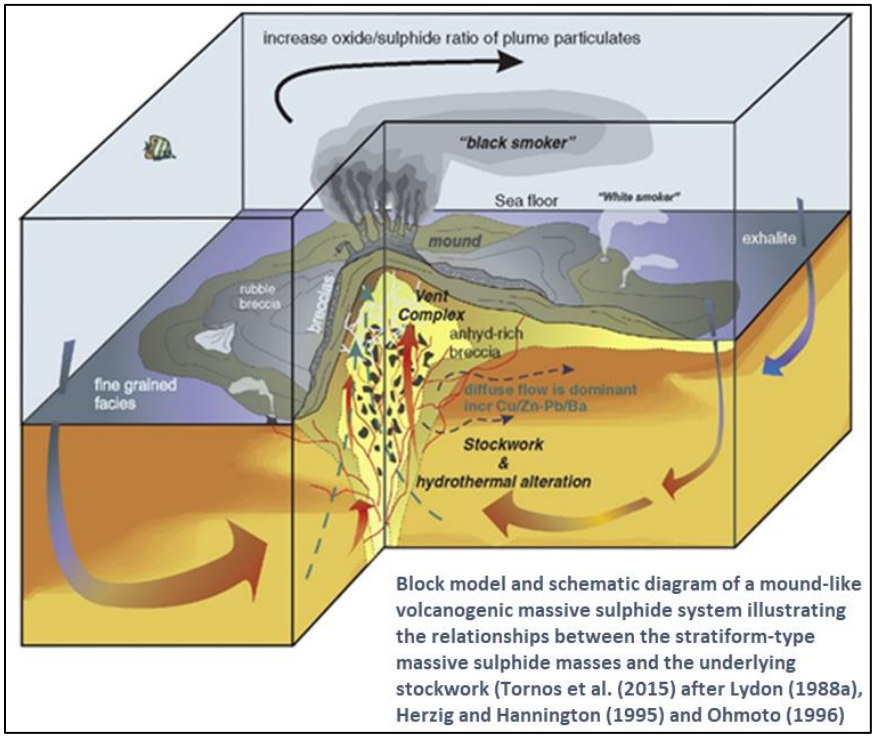
VMS Type	Tectonic Setting	Rock Types	Ore Hosts	Metals	Examples
Felsic-siliciclastic, a.k.a. Bathurst or Iberian Pyrite Belt types, Zn-Pb-Cu type	Continental rifts, continental arc rifts, back-arcs	Bimodal sequences, with felsic volcaniclastic and sedimentary rocks, and subordinate mafic rocks	Felsic volcanic and volcaniclastic rocks and sedimentary rocks	Zn-Pb-Cu (Ag-Au)	Deposits in the BMC and Iberian Pyrite Belt
Bimodal felsic, a.k.a. Kuroko type, Zn-Pb-Cu type	Rifted continental arcs	Bimodal sequences, with dominant felsic rocks, and subordinate mafic rocks	Felsic volcanic rocks	Zn-Pb-Cu (Au-Ag)	Deposits in Kuroko district, Mount Read Belt, Bergslagen district
Bimodal mafic, a.k.a. Noranda type, Cu-Zn-Pb	Rifted primitive arcs ± back-arc mid-ocean ridge basalt (MORB-rich) and forearc (boninite-rich)	Bimodal sequences of mafic rocks, with minor amounts of felsic rocks	Felsic volcanic rocks, with minor amounts of mafic rocks	Cu-Zn-Pb (Au-Ag)	Deposits in the Noranda and Flin Flon/Snow Lake districts; mid- and south Urals

VMS Type	Tectonic Setting	Rock Types	Ore Hosts	Metals	Examples
Mafic siliciclastic, a.k.a. Besshi-type, Cu-(Co)-rich, pelitic mafic	Sedimented back-arc and forearc environment; sedimented ridges	Mafic volcanic and intrusive rocks, with abundant siliciclastic sedimentary rocks.	Mafic volcanic, and/or ultramafic intrusive rocks.	Cu-(Co-Zn-Ni)	Deposits in Besshi district, Japan, and Windy Craggy, Outokumpu
Mafic, a.k.a. Cyprus-type, Cu-rich.	Back-arc, forearc, and mid-ocean ridge	Mafic volcanic and intrusive rocks, commonly in ophiolite environments	Mafic extrusive and intrusive rocks; rare in ultramafic rocks	Cu-Zn	Deposits in Cyprus, Oman; Appalachian ophiolites (e.g., Tilt Cove, Bay of Islands)

Note: Modified from Piercey et al., 2015

Genetically, VMS deposits form in basins with volcanic and hydrothermal activity, the latter bearing base metals, and exhalating onto the sea floor through black smokers. These deposits are characterized to have at least one of two distinctive mineralization features and associated morphologies: a stratiform massive sulphide body situated above a vent complex, and/or a discordant mineralized vent complex acting as the feeder of hydrothermal fluids. Hybrid mineralization types occur when the discordant part grows and superimposes over other stratiform massive sulphide bodies. Massive sulphide bodies showing stratiform features are considered more evolved than massive sulphide mounds, with or without a vent complex type of mineralization (Tornos et al., 2015). Figure 8-1 exemplifies an idealized VMS system.

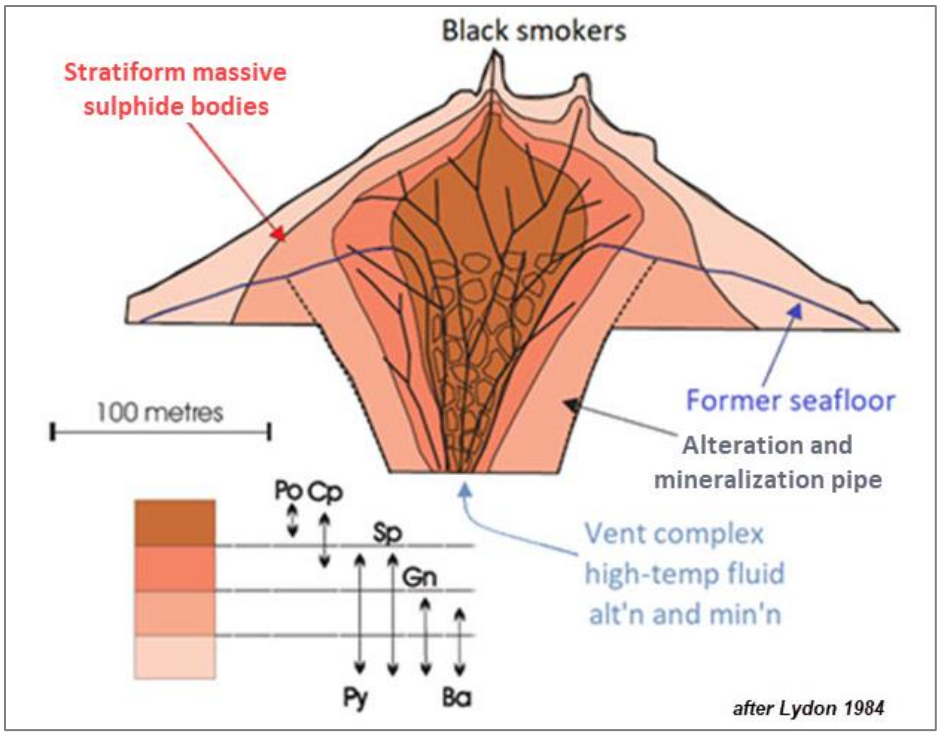
Figure 8-1: Idealized VMS System



Block model and schematic diagram of a mound-like volcanogenic massive sulphide system illustrating the relationships between the stratiform-type massive sulphide masses and the underlying stockwork (Tornos et al. (2015) after Lydon (1988a), Herzig and Hannington (1995) and Ohmoto (1996)

Important sulphide minerals in the VMS deposits of the felsic-siliciclastic type are primarily pyrite, pyrrhotite, sphalerite, galena, and chalcopyrite. The sulphides usually group in specific assemblages which broadly fall into two major groups: those dominant in pyrite-sphalerite-galena (Py-Sp-Gn), and those dominant in pyrite-pyrrhotite-chalcopyrite (Py-Po-Cp), although pyrrhotite can be present with the former group (Po-Sp-Gn) in some areas. VMS systems are inherently inhomogeneous, yet some deposits develop distinguishable metal zonation, with an outer rim composed mainly of Py-Sp-Gn-(Ba), a core rich in Po-Cp, and both of these overlaid by a chl±qtz-rich stringer zone. It is common to find mixed types of textural and mineral assemblages, due to the intricate growth of the mineral deposits, and the area's multifaceted evolution of the metamorphic terrain. Figure 8-2 exhibits an idealized sulphide metal zonation somewhat expected in zinc-rich VMS deposits.

Figure 8-2: Idealized Sulphide Metal Zonation

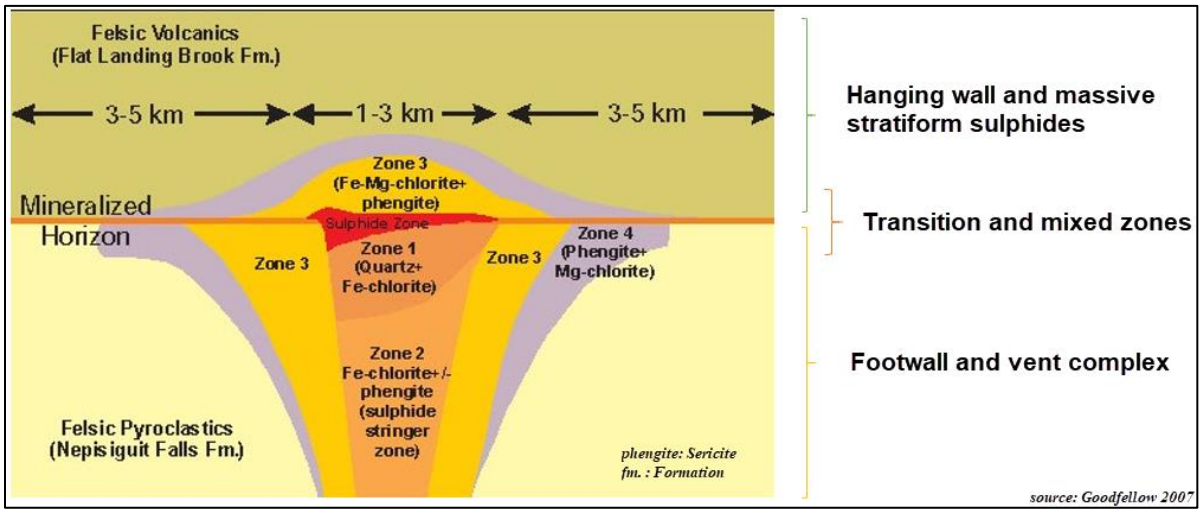


Vent complex zones (feeder systems or stringer zones) in a VMS deposit consist of structural conduits (e.g., fracture systems, fault zones) where hydrothermal fluids ascend to discharge onto the sea floor through black smokers. Since hydrothermal fluids ascend through wall rocks, these react with each other and alter (modify) each other's chemistries, so that the wall rock becomes hydrothermally altered. Therefore, vent complexes typically have irregular, pipe-like shapes of altered and mineralized rocks discordantly cross-cutting through the footwall up to the discharging (venting), and strongly mineralized area.

The hottest hydrothermal activity is usually associated with the footwall rocks with most intense alteration and sulphide endowment: Po-Py±Cp as stringers and disseminations, and chl±qtz-ser-carb alteration. On plan view, these sulphides radiate outward from these central areas; alteration and

the sulphide mineral assemblages often have zonal distributions. Figure 8-3 shows a schematic zonal distribution of the common alteration zones in BMC's VMS deposits.

Figure 8-3: Schematic of Hydrothermal Alteration Zones at the Brunswick No. 12 Deposit



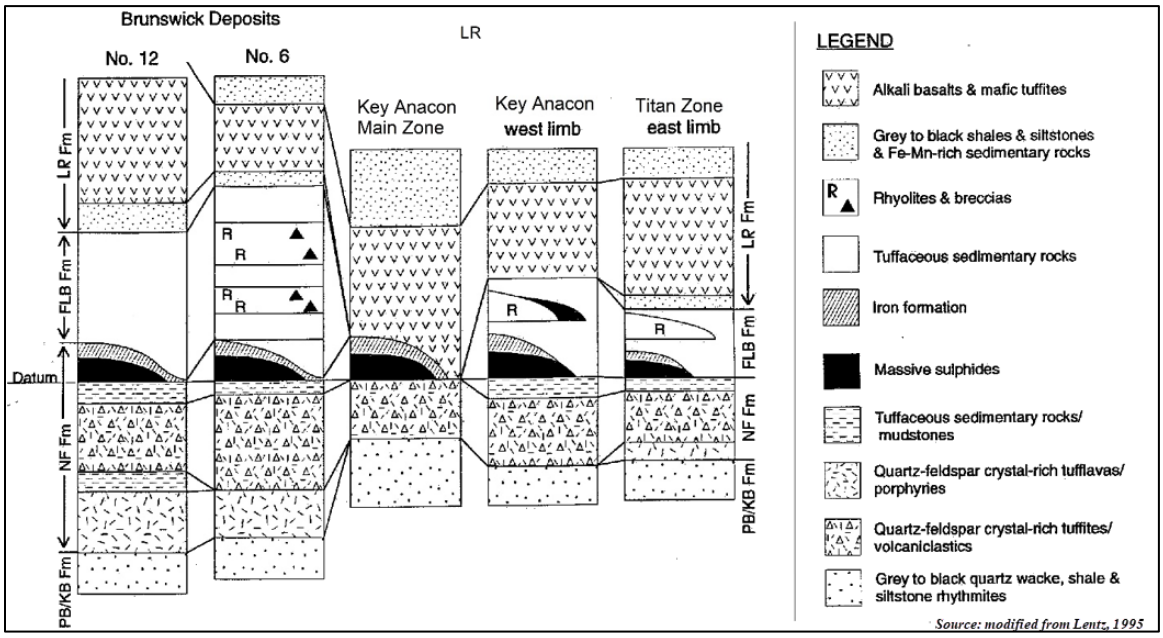
8.2 General Geological Concepts Applied to the Osisko Metals BMC Project

For the delineation of the deposits in this report, and for the exploration of undiscovered mineable resources, Osisko Metals is applying the following concepts, based on literature available about VMS deposits in the BMC.

The massive sulphide deposits in the BMC occur as syngenetic deposits along horizons at several stratigraphic positions within the Bathurst Supergroup (see Section 7 for geology descriptions). The Caribou horizon occurs in the California Lake Group, the Chester horizon occurs in the Sheephouse Brook Group, and the Stratmat and Brunswick horizons occur within the Tetagouche Group (Goodfellow, 2007). The Tetagouche Group includes the Brunswick Belt and hosts the Brunswick No. 12 and the Brunswick No. 6 deposits, which lie at or near the upper contact of the Nepisiguit Falls Formation's felsic unit and the Flat Landing Brook felsic volcanic rocks of the Tetagouche Group. That stratigraphic position is known as the Brunswick horizon. The Brunswick horizon also hosts the known deposits in the Gilmore South and Key Anacon deposits.

The stratigraphy of the Key Anacon and Gilmour South property is part of the Tetagouche Group, and both host the stratigraphic equivalent to Brunswick No. 12 and Brunswick No. 6 (see Figure 8-4). The Austin Brook iron formation, which forms part of the Brunswick horizon, is absent at both properties, and the rocks of the Flat Landing Brook Formation are only found in minor quantities. The bulk of the mineralization is hosted at the contact of the Little River mafic volcanics with the Nepisiguit Falls felsic volcanics.

Figure 8-4: Stratigraphy Sections: BMC Compared with Key Anacon and Gilmour South



If a VMS deposit developed zonation of sulphide minerals in the semi-massive and massive bodies, these can be used to orient the mineral deposit relative to the hanging wall and footwall. For example, Van Staal mapped zonation of the sulphide minerals at Brunswick No. 12 and Brunswick No. 6 deposits, and used this with the overlying Austin Brook iron formation to determine the top and bottom directions of the deposits. Ideally, massive pyrite stratigraphically overlaps Py-Sp-Ga-rich mineralization, interpreted to represent seafloor concordant stratiform-type mineralization, whereas abundant Po-Cp (≥1% Cu) is interpreted to represent an environment more proximal to the feeder pipe. These principles are applicable to the Key Anacon and Gilmour South properties.

Similarly, the intensity and type of hydrothermal alteration can be used to indicate proximity to a feeder pipe, or to orient the mineral deposit relative to the hanging wall and footwall. As a rule of thumb, the intensity of chlorite and quartz alteration roughly indicates close spatial proximity to the central parts of a feeder pipe. This central part is surrounded by broader zones of sericite alteration (±chlorite and/or carbonate), decreasing in intensity moving away from it. This alteration often indicates footwall alteration. Figure 8-3 shows the hydrothermal alteration zones associated with Bathurst-type VMS deposits; this model of zonation is being applied by Osisko Metals' exploration team.

In theory, the primary order of depositional controls is either: fracture-related systems (faulted zones) serving as feeder-zone conduits for mineralizing hydrothermal fluids; and/or topographic lows serving as pools to accumulate metal-rich hydrothermal brines. However, the secondary order of controls, in specific structural deformation, appears to be the most significant geological control on the present distribution of VMS deposits in the Bathurst Camp, including at the Key Anacon and Gilmour South properties. Due to the tectonic deformation, VMS deposits gained complexity in form and composition, and thus are a major challenge in the modelling of the mineral deposits.

In particular, the first two deformation events (D1 and D2) had the primary influence on the secondary order of control to redistribute sulphide deposits and associated alteration halos. Interference folds favour the most ductile sulphides to migrate towards, and accumulate at, the hinges of F2 folds, particularly refolded F1 folds formed during the D2 event (van Staal, 1985). These interference F1-F2 folds are targeted in the Key Anacon deposits, and this model could potentially also apply to the Gilmour South mineralization. However, due to the tectonic complexity in our area, it is very challenging to interpret paleoenvironments.

9 EXPLORATION

Exploration prior to Osisko Metals is described in various assessment reports filed with the New Brunswick Government. A summary of the exploration at Key Anacon and Gilmour South property is described in Section 6 of this report.

9.1 Osisko Metals Exploration 2017–Present

In September 2017, Osisko Metals announced plans for an aggressive Phase I exploration and drill program in the Bathurst Mining Camp. Since commencing the work, Osisko Metals has employed a variety of exploration techniques focussed on investigating the deposits on the Key Anacon and Gilmour South properties, consisting of:

- Locating and orienting historical drill collars
- 3D modelling study
- Diamond drilling
- PEM
- Portable X-Ray Fluorescence Spectrometry (pXRF)
- Optical televiewer (OTV) drill core logging.

9.1.1 Location and Orientation of Historical Drill Collars

Prior to commencing drilling on Gilmour South and Key Anacon properties, Osisko Metals conducted a review of historical drilling. The historical drilling on both properties had been compiled in a database by Noranda. Previous operators on the properties had used local grid coordinate systems; however, Osisko Metals staff decided to move data from all projects into NAD83 NB Double Stereographic projection. NAD83 NB Double stereographic projection is the recommended coordinate system for the area and is the accepted coordinate system for the New Brunswick Department of Natural Resources.

WSP consultants were engaged to survey current and historical drill holes at both the Gilmour South and Key Anacon deposits. The survey was carried out with a high precision differential GPS (DGPS). WSP's report is available in Appendix B.

Of the 110 past and present Gilmour South holes, 55 were surveyed using DGPS and 32 new holes were surveyed using handheld GPS. The 23 remaining holes fall in one of two groups consisting of either a wedge hole for which a collar location is shared with a "Parent Hole" or holes re-collared due to excessive deviation. In total, Gilmour South has 4 wedge holes and 19 re-collared holes.

Due to multiple generations of drilling at the Key Anacon property, several techniques were used to locate the holes:

1. Initially, WSP surveyed 15 historical collar points throughout the property using DGPS.
2. Historical grid locations contained in the Noranda database were transformed to NAD83 Double Stereographic Projection using a transformation Algorithm employing the least square best fit calculation method by survey contractor WSP. This method allowed for the calculation of the relative positioning of the drill collars from the original grid coordinates based on the relative location of the 15 high confidence drill collars surveyed by WSP. In total, 435 points were transformed.
3. Note: Only 408 of the 435 historical drill holes contained in the original Noranda database have been used in the resource estimate.
4. To verify the transformation data set; surveying of surface collar points continued. In total, 110 of the 253 surface collars were located and surveyed using DGPS.
5. None of the 215 underground drill holes could be surveyed by Osisko Metals' employees or contractors; however, Noranda had compiled the historical drill hole collar locations for both surface and underground drilling. The collar location data were then converted to NAD83 NB Double Stereographic projection. This allowed for the underground drill holes to be modelled in a 3D workspace. To independently verify the underground location data, Mira Geoscience created a 3D model of the underground levels based on the historical level plans and mine grid. As a final check, a high precision survey of the shaft collar and vent raise provided a reasonable correlation with the shaft depicted on the underground level maps. The shaft collar provides the only vertical reference point between surface and all levels of the underground workings. AGP notes that this work also confirms the rotation used during the transformation. Table 9-1 list the drill holes in the database and the collar survey method.

Table 9-1: Drill Holes Used in Bathurst Mining Camp Resource Estimate and Survey Methods

Deposit	Total No. Drill Holes	No. Historical Drill Holes	No. Osisko Metals Drill Holes	Survey Method			
				DGPS	Handheld GPS	Underground Holes	Estimated Based on Historical Location
Key Anacon (Main + Titan)	468	408	60	110	0	215	143
Gilmour South	110	78	32	55	32	0	23
Total	**578**	**486**	**92**	**165**	**32**	**215**	**166**

6. To understand the degree of accuracy of the transformed dataset, the transformed data were compared to the surveyed data set. In total, 89 surveyed points were compared to their transformed counterparts. On average, points were found to have an easting disparity of 2.619 m, a northing disparity of -2.558 m, and an average elevation disparity of -2.146 m.

Table 9-2 depicts a statistical comparison between transformation and survey data coordinates.

Table 9-2: Statistical Comparison between Transformed and Surveyed Collar Points

	East	North	Horizontal	Elevation
Average	2.619	-2.558	3.661399969	-2.146
Std. Dev.	5.127	4.266	6.669635211	5.079
Maximum	11.368	6.297	12.995523580	16.134
Minimum	-13.367	-13.570	-16.837	-16.837
Spread	24.735	19.867	29.833	32.971

Note: From WSP summary of work.

From discussions with WSP, it would be possible to perform a second transformation using the additional surveyed data points; however, given the precision of the historical survey methods and grid system, it may not be possible to improve upon the accuracy of the locations with the additional transformation.

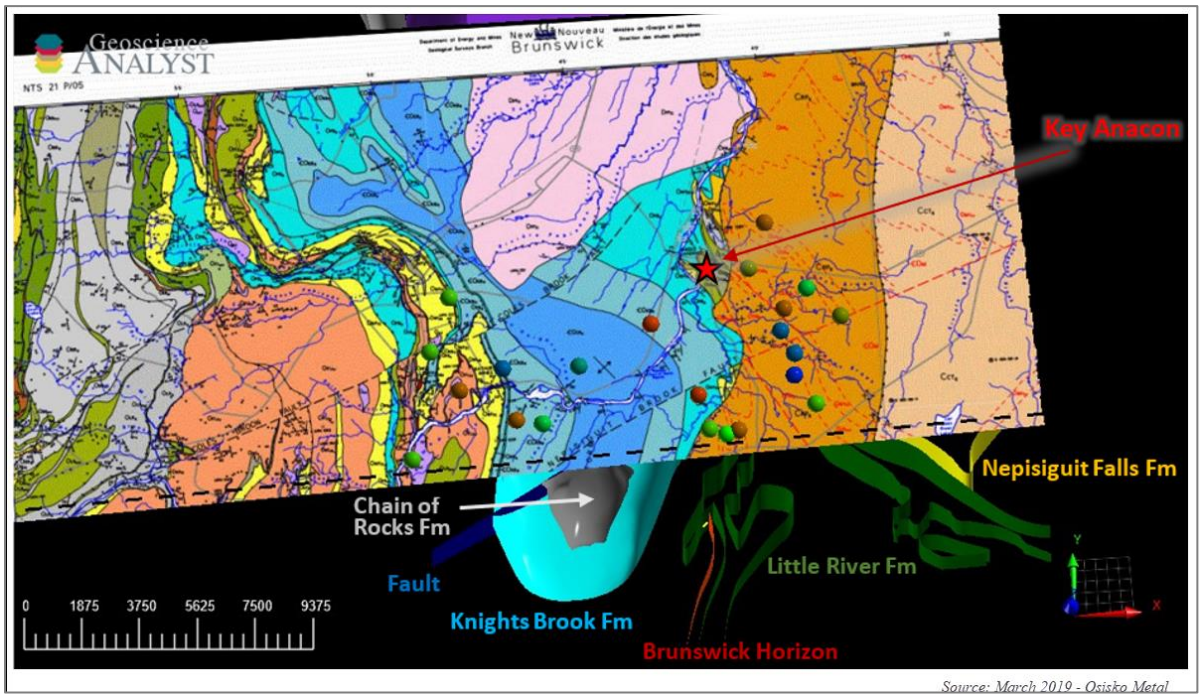
9.1.2 3D Modelling Study

3D modelling studies help generate and prioritize drill targets. Osisko Metals and MIRA Geoscience compiled an extensive database of drilling, geological, and geophysical data obtained from the New Brunswick Department of Natural Resources and past property owners. MIRA Geoscience performed geophysical interpretations and inversions to evaluate geophysical anomalies and produce a model of the subsurface stratigraphy. Based on this study, targets were generated, rated, and prioritized according to weighted criteria. The target rating system has been helpful to narrow down and test the potential in the targeted areas of interest.

MIRA Geoscience came up with 58 discrete targets camp-wide, all of them ranked in a scale from 6.5 to 14.5, where the higher the number, the more “attractive” the target. As an example, Figure 9-1 exhibits the targets as colour-coded spheres overlying the government bedrock map, and this is in turn underlain by a 3D model of the subsurface strata. Note that the targets are colour-coded similar to a heat map with blue shades depicting the lowest scores, while hotter colours such as red depicting the highest scores.

Figure 9-1 is a screenshot of a 3D model of the government bedrock map, a 3D model of the subsurface stratigraphy, and colour-coded spheres representing potential targets for testing.

Figure 9-1: 3D Models of the Government Bedrock Map and the Subsurface Stratigraphy



9.1.3 Diamond Drilling

Osisko Metals has completed drilling programs on both the Key Anacon and Gilmour South Properties consisting of 60 and 32 holes, respectively (Table 9-3).

Table 9-3: Drill Holes at Key Anacon and Gilmour South Properties Completed by Osisko Metals

Deposit Name	No. of Holes	Length (m)
Key Anacon Main	35	13,522
Key Anacon Titan	25	9,498
Total Anacon	**60**	**20,020**
Gilmour South	32	15,455
Grand Total	**92**	**38,475**

Drilling is discussed in detail in Section 10 of this report.

9.1.4 Downhole Pulse Electromagnetics

During the 2017–2018 drilling program, downhole PEM surveys were conducted at 11 drill holes, (4 Anacon Main Zone holes, 2 Anacon Titan Zone holes, and 5 Gilmore South holes). Eastern Geophysics of West Pubnico, Nova Scotia conducted geophysical testing using the Crone Pulse EM system to detect off-hole anomalies. The Crone Pulse EM system is a time domain electromagnetic

method (TDEM) that uses an alternating pulsed primary current with a controlled shut off that measures the rate of decay of the induced secondary field across a series of time windows during the off time. The receiver is moved down boreholes or along surface lines. The EMF created by the shutting off of the current induces eddy currents in any nearby conductive material, thus setting up a secondary magnetic field. When the primary field is terminated, this secondary magnetic field will decay with time. The amplitude of the secondary field and the decay rate are dependent on the quality and size of the conductor.

The borehole EM (BHEM) data are imported into the modelling and interpretation software Maxwell from Electromagnetic Imaging Technology (EMIT). The software platform allows visualization of the BHEM data in various ways such as profiles and decays, which aid in visual interpretation of the data. The data are then reviewed for the presence of anomalies due to discrete conductive bodies and these anomalies can be modelled in terms of a plate model. A plate model is typically rectangular, though more arbitrary shapes are possible. The plate consists of a group of concentric current filaments, essentially current loops that serve to model electromagnetic induction in conductive bodies. Plate models are effective for any type of discrete conductor, which is, in some sense, 'thin' compared to its lateral extents. Typically, plates are defined by their location, orientation and conductance or conductivity thickness product. Plates are infinitesimally thin typically, though thick plates can be modelled if required, and in each case the conductivity of the plate rather than the conductance can be derived. A valid plate model is considered to have been achieved when the modelled data from the plate accurately reproduce the key elements of the data anomaly in question.

Figure 9-2 and Figure 9-3 show the EM plates constructed from the BHEM surveys that took place during the 2018 drilling program at Key Anacon.

Table 9-4: Drill Holes Surveyed with Pulse EM

Pulse EM – Key Anacon	Pulse EM – Gilmour South
KAMZ-18-02	GS-99-22
KAMZ-18-03	GS-17-07A
KAMZ-18-13	GS-18-15
KAMZ-18-23	GS-18-16
KAEZ-18-03	GS-18-17
KAEZ-18-04	

Figure 9-2: EM Plates shown for Three Holes from the Key Anacon Main Deposit

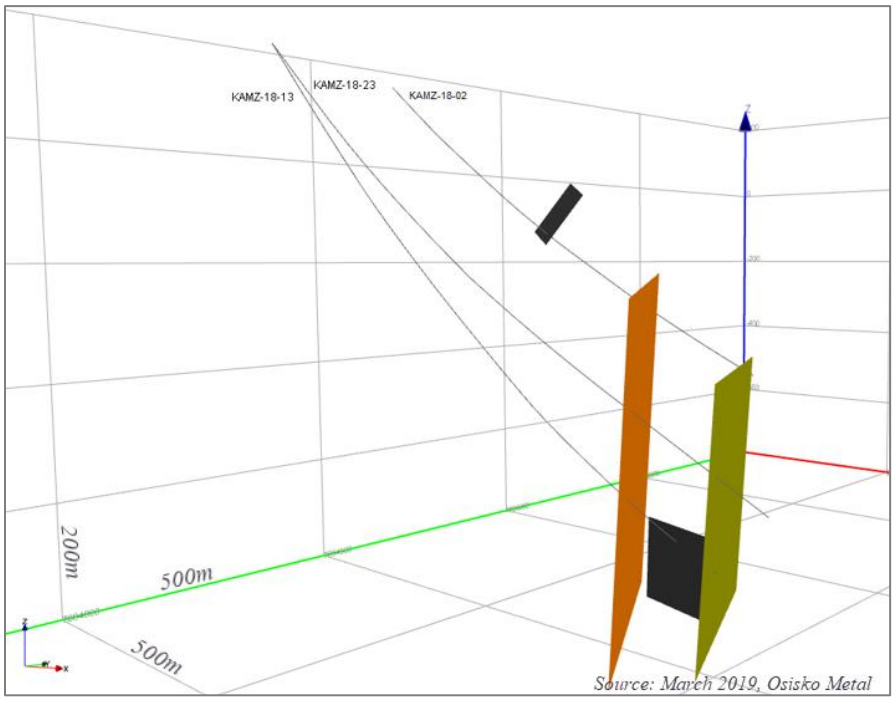
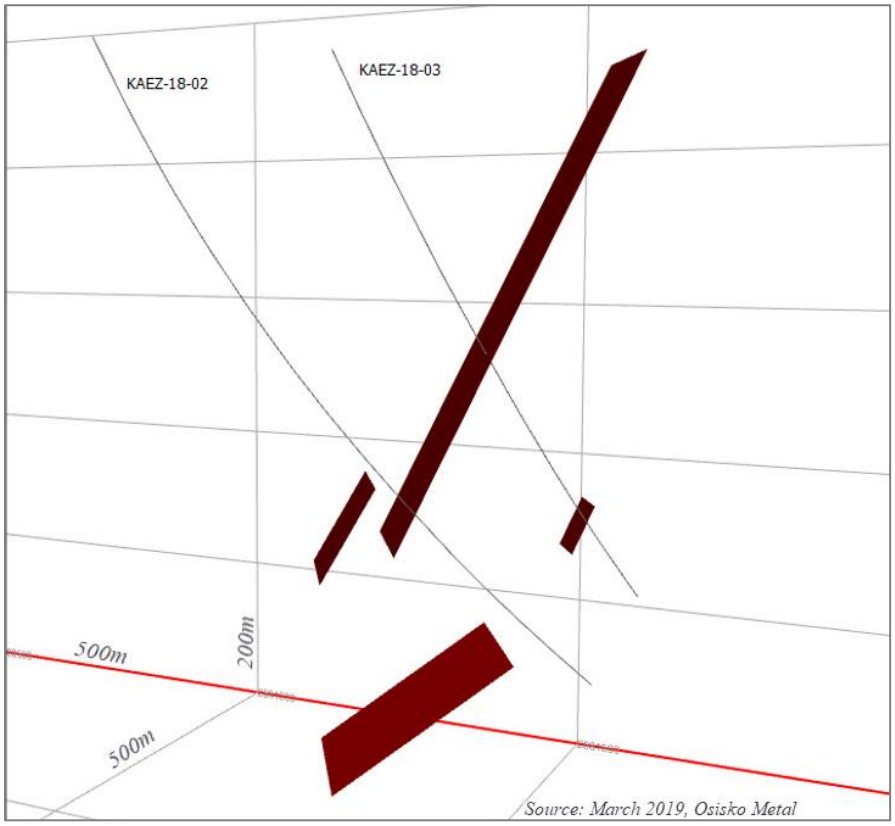


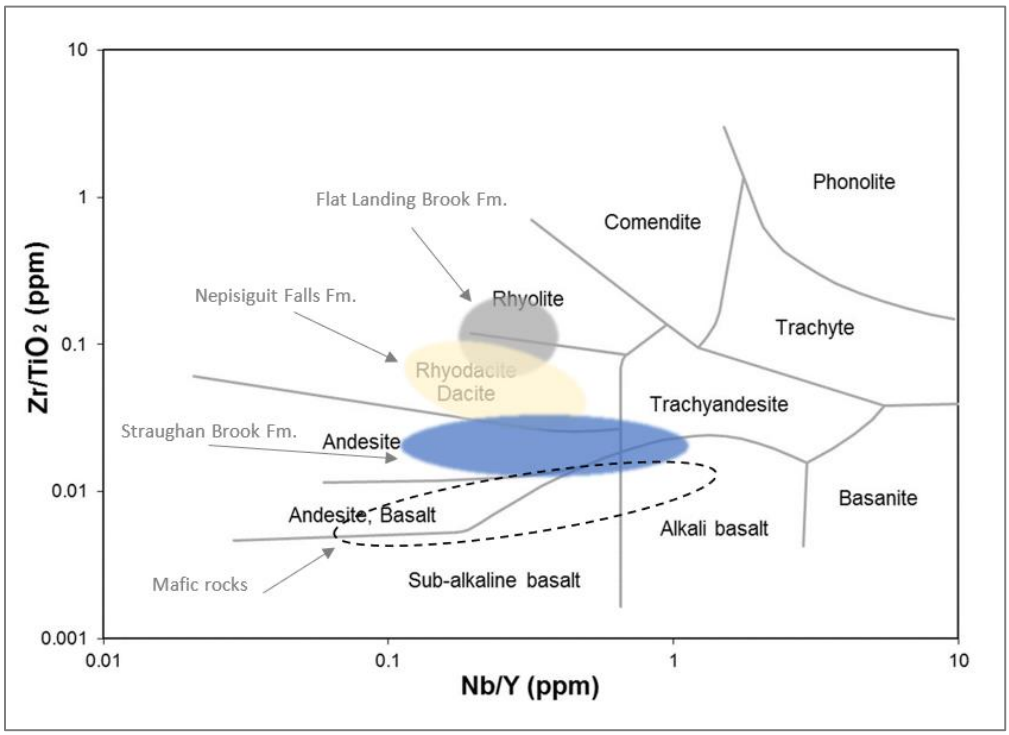
Figure 9-3: EM Plates shown for Two Holes from the Key Anacon Titan Deposit



9.1.5 Portable X-Ray Florescence Spectrometry

A hand-held Olympus Vanta M-series pXRF device was used to measure chemical compositions in drill core. Osisko Metals used pXRF to analyze drill core from the last drilling campaign as well as some core from historical drilling. This lithogeochemical data were initially collected for discriminate rock types with variable degrees of alteration and deformation. Currently, Osisko Metals is analyzing extensive pXRF data from Key Anacon's drill core in order to develop in-house lithogeochemical discrimination plots for the volcanic rocks, based on the Winchester and Floyd technique (1977) on immobile high-field-strength elements. Figure 9-4 exhibits an example of this methodology used in the BMC. These data will be used to discriminate sediment provenances, characterize and vector alteration, identify individual mineral chemistry, check metal composition and grade in sulphides, and chemostratigraphic correlation of favourable horizons.

Figure 9-4: Example of Winchester and Floyd's Principles Applied to Discriminate Amongst Lithochemostratigraphic Units in the Bathurst Mining Camp



Note: Walker, personal communication.

9.1.6 Optical Televiewer Drill Core Logging

The Bathurst Mining Camp is a structurally complex camp. As such, deciding what data are useful to collect, how to do so, and how to interpret the results is challenging. During the 2017 and 2018 drilling programs, a significant effort was made to understand the structural complexity of the deposits being drilled. Both the Gilmour South and Key Anacon properties are overlain by several metres of glacial till with little or no outcropping bedrock, making reliance on drill cores a necessity. Structure logging

of drill cores as well as oriented down-hole imaging of bedrock, were employed to gain some structural understanding and to obtain oriented measurements of structural features.

About 40% of the Osisko Metals drilled cores at Gilmour South and at Key Anacon Main and Titan Zones were examined and logged for structures by S. Watters, P.Geo. This helped determine where the more limited logging (9% to 10%) by oriented televiewer could be most useful. Portions of 11 drill holes (4 at Key Anacon Main Zone, 4 at Key Anacon Titan Zone, and 3 at Gilmour South), were imaged down-hole, by DGI Geoscience Inc. using an OTV probe. Table 9-5 shows a summary of coverage.

Table 9-5: Coverage by OTV and Core Structure Logging

		Total Metres Surveyed (m)	No. of Holes	Percentage of Drilled Metres (%)
Gilmour South (total 15,455 metres drilled)				
OTV (downhole)		1,465	3	9.5
Various non-PEM geophysical properties (downhole)		1,920	3	12.4
Structural logging of cores		6,370	16	41.2
Key Anacon (total 23,030 metres drilled)				
OTV (downhole)	Total	2,210	8	9.2
Main Zone	1,047 m		4	
Titan Zone	1,076 m		4	
Structural logging of cores	Total	9,070	42	39.4
Main Zone	5,780 m		22	
Titan Zone	3,290 m		20	

Note: Summary table of Structure Logging (drill cores) and downhole Optical Televiewer, plus test measurement of various geophysical properties by DGI Geosciences – Gilmour South only

The Gilmour South televiewered holes (and one un-televiewered hole) were also probed down-hole by DGI to provide continuous measurement of several geophysical properties, to determine if they could usefully assist in the core logging identification of lithologies, alteration, mineralization and drill targeting. Properties measured included the suite offered by DGI Geosciences: magnetic susceptibility, density, spontaneous potential, resistivity, induced polarization, and natural gamma. These properties were compared with the geology core logs and, although correlations were seen, it was not determined to be cost effective so only the OTV was employed at Key Anacon.

The televiewer camera takes an oriented, 360-degree image of the inside of the borehole at 1 mm to 2 mm resolution. This allows for the true orientation in space to be measured for visible planar structures such as prominent foliations, bedding, lithologic contacts (including massive sulphide contacts), faults, and veins. The images captured also allow one to locate and mark the oriented high point of the hole on the cores themselves, in order to take measurements and calculate the true orientation of other structures that are too fine to be imaged at the resolution of the down-hole camera. The overall objective of structure logging and televiewer imaging was to improve the

targeting of individual drill holes by gaining a better understanding of the structural setting and controls of the mineralized zones.

Procedures

Televiewer images first need to be depth-corrected to compensate for wire-line stretching. This was done about every 50 m by matching distinctive features in the OTV image with the same features in Osisko Metals' drill-core photos (taken in core boxes showing the drillers' depth tags). After viewing the corrected images, discussion between DGI and Watters established which planar features are visible and which categories of structural features can and need to be identified and measured. The process of vetting structural feature picks of DGI involved examining the feature picks on the televiewer image and comparing directly with the drill cores themselves when possible. Some reclassification and addition of structures to pick is usually necessary, resulting in a back and forth process to maximize the quality and usefulness of the structural measurements. DGI uses WellCAD software to measure and report (in Excel table format) the calculated dip and dip direction of categorized planar features along with their core depths. Linear features cannot at present be measured using their software. To measure fold axes, DGI measured the limbs of decimeter scale folds, and Watters calculated their fold axes using GeoCalculator, ver. 5 software.

Features such as fine foliations and some linear features, which were not measurable on televiewer images, were measured directly on cores either using Reflex Instruments' IQ Logger or by hand, using the standard conventions of alpha, beta, and gamma angles relative to oriented top or bottom lines marked on the cores. The top or bottom location on the core was identified using distinctive features on the OTV image (on which the top side of the hole is identified). Features measured directly on cores include foliations S1, S2, S3/S4, fold axes, fault surfaces, and slicken fibers.

An example of a portion of the televiewer image showing structural feature picks for a Gilmour South drill hole is shown on Figure 9-5. Planes appear as sigmoidal curves when the 360-degree image is unwrapped and flattened. The top of hole is the outside edge of the image. Vertical compression of the images is used to minimize image scrolling. Therefore, angular relationships are distorted in the images. Osisko Metals logged lithologies were plotted alongside the OTV images.

During structural core logging of holes that were not televiewered, structures were measured by hand relative to the main foliation (Sm) using the standard conventions for 'partially oriented' cores. Sm was chosen as the reference plane at Key Anacon and Gilmour South mainly because it is pervasive and has fairly uniform orientation (e.g., structural measurements mapped along the Nepisiquit River near Key Anacon by the New Brunswick Government (Map Plate 90-102)). At Gilmour South, the limited variation in orientation of Sm is shown on the stereonet plot of poles to Sm from the three televiewered holes (Figure 9-6).

Figure 9-5: Annotated Portion of WellCAD OTV Image – Gilmour South DDH GS-17-22-W1

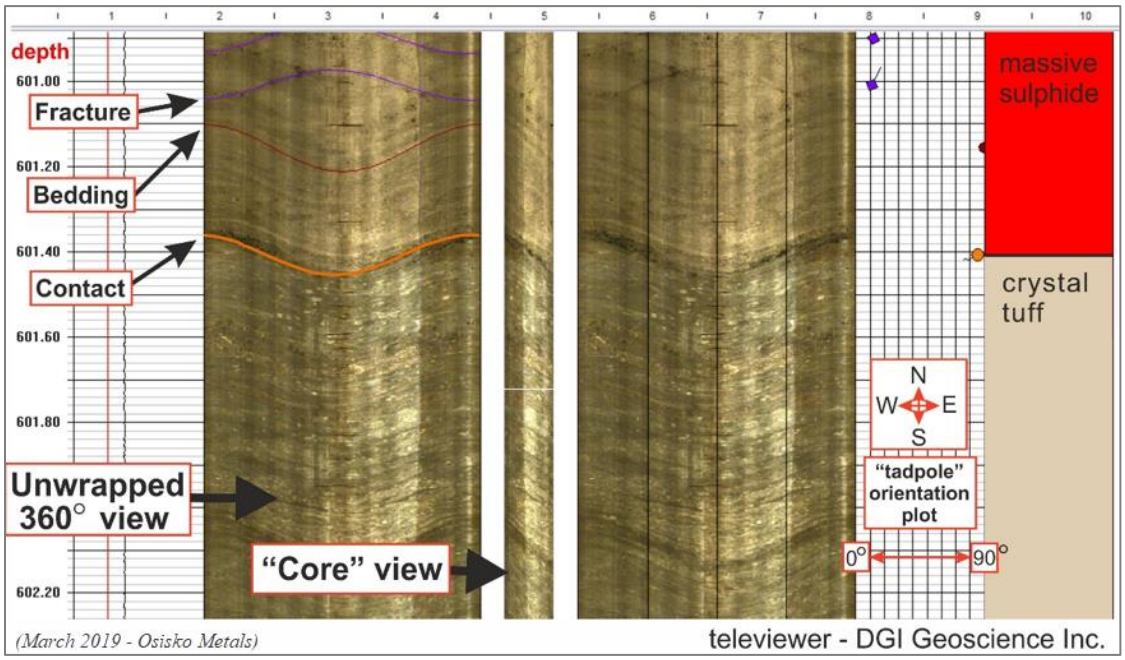
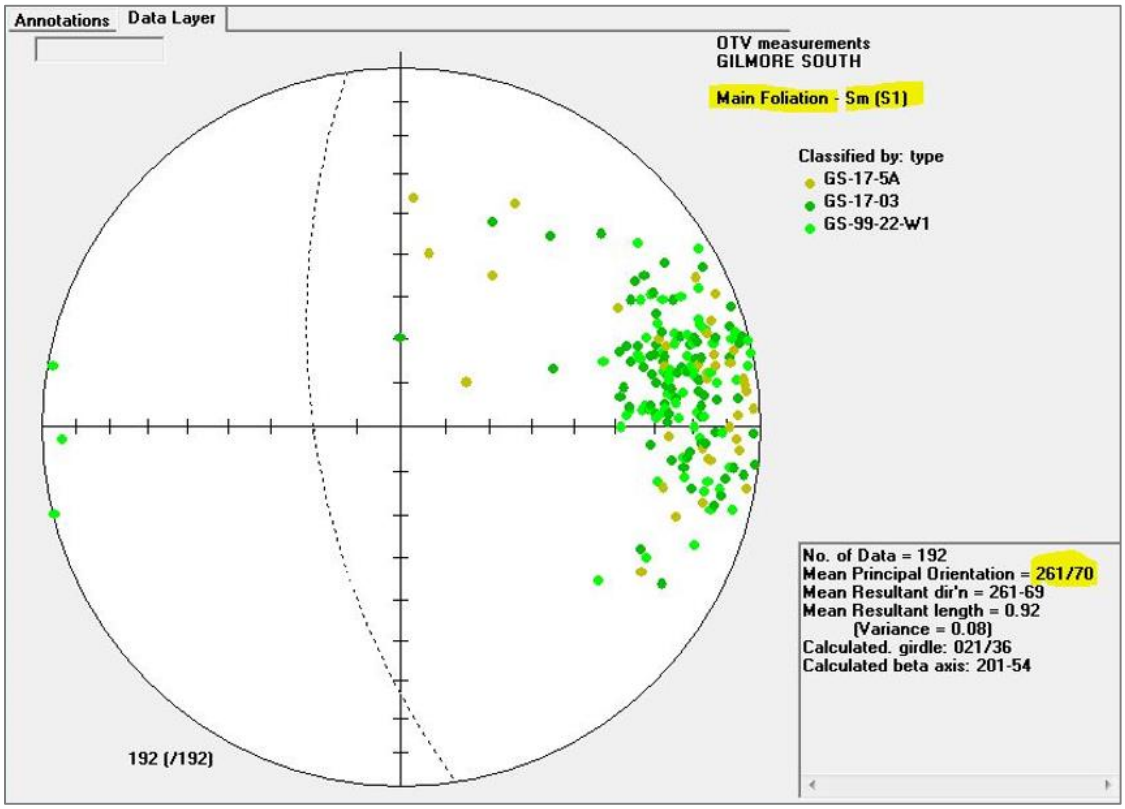


Figure 9-6: Stereonet Pole Plot of Main Foliation (Sm) at Gilmour South Measures from OTV Images – Plotted using GEOrient



Results and Interpretation

Structural measurements from the oriented televiewer images and measurements made directly on cores (oriented using the televiewer images) are in the process of being transcribed and collated to bring into Osisko Metals 3D model where their orientations can be used for deposit-scale structural interpretation. In the meantime, some general observations and interpretation from the structure logging are given below.

Examination of drill cores at the Gilmour South and Key Anacon properties indicate the presence of at least four and probably five separate phases of deformation (D1 to D5) based on overprinting relationships. Individual core samples at Key Anacon generally show at least two (locally 3) overprinting foliations. The interpreted four or five phases is based on a comparison of the overprinting relationships of foliations between cores from various locations. Structures of D4 and D5 do not overprint one another but they vary in style where they individually overprint S3. Since the massive sulphide deposits are interpreted to be syngenetic, they have been affected along with their host rocks by all of the deformation phases.

The first two phases, which are interpreted to have caused the greatest structural redistribution of the primary massive sulphides, producing isoclinal folding and the associated, pervasive, and most prominent foliation(s). Ductile faulting/mylonitic high-strain zones are also interpreted to be related to these first phases. This early deformation involved two processes that are locally demonstrable in the drill cores:

1. Differentiated layering (producing compositional layering parallel to axial surfaces of folds – this layering can be confused with bedding)
2. Transposed foliation (rotating primary structures such as bedding and foliation into parallelism with the axial surface of their related folds).

Due to intense transposition, it is rare that effects of D1 and D2 can be distinguished from one another in the drill cores. The main foliation, therefore, might be a composite of the S1 and S2 foliations and is generally referred to as “Sm” (main). This foliation is almost everywhere steeply dipping and generally north to northwest trending. Only a few S2 foliations were mapped by previous workers along the Nepisiguit River on strike of the Key Anacon Main Zone deposit (Saif, 1978), and this appears to be the basis for his interpretation of a tight, steeply south-plunging F2 synclinal fold as the structural setting of the Main Zone deposit.

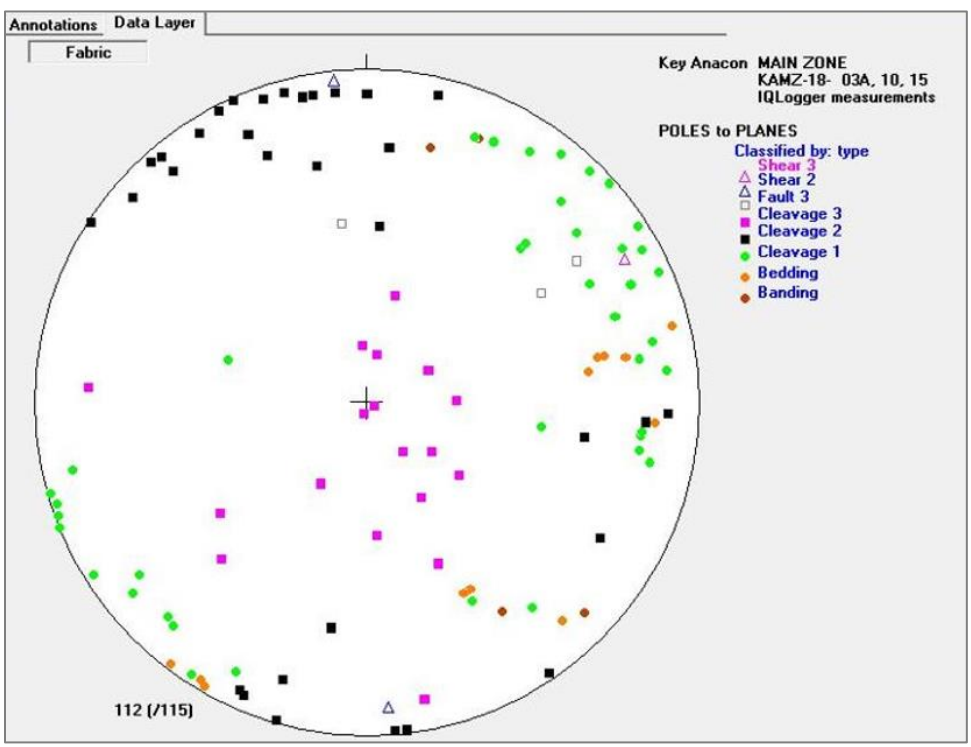
The D1 and D2 deformation is domanial in terms of intensity, style, and thickness. Some of the domains of intense strain are related to competency contrast (e.g., at the boundary between Little River Fm. mafic volcanic rocks and the stratigraphically underlying Nepisiguit Falls Fm). Massive sulphide lenses, typically thought to be less competent than the volcanic host rock, were locally observed to be enclosed in possibly less competent zones of intensely chlorite- and sericite-altered host rock that is inferred to be part of the alteration pipe of the deposits. In at least one location, there appears to be preservation of a primary layering in felsic host rocks that includes its contact with the massive sulphides as well as the adjacent internal sulphide compositional layering.

The interpreted D1 and/or D2 transposition has implications for reporting of true thicknesses of mineralized intersections from individual drill holes. Where transposition is suspected (generally the case), the otherwise standard procedure for estimating true thickness using contact angles to core axis is not reliable. If mineralized intersections can reasonably be interpreted to be continuous between close-spaced drill holes, the true thickness is expected to be more accurately determined using the geometry of the interpreted inter-hole continuity.

The first post-Sm deformation produced a penetrative, generally mm-spaced S3 cleavage (labelled S2 throughout the structure logs and OTV measurements due to being the second readily recognizable cleavage in the cores). It is typically at a large angle to the Sm main foliation, has a moderately steep to vertical dip and a strike range of E-W to NE, and is commonly observed as axial planar to dm-scale tight to open folds in the cores. It is visibly widespread in the phyllosilicate-rich layers and beds in the drill cores, producing a fine crinkle lineation on the Sm. Its effect on massive sulphide distribution has yet to be determined.

The next overprinting deformations D4 and/or D5 are observed locally as similarly oriented cm-scale kinks or folds of cm- to dm-scale. The kink planes have variable but overall shallow dips. Elsewhere there is an irregularly spaced, generally cm- to dm-spaced discontinuous fracture cleavage that overprints S3. Where it is best developed, it is cm-spaced. Timing between these two styles is uncertain. Figure 9-7 shows the results of orientation measurements made using the Reflex IQ Logger instrument on oriented drill cores in the area of the Key Anacon Main Zone.

Figure 9-7: Stereonet Pole Plot of Three Foliation/Cleavage Phases at Key Anacon Main Zone



Note: Measures from drill cores – plotted using GEOrient (Rod Holcombe software).

Faulting observed in drill cores includes early ductile and later brittle faulting. Some brittle faults are annealed and are interpreted to pre-date brittle faulting (fracture, brecciation and gouge development). Several faults, both ductile and brittle, located in or near the massive sulphide zones at the Key Anacon Titan Deposit. Associated movement indicators are drag folds, gash veins or repeated, consistent slickenfiber orientations. Where these indicators were televiewered, their orientation and movement sense were calculated and will be incorporated in the 3D model.

10 DRILLING

10.1 Drilling Prior to the Osisko Metals 2017–2018 Campaign

Core handling practises prior to Osisko Metals' 2017 drill campaign are less well documented and subject to what is available in assessment reports. The drilling methodologies for the drill holes used in the Resource Estimate are presented in Table 10-1. The information was compiled mainly from claim assessment reports, drill logs, and other geological reports. AGP cannot confirm that the information presented prior to Osisko Metals work is accurate. AGP assumes that the drilling procedures and core-handling methodology used by previous operators met industry standards at the time the drilling was conducted and has no reason to believe otherwise. This is especially true for large multi-national companies such as Rio Algom and Noranda. AGP is aware that a number of Osisko Metals employees in Bathurst area were present and participated in the exploration programs during the Noranda era.

Table 10-1: Drilling Methodology

Company	Years	Metres Drilled (m)	% of Drilling in Resource (%)	Core Size	Original Collar Survey Type	Downhole Survey Type
Larder surface drilling	1950s	19,012	12.15	AXT	Grid	Acid
Key Anacon underground	1950s and 1960s	18,352	11.73	EX (21 mm)	Grid	Acid
Key Anacon surface drilling	1960s-1990s	1,793	1.15	Most likely AXT	Grid	Acid
Rio Algom	1992–1993	29,489	18.85	NQ	Grid	Pajari
Noranda	1995–2011	48,591	31.06	HQ, NQ, BQ	Grid	Gyro
Hunter Brook & El Nino	2007–2015	742	0.47	NQ	UTM NAD 83	Sperry Sun, Gyro
Osisko Metals	2017–2018	38,475	24.59	NQ	NB Double Stereographic	Gyro
Total		**156,453**				

The drill logs for much of the historical core are available in assessment reports on file with NB DERD. A selection of the original core is also available at the NB DERD core storage facility in Madran, New Brunswick.

10.1.1 New Larder "U" Island Mines Ltd; Anacon Lead Mines; and Key Anacon Mines Ltd.

Larder acquired the present-day Key Anacon deposits in 1952 and was subsequently taken over by Anacon Lead Mines in 1955. Anacon Lead Mines Ltd. subsequently re-structured into Key Anacon Mines Ltd. in 1964.

A selection of underground drill core available from these companies is stored at the Madran core storage facility, and was found to be EXT (23 mm) size. Logs from the surface drilling indicate AXT (32.5 mm) size. Downhole surveys were performed by acid testing and would only provide downhole dip information. Collar survey points of the day were recorded in project-specific grid coordinates. AGP assumes that surface drill holes were either chained from known points or surveyed using a theodolite. Underground holes were likely only chained from underground survey stations. All holes that have down hole surveys consisting solely of acid test are obviously less accurate since the deviation is only measured on the vertical plane. This affects the longer surface drill holes more so than the shorter underground drill holes. Because of this, a number of the Larder "U" drill holes had to be eliminated from the resource estimate due to probable issues with collar coordinate and/or issues with down hole surveys. The remaining holes were retained since the mineralized intersections are believed to be present albeit the exact location may be off. AGP recommends re-drilling the high-grade intersections generated by the Larder "U" surface drilling to eliminate as much as possible their influences on future resource estimate.

10.1.2 Rio Algom Exploration Inc.

In 1992, Rio Algom optioned the property and conducted exploration drilling. Drilling standards had improved significantly since the 1950s and 1960s and drill core diameter was NQ with downhole surveys completed using Pajari. The Pajari is a single-shot, micro-mechanical borehole surveying instrument operated by a timing device. Borehole direction was measured from the earth's magnetic field, accurate to ±0.5 degrees. The Pajari provides both direction and inclination, which can be used to define the attitude of the borehole at the survey depth. This instrument was popular in the 1990s. The QP experience with Pajari is that the results can be reliable as long as the equipment was kept clean and well maintained. Rio Algom continued in the practice of locating holes using a property-specific grid system.

10.1.3 Noranda Mining and Exploration Inc.

Noranda completed much of the historical drilling for the Gilmour South Project and completed several holes on the Key Anacon property. Drill core was of HQ, NQ, or BQ size. Records indicate that downhole surveys of the time were completed using a Gyro. Noranda continued with the practice of locating holes using a grid system and compiled historical drill collar locations in a database under a common grid system.

10.1.4 Hunter Brook Holdings Ltd.

Hunter Brook Holdings Ltd. completed a single NQ drill hole on the Key Anacon property in 2015. The downhole survey was conducted using a Gyro, and the survey collar location was surveyed originally in UTM NAD83.

10.1.5 El Nino Ventures Inc.

El Nino Venture Inc. completed two BTW size drill holes on the Gilmour South property in 2007. The downhole survey was conducted using a Sperry Sun instrument, and the survey collar location was surveyed originally in UTM NAD83.

10.2 Osisko Metals 2017–2018 Drilling and Core Logging Procedures

In this section, items that are not specifically in the Key Anacon and Gilmour South deposits sub-sections are common to both deposits unless otherwise noted in the text. Logan Drilling Group of 37 Commo Road, Stewiacke, NS, B0N 2J0 carried out Osisko Metals' drilling during the 2017–2018 program.

10.2.1 Drill Procedures

Drill Hole Location and Set-up

The 2018 drilling on the Key Anacon Main deposit consisted of 35 drill holes, 32 of which focussed on delineating extensions of the known deposit at 50 m to 100 m centre spacing. Three of the drill holes passed through the heart of the deposit to confirm the grade and width of historical drilling.

The 2018 drilling on the Key Anacon Titan deposit consisted of 25 drill holes. All of the 2018 drill holes were within 600 m vertical from surface and the bulk of the drilling focussed on delineating the deposit at 50 m centre spacing within 300 m vertical of surface. The deepest historical drilling intercepted massive sulphides to a depth of 1,100 m vertical.

The drilling on the Gilmour South property commenced in October 2017, completed in April 2018, and consisted of 32 drill holes totalling 15,455 m. Drilling focused on exploring the deposit at 50 m to 100 m step-outs form the historical drilling.

Drill Hole Location/Set-up/Survey

The coordinate system used was New Brunswick Double Stereographic Projection of NAD83 Zone 20. Magnetic Declination in the Bathurst region is 17^0 46' degrees west.

Drill hole collar locations were pre-surveyed by Osisko Metals' staff or contractors using a Trimble Nomad 1050 GPS. The Trimble Nomad system is a handheld GPS that provides superior accuracy compared to a standard hand-held GPS. The Trimble Nomad system was the only handheld GPS that would permit the use of New Brunswick Double Stereograph Projection (the New Brunswick standard). Once completed, the drill hole collars at Key Anacon and Gilmour South were re-surveyed using an in-house handheld Trimble Nomad GPS, which has an estimated accuracy of 5 m. At the Key Anacon Project, additional control was required when surveying collar locations due to the extensive historical drilling and mining so survey contractor WSP was engaged to survey the current and all available historical collars using a high accuracy differential GPS set-up consisting of a Trimble

Base/Rover setup with two R8 GPS receivers and a TSC3 data collector. WSP surveyed the historical collars at Gilmour South using the same equipment and Osisko Metals' holes were surveyed with an in-house handheld Trimble Nomad GPS.

A wooden picket was hammered into the ground to mark the collar location. The stake was labelled with the drill hole identification number and the planned azimuth, dip and depth of the hole. To facilitate drill rig alignment, a set of marked wooden pickets were hammered into the ground (at a sufficient distance away from the collar) to depict the foresight and back sight of the drill rig. To refine the orientation of the rig, a geologist would use a compass and/or the Reflex Azimuth Pointing System (APS) tool. This tool is attached to a rod in the drill head and uses satellites to determine the desired azimuth. Deeper drill holes would often require the accuracy of the APS device, while shallower holes could be oriented with a compass.

The drill hole number was assigned by Osisko Metals in sequential manner, containing information on the project area, year drilled, and hole number. An example would be Area-Year(YY)-Hole (e.g., KAT-18-10 would represent Key Anacon Titan Zone-2018-hole 10).

The collar location and roads were prepared by Osisko Metals to allow for easy access of drilling equipment and personnel; involving brush cutting and tree removal. Field geologists would visit and inspect the drill site with the drill foreman to confirm the integrity of the rig set-up, as well as health and safety standards. Care was always taken to ensure that the drill platform and footprint of the area were as small as possible. Hay was laid over the site once the drilling equipment left the drill site.

During the drilling process, Osisko Metals' geologists or technicians visited the site daily to pick up core and ensure that safe and environmentally responsible drilling practices were being taken.

Drill Hole Deviation during Operation

The drill contractor was responsible for surveying the hole at regular intervals as prescribed by the site geologist:

- First reading was taken 15 m below the bottom of the casing
- Readings were taken every 15 m to a depth of 100 m
- Below 100 m, readings were taken every 30 m
- Final reading was taken at the bottom of the hole.

Due to magnetic minerals in the hole/core, magnetic deviation tool measurements (Azimuth) are often inadequate. Magnetic interference was more intense when the hole intersected magnetic pyrrhotite or magnetite-rich basalts. For this reason, a Reflex Gyro surveying tool was used on all Key Anacon Main and Titan drill holes. A Reflex EZ-track Magnetic surveying tool was used on all holes at Gilmour South.

At the end of each drill hole, the geologist would review and approve the survey data.

Drill Hole Coring

Drill core was provided by the drilling contractor in NQ (46 mm) size. On one occasion, drillers were unable to recover NQ core in hole GS-17-5A; in which case, BQ (36 mm) core was accepted. The core was collected in a standard drilling tube, and the driller's helper would carefully place the core into wooden core boxes or trays supplied by Osisko Metals. The drill helper would mark the current drill hole depth on a wooden block after each 3-m run and place it in the corresponding place in core.

The drill holes were terminated by Osisko Metals once the targeted depth was reached and the core was inspected to ensure that the hole ended in unaltered or unmineralized material. Once the drill holes were terminated, and the final downhole survey was taken, the drill crew would pull the rods for mobilization to the next drill site. Drill hole casing was left in the hole and capped using an aluminum casing cap with the drill hole number stamped into the top. A metal flag was attached to the casing cap.

Once drilling was completed, and equipment left the site, hay was spread over the drill site to assist in site reclamation. A final site closure review was completed to ensure that the contractors met their site clean-up requirements. During this site closure review, the final drill hole location would be surveyed. For winter drill sites, a return visit and inspection in spring might be warranted to ensure the site was clean and safe.

Drilling and Core Handling

Diamond drill core was collected in up to 3 m lengths or runs in a NQ core barrel. The NQ core trays hold a nominal 4.5 m of core in three, 1.5 m rows. Core was deposited in the wooden trays at the drill rig by the driller's helper after completion of each drill run under the supervision of the driller. Core trays were numbered with a permanent marker by the driller's helper indicating the drill hole and box number.

The driller's helper inserted a meterage tag (wooden block) at the downhole end of the last piece of core taken from the core tube. The block identified the exact depth at the end of each drill run measured from where the ground meets the casing. Although the barrel is designed to hold a 3 m run, rock conditions or mechanical failures can dictate smaller core recovery lengths.

Additional notations can be provided on separate wooden blocks indicating bad or blocky ground, water conditions, or lost core with associated measurements. Once the core tray was filled, it was set aside, and secured using heavy-duty rubber bands and carefully stacked for transport to the logging facility in Bathurst.

Receiving Core at the Bathurst Warehouse

Drill core was transported daily to the core logging facility in Bathurst by Osisko Metals' geological technicians. Care was taken to ensure that the lids were secure, and disturbance was minimized to prevent undue breakage and loss during transport.

All core trays were verified in the warehouse/logging facility, checking the accuracy of the wooden marker blocks before logging was initiated. If blocks did not correspond with the observed core, the driller and/or supervisor was consulted at the first available opportunity.

Core Logging

Logging of core is a collection of data that is used in the short term to evaluate the exploration program and in the long term to potentially lead into resource and reserve estimations, pre-feasibility and feasibility studies. As such, observations made at the outset can have significant impacts on the project going forward.

The Key Anacon and Gilmour South projects have a large amount of historical drill data with regards to lithologies, mineralization styles, and controls. Early in the Project, a significant amount of time was spent transcribing and interpreting historical logs to use the in a modern classification system as previously discussed in Section 9 of this report.

The detailed logging of core has several components: geological logging (lithology, structure, alteration, and mineralization), geotechnical logging, sampling, and photography. These components are described below.

In fall 2017, Geotic Log software was acquired by Osisko Metals before the commencement of drilling at the Key Anacon property. From the outset of the 2018 program, all Key Anacon drill core was logged using Geotic. Before Geotic, all Gilmour South core was logged in Excel. All Excel logs have since been imported into Geotic. Geotic's worksheets /sections are discussed below.

Geotic Database

The Index table collects data about the project name, survey (hole number), planned name, and borehole type of the drill hole.

The coordinates table is used for housing drill hole location data. The table contains:

- Project Name
- Survey (hole number)
- Azimuth – recorded from 0 to 360 reported relative to true north
- Dip – reported from 0 to 90 with negative dips reporting holes that are drilled below horizontal and positive dips reporting holes that are drilled above horizontal
- Length (depth of hole) reported by the drilling contractor in metres and measured from the intersection point where the collar meets the ground
- Location data reported in New Brunswick Double Stereographic Projection NAD83.
- Elevation data are recorded in metres above mean sea level.

The hole information table is used for housing drill hole ancillary details. The table contains:

- Claims Title – the claim number or unique property name as assigned by the New Brunswick Department of Energy and Resource Development
- Drill hole contractor
- Author – the geologist who logged the drill hole
- Township – the township or county where the drill hole is located
- Level – used to record the underground level where a drill hole collar is located
- Start date – the date in which drilling started on the drill hole
- Description date – the date when a geologist started to log the drill hole
- Additional details – core size, storage location, and status, as well as whether or not a drill hole is cemented.

The downhole survey-table stores drill hole deviations data such as depth, survey method, surveyed azimuth (relative to true north), surveyed dip (+ for up holes, - for down-holes), as well as quality assurance details, such as whether or not the survey was approved or deemed invalid by the geologist reviewing the survey.

The BMC lithology table records data such as geological formation, rock type, texture, and a detailed lithological description. Considerable effort was taken to interpret formation data and rock types in accordance with the Bathurst Mining Camp Stratigraphy as defined by the Geological Survey Branch of the NB DERD.

The BMC mineralization table records the presence of relevant sulphides (pyrite, pyrrhotite, sphalerite, galena, chalcopyrite, magnetite, and arsenopyrite), as well as the total sulphide content and a detailed description of the sulphides.

The structures table allows core logging geologists to record geological structures such as foliation, faults, folds, and the general orientation of these features observed at various depths within the drill core. The collection of the data throughout drill holes provides important information about the distribution of mineralization throughout the property, which can be used to aid future exploration and possible mine planning.

The assay table contains the sample number and interval data relating to the various drill holes, including a record of all standards, blanks, and duplicates collected. Once results are returned from the Assay Laboratory, the database software is used to integrate and store the assay results with the sample collection data. Assays and analytical procedures are described in Section 11 of this report.

Rock quality designation is documented to give qualitative and quantitative information on the stability of rock surrounding and included in the mineral deposit. This information is used to determine if an area can be mined safely, based on the integrity and recovery of the core.

RQD is a quantitative index of rock quality based on a core recovery procedure that is calculated by summing the length of all pieces of solid core that is longer than twice the diameter of the core. For NQ core, the nominal diameter is 5 cm, so the RQD index length is 10 cm. Shorter lengths of core are ignored in the RQD calculation. Typically, RQD is calculated for each run of core. RQD is determined using the following formula:

RQD (%) = 100 x [(sum up the length of core pieces equal to or greater than 10 cm within a run of core)/ (measured length of the core run)]

It is important to distinguish between mechanical and natural breaks, as mechanical breaks are induced by the drilling process and have no bearing in the overall quality of the rocks.

Core Photography

All drill core is photographed to have a digital image record of sufficient detail to clearly see core features before destructive sampling procedures. This record can be used later to qualify rock quality features and to examine core images against geological logging and sampling if the core is unavailable for examination. The photos can also be used during the construction of geological sections:

- Core is photographed after it has been geologically logged (sample tags inserted) and before it has been cut. The camera is mounted at an appropriate height on a mobile cart, and the wet core is laid out on the logging tables.
- All depth marker blocks should be clean, legible, and visible in the photograph. The "from-to" for top and bottom core depth is clearly marked on the wooden core tray as well as the box number and drill hole name.
- The core is photographed dry and wet.
- Digital photographs are saved into the appropriate drill hole folder for the project database.

Additional close-up photographs may be taken of mineralized intersections, structural features, or other items of note by the geologist during the logging process. As a general guideline, core photography is the last step taken prior to the cutting and bagging of core so that details such as meterage, sample tag numbers, lithological logging, structural logging, and pXRF sample locations are annotated and clearly visible on the core.

Sampling and Core Cutting

Selective sampling is performed by the logging geologist. Samples intervals range in length from 30 cm to 150 cm and broken along all major geological or mineralogical contacts. A series of sequential samples is marked using a red china grease marker along the upper and lower sample margins. Stop and start arrows are generally used to annotate the first and last sample in the series.

The sampling process includes the addition of standards, blanks, and ¼ core duplicates. Standards and blanks generally alternate and are inserted every 10th sample. A single ¼ core duplicate is taken

per sulphide interval. Sampling preparation, analytical procedures, and QA/QC are discussed in Section 11 of this report.

A geotechnician trained in core cutting procedures executes the core cutting at the Bathurst warehouse. Before cutting, the logging geologist has clearly marked out all pertinent core intervals with a red china grease marker. Once sample intervals are selected and marked, the logging geologist is responsible for entering the sample intervals, standards, and blanks into the Geotic database and for providing a printed list of all samples, blanks, and duplicates to the geotechnician. The geotechnician is then responsible for filling out the sample tag books and placing and stapling the sample tags into the core trays. This weather-proof fabric tag remains in core trays as a permanent record of the sampling process. Once the tags are affixed to the core boxes with the sample number visible, the core is photographed to record the logging and sampling work conducted.

A second sample tag is then placed inside a plastic sample bag. Sample bags are labelled a second time on the outside with a permanent black marker. Quality control samples are added systematically to the sample sequence. The core is then cut with a diamond saw, and one-half of the core sample is placed in the sample bag, and the remaining half returned to the core box. The sample is taken consistently from the same half of the split core, using a red centerline drawn on the core as a reference. The cut core is returned to the core box in the same position as it was removed so as not to rotate the core or reverse the down-hole direction of the core. If the above procedure is carefully followed, the core remaining in the tray will retain its “fitted” appearance.

Once specific gravity (SG) measurements are complete, the sample bag is sealed using a plastic zip tie and placed into a numbered plastic pail. The sample intervals are recorded on a numbered pail and sealed for shipping to Actlabs in Fredericton, New Brunswick for sample preparation. Samples are then shipped to Ancaster, Ontario, for SG, fire assay, ICP, and/or fusion analysis. Once complete, assay results are returned in the form of an Adobe .pdf file and an Excel file, which are then imported into the Geotic database. Pulps and rejects are returned from Ancaster to the Bathurst warehouse for storage.

Core Storage

Following sampling, the core trays are labelled using either an embossed aluminum Dymo tag or printed onto permanent polyester Dymo tape. Printed tags are reinforced with aluminum Dymo tape. This labelling process uses a Dymo XTL 300 Industrial Label Printer that uses thermal transfer printing technology to transfer text to a sticky smear-proof, heat-, chemical-, and UV-resistant permanent polyester tag. The tags are then fixed to a blank aluminum Dymo tag (for re-enforcement) and stapled to the core box ends. This form of printing allows for rapid box labelling that provides superior visibility to traditional aluminum-embossed tags. The core tray tags are marked with the hole number, tray number, and the From-To meterage. The final tray in a hole is marked with end-of-hole (EOH).

The mineralized intercepts are stored in steel racks in Osisko Metals’ Bathurst Warehouse to minimize deterioration of cores due to oxidation. The remainder of the core trays is permanently stored on

pallets at the Key Anacon site. The core stored on the Key Anacon site is stored on pallets, and cross-stacked to prevent tipping.

10.3 Specific Gravity Determination

Once a sampling interval was chosen, cut and bagged, the entire samples were then weighed dry and subsequently submerged for use in SG measurements. SG measurements are identically taken on every sample in-house. The basket is first weighed dry and then wet, and then it is recorded, followed by dry and wet weighing of a known piece of rebar and casing cap. Once all three items are recorded and no anomalous weights were observed, the basket is hung and tared. Upon taring of the weigh-basket, core samples are measured. No paraffin or shellac is used to coat the samples. During the SG testing, the sample tag remains with the cut core and collectively returned to the appropriately labelled sample bag. SG of samples are calculated using the following formula:

$$Specific\ Gravity = Mass\ in\ air\ /\ (Mass\ in\ air - Mass\ submerged)$$

Collection of SG measurements by Bathurst employees began during the Key Anacon Project. Prior to this time, measurements were only conducted at Actlabs. Samples were analyzed for SG roughly every 20th sample.

10.4 Key Anacon Main Deposit Drilling Results 2017–2018

In 2018, 60 holes totalling 23,020 m were drilled to test both the Key Anacon Main and Titan deposits.

Drilling on the Main deposit consisted of 28 drill holes, 25 of which focussed on delineating peripheral extensions of the known deposit at roughly 50 m to 100 m centre spacing. An additional 3 drill holes were designed to pass through the known deposit near historical drilling to confirm historical intercepts. The holes are listed in Table 10-2 and shown on Figure 10-1. The drilling highlights are listed in

Table 10-3.

Drilling confirmed known presence of massive sulphides as well as confirmed historical reported grades and focused on step-out drilling of the main deposit based on historical drilling.

Table 10-2: Key Anacon Deposit Drill Collars

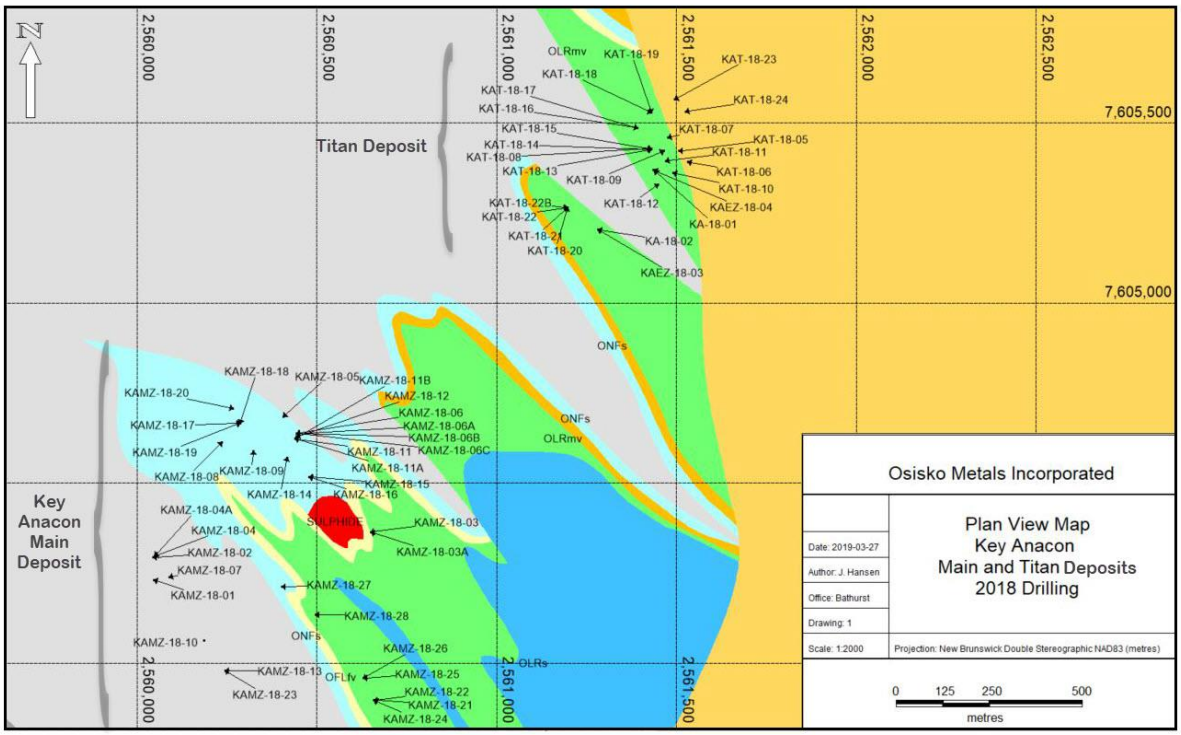
Hole Number	Easting	Northing	Elevation	Azimuth	Dip	Length (m)
KAMZ-18-01	2560047	7604231	64.2	59	-57	806
KAMZ-18-02	2560045	7604294	65.3	50	-47	704
KAMZ-18-03	2560651	7604364	59.6	242	-57	82
KAMZ-18-03A	2560651	7604364	59.6	241	-59	301
KAMZ-18-04	2560049	7604297	62.8	53	-53	272
KAMZ-18-04A	2560049	7604297	62.8	52	-50	590
KAMZ-18-05	2560407	7604685	66.1	217	-55	593
KAMZ-18-06	2560445	7604638	60.7	222	-53	23
KAMZ-18-06A	2560445	7604638	60.7	222	53	11
KAMZ-18-06B	2560445	7604638	60.7	222	-53	8
KAMZ-18-06C	2560445	7604638	60.7	222	-53	353
KAMZ-18-07	2560090	7604239	57.1	54	-46	620
KAMZ-18-08	2560236	7604612	61.1	230	-45	209
KAMZ-18-09	2560324	7604589	60.3	235	-48	275
KAMZ-18-10	2560186	7604062	57.1	54	-55	767
KAMZ-18-11	2560440	7604622	60.7	223	-61	86
KAMZ-18-11A	2560440	7604622	60.7	220	-61	47
KAMZ-18-11B	2560440	7604622	60.7	215	-61	426
KAMZ-18-12	2560444	7604629	60.7	218	-56	440
KAMZ-18-13	2560245	7603979	56.8	50	-60	815
KAMZ-18-14	2560418	7604571	60.7	225	-61	278
KAMZ-18-15	2560480	7604517	60.6	225	-61	458
KAMZ-18-16	2560480	7604517	60.5	225	-46	359
KAMZ-18-17	2560287	7604666	61.6	245	-58	299
KAMZ-18-18	2560287	7604666	61.6	245	-70	389
KAMZ-18-19	2560287	7604666	61.4	245	-64	308
KAMZ-18-20	2560267	7604707	61.0	245	-58	296
KAMZ-18-21	2560660	7603897	64.1	48	-58	365
KAMZ-18-22	2560660	7603897	64.1	48	-66	419
KAMZ-18-23	2560245	7603979	56.8	52	-55	798
KAMZ-18-24	2560659	7603897	64.1	52	-74	535
KAMZ-18-25	2560631	7603958	64.4	48	-66	377
KAMZ-18-26	2560631	7603958	64.1	48	-58	302
KAMZ-18-27	2560403	7604211	63.1	41	-52	401
KAMZ-18-28	2560497	7604134	62.0	57	-65	510
Total			**13,522**			

Table 10-3: Drilling Highlights – Key Anacon Main Zone Highlights

Hole Name	From (m)	To (m)	Width (m)	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Zn+Pb (%)
KAMZ-18-03A	127.10	133.00	5.90	5.19	1.82	0.01	37.22	7.01
And	159.50	162.90	3.40	8.11	3.21	0.04	133.49	11.32
And	198.30	205.50	7.20	7.92	3.70	0.05	149.50	11.62
And	210.40	223.00	12.60	3.39	1.20	0.03	34.73	4.59
And	254.00	300.50	46.50	8.94	3.14	0.10	98.37	12.08
Including	254.00	274.00	20.00	14.71	5.71	0.08	183.00	20.42
KAMZ-18-07	444.60	447.60	3.00	5.62	1.87	0.10	28.04	7.49
KAMZ-18-10	634.95	643.25	8.30	10.47	3.47	0.03	92.00	13.94
KAMZ-18-15	224.60	229.90	5.30	14.87	5.71	0.01	294.92	20.58
And	241.40	248.40	7.00	9.85	3.82	0.00	126.14	13.67
KAMZ-18-24	483.00	488.00	5.00	4.22	1.17	0.04	48.98	5.39
KAMZ-18-27	197.00	202.6	5.60	1.30	0.17	1.75	25.72	1.47
And	204.10	214.10	10.00	4.22	0.83	0.44	35.98	5.05
And	253.40	274.10	20.70	7.92	4.72	0.19	185.39	12.64
KAMZ-18-28	398.60	407.46	8.86	9.13	3.61	0.01	132.87	12.74

Note: The width expressed in core length, true width, at the Key Anacon Main deposit ranges from 41 percent to 88 percent (5th to 95th percentile) of the core length with an average of 66 percent.

Figure 10-1: Plan View Map of 2018 Drill Hole Locations of the Main and Titan Deposits



10.5 Key Anacon Titan Deposit Drilling Results 2017–2018

Drilling on the Titan Zone consisted of 24 drill holes, all targeting the mineralized corridor within 600 m vertical of surface. The bulk of the drilling focussed on delineating the deposit at 50 m centre spacing within 300 m vertical of surface for use in the 2018 Titan Resource Estimate. The holes are listed in Table 10-4. The drilling highlights are listed in Table 10-5.

Drilling confirmed the presence of massive sulphides as well as historically reported grades and focused on step-out and infill drilling of the upper 500 m to surface of the deposit.

Table 10-4: Key Anacon Titan Drill Collar

Hole Number	Easting	Northing	Elevation	Azimuth	Dip	Length (m)
KA-18-01	2561438.9	7605370.3	65.08	56	-73	404
KA-18-02	2561281.7	7605205.8	64.43	61	-70	803
KAEZ-18-03	2561281.7	7605205.8	64.43	56	-64	746
KAEZ-18-04	2561439.2	7605375.6	73.38	72	-65	584
KAT-18-05	2561511.6	7605422.2	68.45	56	-55	329
KAT-18-06	2561537.8	7605390.3	68.76	56	-55	338
KAT-18-07	2561480.7	7605463.2	69.96	56	-55	311
KAT-18-08	2561427.5	7605434	69.1	56	-55	305
KAT-18-09	2561467.3	7605429.1	71.575	56	-55	395
KAT-18-10	2561497.1	7605359.3	73.4	56	-55	431
KAT-18-11	2561468.1	7605392.5	75.3	56	-55	326
KAT-18-12	2561447.8	7605327.7	72.1	56	-55	344
KAT-18-13	2561432.4	7605431.9	71.7	55	-73	368
KAT-18-14	2561432.4	7605431.9	71.7	33	-64	386
KAT-18-15	2561432.4	7605431.9	71.7	35	-49	329
KAT-18-16	2561389.6	7605482.4	67.3	44	-71	404
KAT-18-17	2561389.6	7605482.4	67.3	46	-60	344
KAT-18-18	2561433.5	7605525.3	71.5	48	-62	236
KAT-18-19	2561433.5	7605525.3	71.5	48	-45	182
KAT-18-20	2561194.9	7605265	73.3	55	-62	635
KAT-18-21	2561194.9	7605265	73.3	56	-67	680
KAT-18-22	2561194.9	7605265	73.3	54	-61	314
KAT-18-22B	2561194.9	7605265	73.3	52	-65	101
KAT-18-23	2561502.2	7605564.8	70.8	55	-45	101
KAT-18-24	2561518.7	7605531.2	70.9	55	-45	101
						9,498

Table 10-5: Drilling Highlights – Key Anacon Titan Highlights

Hole Name	From (m)	To (m)	Width (m)	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Zn+Pb (%)
KA-18-01	212.50	215.35	2.85	2.46	0.44	0.28	25.53	2.90
And	283.30	305.50	22.20	6.07	2.19	0.92	48.80	8.26
And	347.55	357.80	10.25	6.37	2.43	0.63	65.51	8.80
Including	341.05	348.50	7.45	1.85	0.84	2.17	47.95	2.69
KA-18-02	523.00	525.10	2.10	10.52	4.02	0.45	422.38	14.54
And	546.00	566.90	20.90	1.92	0.65	1.84	23.73	2.57
Including	549.00	553.00	4.00	6.25	2.23	0.92	55.03	8.48
KAEZ-18-03	514.00	546.00	32.00	2.56	0.92	0.54	23.68	3.48
Including	514.00	533.00	19.00	3.50	1.36	0.50	32.65	4.86
Including	527.00	533.00	6.00	6.14	2.68	0.55	43.53	8.82
KAEZ-18-04	254.90	262.00	7.10	0.32	0.09	1.05	7.29	0.41
And	268.50	272.55	4.05	1.97	0.62	1.49	24.40	2.59
KAT-18-07	74.60	77.00	2.40	5.75	2.11	0.32	57.99	7.85
KAT-18-08	87.00	95.00	8.00	9.53	3.63	0.20	68.62	13.16
And	122.00	126.50	4.50	3.83	1.41	0.36	43.26	5.24
And	187.10	203.30	16.20	0.82	0.12	1.18	8.90	0.94
KAT-18-10	238.00	244.06	6.06	4.30	2.82	0.08	44.07	7.12
KAT-18-11	149.80	187.83	38.03	5.06	1.68	0.51	44.45	6.74
including	166.00	176.00	10.00	6.69	2.46	0.54	58.79	9.15
KAT-18-13	238.30	264.90	26.60	1.79	0.88	0.93	19.08	2.67
including	253.50	260.00	6.50	5.34	2.81	0.62	24.40	8.14
KAT-18-16	285.00	294.05	9.05	0.68	0.24	1.46	11.28	0.92
KAT-18-19	122.65	136.00	13.35	3.95	1.16	0.81	29.92	5.11
KAT-18-20	553.00	588.00	35.00	0.42	0.07	0.97	6.25	0.49
KAT-18-21	588.50	614.00	25.50	0.05	0.02	0.81	3.10	0.07
KAT-18-23	22.00	38.25	16.25	1.95	0.73	1.30	19.97	2.68
including	31.50	36.25	4.75	4.83	1.70	2.93	34.16	6.53

Note The width expressed in core length, true width, at the Key Anacon Titan deposit ranges from 44 to 89 percent (5th to 95th percentile) of the core length with an average of 69 percent.

10.6 Gilmour South Drilling Results 2017–2018

Drilling on Gilmour South deposit consisted of 32 holes totalling 15,455 m. Drilling focused on exploring the deposit at a 50 m to 100 m step-outs. The holes are listed in Table 10-6 and shown on Figure 10-2. The drilling highlights are listed in Table 10-7.

Table 10-6: Gilmour South Drill Collars

Hole Number	Easting	Northing	Elevation (m)	Azimuth	Dip	Length (m)
GS_17_01	2550441.1	7591857.9	112.6	91	-84	217
GS_17_02	2550555.9	7591340.4	112.6	102	-75.5	699
GS_17_03	2550555.3	7591340.4	112.6	91	-75.3	690
GS_17_04	2550537.6	7591442.2	112.9	90	-76	356
GS_17_04A	2550537.6	7591442.2	112.9	87	-80	20
GS_17_04B	2550535.8	7591443.5	112.9	87	-80	35
GS_17_05	2550400.2	7591047.2	118.1	85	-82	167
GS_17_05A	2550400.2	7591047.2	118.1	91	-84	868
GS_17_06	2550486	7591452.8	114	91	-84	656
GS_17_07	2550470.3	7591444.2	114.2	85	-71	50
GS_17_07A	2550470.3	7591444.2	114.2	85	-71	708
GS_17_08	2550465.9	7591493.1	114	83	-72	17
GS_17_08A	2550465.9	7591493.1	114	83	-72	329
GS_17_09	2550473.8	7591520	114	78	-70	683
GS_17_10	2550386.8	7591090.8	114	91	-84	39
GS_18_11	2550416.5	7591097.1	118	85	-80	816
GS_18_12	2550471.3	7591543.2	114	91	-84	90
GS_18_12A	2550463.3	7591538.5	114	91	-84	674
GS_18_13	2550432.3	7591907.8	114	90	-82	89
GS_18_14	2550590.3	7590559.5	115.1	95	-70	753
GS_18_15	2550414.9	7591912.3	114	90	-83	818
GS_18_16	2550389.6	7590986.7	118.5	92	-80	1119
GS_18_17	2550465.9	7591493.1	114	80	-65	725
GS_18_18	2550398.2	7591041.2	118.1	91	-79	17
GS_18_19	2550555.5	7591337.2	112.6	110	-79	758
GS_18_20	2550554.9	7591340.6	112.6	120	-80	508
GS_18_18A	2550398.2	7591041.2	118.1	91	-80	930
GS_18_20A	2550555.6	7591337.5	112.6	120	-80	62
GS_18_20B	2550555.6	7591337.5	112.6	130	-80	78
GS_18_22	2550553.6	7591342.5	112.6	140	-80	845
GS_18_21	2550387.5	7590984.5	118.5	95	-78	825
GS_18_22_W1	2550553.6	7591342.5	112.6	140	-80	818
						15,455

Drilling confirmed known presence of massive sulphides as well as confirmed historical reported grades and focused on step-out and infill drilling of the main deposit based on historical drilling.

Figure 10-2: Plan View Map of 2017–2018 Drill Hole Locations of the Gilmour South Deposit

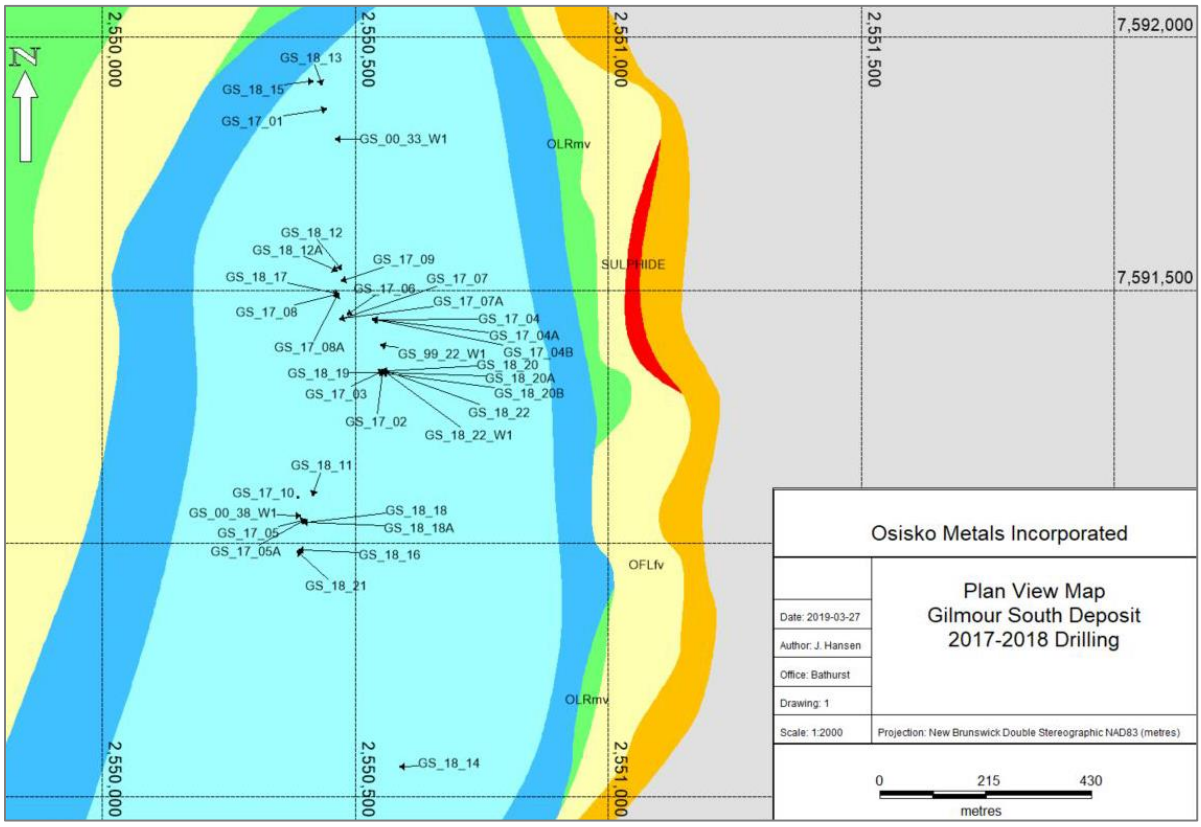


Table 10-7: Drilling Highlights – Gilmour South Highlights

Hole Name	From (m)	To (m)	Width (m)	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	Zn+Pb (%)
GS-99-22W1	592.8	600.40	7.55	11.31	2.10	0.16	20.95	13.40
GS-00-38W1	760.50	765.60	5.10	8.03	1.2	0.35	0.03	9.23
GS-17-02	622.60	634.00	11.40	7.74	2.42	0.48	79.34	10.16
GS-17-05A	702.00	710.65	8.50	7.11	1.25	0.36	32.48	8.36
GS-17-07A	626.65	633.30	6.65	3.48	0.51	0.37	18.77	3.99
GS-17-09	607.35	609.60	2.25	4.85	1.42	0.25	0.02	6.27
GS-18-11	668.33	672.70	4.37	5.35	1.93	0.28	16.87	7.28
GS-18-12A	629.00	630.00	1.00	0.15	0.01	0.16	0.00	0.16
GS-18-14	559.30	560.30	1.00	0.01	0.00	0.00	1.10	0.01
GS-18-15	790.73	791.30	0.57	0.49	0.06	0.84	1.20	0.55
GS-18-16	907.50	908.00	0.50	0.03	0.00	0.76	1.80	0.03
GS-18-17	584.00	591.00	7.00	0.95	0.15	0.03	2.77	1.1
GS-18-19	674.80	685.80	11.00	13.76	3.39	0.23	50.81	17.15
GS-18-19	674.80	685.80	11.00	13.76	3.39	0.23	50.81	17.15

Note The width expressed in core length, true width, at the Gilmour South deposit ranges from 69 to 100 percent (5th to 95th percentile) of the core length with an average of 97 percent.

10.7 Twinning Program

To confirm grades and widths of the mineralization reported in historical drill holes, Osisko Metals, at the end of the 2018 drill program, drilled 3 holes into the heart of the deposit at the Key Anacon Main deposit. The Main Zone and the Main East Zone were targeted since they bear the bulk of the resource tonnage that is supported mainly by historical holes completed in the 1950s and 1960s. Twinned holes consisted of KAMZ-18-03A, KAMZ-18-27, and KAMZ-18-28. The twinning program consisted of 1,211.5 m of drilling and collected a total of 444 samples (including QA/QC inserts). Samples were sent to Actlabs in Fredericton, New Brunswick for sample preparation, following Osisko Metals' best practice detailed in Section 10.2.1.

The twin drill holes were plotted on custom vertical sections coinciding with the twin drill hole trace, and were visually compared with historical holes.

To statistically compare the drill holes, the twin holes and original historical holes were composited in 2 m intervals within the mineralized wireframes and the composites were then paired (historical vs. twin) for each of the mineralized zones intersected. Statistical evaluation of the data was carried out at 0 m to 10 m, 10 m to 15 m, and 15 m to 20 m separation distance between the pairs.

This work is described in detail in Section 12 of this report.

10.8 Qualifying Person's Comment

The drill hole orientation was found to be appropriate for the deposit style and the orientation of the mineralization. Drill spacing varies in the 2017–2018 Osisko Metals' drilling, which is reflected in the assignment of the Resource classification.

Drill core logging is appropriate for the mineralization style and carried out to industry standards. Drill core handling, surveying, and chain of custody from the rig to the core logging facility were found to meet or exceed industry standards. SG measurements exceeded in quality the typical programs in place seen at other operations visited by the QP.

After reviewing the twin hole data, AGP is of the opinion that the underground drill holes completed by Key Anacon Mine Limited in the 1950s are useable for resource estimation purposes, but with restriction on the classification due to variability in the grade of the individual pairs, as indicated by the standard deviation and the variation coefficient, and small core size and long sampling intervals. The restriction imposed by AGP is not to assign Measured Resources in the model described in Section 14 of this report.

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Historical Data

Historically, both Key Anacon deposits (Main and Titan) and the Gilmour South deposit have been extensively explored. From the data compiled, much of the historical information related to sample preparation, analysis, and security is missing or non-existent. A few original assay certificates exist for programs in the later years. Assays from these historical drill holes relied largely on the assay values printed in the drill logs. Table 11-1 shows the data available for the various drill programs.

Table 11-1: Drilling Preparation and Analysis of Drill Holes

Company	Years	Metres Drilled	% of Drilling in Resource	Laboratory	Analyte	QA/QC Standard	QA/QC Blanks	QA/QC Duplicates
Larder surface drilling	1950s	19,012	12.15%	Unknown	Zn, Pb, ±(Ag, Cu, Au)	Not known to be done	Not known to be done	Not known to be done
Key Anacon underground	1950s and 1960s	18,352	11.73%	Unknown	Zn, Pb, Cu, Ag, ±Au	Not known to be done	Not known to be done	Not known to be done
Key Anacon surface drilling	1960s-to 1990s	1,793	1.15%	Unknown	Zn, Pb, Cu, Ag, ±Au	Not known to be done	Not known to be done	Not known to be done
Rio Algom	1992-1993	29,489	18.85%	ALS Chemex Labs	Zn, Pb, Cu, Ag, Au +ICP -24 analytes	Not known to be done	Not known to be done	Not known to be done
Noranda	1995-2011	48,591	31.06%	Brunswick Mines and XRAL	Zn, Pb, Cu, Ag, ±Au	Not known to be done	Not known to be done	Not known to be done
Hunter Brook & El Nino	2007-2015	742	0.47%	Actlabs and Brunswick Mines	Zn, Pb, Cu, Ag, ±Au	yes	yes	yes
Osisko Metals	2017-2018	38,475	24.59%	Actlabs	Zn, Pb, Cu, Ag, Au +ICP-34 analytes	yes	yes	yes
Total		**156,453**						

Note: "unknown laboratory" effectively means that the original assay certificates were not available for review.

The drill logs for much of the historical core are available in assessment reports on file with NB DERD. A selection of the original core is also available at the NB DERD core storage facility in Madran, New Brunswick.

11.1.1 Key Anacon Historical Sample Preparation and Analysis

Rio Algom Exploration Inc.

The 1992 Key Anacon Rio Algom core was analyzed by ALS Chemex Labs (Chemex). The original Chemex lab certificates are available in company assessment reports. Standard, blank, or duplicate analysis data are not present with the drill logs, and are not known to exist.

Noranda Mining and Exploration Inc.

Noranda drilling conducted on the Key Anacon property was analyzed by Brunswick Mine Laboratory. The analysis is included with the drill logs; however, the original lab certificates are not present in company assessment reports. Standard, blank, and duplicate analysis data are not present with the drill logs, and are not known to have been done.

Hunter Brook Holdings Ltd.

Hunter Brook completed a single drill hole on the Key Anacon property in 2015. Actlabs analyzed the core samples, and the original certificate is available in the 2015 Hunter Brook Assessment Report. Hunter Brook did not appear to have included standards, blanks, and duplicates in their QA/QC program, instead relying on Actlabs internal QA/QC procedures which included standards, blanks, and duplicates. Results of the laboratory QA/QC programs are available with the certificate attached to the assessment report. This single hole from Hunter Brook has no material impact on the resource estimate.

11.1.2 Gilmour South Deposit Historical Sample Preparation and Analysis

Drilling on the Gilmour South deposit first began in 1997, and was explored by two companies before Osisko Metals acquired the Project in 2017. In total, 78 holes were drilled on the property, 76 were drilled by Noranda and two by El Nino.

Noranda retained paper and digital copies of the logs and assay results during their drilling campaign on Gilmour South, but no QA/QC procedures or data were found. X-Ray Assay Laboratories (XRAL) based in Toronto, Ontario, did all the assaying for Noranda.

The two El Nino holes have complete QA/QC data, available in the assessment report on their 2006–2007 program. These two holes from El Nino have no material impact on the resource estimate. The samples were prepared and analyzed at the Brunswick Mine Laboratory. The sample preparation and analysis from the 2007 El Nino assessment report is described below.

All samples were crushed in a jaw crusher and reduced to approximately a 4 mesh. Samples were then transferred to a roll crusher and the materials reduced from a 4 to 20 mesh. The material was separated in a riffle splitter to obtain a homogenous split. One portion of the sample was labelled with a bar code number. The crush Rejects were sent back to the core shack for storage. The other portion of the sample was further reduced with a disc pulverizer to obtain a size of about 100 mesh. Depending on the sample hardness, typically 90 seconds for pulverization was sufficient. The discs were adjusted regularly to get a constant size. To minimize contamination during sequential sample preparation, the pulverizer was cleaned with a high-pressure air hose after passing each sample through the pulverizer. About 50 g of rock powder (the pulp) was then transferred to a previously labelled pulp bag. A record is kept of the sequence in which the samples were ground, and of the identity number of the container used for each sample. The labelled pulp samples were then sent to the mine assay laboratory for analysis.

The diamond drill samples were assayed for the following elements: lead, zinc, copper, and silver. The gold was analyzed occasionally, when requested by the geologists. The analytical procedures were standard for sulphide minerals. All the samples are analyzed by flame atomic absorption spectroscopy (FAAS) for lead, zinc, copper, and silver. For those samples that exceed the upper calibration limits, titrimetric, or gravimetric methods were used, as outlined below. These procedures from the International Organization for Standardization (ISO) are recognized and standard in base metal industries.

- Pb >10%, Pb determined by EDTA titration (ISO 11441)
- Zn >20%, Zn determined by EDTA titration (ISO/TC183 N 489 E)
- Cu >3%, Cu determined by short iodide titration (ISO 10258)
- Ag >480 g/t, Ag assay fusion and cupellation (ISO/TC183 N 490 E)
- Au preconcentration by fire-assay and completed by atomic absorption spectroscopy (FA-AAS).

11.2 Osisko Metals Drill Core Sample Preparation (2017–2018)

Osisko Metals has been exploring the Gilmour South and Key Anacon properties since October 2017. During that time, Osisko Metals has completed 32 drill holes at Gilmour South (15,455 m) and 60 drill holes on the Key Anacon property (23,020 m).

Sample intervals range from 30 cm to 150 cm, with recommended sample lengths of 1 m. The purpose of shorter samples is to reflect sharp boundaries in high-grade mineralization, while longer samples are indicators of poor recovery. The start and end of sample sequences includes a minimum 1 m shoulder sample of non-mineralized core. Sampling intervals are indicated on the core using red china grease markers, and a red cut line is drawn along the apex of the dominant foliation to produce two near identical and representative halves of core.

The core is cut in half with a diamond saw along its length, and one half is bagged tagged and shipped using Armour Transportation Systems (Armour) to Actlabs facility in Fredericton, New Brunswick.

At Actlabs, the entire sample is crushed to a nominal -10 mesh (1.7 mm), mechanically riffle-split to obtain a representative sample, and then pulverized to at least 95% -150 mesh (106 µm).

The pulps are then shipped either to the Actlabs facility in Ancaster, Ontario, or their facility in Kamloops, British Columbia. Actlabs' Quality System is accredited to international quality standards through the ISO/International Electrotechnical Commission (IEC), ISO/IED 17025, which includes ISO 9001 and ISO 9002 specifications, and by the Standards Council of Canada (SCC) CAN-P-1578 (forensic testing standards), CAN-P-1579 (mineral testing standards) and CAN-P-1585 (environmental testing standards) for specific registered tests.

11.3 Osisko Metals Drill Core Sample Analysis (2017–2018)

Once received by the analytical laboratory, a 0.25 g subsample (from the pulp) is analyzed for 36 elements using a four-acid "near total" digestion (Code 1F2) via ICP-OES. Actlabs describes the method as follows:

> *A 0.25 g sample is digested with four acids beginning with hydrofluoric, followed by a mixture of nitric and perchloric acids. This is then heated using precise programmer-controlled heating in several ramping and holding cycles which takes the samples to incipient dryness. After incipient dryness is attained, samples are brought back into solution using aqua regia. With this digestion, certain phases may be only partially solubilized. These phases include zircon, monazite, sphene, gahnite, chromite, cassiterite, rutile, and barite. Ag greater than 100 ppm and Pb greater than 5,000 ppm should be assayed, as high levels may not be solubilized. Only sulphide sulphur will be solubilized. The samples are then analyzed using an Agilent 735 ICP.*

Copper, lead, and zinc over limit samples were reanalyzed using a peroxide fusion ICP-OES, which is described as follows:

> *Samples are fused with sodium peroxide and undergo a hot acid dissolution. Samples are then analyzed by a Varian 735ES ICP. A fused blank is run in triplicate for every 22 samples.*

Silver samples showing an ICP-OES greater than 100 ppm are reanalyzed using fire assays with gravimetric finishes (FA-GRAV), which is described as follows:

> *A sample size of 10 g to 50 g can be used but the routine 30 g size is applied for rock pulps. The sample is mixed with fire assay fluxes (borax, soda ash, silica, and litharge), which contain no silver. The mixture is placed in a fire clay crucible, preheated to 850°C, raised to an intermediate 950 °C and finished at 1,060 °C. The entire fusion process lasts 60 minutes. The crucibles are then removed from the assay furnace and the molten slag (lighter material) is carefully poured from the crucible into a mould, leaving a lead button at the base of the mould. The lead button is then placed in a preheated cupel which absorbs the lead when cupelled at 950°C to recover the silver."*

Gold is assayed using an FA-AAS. The method is described as follows:

> *The entire Ag doré bead is dissolved in aqua regia and the gold content is determined by AA. On each tray of 42 samples there are two blanks, three sample duplicates and two certified reference materials, one high and one low (7 QC out of 42 samples).*

All gold samples above 5,000 ppb are re-assayed using FA-GRAV to ensure accurate values.

Table 11-2 shows the elements analyzed by Actlabs for the Osisko Metals samples and the lower and upper limits.

Table 11-2: Elements Analyzed by Actlabs for Osisko Metals Samples

Element	Detection Limit	Upper Limit	Element	Detection Limit	Upper Limit	Element	Detection Limit	Upper Limit
4-Acid – ICP-OES (detection limits in ppm except where noted)								
Ag	0.3	100	Ga	1	10,000	Sb	5	10,000
Al	0.01%	50%	Hg	1	-	Sc	4	10,000
As	3	5,000	K	0.01%	10%	Sr	1	10,000
Ba	7	1,000	Li	1	10,000	Te	2	10,000
Be	1	10,000	Mg	0.01%	50%	Ti	0.01%	10%
Bi	2	10,000	Mn	1	100,000	Tl	5	10,000
Ca	0.01%	70%	Mo	1	10,000	U	10	10,000
Cd	0.3	2,000	Na	0.01%	10%	V	2	10,000
Co	1	10,000	Ni	1	10,000	W	5	10,000
Cr	1	10,000	P	0.00%	10%	Y	1	1000
Cu	1	10,000	Pb	3	5,000	Zn	1	10,000
Fe	0.01%	50%	S+	0.01%	20%	Zr	5	10,000
Peroxide fusion ICP-OES (detection limits in percent								
Cu	0.01%	-	Pb	0.01%	-	Zn	0.01%	-
Fire assays with AA finish (detection limits in ppb)								
Au	5	5,000						
Fire assays with gravimetric finish (detection limit in g/t)								
Ag	3	10,000						

Actlabs has its own internal QA/QC program.

11.4 Quality Assurance and Quality Control

QA/QC programs have two components. Quality Assurance (QA) deals with the prevention of problems using established procedures, while Quality Control (QC) aims to detect problems, assess them, and take corrective actions.

QA programs should be rigorous, applied to all types and stages of data acquisition, and include written protocols for: sample location, logging, and core handling; sampling procedures; laboratories and analysis; data management; and reporting.

QC programs are designed to assess the quality of analytical results for accuracy, precision, and bias. At Osisko Metals, this is accomplished through the in-house regular submission of standards, blanks, and duplicates with every batch of samples submitted to the laboratory.

The materials conventionally used in mineral exploration QC programs include standards, blanks, and duplicates. Definitions of these materials are as follows:

- **Standards** are samples of known composition that are inserted into sample batches to independently test the accuracy of an analytical procedure. They are acquired from a known and trusted commercial source. Standards are selected to fit the grade distribution identified in the BMC mineralization.
- **Blanks** consist of material that is predetermined to be free of elements of economic interest to monitor for potential sample contamination during the sample preparation stage and also to monitor the analytical procedures at the laboratory.
- **Duplicate samples** are submitted to assess both assay precision (repeatability) and to assess the homogeneity of mineralization. Duplicate samples can be submitted at all stages of sample preparation (quarter core, crushed rejects, pulps), with the expectation that better precision is demonstrated by duplicates submitted further along in the preparation process.

Osisko Metals inserted QC samples into the sample batches sent to the laboratory. Inserts included standards, blanks, and duplicates. A total of 168 blank samples and 211 Certified Reference Material (CRM) pulps were sent to Actlabs during the 2017–2018 campaign. The quarter-core duplicates protocol was added to the QA/QC program late in the 2018 program, and six samples were submitted.

11.4.1 Duplicate

Duplicate samples are submitted to assess both assay precision (repeatability) and the homogeneity of mineralization.

Several duplicates are used in the mineral industry; core duplicates (quarter-core), coarse duplicates (rejects and preparation duplicates), pulp duplicates (2nd split of final pulp prior to analysis) and field duplicates (double samples collected in field, where applicable).

Osisko Metals began using quarter-core duplicates near the end of the 2018 drilling campaign on the BMC Project. The duplicate sample core is first split and half is returned to the box and stored for record keeping. The half core sample is then split again into quarter-core and placed into separate bags with unique duplicate sample numbers. This method was chosen to enable direct comparisons and compositing between original and duplicate samples without introducing mass fraction issues related to half-core samples being evaluated with quarter-core duplicates. Nugget effect concerns related to decreased sample mass are minimized in the base metal mineralization, due to the visibility and predictability of the economic minerals within the generally laminar fabric. Laboratory analytical duplicates and laboratory preparation duplicates were routinely completed by Actlabs. Below are tables and graphs that compares the different type of duplicates. AGP notes that the laboratory duplicates and laboratory preparation duplicates results are Actlabs internal QA/QC program, and did not originate with Osisko Metals. Summary statistics for all three types of duplicates can be found in Table 11-3 followed by select duplicate-original sample linear regression plots (Figure 11-1 and Figure 11-2).

Table 11-3: Duplicate Mean % Relative Differences

Element	Zn (%)	Pb (%)	Cu (%)	Ag (ppm)	Au (ppm)	
Mean %RDiff.	**14.236**	**13.565**	**9.627**	**6.966**	**32.101**	Quarter Core Duplicates
Mean Diff.	0.016	0.006	-0.016	-0.383	-0.266	
Mean grade	2.122	0.596	0.500	13.408	0.469	
No. of pairs	6	6	6	6	6	
Mean %RDiff.	**1.885**	**5.006**	**6.415**	**8.716**	**20.3**	Laboratory Duplicates
Mean Diff.	0.0028	0.0005	-0.0005	-0.0580	0.0102	
Mean grade	1.081	0.0408	0.304	15.341	0.368	
No. of pairs	230	230	226	201	290	
Mean %RDiff.	**5.527**	**3.595**	**6.685**	**17.818**	**17.544**	Laboratory Preparation Duplicates
Mean Diff.	-0.026	0.0012	0.0017	-0.234	-1.025	
Mean grade	0.997	0.383	0.276	10.181	119.913	
No. of pairs	27	27	27	22	20	

Figure 11-1: Actlabs Duplicate Regression Plots

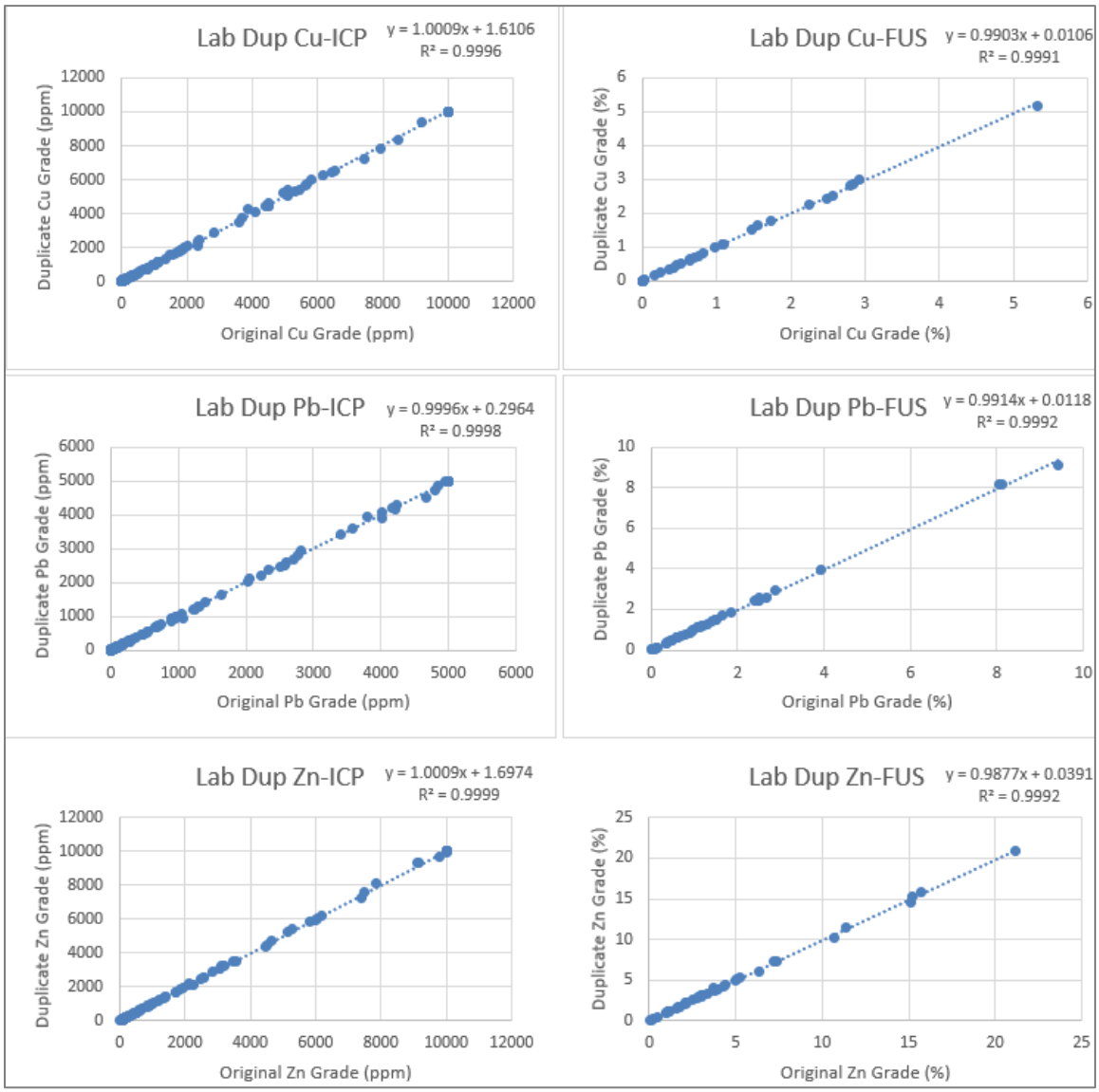
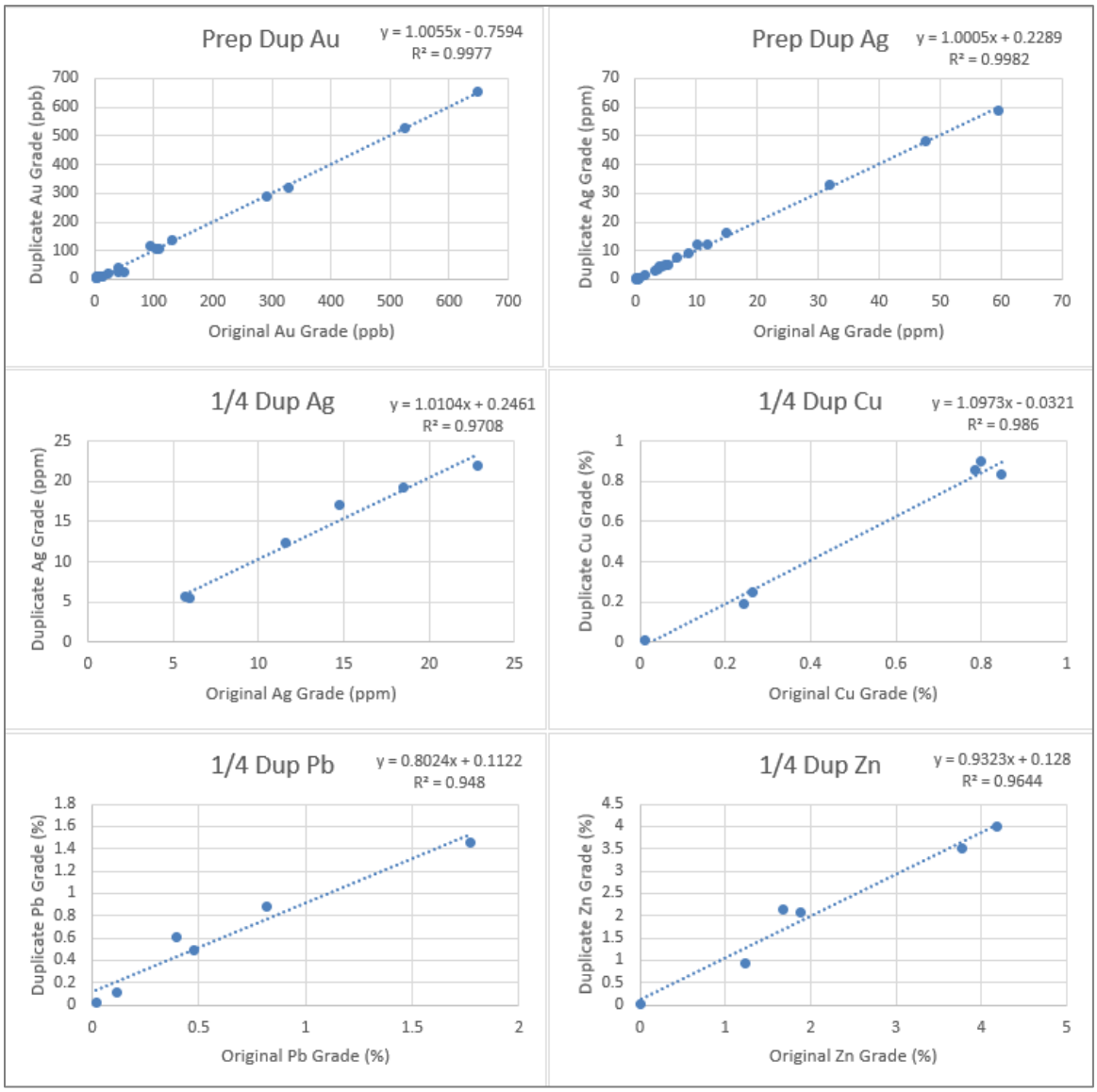


Figure 11-2: Osisko Metals Quarter-Core Duplicate Regression Plots



AGP comment that the number of samples submitted in the Osisko Metals quarter core duplicate is low due to its late introduction during the 2018 drilling campaign. Due to the low sample count, the result may not be statistically significant. All the Osisko Metals quarter-core duplicate shows a R^2 equal to 0.95 or higher indicating that the data are closed to the fitted equation. The data also show a slope of regression approaching 1 except for lead which is 0.8. This indicates excellent reproducibility with minimal bias. The performance of the laboratory duplicates and the laboratory preparation duplicates were found to be excellent.

11.4.2 Blanks

Blanks are used to monitor for potential sample contamination that may take place during sample preparation and/or assaying procedures at the primary laboratory. There are three types of blanks commonly used in a QC programs, these being "Coarse Blanks," "Fine Blanks," and "Pulp Blanks."

Osisko Metals used two different blanks during the 2017–2018 drilling campaign in Bathurst. Both were selected due to their depleted base metal geochemical signature. The first is CDN-BL-10, which is pulverized blank granitic material suitable for monitoring contamination at the analytical stage. The second is an in-house Gabbro core blank that was collected from the government core facility in Madran, New Brunswick. This crushable material is not only blind to the laboratory since it resembles the normal Osisko Metals core, but it is also suitable to monitor contamination during the sample preparation stage. One blank was added every 20 samples; on the charts presented below, the red line represents 2xStn deviation (Figure 11-3 to Figure 11-9).

Figure 11-3: Gabbro Blank for Zinc

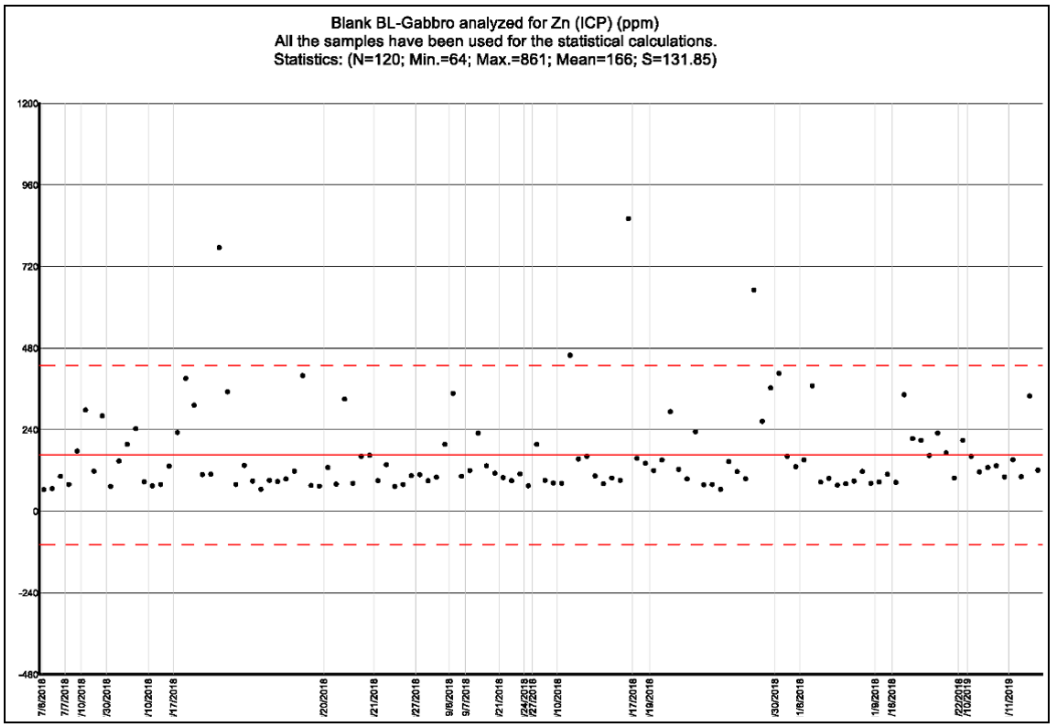


Figure 11-4: CDN Laboratory BL-10 Blank for Zinc

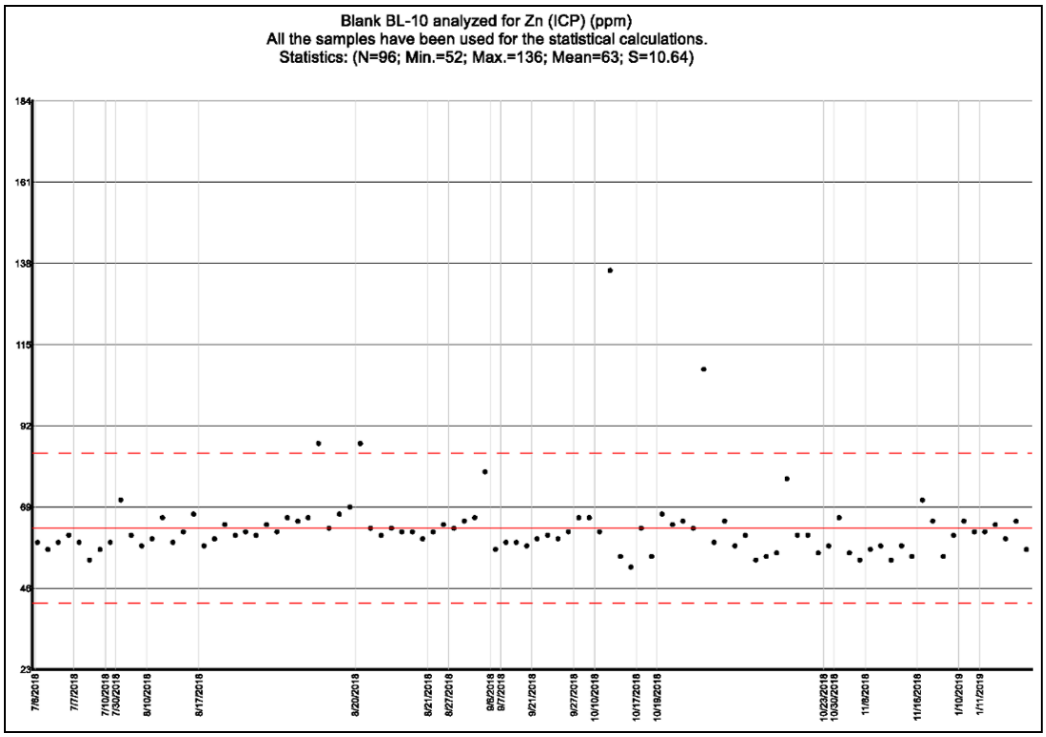


Figure 11-5: Gabbro Blank for Copper

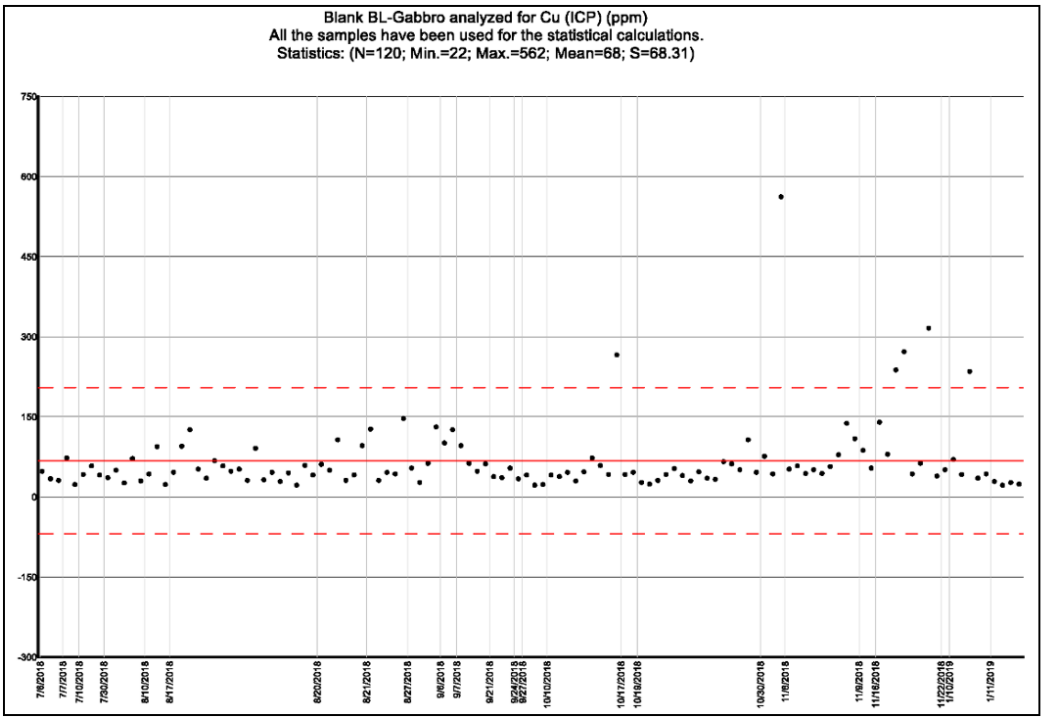


Figure 11-6: CDN Laboratory BL-10 Blank for Copper

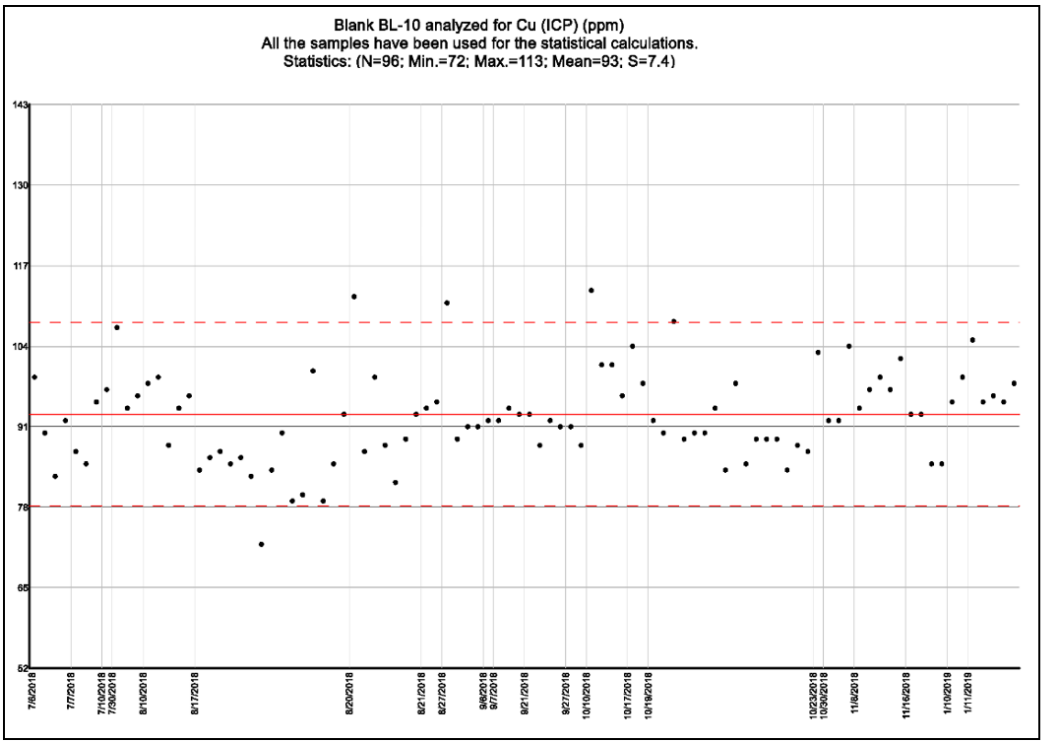


Figure 11-7: Gabbro Blank for Lead

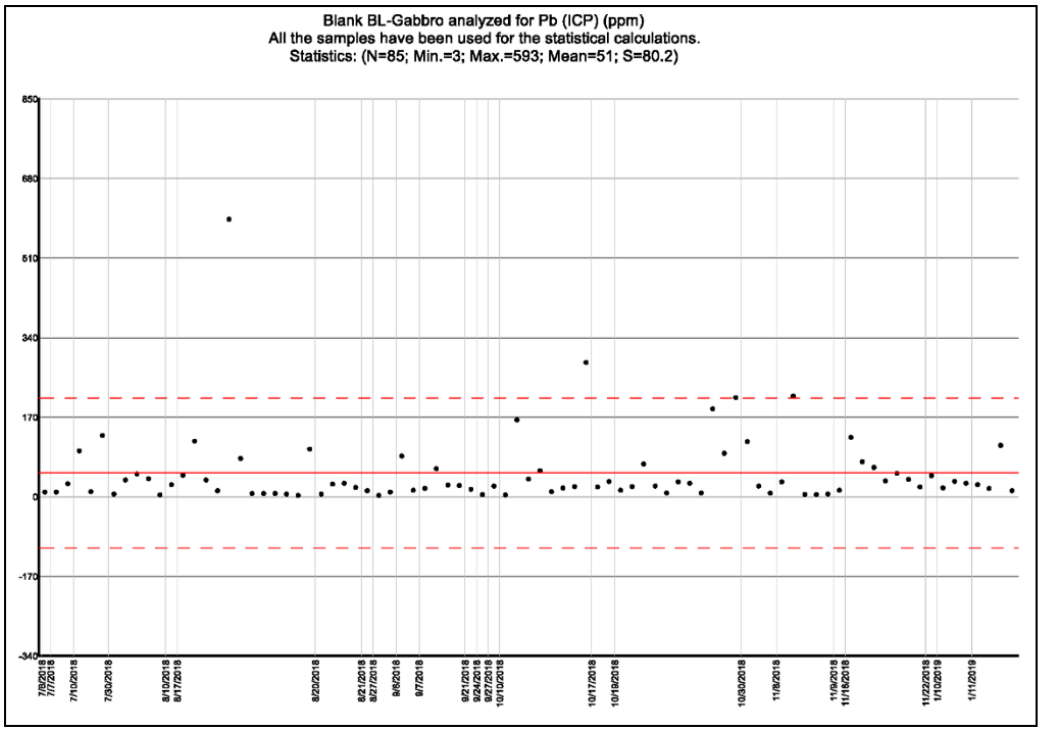


Figure 11-8: CDN Laboratory BL-10 Blank for Lead

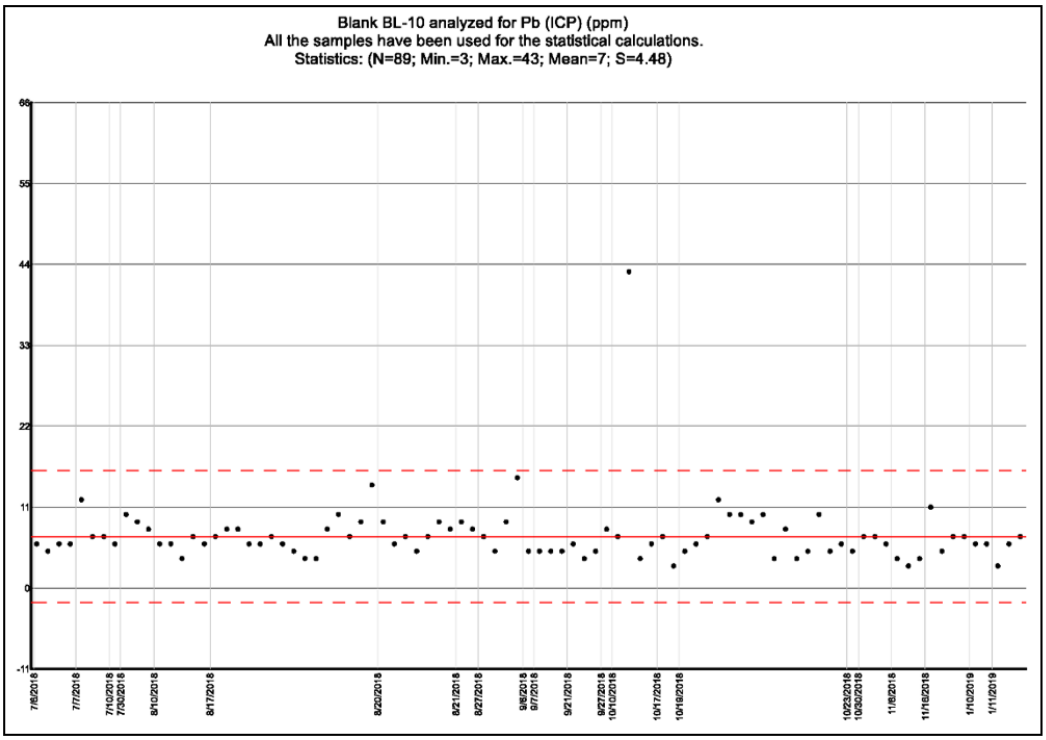
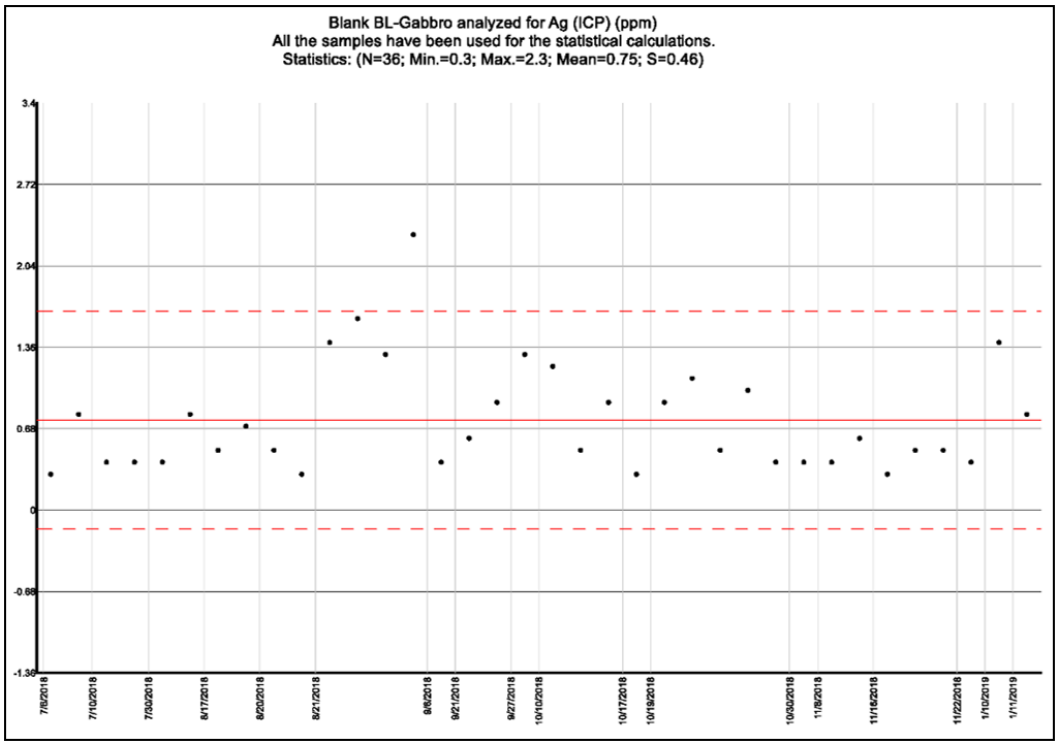


Figure 11-9: Gabbro Blank for Silver



AGP notes that the results from the inserted blanks are very good. The CDN BL10 material displays less variability than the Gabbro blank. Samples failures are rare and isolated although they are more frequently located immediately after a very high-grade sample, which indicates that a minor amount of cross contamination occasionally took place between samples. The data do not show a systemic contamination problem during the sample preparation stage and the analysis stage.

11.4.3 Certified Reference Materials (Standards)

A suite of four commercially available CRM was selected from CDN Resources Laboratories Ltd. (Table 11-4). The selection was based on anticipated zinc grades; ranging from low- to average-grade standards (3% to 5%) and high-grade standards (7% to 15%). The standards selected by the geologist are meant to reflect the core that is being sampled. A CRM was inserted every 20 samples.

Table 11-4: CRM Expected Value and 2xStn Deviations

Standard	Element	Unit	Recommended Value	Between Lab 2xStn Deviation
CDN-ME-17	Silver	g/t	38.2	±3.3
	Copper	%	1.360	±0.10
	Lead	%	0.676	±0.054
	Zinc	%	7.340	±0.37
CDN-ME-1201	Silver	g/t	37.6	±3.4
	Copper	%	1.572	±0.086
	Lead	%	0.465	±0.032
	Zinc	%	4.990	±0.29
CDN-ME-1402	Silver	g/t	131	±7.0
	Copper	%	2.90	±0.16
	Lead	%	2.48	±0.11
	Zinc	%	15.23	±0.67
CDN-ME-1405	Silver	g/t	88.8	±6.6
	Copper	%	0.685	±0.036
	Lead	%	0.638	±0.052
	Zinc	%	3.02	±0.11

CDN-ME-17 SRM originates from massive to semi-massive sulphides from the Izok Lake deposit, an Archean aged VMS deposit in the Slave structural province of Canada. It consists of pyrite, pyrrhotite, chalcopyrite, sphalerite, and minor galena.

CDN-ME-1201 Standard is made from mineralization supplied by Minerals & Metals Group (MMG). The mineralization is described as massive to semi-massive sulphides from an Archean aged VMS deposit in the Slave structural province of Canada.

CDN-ME-1402 Standard is reportedly made with a mixture of mineralized material.

CDN-ME-1405 was supplied by Farallon Mining Ltd. from their Campo Morado property in Mexico. The Campo Morado precious-metal bearing, volcanogenic massive sulphide deposits occur in a lower Cretaceous bimodal, calc-alkaline volcanic sequence.

All reference materials were analyzed by 4-acid digestion, AA, or ICP finish. AGP notes that the CRMs matching the Osisko Metals BMC mineralization are ME-17 and ME-1201.

11.4.4 Discussion

Osisko Metals best practices flagged any sample exceeding ±2 standard deviations as a failure. Table 11-5 lists the failure rate as reported by Osisko Metals.

Table 11-5: Failure Rate of the CRM as Reported by Osisko Metals

Element	CRM (comments)	Quantity Inserted	Certified Value	Number Failed	Passing QC (%)
Zinc (%)	ME-17	34	7.34	7	79
	ME-1201	33	4.99	1	97
	ME-1402	67	15.23	6	91
	ME-1405	77	3.02	9	88
Lead (%)	ME-17	34	0.68	0	100
	ME-1201 (near upper detection limit)	33	0.47	33	0
	ME-1402	67	2.48	3	96
	ME-1405 (above upper detection limit)	77	0.64	21	73
Copper (%)	ME-17	34	1.36	0	100
	ME-1201	33	1.57	1	97
	ME-1402	67	2.9	4	94
	ME-1405 (near ICP upper det.)	77	0.69	53	31
Silver (g/t)	ME-17	34	38.20	4	88
	ME-1201	33	37.60	2	94
	ME-1402 (above ICP upper det.)	67	131	21	69
	ME-1405 (near ICP upper det.)	77	88.80	33	57

The lead values for ME-1201 and ME-1405 (Figure 11-10) and silver values for ME-1402 and ME-1405 (Figure 11-11) show clear under-reporting bias. The issues related to those CRMs are the result of their certified lead concentrations of 0.465% and 0.638% and silver concentration of 131 g/t and 88.8 g/t being extremely close to the upper limit of detection for lead and silver by ICP-MS (0.5% and 100 ppm). When a sample is determined to have >0.5% Pb or >100 ppm Ag, Actlabs automatically re-assays the sample using a peroxide fusion total digestion, which no longer match the analytical method used for the CRM.

Figure 11-10: Lead Assays for ME-1201

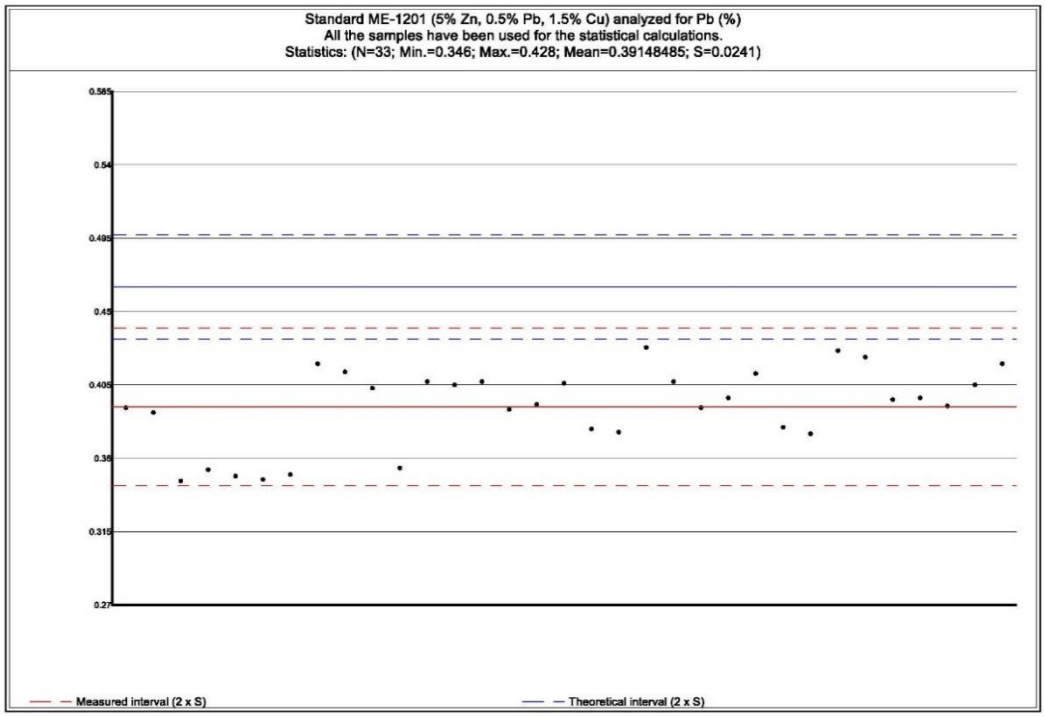
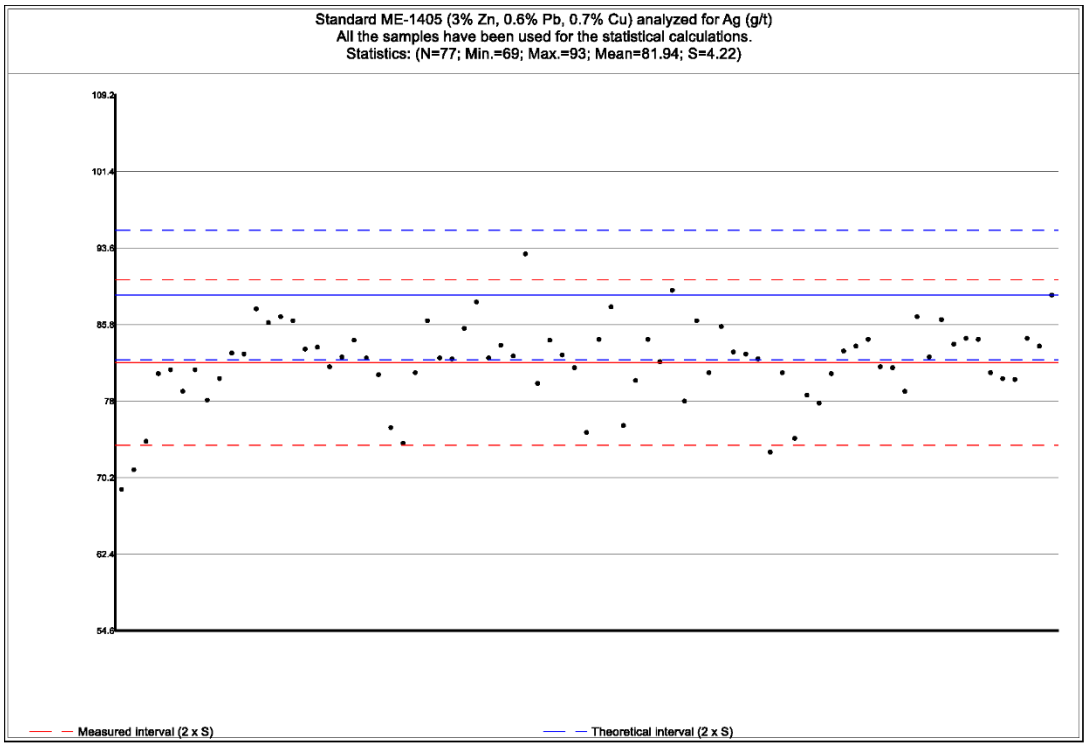


Figure 11-11: Silver Assays for ME-1405



None of the ME-1201 Pb samples triggered the 0.5% total-digestion threshold to be re-assayed, and as a result, all samples returned an assay value below 2xStd Dev. of the certified value.

The silver ME-1405 results show a similar under-reporting bias and are not high grade enough to trigger a switch from 4-acid digestion ICP-OES to Fire Assay with gravimetric finish. The consistent under-reporting is likely the result of the 4-acid digestion not being able to completely dissolve all the lead or silver with concentrations within 0.035% and 11 g/t of the upper detection limit.

The ME-1405 Pb (Figure 11-12) and ME-1402 Ag (Figure 11-13) values have a bimodal distribution of concentrations. The bimodal distribution in ME-1405 Pb and ME-1402 Ag is caused by a portion of the samples correctly reaching the 0.5% or 100 g/t thresholds and being re-assayed by Actlabs, while some other samples do not dissolve enough during the 4-acid digestion to trigger re-assay and are therefore under-reported. All samples that were below 2xStd of the certified value were assayed by Actlabs with a 4-acid digestions.

Figure 11-12: Lead Assays for ME-1405

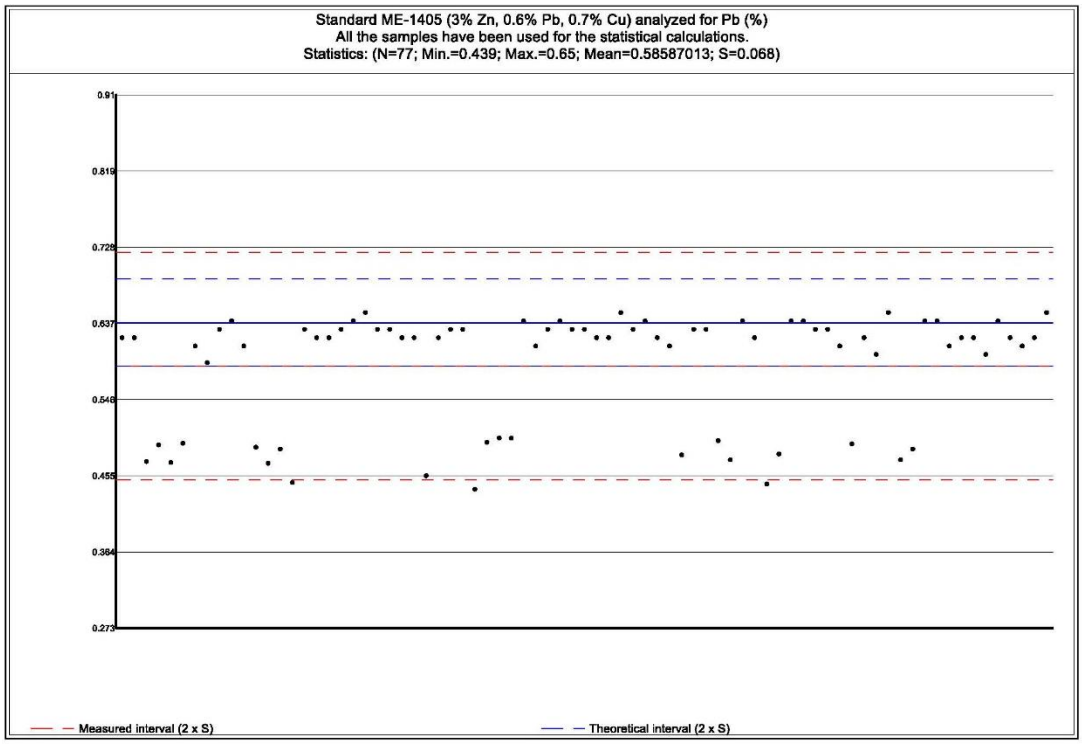
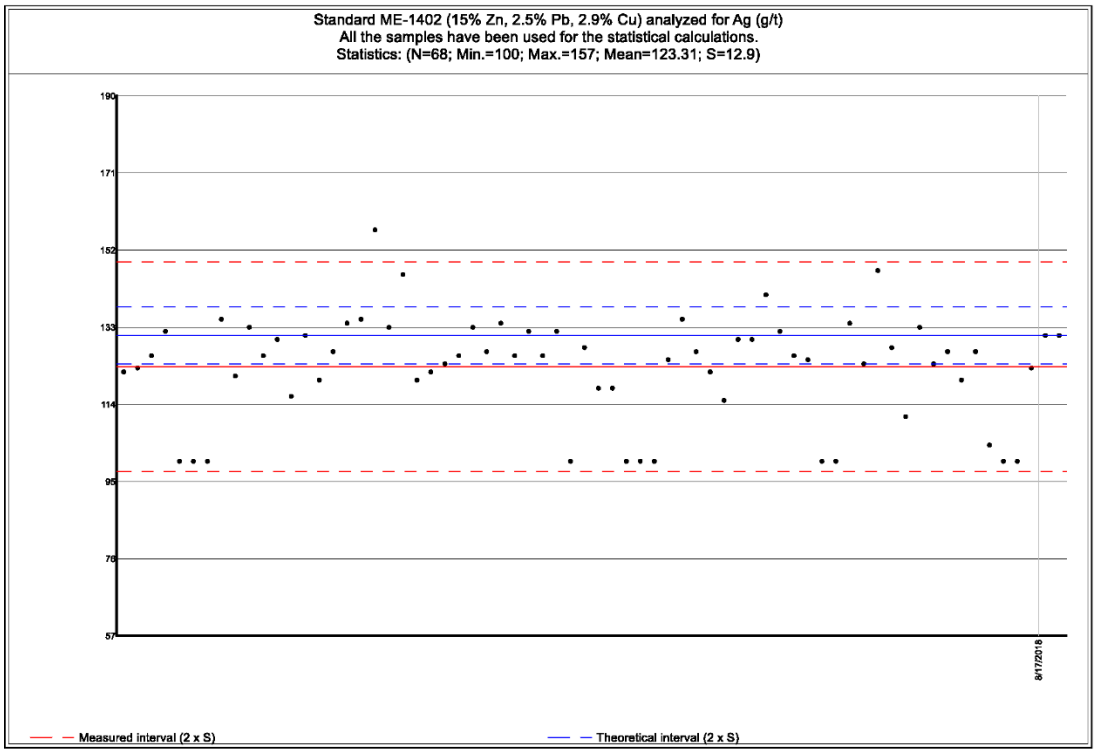


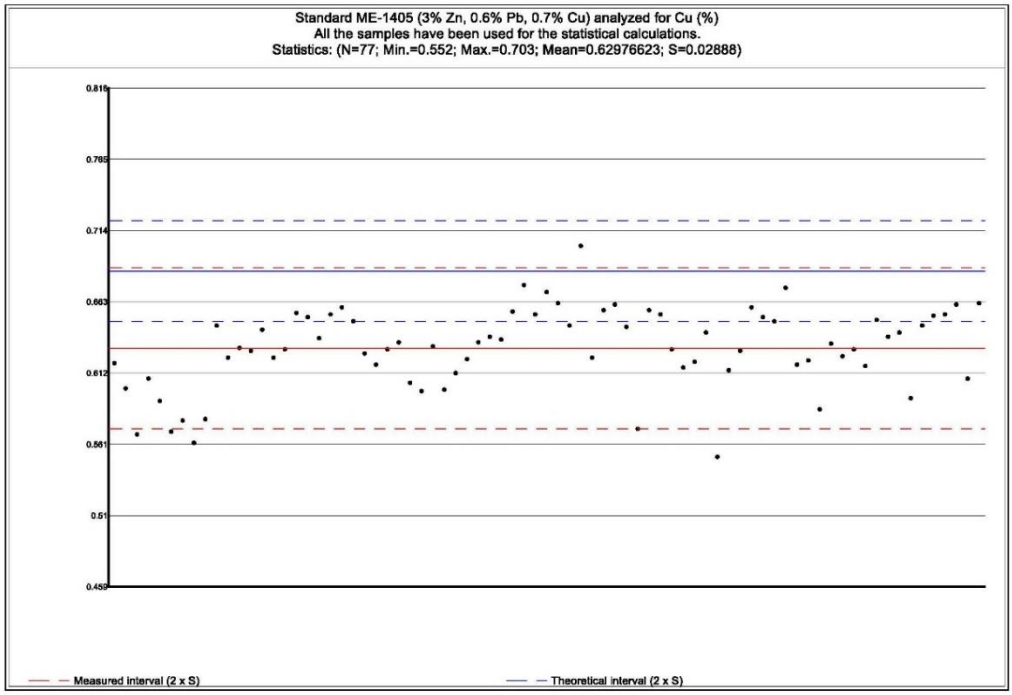
Figure 11-13: Silver Assays for ME-1402



The copper values for CRM ME-1405 (Figure 11-14) show a similar under-reporting bias as lead in ME-1201. The certified concentration of copper is 0.685% and the total digestion threshold for copper is 1% instead of 0.5%; however, it is possible that there are still 4-acid digestion issues occurring at 0.7%, lowering reported copper values.

Osisko Metals commented that all potential issues related to standards outlined above are exclusively under-estimations related to dilution. No positive bias has been observed that could inflate assay values.

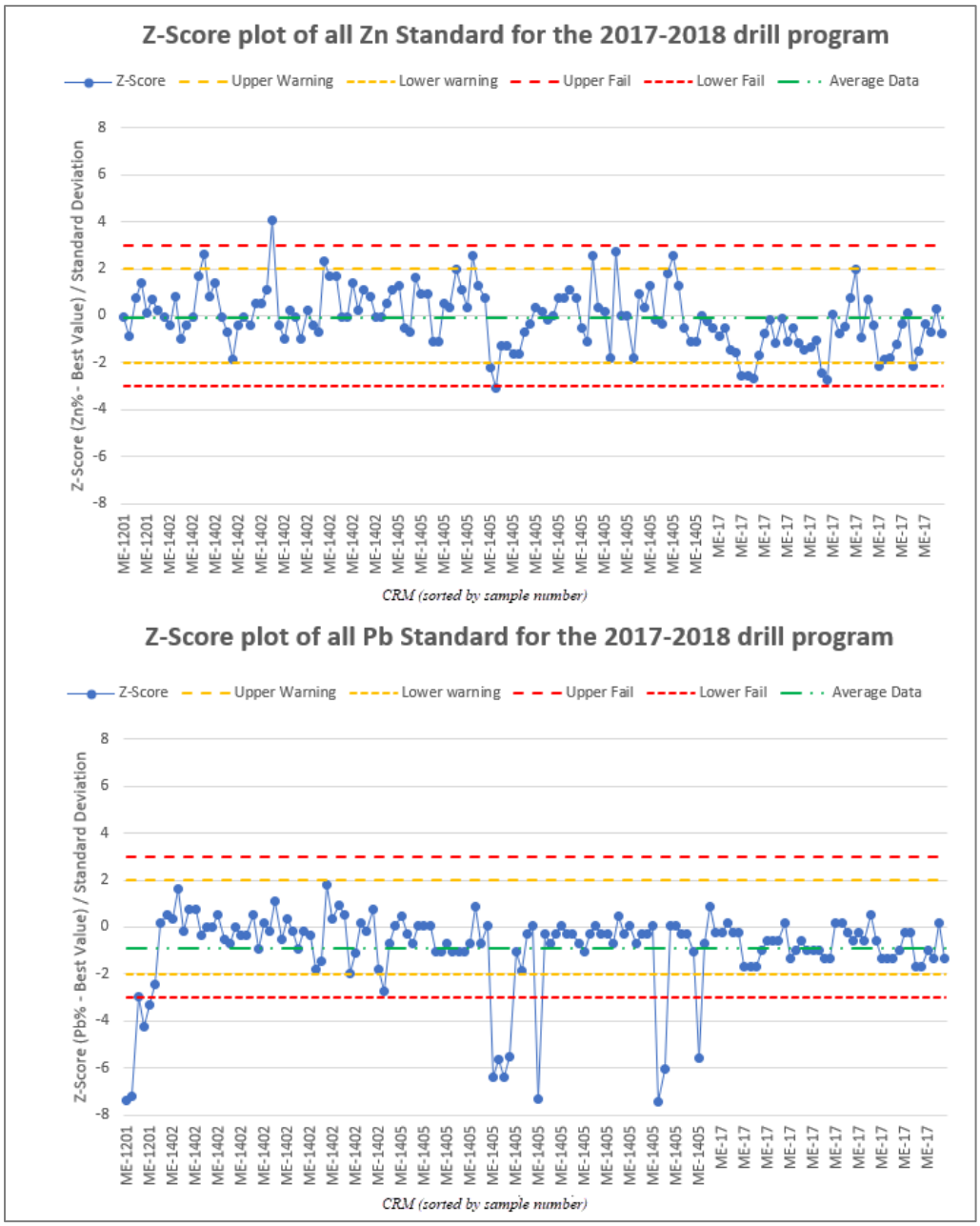
Figure 11-14: Copper Assays for ME-1405



To validate Osisko Metals' findings, AGP plotted Z-Score charts of a sub-set of the CRM results. For zinc (Figure 11-5) the assays (with a few exception) stay within the ±2Std warning lines. CRM's ME-17 result track with a low bias, which could be attributed to a matrix match issue or a difference in the analytical procedures. AGP notes that low bias for ME-17 is also apparent for lead.

The Z-Score chart for lead (Figure 11-5) shows multiple failures for ME-1201 and erratic behaviour coupled with multiple failures for ME-1405. AGP agrees with Osisko Metals' assessment that the issue is related to the lead value approaching the upper detection limit as explained earlier.

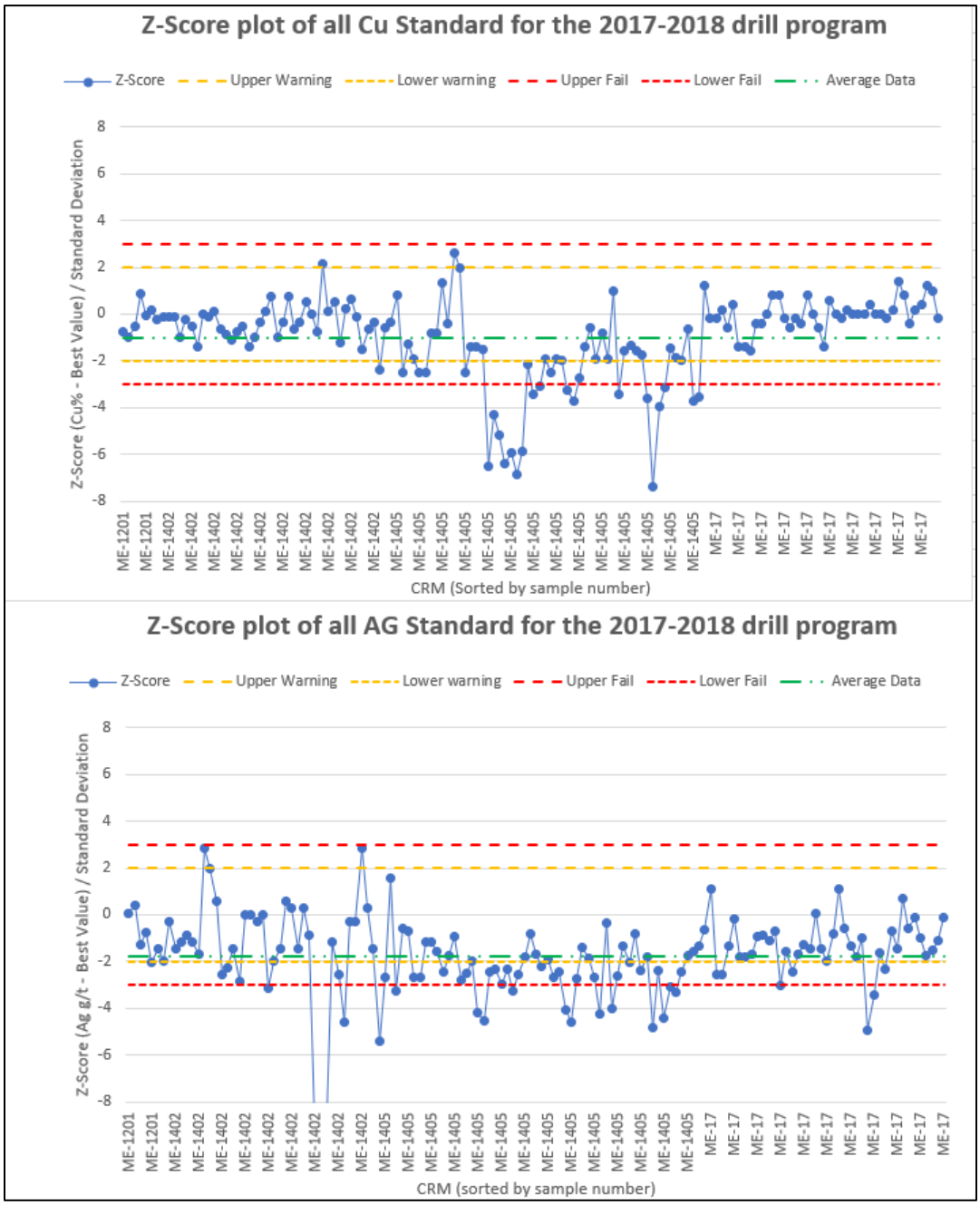
Figure 11-15: Z-Score Charts for Zinc and Lead



The same issue is apparent for copper (Figure 11-6) assays of the ME-1405 CRM where the CRM certified value is approaching the copper upper detection limit.

Silver assays for ME-1402 tracked remarkably well (Figure 11-6) considering that the analytical procedures for the CRM is different than the analytical procedure used by Osisko Metals for assays above 100 g/t Ag. Assays for the CRM ME-1405 are plagued with the same issue of being too close to the upper detection limits and are tracking with a negative bias.

Figure 11-16: Z-Score Charts for Copper and Silver



11.4.5 Osisko Metals QA/QC Monitoring Procedures

Osisko Metals has implemented a comprehensive monitoring of the QA/QC protocols to promptly identify and address any QA/QC issues during the drill campaign:

- The Senior Geologist or Exploration Manager assesses the analytical results as they are received and communicates results with the Geological Team.
- Results are first assessed on a hole-by-hole basis, followed by incorporation of the results received for the program to date.
- Errors or issues are resolved on an ongoing basis; some of the follow-up actions may include:
  - Re-running the assays associated with the failed QC material
  - If needed, changing QC materials (adopting new CRMs or blanks if contamination is detected)
  - reviewing procedures used by the laboratory (e.g., verifying instrument cleaning, preventing crusher contamination by running silica sand)
  - Reviewing site sampling procedures (e.g., identifying any human errors in sampling).
- QC data are stored on a secure database at the Bathurst Office.
- An Excel spreadsheet incorporating all analytical and associated check assay results and evaluations is produced showing a summary sheet, as well as sheets showing evaluations for each standard, blank, duplicate, and check assay.
- The sample summary Excel spreadsheet includes drill hole ID, sample number, certificate number for each line of QC data as a link to the original data set and results obtained.

11.5 Comments from the Qualified Person

Osisko Metals routinely charts all QA/QC samples. If a trend exists or samples deviate from the norm, the batches are re-submitted, or the laboratory is contacted for advice. Blanks sample failures are rare and isolated. While a minor amount of cross contamination occasionally occurs between samples, the data do not show a systemic contamination problem during the sample preparation stage and the analysis stage. All the Osisko Metals quarter cores indicated excellent reproducibility with minimal bias. The performance of the Actlabs laboratory duplicates was found to be excellent. AGP agrees with Osisko Metals' assessment of the CRM. AGP recommends replacing the CRM that are approaching the detection limits for new material that are either well above or well below the detection limits.

Osisko Metals does not have a program of re-submitting 5% of the pulps to an umpire laboratory. AGP recommends adding this QA/QC protocol to the existing program in the future.

The QP reviewed the sample preparation, analytical and security procedures, as well as insertion rates and the performance of blanks, standards and duplicates for the 2017–2018 drilling program and concludes that the observed failure rates are within expected ranges and that no significant assay biases are present. Furthermore, the assays of the 2017–2018 drilling campaign at the BMC are considered to be sufficiently precise and accurate for resource estimation purposes.

12 DATA VERIFICATION

The description in Section 12.1 pertains to the procedures implemented by Osisko Metals during the 2018 drill campaign as observed by the QP during the site visits. No review of historical core prior to Osisko Metals was carried out by the author.

12.1 AGP Field Inspection

Mr. Pierre Desautels, P.Geo., visited the Bathurst Mining Camp and Osisko Metals facilities on July 25 through July 27, 2018, accompanied by Mr. Charles Kodors, P.Geo., Exploration Manager, Mr. Gary Woods, Senior Exploration Manager, and Mr. Jason Flight, P.Geo., Geologist, all of Osisko Metals. Mr. Desautels revisited the BMC Project on January 19 through January 22, 2019, primarily to present the 3D wireframes for Gilmour South and Key Anacon, and to discuss the upcoming resource estimate. Drilling was in progress at the time of the first visit.

The 2018 site visit entailed brief reviews of the following:

- Overview of the geology and exploration history of the property
- Management of the exploration program on the property
- Drill hole collar locations for the Gilmour South, Key Anacon, and Mount Fronsac deposits
- Description of the drill rig procedures, including core handling
- Sample collection protocols at the core logging facility
- Discussion of sample transportation, chain of custody, and security
- Core recovery
- QA/QC program (insertion of standards, blanks, and duplicates)
- Monitoring of the QA/QC program
- Review of diamond drill core, core logging sheets and procedures. The review included commentary on typical lithologies, alteration and mineralization styles, and contact relationships at the various lithological boundaries
- SG sample collection.

Independent characterization samples were collected during the first site visit. AGP packaged the samples, which were subsequently shipped via Canada Post directly to Actlabs, Ancaster, Ontario. The sample analysis allowed an independent laboratory to confirm the presence of lead, zinc, copper, and silver in the deposit, and assess differences in terms of grade ranges. Samples were analyzed for copper, lead, and zinc using a four-acid digestion followed by inductively coupled plasma optical emission spectrometry (ICP OES); silver was analyzed by fire assay with gravimetric finish; gold was analyzed using a 50 g charge fire assay with atomic absorption (AA) spectrometry finish, and the

remaining 36 other elements using total digestion ICP. The procedure used for the characterization samples matches the procedure used by Osisko Metals. Core SG was also requested on all samples.

Table 12-1 shows the analytical results of the AGP samples.

Table 12-1: Independent Characterization Sample Results vs. Osisko Metals Assays

Hole-ID	From (m)	To (m)	Osisko Metals Assays					AGP Check Sample Assays					
			Sample No. (Osisko Metals)	Zn (%)	Pb (%)	Cu %	Ag (g/t)	Sample No. (AGP)	Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	SG (g/cm³)
KAMZ-18-03A	254.0	255.00	685370	17.20	14.70	0.04	716.0	83666	14.80	10.10	0.03	311.0	4.18
MF00-29W1	382.5	383.30	684178	6.15	3.68	0.04	69.0	83667	6.01	4.47	0.04	75.6	3.71
GS_18_21	737.2	737.65	686497	11.20	0.27	0.10	4.8	83668	10.20	0.23	0.05	6.7	4.61
KAMZ-18-07	389.4	390.40	688349	0.27	0.08	0.03	2.9	83669	0.24	0.09	0.03	3.2	3.40
GS_18_12A	629.0	630.00	687563	0.15	0.01	0.16	1.3	83670	0.19	0.01	0.15	1.7	4.03
MF00-31W1	392.1	393.10	684087	8.39	2.33	0.04	39.0	83671	8.31	2.01	0.03	28.7	2.94

Assay results on the AGP check samples also revealed three other elements with elevated values, as indicated in Table 12-2. It was noted by AGP that the zirconium to titanium ratio is used to assist Osisko Metals in determining the lithology and formation name.

Table 12-2: Elements with Elevated Values

AGP Sample Number	As (ppm)	S (%)	Fe (%)
83666	>5,000	>20	21.9
83667	771	19.4	13.9
83668	1,000	>20	30.5
83669	658	>20	21.7
83670	174	>20	35.3
83671	>5,000	11.8	9.55

The drilling program was in progress during both site visits. The drill rig was operated by Logan Drilling Group (Logan), and was located on the Key Anacon deposit drill hole number KAMZ-18-13 at 814 m. Core size was NQ or 47.6 mm in diameter. All drill holes were accessible by gravel road and 4-wheel drive vehicles, with no requirement for helicopter support.

Drill hole down-the-hole surveys are conducted using a modern REFLEX EZ-GYRO™ instrument, which is not affected by pyrrhotite and magnetite. The drill rig azimuth and dip set-up are carried out using a GPS-based system provided by REFLEX Instrument (REFLEX North Finder APS).

The drill core is picked up daily at the drill rig by a core technician or a geologist. Once brought into the core logging facility, located in Bathurst, New Brunswick, the core boxes are opened, the core is laid out on the core logging table, and then measured and marked for sampling. AGP notes the core was of particularly good quality, with high rock quality designation (RQD).

The core is logged in the core logging facility directly into the GeoticLog™ software. Items logged are lithology, mineralization, alteration, structure, and magnetic susceptibility. During the site visit, the geotechnical information collected consisted of RQD and core recovery. Lithology is logged using a standardized BMC legend. Prior to the 2017 drill program, the historical drill logs were converted to the same legend to ensure consistency.

Once logged, the sampling intervals are marked on the core, and the geologist inserts the control samples, consisting of standards and blanks. Osisko Metals used a crushable blank material (gabbro) suitable for monitoring cross contamination during sample preparation. During the site visit, Osisko Metals was contemplating adding quarter-core duplicates to the QA/QC protocols. Resubmitting pulp to an umpire laboratory was not routinely done during the site visit. After a review of the control sample assays and charting, AGP found the QA/QC program was well followed.

All core is photographed wet before cutting, using the same camera set-up, which ensures consistency in the photos.

The drill holes inspected by AGP show the core was properly marked. Sampling intervals average 1.0 m, and can range in the database between 0.25 m to 2.0 m long, depending on lithology and mineralization.

Bulk density was measured using an Ohaus electronic scale. Samples are air dried before weighing, and not sealed. This does not appear to be an issue, since the core observed by AGP did not appear porous. Osisko Metals carried out density measurements on every assay interval collected. The entire sample intervals are measured, as opposed to using a single representative core piece. Approximately 1 in 15 samples are duplicated at Actlabs as part of the normal QA/QC procedures to validate the data measured in-house. A steel rebar and an aluminium cap of known density are used as standard.

The NQ-sized core is cut longitudinally with an electric-powered Vancon™ diamond core saw. Osisko Metals uses recirculated water to cool the saw blade. The water goes through three large decantation tanks before being reused to minimize cross-sample contamination. The tanks are pumped approximately once per month, and the contents replaced with freshwater. This system ensures no saw cuttings go through the city sewage systems.

Samples are bagged in 6 mil plastic bags, sealed with tie wraps, and inserted in polypropylene rice bags for shipping. The samples are transported to the Actlabs preparation facility in Fredericton, New Brunswick, with the resulting pulps sent for analysis to Actlabs' facilities in Kelowna, BC, or Ancaster, Ontario.

Osisko Metals stores the high-grade core in racks in the warehouse. The remaining unsampled core is stored at the logging facility in Bathurst, New Brunswick, or at the Key Anacon property. The core is considered secure by AGP.

AGP inspected holes KAMZ-18-03A, MF0029W, GS-18-21, KAMZ-18-07, GS-18-12A, and MF-00-31W1. High-grade mineralization occurs in semi-massive and massive sulphide zones. The zones tend to

display sharp contacts with the surrounding waste, as shown in hole KAMZ-18-03A at 254 m (Figure 12-1).

Figure 12-1: Sharp MS Contact in Hole KAMZ-18-03A at 254 m

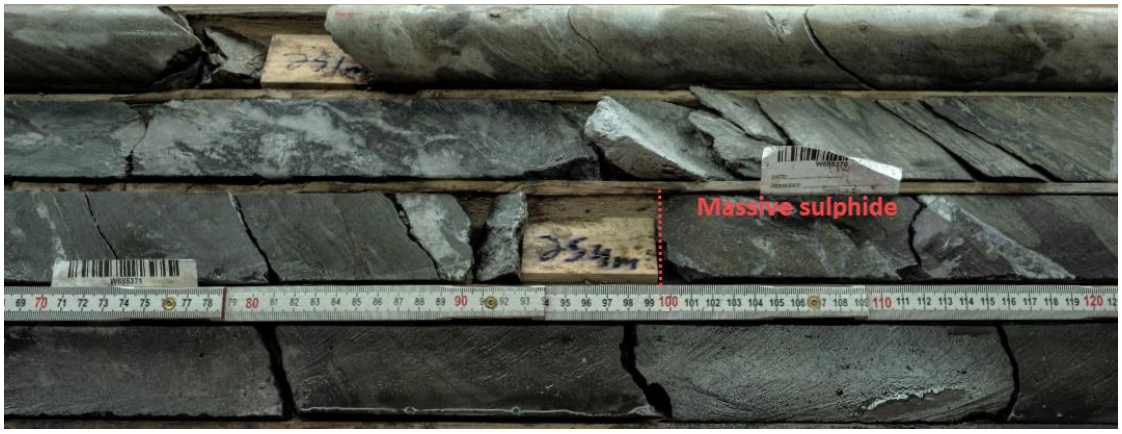
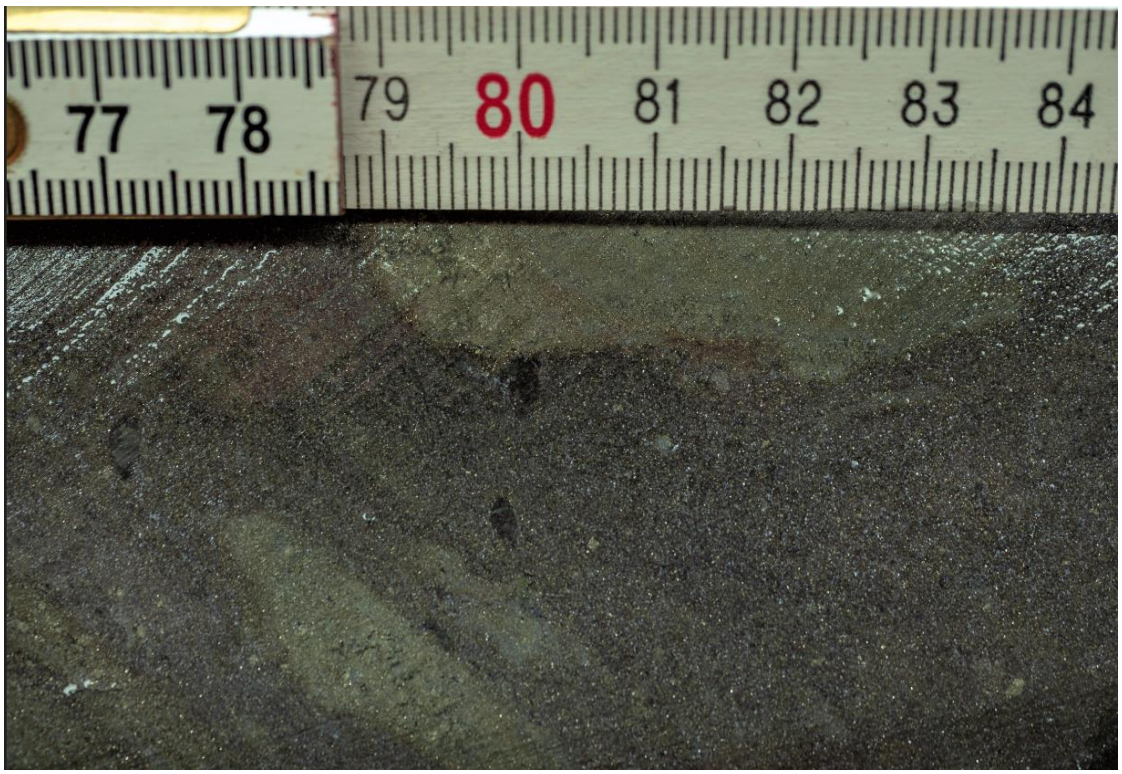


Figure 12-2 shows details of folding in the massive sulphide unit in hole KAMZ-18-03A at 254.8 m.

Figure 12-2: Folding in MS Unit in Hole KAMZ-18-03A at 254.8 m



In the field, the new drill holes are clearly marked with cap casings engraved with the drill hole name. Older holes can be identified from the casings left in the ground and aluminium tags with the hole names posted on wooden sticks. Figure 12-3 shows a few photographs taken during the site visit by AGP.

Figure 12-3: 2016 Site Visit Photographs by AGP

Hole KAMZ-18-10 Collar

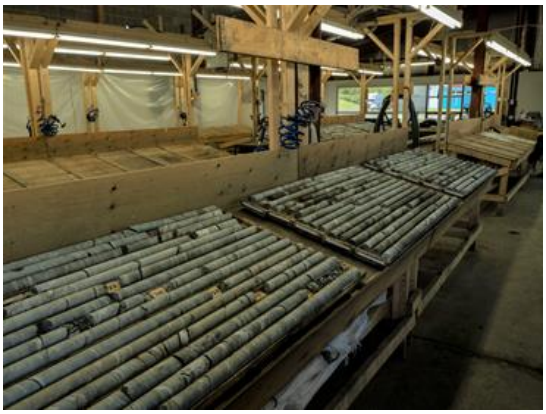
Diamond Drill Rig on Hole KAMZ-18-13

Hole GS-99-22A Marking

Key Anacon Shaft Collar

Core Storage

Core Logging Facility



Overall, AGP concludes that the logging, sampling, sample preparation, security, and chain of custody procedures reviewed during the site visits are to industry standards and adequate to support the resource estimate.

12.2 Database Validation

Following the site visits, and prior to the resource evaluation, AGP carried out an internal validation of the drill holes in the Key Anacon and Gilmour South databases.

12.2.1 Collar Coordinate Validation

All holes drilled by Osisko Metals were surveyed once completed, using a Trimble Nomad high-precision GPS device.

Collar coordinates were validated by AGP in the field with the aid of a hand-held Garmin GPSMAP 60CSx. Collars were randomly selected from various drill campaigns and their GPS position recorded in UTM WGS84, and then converted to the NAD83 (CSRS) Stereographic double projection using software provided from the New Brunswick Government (NB Coordinate Transformation Service (CTS). The differences with the GEMS database were calculated in an X-Y 2D plane using the following formula:

$$X - Y\ difference = \sqrt{(\Delta East)^2 + (\Delta North)^2}$$

As shown in Table 12-3, results indicated an average difference in the X-Y plane of 4.5 m. AGP found the collar elevations displayed more variability when compared to the Osisko Metals data. On the Z plane, an average difference of 8 m was recorded. These differences are well within the precision of the Garmin 60CSx used for the validation.

Table 12-3: Collar Coordinate Verification

	Gems Database Entry			GPS Points Recorded During Site Visit (converted*)			Differences between GEMS and GPS	
Point-ID	East	North	El. (+5000)	East	North	El. (+5000)	X-Y Plane (m)	Z Plane (m)
KAMZ-18-02	2560044.7	7604293.6	5065.3	2560046.5	7604297.6	5057	4.4	-8.3
KAMZ-18-01	2560047.4	7604231	5064.2	2560046.7	7604225.5	5074	5.5	9.8
KAMZ-18-03A	2560651.1	7604363.5	5059.6	2560650.1	7604361.8	5071	2.0	11.4
KAMZ-18-07	2560090.2	7604239.3	5057.1	2560089.5	7604231.5	5066	7.9	8.9
KAMZ-18-08	2560235.6	7604612.3	5061.1	2560229.7	7604608.1	5066	7.2	4.9
KAMZ-18-10	2560186.3	7604062.3	5057.1	2560188.3	7604060.7	5061	2.5	3.9
KAMZ-18-13	2560245.3	7603978.9	5056.8	2560252.9	7603981.6	5078	8.0	21.2
GS_18_19	2550555.5	7591337.2	5112.6	2550548.8	7591342.1	5128	8.3	15.4
GS_17_02	2550555.9	7591340.4	5112.6	2550548.8	7591342.1	5128	7.3	15.4
GS_18_22_W1	2550553.6	7591342.5	5112.6	2550554.7	7591346.4	5122	4.0	9.4
GS_00_36	2550137.9	7591633.2	5128.6	2550142.5	7591632.1	5140	4.7	11.4
GS_99_22	2550551.6	7591391.9	5112.6	2550556.6	7591391.5	5121	5.1	8.4
MF00-24	2511443.3	7601821.5	5544.9	2511443.1	7601821.7	5550	0.3	5.1
MF00-25	2511438.7	7601914.2	5535.6	2511438	7601913.9	5537	0.7	1.4
MF00-29	2511559.5	7601522.8	5551.4	2511559.6	7601523.8	5549	1.0	-2.4
MF17-43	2511561	7601573	5551.2	2511562.3	7601576.7	5561	3.9	9.8
MF17-46	2511471	7601733	5550.8	2511472.3	7601735.7	5561	3.0	10.2
Average Difference*							4.5	8.0

Note: *conversion using NB CTS (http://geonb.snb.ca/cts/index.html)

12.2.2 Down-Hole Survey Validation

AGP reviewed the down-hole deviation data, comparing each entry with the previous ones. There was no obviously erroneous entry noted; however, 43 azimuth entries and 62 dip entries were flagged for review. These were sent to Osisko Metals, and all entries were found to match the information recorded in the logs.

12.2.3 Assay Validation

Assays in the database were validated using information derived from assay values written in historical drill hole logs, original laboratory assay certificates on paper, and electronic versions of the laboratory certificates in Excel and pdf formats. The data available depended on the year of the drill campaign. Recent Osisko Metals assays were all available in Excel, with a matching pdf version of the same certificate from the originating laboratory.

AGP randomly selected a suite of drill logs and assay certificates. A total of 3,094 assays were validated by AGP, amounting to 29% of the assay database (Table 12-4.). The error rate was very low, and any issues were corrected prior to interpolating the resource estimate.

Table 12-4: Assay Validation Rate

Deposit/Drill Program Operator	Assays Not Validated	Assays Validated via Assay Certificates	Assays Validated via Logs	Total Assays Validated	Total Number of Assays	Percent Validated (%)
Gilmour (Total)	***908***	***1,064***	***243***	***1,307***	***2,215***	***59.0***
Noranda	780	275	243	518	1298	39.9
Osisko Metals	124	789		789	913	86.4
El-Nino and Xstrata	4				4	0.0
Key Anacon Main Deposit (Total)	***4,892***	***576***	***568***	***1,144***	***6,036***	***19.0***
Anacon Lead Mines Ltd. or New Larder "U" Op.	745				745	0.0
Hunter Brook	74				74	0.0
Key Anacon (UG)	1197		276	276	1,473	18.7
Noranda	407		292	292	699	41.8
Osisko Metals	1,840	275		275	2,115	13.0
Rio Algom Ltd.	629	301		301	930	32.4
Titan Deposit (Total)	***1,778***	***491***	***152***	***643***	***2,421***	***26.6***
Anacon Lead Mines Ltd. or New Larder "U" Op.	11				11	0.0
Key Anacon	3				3	0.0
Noranda	167		152	152	319	47.6
Osisko Metals	675	479		479	1,154	41.5
Rio Algom	922	12		12	934	1.3
Grand Total	**7,578**	**2,131**	**963**	**3,094**	**10,672**	**29.0**

12.2.4 Density Data Validation

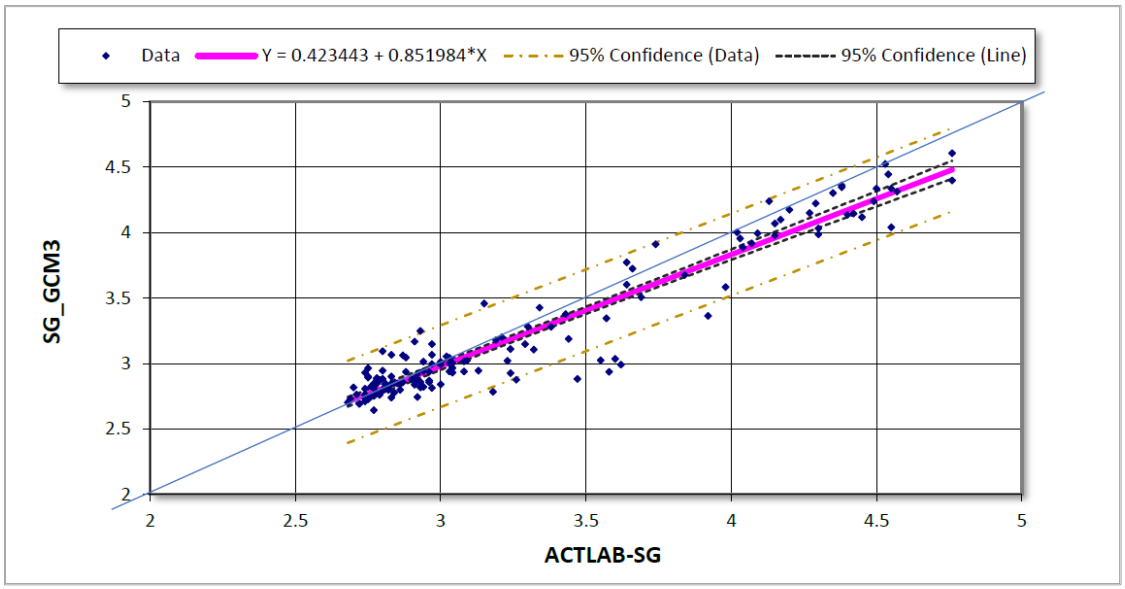
Osisko Metals submitted density data to Actlabs for validation of the in-house measured values. A total of 144 density data were examined by AGP. The data shows the Osisko Metals measured data are generally conservative when compared to the Actlabs values for densities above 3.0 g/cm^3 (Table 12-5).

Table 12-5: Paired Density Data Statistics

	Actlabs SG	Osisko Metals SG	Difference
Valid cases	144	144	
Mean	3.28	3.22	0.06
Variance	0.37	0.29	
Standard Deviation	0.60	0.54	
1st percentile	2.68	2.66	0.02
5th percentile	2.74	2.73	0.01
10th percentile	2.75	2.76	-0.01
25th percentile	2.81	2.84	-0.03
Median	2.99	2.96	0.03
75th percentile	3.64	3.49	0.15
90th percentile	4.37	4.16	0.21
95th percentile	4.52	4.33	0.19
99th percentile	4.76	4.57	0.19
Geometric mean	3.23	3.18	0.05

The liner regression constructed with the paired data shows an R^2 of 0.92 and a slope of regression of 0.852 (Figure 12-4). The difference can be attributed to the smaller sample sizes used by Actlabs, which were only 20 g to 50 g in weight, versus Osisko Metals, which weighed the entire drill core sample interval. Coating the core sample with paraffin wax was not considered necessary, and was not investigated. Overall, AGP considers the density data collected by Osisko Metals to exceed industry standards, and be suitable for use in the resource estimate.

Figure 12-4: Osisko Metals Measured Density vs. Actlabs Density



12.2.5 Twin Drill Hole Assessment

The Key Anacon Main deposit contributes a large portion of the overall resource for the BMC. Resources for the Key Anacon Main Zone and the Key Anacon Main East Zone is supported mainly by the historical Key Anacon drilling carried out in the 1950s. What drill rig Key Anacon used is not known; typical drilling equipment for drilling underground short hole in the 1950s was a Bazooka drill (Figure 12-5), which produced either EXT or AXT drill core measuring 23 mm or 32.5 mm in diameter, respectively. A few drill logs from that period indicated "EX" core. The sampling lengths on these historical holes averaged 2.44 m.

Figure 12-5: Bazooka Drill

Source: Canyon Equipment web site (2019)

To validate this data, three twin drill holes were completed by Osisko Metals: KAMZ-18-27, KAMZ-18-28, and KAMZ-18-03A. Hole KA-15-01 was also added to the data set.

To compare the drill holes, the drill data were composited in 2 m intervals within the wireframes, then the composites were paired for each of the mineralized zones intersected.

The data show the mean differences in the paired data between 0 m and 10 m in separation distance is -0.84 Zn% and +0.08 Pb%, with a median of -0.70 Zn% and -0.49 Pb%. Table 12-6 shows the statistics for the paired data up to 20 m in separation distances.

Table 12-6: Zinc and Lead Grade Differences at Various Separation Distances

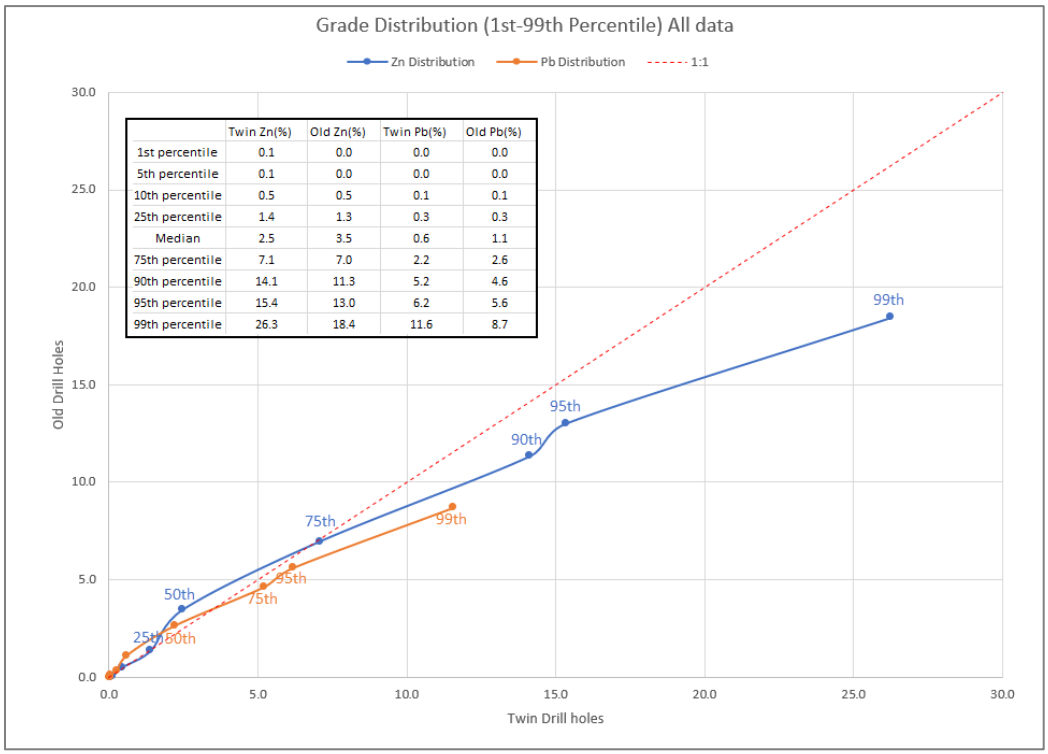
Elements	Zinc Grade Difference Between Pairs				Lead Grade Difference Between Pairs			
Separation Distance (m)	**All Data**	**>0 and ≤10**	**>10 and ≤15**	**>15 and ≤20**	**All Data**	**>0 and ≤10**	**>10 and ≤15**	**>15 and ≤20**
Valid cases	301	36	78	58	301	36	78	58
Mean	0.35	-0.84	0.50	-0.26	-0.07	0.08	-0.41	-0.29
Variance	40.64	16.40	35.49	14.38	8.47	14.97	6.68	2.00
Std. Dev.	6.37	4.05	5.96	3.79	2.91	3.87	2.58	1.41
Variation Coefficient	18.09	-4.83	11.88	-14.34	-42.61	49.29	-6.27	-4.94
Minimum	-20.42	-9.89	-13.27	-11.57	-11.63	-5.17	-10.40	-3.43
Maximum	26.45	7.50	13.99	12.73	14.52	14.52	4.69	5.64
1st percentile	-16.18	-	-	-	-8.33	-	-	-
5th percentile	-10.44	-7.00	-9.84	-5.80	-3.88	-4.85	-7.01	-2.47
10th percentile	-7.30	-5.80	-7.66	-5.07	-2.85	-2.95	-3.04	-1.98
25th percentile	-3.30	-3.80	-3.40	-2.05	-1.19	-1.61	-1.36	-0.80
Median	0.21	-0.70	0.45	-0.73	-0.16	-0.49	-0.05	-0.28
75th percentile	3.28	1.91	3.23	1.71	0.80	0.38	0.86	0.15
90th percentile	7.78	5.61	9.55	3.94	2.64	3.13	2.51	0.89
95th percentile	12.19	6.59	12.25	5.46	4.70	13.50	3.71	2.27
99th percentile	20.28	-	-	-	11.02	-	-	-

The percentile chart indicated that, for all data, the distribution between the twin drill holes, when compared to the old drilling, is comparable up to the 75th percentile. Beyond the 75th percentile, the twin drill holes are generally lower grade than the old drilling (Figure 12-6).

From the data reviewed, AGP is of the opinion that the underground drill holes completed by Key Anacon in the 1950s are useable for resource estimation purposes, but with restrictions on the classification due to: variability in the grade of the individual pairs, as indicated by the standard deviation and the variation of coefficient; and small core sizes and long sampling intervals. The restriction imposed by AGP is not to assign any Measured Resources in the model described in Section 14 of this report.

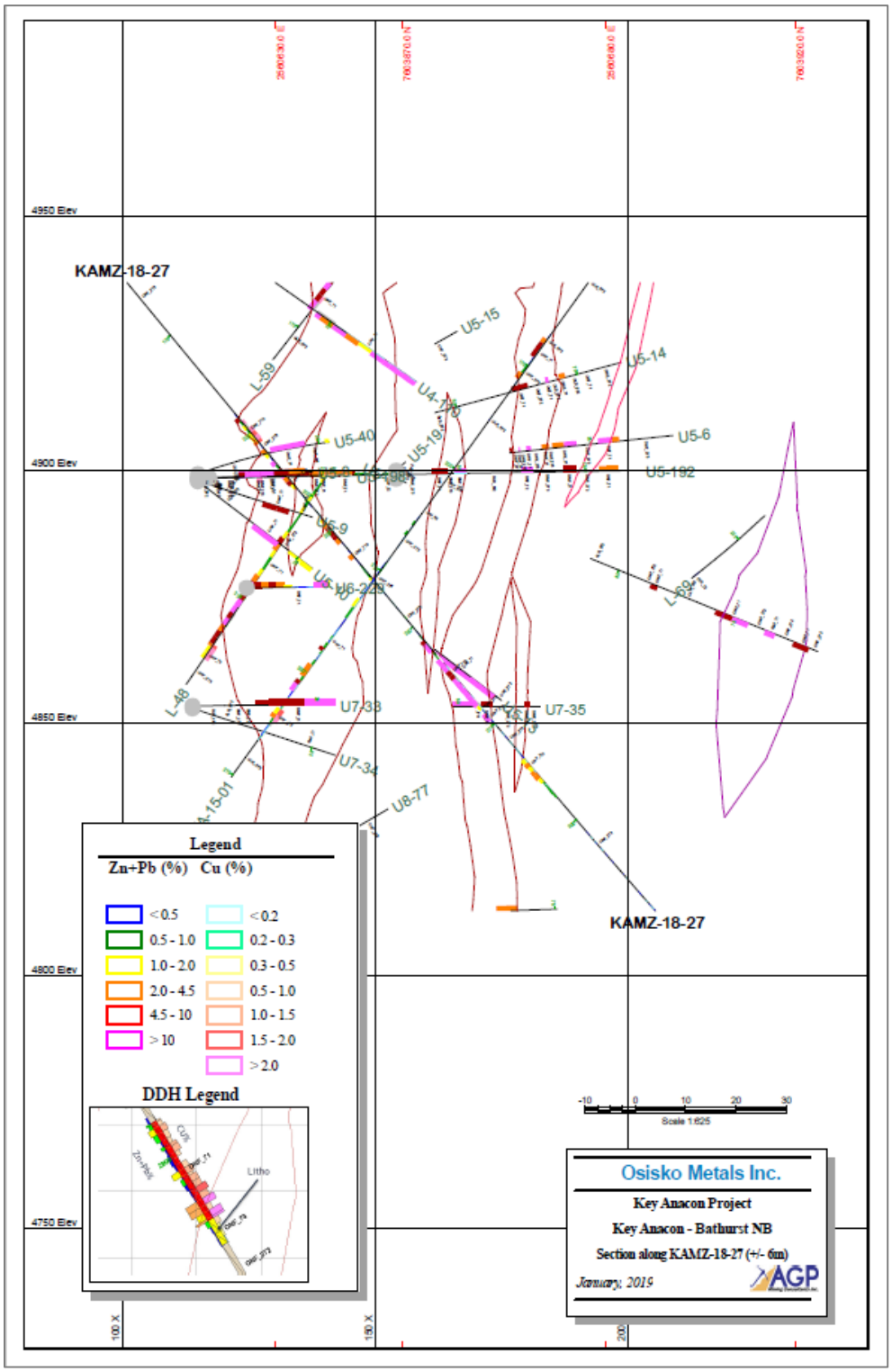
The data were also plotted on custom vertical sections coinciding with the twin drill hole traces and visually compared. Figure 12-7 shows one example section for hole KAMZ-18-27.

Figure 12-6: Percentile Grade Distribution



	Twin Zn(%)	Old Zn(%)	Twin Pb(%)	Old Pb(%)
1st percentile	0.1	0.0	0.0	0.0
5th percentile	0.1	0.0	0.0	0.0
10th percentile	0.5	0.5	0.1	0.1
25th percentile	1.4	1.3	0.3	0.3
Median	2.5	3.5	0.6	1.1
75th percentile	7.1	7.0	2.2	2.6
90th percentile	14.1	11.3	5.2	4.6
95th percentile	15.4	13.0	6.2	5.6
99th percentile	26.3	18.4	11.6	8.7

Figure 12-7: Vertical Section along KAMZ-18-27 ±6 m



12.2.6 Qualified Person's Comments

The QP identified no material sample issues during the review of the drill data and assays. The data collected by Osisko Metals adequately represents the style of mineralization present in the BMC. A restriction was imposed by AGP not to assign Measured Resources for the Key Anacon Main Zone deposit due to the small core sizes and data quality issues related to the historical Key Anacon drilling. The error rate in the Osisko Metals drill database, for the data that was validated by the QP, was found to be very low to non-existent.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Osisko Metals did not conduct any metallurgical or mineralogical testing on the mineralization of the Key Anacon and Gilmour South deposits.

Metallurgical recoveries used in this report were derived from the recoveries achieved at the end-of-life of the Brunswick No. 12 Mine and based on similarity of mineralization, sulphide mineralogy, gangue mineralogy, and grain size characteristics. AGP cautions that recoveries at the former Brunswick Mine may not be representative of the metal recoveries for the Key Anacon and Gilmour South mineralization.

In 2017, Hunter Brook Holdings initiated a study at RPC Science and Engineering (RPC) to investigate the copper upgrading and recovery potential for their Key Anacon properties. The preliminary analysis on core samples was conducted by RPC, and based on the results six samples were identified for further testing. RPC was contracted to conduct a testwork scope that entailed two phases. The first phase included mineralogical characterization, diagnostic tests to guide the flotation separation work, and open circuit optimization testing; the second phase was to have been carried out at a later date, and involve locked-cycle testing to confirm the grades and recoveries obtainable, and to produce metal concentrates for product evaluation. Results from the first phase of study were published in a report dated March 18, 2018, titled *Key Anacon Copper Ore Recovery Phase I,* authored by Katie Cougle of RPC. The samples collected were from drill hole KA-15-01. This drill hole intersected the Key Anacon Main Zone East, and the eastern limb of the Key Anacon Main Zone.

The study concluded that:

- The mineralogy indicated that approximately 40% of the sample comprises sulphide minerals, with quartz and muscovite as the dominant silicate minerals
- On average, the density of the core samples were found to be 3 g/cm^3
- A product containing 21.6% Cu could be attained with 93.5% Cu recovery in 6.4% of the mass, using 10 g/t of Aero 3418A in a single rougher and cleaner flotation circuit
- During the rougher flotation testwork, it was found that a grind size of 80% passing 50 µm provided optimal copper recovery results, which agreed with the mineralogical work carried out by RPC.

RPC viewed these results as encouraging, and recommended that the Phase II locked-cycle and product evaluation testwork proceed. It is not known if the Phase II program was completed.

13.1 Historical Testwork – Key Anacon Deposit

A report completed in 1965 titled *Key Anacon Mines Limited, New Larder "U" Property, New Brunswick, Volume 1,* and authored by G.H. Gibbs, states that a metallurgical test was conducted in 1964 using core from two AXT diamond drill holes drilled through a typical section of the No. 2 Zone on the 700 level of the Key Anacon Mine. The core was reportedly split, and a portion sent to Brunswick Mining and Smelting Corporation Limited for preliminary bulk flotation tests in November 1964. The remainder was submitted to the Gallagher Company in Salt Lake City in February 1965 for final tests, for selective recovery of lead and zinc with maximum silver recovery in the lead concentrate.

The test results were summarized in the report. The tests indicated differential flotation after grinding to 65.8% through 325 mesh would produce two concentrates, as shown in Table 13-1.

Table 13-1: Concentrate from Historical Testwork for Key Anacon Main Deposit (circa 1965)

	First 2½ Years of Milling				
	Pb%	**Zn%**	**Cu%**	**Ag oz/st**	**Ratio of Concentration**
Head assays	2.74	6.20	0.48	2.94	
Cu-Pb conc. grade	30.00	10.21	3.82	26.70	7.46% of tons milled
Recovery %	81.70	12.20	59.10	67.70	
Zn conc. grade	1.01	53.00	1.04	3.31	8.52% of tons milled
Recovery %	3.10	72.60	18.40	9.60	
	Second 2½ Years of Milling				
	Pb%	**Zn%**	**Cu%**	**Ag oz/st**	**Ratio of Concentration**
Head assays	3.16	8.24	0.15	3.17	
Cu-Pb conc. grade	30.70	10.20	0.28	25.49	8.42% of tons milled
Recovery %	81.70	40.40	15.40	67.90	
Zn conc. grade	1.29	53.00	0.16	2.54	11.97% of tons milled
Recovery %	4.90	77.00	12.20	9.60	

It was also noted in the report that the testwork indicated separation of the copper and lead concentrates would not be profitable with 0.48% Cu. A combined copper-lead concentrate was recommended.

APG notes that this testwork was based on an exceedingly small sample size, is historical in nature, and is quoted here solely for completeness. The testwork indicated here is not necessarily indicative of the recovery at the Key Anacon deposit, as metallurgical science has evolved since 1965.

AGP is unaware of any other metallurgical testing having been done at the Key Anacon or Gilmour South deposits.

14 MINERAL RESOURCE ESTIMATE

AGP completed a maiden MRE for the BMC Project, which includes the Gilmour South and Key Anacon deposits, the latter consisting of the Key Anacon Main and the Key Anacon Titan deposits. No other deposits were estimated. GEOVIA GEMS™ (Version 6.8) software was used for the resource estimate, in conjunction with SAGE 2001 for the variography. The metals of interest at the BMC Project are zinc, lead, copper, and silver, with minor quantities of gold that were not estimated.

14.1 Data

In July 2018, Osisko Metals provided AGP with a project data set covering the Gilmour South deposit. A preliminary data set for the Key Anacon deposits were received on April 2018. This data set were subsequently updated on November 9, 2018, and again on January 14, 2019.

The data consisted of:

- Drill data for Gilmour South, Key Anacon Main, and Key Anacon Titan deposits, consisting of collar, down–the-hole surveys, lithology, mineralization, and assays
- Recent and some historical laboratory assay certificates in paper and/or digital format
- Drill logs of new and historical drill holes
- Key Anacon shaft collar coordinates
- Key Anacon mine workings and underground development in DXF format
- Various assessment reports
- QA/QC data
- Topography (from GeoNB open data, in NAD83, NB Stereographic Double projection)
- Additional iron assays recovered from historical data.

AGP imported all data into the GEMS database. All data was checked for overlapping, missing, or negative length intervals. A minor number of database records needed adjustment. The data was validated before being used in the resource estimate, as described in Section 12 of this report.

No further addition was made to the database after January 14, 2019, which constituted the official data cut-off date for this resource estimate.

A number of companies contributed to the data set. Table 14-1 lists the drill campaign and approximate years of drilling for all holes in the database.

Table 14-1: Drill Holes by Company

Deposit	Company	Year	No. of Holes
Key Anacon Main	Anacon Lead Mines Ltd. – New Larder "U" Island Mines Ltd.	1950s	99
Key Anacon Main	Key Anacon Mine Ltd. (underground)	1950s and 1960s	219
Key Anacon Main	Key Anacon Mine Ltd.	1976–1990	8
Key Anacon Main	Rio Algom Ltd.	1992–1993	21
Key Anacon Main	Noranda Inc.	2001	16
Key Anacon Main	Hunter Brook Holding Ltd.	2015	1
Key Anacon Main	Osisko Metal Incorporated	2018	35
Key Anacon Titan	Anacon Lead Mines Ltd. – New Larder "U" Island Mines Ltd.	1950s	4
Key Anacon Titan	Key Anacon Mine Ltd.	1976–1990	5
Key Anacon Titan	Rio Algom Ltd.	1992–1993	51
Key Anacon Titan	Noranda Inc.	2001	10
Key Anacon Titan	Osisko Metal Incorporated	2018	25
Gilmour South	Noranda Inc.	1995–2001	76
Gilmour South	El-Nino Ltd. and Xstrata	2007	2
Gilmour South	Osisko Metal Inc.	2017–2018	32

Not all holes were used in the resource estimate. A total of 578 holes were used, of which, 92 were drilled by Osisko Metals. A total of 26 holes were removed from the resource estimate. Nine holes were abandoned prematurely due to excessive deviation. One hole was an extension of a previous hole where the data was combined in a single hole. Two holes were planned but not drilled. Ten holes were removed due to probable issues with collar coordinates and/or issues with down-the-hole surveys, and four additional holes were removed due to lack of assays in the massive sulphide zone where all other nearby holes indicated high-grade mineralization.

The topography was obtained from the Province of New Brunswick's gateway to geographic information (GeoNB). The topography was available in NAD83, NB Stereographic Double projection. Drill hole collar elevations were verified against the topography and no corrections were made to the elevation.

Once imported, the entire data set was elevated by 5,000 m to avoid negative elevation in the model.

Table 14-2 shows a summary of the number of holes and assays used in the resource estimate. A complete list of the holes can be found in Appendix C of this report.

The topography was obtained from the Province of New Brunswick's gateway to geographic information (GeoNB). The topography was available in NAD83, NB Stereographic Double projection. Drill hole collar elevations were verified against the topography and no corrections were made to the elevation.

Once imported, the entire data set was elevated by 5,000 m to avoid negative elevation in the model.

Table 14-2: Summary of Number of Holes Used in the Resource Estimate

Deposit	In Database			Within Mineralized Wireframes		
	No. of Holes	Length (m)	No. of Assays	No. of Holes	Length (m)	No. of Assays
All Drill Holes (including Osisko Metal Drilling)						
Gilmour South	110	50,328	2,215	39	958	871
Key Anacon Main	376	73,523	5,846	263	4,564	2,394
Key Anacon Titan	92	32,602	2,404	38	1,217	1,238
Total	**578**	**156,453**	**10,465**	**340**	**6,739**	**4,503**
Osisko Metals' Holes						
Gilmour South	32	15,455	913	17	500	531
Key Anacon Main	35	13,522	2,115	26	580	608
Key Anacon Titan	25	9,498	1,137	21	630	666
Total	**92**	**38,475**	**4,165**	**64**	**1,710**	**1,805**

14.1.1 Sampling Length

For the Gilmour South deposit, the data indicated two preferred sampling widths of 0.5 m and 1.0 m. The data prior to 2017, while showing more variability, still displays a preferential sampling length of 1.0 m. The Zn+Pb grade tends to increase with the shorter sampling intervals. The third quartile of the sampling length is 1.0 m.

For the Key Anacon Main deposit, Osisko Metals preferentially sampled the drill core in 1 m intervals. Shorter intervals are allowed in order to isolate mineralized zones or to respect lithological boundaries. Samples over 1.0 m in length were rare. More variability was observed in the historical drilling. This is especially true for the holes drilled in the 1950s and 1960s, which tend to have longer sampling lengths. The sampling length statistics shows a mean length of 1.45 m, with a median of 1 m, and a third quartile of 1.53 m. These statistics are skewed by the long sampling intervals in the historical drilling. For example, the sampling length for the underground drill holes showed a mean length of 2.44 m, median of 2.14 m, and a third quartile of 3.05 m.

The sampling lengths affect the composite lengths, which will be discussed in the composite sections for the various deposits.

14.1.2 Correlation between Elements

Spearman rank correlation between the elements at Gilmour South indicated a very good correlation between zinc and lead, with a correlation coefficient of 0.90. Silver correlates equally well with zinc and lead, with correlation coefficients of 0.81 and 0.83, respectively. Copper does not correlate with either zinc, lead, or silver.

The same is visible for the Key Anacon Main Deposit: Spearman rank correlation between zinc and lead shows an excellent correlation coefficient of 0.92, and correlations between silver and zinc and lead are 0.73 and 0.77, respectively. Copper bears no correlation with either lead, zinc, or silver.

This suggests that zinc, lead, and silver could use the same variogram, and the data also suggest that these elements could use the same wireframe. Copper being independent from zinc and lead suggests that this element will likely need to be treated separately.

14.1.3 Bulk Density

During the Key Anacon deposit drill campaign, Osisko Metals elected to collect density data on every sample collected from the core. Bulk density is measured conventionally using the Archimedes principle on uncoated samples. Osisko Metals measures density on the entire sampling length, as opposed to using a short representative section of the core. Figure 14-1 shows a large basket, suitable for holding over 1 m of core.

Figure 14-1: Density Measurements

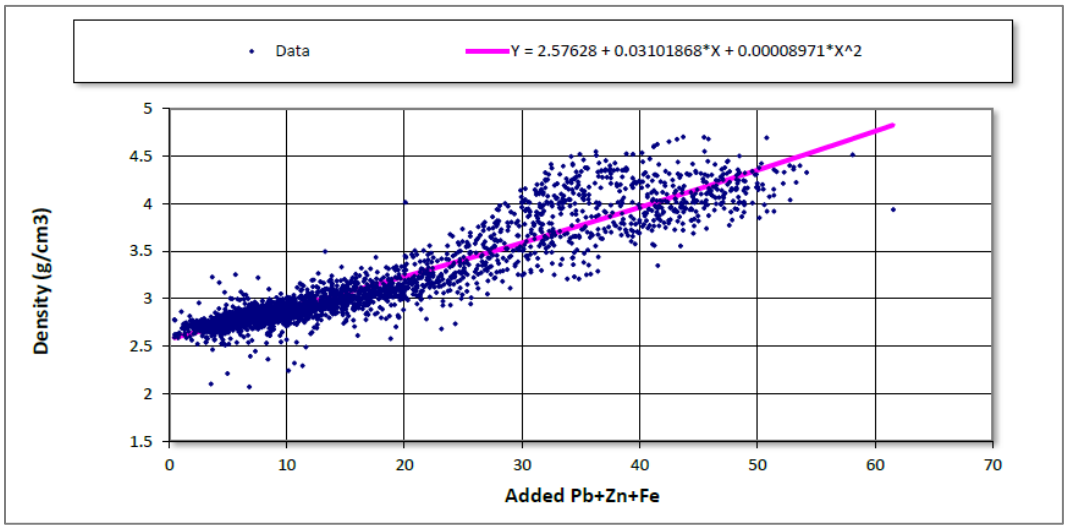
For the Key Anacon Main deposit, a total of 3,631 measurements were received. Out of those, 340 were QA/QC measurements, 3 values were eliminated from the data set, and 22 originated from a project not connected with the Key Anacon Main deposit.

Statistical analysis of the data indicated the following:

- The R^2 of a regression using Co% + Cu% + Pb% + Zn% + Fe% was almost the same as a it was for a regression using Pb% + Zn% + Fe%, indicating that copper and cobalt do not contribute much to the regression.
- Using Pb% + Zn% only, without the Fe%, results in a regression with a poor R^2.

For the data where no density value was available, a regression equation was derived. Following the removals of 12 outliers, the regression returned an R^2 of 0.88 (Figure 14-2).

Figure 14-2: Regression Equation for Density



The equation was tested by back-calculating the density value and comparing the statistics. As shown in Table 14-3, the performance of the back-calculated values, when compared to the original distribution, was excellent.

Table 14-3: Back-Calculated Data Statistics

	Measured Density	Back Calculated Density	Percent Difference (%)
Valid cases	3,254	3,254	-
Mean	3.11	3.11	0.0
Variance	0.23	0.20	-
Standard deviation	0.48	0.45	-
Variation coefficient	0.16	0.15	-
Minimum	2.07	2.59	-
Maximum	4.70	4.82	-
1st percentile	2.58	2.63	-2.0
5th percentile	2.69	2.69	0.3
10th percentile	2.73	2.71	0.5
25th percentile	2.79	2.78	0.3
Median	2.89	2.91	-0.6
75th percentile	3.22	3.30	-2.4
90th percentile	3.99	3.88	2.8
95th percentile	4.19	4.10	2.0
99th percentile	4.41	4.33	1.8

No density data was available for Gilmour South, so Gilmour South's density was calculated using a slightly different equation, as the study was conducted prior to the end of the drill program at Key

Anacon, resulting in a smaller data set. The following equations were used to calculate densities in the assay records where no measured densities existed, but the data had iron assays available.

For the Key Anacon deposits (Key Anacon Main and Titan):

$$Density = 2.57628 + (0.03101868*(Pb\%+Zn\%+Fe\%)) + (0.00008971*(Pb\%+Zn\%+Fe\%)^2)$$

For the Gilmour South deposit:

$$Density = 2.5767 + (0.031113*(Pb\%+Zn\%+Fe\%)) + (0.0000732174*(Pb\%+Zn\%+Fe\%)^2)$$

Calculated densities were only used if measured densities were not available. The densities (measured and calculated) in the assay table were treated similarly to a grade element when the data was composited. Details regarding the composite calculation is discussed in the composite section for the various deposits.

14.2 Gilmour South Deposit

14.2.1 Geological Interpretation

In order to model the mineralization, the hanging wall and footwall of the geological formations were first modelled as surfaces and 3D solids. This work assisted in the interpretation of the mineralized zones.

For VMS deposits, the wireframes typically consist of a combined massive and semi-massive mineralized solid. This is followed by modelling the disseminated mineralized zone, sometime called the stringer zone, and finally by modelling the low-grade/waste pyrite zone. Zoning is often an issue, and a separate, copper-rich zone is often required.

Osisko Metals and prior operators only assayed material bearing sign of mineralization. It is likely that the criteria used, for the historical holes was based on sulphide content, although in the logs, material with 5% pyrite was not always assayed. For that reason, the mineralized zones are easily identifiable in cross-sections. A separate code massive sulphide (MS) code 71* and semi-massive sulphide (SSM) Code 72* were used for the 2000–2017 and for the 2018 drilling. The code generally corresponds to a grade of 4.0% ZnEq or above, although exceptions occur. Grades lower than this often occur in the SMS code 72*, although this is not as consistent. Mineralization in the range of 0.5% to 4.5% Pb+Zn often occurs in the Felsic Tuff (2T2), and were considered to be part of the mineralized zones for the purpose of wireframing, assuming that this material is in the disseminated sulphide zone. A separate pyrite zone could not be modelled, since information for the pyrite is tied, in part, to the lithological descriptions, and the data would need to be extracted out.

The wireframes form elongated, discrete, narrow zones of mineralization. The zones of mineralization were defined and named the South Zone, the Mid Zone, and the North Zone. The South Zone has poor drill hole support and requires more drilling. A tight fold was modelled around coordinate 7,591,300 north; however, this could also be the result of a fault displacement.

Copper was examined separately, and occurs without significant lead and zinc in the footwall of the Mid Zone and the North Zone. A rather loose wireframe was defined to encapsulate the copper grade.

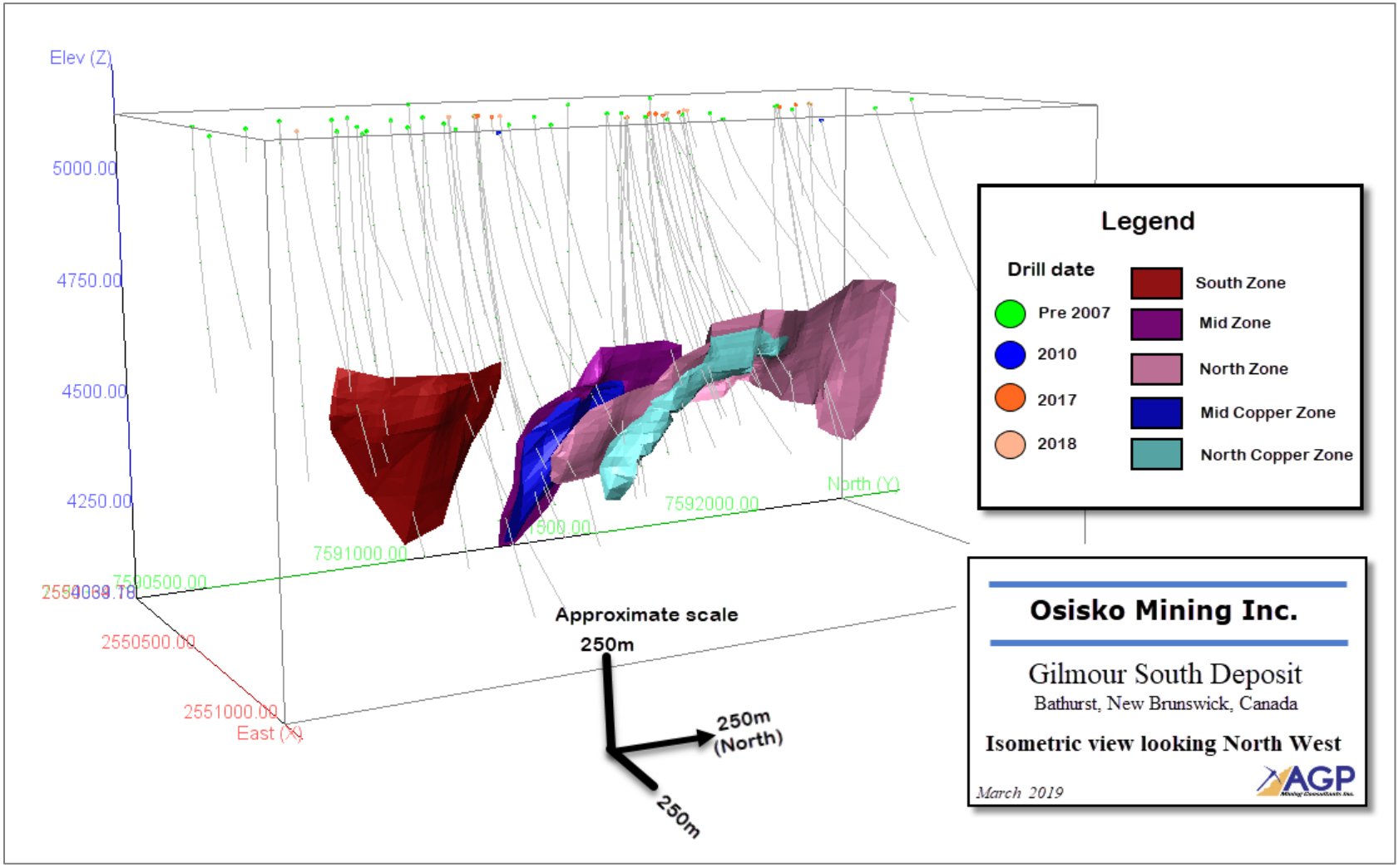
14.2.2 Wireframe Volume

The total wireframe volume of the mineralized zone amounted to 5,640,951 m^3 (Table 14-4). **Error! Reference source not found.**3 illustrates the position of the mineralized wireframes in relation to the drill holes.

Table 14-4: Gilmour South Wireframe Volume

GEMS Name			Domain Name	Volume
NAME1	NAME2	NAME3		
ZONE	SOUTH	FINAL	Z_SOUTH	516,361
ZONE	MID	FINAL	Z_MID	1,184,294
ZONE	NORTH	FINAL	Z_NORTH	2,047,001
ZONE	MID-CU	FINAL	Z_MIDCU	1,122,873
ZONE	NORTH-CU	CLIP	Z_NORCU	770,422
Total Volume				**5,640,951**

Figure 14-3: Position of the 3D Wireframes, Gilmour South Deposit



14.2.3 Exploratory Data Analysis

Exploratory data analysis is the application of various statistical tools to characterize the statistical behaviour or grade distributions of the data set. In this case, the objective is to understand the population distribution of the grade elements in the various domains using such tools as histograms, descriptive statistics, and probability plots.

14.2.4 Assays

The raw assay statistics were evaluated, grouping all assays intersecting the various domains. Table 14-5 provides descriptive statistics for raw, uncapped assays in the various domains.

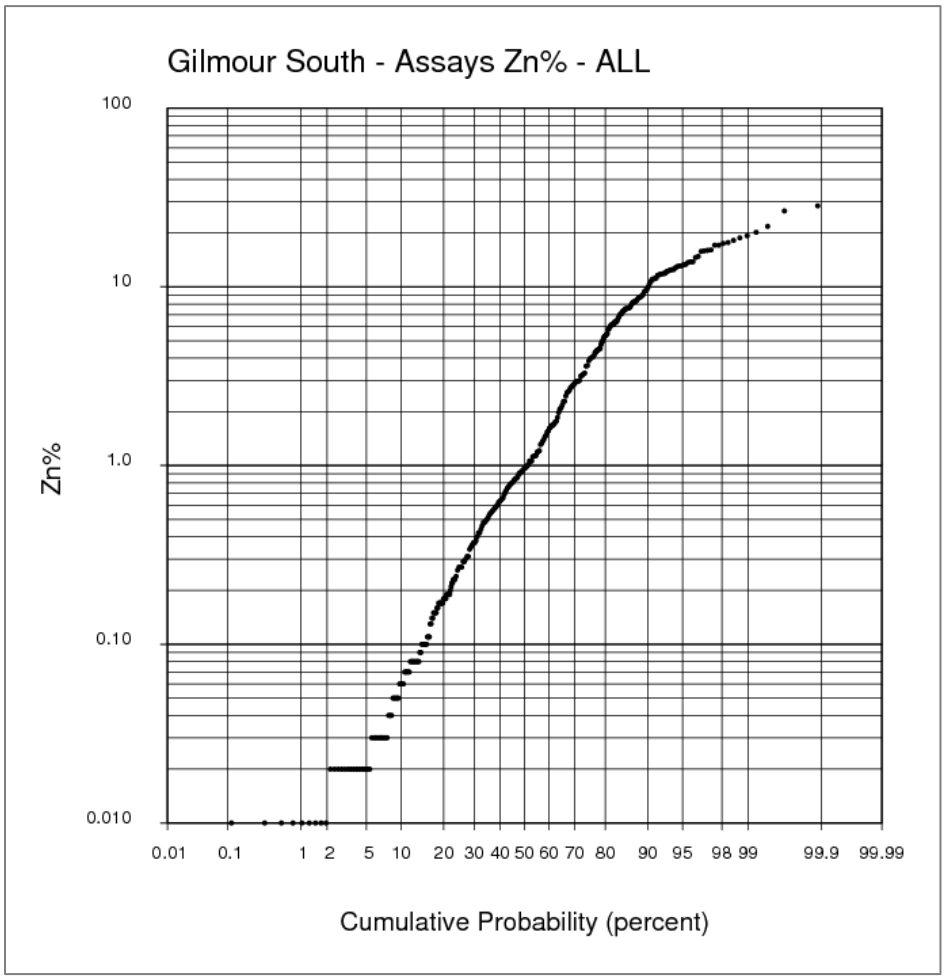
Table 14-5: Descriptive Raw Assay Statistics (Gilmour South)

Element	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc	All Main Z	455	2.99	4.57	1.53	0.00	28.40	0.01	0.03	0.21	0.91	3.63	9.58	13.14	19.70
	South-Z	25	2.90	5.43	1.87	0.01	21.80	0.01	0.12	0.46	0.85	2.65	11.86	20.72	-
	Mid-Z	147	3.79	4.77	1.26	0.00	26.60	0.01	0.02	0.31	1.72	5.80	11.80	13.22	23.53
	North-Z	283	2.58	4.34	1.68	0.00	28.40	0.02	0.04	0.18	0.72	2.72	8.50	12.90	18.88
	All Cu Z	416	0.07	0.69	10.36	0.00	12.80	0.00	0.00	0.00	0.01	0.02	0.05	0.09	0.60
	Mid-Cu	209	0.02	0.05	3.09	0.00	0.67	0.00	0.00	0.00	0.01	0.01	0.03	0.05	0.28
	North-Cu	207	0.12	0.97	8.40	0.00	12.80	0.00	0.00	0.00	0.01	0.03	0.06	0.13	5.29
Lead	All Main Z	455	0.78	1.46	1.87	0.00	11.60	0.00	0.01	0.04	0.21	0.87	2.19	3.14	7.43
	South-Z	25	1.64	3.07	1.87	0.00	11.60	0.00	0.04	0.34	0.59	1.11	7.17	11.48	-
	Mid-Z	147	0.72	1.32	1.83	0.00	8.46	0.00	0.01	0.07	0.19	0.79	2.14	4.08	7.59
	North-Z	283	0.74	1.29	1.75	0.00	7.75	0.00	0.01	0.03	0.18	0.87	2.21	2.97	6.82
	All Cu Z	416	0.02	0.22	11.87	0.00	4.29	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.10
	Mid-Cu	209	0.00	0.00	1.67	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.03
	North-Cu	207	0.03	0.31	9.00	0.00	4.29	0.00	0.00	0.00	0.00	0.01	0.01	0.05	1.04
Copper	All Main Z	455	0.21	0.35	1.67	0.00	2.71	0.01	0.01	0.02	0.05	0.26	0.59	0.91	1.84
	South-Z	25	0.14	0.20	1.50	0.00	0.73	0.00	0.00	0.01	0.03	0.26	0.49	0.66	-
	Mid-Z	147	0.22	0.23	1.07	0.00	1.07	0.01	0.01	0.03	0.12	0.36	0.57	0.70	1.00
	North-Z	283	0.22	0.41	1.90	0.00	2.71	0.00	0.01	0.01	0.04	0.20	0.68	1.18	2.11
	All Cu Z	416	0.13	0.33	2.59	0.00	3.37	0.01	0.01	0.02	0.04	0.11	0.24	0.42	2.36
	Mid-Cu	209	0.10	0.26	2.55	0.00	2.64	0.01	0.01	0.02	0.04	0.10	0.19	0.30	2.27
	North-Cu	207	0.15	0.38	2.54	0.00	3.37	0.01	0.01	0.02	0.05	0.11	0.30	0.56	2.86
Silver	All Main Z	455	23.9	63.5	2.7	0.0	948.0	0.2	1.1	1.6	5.2	22.9	62.8	93.7	205.9
	South-Z	25	86.4	204.7	2.4	0.6	948.0	0.9	3.3	9.4	18.4	49.2	318.2	804.6	-
	Mid-Z	147	18.9	24.9	1.3	0.2	160.0	0.2	0.8	3.2	8.7	25.7	55.3	76.2	135.5

Element	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
	North-Z	283	20.9	47.2	2.3	0.0	541.4	0.2	1.0	1.5	2.9	16.8	65.6	103.8	187.9
	All Cu Z	416	1.2	3.0	2.6	0.2	52.0	0.2	0.2	0.2	0.5	1.2	1.7	3.5	12.4
	Mid-Cu	209	0.9	1.4	1.6	0.2	14.9	0.2	0.2	0.2	0.5	1.0	1.5	2.1	10.3
	North-Cu	207	1.4	4.1	2.8	0.2	52.0	0.2	0.2	0.2	0.6	1.3	2.6	4.9	15.5

AGP notes that, while copper is present in all domains in about the same proportion, what distinguishes the copper domains is the depletion of zinc, lead, and silver. The frequency distribution of the raw assays (Figure 14-4) shows a break above 10% Zn, suggesting a separate population. The spatial distribution of the assays above 10% Zn was reviewed in GEMS, and the data show a sporadic distribution mixed with lower grade assays. The zones were considered too narrow to be separated by adding an internal wireframe.

Figure 14-4: Raw Assay Frequency Distribution, Zinc in All Domains



14.2.5 Capping

A combination of decile analysis and a review of probability plots was used to determine the potential risk of grade distortion from higher grade assays. A decile is any of the nine values that divide the sorted data into ten equal parts, such that each part represents one tenth of the sample or population. In a mining project, high-grade outliers can contribute excessively to the total metal content of the deposit.

Typically, in a decile analysis, capping is warranted if any of the following conditions are met:

- The last decile has more than 40% metal
- The last decile contains more than 2.3 times the metal quantity contained in the penultimate decile
- The last centile contains more than 10% metal

- The last centile contains more than 1.75 times the metal quantity contained in the penultimate centile.

The decile analysis results indicated that grade capping was marginally warranted for most domains. The low coefficients of variation (CV) in the raw assays for the South Zone, Mid Zone, and North Zone indicate that the capping threshold does not need to be too aggressive. The CVs for the Mid and North copper zones indicate more variability; these zones may require a more aggressive capping scenario.

After conducting a careful examination of the data set, AGP elected to apply a hard cap on the raw assay data prior to compositing, with no search restriction on the mild outlier populations.

Raw Assay Capping

Capping values were selected with the aid of probability plots and degradation analysis. Table 14-6 shows a summary of the treatment of high-grade outliers during interpolation. The cap values selected were generally near the 99th percentile of the raw assay distribution.

Table 14-6: High-Grade Treatments for Gilmour South

Domain	Domain Code	Element	Capped Value	No. Capped	Total No.	% Capped	Element	Capped Value	No. Capped	Total No.	% Capped
Z_MID	2000	Zinc (%)	15	3	147	2.04	Lead (%)	5	3	147	2.04
Z_MIDCU	2500		N/A	0	209	N/A		N/A	0	209	N/A
Z_NORCU	3500		N/A	0	207	N/A		N/A	0	207	N/A
Z_NORTH	3000		17	6	283	2.12		5	8	283	2.83
Z_SOUTH	1000		7	3	25	12		5	2	25	8
Z_MID	2000	Copper (%)	0.7	7	147	4.76	Silver (g/t)	80	4	147	2.72
Z_MIDCU	2500		0.4	7	209	3.35		N/A	0	209	N/A
Z_NORCU	3500		1	6	207	2.9		N/A	0	207	N/A
Z_NORTH	3000		1.5	6	283	2.12		170	5	283	1.77
Z_SOUTH	1000		0.6	1	25	4		300	2	25	8

The raw assay capping scenario reduced the CV below 2 for most domains, except for the north copper zone (Table 14-7).

Table 14-7: Raw Assay CV Before and After Capping

Domain	Domain Code	Zinc		Lead		Copper		Silver	
		CV	CV (Capped)	CV	CV (Capped)	CV	CV (Capped)	CV	CV (Capped)
Z_MID	2000	1.3	1.2	1.8	1.7	1.1	1.0	1.3	1.2
Z_MIDCU	2500	3.1	3.1	1.7	1.7	2.6	1.2	1.6	1.6
Z_NORCU	3500	8.4	8.4	9.0	9.0	2.5	1.6	2.8	2.8
Z_NORTH	3000	1.7	1.6	1.8	1.6	1.9	1.8	2.3	1.8
Z_SOUTH	1000	1.9	1.2	1.9	1.3	1.5	1.4	2.4	1.6

Total Metal Affected by the Treatment of Outliers

The total metal affected by the treatment of outliers was evaluated in the final model. At a 5.5% ZnEq cut-off, the capping strategy removed 9% of the in-situ zinc, 16% of the lead, 6% of the copper, and 17% of the silver, as shown in Table 14-8.

Table 14-8: Metal Removed by Capping Strategy (Inferred Category, Gilmour South)

Cut-off (ZnEq%)	Zn Metal (%)	Pb Metal (%)	Cu Metal (%)	Ag Metal (%)	ZnEq Metal (%)
>6.0	-12	-18	-8	-19	-13
>5.5	-9	-16	-6	-17	-10
>4.0	-7	-14	-5	-16	-9
>0.0	-5	-9	-3	-10	-6

14.2.6 Composites

From the sampling length statistics described above, AGP elected to use a composite length of 1.5 m. The composite size selected is above the third quartile and allows grade variations to be represented while reducing the variance.

Assays were length-weight averaged, and any grade capping was applied to the raw assay data prior to compositing. True gaps in sampling were composited at zero grade. There were no stope voids, drifts, or other underground excavations that needed to be considered while compositing the raw assays.

The 1.5 m composite intervals were created moving downward from the collar of the holes toward the hole bottoms. Composite lengths were automatically adjusted by the software to leave no remnants. The adjustment resulted in composite lengths ranging between 1.2 m and 2.3 m, with 92.2% of the composites ranging between 1.4 m and 1.6 m. Table 14-9 shows the descriptive statistics for the composites point located within the mineralized envelope only.

Table 14-9: Descriptive Statistics for Composites – Capped (Gilmour South)

Element	Domain	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zn Capped	All Zones	614	1.08	2.59	2.40	0.00	16.21	0.00	0.00	0.00	0.02	0.64	3.80	7.35	13.63
	South-Z	17	1.48	1.86	1.25	0.00	6.88	-	0.00	0.27	0.78	1.96	5.37	-	-
	Mid-Z	78	2.97	3.37	1.13	0.00	11.09	0.00	0.00	0.15	1.39	5.64	8.29	10.43	-
	North-Z	169	2.32	3.65	1.57	0.00	16.21	0.01	0.03	0.24	0.71	2.50	7.85	12.66	15.77

Element	Domain	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
	Mid-Cu	176	0.01	0.04	3.39	0.00	0.54	0.00	0.00	0.00	0.00	0.01	0.03	0.05	0.25
	North-Cu	174	0.07	0.46	6.93	0.00	4.34	0.00	0.00	0.00	0.01	0.02	0.04	0.09	4.23
Pb Capped	All Zones	614	0.27	0.67	2.44	0.00	4.99	0.00	0.00	0.00	0.00	0.19	0.90	1.60	3.61
	South-Z	17	0.91	1.26	1.39	0.00	4.59	-	0.00	0.12	0.53	0.97	3.77	-	-
	Mid-Z	78	0.56	0.79	1.40	0.00	3.61	0.00	0.00	0.02	0.23	0.77	1.39	2.60	-
	North-Z	169	0.62	0.91	1.47	0.00	4.99	0.00	0.01	0.03	0.24	0.84	1.87	2.51	4.96
	Mid-Cu	176	0.00	0.00	1.93	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02
	North-Cu	174	0.02	0.14	6.88	0.00	1.46	0.00	0.00	0.00	0.00	0.01	0.01	0.03	1.18
Cu Capped	All Zones	614	0.11	0.20	1.84	0.00	1.46	0.00	0.00	0.01	0.04	0.12	0.31	0.50	1.30
	South-Z	17	0.12	0.17	1.50	0.00	0.54	-	0.00	0.00	0.02	0.19	0.45	-	-
	Mid-Z	78	0.15	0.17	1.11	0.00	0.61	0.00	0.00	0.02	0.08	0.26	0.44	0.52	-
	North-Z	169	0.18	0.32	1.79	0.00	1.46	0.00	0.01	0.01	0.04	0.17	0.56	1.16	1.45
	Mid-Cu	176	0.06	0.07	1.29	0.00	0.34	0.00	0.00	0.00	0.03	0.07	0.16	0.22	0.34
	North-Cu	174	0.08	0.12	1.55	0.00	0.76	0.00	0.00	0.00	0.04	0.10	0.21	0.31	0.70
Ag Capped	All Zones	614	8.12	22.90	2.82	0.00	244.55	0.00	0.00	0.20	1.00	3.10	21.71	45.07	131.30
	South-Z	17	41.64	72.29	1.74	0.00	244.55	-	0.00	4.58	15.51	28.93	220.10	-	-
	Mid-Z	78	13.80	16.08	1.17	0.00	58.34	0.00	0.18	1.04	6.66	21.51	41.01	54.07	-
	North-Z	169	17.33	31.08	1.79	0.00	143.42	0.20	0.64	1.45	2.93	16.94	61.18	103.63	138.20
	Mid-Cu	176	0.64	0.96	1.51	0.00	7.65	0.00	0.00	0.02	0.32	1.00	1.50	1.86	7.13
	North-Cu	174	0.92	1.98	2.14	0.00	18.32	0.00	0.00	0.20	0.36	1.05	1.99	2.65	13.55

Density was calculated in the composite intervals and exported out as part of the point file required for the grade interpolation. Composite points with no iron assays, where the density could not be calculated, were assigned a value of -999 unless the Pb+Zn grade was less than 0.1%, where a default density of 2.8 g/cm^3 was used. Values of -999 in the composite data points are ignored during the interpolation process in GEMS™.

14.2.7 Spatial Analysis – Variography

Geostatisticians use a variety of tools to describe the pattern of spatial continuity, or strength of the spatial similarity of a variable with separation distance and direction. If we compare samples that are close together, it is common to observe that their values are quite similar. As the distance between samples increases, there is likely to be less similarity in the values. The experimental semi-variogram mathematically describes this process. It is commonly represented as a graph that shows the variance in measurements with distances between all pairs of sampled locations.

In all semi-variograms, the distance where the model first flattens out is known as the range. Sample locations separated by distances closer than the range are believed to be spatially auto-correlated. The sill is the value on the Y-axis where the model attains the range, while the nugget is the value at the location where the model intercepts the Y-axis. The nugget typically represents variation at a micro scale that can be attributed to measurement errors, sources of variation at distances smaller than the sampling interval, or both. Therefore, the shape of the semi-variogram describes the pattern of spatial continuity. A very rapid decrease near the origin indicates short-scale variability. A more gradual decrease moving away from the origin suggests longer-scale continuity.

Variography was attempted on the combined Mid Zone and North Zone Pb+Zn composites. A total of 242 data points was selected, and the variogram produced by the SAGE2001™ software returned a maximum range of continuity between 50 m and 60 m at 100% of the sill value. At 97% of the sill value, the range falls to 40 m. The ratio between the major and semi-major was 1.30, and the ratio between the semi-major and minor was approximately 1.20. The ellipsoid describing the anisotropy was plotted in GEMS™, and the angle did not coincide well with the expected trend of the mineralization. It was therefore decided to use the variography to help set the sample search ellipsoid range only, and interpolate the model using the Inverse Distance to the power of 2 (ID^2) method.

14.2.8 Search Ellipsoid Dimensions and Orientations

While it is common to use the variogram model as a guide to set the search ellipsoids' ranges and attitudes, the geologist modelling the deposit must consider the strike and dip of the mineralized horizon, and the drill hole spacing and distribution.

For this model, AGP used the overall geometry of the zones and the proposed variogram range as guiding principles to set the search ellipsoid orientations.

The first pass maximum range was sized to reach at least the next drill section. A 1.5 x multiplier (from Pass 1) was used to set the range of the second pass. The second pass exceeded the maximum range of the variogram by approximately 25%. Lastly, a 2 x multiplier (from Pass 2) was used to set the range for the third interpolation pass and was intended to fill the blocks.

Due to the undulating nature of the mineralized zones, a number of orientation subdomains were delineated. The subdomains allowed for rotation of the search ellipsoid, in order to optimize the sample search with the orientation of the zones without resorting to unfolding methodology. Table 14-10 lists the final values used in the resource model for the range of the major, semi-major, and minor axes. Rotation angles are based on the GEMS ZXZ or ZYZ methodology, which uses a conventional right-hand rule.

Table 14-10: Search Ellipsoid Dimensions (Gilmour South)

Interpolation Domains	Domain Code	Rotation (Z, X, Z)	Pass 1 Range Major, Semi-major, Minor (m)	Pass 2 Range Major, Semi-major, Minor (m)	Pass 3 Range Major, Semi-major, Minor (m)
South-Z (orientation 1)	1001	110, -65, 0	39, 52, 15	59, 78, 22	117, 156, 45
South-Z (orientation 2)	1002	80, -63, 0	39, 52, 15	59, 78, 22	117, 156, 45
Mid-Z (Orientation 1)	2001	115, -60, 0	39, 52, 15	59, 78, 22	117, 156, 45
Mid-Z (Orientation 2)	2002	90, -50, 0	39, 52, 30	59, 78, 45	156, 117, 90
Mid-Z (Orientation 3)	2003	90, 69, 0	39, 15, 52	59, 22, 78	117, 45, 156
North-Z (Orientation 1)	3001	110, -70, -40	52, 39, 15	78, 59, 22	156, 117, 45
North-Z (Orientation 2)	3002	75, -70, -40	52, 39, 30	78, 59, 45	156, 117, 90
North-Z (Orientation 3)	3003	120, -70, 35	52, 39, 15	78, 59, 22	156, 117, 45
Mid-Cu Zone	2500	90, -60, -50	52, 39, 30	78, 59, 45	156, 117, 90
North-Cu Zone	3500	75, -70, -40	52, 39, 30	78, 59, 45	156, 117, 90

14.2.9 Resource Block Model

The block model was constructed using GEMS 6.8™. A block size of 10 m horizontally by 5 m across by 5 m vertically was selected, based on mining selectivity considerations and the density of the data set. This block matrix size assumed a medium-sized underground mining operation.

The block model was defined on the BMC Project coordinate system with a 0-degree rotation. Table 14-11 lists the upper southeast corner of the model, and is defined on the block edge.

The rock type model was coded by combining the domain code with the subdomain code, controlling the search ellipsoid orientation.

Table 14-11: Block Model Definition (Block Edge)

Resource Model Items	Parameters
Easting	2,550,480
Northing	7,590,400
Top relative elevation	4,750
Rotation angle (counterclockwise)	0
Block size (X, Y, Z in metres)	5, 10, 5
Number of blocks in the X direction	114
Number of blocks in the Y direction	175
Number of blocks in the Z direction	120

14.2.10 Interpolation Plan

The resource model was created in GEMS 6.8™ with a single folder setup, using ID^2 for interpolating the zinc, lead, copper, and silver grades, along with the density. A nearest neighbour (NN) model was used for validation. The interpolation was carried out in a multi-pass approach, with an increasing search dimension coupled with decreasing sample restrictions.

- Pass 1 used an ellipsoid search with 7 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 3 holes to be used in the search.
- Pass 2 used an ellipsoid search with 5 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 2 holes to be used in the search.
- Pass 3 used an ellipsoid search with 2 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, allowing a block to be interpolated by a single hole.

All orientation subdomain boundaries were treated as soft boundaries, allowing samples from one subdomain to be used in the interpolation of the adjacent subdomain. This is the correct methodology, since the orientation subdomains were only used to control the orientation of the sample search ellipsoids, and do not correspond to any known lithological contacts or faults. The remaining domains were treated as hard boundaries.

The model was interpolated only within the mineralized wireframe. Volume reporting used the mineralized wireframes to correctly assign the tonnages to the correct grade bins. The methodology intrinsically assumes the hanging wall and footwall contacts will be separated out during mining. For this deposit, AGP believes this is the correct approach, since the high grade massive and semi-massive mineralization is visually distinct from the surrounding waste in the field.

14.2.11 Mineral Resource Classification

Several factors are considered in the definition of a resource classification:

- CIM requirements and guidelines
- Experience with similar deposits
- Spatial continuity
- Confidence limit analysis
- Geology.

No environmental, permitting, legal, title, taxation, socioeconomic, marketing, or other relevant issues are known to the author that may currently affect the estimate of Mineral Resources. Mineral Reserves can only be estimated based on an economic evaluation used in a prefeasibility or feasibility

study of a mineral project. Thus, no reserves have been estimated. Mineral resources, which are not Mineral Reserves, do not have demonstrated economic viability.

Typically, the confidence level for a grade in the block model is reduced with the increase in the search ellipsoid size, along with the diminishing restriction on the number of samples used for the grade interpolation. This is essentially controlled by the pass number of the interpolation plan, as described in the previous section. A common technique is to categorize a model based on the pass number and distance to the closest sample. For Gilmour South, in addition to using the pass number and distance to the closest composite, a manual adjustment model was created to manually downgrade Inferred blocks showing poor drill support.

Only one confidence category exists in the model: the usual CIM guideline class of Inferred, which is coded with a value of 3. A special Code 4 represents mineralization that was considered too far away from the existing drilling to be classified as an Inferred Resource. The Code 4 blocks have been left in the classification model as exploration targets for Osisko Metals. Table 14-12 lists the parameters used to code the classification model, and Figure 14-5 illustrates the distribution of the Inferred Resources for the Gilmour South Deposit.

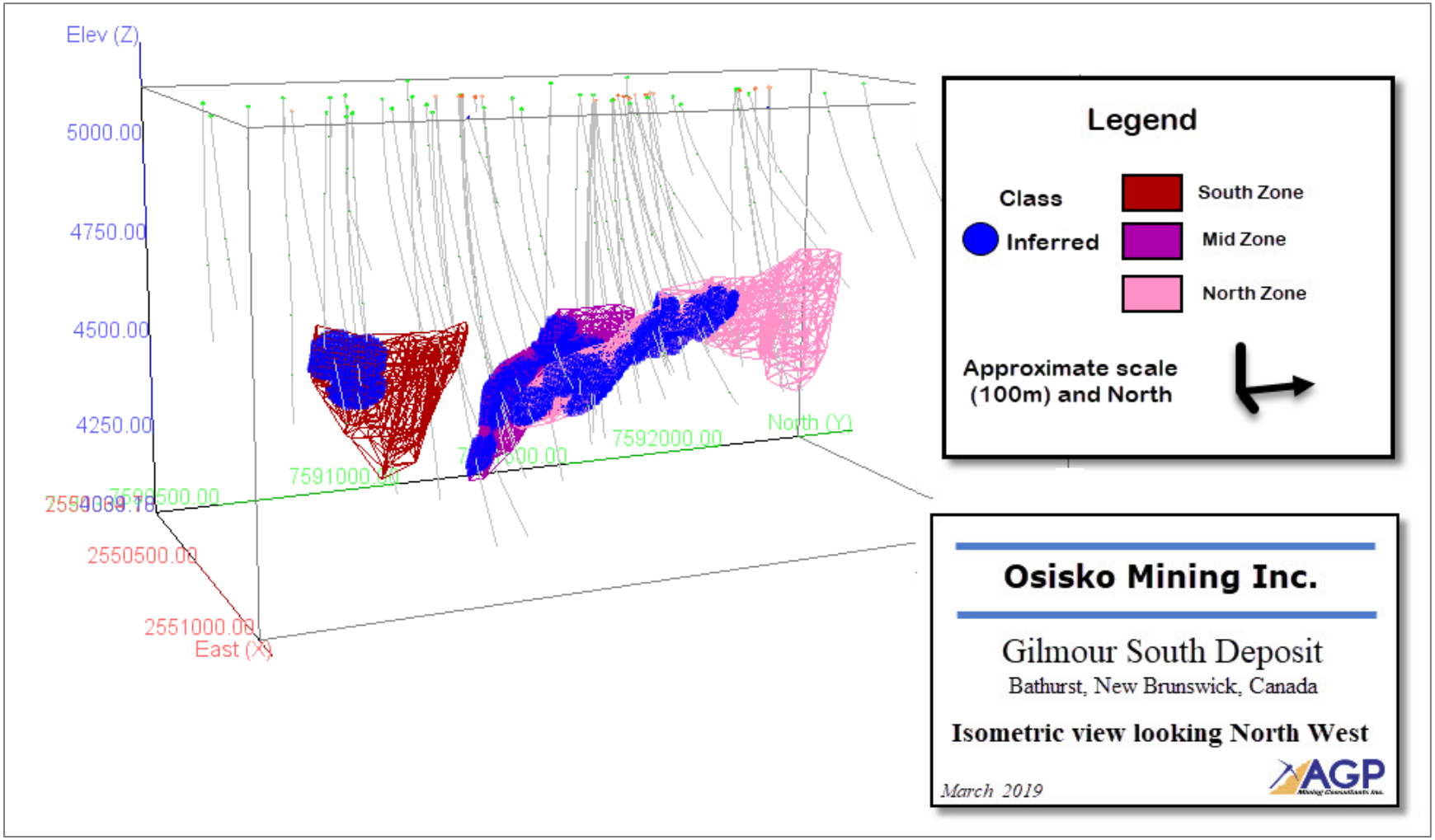
Table 14-12: Classification Parameters – Gilmour South

Pass Number	Retained As:	Downgraded To:
Passes 1 and 2	Inferred (Code 3) if the distance to the closest composite is <65 m and the manual adjustment model value is 0	Code 4 if the distance to the closest composite is >=65 m and/or the manual adjustment model value is 1

Final adjustments are often required to the classification of individual block values to create areas suitable for mine planning. This is accomplished by using a GEMS™ Cypress-enabled script that adjusts, or grooms, the confidence category of isolated blocks to create contiguous resource blocks with reasonably smooth class values. The classifications of isolated blocks were upgraded or downgraded depending on the classifications of the 26 surrounding blocks. AGP validated the final block classification visually. AGP also generated histograms of the distance to the closest composites versus the class model value to evaluate the class model for reasonableness.

Approximately 40% of the volume within the mineralized solid is classified as Inferred. The remaining 60% of the volume was either assigned Code 4 or in areas that could not be interpolated, and therefore bore no grade. No resources were classified as Measured or Indicated for Gilmour South.

Figure 14-5: Block Model Classification on Isometric View



14.2.12 Block Model Validation

The Gilmour South deposit grade models were validated by four methods:

- Visual comparison of colour-coded block model grades with composite grades on sections and plans
- Comparison of the global mean block grades for ID^2 and NN models, composites, and raw assay grades
- Comparison using grade profiles to investigate local bias in the estimate
- Naïve cross-validation tests with composite grade versus block model grade.

14.2.13 Visual Comparison

The visual comparison of block model grades with composite grades shows a reasonable correlation between values for most of the model (Appendix D).

14.2.14 Global Comparisons

Table 14-13 shows the grade statistics for the raw assays, composites, NN and ID^2 models for the South Zone, Mid Zone, and North Zone (Gilmour South principal zones). AGP found that the ID^2 zinc, lead, and silver model grades were slightly elevated when compared to the NN model, which is typically regarded as a high bias in the estimation. There are only 215 composites in the data set for the Gilmour South zones, which may have resulted in statistics that may not be very representative. AGP believes that the grade between the raw assays, composites, NN, and ID^2 models are within reasonable limits of each other if one considers that the model has limited drill supports and the mineralization is all classed as Inferred. More drill holes would obviously improve the model.

Table 14-13: Global Comparisons at 0 Cut-off (Inferred, Gilmour South)

Methodology	Zn (%) at >0.0 Cut-off (Cat. 1–3)	Pb (%) at >0.0 Cut-off (Cat. 1–3)
Raw assays uncapped (clustered/de-clustered)	3.26/2.84	0.77/0.72
Composite capped (clustered/de-clustered)	2.82/2.56	0.67/0.63
NN	2.35	0.63
ID^2 using true distance	2.81	0.73
Methodology	**Cu (%) at >0.0 Cut-off (Cat. 1–3)**	**Ag (g/t) at >0.0 Cut-off (Cat. 1–3)**
Raw assays uncapped (clustered)	0.20	20.9
Composite capped (clustered)	0.17	17.9
NN	0.09	18.5
ID^2 using true distance	0.10	22.0

14.2.15 Local Comparisons – Grade Profile

Comparison of the grade profiles (swath plots) of the raw assay, composites, and estimated grades allow for visual verification of an over- or underestimation of the block grades at the global and local scales. A qualitative assessment of the smoothing and variability of the estimates can also be observed from the plots. The output consists of three swath plots, generated at four-times the block model matrix size, or intervals of 20 m in the X direction, 40 m in the Y direction, and 20 m vertically (Z).

The ID^2 estimates should be smoother than the NN estimates; the NN estimate should fluctuate around the ID^2 estimates on the plots or, display a slightly higher grade. The composite lines are generally located between the assay and the interpolated grades. A model with good composite distribution should show very few crossovers between the composites and the interpolated grade lines on the plots. In the fringes of the deposits, as composite data points become sparse, crossovers are often unavoidable. The swath size also controls this effect to a certain extent; if the swaths are too small, then fewer composites will be encountered, which usually results in a very erratic line on the plots.

Due to the orientation of the Gilmour South deposit, the swath plot should show the best results in the Y and Z axes for this model.

In general, the swath plots show good agreement, with the three methodologies showing no major local bias. The peaks and valleys on the assay and composite lines are well represented in the resource model, with the interpolated model offering more smoothing. The smoothing resulted in a few crossovers, mainly due to the low number of composites.

Grade profiles for zinc are presented on Figure 14-6 and Figure 14-7. The profile for the X chart was omitted. Swath plots for lead, copper, and silver are not shown, but display the same patterns.

Figure 14-6: Y Axis Swath Plots (Inferred Classification – Principal Zones Only)

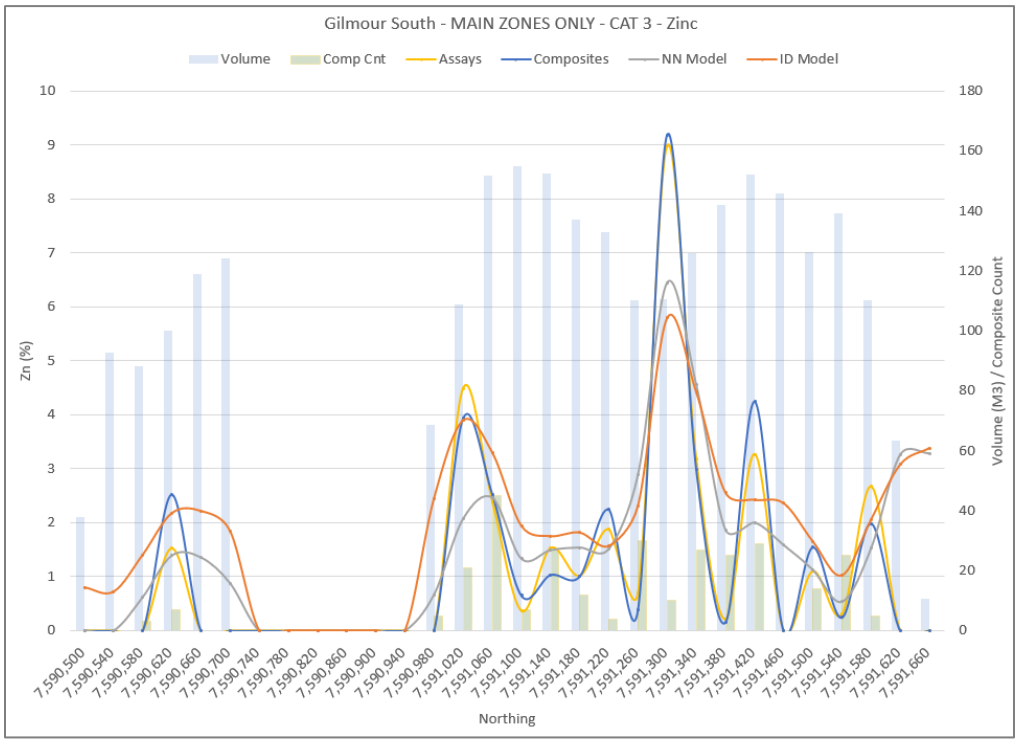
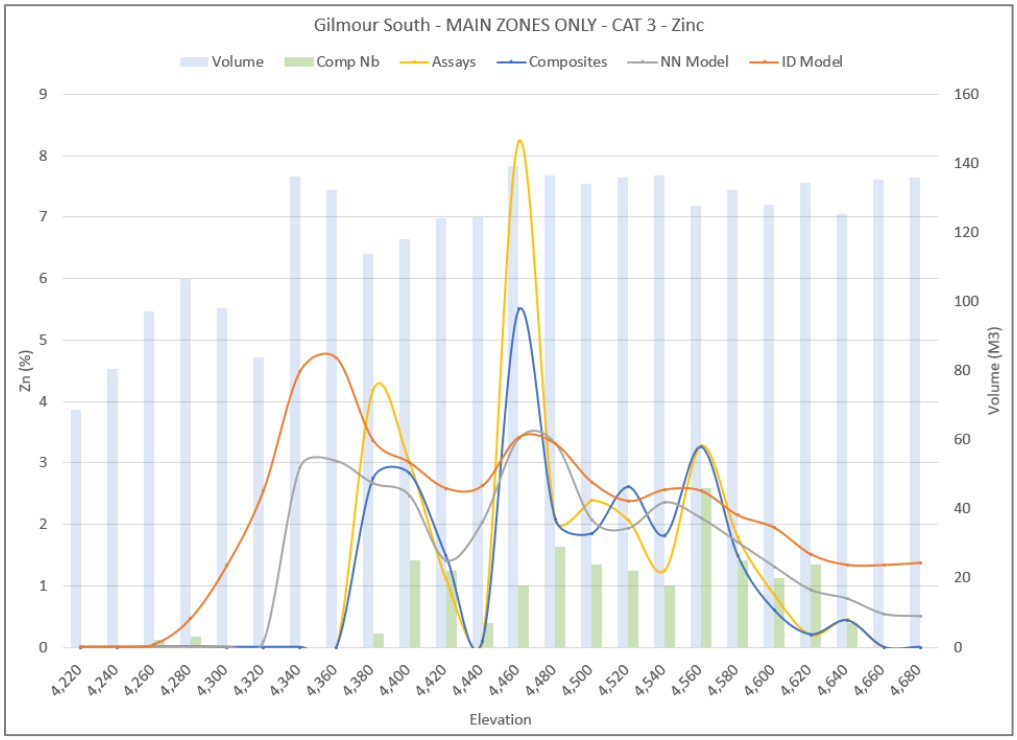


Figure 14-7: Z Axis Swath Plots (Inferred Classification – Principal Zones Only)



14.2.16 Naïve Cross-Validation Test

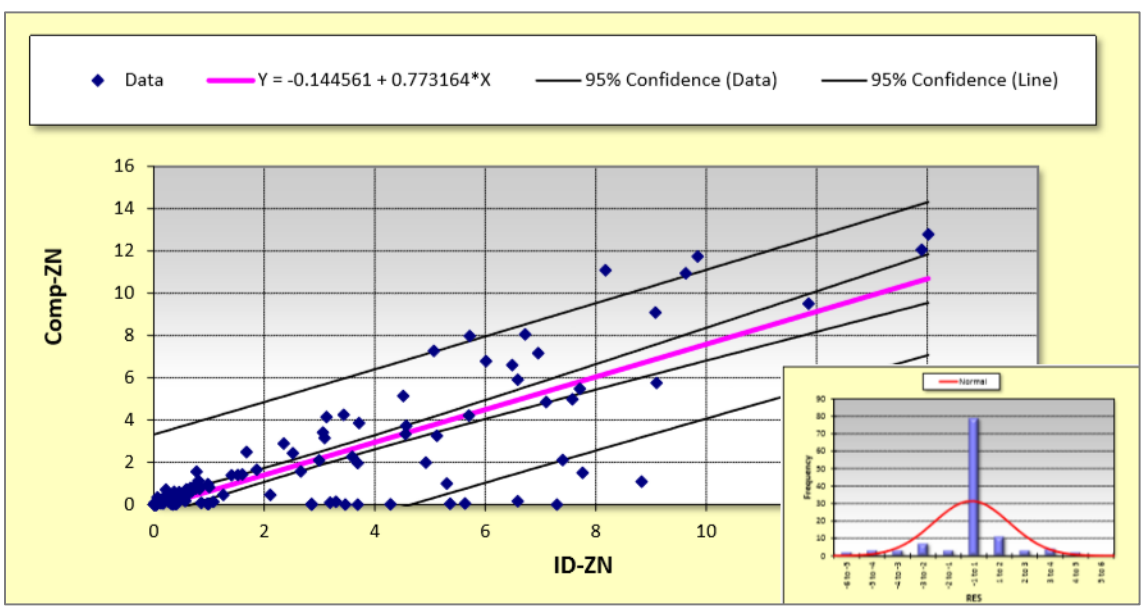
A comparison of the average grade of the composites within a block with the estimated grade of that block provides an assessment of the estimation process close to measured data. Pairing of these grades on a scatter plot gives a statistical valuation of the estimates. This methodology is distinct from "jackknifing," which replaces a composite with a pseudo-block at the same location, and evaluates and compares the estimated grade of the pseudo-block against that of the composite grade.

It is anticipated that the estimated block grades should be similar (while not exactly the same value) to the composited grades within the block.

A high correlation coefficient (R^2) indicates satisfactory interpolation process results, while a medium to low correlation coefficient indicates larger differences in the estimates or a low data density. Results from the pairing of the composited and estimated grades within blocks pierced by a drill hole are presented on Figure 14-8. Out of 117 pairs, the R^2 value is moderate, at 0.68 R^2. The slope of the regression is 0.77 indicating a slight positive bias.

The regression residuals are the differences, on a case-by-case basis, between the actual Y values and the values calculated by the best-fit equation. These can be evaluated for normality and randomness. The inset image on Figure 14-8 shows the residual distribution. The chart shows a normally distributed bell curve with a slight positive bias.

Figure 14-8: Naïve Cross-Validation Test Results



14.3 Key Anacon – Main Deposit

14.3.1 Geological Interpretation

At the Key Anacon Main and Titan deposit, the bulk of the mineralization is trapped in fold noses and in elongated lenses between the mafic volcanic unit of the Little River Formation (OLR-5F2) and the barren felsic tuff units of the Nepisiguit Falls Formation. Within the Nepisiguit Falls Formation, stacked mineralized lenses are usually separated by barren felsic tuff units. In order to assist in modelling the deposit, a preliminary mafic volcanic 3D wireframe was modelled along with a tuff 3D surface, in order to limit the interpretation in the northern portion of the deposit. These wireframes are not final, and they were only used to assist in the interpretation of the mineralized zones.

As at Gilmour South, Osisko Metals and prior operators only assayed material at Key Anacon bearing signs of mineralization. It is likely that the criteria used in the historical holes was based on sulphide content; for that reason, the mineralized zones are easily identifiable in cross-sections. A separate code MS (massive sulphide code 71*) SSM (semi-massive sulphide Code 72*) was used for the 2000–2017 and 2018 drilling. The codes, generally correspond to a grade between 2.0% to 4.0% ZnEq or above, although exceptions occur. Grades lower than 2% Zn+Pb often occur in the SMS Code 72, although this is not as consistent, since a significant amount of lower-grade mineralization also occurs in the felsic tuff (2T2).

A grade at or above 1.0% Zn+Pb was targeted to outline the mineralized zones. Lithology was taken into account in order to ensure that the various zones were projected correctly between sections. The 3D wireframes were constructed conventionally with polylines and tie lines, and most wireframes were reconciled in both sections and plans.

The wireframes show large pockets of massive sulphide mineralization trapped in fold noses, and also in elongated, discrete, and medium to narrow zones of mineralization away from the folding.

Four groups of mineralized zones (Zone Group) were defined, namely the Key Anacon Main Zone (KA-MZ), Key Anacon Main Zone East (KA-MZE), Key Anacon Southeast Zone (KA-SE) and Key Anacon Northwest Zone (KA-NW).

Copper was examined separately, and occurs without significant lead and zinc in minor amounts, which was deemed not significant enough to wireframe separately. A pocket of high-grade copper mineralization (>1.00%) occur in the model. This pocket is predominantly located in the upper section of the Main Zone above the 400 level mine working at 4,955 m elevation.

14.3.2 Wireframe Volume

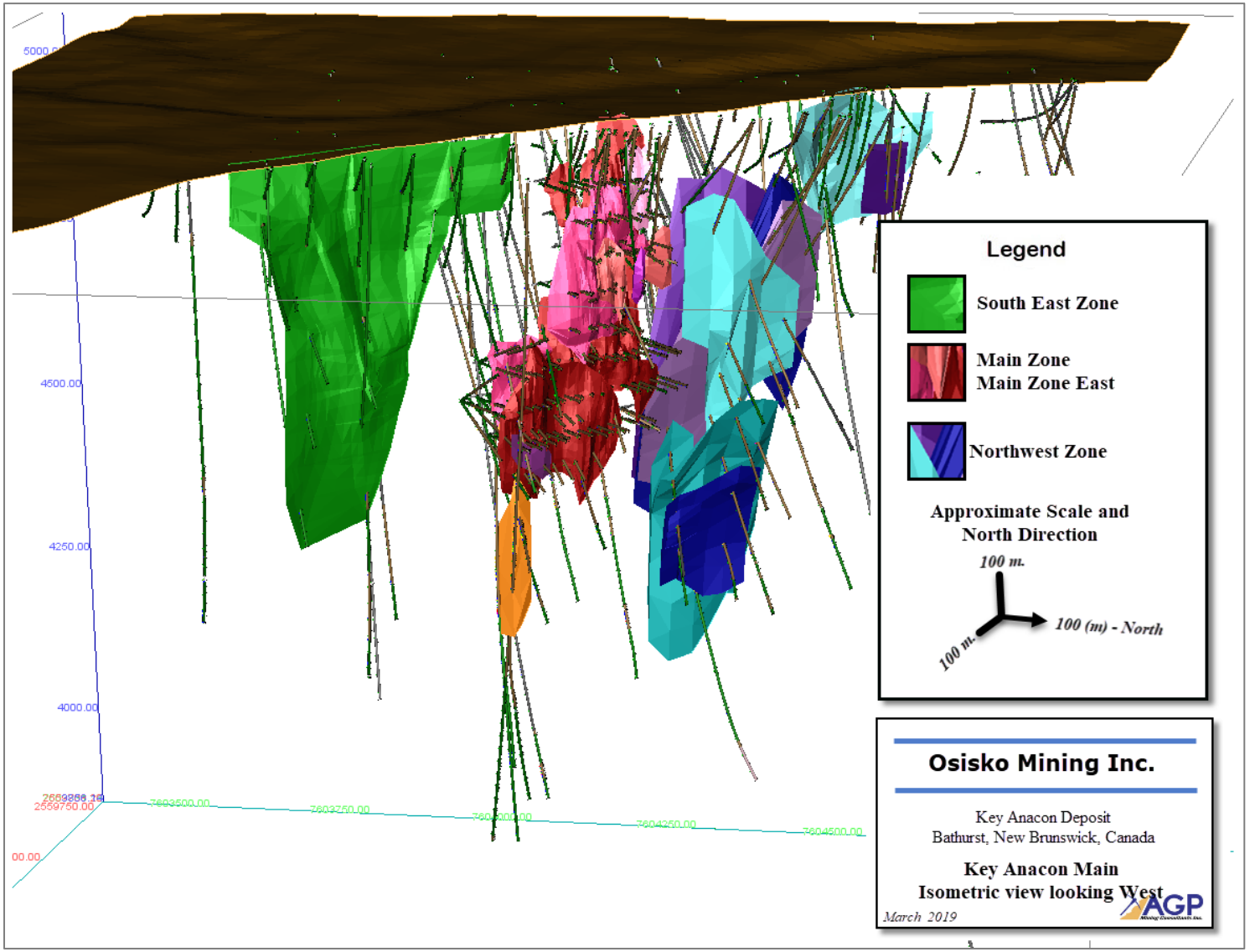
The total wireframe volume of the mineralized zones amounted to 3,022,459 m^3 (Table 14-14).

Figure 14-9 shows the position of the mineralized wireframes in relation to the drill holes.

Table 14-14: Anacon Main Deposit Wireframe Volume

Zone Group (abbreviation and group code)	GEMS Mineralized Lens Name			Lens Rock Code	Lens Volume (m^3)
	NAME1	NAME2	NAME3		
South East Zone (KA-SE – KA1100 Series)	KA	SE	FINAL	KA1100	428,561
Main Zone (KA-MZ – KA1300 Series)	KA	MZ-Union	FINAL	KA1310	592,943
	KA	MZ-02	FINAL	KA1320	14,388
	KA	MZ-03	FINAL	KA1330	3,465
	KA	MZ-04	FINAL	KA1340	11,855
	KA	MZ-05	FINAL	KA1350	11,557
	KA	MZ-06	FINAL	KA1360	6,103
	KA	MZ-07	FINAL	KA1370	6,782
Main Zone East (KA-MZE – KA1200 Series)	KA	MZE-01	FINAL	KA1210	138,802
	KA	MZE-02	FINAL	KA1220	9,558
	KA	MZE-03Union	FINAL	KA1230	108,961
	KA	MZE-04	FINAL	KA1240	20,799
Northwest Zone (KA-MZW – KA1400 Series)	KA	NW-01	FINAL	KA1400	171,447
	KA	NW-02Union	FINAL	KA1410	481,919
	KA	NW-03	FINAL	KA1420	140,921
	KA	NW-04	FINAL	KA1430	180,970
	KA	NW-05	FINAL	KA1440	279,920
	KA	NW-06	FINAL	KA1450	173,156
	KA	NW-07	FINAL	KA1460	61,294
	KA	NW-08	FINAL	KA1470	165,643
	KA	NW-09	FINAL	KA1480	5,434
	KA	NW-10	FINAL	KA1490	7,981
Total Volume					**3,022,459**

Figure 14-9: Position of the 3D Wireframes, Key Anacon Main Deposit



14.3.3 Exploratory Data Analysis

14.3.4 Assays

The raw assay statistics were evaluated, grouping all assays intersecting the various domains. Table 14-15 provides descriptive statistics for raw, uncapped assays in the various domains.

Table 14-15: Descriptive Raw Assay Statistics (Key Anacon Main)

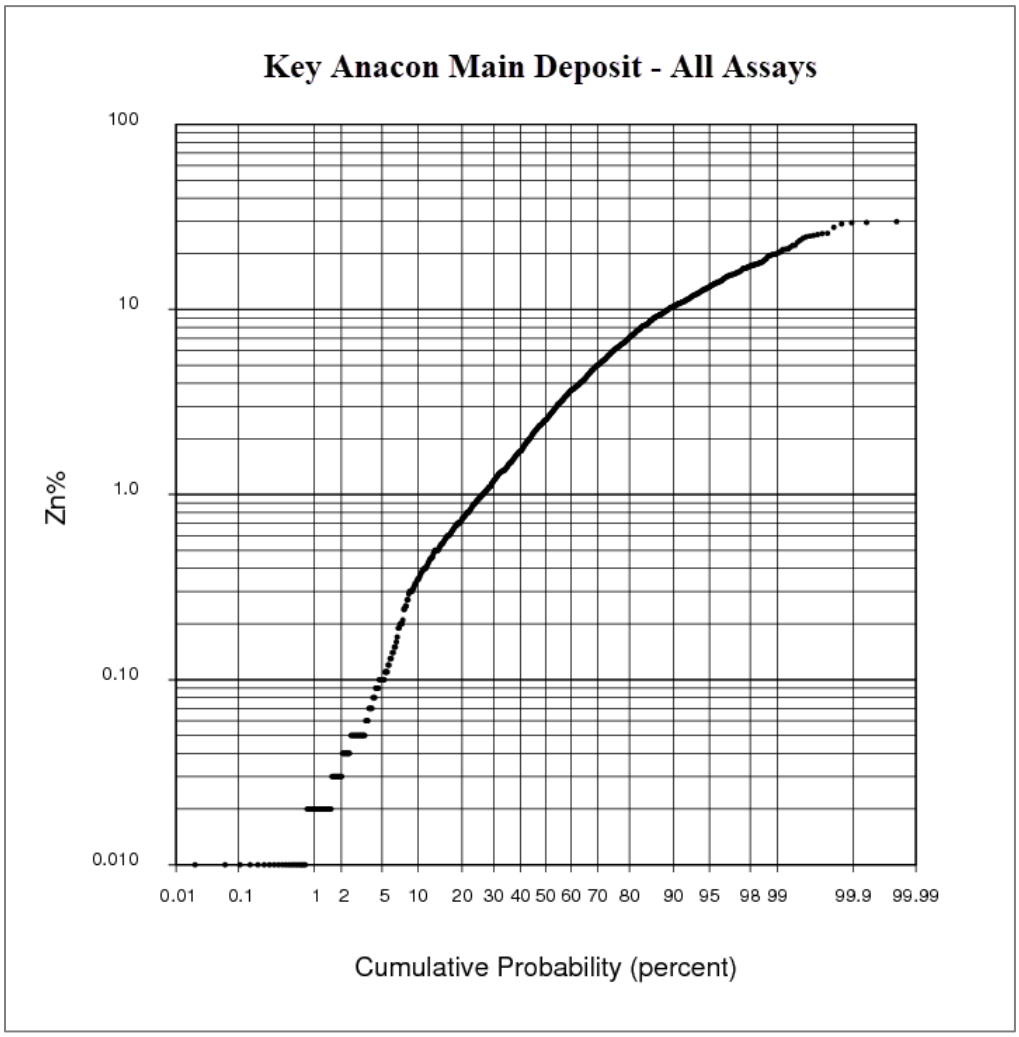
Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc (%)	South East KA1100	115	2.62	2.28	0.87	0.0	13.54	0.12	0.47	0.86	1.96	3.78	5.98	6.80	12.83
Lead (%)	South East KA1100	115	0.66	0.66	1.00	0.0	3.61	0.00	0.01	0.15	0.44	1.11	1.60	1.95	3.42
Copper (%)	South East KA1100	115	0.06	0.28	4.69	0.0	2.41	0.00	0.00	0.00	0.00	0.01	0.04	0.18	2.20
Silver (g/t)	South East KA1100	115	25	33.4	1.4	0.0	211.20	0.00	0.70	5.70	13.71	32.91	56.58	74.06	210.32
Zinc (%)	ALL Main Zone E	304	4.98	4.00	0.80	0.0	24.30	0.31	0.64	1.89	4.31	7.00	10.38	12.28	19.43
	KA1210	149	5.60	4.18	0.75	0.0	21.10	0.20	0.50	2.46	4.90	8.18	10.70	13.74	20.30
	KA1220	11	6.54	3.21	0.49	2.6	12.68	-	2.57	3.84	6.30	8.35	12.20	-	-
	KA1230	126	4.54	3.81	0.84	0.0	24.30	0.53	0.79	1.75	3.70	6.29	10.01	12.07	21.67
	KA1230	18	1.91	1.80	0.94	0.1	7.21	-	0.09	0.27	1.72	2.38	4.83	-	-
Lead (%)	ALL Main Zone E	304	1.95	1.77	0.91	0.0	9.72	0.06	0.15	0.53	1.57	2.90	4.28	5.16	8.13
	KA1210	149	2.27	1.87	0.82	0.0	9.10	0.08	0.15	0.92	2.00	3.33	4.40	6.00	8.62
	KA1220	11	3.22	2.06	0.64	0.5	6.60	-	0.67	1.53	2.38	5.30	6.56	-	-
	KA1230	126	1.64	1.54	0.94	0.0	9.72	0.06	0.15	0.50	1.16	2.30	3.70	4.40	8.82
	KA1230	18	0.61	0.86	1.39	0.0	3.48	-	0.05	0.14	0.29	0.72	1.97	-	-
Copper (%)	ALL Main Zone E	304	0.08	0.11	1.42	0.0	1.20	0.00	0.00	0.02	0.06	0.10	0.14	0.20	0.55
	KA1210	149	0.09	0.11	1.19	0.0	1.12	0.00	0.01	0.05	0.08	0.11	0.15	0.23	0.84
	KA1220	11	0.05	0.05	1.04	0.0	0.18	-	0.00	0.00	0.06	0.08	0.16	-	-
	KA1230	126	0.07	0.12	1.67	0.0	1.20	0.00	0.00	0.00	0.06	0.09	0.11	0.16	0.96
	KA1230	18	0.04	0.10	2.84	0.0	0.45	-	0.01	0.01	0.01	0.02	0.06	-	-
Silver (g/t)	ALL Main Zone E	304	62	71.6	1.2	0.0	442	0	3	11	34	87	158	199	367
	KA1210	149	80	76.3	1.0	0.0	442	3	7	23	58	117	176	243	377
	KA1220	11	103	139.8	1.4	0.0	377	-	0	0	65	120	376	-	-
	KA1230	126	40	48.6	1.2	0.0	278	0	0	8	23	55	99	122	275
	KA1230	18	36	59.0	1.7	4.1	221	-	6	8	11	36	170	-	-
Zinc (%)	ALL Main Zone	1220	5.20	4.92	0.95	0.0	29.84	0.24	0.55	1.35	3.70	7.77	11.95	15.00	22.24
	KA1310	1135	5.36	5.00	0.93	0.0	29.84	0.27	0.57	1.45	3.82	8.10	12.20	15.21	22.79
	KA1320	10	2.18	1.74	0.80	0.5	5.26	-	0.51	0.68	1.97	3.46	5.23	-	-
	KA1330	7	2.05	2.73	1.33	0.1	8.05	-	-	0.56	1.52	1.87	-	-	-
	KA1340	24	2.35	2.06	0.88	0.4	9.10	0.38	0.42	0.89	1.78	3.20	5.49	8.35	-
	KA1350	31	3.24	2.69	0.83	0.1	9.40	0.08	0.50	1.22	2.94	4.45	7.81	9.17	-
	KA1360	9	2.35	2.88	1.23	0.0	7.84	-	0.02	0.10	0.76	4.95	-	-	-
	KA1370	4	10.43	5.66	0.54	5.0	17.20	-	-	5.38	9.78	16.13	-	-	-

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Lead (%)	ALL Main Zone	1220	2.07	2.53	1.22	0.0	28.60	0.05	0.12	0.34	1.19	2.94	5.07	7.15	12.02
	KA1310	1135	2.15	2.59	1.20	0.0	28.60	0.06	0.13	0.36	1.25	3.18	5.19	7.30	12.39
	KA1320	10	0.89	1.14	1.27	0.0	3.50	-	0.00	0.00	0.67	1.31	3.36	-	-
	KA1330	7	0.54	0.62	1.15	0.2	1.85	-	-	0.17	0.25	0.81	-	-	-
	KA1340	24	0.64	0.76	1.19	0.0	3.60	0.00	0.04	0.19	0.39	0.81	1.41	3.08	-
	KA1350	31	1.02	0.99	0.97	0.0	3.57	0.00	0.08	0.26	0.48	1.78	2.53	3.06	-
	KA1360	9	0.74	0.89	1.20	0.0	2.20	-	0.00	0.03	0.36	1.67	-	-	-
	KA1370	4	4.07	2.40	0.59	1.8	6.54	-	-	1.89	4.00	6.33	-	-	-
Copper (%)	ALL Main Zone	1220	0.24	0.54	2.26	0.0	5.73	0.00	0.00	0.02	0.08	0.18	0.61	0.99	3.07
	KA1310	1135	0.25	0.55	2.21	0.0	5.73	0.00	0.00	0.03	0.08	0.20	0.64	1.08	3.11
	KA1320	10	0.00	0.00	-	0.0	0.00	-	0.00	0.00	0.00	0.00	0.00	-	-
	KA1330	7	0.15	0.04	0.24	0.1	0.20	-	-	0.14	0.16	0.16	-	-	-
	KA1340	24	0.06	0.05	0.76	0.0	0.21	0.00	0.00	0.02	0.08	0.10	0.12	0.19	-
	KA1350	31	0.05	0.06	1.28	0.0	0.20	0.00	0.00	0.00	0.00	0.09	0.13	0.18	-
	KA1360	9	0.08	0.05	0.59	0.0	0.14	-	0.00	0.03	0.08	0.11	-	-	-
	KA1370	4	0.00	0.00	-	0.0	0.00	-	-	0.00	0.00	0.00	-	-	-
Silver (g/t)	ALL Main Zone	1220	68	104.1	1.5	0.0	1090	0	0	8	27	82	183	278	477
	KA1310	1135	71	106.9	1.5	0.0	1090	0	0	8	30	89	192	290	480
	KA1320	10	31	31.1	1.0	0.0	82	-	0	0	31	56	81	-	-
	KA1330	7	10	7.7	0.8	4.1	25	-	-	4	6	14	-	-	-
	KA1340	24	15	16.8	1.1	0.0	79	0	1	5	13	18	38	70	-
	KA1350	31	31	32.7	1.1	0.0	119	0	0	7	21	56	83	106	-
	KA1360	9	19	23.5	1.3	0.6	63	-	1	1	9	40	-	-	-
	KA1370	4	0	0.0	-	0.0	0	-	-	0	0	0	-	-	-
Zinc (%)	ALL Northwest Z	755	2.30	3.43	1.49	0.0	25.10	0.02	0.06	0.46	1.17	2.60	5.31	9.32	19.80
	KA1400	82	3.18	3.95	1.24	0.0	19.84	0.03	0.11	0.71	1.57	3.81	8.92	11.95	-
	KA1410	108	3.30	4.89	1.48	0.0	25.10	0.05	0.23	0.65	1.36	3.61	9.48	17.18	24.80
	KA1420	67	1.27	1.26	0.99	0.0	7.27	0.04	0.09	0.50	1.02	1.60	2.58	4.07	-
	KA1430	68	1.74	2.14	1.23	0.0	11.97	0.05	0.07	0.45	0.93	2.72	4.09	6.65	-
	KA1440	155	2.34	3.71	1.58	0.0	24.70	0.03	0.05	0.32	1.00	2.90	5.71	10.21	22.35
	KA1450	64	1.88	1.76	0.94	0.0	9.25	0.04	0.16	0.75	1.31	2.56	4.05	5.82	-
	KA1460	34	1.31	1.62	1.23	0.0	7.80	0.02	0.03	0.45	0.80	1.38	3.34	6.08	-
	KA1470	155	2.34	3.51	1.50	0.0	21.20	0.01	0.01	0.30	1.30	2.80	5.14	10.52	19.88
	KA1480	6	1.39	0.65	0.47	0.7	2.37	-	-	0.83	1.23	2.05	-	-	-
	KA1490	16	0.89	0.60	0.67	0.0	2.20	-	0.05	0.56	0.82	1.26	1.84	-	-
Lead (%)	ALL Northwest Z	755	0.78	1.29	1.66	0.0	9.16	0.01	0.02	0.11	0.33	0.78	1.92	3.53	6.87
	KA1400	82	1.25	1.58	1.26	0.0	6.99	0.01	0.03	0.20	0.55	1.71	3.46	5.14	-
	KA1410	108	1.20	1.91	1.60	0.0	9.16	0.02	0.03	0.16	0.47	1.04	3.90	6.39	9.04
	KA1420	67	0.42	0.50	1.18	0.0	2.98	0.02	0.04	0.13	0.27	0.54	1.03	1.53	-
	KA1430	68	0.52	0.65	1.26	0.0	3.49	0.01	0.02	0.14	0.27	0.65	1.30	2.16	-
	KA1440	155	0.88	1.46	1.66	0.0	7.97	0.01	0.02	0.10	0.34	0.88	2.26	4.24	7.38

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
	KA1450	64	0.69	1.00	1.46	0.0	4.93	0.02	0.05	0.14	0.40	0.75	1.60	3.39	-
	KA1460	34	0.47	0.67	1.44	0.0	3.48	0.01	0.03	0.13	0.22	0.51	1.27	2.24	-
	KA1470	155	0.57	0.94	1.65	0.0	5.51	0.00	0.00	0.02	0.23	0.74	1.35	2.52	5.33
	KA1480	6	0.48	0.19	0.40	0.3	0.77	-	-	0.32	0.40	0.68	-	-	-
	KA1490	16	0.27	0.24	0.88	0.0	0.71	-	0.01	0.06	0.23	0.45	0.70	-	-
Copper (%)	ALL Northwest Z	755	0.04	0.11	3.10	0.0	1.68	0.00	0.00	0.01	0.01	0.03	0.07	0.12	0.45
	KA1400	82	0.03	0.03	1.05	0.0	0.14	0.00	0.01	0.01	0.02	0.03	0.09	0.12	-
	KA1410	108	0.02	0.02	1.04	0.0	0.09	0.00	0.00	0.01	0.01	0.02	0.06	0.08	0.09
	KA1420	67	0.01	0.01	0.69	0.0	0.03	0.00	0.00	0.00	0.01	0.01	0.02	0.03	-
	KA1430	68	0.03	0.06	1.80	0.0	0.38	0.00	0.00	0.01	0.02	0.03	0.06	0.18	-
	KA1440	155	0.05	0.10	1.94	0.0	0.93	0.00	0.00	0.01	0.02	0.06	0.11	0.21	0.67
	KA1450	64	0.05	0.08	1.66	0.0	0.52	0.00	0.01	0.01	0.02	0.04	0.11	0.17	-
	KA1460	34	0.04	0.04	0.96	0.0	0.16	0.01	0.01	0.01	0.02	0.05	0.10	0.15	-
	KA1470	155	0.03	0.12	4.50	0.0	1.20	0.00	0.00	0.00	0.01	0.01	0.03	0.07	1.03
	KA1480	6	0.02	0.01	0.51	0.0	0.04	-	-	0.01	0.02	0.03	-	-	-
	KA1490	16	0.21	0.53	2.55	0.0	1.68	-	0.00	0.00	0.01	0.01	1.53	-	-
Silver (g/t)	ALL Northwest Z	755	26	49.6	1.9	0.0	433	1	2	4	11	24	60	127	260
	KA1400	82	56	78.6	1.4	0.3	393	1	2	6	22	77	166	230	-
	KA1410	108	34	50.2	1.5	0.2	265	2	3	8	18	29	81	163	263
	KA1420	67	12	12.5	1.0	0.2	84	1	2	4	9	16	25	34	-
	KA1430	68	16	19.9	1.2	0.7	128	1	2	6	11	18	40	50	-
	KA1440	155	35	66.8	1.9	0.5	433	1	2	5	14	31	80	174	412
	KA1450	64	21	29.7	1.4	0.3	182	1	2	5	12	26	47	95	-
	KA1460	34	14	13.1	1.0	1.4	53	3	4	6	9	17	38	51	-
	KA1470	155	16	31.8	2.0	0.0	199	0	0	2	5	14	40	72	197
	KA1480	6	15	6.6	0.4	8.1	28	-	-	11	14	18	-	-	-
	KA1490	16	3	2.2	0.7	0.4	8	-	1	1	3	5	7	-	-

AGP notes that copper grades are very low at the Key Anacon Main deposit except for the upper section of the Main Zone as stated earlier. The frequency distribution of the raw assays (Figure 14-10) shows a smooth distribution, with a low CV. About 95% of the zinc assays are below 10.5%, and 6% of the lead assays are below 6%.

Figure 14-10: Raw Assay Frequency Distribution, Zinc in All Domains



14.3.5 Capping

The grade capping analysis was carried out on the Zone Group only, and not on the individual lenses. The decile analysis results indicated grade capping was marginally warranted on all Zone Groups except for copper, which exhibited more variability. The raw assays' low CV for the KA-NW, KA-MZ, KA-MZE, and KA-SE Zone Groups for zinc, lead, and silver indicated that the capping thresholds do not need to be too aggressive. The CV for the copper zone indicates more variability, and thus may require a more aggressive capping scenario.

After conducting a careful examination of the data set, AGP elected to apply a hard cap on the raw assay data prior to compositing, with no search restriction on the mild outlier populations.

Raw Assay Capping

Capping values were selected with the aid of probability plots and degradation analysis. Table 14-16 shows a summary of the treatment of high-grade outliers during interpolation. The cap values selected were generally near the 99th percentile of the raw assay distribution.

Table 14-16: High-Grade Treatments for Key Anacon Main

Zone Group (group code)	Element	Cap Used	No. Sample	Total No. Sample	Percent Affected
KA-SE (KA1100 Series)	Zn (%)	8	3	115	2.6
	Pb (%)	2	4	115	3.5
	Cu (%)	0.1	8	115	7
	Ag (g/t)	80	5	115	4.3
KA-MZE (KA1200 Series)	Zn (%)	15	6	304	2
	Pb (%)	8	4	304	1.3
	Cu (%)	0.5	3	304	1
	Ag (g/t)	300	5	304	1.6
KA-MZ (KA1300 Series)	Zn (%)	25	8	1,220	0.7
	Pb (%)	14	6	1,220	0.5
	Cu (%)	3.5	10	1,220	0.8
	Ag (g/t)	700	3	1,220	0.2
KA-NW (KA1400 Series))	Zn (%)	21	4	755	0.5
	Pb (%)	7	4	755	0.5
	Cu (%)	0.28	11	755	1.5
	Ag (g/t)	250	8	755	1.1

The raw assay capping scenario reduced the CV below 2 for most domains, except for the copper in the KA-SE and KA-MZ zones (Table 14-17).

Table 14-17: Raw Assay CV Before and After Capping

Zone Group (group code)	Element	CV (Uncapped)	CV (Capped)
KA-SE (KA1100 Series)	Zn	0.87	0.81
	Pb	1.00	0.93
	Cu	4.69	2.11
	Ag	1.36	1.00
KA-MZE (KA1200 Series)	Zn	0.80	0.76
	Pb	0.91	0.89
	Cu	1.42	1.02
	Ag	1.16	1.11

Zone Group (group code)	Element	CV (Uncapped)	CV (Capped)
KA-MZ (KA1300 Series)	Zn	0.95	0.94
	Pb	1.23	1.18
	Cu	2.26	2.11
	Ag	1.53	1.50
KA-NW (KA1400 Series))	Zn	1.49	1.47
	Pb	1.66	1.63
	Cu	3.10	1.63
	Ag	1.87	1.70

Total Metal Affected by the Treatment of Outliers

The total metal affected by the treatment of outliers was evaluated in the final model. At a 5.5% ZnEq cut-off, the capping strategy removed 0.9% of the in-situ zinc metal, 0.5% of the lead, 1.3% of the copper, and 0.7% of the silver in the Indicated category. The Inferred category was more affected by capping, likely due to the wider drill spacing and more erratic grades. At a 5.5% ZnEq cut-off, the capping strategy removed 5.8% of the in-situ zinc metal, 6.8% of the lead, 67.4% of the copper, and 8.5% of the silver, as shown in Table 14-18. In the KA-SE and KA-NW zones, where most of the Inferred Resources are located, copper shows only a few ultra-high assays followed by much lower grades, and so the amount of metal removed was disproportionately affected by the capping scenario.

Table 14-18: Metal Removed by Capping Strategy (Key Anacon Main Deposit)

Class	Cut-off (ZnEq%)	Zn Metal (%)	Pb Metal (%)	Cu Metal (%)	Ag Metal (%)
Indicated	>6.0	-1.1	-0.6	-1.2	-0.8
	>5.5	-0.9	-0.5	-1.3	-0.7
	>4.0	-0.7	-0.3	-1.8	-0.6
	>0.0	-0.6	-0.3	-1.6	-0.5
Inferred	>6.0	-8.8	-10.0	-72.2	-10.5
	>5.5	-5.8	-6.8	-67.4	-8.5
	>4.0	-4.4	-4.8	-57.2	-8.2
	>0.0	-0.8	-1.7	-34.7	-3.5

14.3.6 Composites

From the sampling length statistics described above, AGP elected to use a composite length of 1.5 m, except for the underground drill holes, which were composited at 3.0 m. The composite size selected is at or above the third quartile, and allows grade variations to be represented while reducing the variance.

Assays were length-weight averaged, and any grade capping was applied to the raw assay data prior to compositing. True gaps in sampling were composited at zero grade. The Key Anacon Main deposit has underground drifts and cross cuts but no stopes or large voids. The drifts and cross cuts do not create a problem, since the openings are restricted to the hanging wall of the mineralization.

The composite intervals were created by moving downward from the collar of the holes toward the hole bottoms. Composite lengths are automatically adjusted by the software to leave no remnants at the intersections with the wireframes. The adjustments resulted in composite lengths ranging between 0.75 m and 4.50 m, with 45.8% of the composites ranging between 1.25 m and 1.75 m, and a further 33.5% of the composites ranging between 2.75 m and 3.25 m. **Error! Not a valid bookmark self-reference.** shows the descriptive statistics for the composites point-located within the mineralized envelope only.

Table 14-19: Descriptive Statistics for Composites – Capped (Key Anacon Main Deposit)

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc (%)	South East KA1100	88	2.51	1.84	0.73	0.00	7.54	7.54	0.38	0.57	1.03	1.97	3.49	5.06	6.61
Lead (%)	South East KA1100	88	0.60	0.52	0.87	0.00	1.83	1.83	0.00	0.07	0.21	0.42	0.98	1.53	1.68
Copper (%)	South East KA1100	88	0.01	0.02	2.43	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.03	0.07
Silver (g/t)	South East KA1100	88	20.0	18.5	0.9	0.0	79.7	79.7	0.0	1.5	5.8	14.0	33.3	46.1	59.0
Zinc (%)	ALL Main Zone E	241	4.54	3.33	0.73	0.00	15.00	15.00	0.23	0.63	1.84	4.10	6.35	9.79	10.75
	KA1210	109	5.03	3.38	0.67	0.00	15.00	15.00	0.21	0.83	2.21	4.90	6.69	9.95	11.83
	KA1220	12	6.50	3.61	0.56	2.55	12.68	10.13	-	2.58	3.09	5.80	9.41	12.68	-
	KA1230	109	4.09	3.20	0.78	0.00	12.30	12.30	0.33	0.57	1.46	3.42	6.12	9.16	10.40
	KA1230	11	1.93	1.20	0.62	0.05	4.51	4.46	-	0.08	1.53	1.90	2.30	4.17	-
Lead (%)	ALL Main Zone E	241	1.82	1.55	0.85	0.00	7.97	7.97	0.07	0.20	0.51	1.50	2.63	4.03	4.80
	KA1210	109	2.12	1.64	0.77	0.00	7.97	7.97	0.11	0.25	0.78	1.79	3.07	4.32	5.63
	KA1220	12	3.30	2.05	0.62	0.47	6.59	6.12	-	0.77	1.66	2.58	5.30	6.53	-
	KA1230	109	1.49	1.24	0.83	0.00	4.81	4.81	0.05	0.12	0.43	1.21	2.38	3.34	4.05
	KA1230	11	0.48	0.38	0.80	0.10	1.25	1.15	-	0.10	0.24	0.30	0.76	1.21	-
Copper (%)	ALL Main Zone E	241	0.07	0.07	1.01	0.00	0.50	0.50	0.00	0.00	0.01	0.06	0.09	0.12	0.18
	KA1210	109	0.08	0.06	0.73	0.00	0.30	0.30	0.00	0.02	0.04	0.07	0.10	0.15	0.21
	KA1220	12	0.04	0.05	1.33	0.00	0.18	0.18	-	0.00	0.00	0.02	0.06	0.15	-
	KA1230	109	0.06	0.07	1.14	0.00	0.50	0.50	0.00	0.00	0.00	0.06	0.09	0.10	0.13
	KA1230	11	0.05	0.13	2.59	0.00	0.45	0.45	-	0.01	0.01	0.01	0.02	0.36	-
Silver (g/t)	ALL Main Zone E	241	54.7	60.9	1.1	0.0	300.0	300.0	0.0	0.0	10.0	31.5	78.5	141.3	175.3
	KA1210	109	75.0	64.2	0.9	0.0	296.6	296.6	4.6	6.9	22.1	65.9	112.7	158.5	205.7
	KA1220	12	76.6	112.1	1.5	0.0	300.0	300.0	-	0.0	0.0	24.7	113.2	300.0	-
	KA1230	109	35.3	43.1	1.2	0.0	237.4	237.4	0.0	0.0	5.5	21.0	51.5	94.9	108.7
	KA1230	11	22.2	19.8	0.9	6.2	60.2	54.0	-	6.6	8.2	11.2	29.9	59.8	-

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc (%)	ALL Main Zone	1191	4.54	4.33	0.95	0.00	25.00	25.00	0.00	0.16	1.14	3.19	6.85	10.85	12.96
	KA1310	1102	4.71	4.40	0.93	0.00	25.00	25.00	0.00	0.21	1.23	3.37	7.20	11.03	13.12
	KA1320	10	1.60	1.63	1.02	0.00	4.92	4.92	-	0.01	0.37	1.02	3.15	4.75	-
	KA1330	7	1.77	1.85	1.04	0.05	5.73	5.68	-	-	0.61	1.52	1.68	-	-
	KA1340	22	2.04	1.95	0.95	0.00	9.09	9.09	0.00	0.00	0.85	1.83	2.70	3.81	8.32
	KA1350	36	2.52	2.39	0.95	0.00	7.59	7.59	0.00	0.00	0.69	1.63	3.27	7.20	7.51
	KA1360	7	1.74	1.75	1.01	0.00	4.65	4.65	-	-	0.10	2.18	2.90	-	-
	KA1370	7	6.27	4.17	0.67	0.84	14.32	13.48	-	-	3.71	5.85	7.55	-	-
Lead (%)	ALL Main Zone	1191	1.76	2.07	1.18	0.00	14.00	14.00	0.00	0.02	0.28	1.00	2.58	4.56	5.89
	KA1310	1102	1.83	2.11	1.15	0.00	14.00	14.00	0.00	0.03	0.30	1.07	2.77	4.62	6.05
	KA1320	10	0.70	1.10	1.57	0.00	3.50	3.50	-	0.00	0.00	0.15	1.15	3.28	-
	KA1330	7	0.48	0.44	0.92	0.16	1.35	1.19	-	-	0.25	0.25	0.81	-	-
	KA1340	22	0.50	0.45	0.89	0.00	1.80	1.80	0.00	0.00	0.19	0.40	0.69	1.12	1.70
	KA1350	36	0.77	0.86	1.11	0.00	2.65	2.65	0.00	0.00	0.08	0.38	1.43	2.39	2.55
	KA1360	7	0.66	0.67	1.02	0.00	1.52	1.52	-	-	0.03	0.47	1.28	-	-
	KA1370	7	2.35	1.36	0.58	0.30	4.78	4.48	-	-	1.75	2.29	2.96	-	-
Copper (%)	ALL Main Zone	1191	0.19	0.40	2.10	0.00	3.36	3.36	0.00	0.00	0.00	0.06	0.15	0.57	0.82
	KA1310	1102	0.20	0.41	2.05	0.00	3.36	3.36	0.00	0.00	0.00	0.06	0.17	0.59	0.89
	KA1320	10	0.00	0.00	-	0.00	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	-
	KA1330	7	0.16	0.04	0.26	0.08	0.20	0.12	-	-	0.14	0.16	0.20	-	-
	KA1340	22	0.05	0.05	0.85	0.00	0.16	0.16	0.00	0.00	0.00	0.05	0.09	0.12	0.15
	KA1350	36	0.03	0.05	1.58	0.00	0.20	0.20	0.00	0.00	0.00	0.00	0.07	0.11	0.14
	KA1360	7	0.07	0.04	0.59	0.00	0.12	0.11	-	-	0.03	0.08	0.09	-	-
	KA1370	7	0.00	0.00	-	0.00	0.00	0.00	-	-	0.00	0.00	0.00	-	-
Silver (g/t)	ALL Main Zone	1191	53.8	84.1	1.6	0.0	700.0	700.0	0.0	0.0	3.1	20.9	67.4	147.6	235.2
	KA1310	1102	56.7	86.5	1.5	0.0	700.0	700.0	0.0	0.0	3.3	22.9	72.0	158.2	243.6
	KA1320	10	22.9	28.7	1.3	0.0	82.3	82.3	-	0.0	0.0	9.9	45.3	79.1	-
	KA1330	7	9.1	5.5	0.6	4.1	19.4	15.3	-	-	5.5	7.5	13.7	-	-
	KA1340	22	12.0	11.1	0.9	0.0	39.4	39.4	0.0	0.0	3.9	9.6	15.3	33.0	38.6
	KA1350	36	23.4	27.8	1.2	0.0	92.1	92.1	0.0	0.0	2.8	12.1	31.0	80.1	85.3
	KA1360	7	16.9	17.5	1.0	0.1	39.7	39.6	-	-	1.0	9.7	32.9	-	-
	KA1370	7	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-
Zinc (%)	ALL Northwest Z	509	2.14	2.98	1.39	0.00	21.00	21.00	0.02	0.10	0.53	1.26	2.44	4.82	7.34
	KA1400	49	3.07	3.30	1.08	0.03	14.37	14.35	0.19	0.41	0.82	1.87	4.65	7.18	11.73
	KA1410	74	3.03	4.32	1.43	0.04	21.00	20.96	0.22	0.38	0.83	1.56	3.17	9.24	15.10
	KA1420	46	1.24	1.06	0.86	0.01	5.11	5.10	0.06	0.22	0.56	0.95	1.51	2.46	4.15
	KA1430	48	1.56	1.51	0.97	0.07	6.40	6.34	0.11	0.16	0.53	1.00	1.92	3.82	5.44
	KA1440	90	2.28	3.36	1.47	0.02	18.17	18.15	0.04	0.10	0.51	1.28	2.49	5.48	10.52

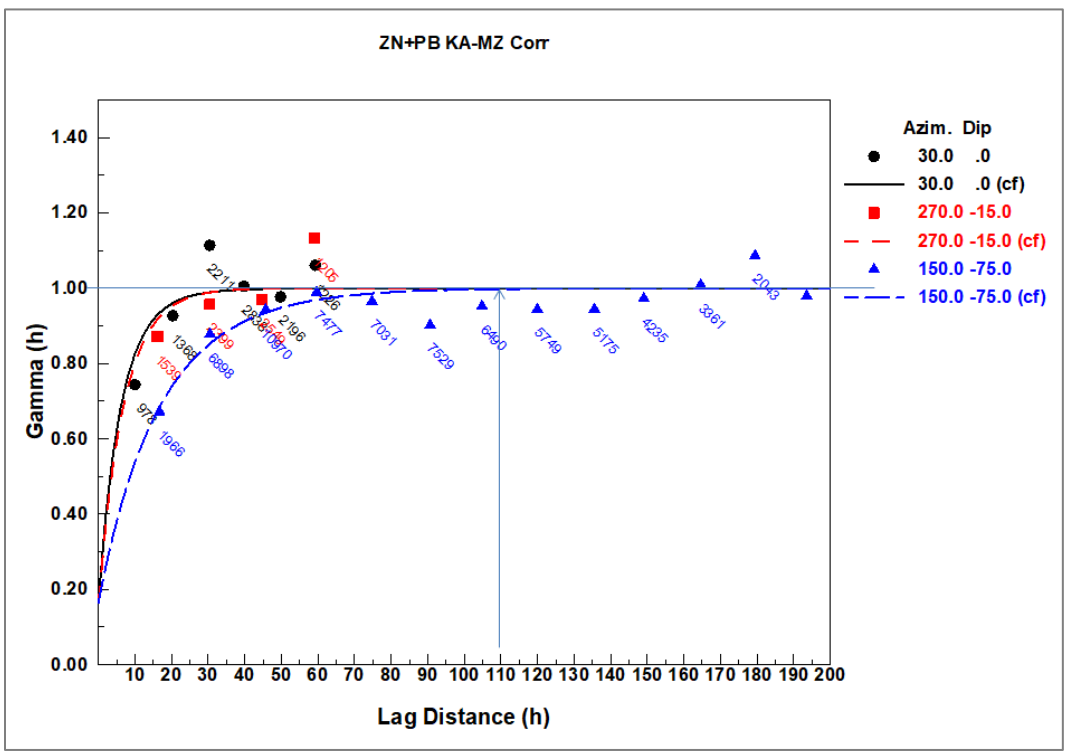
Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
	KA1450	42	1.78	1.44	0.81	0.00	6.90	6.90	0.02	0.14	0.84	1.63	2.51	3.71	4.78
	KA1460	23	1.09	0.87	0.79	0.00	3.13	3.13	0.00	0.01	0.42	0.94	1.47	2.61	3.07
	KA1470	122	2.16	3.08	1.42	0.00	18.14	18.14	0.00	0.01	0.18	1.29	2.62	5.50	7.43
	KA1480	4	1.45	0.47	0.33	0.87	1.87	1.00	-	-	0.97	1.53	1.85	-	-
	KA1490	11	0.89	0.39	0.44	0.28	1.46	1.18	-	0.30	0.53	0.86	1.26	1.44	-
Lead (%)	ALL Northwest Z	509	0.71	1.08	1.51	0.00	6.70	6.70	0.01	0.02	0.15	0.35	0.74	1.76	3.13
	KA1400	49	1.22	1.44	1.17	0.01	5.69	5.68	0.03	0.10	0.21	0.60	1.77	3.15	5.29
	KA1410	74	1.09	1.59	1.45	0.02	6.70	6.68	0.05	0.08	0.25	0.47	1.04	3.70	5.67
	KA1420	46	0.40	0.42	1.03	0.01	1.99	1.99	0.02	0.05	0.14	0.28	0.50	1.01	1.47
	KA1430	48	0.44	0.42	0.96	0.01	1.81	1.80	0.02	0.06	0.15	0.29	0.60	1.04	1.52
	KA1440	90	0.86	1.30	1.50	0.01	6.51	6.51	0.02	0.04	0.16	0.43	0.93	2.17	4.31
	KA1450	42	0.66	0.84	1.27	0.00	4.05	4.05	0.01	0.04	0.18	0.41	0.74	1.46	3.34
	KA1460	23	0.39	0.38	0.99	0.00	1.46	1.46	0.00	0.01	0.19	0.24	0.51	1.10	1.45
	KA1470	122	0.51	0.74	1.44	0.00	4.24	4.24	0.00	0.00	0.03	0.26	0.64	1.29	2.35
	KA1480	4	0.49	0.13	0.26	0.32	0.59	0.27	-	-	0.36	0.53	0.59	-	-
	KA1490	11	0.27	0.21	0.77	0.02	0.70	0.69	-	0.03	0.10	0.24	0.36	0.68	-
Copper (%)	ALL Northwest Z	509	0.03	0.04	1.60	0.00	0.28	0.28	0.00	0.00	0.01	0.01	0.03	0.07	0.11
	KA1400	49	0.03	0.03	0.99	0.00	0.12	0.12	0.00	0.01	0.01	0.02	0.03	0.09	0.10
	KA1410	74	0.02	0.02	1.01	0.00	0.09	0.09	0.00	0.01	0.01	0.01	0.02	0.05	0.07
	KA1420	46	0.01	0.01	0.56	0.00	0.02	0.02	0.00	0.00	0.01	0.01	0.01	0.02	0.02
	KA1430	48	0.03	0.04	1.36	0.00	0.18	0.18	0.00	0.00	0.01	0.02	0.04	0.08	0.17
	KA1440	90	0.04	0.06	1.34	0.00	0.28	0.28	0.00	0.00	0.01	0.02	0.05	0.13	0.20
	KA1450	42	0.04	0.04	1.18	0.00	0.21	0.21	0.00	0.00	0.01	0.02	0.04	0.09	0.16
	KA1460	23	0.03	0.03	0.95	0.00	0.15	0.15	0.00	0.01	0.01	0.03	0.04	0.08	0.13
	KA1470	122	0.02	0.04	2.70	0.00	0.28	0.28	0.00	0.00	0.00	0.00	0.01	0.04	0.08
	KA1480	4	0.02	0.01	0.29	0.01	0.03	0.01	-	-	0.02	0.02	0.03	-	-
	KA1490	11	0.05	0.09	1.87	0.00	0.23	0.22	-	0.00	0.00	0.01	0.01	0.23	-
Silver (g/t)	ALL Northwest Z	509	23.7	38.2	1.6	0.0	250.0	250.0	0.4	1.6	5.0	11.3	23.0	51.1	107.5
	KA1400	49	52.8	62.9	1.2	1.3	241.6	240.3	1.5	3.9	9.5	21.9	98.8	164.1	192.9
	KA1410	74	32.4	44.3	1.4	2.0	219.7	217.7	3.2	5.7	12.4	19.0	29.8	76.6	154.3
	KA1420	46	11.8	10.2	0.9	0.6	57.6	57.0	1.0	2.4	6.2	10.2	14.4	27.1	31.2
	KA1430	48	14.6	14.0	1.0	1.0	65.2	64.1	1.5	1.9	5.8	10.2	19.6	35.8	51.2
	KA1440	90	31.8	48.0	1.5	0.7	250.0	249.3	1.6	2.3	6.9	14.8	33.5	89.1	158.3
	KA1450	42	20.4	25.6	1.3	0.0	131.4	131.4	0.5	2.0	5.1	13.2	24.8	48.7	93.3
	KA1460	23	12.5	9.9	0.8	0.0	36.1	36.1	0.3	2.5	6.5	9.0	19.3	29.6	34.8
	KA1470	122	14.2	25.2	1.8	0.0	119.6	119.6	0.0	0.0	1.3	5.3	12.1	40.2	82.6
	KA1480	4	15.2	3.9	0.3	12.9	21.1	8.2	-	-	13.0	13.4	19.2	-	-
	KA1490	11	3.2	1.7	0.5	0.8	6.2	5.4	-	1.0	1.8	2.7	4.8	6.1	-

Density was calculated in the composite intervals and exported out as part of the point file required for the grade interpolation. Composite points with no iron assays, where the density could not be calculated, were assigned a value of -999 unless the Pb+Zn grade was less than 0.1%, where a default density of 2.8 g/cm^3 was used. Values of -999 in the composite data points are ignored during the interpolation process in GEMS™.

14.3.7 Spatial Analysis – Variography

Variography was completed for the Key Anacon Main Zone using Pb+Zn composites. Separate variograms were also completed for copper and silver. A total of 1,190 data points was selected, and the variogram produced by the SAGE2001™ software returned a maximum range of continuity between 100 m and 120 m at 100% of the sill value. At 97% of the sill value, the range falls to 65 m. The ratio between the major and semi-major was 2.42, and the ratio between the semi-major and minor was approximately 1.18 (Figure 14-11).

Figure 14-11: Variogram for Key Anacon Main Zone



The ellipsoid describing the anisotropy was plotted in GEMS™, and the angle coincided more or less with the expected trend of the mineralization for the C1 component of the variogram; the Main Zone domains (KA1300 series) were interpolated using Ordinary Krige (OK). A single variogram was used for zinc and lead, and separate variograms were used for copper and lead. Variograms for the Main Zone East, Southeast, and Northwest Zones were inconclusive, and therefore these models were interpolated using ID^2. Table 14-20 shows the variogram parameters for zinc, lead, copper, and silver

for the Main Zone domain. Rotation angles are based on the GEMS ZXZ or ZYZ methodology, which uses a conventional right-hand rule.

Table 14-20: Variogram Parameters for Key Anacon Main Zone

Domain	Element	Component		Rotation Angle (ZXZ)	Range X,Y,Z (m)
KA-MZ (1300 series)	Zn, Pb	Nugget	0.193	N/A	
		C1	0.807	29, 82, -81	17.6, 7.0, 6.8
KA-MZ (1300 series)	Cu	Nugget	0.293	N/A	
		C1	0.707	-25, 26, 7	9.7, 34.6, 31.5
KA-MZ (1300 series)	Ag	Nugget	0.508	N/A	
		C1	0.492	-25, 78, 7	9.40, 40.7, 13.6

14.3.8 Search Ellipsoid Dimension and Orientation

For this model, AGP used the overall geometry of the zones and the proposed variogram range as guiding principles to set the search ellipsoid orientation.

The first pass maximum range was sized to reach at least the next drill section in the fringe of the Southeast and Northwest zones. A 2 x multiplier (from Pass 1) was used to set the range of the second pass. The second pass reached the range displayed at 95% of the sill value. Lastly, a 2 x multiplier (from Pass 2) was used to set the range for the third interpolation pass, which was intended to fill the blocks.

No orientation subdomain was required for the Key Anacon Main deposit. Originally, all sample searches were ellipsoidal in shape. Upon verification of the kriging metrics for the Key Anacon Main Zone, the sample search was modified to an octant search in order to decluster the data and minimize negative kriging weights. Table 14-21 lists the final values used in the resource model for the range of the major, semi-major, and minor axes. Rotation angles are based on the GEMS ZXZ or ZYZ methodology, which uses a conventional right-hand rule based on the block model edges.

Table 14-21: Search Ellipsoid Dimensions (Key Anacon Main Deposit)

Zone	Zone Group	Profile Name-Pass No.	Rotation Z	Rotation X	Rotation Z	Range X	Range Y	Range Z	Type	Minimum No. of Octant	Maximum Sample per Octant
KA-MZ	1300 Series	KOR3-P1	0	5	0	12	24	36	Octant	5	2
KA-MZ	1300 Series	KOR3-P2	0	5	0	24	50	73	Octant	4	3
KA-MZ	1300 Series	KOR3-P3	0	5	0	36	73	146	Ellipsoidal	N/A	N/A
KA-MZE	1200 Series	KOR1-P1	0	5	0	12	24	36	Ellipsoidal	N/A	N/A
KA-MZE	1200 Series	KOR1-P2	0	5	0	24	50	73	Ellipsoidal	N/A	N/A
KA-MZE	1200 Series	KOR1-P3	0	5	0	36	73	146	Ellipsoidal	N/A	N/A
KA-SE	1100 Series	KOR1-P1	0	5	0	12	24	36	Ellipsoidal	N/A	N/A
KA-SE	1100 Series	KOR1-P2	0	5	0	24	50	73	Ellipsoidal	N/A	N/A
KA-SE	1100 Series	KOR1-P3	0	5	0	36	73	146	Ellipsoidal	N/A	N/A

Zone	Zone Group	Profile Name-Pass No.	Rotation Z	Rotation X	Rotation Z	Range X	Range Y	Range Z	Type	Minimum No. of Octant	Maximum Sample per Octant
KA-NW	1400 Series	KOR2-P1	0	13	0	12	24	36	Ellipsoidal	N/A	N/A
KA-NW	1400 Series	KOR2-P2	0	13	0	24	50	73	Ellipsoidal	N/A	N/A
KA-NW	1400 Series	KOR2-P3	0	13	0	36	73	146	Ellipsoidal	N/A	N/A

14.3.9 Resource Block Model

The block model was constructed using GEMS 6.8™. In order to establish the block model matrix, dimension a drill hole spacing was completed. The data reveal the following:

- KA-MZ: 50% of the drill holes will have another drill hole within 14 m
- KA-SE: 50% of the drill holes will have another drill hole within 65 m
- KA-NW: 50% of the drill holes will have another drill hole within 43 m.

Since the bulk of the tonnage in the Indicated category for the Key Anacon Main deposit is in the Key Anacon Main Zone, and using the criteria of one-quarter the drill spacing, the data supports a block size down to 3.5 m (14 m/4). This block size is too small for the Southeast and Northwest Zone; however, these two zones largely hold Inferred Resources.

AGP elected to use a block size of 4 m by 4 m by 4 m, based on mining selectivity considerations and the density of the data set. This block matrix size assumed a medium-sized underground mining operation.

The block model was defined on the Project coordinate system with a 40-degree counter-clockwise rotation. Table 14-22 lists the upper southeast corner of the model and is defined on the block edge.

Table 14-22: Block Model Definition (Block Edge)

Resource Model Items	Parameters
Easting	2,560,740
Northing	7,603,750
Top relative elevation	5,100
Rotation angle (counterclockwise)	40
Block size (X, Y, Z in metres)	4, 4, 4
Number of blocks in the X direction	75
Number of blocks in the Y direction	300
Number of blocks in the Z direction	210

14.3.10 Interpolation Plan

The resource model was created in GEMS 6.8™ with a single folder setup, using ID^2 for interpolating the zinc, lead, copper, and silver grades for the Southeast Zone, Northwest Zone, and Main Zone East. OK was used for interpolating the Main Zone only. Density was interpolated in the model using ID^2. An NN model was used for validation. The interpolation was carried out in a multi-pass approach, with an increasing search dimension coupled with decreasing sample restrictions.

- Pass 1 used an ellipsoid search with 8 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 3 holes to be used in the search.
- Pass 2 used an ellipsoid search with 6 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 2 holes to be used in the search.
- Pass 3 used an ellipsoid search with 4 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 2 holes to be used in the search.

The model was interpolated only within the mineralized wireframe. Volume reporting used the mineralized wireframes to correctly assign the volumes and tonnages to the correct grade bins, which is equivalent to a percent model in most mining software packages. The methodology intrinsically assumes the hanging wall and footwall contacts will be separated out during mining. For this deposit, AGP believes this is the correct approach, as the high grade massive and semi-massive mineralization is visually distinct from the surrounding waste in the field.

14.3.11 Mineral Resource Classification

No environmental, permitting, legal, title, taxation, socioeconomic, marketing, or other relevant issues are known to the author that may currently affect the estimate of Mineral Resources. Mineral Reserves can only be estimated based on an economic evaluation used in a prefeasibility or feasibility study of a mineral project. Thus, no reserves have been estimated. Mineral resources, which are not mineral reserves, do not have demonstrated economic viability.

Typically, the confidence level for a grade in the block model is reduced with the increase in the search ellipsoid size, along with the diminishing restriction on the number of samples used for the grade interpolation. This is essentially controlled by the pass number of the interpolation plan, as described in the previous section. A common technique is to categorize a model based on the pass number and distance to the closest sample. For the Key Anacon Main deposit, in addition to using the pass number and distance to the closest composite, the categorization model also used a minimum number of holes and the krige efficiency for the Main Zone.

Table 14-23 lists the parameters used to code the classification model, and Figure 14-12 illustrates the distribution of the class model for the Key Anacon Main deposit.

Table 14-23: Classification Parameters – Key Anacon Main Deposit

Pass Number	Retained As	Downgraded To
Pass 1	Retained as Code 1 if distance to the closest composite is <15 m and the Number of drill holes used in the estimate is >= to 3 and the Krige efficiency is greater than 0.3	To Code 2 if distance to the closest composite is > = 15 and < 60 m and the number of holes used in the estimate is >= to 3.
Pass 2	Retained as Code 2 if distance to the closest composite is > = 15 and < 60 m and the number of holes used in the estimate is >= to 3.	To Code 3 if distance to the closest composite is > = 60 and < 110 m and the number of holes used in the estimate is >= to 2.
Pass 3	Retained as Code 3 if distance to the closest composite is > = 60 and < 110 m and the number of holes used in the estimate is >= to 2.	To Code 4 if distance to the closest composite is > >= 110 m

Once the class model coding is reviewed in 3D, final adjustments were made affecting a number of zones. These are:

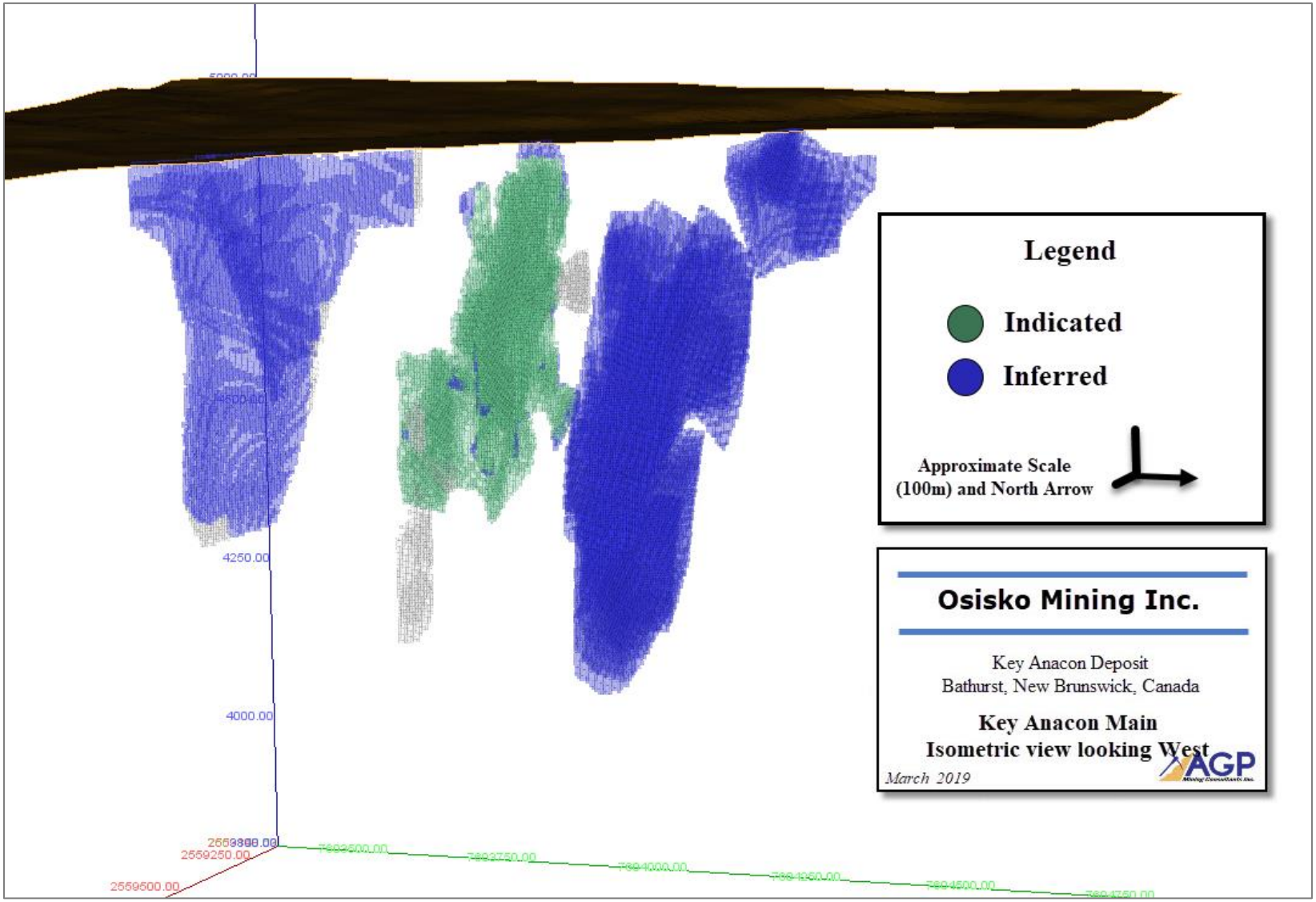
- Resource blocks in Zones KA1240, KA 1320, KA1330, KA1360, and KA1370 were downgraded to Code 4 regardless of the original code due to poor data support.
- Code 2 blocks for zones KA1100, KA1399, and KA1491 were downgraded to Code 3 due to erratic distribution of the Code 2 blocks.
- Code 1 blocks in the entire model were downgraded to Code 2 due to a lack of confidence in the underground drill results. This modification affected only the Main Zone. Additional twin holes should be drilled to confirm the grade and to increase the support from more recent drilling.

Final adjustments are often required to the classification of individual block values to create areas suitable for mine planning. This is accomplished by using a GEMS™ Cypress-enabled script that adjusts, or grooms, the confidence category of isolated blocks to create contiguous resource blocks with reasonably smooth class values. The classifications of isolated blocks were upgraded or downgraded depending on the classifications of the 26 surrounding blocks. AGP validated the final block classification visually. AGP also generated histograms of the distance to the closest composites versus the class model value, to evaluate the class model for reasonableness.

Two confidence categories exist in the model. The usual CIM guideline classes of Indicated and Inferred are coded 2, and 3, respectively. A special Code 4 represents mineralization that was considered too far away from the existing drilling to be classified as an Inferred Resource. The Code 4 blocks have been left in the classification model solely to assist Osisko Metals in its exploration activity.

Approximately 29% of the volume within the mineralized solids is classified as Indicated, and 69% of the blocks were classed as Inferred. The remaining 2% of the volume was either assigned Code 4, or areas that could not be interpolated, and therefore bore no grade. No resources were classified as Measured.

Figure 14-12: Block Model Classification on Isometric View



14.3.12 Block Model Validation

The Key Anacon Main deposit grade models were validated by four methods:

- Visual comparison of colour-coded block model grades with composite grades on sections and plans
- Comparison of the global mean block grades for OK/ID^2, and NN models, composites, and raw assay grades
- Comparison using grade profiles to investigate local bias in the estimate
- Naïve cross-validation tests with composite grades versus block model grades.

14.3.13 Visual Comparison

The visual comparison of block model grades with composite grades shows a reasonable correlation between values for most of the model (Appendix E).

14.3.14 Global Comparisons

Table 14-24 shows the grade statistics for the raw assays, composites, NN and ID^2/OK models for the entire Key Anacon Main deposit in the Indicated and Inferred categories. Statistics for the zinc, lead, and silver composite mean grades compare well to the raw assay grades, with a normal reduction in values due to smoothing during the compositing process. As stated earlier, capping disproportionately affected the copper values due to a small number of extreme assays.

The block model mean grade, when compared against the composites, showed a normal reduction in values due to smoothing, related to volume variance. More importantly, the grades of the NN and ID^2/OK models are within 7% of each other, indicating that the methodology used did not introduce a bias into the estimate. For the Main Zone only, the difference between the NN estimate and ID^2/OK is reduced to 0.5%.

Table 14-24: Global Comparisons at 0 Cut-off (Indicated and Inferred Key Anacon Main)

Methodology	Zn (%) at >0.0 Cut-off (Cat. 1–3)	Pb (%) at >0.0 Cut-off (Cat. 1–3)
Raw assays uncapped (clustered)	4.10	1.58
Composite capped (clustered)	3.85	1.45
NN	3.18	1.14
ID^2/ OK	2.95	1.06
Methodology	**Cu (%) at >0.0 Cut-off (Cat. 1–3)**	**Ag (g/t) at >0.0 Cut-off (Cat. 1–3)**
Raw assays uncapped (clustered)	1.45	52
Composite capped (clustered)	0.13	45
NN	0.06	35
ID^2/ OK	0.06	33

14.3.15 Local Comparisons – Grade Profile

In general, the swath plots show good agreement, with the three methodologies showing no major local bias. The peaks and valleys on the assay and composite lines are well represented in the resource model, with the interpolated model offering more smoothing. The smoothing resulted in a few crossovers, mainly due to the low number of composites. This is most apparent in the Southeast Zone area. The NN line is generally above the ID^2/OK line, but generally follows the same pattern with less smoothing.

Grade profiles for zinc are presented on Figure 14-13, Figure 14-14, and Figure 14-15. Swath plots for lead, copper, and silver are not shown but display similar patterns.

Figure 14-13: X Axis Swath Plots (Indicated and Inferred Classification)

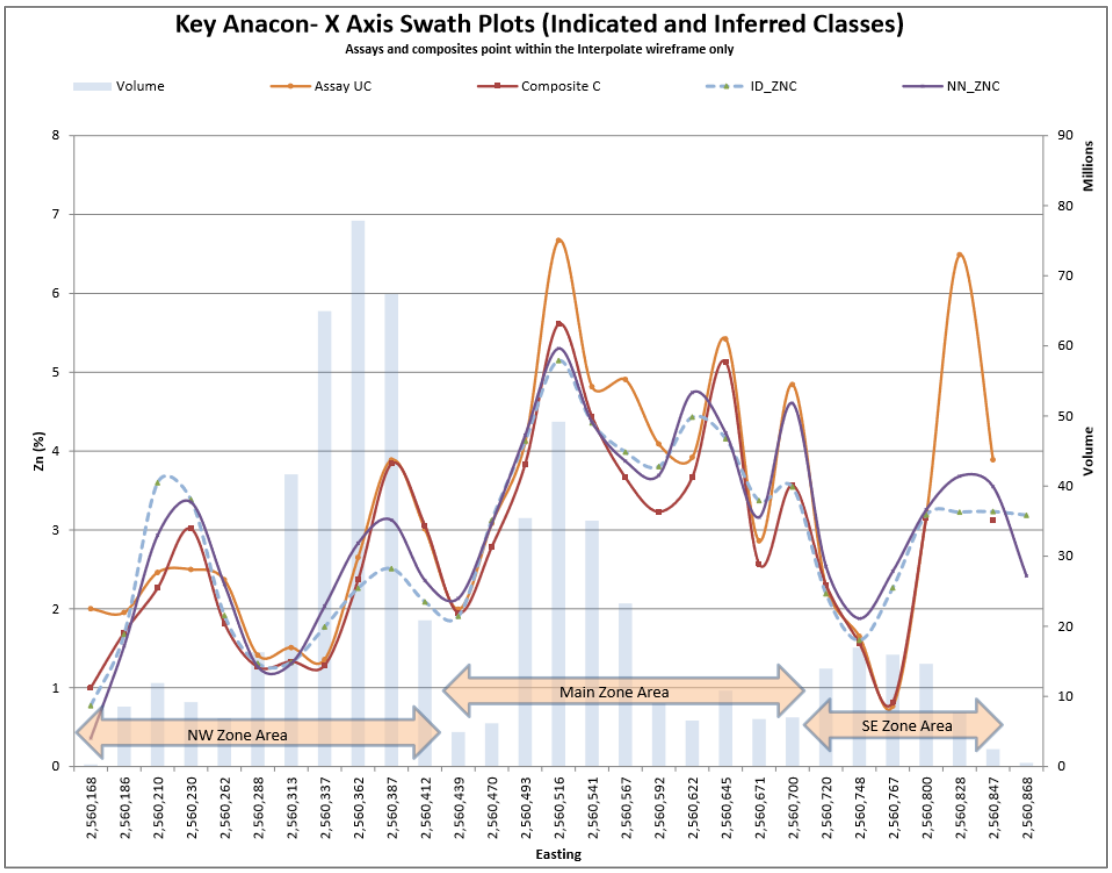


Figure 14-14: Y Axis Swath Plots (Indicated and Inferred Classification)

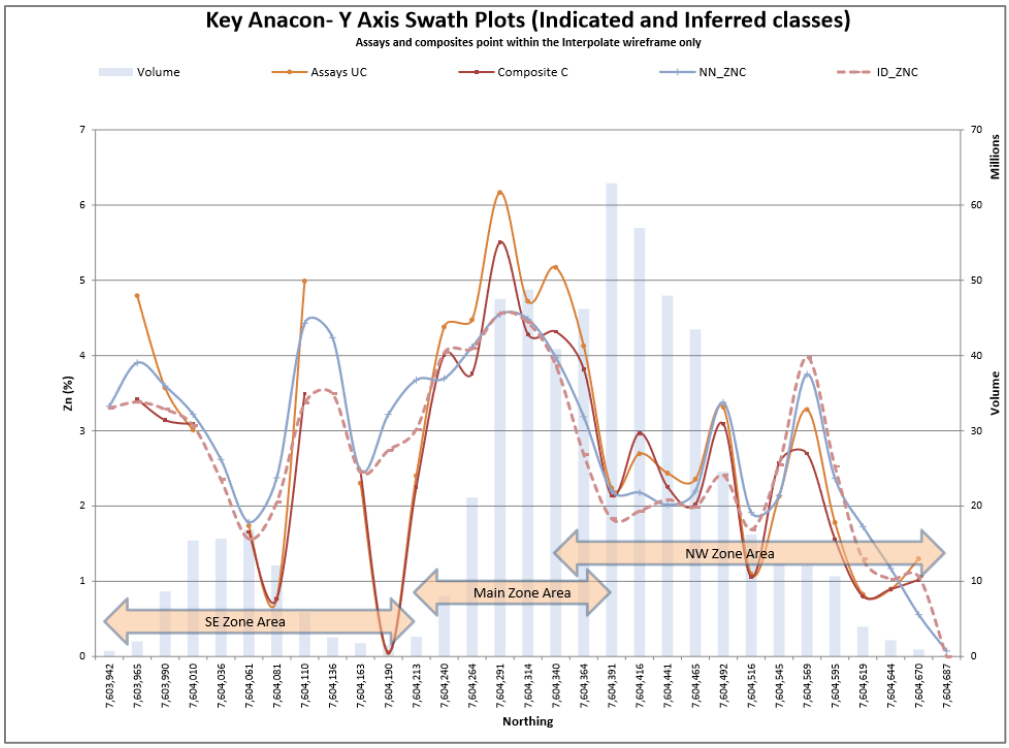
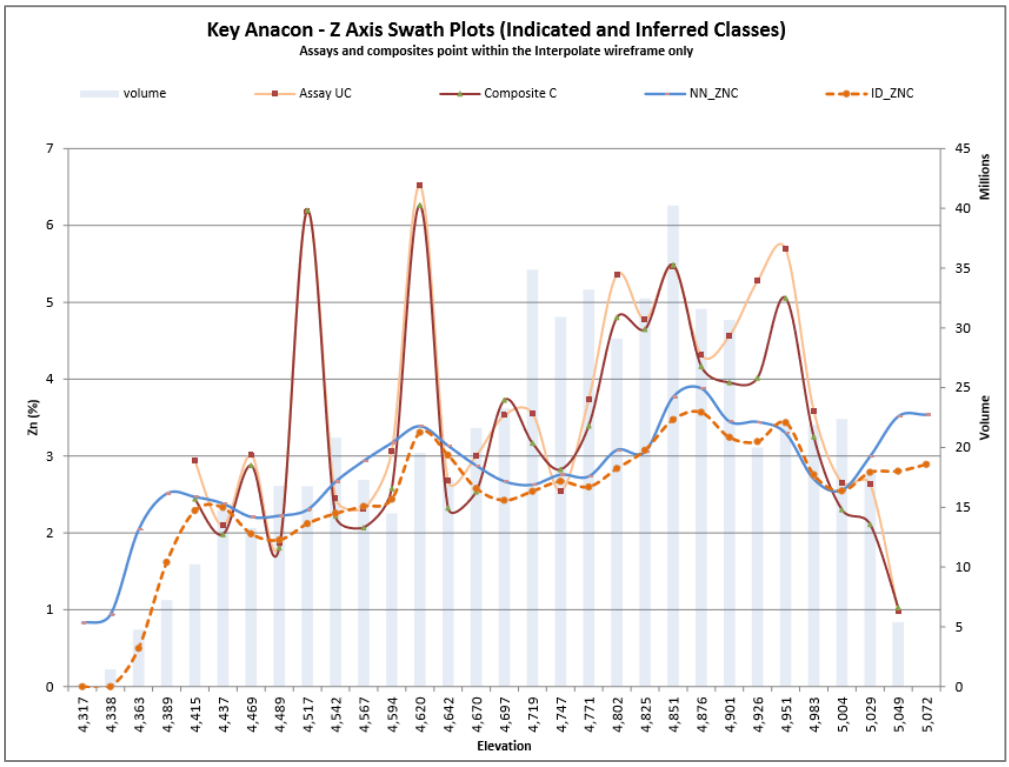


Figure 14-15: Z Axis Swath Plots (Inferred Classification)

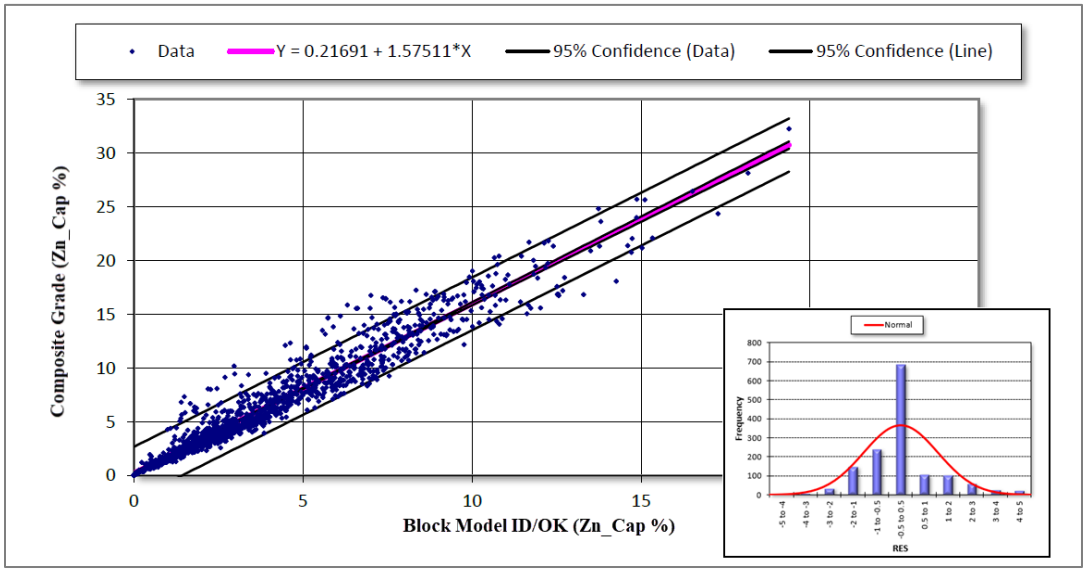


14.3.16 Naïve Cross-Validation Test

Results from the pairing of the composited and estimated grades within blocks pierced by a drill hole are presented on Figure 14-16. Out of 1,426 pairs with 10 outliers removed, the R^2 value is high at 0.94. The slope of the regression is 1.58, indicating a slight negative bias.

The regression residuals are the differences, on a case-by-case basis, between the actual Y values and the values calculated by the best-fit equation. These can be evaluated for normality and randomness. The inset image on Figure 14-16 shows the residual distribution. The chart shows a normally distributed bell curve with a slight negative bias.

Figure 14-16: Naïve Cross-Validation Test Results (Key Anacon Main)



14.4 Key Anacon – Titan Deposit

14.4.1 Geological Interpretation

At the Key Anacon Titan deposit, the bulk of the mineralization is trapped in a fold nose and in elongated lenses on the footwall of the Little River Formation (OLR) within the Nepisiguit Falls Formation (ONF). Stacked mineralized lenses are usually separated by barren felsic tuff units. In order to assist in interpretation of the mineralization, the footwall contact of the OLR was modelled in 3D.

As with Gilmour South and Key Anacon Main, Osisko Metals and prior operators only assayed material bearing signs of mineralization, and for that reason the mineralized zones are easily identifiable on cross-sections. A separate code MS massive sulphide (code 71*) SSM (semi-massive sulphide Code 72*) was use for the 2000–2017 and 2018 drilling. While the codes were based on the sulphide content, it generally corresponded to a grade between 2.0% to 5.0% ZnEq or above, although exceptions occur. Grades lower than 2% Zn+Pb often occurs in the SSM (code 72), although this is less consistent, as a significant amount of lower grade mineralization also occurs in the felsic tuff (2T2).

A key difference for the Titan deposit is the copper distribution. For all deposits of the BMC, copper generally occurs in combination with the lead and zinc mineralization; however, at the Titan deposit, copper also occurs in pockets with depleted lead and zinc values, infilling the spaces created between the fold limbs. Copper grades at the Key Anacon Titan deposit are noticeably higher than in the Gilmour South and Key Anacon Main deposits.

Further away from the OLR footwall contact is what Osisko Metals' describes as the stringer zone. The stringer zone was intersected in a number of widely spaced drill holes. It was wireframed in three separate lenses by AGP and named the Lower East Zone, mostly to provide Osisko Metals with a preliminary interpretation for exploration purposes.

A grade at or above 1.0% Zn+Pb was targeted to outline the lead-zinc-rich mineralized at the Titan Main Zone. Lithology was taken into account in order to ensure that the various zones were projected correctly between sections. Once this model was completed, the remaining mineralization was modelled using a zinc equivalent grade ≥1.0% ZnEq, which allowed the model to encompass the copper-rich zones with poorer lead-zinc assays, along with the remaining lead-zinc-copper stringer zone.

All 3D wireframes were constructed conventionally with polylines and tie lines, and the wider zones with good drill supports were reconciled on both sections and plans.

14.4.2 Wireframe Volume

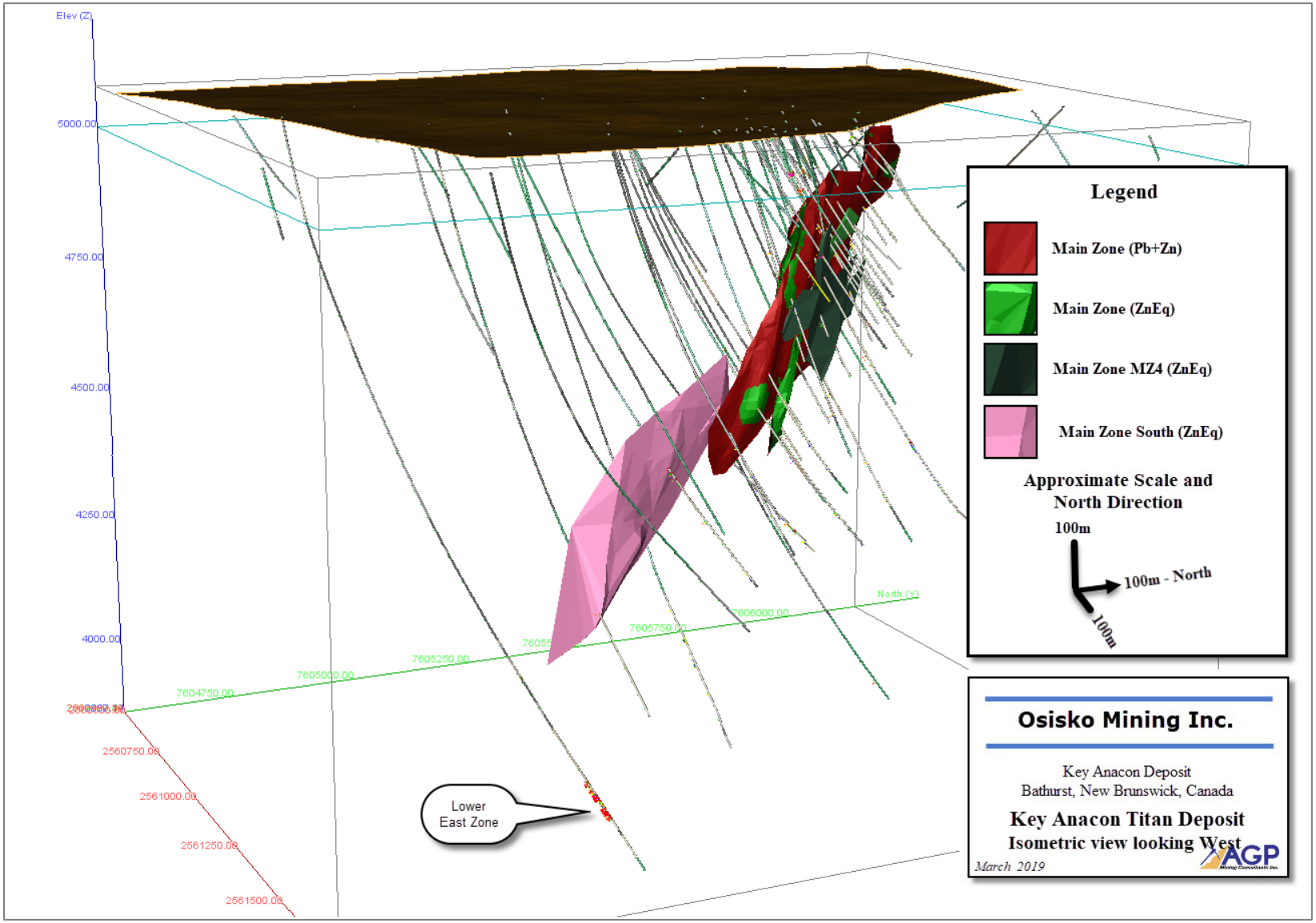
The total wireframe volume of the mineralized zones amounted to 11,771,432 m^3 (illustrates the position of the mineralized wireframes in relation to the drill holes, excluding the Lower East Zone wireframes.

Table 14-25). Figure 14-17 illustrates the position of the mineralized wireframes in relation to the drill holes, excluding the Lower East Zone wireframes.

Table 14-25: Anacon Titan Deposit Wireframe Volume

Zone Group	GEMS Mineralized Lens Name			Rock Code	Volume (m^3)
	NAME1	NAME2	NAME3		
Main Zone (Zn+Pb)	MZpart1	Final	Geology	T2210	1,370,711
Main Zone (ZnEq)	ZNEQ-MZ	Final	Geology	T2410	503,491
	ZNEQ-MZpart3	Final	Geology	T2430	39,689
	ZNEQ-MZ4	Final	Geology	T2440	128,423
Main Zone South (ZnEq)	ZNEQ-S	Final	Geology	T2310	711,194
Lower East Zone (ZnEq)	ZNEQ-LE1	Final	Geology	T2510	7,804,917
	ZNEQ-LE2	Final	Geology	T2520	1,139,213
	ZNEQ-LE3	Final	Geology	T2530	73,794
Total Volume					**11,771,432**

Figure 14-17: Position of the 3D Wireframes, Key Anacon Titan Deposit



14.4.3 Assays

The raw assay statistics were evaluated, grouping all assays intersecting the various domains. Table 14-26 provides descriptive statistics for raw, uncapped assays in the various domains.

Table 14-26: Descriptive Raw Assay Statistics (Key Anacon Titan)

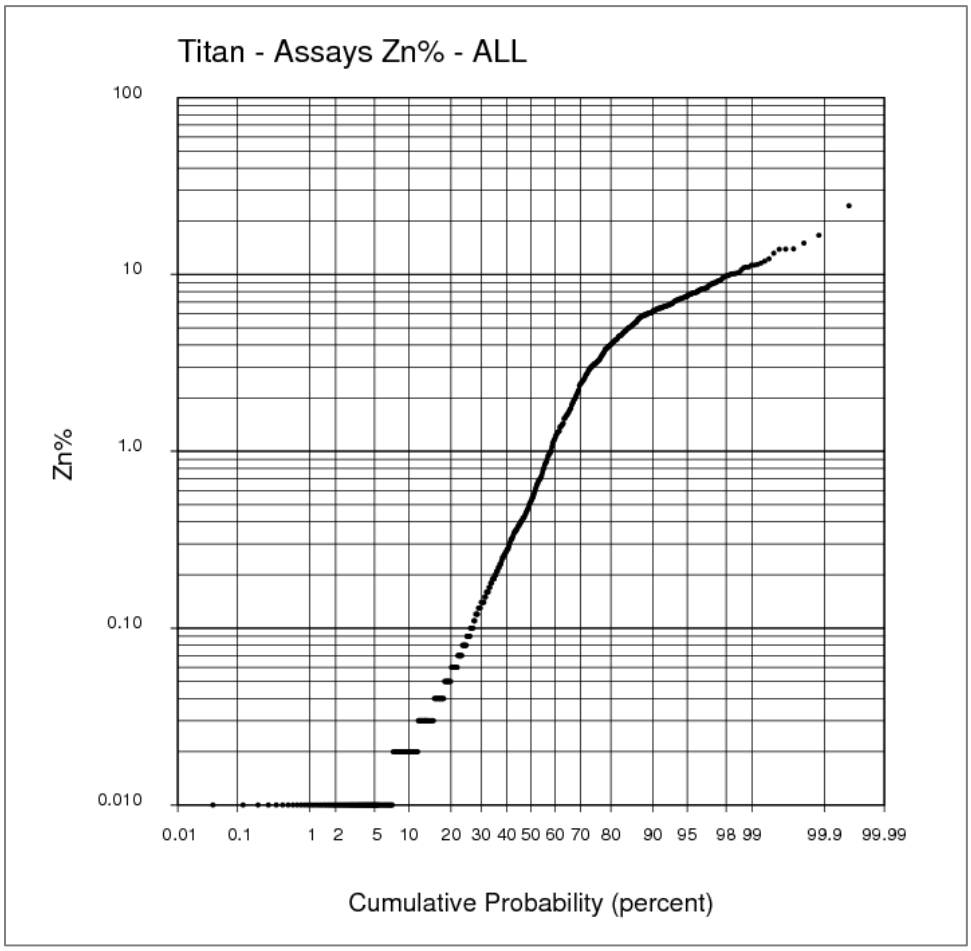
Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc (%)	Main Z (Zn+Pb) - T2210	591	2.47	2.93	1.19	0.0	24.48	0.02	0.04	0.22	1.23	4.11	6.70	8.25	11.02
Lead (%)	Main Z (Zn+Pb) - T2210	591	0.94	1.21	1.29	0.0	6.78	0.01	0.02	0.07	0.34	1.44	2.90	3.71	4.83
Copper (%)	Main Z (Zn+Pb) - T2210	591	0.72	0.93	1.28	0.0	13.00	0.03	0.07	0.22	0.51	0.86	1.55	2.24	4.56
Silver (g/t)	Main Z (Zn+Pb) - T2210	591	25.4	25.6	1.0	0.0	191.0	1.0	1.9	6.0	17.1	38.8	62.1	75.8	107.8
Zinc (%)	Main Z (ZnEq) - ALL	329	0.83	1.93	2.33	0.0	11.40	0.01	0.01	0.02	0.07	0.30	3.22	5.78	10.04
	T2410	231	0.74	1.87	2.52	0.0	11.40	0.01	0.01	0.02	0.07	0.23	3.12	4.68	10.66
	T2430	37	1.65	2.57	1.56	0.0	10.08	0.02	0.03	0.05	0.23	2.45	6.38	8.22	-
	T2440	61	0.66	1.59	2.42	0.0	6.72	0.01	0.02	0.03	0.05	0.26	1.93	6.05	-
Lead (%)	Main Z (ZnEq) - ALL	329	0.37	1.06	2.86	0.0	8.14	0.00	0.00	0.01	0.04	0.15	1.00	1.76	6.09
	T2410	231	0.29	0.93	3.24	0.0	8.14	0.00	0.00	0.01	0.03	0.12	0.68	1.31	6.63
	T2430	37	0.80	1.61	2.01	0.0	6.20	0.01	0.01	0.03	0.09	0.74	4.22	5.86	-
	T2440	61	0.42	1.04	2.47	0.0	4.26	0.01	0.01	0.02	0.03	0.16	1.26	4.08	-
Copper (%)	Main Z (ZnEq) - ALL	329	0.55	0.76	1.37	0.0	5.10	0.01	0.02	0.10	0.28	0.66	1.38	2.23	3.67
	T2410	231	0.64	0.83	1.29	0.0	5.10	0.00	0.01	0.17	0.38	0.79	1.51	2.56	4.45
	T2430	37	0.18	0.32	1.76	0.0	1.77	0.01	0.02	0.02	0.08	0.20	0.47	0.90	-
	T2440	61	0.42	0.53	1.25	0.0	2.66	0.02	0.03	0.08	0.20	0.58	1.14	1.75	-
Silver (g/t)	Main Z (ZnEq) - ALL	329	13.3	24.8	1.9	0.0	287.7	0.5	0.7	1.6	6.0	15.8	32.2	51.4	106.9
	T2410	231	12.4	20.6	1.7	0.0	200.0	0.3	0.6	1.2	5.5	16.3	31.3	44.4	106.3
	T2430	37	16.5	19.7	1.2	0.5	79.6	1.0	1.4	1.9	10.3	22.8	45.4	71.7	-
	T2440	61	15.0	38.5	2.6	1.2	287.7	1.4	1.8	3.3	6.4	11.7	17.9	71.5	-
Zinc (%)	Main Z South (ZnEq) - T2310	98	3.27	3.55	1.09	0.0	16.67	0.03	0.04	0.46	2.15	5.12	6.98	12.01	-
Lead (%)	Main Z South (ZnEq) - T2310	98	1.01	1.26	1.24	0.0	5.27	0.02	0.03	0.14	0.43	1.58	2.67	4.23	-
Copper (%)	Main Z South (ZnEq) - T2310	98	0.44	0.54	1.22	0.0	4.05	0.04	0.09	0.21	0.33	0.44	0.67	1.42	-
Silver (g/t)	Main Z South (ZnEq) - T2310	98	39.2	77.1	2.0	0.6	744.0	1.2	3.4	11.5	25.7	48.3	64.5	107.1	-
Zinc (%)	Lower East Z (ZnEq) ALL	220	1.73	2.39	1.39	0.0	13.92	0.04	0.06	0.20	0.47	2.46	5.89	7.00	9.08
	T2510	173	1.97	2.53	1.28	0.0	13.92	0.04	0.07	0.23	0.57	3.20	6.28	7.15	10.46
	T2520	35	1.02	1.70	1.67	0.0	8.28	0.03	0.03	0.18	0.43	1.02	2.79	6.38	-
	T2530	12	0.28	0.37	1.35	0.0	1.36	-	0.04	0.07	0.14	0.26	1.14	-	-

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Lead (%)	Lower East Z (ZnEq) ALL	220	0.64	1.08	1.69	0.0	9.37	0.02	0.03	0.06	0.20	0.76	2.01	2.59	5.04
	T2510	173	0.71	1.12	1.59	0.0	9.37	0.02	0.03	0.07	0.21	0.96	2.09	2.64	6.17
	T2520	35	0.48	0.96	1.99	0.0	5.04	0.01	0.02	0.09	0.21	0.40	1.04	3.49	-
	T2530	12	0.10	0.10	1.05	0.0	0.36	-	0.01	0.03	0.06	0.18	0.31	-	-
Copper (%)	Lower East Z (ZnEq) ALL	220		0.96	2.36	0.0	6.96	0.01	0.01	0.02	0.14	0.33	0.77	1.59	6.33
	T2510	173	0.44	1.02	2.32	0.0	6.96	0.01	0.01	0.04	0.17	0.36	0.78	1.56	6.65
	T2520	35	0.08	0.15	1.86	0.0	0.74	0.00	0.01	0.01	0.02	0.05	0.33	0.46	-
	T2530	12	0.85	1.15	1.35	0.0	3.47	-	0.06	0.12	0.18	1.59	3.18	-	-
Silver (g/t)	Lower East Z (ZnEq) ALL	220	18.5	18.2	1.0	0.6	121.0	1.7	3.2	6.4	12.3	23.5	45.2	54.6	88.7
	T2510	173	20.7	19.6	0.9	0.6	121.0	2.1	3.4	6.7	13.4	29.2	48.2	58.0	97.3
	T2520	35	11.3	7.1	0.6	1.0	34.8	1.2	3.4	6.2	10.3	13.1	19.5	31.6	-
	T2530	12	7.5	5.3	0.7	1.0	14.9	-	1.2	3.4	5.4	13.8	14.9	-	-

The frequency distribution of the raw assays (Figure 14-18) shows a distribution with a low CV, with a strong inflection at 5% Zn and 2% lead, suggesting a separate population. The spatial distribution of the assays above 5% Zn was reviewed in GEMS™ and the data show sporadic high-grade assays mixed with lower-grade material within the existing mineralized zones. The distribution prompted AGP not to use an internal wireframe to separate assays above 5% Zinc.

Copper distribution is smooth with no inflections. About 95% of the zinc assays are below 7% and 95% of the lead assays are below 3.8%. Copper assays at the 95th percentile average 2.3%.

Figure 14-18: Raw Assay Frequency Distribution, Zinc in All Domains



14.4.4 Capping

The grade capping analysis was carried out on the zone group only, and not on the individual lenses. The decile analysis results indicated grade capping was marginally warranted on all Key Anacon Titan zone groups. The raw assays show a CV below 2 for most zones and elements, with the exception to this being the Key Anacon Titan Main Zone copper-rich domain, where the lead and zinc display more variability, as expressed by a CV above 2.

After conducting a careful examination of the data set, AGP elected to apply a hard cap on the raw assay data prior to compositing, with no search restriction on the mild outlier populations.

Raw Assay Capping

Capping values were selected with the aid of probability plots and degradation analysis. Table 14-27 shows a summary of the treatment of high-grade outliers during the interpolation. The cap values selected were generally near the 99th percentile of the raw assay distribution.

Table 14-27: High-Grade Treatment for Key Anacon Titan

Zone Group (Group code)	Element	Cap Used	No. Sample	Total No. Sample	Percent Affected
T-Main Zone (Pb-Zn) (2210)	Zn (%)	13	2	591	0.3
	Pb (%)	5	4	591	0.7
	Cu (%)	5	4	591	0.7
	Ag (g/t)	110	4	591	0.7
T-South zone (NiEq) (2310)	Zn (%)	7.5	8	98	8.2
	Pb (%)	3.5	6	98	6.1
	Cu (%)	1.8	3	98	3.1
	Ag (g/t)	100	5	98	5.1
T-Main Zone (ZnEq) (2400 Series)	Zn (%)	6	15	329	4.6
	Pb (%)	2	15	329	4.6
	Cu (%)	3.5	5	329	1.5
	Ag (g/t)	80	5	329	1.5
T-Lower East Zone (ZnEq) (2500 Series)	Zn (%)	9	2	220	0.9
	Pb (%)	4	4	220	1.8
	Cu (%)	1.5	12	220	5.5
	Ag (g/t)	70	4	220	1.8

The raw assay capping scenario reduced the CV below 2 for most domains, except for the lead and zinc in the Key Anacon Titan Main Zone copper domain T-MZ (ZnEq) (Table 14-28).

Table 14-28: Raw Assay CV Before and After Capping

Zone Group (Group code)	Element	CV (Uncapped)	CV (Capped)
T-Main Zone (Pb-Zn) (2210)	Zn	1.19	1.15
	Pb	1.29	1.27
	Cu	1.28	1.10
	Ag	1.01	0.98
T-South Zone (NiEq) (2310)	Zn	1.09	0.88
	Pb	1.24	1.13
	Cu	1.22	0.89
	Ag	1.97	0.82
T-Main Zone (ZnEq) (2400 Series)	Zn	2.33	2.13
	Pb	2.86	2.05
	Cu	1.37	1.30
	Ag	1.86	1.38
T-Lower East Zone (ZnEq) (2500 Series)	Zn	1.39	1.35
	Pb	1.69	1.46
	Cu	2.36	1.40
	Ag	0.98	0.91

Total Metal Affected by the Treatment of Outliers

The total metal affected by the treatment of outliers was evaluated in the final model. At a 5.5% ZnEq cut-off, the capping strategy removed 1.3% of the in-situ zinc, 1.9% of the lead, 4.8% of the copper, and 3.6% of the silver in the Indicated category. The Inferred category was more affected by capping, likely due to the wider drill spacing and more erratic grades. At a 5.5% ZnEq cut-off, the capping strategy removed 9.5% of the in-situ zinc, 12.8% of the lead, 11.5% of the copper, and 10.1% of the silver, as shown in Table 14-29.

Table 14-29: Metal Removed by Capping (Key Anacon Titan Deposit)

Class	Cut-off (ZnEq%)	Zn Metal (%)	Pb Metal (%)	Cu Metal (%)	Ag Metal (%)
Indicated	>6.0	-1.6	-2.1	-7.4	-3.9
	>5.5	-1.3	-1.9	-4.8	-3.6
	>4.0	-0.6	-1.1	-0.7	-2.2
	>0.0	-0.8	-1.1	-0.2	-1.4
Inferred	>6.0	-8.1	-11.7	-9.4	-9.0
	>5.5	-9.5	-12.8	-11.5	-10.1
	>4.0	-6.7	-10.4	-7.9	-7.7
	>0.0	-2.6	-7.0	-2.6	-3.5

14.4.5 Composites

From the sampling length statistics, AGP elected to use a composite length of 1.5 m. The composite size selected was at or above the third quartile, and allows grade variations to be represented while reducing the variance.

Assays were length-weight averaged, and any grade capping was applied to the raw assay data prior to compositing. True gaps in sampling were composited at zero grade.

The composite intervals were created by moving downward from the collar of the holes toward the hole bottoms. Composite lengths are automatically adjusted by the software to leave no remnants at the intersection to the wireframes. The adjustment resulted in composite lengths ranging between 0.9 m and 2.3 m, with 87.5% of the composites ranging between 1.4 m and 1.6 m. Table 14-30 shows the descriptive statistics for the composites point-located within the mineralized envelope only.

Table 14-30: Descriptive Statistics for Composites – Capped (Key Anacon Titan Deposit)

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Zinc (%)	Main Z (Zn+Pb) - T2210	371	2.40	2.54	1.06	0.00	10.74	0.02	0.07	0.40	1.33	4.11	6.39	7.32	10.22
Lead (%)	Main Z (Zn+Pb) - T2210	371	0.91	1.05	1.15	0.00	4.56	0.01	0.04	0.10	0.46	1.43	2.42	3.36	4.02
Copper (%)	Main Z (Zn+Pb) - T2210	371	24.7	22.2	0.9	0.0	100.6	1.3	2.4	7.2	17.6	37.7	57.2	68.4	90.1
Silver (g/t)	Main Z (Zn+Pb) - T2210	371	0.69	0.66	0.96	0.00	4.16	0.03	0.09	0.25	0.52	0.88	1.51	2.14	3.23
Zinc (%)	Main Z (ZnEq) - ALL	227	0.61	1.30	2.15	0.00	6.13	0.00	0.01	0.02	0.06	0.36	2.31	4.03	5.92
	T2410	168	0.50	1.22	2.45	0.00	6.13	0.00	0.00	0.01	0.06	0.21	1.37	3.99	5.84
	T2430	22	1.29	1.50	1.16	0.00	5.09	0.00	0.02	0.07	0.74	2.15	3.92	4.93	-
	T2440	37	0.69	1.44	2.08	0.01	5.92	0.01	0.02	0.03	0.06	0.58	2.31	5.91	-
Lead (%)	Main Z (ZnEq) - ALL	227	0.20	0.42	2.06	0.00	2.00	0.00	0.00	0.01	0.03	0.15	0.70	1.42	2.00
	T2410	168	0.15	0.36	2.35	0.00	1.85	0.00	0.00	0.00	0.02	0.08	0.43	1.20	1.84
	T2430	22	0.41	0.50	1.24	0.00	2.00	0.00	0.01	0.02	0.20	0.64	1.11	1.88	-
	T2440	37	0.30	0.54	1.82	0.01	2.00	0.01	0.02	0.02	0.03	0.33	1.43	2.00	-
Copper (%)	Main Z (ZnEq) - ALL	227	0.48	0.61	1.25	0.00	3.50	0.00	0.00	0.07	0.28	0.63	1.15	1.58	3.21
	T2410	168	0.54	0.66	1.22	0.00	3.50	0.00	0.00	0.12	0.33	0.68	1.30	2.09	3.37
	T2430	22	0.20	0.28	1.37	0.00	1.04	0.00	0.02	0.03	0.10	0.25	0.76	1.02	-
	T2440	37	0.39	0.39	0.99	0.01	1.44	0.03	0.03	0.09	0.22	0.60	0.95	1.36	-
Silver (g/t)	Main Z (ZnEq) - ALL	227	10.4	14.2	1.4	0.0	74.4	0.0	0.2	1.1	5.1	14.1	25.4	45.0	72.8
	T2410	168	9.5	13.7	1.5	0.0	74.4	0.0	0.0	0.9	4.3	13.8	22.6	44.5	64.5
	T2430	22	14.6	14.2	1.0	0.0	49.6	0.1	1.0	2.2	13.4	20.4	42.1	48.7	-
	T2440	37	12.3	15.8	1.3	1.8	74.2	2.1	2.6	4.0	8.5	12.4	28.9	69.7	-
Zinc (%)	Main Z South (ZnEq) - T2310	55	2.90	2.19	0.75	0.02	7.47	0.02	0.05	1.24	2.59	4.59	6.03	7.17	-
Lead (%)	Main Z South (ZnEq) - T2310	55	0.97	0.89	0.92	0.01	3.30	0.01	0.06	0.26	0.61	1.64	2.08	2.97	-
Copper (%)	Main Z South (ZnEq) - T2310	55	32.0	22.9	0.7	0.4	92.7	1.3	3.6	13.7	27.7	46.8	60.4	87.4	-
Silver (g/t)	Main Z South (ZnEq) - T2310	55	0.39	0.30	0.76	0.00	1.71	0.06	0.14	0.22	0.34	0.44	0.77	1.13	-
Zinc (%)	Lower East Z (ZnEq) ALL	157	1.48	1.99	1.35	0.00	7.62	0.03	0.05	0.22	0.57	1.72	4.78	6.45	7.61
	T2510	125	1.72	2.15	1.25	0.00	7.62	0.01	0.08	0.25	0.66	2.69	5.56	6.62	7.62
	T2520	25	0.62	0.62	1.00	0.03	2.94	0.03	0.03	0.10	0.51	0.87	1.27	2.47	-
	T2530	7	0.32	0.34	1.06	0.09	1.03	-	-	0.11	0.20	0.44	-	-	-
Lead (%)	Lower East Z (ZnEq) ALL	157	0.51	0.67	1.32	0.00	2.82	0.00	0.02	0.06	0.22	0.63	1.67	2.09	2.76
	T2510	125	0.58	0.72	1.25	0.00	2.82	0.00	0.03	0.08	0.22	0.88	1.79	2.20	2.79
	T2520	25	0.25	0.19	0.77	0.01	0.65	0.01	0.01	0.04	0.32	0.39	0.46	0.61	-
	T2530	7	0.10	0.09	0.83	0.03	0.27	-	-	0.04	0.05	0.15	-	-	-

Elements	Domains	Valid cases	Mean	Std. Deviation	Variation Coefficient	Minimum	Maximum	5th percentile	10th percentile	25th percentile	Median	75th percentile	90th percentile	95th percentile	99th percentile
Copper (%)	Lower East Z (ZnEq) ALL	157	0.26	0.33	1.28	0.00	1.50	0.00	0.01	0.03	0.15	0.32	0.71	1.05	1.50
	T2510	125	0.27	0.34	1.24	0.00	1.50	0.00	0.01	0.03	0.19	0.35	0.69	1.12	1.50
	T2520	25	0.11	0.17	1.59	0.00	0.74	0.00	0.01	0.01	0.03	0.12	0.37	0.65	-
	T2530	7	0.58	0.45	0.78	0.09	1.30	-	-	0.17	0.64	0.89	-	-	-
Silver (g/t)	Lower East Z (ZnEq) ALL	157	16.4	14.4	0.9	0.0	56.3	0.8	2.7	6.3	11.9	22.9	44.4	49.3	56.3
	T2510	125	18.3	15.5	0.9	0.0	56.3	0.2	2.4	6.7	12.4	25.4	45.4	50.6	56.3
	T2520	25	9.6	4.0	0.4	1.0	15.6	1.1	3.0	6.1	10.7	12.3	14.2	15.4	-
	T2530	7	8.0	4.3	0.5	3.1	13.1	-	-	3.2	9.4	11.9	-	-	-

Density was calculated in the composite intervals and exported out as part of the point file required for the grade interpolation. Composite points with no iron assays, where the density could not be calculated, were assigned a value of -999 unless the Pb+Zn grade was less than 0.1%. In these low-grade values, a default density of 2.8 g/cm^3 was assigned. AGP notes that values of -999 in the composite data points are ignored during the interpolation process in GEMS™.

14.4.6 Spatial Analysis - Variography

Variography was attempted on the Titan Main Zone Pb+Zn composites. A total of 598 data points was selected, and the variogram produced by the SAGE2001™ software returned a maximum range of continuity between 60 m and 70 m at 100% of the sill value. At 97% of the sill value, the range falls to 40 m. The ellipsoid describing the anisotropy was plotted in GEMS, and the angle did not coincide well with the expected trend of the mineralization. It was therefore decided to use the variography to assist in setting the sample search ellipsoid range only, and to interpolate the model using the ID^2 method.

14.4.7 Search Ellipsoid Dimension and Orientation

For the Key Anacon Titan model, AGP used the overall geometry of the zones and the experimental variogram range as guiding principles to set the search ellipsoid size and orientation.

The first pass maximum range was sized to reach at least the next drill section. A 2 x multiplier (from Pass 1) was used to set the range of the second pass. The second pass reached the range displayed at the sill value. Lastly, a 2 x multiplier (from Pass 2) was used to set the range for the third interpolation pass and was intended to fill the blocks.

No orientation subdomain was required for the Key Anacon Titan deposit. Table 14-31 lists the final values used in the resource model for the range of the major, semi-major, and minor axes. Rotation

angles are based on the GEMS ZXZ methodology, which uses a conventional right-hand rule where the start point for the rotation of the axis coincides with the block model edges.

Table 14-31: Search Ellipsoid Dimensions (Key Anacon Titan Deposit)

Zone	Zone Group	Profile Name-Pass No.	Rotation Z	Rotation X	Rotation Z	Range X	Range Y	Range Z	Type
T-MZ(Pb-Zn)	T2210	TOR1-P1	88	-76	20	24	36	12	Ellipsoidal
T-MZ(Pb-Zn)	T2210	TOR1-P2	88	-76	20	50	73	24	Ellipsoidal
T-MZ(Pb-Zn)	T2210	TOR1-P3	88	-76	20	73	146	36	Ellipsoidal
T-MZ (ZnEq)	T2400 Series	TOR1-P1	88	-76	20	24	36	12	Ellipsoidal
T-MZ (ZnEq)	T2400 Series	TOR1-P2	88	-76	20	50	73	24	Ellipsoidal
T-MZ (ZnEq)	T2400 Series	TOR1-P3	88	-76	20	73	146	36	Ellipsoidal
T-S (ZnEq)	T2310	TOR2-P1	75	-76	25	24	36	12	Ellipsoidal
T-S (ZnEq)	T2310	TOR2-P2	75	-76	25	50	73	24	Ellipsoidal
T-S (ZnEq)	T2310	TOR2-P3	75	-76	25	73	146	36	Ellipsoidal
T-LE (ZnEq)	T2500 Series	TOR3-P1	-80	60	20	24	36	12	Ellipsoidal
T-LE (ZnEq)	T2500 Series	TOR3-P2	-80	60	20	50	73	24	Ellipsoidal
T-LE (ZnEq)	T2500 Series	TOR3-P3	-80	60	20	73	146	36	Ellipsoidal

14.4.8 Resource Block Model

The block model was constructed using GEMS 6.8™. In order to establish the block model matrix dimensions, a drill hole spacing study was completed. The study revealed that, at Titan, 50% of the drill holes will have another drill hole within 48 m. Using the criteria of one-quarter the drill spacing, the data supports a block size of 12 m (48 m/4). This block size is considered too large for the size of the individual zones. AGP elected to use a smaller block size of 8 m on strike by 4 m across by 8 m vertically, based mostly on mining selectivity considerations. This block matrix size assumed a medium-sized underground mining operation.

The block model was defined on the Project coordinate system with a 30-degree counter-clockwise rotation. Table 14-32 lists the upper southeast corner of the model, and is defined on the block edge.

Table 14-32: Block Model Definition (Block Edge)

Resource Model Items	Parameters
Easting	2,561,460
Northing	7,604,760
Top relative elevation	5,100
Rotation angle (counter clockwise)	30
Block size (X, Y, Z in metres)	4, 8, 8
Number of blocks in the X direction	155
Number of blocks in the Y direction	165
Number of blocks in the Z direction	188

14.4.9 Interpolation Plan

The resource model was created in GEMS 6.8™ with a single folder setup, using ID^2 for interpolating the zinc, lead, copper, and silver grades. An NN model was used for validation. The interpolation was carried out in a multi-pass approach, with an increasing search dimension coupled with decreasing sample restrictions.

- Pass 1 used an ellipsoid search with 8 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 3 holes to be used in the search.
- Pass 2 used an ellipsoid search with 6 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 2 holes to be used in the search.
- Pass 3 used an ellipsoid search with 4 samples minimum, and 15 maximum. A maximum of 3 samples per hole was imposed on the data selection, forcing a minimum of 2 holes to be used in the search.

The model was interpolated only within the mineralized wireframes. The Titan Main Zone lead-zinc domain T2210 was interpolated separately from the other domains. The final grades were obtained by combining the grades of T2210 with the grades of the other domains using a percent occupancy weighted method. This was done to preserve the grade distribution within the T2210 domain and minimize the blending of grade for the blocks overlapping the contact between T2210 and domains T2410, T2420, and T2430. Volume reporting uses the mineralized wireframes to correctly assign the volume and tonnages to the grade bins. This is equivalent to a percent model in most mining software packages. The methodology intrinsically assumes the hanging wall and footwall contacts will be separated out during mining. For this deposit, AGP believes this is the correct approach, since the high-grade massive and semi-massive mineralization is visually distinct from the surrounding waste in the field.

14.4.10 Mineral Resource Classification

No environmental, permitting, legal, title, taxation, socioeconomic, marketing, or other relevant issues are known to the author that may currently affect the estimate of Mineral Resources. Mineral Reserves can only be estimated based on an economic evaluation used in a prefeasibility or feasibility study of a mineral project. Thus, no reserves have been estimated. Mineral resources, which are not mineral reserves, do not have demonstrated economic viability.

Typically, the confidence level in the block model is reduced with the increase in the search ellipsoid size, along with the diminishing restriction on the number of samples used for the grade interpolation. This is essentially controlled by the pass number of the interpolation plan. A common technique is to categorize a model based on the pass number and distance to the closest sample. For the Key Anacon Titan deposit, in addition to using the pass number and distance to the closest composite, the categorization model also used a minimum number of holes.

Table 14-33 lists the parameters used to code the classification model, and Figure 14-19 illustrates the distribution of the class model for the Key Anacon Titan deposit.

Table 14-33: Classification Parameters – Key Anacon Titan Deposit

Pass Number	Retained As	Downgraded To
Pass 1	Code 1 if distance to the closest composite is <15 m and the Number of drill holes used in the estimate is >= to 3	Code 2 if distance to the closest composite is > = 15 and < 60 m and the number of holes used in the estimate is >= to 3.
Pass 2	Code 2 if distance to the closest composite is > = 15 and < 60 m and the number of holes used in the estimate is >= to 3.	Code 3 if distance to the closest composite is > = 60 and < 110 m and the number of holes used in the estimate is >= to 2.
Pass 3	Code 3 if distance to the closest composite is > = 60 and < 110 m and the number of holes used in the estimate is >= to 2.	Code 4 if distance to the closest composite is > >= 110 m

Once the class model coding was completed, it was reviewed in 3D, and final adjustments were made that affected a number of zones. These are:

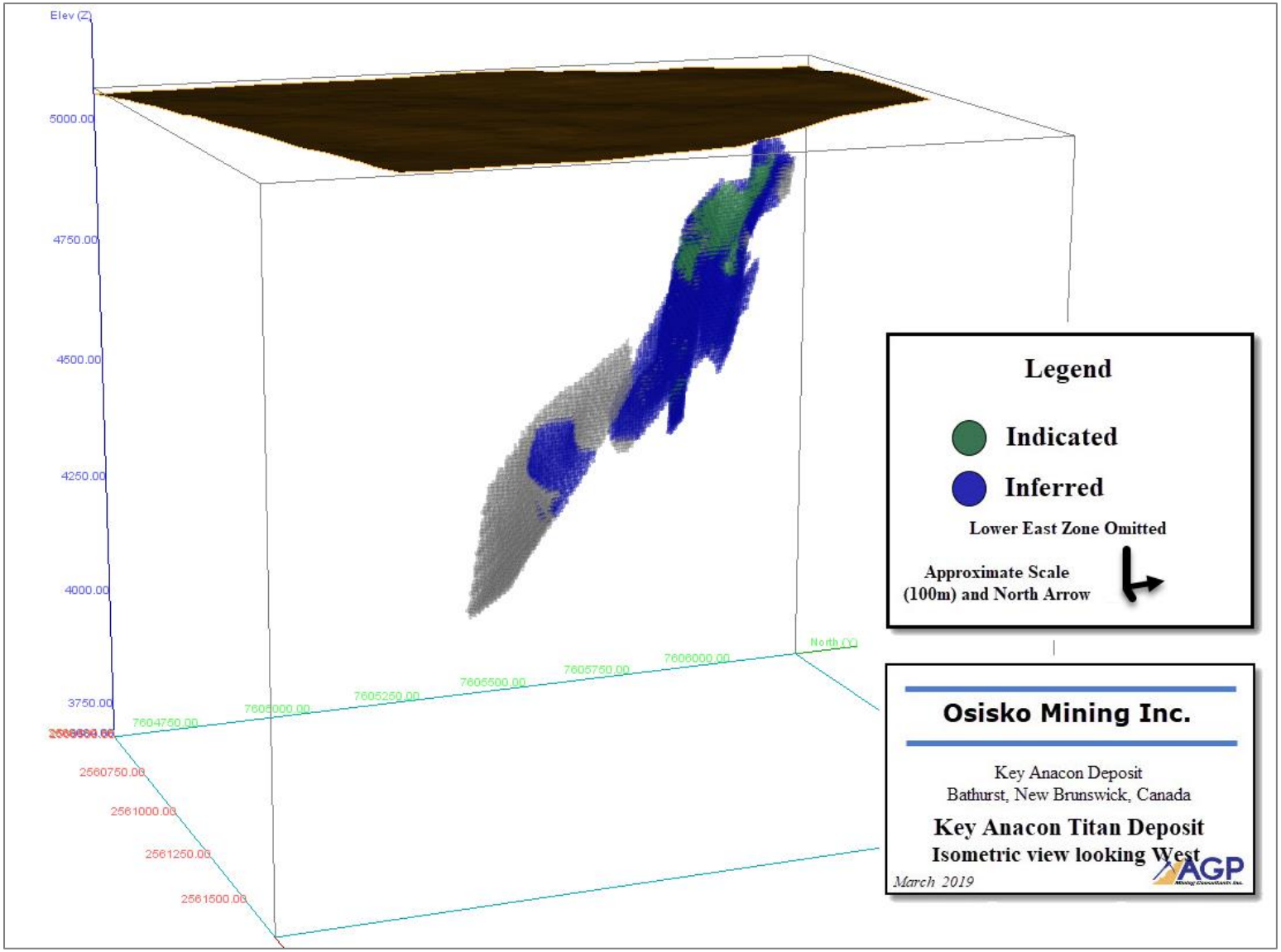
- Resource blocks in the Lower East Zone, coded T2510, T2520, and T2530 were downgraded to Code 4 due to poor data support
- Code 3 blocks for the Main Zone South, coded T2310 were downgraded to Code 4 if the number of holes used in the estimate was less than three.

Final adjustments are often required in the classification of individual block values to create areas suitable for mine planning. This is accomplished by using a GEMS™ Cypress-enabled script that adjusts, or grooms, the confidence category of isolated blocks to create contiguous resource blocks with reasonably smooth class values. The classifications of isolated blocks were upgraded or downgraded depending on the classifications of the 26 surrounding blocks. AGP validated the final block classification visually. AGP also generated histograms of the distance to the closest composites versus the class model value to evaluate the class model for reasonableness.

Two confidence categories now exist in the model. The usual CIM guideline classes of Indicated, and Inferred are coded 2 and 3, respectively. A special Code 4 represents mineralization that was considered too far away from the existing drilling to be classified as an Inferred Resource. The Code 4 blocks have been left in the classification model solely to assist Osisko Metals in its exploration activity.

Approximately 5% of the volume within the mineralized solids is classified as Indicated resources and 13% of the total volume was class as Inferred Resources. The remaining 82% of the volume comprised mostly of the large Lower East Zone, was removed from the resource due to widely spaced drilling and are assigned as Code 4 to the blocks. No resources were classified as Measured.

Figure 14-19: Block Model Classification on Isometric View (Lower East Zone Omitted)



14.4.11 Block Model Validation

The Key Anacon Main deposit grade models were validated by four methods:

- Visual comparison of colour-coded block model grades with composite grades on sections and plans
- Comparison of the global mean block grades for ID^2, NN models, composite, and raw assay grades
- Comparison using grade profiles to investigate local bias in the estimate
- Naïve cross-validation tests with composite grade versus block model grade.

14.4.12 Visual Comparison

The visual comparison of block model grades with composite grades shows a reasonable correlation between values for most of the model (Appendix F).

14.4.13 Global Comparisons

Table 14-34 shows the grade statistics for the raw assays, composites, NN and ID^2 models for the entire Key Anacon Titan deposit in the Indicated and Inferred categories. Statistics for the zinc, lead, and silver composite mean grades compare well to the raw assay grades, with a normal reduction in values due to smoothing during the compositing process.

The block model mean grade, when compared against the composites, shows a small increase in values. This is attributed to the small number of composites and smoothing of the composite grade during interpolation, as shown in the swath plots. More importantly, the grade of the NN and ID^2 models are within 8% of each other, indicating the methodology used did not introduce a bias into the estimate.

Table 14-34: Global Comparisons at 0 Cut-off (Indicated and Inferred Key Anacon Titan)

Methodology	Zn (%) at >0.0 Cut-off (Cat. 1–3)	Pb (%) at >0.0 Cut-off (Cat. 1–3)
Raw assays uncapped (clustered)	1.96	0.74
Composite capped (clustered)	1.76	0.64
NN	1.94	0.73
ID^2	1.79	0.66
Methodology	Cu (%) at >0.0 Cut-off (Cat. 1–3)	Ag (g/t) at >0.0 Cut-off (Cat. 1–3)
Raw assays uncapped (clustered)	0.60	22.1
Composite capped (clustered)	0.53	19.6
NN	0.63	22.0
ID^2/OK	0.64	21.0

14.4.14 Local Comparisons – Grade Profile

In general, the swath plots generated at 25 m intervals show good agreement, with the three methodologies showing no major local bias. The peaks and valleys on the assay and composite lines are represented in the resource model, with the interpolated model offering much more smoothing. The smoothing resulted in a few crossovers, mainly due to the low number of composites. The NN line is generally above the ID^2 line, but follows the same pattern as the ID^2 line with less smoothing.

Grade profiles for zinc are presented on Figure 14-20, Figure 14-21, and Figure 14-22. Swath plots for lead, copper, and silver are not shown, but display similar the same patterns.

Figure 14-20: X Axis Swath Plots (Indicated and Inferred Classification)

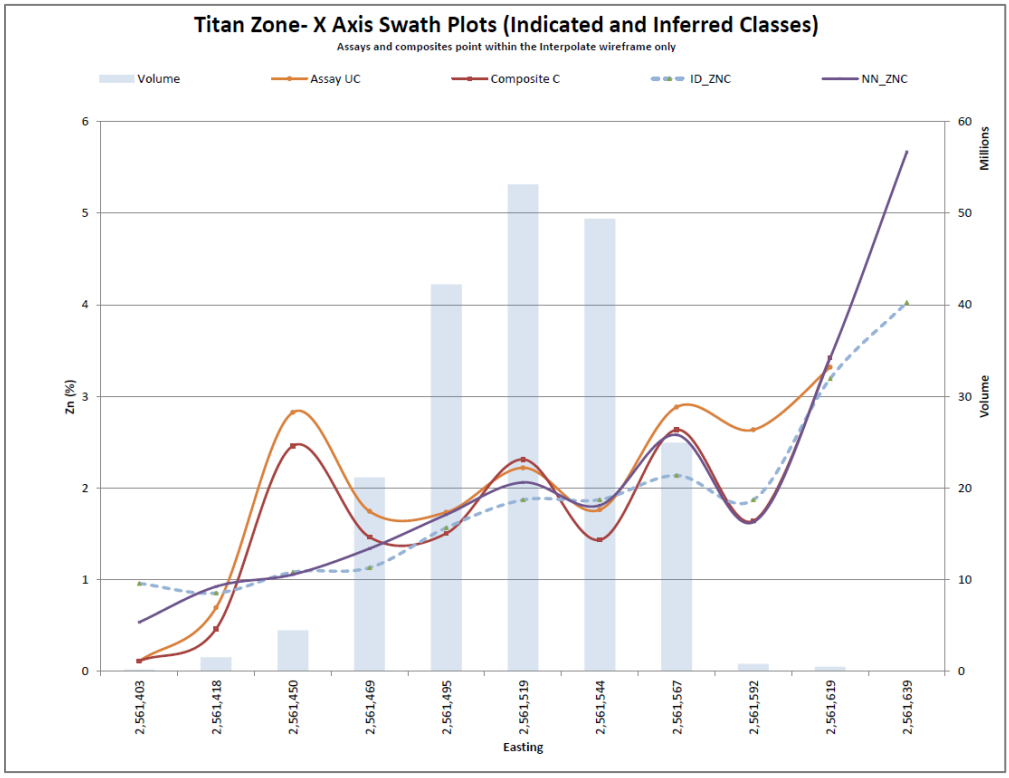


Figure 14-21: Y Axis Swath Plots (Indicated and Inferred Classification)

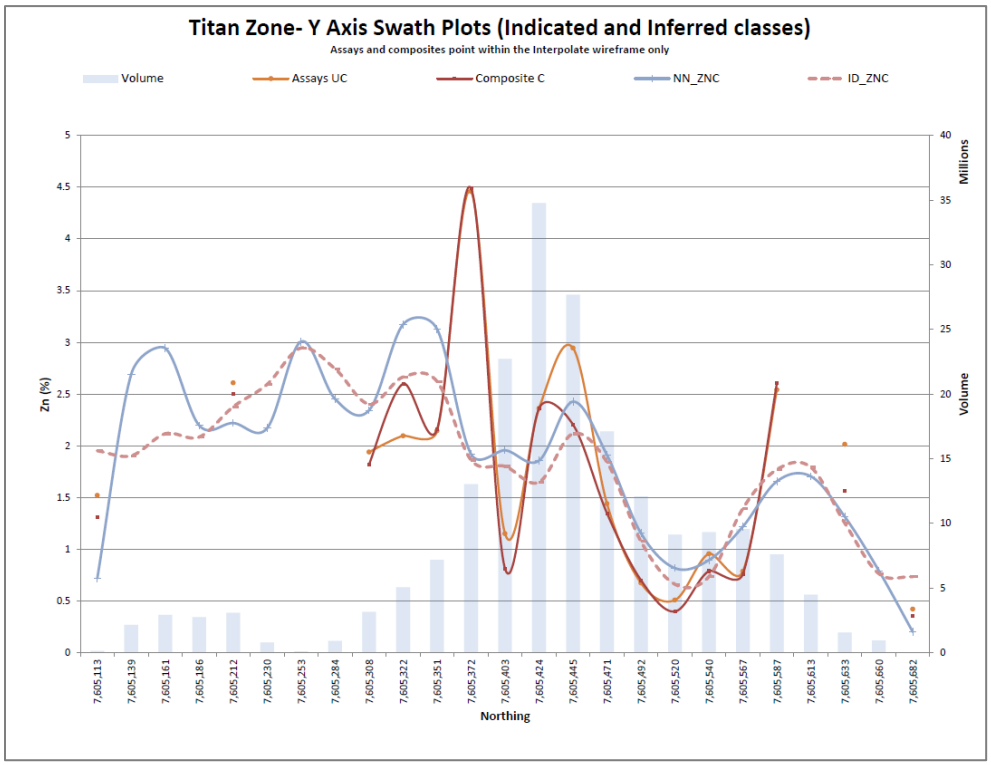
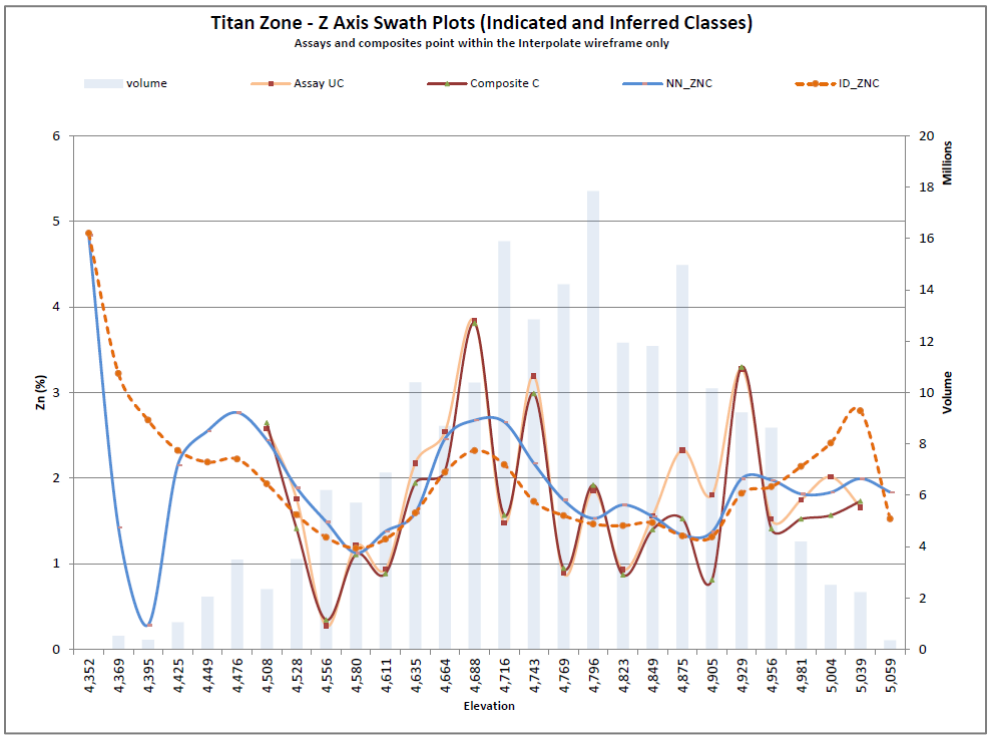


Figure 14-22: Z Axis Swath Plots (Indicated and Inferred Classification)

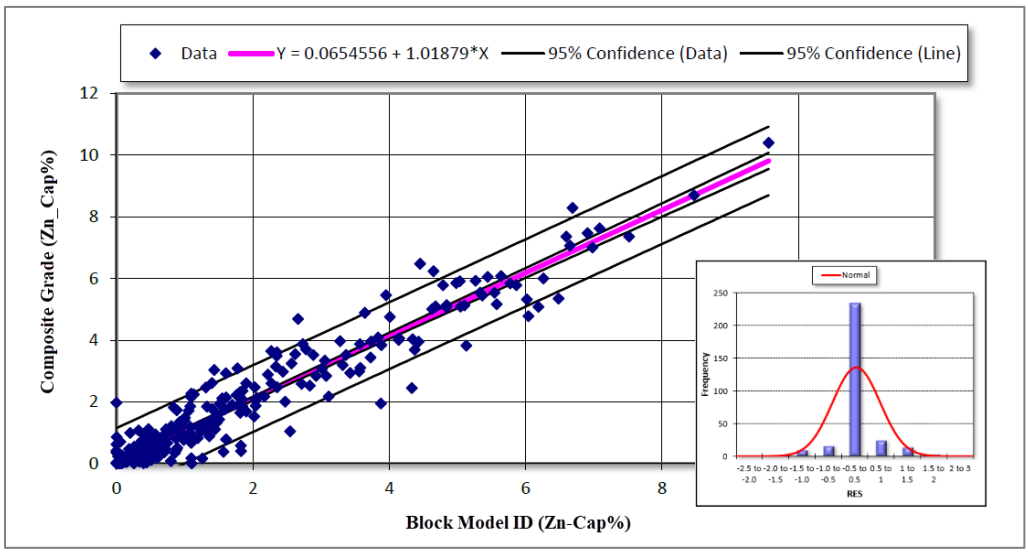


14.4.15 Naïve Cross-Validation Test

Results from the pairing of the composited and estimated grades within blocks pierced by a drill hole are presented on Figure 14-23. Out of 307 pairs with 3 outliers removed, the R^2 value is high, at 0.93. The slope of the regression is 1.02, indicating a very good distribution of the data about the parity line.

The regression residuals are the differences, on a case-by-case basis, between the actual Y values and the values calculated by the best-fit equation. These can be evaluated for normality and randomness. The inset image on Figure 14-23 shows the residual distribution. The chart shows a normally distributed bell curve with a very small positive bias.

Figure 14-23: Naïve Cross-Validation Test Results (Key Anacon Titan)



14.5 Mineral Resource Tabulation Bathurst Mining Camp Project

Effective February 20, 2019, AGP completed a maiden MRE covering the Gilmour South, Key Anacon Main, and Key Anacon Titan deposits. The Mineral Resource presented herein is in conformance with the CIM Mineral Resource definitions (2014) referred to in the NI 43-101 Standards of Disclosure for Mineral Projects.

Key Anacon's Main and Titan deposits are located 1,500 m apart. Gilmour South is located approximately 27 km southwest, and is connected to the Key Anacon site by major forestry roads. All three deposits are hosted within the Brunswick Horizon, which is the key stratigraphy that hosted the Brunswick No. 12 and Brunswick No. 6 mines that were in production over a period of fifty years.

The MRE considered 110 surface drill holes at Gilmour South, 92 surface drill holes at Key Anacon Titan, and 376 surface and underground drill holes at the Key Anacon Main deposit, for a total of 578 drill holes with an aggregated length of 156,453 m and 10,465 assays. Of these, 340 holes intercepted

mineralization in sufficient quantity to be included in the mineralized wireframes. The estimate considers all data that was available prior to January 14, 2019, the data cut-off date for the resources.

The estimate was completed based on the concept of a medium-sized underground operation, with three separate deposits feeding a single processing facility. This resource also assumes a certain degree of selectivity in order to separate the high-grade mineralized zones from the surrounding waste. AGP assumed this selectivity will be obtained via a comprehensive grade control program assisted by the use of a portable XRF unit. No other deposit in the BMC was evaluated.

The resource estimate consists of Indicated and Inferred Resource. Based on current exploration drilling data, the deposits remain open at depth and along strike. At the time of writing this report, no metallurgical testing had been carried out by Osisko Metals.

14.5.1 Marginal Cut-off Grade for Resource Estimate

The economic calculation to support this estimate is provided in Table 14-35. Operating costs and metal recovery assumptions must be considered conceptual at this stage, and no detailed economic analysis has been made to test these figures. Prices (including the 1.1 revenue factor) used for the calculation were US$1.21/lb for zinc, US$2.99/lb for copper, US$0.99/ lb for lead, and US$17.49/oz for silver. The lead and zinc prices correspond to the 3-year trailing averages for January 2019 of the London Metal exchange (LME). Copper prices reflects a 10% premium over the 3-year trailing average, and the silver price reflects a 5% premium.

Metallurgical recoveries were derived from the recoveries achieved at the end-of-life of the Brunswick No. 12 Mine. AGP notes that the recoveries at the former Brunswick No. 12 mine may not be representative of the recoveries for the Gilmour South, Key Anacon Main, or Key Anacon Titan deposits.

Table 14-35: Preliminary Breakeven Cut-off Grade Range Assumptions (February 2019, US$)

	Unit	
In-Situ Cut-off Grade		
Zinc	%	3.95
Copper	%	0.13
Lead	%	0.88
Silver		29.13
Contained metal value	US$	149.27
ZnEq in-situ cut-off grade	**%**	**5.60**
Mining dilution	**%**	**15.0**
ORE TO PROCESS PLANT		
ZnEq grade	%	4.87
Metal Prices (incl. 1.1 revenue factor)		
Zinc	US$/lb	1.21
Copper	US$/lb	2.99

	Unit	
Lead	US$/lb	0.99
Silver	US$/oz	17.49
REVENUES		
Bulk Concentrate		
Metallurgical recovery	% of Zn	6.5
	% of Cu	52.0
	% of Pb	8.0
	% of Ag	3.0
Bulk Concentrate Net Receipts	US%/t processed	7.50
Zinc Concentrate		
Metallurgical recovery	% of Zn	77.5
Zinc Concentrate Net Receipts (Ex Rate)	US$/t processed	49.27
Lead Concentrate		
Metallurgical Recovery	% of Pb	52.0
	% of Ag	57.0
Lead Concentrate Net Receipts	***US$/t processed***	***13.06***
NET REVENUE		
Zinc		52.24
Copper		3.23
Lead		7.01
Silver		7.35
NET REVENUE	**US$/t processed**	**69.83**
Operating Costs		
TOTAL OPERATING COST	**US$/t processed**	**69.83**

14.5.2 Zinc Equivalency Calculation for Resource Reporting

To assess the Mineral Resources, an in-situ resource cut-off grade of 5.5% ZnEq was used for potential underground material.

The formula used to calculate the ZnEq model grade that controls the resource reporting grade bins is as follows:

1. Contribution of the various metals in US$:

   *AGCont = Silver Price * Silver recovery * Silver Payable * 0.032150747 * Silver Grade*

   *ZNCont = Zinc Price * Zinc Recovery * Zinc Payable * 22.04622 * Zinc Grade*

   *CUCont = Copper Price * Copper Recovery * Copper Payable * 22.04622 * Copper Grade*

   *PBCont = Lead Price * Lead Recovery * Lead payable * 22.04622 * Lead grade*

2. The ZnEq is calculated by dividing the sum of the metal contributions divided by the Zinc Price, Zinc Recovery, and Zinc Payable multiplied by each other and 22.04622:

$$EQ = \frac{(AGCont + ZNCont + CUCont + PBCont)}{(Zinc\ Price * Zinc\ Recovery * Zinc\ Payable * 22.04622)}$$

Metal prices which include a 1.1 revenue factor, recoveries, and payables used in the ZnEq calculation are shown in Table 14-36.

Table 14-36: Parameters for the Zinc Equivalency Calculation

Element	Metal Price	Recoveries (%)	Payable (%)
Zinc	US$1.21/lb	84	84
Lead	US$0.99/lb	60	96
Copper	US$2.99/lb	52	95
Silver	US$17.49/oz	65	95

14.5.3 Mineral Resource

To meet the CIM definitions of reasonable prospects of economic extraction, a cut-off of 5.5% ZnEq was used for all three deposits, all of which are considered to be amenable to underground extraction. The blocks above the 5.5% ZnEq were visually inspected in 3D, and the majority of the blocks were generally found to coalesce into bulk-mineable shapes, with some exceptions.

Table 14-37 shows a summary of the results of the resource estimate at the BMC

Gilmour South

At the >5.5% ZnEq cut-off selected, the model returned a total of 2.26 Mt of Inferred Resources grading 5.74% Zn, 1.30% Pb, 0.19% Cu, and 44.30 g/t Ag, containing in-situ metals of 286.8 Mlb of zinc, 64.8 Mlb of lead, 9.4 Mlb of copper, and 3.2 Moz.

Key Anacon Main Deposit

As stated in the historical section of this report, Anacon Lead Mines Ltd. sunk a 457 m shaft and eight levels were developed prior to shut-down in 1957. It is reported that significant production was never achieved prior to shut down of the operation. In 1964, Key Anacon Mines Ltd. reopened the mine. Work was once again suspended in July 1966, when the mine was closed before production started. From the historical records, Osisko Metals is of the opinion that no significant tonnages was extracted from the Key Anacon mine. AGP believes that bulk sampling was likely carried out in addition to cross cuts through the mineralization. Since tonnages in unknown no material was removed from the resource statement below.

At the >5.5% ZnEq cut-off selected, the model returned a total of 1.67 Mt of Indicated resources grading 6.02% Zn, 2.52% Pb, 0.14% Cu, and 74.20 g/t Ag, containing 221 in-situ metals of zinc,

92.5 Mlb of lead, 5.1 Mlb of copper, and 4.0 Moz of silver. The model also returned 0.61 Mt of Inferred Resources grading 5.83% Zn, 1.98% Pb, 0.05% Cu, and 68.20 g/t Ag, containing in-situ metals of 77.7 Mlb of zinc, 26.5 Mlb of lead, 0.6 Mlb of copper, and 1.3 Moz of silver.

Key Anacon Titan Deposit

At the > 5.5% ZnEq cut-off selected, the model returned a total of 0.29 Mt of Indicated resources grading 4.36% Zn, 1.57% Pb, 0.65% Cu, and 38.80 g/t Ag, containing in-situ metals of 28.2 Mlb of zinc, 10.1 Mlb of lead, 4.2 Mlb of copper, and 0.4 Moz of silver. The model also returned 0.98 Mt of Inferred Resources grading at 4.12% Zn, 1.62% Pb, 0.78% Cu, and 42.90 g/t Ag, containing in-situ metals of 89.5 Mlb of zinc, 35.2 Mlb of lead, 17 Mlb of copper, and 1.4 Moz of silver.

Bathurst Mining Camp Project Total Resources

At the >5.5% ZnEq cut-off selected, all three models returned a total of 1.96 Mt of Indicated resources grading 5.77% Zn, 2.38% Pb, 0.22% Cu, and 68.9 g/t Ag, containing 249.1 Mlb of zinc, 102.6 Mlb of lead, 9.3 Mlb of copper, and 4.3 Moz of silver. The model also returned 3.85 Mt of Inferred Resources grading 5.34% Zn, 1.49% Pb, 0.32% Cu, and 47.7 g/t Ag, containing in-situ metals of 453.0 Mlb of zinc, 126.4 Mlb of lead, 27 Mlb of copper, and 5.9 Moz .

Table 14-37: Resource Estimate of the Bathurst Mining Camp Project

Zones	Class	Tonnes (M)	Grades (at 5.5 ZnEq Cut-off)					In-situ Metal			
			Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	ZnEq (%)	Zinc (Mlb)	Lead (Mlb)	Copper (Mlb)	Silver (Moz)
Key Anacon	Indicated	1.67	6.02	2.52	0.14	74.2	9.31	221.0	92.5	5.1	4.0
Titan		0.29	4.36	1.57	0.65	38.8	7.25	28.2	10.1	4.2	0.4
Total Indicated @ 5.5 ZnEq cut-off		**1.96**	**5.77**	**2.38**	**0.22**	**68.9**	**9.00**	**249.1**	**102.6**	**9.3**	**4.3**
Key Anacon	Inferred	0.61	5.83	1.98	0.05	68.2	8.49	77.7	26.5	0.6	1.3
Titan		0.98	4.12	1.62	0.78	42.9	7.35	89.5	35.2	17.0	1.4
Gilmour		2.26	5.74	1.30	0.19	44.3	8.08	285.8	64.8	9.4	3.2
Total Inferred @ 5.5 ZnEq cut-off		**3.85**	**5.34**	**1.49**	**0.32**	**47.7**	**7.96**	**453.0**	**126.4**	**27.0**	**5.9**

Notes: Cut-off determined by using a ZnEq grade of 5.5%. ZnEq grade calculated using prices of 1.21 US$/lb for zinc, US$0.99/lb for lead, US$2.99/lb for copper, and US$17.49/oz. for silver which includes a revenue factor of 1.1. Recoveries used were 84% Zn, 60% Pb, 52% Cu, and 65% Ag, and payables were 84% Zn, 96% Pb, 95% Cu, and 95% Ag. Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grades, and contained metals.

AGP is required to inform the public that the quantity and grade of reported Inferred Resources in this estimation must be regarded as conceptual in nature, and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological grade or quality of continuity. For these reasons, an Inferred Resource has a lower level of confidence than an Indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. It is also noted that Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. Lastly, rounding of values as required by the reporting guidelines may result in apparent differences between tonnes, grades, and metal contents. Table 14-38 shows the sensitivity of the model to changes in cut-off.

Table 14-38: Cut-Off Sensitivity

Deposit	Class	ZnEq Cut-off	Tonnes (M)	Grades (at 5.5 ZnEq Cut-Off)					In-Situ Metal			
				Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	ZnEq (%)	Zn (Mlb)	Pb (Mlb)	Cu (Mlb)	Ag (Moz)
Key Anacon Main	Indicated	>8.0	0.98	7.09	3.09	0.15	94.6	11.15	152.8	66.5	3.2	3.0
		>7.0	1.23	6.66	2.85	0.14	85.6	10.39	181.1	77.6	3.8	3.4
		>6.0	1.51	6.25	2.64	0.14	78.0	9.69	207.3	87.5	4.6	3.8
		>5.5	1.67	6.02	2.52	0.14	74.2	9.31	221.0	92.5	5.1	4.0
		>5.0	1.85	5.77	2.40	0.14	70.4	8.91	234.7	97.5	5.7	4.2
		>4.0	2.17	5.37	2.20	0.14	64.1	8.26	256.1	104.8	6.8	4.5
Key Anacon Titan	Indicated	>8.0	0.08	5.85	2.30	0.59	54.3	9.40	9.9	3.9	1.0	0.1
		>7.0	0.13	5.31	2.03	0.61	48.9	8.63	14.9	5.7	1.7	0.2
		>6.0	0.23	4.67	1.71	0.64	41.9	7.69	23.4	8.6	3.2	0.3
		>5.5	0.29	4.36	1.57	0.65	38.8	7.25	28.2	10.1	4.2	0.4
		>5.0	0.35	4.11	1.47	0.67	36.6	6.93	31.7	11.3	5.2	0.4
		>4.0	0.56	3.47	1.23	0.67	31.2	6.01	42.5	15.1	8.2	0.6
Key Anacon Main	Inferred	>8.0	0.25	7.72	2.73	0.05	99.3	11.46	42.7	15.1	0.3	0.8
		>7.0	0.33	7.08	2.47	0.05	90.2	10.47	52.1	18.2	0.3	1.0
		>6.0	0.45	6.42	2.20	0.05	78.7	9.42	64.1	22.0	0.5	1.1
		>5.5	0.61	5.83	1.98	0.05	68.2	8.49	77.7	26.5	0.6	1.3
		>5.0	0.81	5.30	1.78	0.04	59.8	7.67	94.5	31.6	0.8	1.6
		>4.0	1.51	4.29	1.45	0.03	46.8	6.19	142.6	48.3	1.2	2.3
Key Anacon Titan	Inferred	>8.0	0.28	5.65	2.28	0.68	53.8	9.35	34.7	14.0	4.2	0.5
		>7.0	0.49	5.10	2.06	0.66	50.9	8.55	54.8	22.1	7.1	0.8
		>6.0	0.79	4.51	1.78	0.71	45.7	7.76	78.0	30.8	12.2	1.2
		>5.5	0.98	4.12	1.62	0.78	42.9	7.35	89.5	35.2	17.0	1.4
		>5.0	1.18	3.87	1.51	0.79	40.8	7.01	100.7	39.4	20.6	1.5
		>4.0	1.80	3.24	1.24	0.80	36.0	6.12	128.6	49.1	31.9	2.1
Gilmour South	Inferred	>8.0	0.95	7.13	1.74	0.25	61.5	10.30	149.7	36.6	5.3	1.9
		>7.0	1.24	6.64	1.63	0.24	58.7	9.64	181.5	44.4	6.6	2.3
		>6.0	1.89	6.00	1.39	0.20	48.2	8.52	250.4	58.0	8.5	2.9
		>5.5	2.26	5.74	1.30	0.19	44.3	8.08	285.8	64.8	9.4	3.2
		>5.0	2.48	5.56	1.26	0.18	42.6	7.83	304.0	68.9	10.0	3.4
		>4.0	3.22	4.98	1.17	0.17	38.0	7.04	353.5	83.1	11.9	3.9

Due to the use of less reliable historical holes, AGP inspected the block grade supported by the more recent drilling by Osisko Metals. At the stated resource cut-off of 5.5% ZnEq, 54% of the block grade at Gilmour South is supported by Osisko Metals drilling. For the Key Anacon Main deposit, 5% of the Indicated resources block grade is supported by Osisko Metals drilling. This increases to 25% for the Inferred Resources. For the Titan deposit, 68% of the Indicated resources block grade is supported by Osisko Metals drilling, while the Osisko Metals drilling support for Inferred Resources is 61%.

15 MINERAL RESERVE ESTIMATES

This section is not required for a Technical Report on Mineral Resources.

16 MINING METHODS

This section is not required for a Technical Report on Mineral Resources.

17 RECOVERY METHODS

This section is not required for a Technical Report on Mineral Resources.

18 PROJECT INFRASTRUCTURE

This section is not required for a Technical Report on Mineral Resources.

19 MARKET STUDIES AND CONTRACTS

This section is not required for a Technical Report on Mineral Resources.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Key Anacon

Stantec Consulting Ltd. (Stantec) was contracted by Hunter Brook to complete an independent evaluation of known and potential environmental and safety concerns associated with the Key Anacon Project. In 2016, Stantec conducted a site visit and completed a legacy mining site assessment in which they outlined a list of key short-term recommendations to manage the site.

Upon completion of the purchase agreement between Hunter Brook Holdings Limited and Osisko Metals, it was decided that the company would begin the ESA process. In May 2018, GEMTEC was retained by Osisko Metals to undertake a Phase I ESA for the Key Anacon property. The Phase I ESA is required for due-diligence purposes to establish the property's environmental history and liabilities. In addition, a seasonal Surface Water and Sediment Quality Sampling Program commenced in the spring of 2018, which is ongoing.

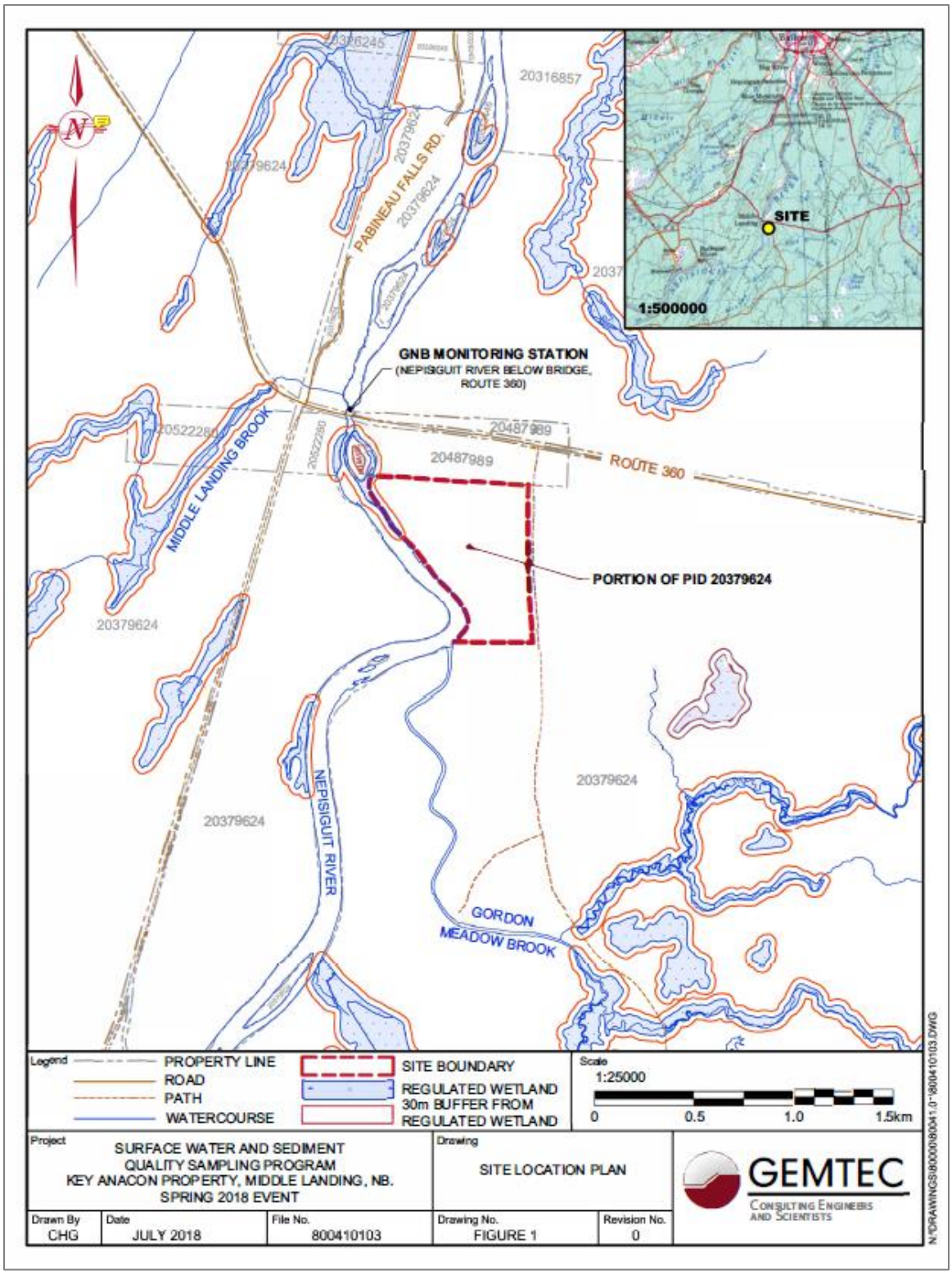
The Key Anacon property is located primarily on ungranted Crown Land (PID 20379624). A small portion of the claim block is covered by surface right holders. Of particular interest is PID 20487989 (Figure 20-1), which is located between the Key Anacon Main and Key Anacon Titan deposits and covers a portion of the access route to both deposits. The surface rights of this land are held by NB Power.

The Phase I ESA carried out by GEMTEC is based on the requirements of the Canadian Standards Association (CSA) Phase I ESA standard, Z768-01 (reaffirmed 2016) and, as such, consists of the following tasks:

- Records review
- Site visit
- Interviews with individuals with current or historical knowledge of the area
- Evaluation of information and preparation of a report.

The purpose of the Phase I ESA is to identify actual and potential for site contamination and potential for regulated materials (e.g., asbestos, ozone-depleting substances). Contamination may exist as a result of current or past activities on the site and/or adjoining properties. The information gathered as part of the Phase I ESA was obtained using non-invasive methods, and no soil, surface water, groundwater, or building materials were sampled or tested as part of this assessment. The Phase I ESA does not include an assessment of the development potential of a land parcel. Any restrictions on the land due to municipal zoning, the presence of environmentally significant areas, watershed protection, the presence of watercourses or wetlands, river classification or groundwater protection do not form part of the Phase I ESA. These concerns should be addressed by contacting the appropriate government agencies.

Figure 20-1: Key Anacon Property Surface Rights Map (GEMTEC, 2018)



20.1.1 Permitting

Osisko Metals has applied for a 2019 exploration permit as the 2018 permit expired March 31, 2019. Osisko Metals will apply for a Harvesting Permit for the summer months once the Exploration permit has been approved.

20.1.2 Social and Community Impact

Osisko Metals is actively consulting with local communities and First Nations to create positive and mutually beneficial relationships. Information regarding the exploration activities has been shared with interested parties, as well as with the local municipal governments and the New Brunswick Government.

20.1.3 Conclusions

The primary environmental liability is a waste rock pile located just north of the capped shaft at the Key Anacon Main Zone. Osisko Metals owns the mineral rights and the Crown owns the surface rights. As such, the Crown owns any environmental liabilities or reclamation obligations that would be associated with surface ownership of the site. If Osisko Metals acquires the surface rights to the site in support of mine development, the site's historical environmental liabilities, including the waste rock pile and related ML/ARD impacts, as well as other potential sources of contamination identified as part of the Phase I ESA, will need to be considered both as part of acquisition negotiations with the Crown prior to transfer of surface rights to Osisko Metals, as well as in subsequent mine development, operation, and rehabilitation and closure planning.

20.2 Gilmour South

20.2.1 Introduction

The Gilmour South property is located within a portion of ungranted Crown Land (PAN 06527246). Due to the early stage of the exploration activity and a lack of historical development, Osisko Metals has yet to undertake a Phase I ESA.

20.2.2 Environmental Studies

No past or present environmental studies have been conducted on the Gilmour South property.

20.2.3 Permitting

Osisko Metals' Work Permit and Harvesting Permit for the Gilmour South property are currently expired and require renewal prior to future exploration activities.

20.2.4 Social and Community Impact

Osisko Metals is actively consulting with local communities and First Nations to create positive and mutually beneficial relationships. Information regarding the exploration activities has been shared with interested parties as well as with the local municipal governments and the New Brunswick Government.

20.2.5 Conclusions

To date, the most invasive exploration on the Gilmour South Project has been diamond drilling, which has not required formal environmental studies. Should the Project proceed to a PEA, it would be advisable to conduct a Phase I ESA.

21 CAPITAL AND OPERATING COSTS

This section is not required for a Technical Report on Mineral Resources.

22 ECONOMIC ANALYSIS

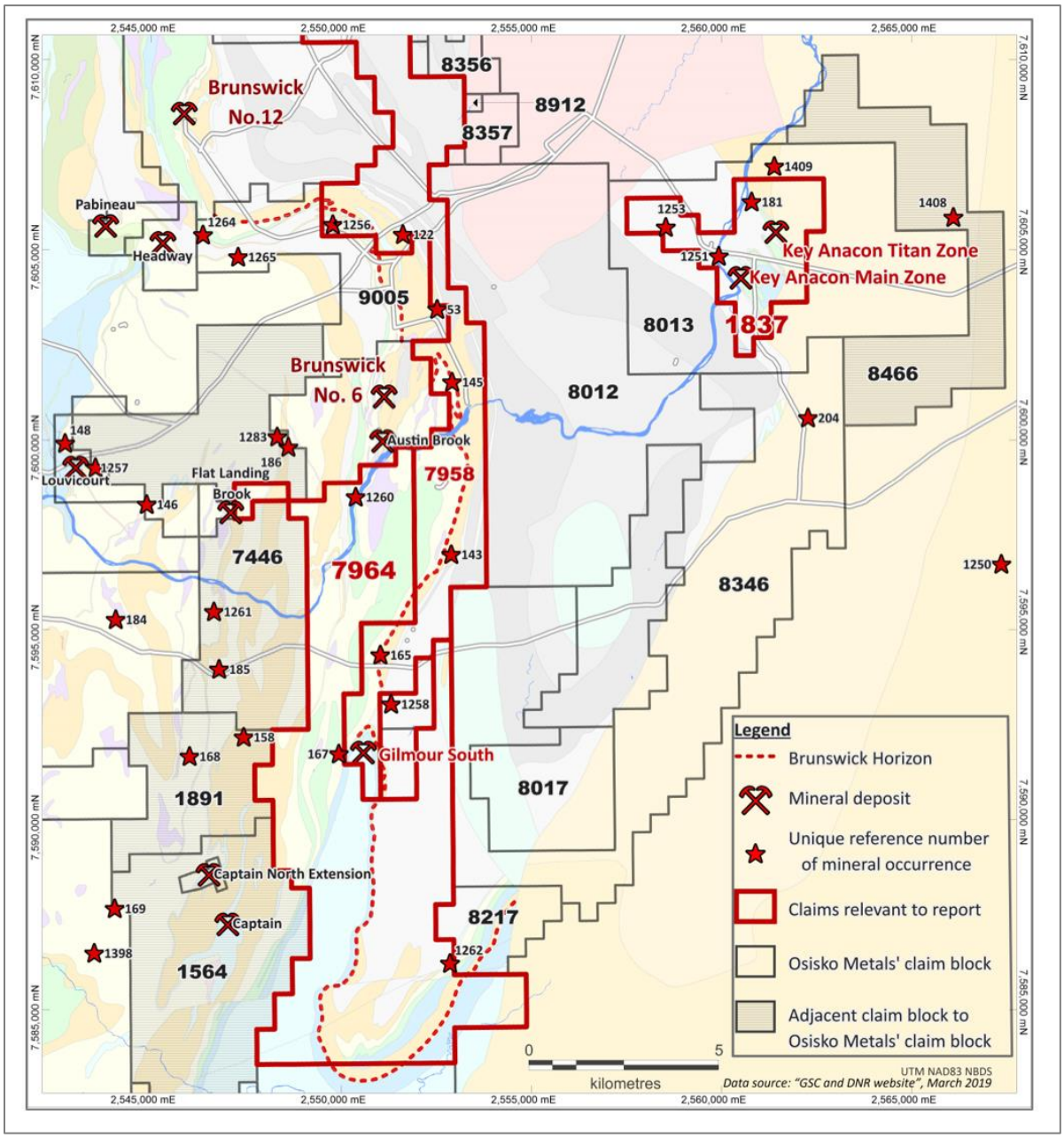
This section is not required for a Technical Report on Mineral Resources.

23 ADJACENT PROPERTIES

Numerous base metal occurrences are known to occur along the geologically favourable stratigraphy referred to as the Brunswick Belt, which hosts past producers: the Brunswick No. 12 mine and the Brunswick No. 6 mine. Osisko Metal's claims currently cover most of the Brunswick Belt, as shown on Figure 23-1.

Descriptions of potentially significant mineral occurrences are referenced with a New Brunswick Government Unique Reference Number (URN) identification. The URN is linked to a detailed description of the mineral occurrence that is easily found on the New Brunswick Government website at https://www2.gnb.ca/content/gnb/en/departments/erd/energy/content/minerals.html, which is the source of the information reported in this section. The URN locations and associated information shown on Figure 23-1 are described below, which are public domain provided by the New Brunswick Government. The author has been unable to verify the accuracy of the information, and AGP note that the information presented here is not necessarily indicative of the mineralization on the property that is the subject of this Technical Report.

Figure 23-1: Adjacent Claim Blocks to Osisko Metals



23.1 Key Anacon Property

23.1.1 Nearby Properties

Bordering the Key Anacon property to the northeast is claim block 8466 (i.e., the Red Pine Brook property), owned by Michael Taylor. The Red Pine Brook property hosts the Red Pine Brook mineral occurrence (URN# 1408). This occurrence is located beneath the Carboniferous cover. To date, minimal drilling has occurred on the property, with the several drill holes intersecting disseminated to stringer pyrrhotite in conglomerate or felsic tuffs.

23.1.2 Nearby Mines

There are no operating or historical mines immediately adjacent to the Key Anacon property claims.

23.2 Gilmour South Property

23.2.1 Nearby Properties

Bordering the Gilmour South property to the west are four claim blocks from north to south; these are claim blocks 7446, 1891, 251, and 1564.

Claim Block 7446

Claim block 7446 which host the former Brunswick No. 6 mine, owned by Wolfden Resource Corp. The Brunswick No. 6 property hosts the Nepisiguit River occurrence (URN# 1261), the Nepisiguit Brook occurrence (URN# 185), the Esker mineral occurrence (URN# 1283), and the Flat Landing Brook East occurrence (URN# 186).

The Nepisiguit River occurrence is described as minor sulphide mineralization consisting of pyrite stringers and locally up to 1% sphalerite blebs occurring in quartz augen schist (drill hole NB-89-1 intersected minor sulphide mineralization occurring in quartz augen schist).

The Nepisiguit Brook occurrence is described as several narrow copper stringer zones found in a sheared chloritic slate (iron-formation) unit within Ordovician Tetagouche Group rhyolite and felsic tuffs. The mineralized zones consist of chalcopyrite, bornite, pyrite, and minor galena. DDH NB-89-3 intersected a 7.1 m wide iron formation containing anomalous lead, zinc, copper, and silver mineralization.

The Esker occurrence is described as several lenses of Stratiform VMS related mineralization hosted by the Flat Landing Brook Formation (Tetagouche Group). Hole 63-2-90 intersected two separate mineralized zones. The first zone contained 5.94 m of mineralized chert interbedded with felsic tuffs and argillites. The mineralization varies from medium-grained banded pyrite to pyrite-pyrrhotite-chalcopyrite stringers. The other mineralized zone was from 126.6 m to 134.8 m and had 5% to 20% pyrite and pyrrhotite with minor sphalerite. Hole 63-3-90 intersected a broad zone of disseminated

sulphide mineralization from 57 m to 73 m. Significant assays include 24 cm at 0.37% Cu, 2.8% Pb, 3.26% Zn, and 18 cm at 0.11% Cu, 3.96% Pb, and 4.59% Zn.

The Flat Landing Brook East occurrence is described as a sulphide-bearing zone within Ordovician Tetagouche Group magnetite and chlorite iron formation, quartz-chlorite breccia, felsic tuff and rhyolite. Mineralization is mainly disseminated and is locally semi-massive to massive. This zone is presumed to correlate with the Flat Landing Brook deposit, but as a separate zone. The mineralization consists of a stratabound zone over 240 m long and 2.5 m to 14 m thick. The sulphides are chiefly pyrite and pyrrhotite.

Claim Block 1891

Claim block 1891 is the Nepisiguit Brook property, owned by Commander Resources. It hosts the McDonough (Trend B) mineral occurrence (URN# 158) and the McDonough West (Trend A) mineral occurrence (URN# 168)

The McDonough (Trend B) occurrence is described as fracture-filling, disseminated and massive sulphide mineralization in Ordovician Tetagouche Group chloritized felsic tuffs. The mineralized zone is erratic both across and along strike. Pyrite and pyrrhotite are most abundant; chalcocite, bornite, and tetrahedrite occur rarely. Trend B contains the McDonough east Copper-prospect. The best drill intercept to date was drill hole 97-10, which included 13.25 m of 2.24% Cu while drilling to test the "JS Copper Zone" (Major General Resources Ltd., Report Number 475035, 1998).

The McDonough West (Trend B) occurrence is described as a base metal sulphide mineralization occurring in a tabular zone as disseminations and stringers within Middle Ordovician chloritized and sericitized rhyolite tuffs of the Flat Landing Brook Formation (Tetagouche Group). The original discovery was a thin film of remobilized galena in rhyolite of the Flat Landing Brook Formation. Apparently a stratabound zone strikes northeast and dips steeply west. Sphalerite and galena occur as veinlets and as fracture fillings. The best intersection was 9 m of sub-2% Pb+Zn in hole 26-2 drilled by Con Harpers of Malartic Gold Mines Ltd. in 1956.

Claim Block 251

Claim block 251 is the CNE property, owned by Stratabound Minerals Corp. The CNE property hosts the Captain North East Extension Deposit (URN# 251) and is commonly referred to as the CNE. The Captain North East Extension Deposit is described as Pyrite and Lead-Zinc-Silver sulphides in Ordovician Tetagouche Group quartz-sericite tuff and chert overlain by black slate and quartz-feldspar augen schist, on the flank of a rhyolite dome. Metal zoning is defined by a chalcopyrite stringer zone in the footwall rhyolite and a zinc rich zone in the hanging wall quartz-crystal tuff. The deposit is located approximately 1.5 km (0.9 miles) N-NW of the Captain Deposit.

Claim Block 1564

Claim block 1564 is the CNE Group property, owned by Statabound Minerals Corp. The CNE Group property hosts the Captain occurrence (URN# 159) and the Nepisiguit Brook South occurrence (URN# 1271).

The Captain occurrence is described as massive banded, stringer, and disseminated pyrite and chalcopyrite in a chloritized quartz feldspar porphyry and augen schist along the contact with chloritized metasediment. Mineralization partially replaces chloritized matrix in the quartz feldspar porphyry and to a lesser extent occurs in quartz stringers, cutting the metasediment. Host rocks are Ordovician within the Tetagouche Group.

The Nepisiguit Brook South occurrence is described as oxide, chlorite, and sulphide iron formation with traces of galena and sphalerite. The iron formation has been folded repeatedly.

23.2.2 Nearby Mines

There are no operating mines immediately adjacent to the Gilmour South claims; however, the northwest portion of the claim area is adjacent to the past-producing Brunswick No. 6 and No. 12 mines, both operated (at closure) by Glencore Canada Corp. The areas around these deposits are mining leases which are not eligible for staking.

The Brunswick No. 6 deposit is described as massive, fine-grained sulphides occurring at the base of Ordovician–Tetagouche Group iron formation. Sulphides are zoned from copper-rich near the footwall chloritic phyllite, to lead-zinc-rich immediately above. Massive pyrite and irregular lenses of lead-zinc occur toward the hanging wall phyllite, felsic tuff, and Conglomerate. On closure, a total of 12.2 Mt grading 5.43% Zn, 2.15% Pb, 0.40% Cu and 67.0 g/t Ag had been mined (The Government of New Brunswick, Department of Energy and Mines Division Mineral Occurrence Database).

The Austin Brook deposit is described as a conformable lens of massive sulphides that are 450 m long, 4.5 m wide and 210 m deep. The deposit represents the sulphide facies of an iron formation that is sandwiched between Ordovician Tetagouche Group felsic metavolcanic rocks.

The Brunswick No. 12 deposit is described as two stratiform lenses converging at a depth of roughly 1,000 m. The deposit strikes north-south, dips steeply to the east, and plunges steeply to the south. The sulphide bodies are divisible into three zones, from footwall to hanging wall:

1. Massive-disseminated chalcopyrite-pyrrhotite, minor sphalerite-galena
2. Massive banded pyrite-sphalerite-galena, minor chalcopyrite-pyrrhotite
3. Massive fine pyrite, minor sphalerite-galena-chalcopyrite.

Past production at Brunswick No. 12 was 136.6 Mt grading 8.74% Zn, 3.44% Pb, 0.37% Cu, and 102.2 g/t Ag (The Government of New Brunswick, Department of Energy and Mines Division Mineral Occurrence Database). AGP notes that reference to historical production on, or in the vicinity of,

Osisko Metals properties within this Technical Report does not imply that any future mineral resources or discoveries will be of economic viability, nor does it imply that additional discoveries will be made.

The Brunswick North End Zone deposit is described as zinc-lead rich massive sulphides occurring at a vertical depth of 1,100 m, 1 km north of the Brunswick No. 12 mine. The zone has a strike length of 200 m and a down-dip extent of 170 m. Sulphides are fine-grained and lack layering. A footwall sequence comprises argillite, crystal tuff, and quartz feldspar augen schist. The hanging wall is substantially thinner than at No. 12. The deposit is interpreted as an F1-fold closure at a deeper structural level than the F1 fold closure occupied by the Brunswick No. 12 mine.

24 OTHER RELEVANT DATA AND INFORMATION

AGP knows of no additional relevant data that might materially impact the interpretations and conclusions presented in this Technical Report.

25 INTERPRETATION AND CONCLUSIONS

The Key Anacon property is recorded as the Key Anacon Mine mineral claim block 1837, a group of 51 claim units located approximately 20 km south-southwest from the town of Bathurst, in Gloucester County, NTS sheet 21P/05, New Brunswick, Canada. The Gilmour South property is recorded as the Gilmour South claim block 7964, consisting of 256 claim units and the Gilmour West claim block 7958 consisting of 200 claim units, both located in Gloucester County, NTS sheet 21P/05, New Brunswick. The deposit is situated 35 km southwest from the town of Bathurst with the bulk of the known mineral deposit within the Gilmour West claim block 7958 and the remaining part on the Gilmour South claim block 7964. Osisko Metals (prospecting Licence Number 16336) owns 100% of the mineral claim block. The surface rights for the entire property are held as Crown Land.

Good year-round property-wide access is provided by paved highways and secondary gravel roads. The entire area is covered by autochthonous forests in flat terrains except for the Nepisiguit River which crosses through the Key Anacon property. Brooks and large swampy areas are common. Glacial cover is thin but extensive resulting in minimal bedrock outcroppings.

Key Anacon and Gilmour South are VMS mineral deposit which shares similarities to the former operating mines in the BMC. The BMC geology comprises basement rocks of the Miramichi Group overlain by the Bathurst Supergroup which contains all the known VMS deposits. The massive sulphide deposits in the BMC occur in syngenetic horizons at several stratigraphic positions within the Bathurst Supergroup. The former producer, Brunswick No. 12 and the Brunswick No. 6 mines lie within the Tetagouche Group at, or near the upper contact of the Nepisiguit Falls Formation felsic unit with the overlying Flat Landing Brook Formation. That stratigraphic position is known as the Brunswick Horizon.

The property geology in the Key Anacon and Gilmour South area consists of the basement sedimentary rocks of the (Late Cambrian to Early Ordovician) Miramichi Group and the prospective volcanic and sedimentary rocks of the (Early to Late Ordovician) Tetagouche Group. Gilmour South and the two mineral deposits occurring within the Key Anacon property, namely, the Key Anacon Main deposit and the Key Anacon Titan deposit are both located at the Brunswick Horizon. On the Key Anacon property, the Brunswick Horizon is complexly folded due to the extent of poly-phase deformation and as a result, there is good exploration potential along strike and at depth. At Gilmour South, the Brunswick Horizon is less deformed than the Key Anacon deposits.

In September 2017, Osisko Metals announced plans for an aggressive Phase I exploration and drill program in the Bathurst Mining Camp. Since commencing work on both the Key Anacon and Gilmour South properties, Osisko Metals has employed a variety of exploration techniques consisting of 3D modelling studies, downhole PEM, pXRF, OTV logging, diamond drilling, and core logging.

Based on the review of the QA/QC, data validation, and statistical analysis the following conclusions were made:

- The regional geology, lithological, and structural controls on the mineralization at the Key Anacon and Gilmour South properties are well understood by Osisko Metals' exploration team.
- AGP has reviewed the methods and procedures to collect and compile geological, geotechnical, and assaying information for the BMC and found them to be suitable for the style of mineralization found on the property and meet accepted industry standards.
- The mineralization on the BMC was sampled over the years with multiple campaigns of core drilling by various operators since the 1950s. The drill database is now a mix of historical data and more recent data collected by Osisko Metals in 2017 and 2018. Both data types were used in the resource estimate.
- The analytical laboratory used by Larder and Key Anacon prior to the 1992 drill campaign is unknown and assays were recovered from historical drill logs. Rio Algom in 1992–1993 used Chemex Laboratory, Noranda from 1995 to 2011 used the Brunswick Mine laboratory and XRAL Laboratories. Hunter Brook and El Nino used Actlabs and the Brunswick Mine laboratory in 2007 and 2015. AGP notes that even though the name of the laboratory is known, not all laboratory certificates were available, and assays were often recovered from drill logs.
- Since 2017, Osisko Metals uses Actlabs, which is ISO/IEC 17025 and ISO 9001 accredited.
- Osisko Metals' drill core are analyzed for 36 elements using a 4-acid "near total" digestion followed by ICP-OES. Over limits for copper, lead, and zinc is re-analyzed using a peroxide fusion digestion followed by ICP-OES. Silver over limits is re-analyzed using fire assays with gravimetric finish.
- Prior to 1997, only a few QA/QC guidelines existed, and monitoring programs were not commonly conducted by mining companies, consequently, QA/QC program for the historical drill holes is not known to exist and assumed by AGP to be non-existent. Osisko Metals in 2017, implemented a QA/QC program consisting of blanks and CRMs. In 2018, the program was improved with the addition of ¼ core duplicates.
- Submission rates meet the industry accepted practice for each of the QA/QC type of samples. The sampling procedures, analytical methods, and QA/QC procedures undertaken by Osisko Metals indicate reasonable accuracy of the sample data and no systemic cross-contamination at the sample preparation level.
- Examination of the QA/QC standards by AGP shows issues with two of the CRM when the recommended value approaches the upper detection limit of the element analyzed. The remaining CRM results indicated good precision of the analytical data produced by Actlabs.

- Osisko Metals validated historical drill holes via twin drilling. Percentile chart indicated that for all data compiled, the distribution between the twin drill holes assays when compared to the historical assays is comparable up to the 75th percentile. Beyond the 75th percentile, the newer twin drill holes are lower grade than the historical drilling. The paired assays show a high variability on the individual pairs. From the data reviewed, AGP believes that the underground drill holes completed by Key Anacon Mine Limited in the 1950s are useable for resource estimation purpose but with a restriction on the classification due to variability in the grade of the individual pairs and small core size and long sampling intervals of the historical holes. The restriction imposed by AGP is not to assign Measured Resources.
- Osisko Metals does not re-submit pulps to an umpire laboratory, and AGP recommends the addition of this QA/QC protocol on future drill programs.
- Density measurement is carried out on site by Osisko Metals' personnel, a number of core samples were submitted to Actlabs as part of the QA/QC procedures for specific density (SD) measurements. This program was implemented to validate the in-house measurements. AGP notes that Actlabs results were slightly lower from the 3 g/cm^3 when compared with Osisko Metals' measurements. This minor density difference was attributed to the lower sample size used by Actlabs, which was only 20 g to 50 g versus Osisko Metals', which weight the entire drill core sample interval.
- Through site visits in 2018 and 2019, AGP performed data verification, collection of independent character samples, and a database audit. The drill database was found to be error-free and suitable to be used for a resource estimate.
- Core handling, core storage, and chain of custody are consistent with industry best practice.
- Osisko Metals did not conduct any metallurgical or mineralogical testing on the mineralization of the Key Anacon and Gilmour South deposits.
- AGP believes that the exploration potential at the Key Ancon Main and Titan deposits remains high at the property scale, justifying compilation, and target generation programs.
- The Key Anacon project hosts a number of mineralized intercepts outside the current MRE that merit follow-up work.
- AGP recommend drilling lateral extensions of the currently identified zones to expand the existing resources.

Based on the above conclusions and effective February 20, 2019, AGP completed a Maiden MRE covering the Gilmour South, Key Anacon Main deposit and Key Anacon Titan deposit. The mineral resource presented herein is in conformance with the CIM Mineral Resource definitions (2014) referred to in the NI 43-101 Standards of Disclosure for Mineral Projects.

The MRE considered 110 surface drill holes at Gilmour, 92 surface drill holes at the Key Anacon Titan deposit and 376 surface and underground drill holes at Key Anacon Main deposit for a total of 578 drill holes with an aggregated length of 156,453 m and 10,465 assays. Of those, 340 holes intercepted

mineralization in sufficient quantity to be included in the mineralized wireframes. The estimate considers all data that was available prior to January 14, 2019, the data cut-off date for the resources.

The estimate was completed based on the concept of a medium underground operation with three separate deposits feeding a single processing facility. This resource also assumes a certain degree of selectivity in order to separate the high-grade mineralized zones from the surrounding waste. AGP assumed this selectivity will be obtained via a comprehensive grade control program assisted by the use of a portable XRF unit. No other deposit on the BMC was evaluated.

To meet the CIM definitions of reasonable prospects of economic extraction a cut-off of 5.5% ZnEq was used for all three deposits which are considered to be amendable to underground extraction. The determination of the cut-off grade was based on:

- Mining costs of US$45/t
- Total operating costs of US$70/t
- MRE is based on a zinc price of US$1.10/lb, a lead price of US$0.90/lb, a copper price of US$2.72/lb, and a silver price of US$15.90/oz and a revenue factor of 1.1
- Recoveries of 84% Zn, 60% Pb, 52% Cu and 65% Ag
- Smelter payable of 84% Zn, 96% Pb, 95% Cu and 95% Ag.

Zinc equivalency percentages are calculated using metal prices, forecasted metal recoveries, and smelter payables (ZnEq=Zn%+0.661*Pb%+1.749*Cu%+0.018*Ag g/t). Blocks above the 5.5% ZnEq were visually inspected in 3D, and the majority of the blocks were generally found to coalesce into bulk mineable shapes with some exceptions.

The MRE presented herein is categorized as a mix of Inferred and Indicated resources. Measured resources were downgraded to Indicated in the Key Anacon Main Zone because of the heavy reliance on the underground historical drill hole data. The reported resources are expressed in metric tonnes. Metal contents are presented as in-situ pounds or ounces.

At the greater than 5.5% ZnEq cut-off selected, all three models returned a total of 1.96 Mt of Indicated resources grading at 5.77% Zn, 2.38% Pb, 0.22% Cu, and 68.9 g/t Ag containing 249.1 Mlb of zinc, 102.6 Mlb of lead, 9.3 Mlb of copper, and 4.3 Moz of silver. The model also returned an additional 3.85 Mt of Inferred resources grading at 5.34% Zn, 1.49% Pb, 0.32% Cu, and 47.7 g/t Ag containing 453.0 Mlb of zinc, 126.4 Mlb of lead, 27 Mlb of copper, and 5.9 Moz of silver of in-situ metals (AGP is not aware of any information not already discussed in this report that would affect their interpretation or conclusions regarding the subject property. AGP is required to inform the public that the quantity and grade of reported Inferred resources in this estimation must be regarded as conceptual in nature and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological grade or quality of continuity. For these reasons, an Inferred resource has a lower level of confidence than an Indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. It is also noted that Mineral Resources that are not

Mineral Reserves, do not have demonstrated economic viability. Lastly, rounding of values as required by the reporting guidelines may result in apparent differences between tonnes, grade, and metal content.

Table 25-1).

AGP is not aware of any information not already discussed in this report that would affect their interpretation or conclusions regarding the subject property. AGP is required to inform the public that the quantity and grade of reported Inferred resources in this estimation must be regarded as conceptual in nature and are based on limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological grade or quality of continuity. For these reasons, an Inferred resource has a lower level of confidence than an Indicated resource. It is reasonably expected that most of the Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration. It is also noted that Mineral Resources that are not Mineral Reserves, do not have demonstrated economic viability. Lastly, rounding of values as required by the reporting guidelines may result in apparent differences between tonnes, grade, and metal content.

Table 25-1: Resource Estimate of the Brunswick Mining Camp Project

Zones	Class	Tonnes (M)	Grades (at 5.5 ZnEq Cut-off)					In-situ Metal			
			Zn (%)	Pb (%)	Cu (%)	Ag (g/t)	ZnEq (%)	Zn (Mlb)	Pb (Mlb)	Cu (Mlb)	Ag (Moz)
Key Anacon Main Deposit	Indicated	1.67	6.02	2.52	0.14	74.2	9.31	221.0	92.5	5.1	4.0
Key Anacon Titan Deposit		0.29	4.36	1.57	0.65	38.8	7.25	28.2	10.1	4.2	0.4
Total Indicated at 5.5 ZnEq cut-off		**1.96**	**5.77**	**2.38**	**0.22**	**68.9**	**9.00**	**249.1**	**102.6**	**9.3**	**4.3**
Key Anacon Main Deposit	Inferred	0.61	5.83	1.98	0.05	68.2	8.49	77.7	26.5	0.6	1.3
Key Anacon Titan Deposit		0.98	4.12	1.62	0.78	42.9	7.35	89.5	35.2	17.0	1.4
Gilmour South		2.26	5.74	1.30	0.19	44.3	8.08	285.8	64.8	9.4	3.2
Total Inferred at 5.5 ZnEq cut-off		**3.85**	**5.34**	**1.49**	**0.32**	**47.7**	**7.96**	**453.0**	**126.4**	**27.0**	**5.9**

Notes: Cut-off determined by using a ZnEq grade of 5.5%. ZnEq grade calculated using a zinc price of 1.12 US$/lb, a lead price of US$0.99/lb, a copper price of US$2.99 /lb and a silver price of US$17.49 /oz, which includes a revenue factor of 1.1. Recoveries of 84% Zn, 60% Pb, 52% Cu, and 65% Ag in addition to 84% Zn payable, 95% Pb payable 96% Cu payable and 95% Ag payable. Rounding of tonnes as required by reporting guidelines may result in apparent differences between tonnes, grade, and contained metal.

26 RECOMMENDATIONS

After reviewing the BMC Project data, AGP makes the following recommendations.

26.1 QA/QC Recommendation

- AGP recommends continued use of Actlabs or lab with comparable standards of performance.
- AGP also recommends introducing the procedure or resubmitting of 5% of the high-grade pulps from Actlabs to an umpire laboratory. A few QC samples, consisting of pulp blanks and standards, should be included in the submission. This additional QA/QC protocol would complete the existing program, bringing it in line with industry standards.

26.2 Drilling Recommendations

AGP recommends continuing exploration and delineation drilling at the Key Anacon Main and Key Anacon Titan deposits. This additional drilling should be designed to expand and improve the quality of Mineral Resources presented in this report and to further the understanding of the geology, specifically the definition of the folded horizon that hosts massive sulphide deposits. A better understanding of geologic controls should help define drill targets for new massive sulphide discoveries.

In consultation with Osisko Metals' exploration team, AGP recommends the following drilling.

26.2.1 Additional In-Fill and Step-Out Drilling at the Key Anacon Main Deposit

Key Anacon Main Deposit – Phase I

A total of 16,450 m of drilling (at a cost of $2,533,300) is recommended to explore the Key Anacon Main deposit between the vertical depths of 200 m and 700 m.

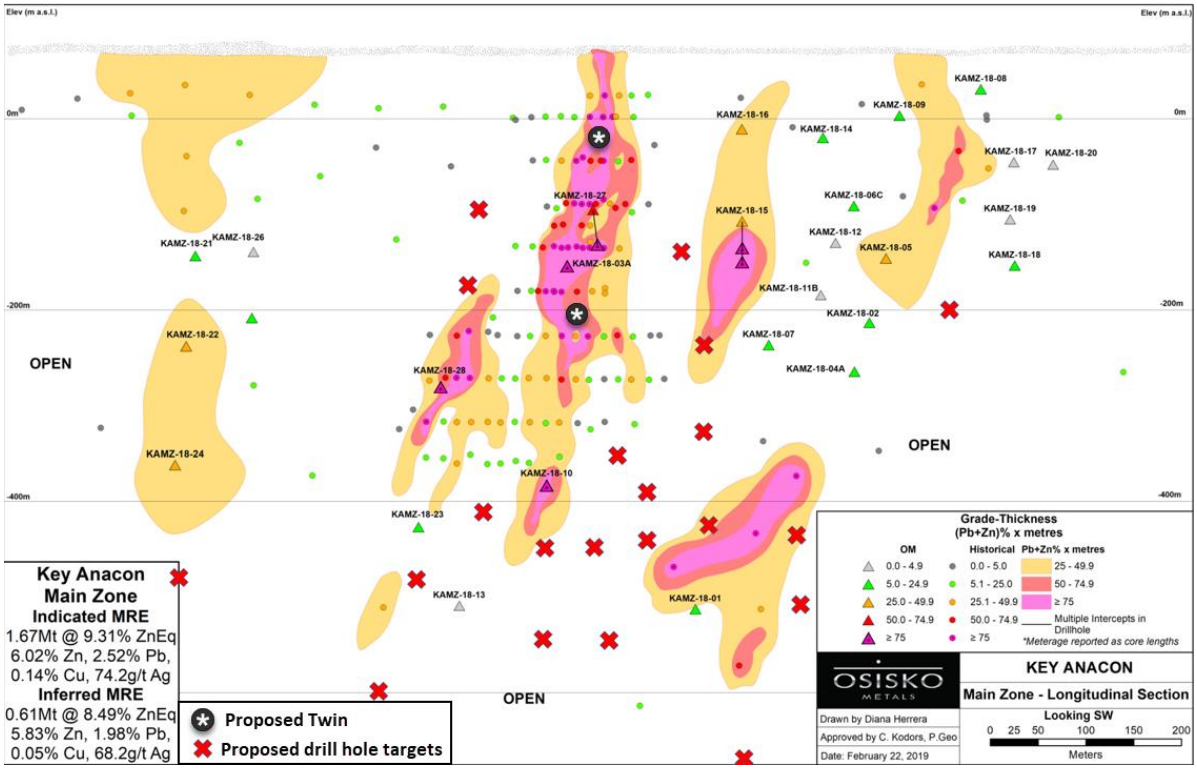
A total of 750 m ($115,500) is recommended to add two additional twins drill holes to the Key Anacon Main Zone and to reduce the reliance on the historical Key Anacon Mine drilling in the resource estimate.

This drill program is entirely included in Phase I, and is shown in Table 26-1 and on Figure 26-1.

Table 26-1: Key Anacon Main Deposit Phase I Program

Location of Collar	Elevation (m)	Hole Length (m)	No. of Holes	Total Meterage
Key Anacon Main Deposit (East or river)	-100	400	1	400
	-200	450	4	1,800
	-300	550	1	550
Key Anacon Main Deposit (West or river)	-400	800	9	7,200
	-500	900	5	4,500
	-600	1,000	2	2,000
Key Anacon Main Deposit additional twins	-150 & -225	375	2	750
Total			**7**	**17,200**
Total Cost (at $140/m all-in + 10% contingency)				**$2,648,800**

Figure 26-1: Key Anacon Main Deposit Phase I Program



26.2.2 Additional In-Fill and Step-Out Drilling at the Key Anacon Titan Deposit

Key Anacon Titan Deposit – Phase I

A total of 32,450 m of drilling (at a cost of $4,997,300) is recommended for Phase I to explore the Titan Main Zone massive sulphides and the copper-rich stringer zone between the vertical depths of 200 m and 1,100 m (Table 26-2 and Figure 26-2).

Table 26-2: Key Anacon Titan Zone Phase I Program

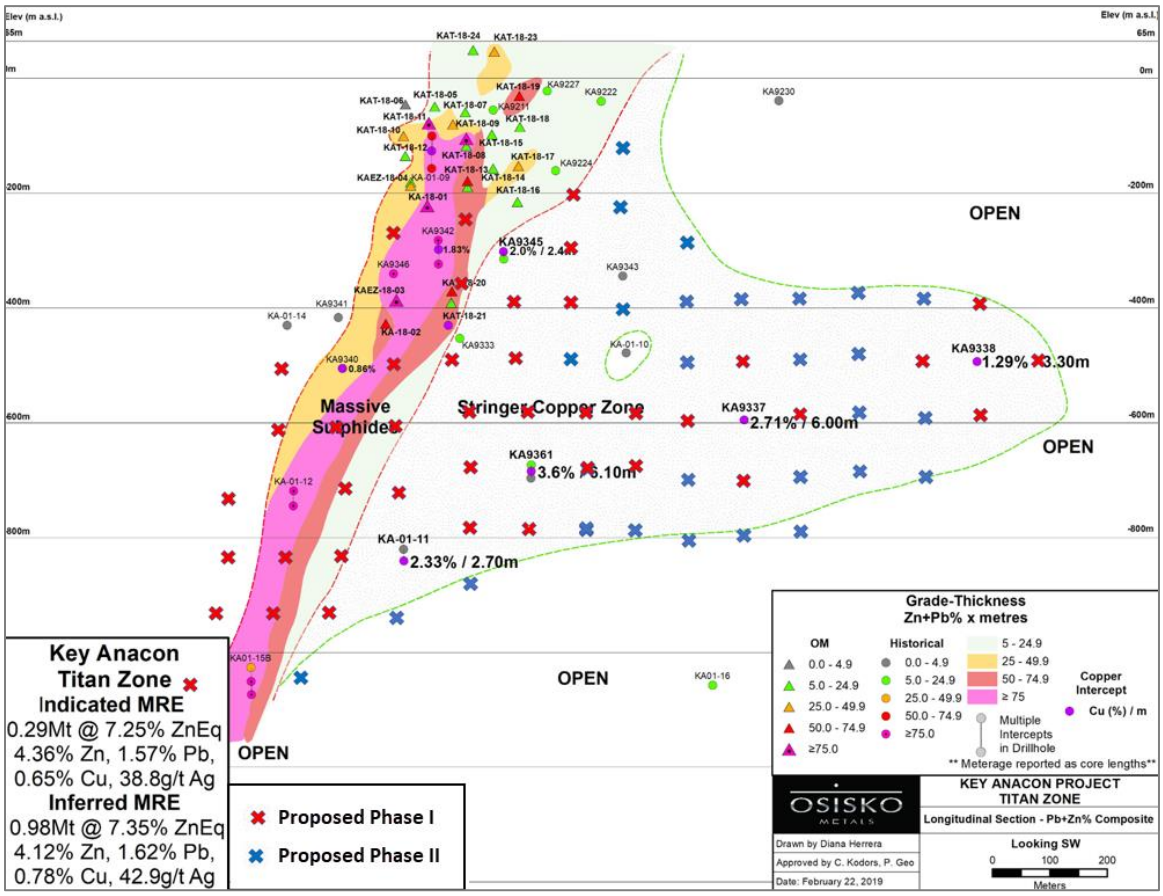
Location of Collar	Elevation (m)	Hole Length (m)	No. of Holes	Total Meterage
Titan Zone Massive Sulphides + Copper-rich Stringer Zone (Phase I)	-200	300	3	900
	-300	450	1	450
	-400	600	4	2,400
	-500	700	7	4,900
	-600	800	10	8,000
	-700	900	7	6,300
	-800	1,000	5	5,000
	-900	1,100	3	3,300
	-1,000	1,200	1	1,200
Total			**41**	**32,450**
Total Cost (at $140/m all-in + 10% contingency)				**$4,997,300**

Dependent on the results from Phase I, an additional 21,050 m of drilling (at a cost of $3,241,700) is recommended for Phase II on the Titan copper-rich stringer zone (Table 26-3).

Table 26-3: Key Anacon Phase II Program

Location of Collar	Elevation (m)	Hole Length (m)	No. of Holes	Total Meterage
Titan Zone Massive Sulphides + Copper rich stringer zone (Phase II)	-200	300	2	600
	-300	450	1	450
	-400	600	6	3,600
	-500	700	4	2,800
	-600	800	2	1,600
	-700	900	4	3,600
	-800	1,000	5	5,000
	-900	1,100	2	2,200
	-1,000	1,200	1	1,200
Total			**27**	**21,050**
Total Cost (at $140/m all-in + 10% contingency)				**$3,241,700**

Figure 26-2: Key Anacon Titan Proposed Drill Program (Phases I and II)



26.3 Exploration Program

A program is recommended to further the understanding of the structurally complex geology of the Key Anacon project area and identify target areas that may host additional massive sulphide deposits. This involves:

- Compiling results from historical exploration programs, and updating the Osisko Metals database
- Geological mapping to examine outcrop while using the portable XRF, which can provide analysis to help determine specific rock formations
- An airborne gravity survey which uses significantly improved technology from what was used historically. Density variation to help determine lithological units below extensive till cover, and younger overlying sedimentary horizons which typically produce only 2% outcrop exposure. It can also highlight near-surface massive sulphide deposits, which will define quality drill targets when gravity anomalies are coincident with EM.

The cost for this program is estimated at $45,000.

26.4 Engineering Scoping Study

AGP recommends a high-level scoping study for the Key Anacon deposits. The study should investigate the possibility of mining a portion of the deposit via open pit. The study cost is estimated at $3,000.

26.5 Metallurgical Testing

A preliminary program of metallurgical testwork is recommended for the Key Anacon Main and Titan deposits. This test program would be conducted on three or four composite samples, and would include: chemical and mineralogical characterization; initial grindability testwork (abrasion index and Bond work index); bench-scale flotation testwork and flotation test-products characterization (Cu/Pb/Zn separation, and presence of penalty elements). The testing would provide initial estimates of metallurgical performance (concentrate quality and metal recovered), and information regarding reagent recipes and dosages.

The recommended budget for a testwork program of this nature is $100,000.

26.6 Recommendation Summary

Table 26-4 shows a summary of the recommended expenditure discussed in the previous sections.

Table 26-4: Recommendation Budget Summary

	No. of Drill Holes	Drilling Metres	Estimated Cost ($)
Diamond Drilling			
Key Anacon			
Diamond drilling	7	17,200	2,648,800
Titan Deposit			
Diamond drilling – Phase I	41	32,450	4,997,300
Diamond drilling – Phase II	27	21,050	4,997,300
Exploration			
Compilation and data assessment			45,000
Engineering			
Scoping study			3,000
Metallurgical testing			
Total	**75**	**70,700**	**12,691,400**

27 REFERENCES

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28 CERTIFICATE OF AUTHORS

28.1 Pierre Desautels, P.Geo.

I, Joseph Rosaire Pierre Desautels of Barrie, Ontario as the sole Qualified Person's of this technical report titled "NI 43-101 Maiden Resource Estimate for the Bathurst Mining Camp Project, New Brunswick, Canada" dated April 4, 2019 with an effective date of February 20, 2019, (the "Technical Report"), do hereby certify the following statements:

- I am a Principal Resource Geologist with AGP Mining Consultants Inc. with a business address at #246-132K Commerce Park Dr., Barrie, Ontario L4N 0Z7.
- I am a graduate of Ottawa University (B.Sc. Hons., 1978).
- I am a member in good standing of the Association of Professional Engineers and Geoscientists of New Brunswick (APEGNB – License # L5862) and the Association of Professional Geoscientists of Ontario (Registration #1362).
- I have practiced my profession in the mining industry continuously since graduation.
- I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101 or the Instrument) and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101), and past relevant work experience, I fulfill the requirements to be a qualified person for the purpose of NI 43-101.
- My relevant experience with respect to resource modelling includes 41 years' experience in the mining sector covering database, mine geology, grade control, and resource modelling. This includes past experience with VMS deposits (Hackett River)
- I visited the property on July 25 to 27, 2018 and again on January 19 to 22, 2019.
- I am the sole author responsible for all sections of this report.
- I have no prior involvement with the property that is the subject of this Technical report.
- As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
- I am independent of the issuer as defined by Section 1.5 of the Instrument.
- I have read NI 43-101 and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

Signed and dated at Barrie, Ontario this 4th day of April 2019.

"electronic signature"

Pierre Desautels, P.Geo.

APPENDIX A

GEMTEC Phase I Environmental Site Assessment – Key Anacon

APPENDIX B

Survey Work by WSP Consultants

APPENDIX C

Holes Used in Resources

APPENDIX D

Gilmour South Sections

APPENDIX E

Key Anacon Main Sections and Plans

APPENDIX F

Key Anacon Titan Section and Plans