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NIOBAY METALS INC.

TECHNICAL REPORT ON THE JAMES BAY NIOBIUM PROJECT, COCHRANE DISTRICT, NORTHEASTERN ONTARIO, CANADA

NI 43-101 Report

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1 SUMMARY

EXECUTIVE SUMMARY

Roscoe Postle Associates Inc. (RPA) was retained by NioBay Metals Inc. (NioBay) to prepare an independent Technical Report on the James Bay Niobium Project (the Project or the Property), located in Cochrane District, northeastern Ontario, Canada. The purpose of this report is to support the disclosure of an initial Mineral Resource estimate. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the Property on September 27, 2017.

As of the effective date of this report, the Project consists of a single mining lease covering an area of approximately 2,585 ha located in 1:50,000 scale NTS map sheet 42I/15 (Meengan Creek). The Project is located approximately 40 km south of town of Moosonee, Ontario, and is accessible by helicopter during the summer and by winter road in the winter.

NioBay is a Montreal-based company formed in January 1954 (as Exploration Minière du Nord Inc. and known more recently as MDN Inc. (MDN)) and is a reporting issuer in British Columbia, Alberta, Ontario, and Quebec. The common shares of NioBay trade on the TSX Venture Exchange and the company is under the jurisdiction of the *Autorité des marchés financiers du Québec.*

On June 7, 2016, MDN announced that it had entered into an agreement with Barrick Gold Corporation, James Bay Columbium Ltd., and Goldcorp Inc. (collectively the Vendors) whereby it could earn a 100% interest in the Property by making a cash payment and issuing common shares, subject to a 2% net smelter return (NSR) royalty, with MDN having the right to buy out half the royalty. The Vendors retained the right to buy back a 51% interest should one or more deposits containing at least 2 million ounces of gold or gold equivalent, in aggregate, be established. The buy back right does not apply to the niobium content of the Property. On June 28, 2016, MDN announced that it had closed the previously announced transaction. On September 2, 2016, MDN announced a name change to NioBay Metals Inc.

Since acquiring the Property, NioBay has completed a re-logging program of historical core, check sampling and preliminary metallurgical testwork on a composite sample taken from historical drill core.

The current Mineral Resource estimate prepared by RPA is summarized in Table 1-1. The Mineral Resources conform to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions). Note that the estimate is reported in short tons. RPA has excluded approximately 7.1 million tons averaging 0.52% Nb_2O_5 situated in a 150 ft thick crown pillar.

TABLE 1-1 MINERAL RESOURCE ESTIMATE AS OF NOVEMBER 8, 2017
NioBay Metals Inc. – James Bay Niobium Project

Classification	Tonnage (M st)	Grade (%Nb_2O_5)	Contained Nb_2O_5 (M lb)
Indicated	25.5	0.53	271
Inferred	25.3	0.51	259

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at a cut-off grade of 0.3% Nb_2O_5 based on an underground mining operating cost of C$70/t and a metallurgical recovery of 70%.
3. Mineral Resources are estimated using a long-term niobium price of US$40 per kg and a US$/C$ exchange rate of 1:1.2.
4. A tonnage factor of 12.2 ft^3/ton (2.93 g/cm^3) was used.
5. A minimum mining width of approximately 25 ft was used to build the resource wireframes.
6. Resources situated in a 150 ft thick crown pillar have been excluded.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

CONCLUSIONS

The James Bay Niobium Project is hosted by the Argor Carbonatite Complex which occurs within the northern portion of the Kapuskasing Structural Zone (KSZ). The KSZ crosscuts an east-trending fabric within the Archean rocks of the Superior Province and is sub-parallel to the Trans-Superior Tectonic Zone (TSTZ). Numerous alkalic and carbonatite intrusions occur along and within the KSZ.

Pyrochlore and, to a lesser extent, columbite, are the economic minerals of interest and are hosted predominantly by the sovite phase of the carbonatite.

Extensive work during the mid to late 1960s resulted in a historical Mineral Resource estimate and feasibility study. The Property has been dormant since 1972. Re-sampling of the historical diamond drill core by NioBay has confirmed that, despite some variation at the individual sample level, the overall grade over wide intervals is similar to historical values.

Preliminary testwork on a composite sample consisting of core from 12 historical drill holes included gravity, flotation, QEMSCAN mineralogy, and heavy liquid separation tests. Although preliminary and subject to verification, the results proved encouraging. Additional testwork on fresh material is recommended.

Historical diamond drilling has outlined mineralization with three-dimensional continuity, and size and grades that can potentially be extracted economically.

Mineral Resources were estimated and classified by RPA following CIM (2014) definitions. At a cut-off grade of 0.3% Nb_2O_5, Indicated Mineral Resources are estimated to total 25.5 million tons grading 0.53% Nb_2O_5 containing approximately 271 million pounds of niobium oxide. Inferred Mineral Resources are estimated to total 25.3 million tons grading 0.51 Nb_2O_5 containing 259 million pounds of niobium oxide.

RPA is of the opinion that there is excellent exploration potential to increase the Mineral Resource at depth with more diamond drilling.

The Ontario Ministry of Northern Development and Mines (MNDM) has identified Moose Cree First Nation (MCFN) as the only Aboriginal community that must be consulted for the Project. Despite a number of requests, the leadership of MCFN has to this day refused to open a dialogue with NioBay and to discuss their concerns associated with the exploration program and the Project. The MNDM is taking steps to organize a meeting with representatives of the MCFN to address any concerns they may have about the proposed drilling campaign. NioBay will continue to hold discussions with the local community members and government officials and will maintain its efforts to engage with the MCFN leadership.

RECOMMENDATIONS

RPA is of the opinion that the James Bay Niobium Project hosts a significant niobium mineralized system, there is good potential to increase the resource base, and additional exploration and technical studies are warranted.

RPA has reviewed and concurs with NioBay's proposed exploration programs and budgets. Phase I of the recommended work program will include 4,000 m of drilling focussed on upgrading portions of the Inferred Resources to Indicated Resources and extending the Mineral Resources at depth, as well as environmental, engineering, and metallurgical studies required to support a Preliminary Economic Assessment (PEA) in 2018.

Details of the recommended Phase I program can be found in Table 1-2.

TABLE 1-2 PROPOSED BUDGET – PHASE I
NioBay Metals Inc. – James Bay Niobium Project

Item	C$
PHASE I	
Head Office Expenses & Property Holding Costs	100,000
Project Management & Staff Cost	200,000
Travel Expenses	25,000
Diamond Drilling (4,000 m)	800,000
Analyses	50,000
Helicopter Support	150,000
Permitting & Environmental Studies	50,000
Resource Estimate Update	50,000
Camp/Accommodations	50,000
Metallurgical Testwork	200,000
Preliminary Economic Assessment Report	150,000
Social/Consultation	50,000
Subtotal	**1,875,000**
Contingency	125,000
TOTAL	**2,000,000**

The Phase I exploration program is contingent on consultations with MCFN and NioBay receiving an exploration permit from the Ministry of Northern Development and Mines (MNDM).

A Phase II exploration program, contingent on the results of Phase I, will include diamond drilling and technical studies required to support a Pre-Feasibility Study (PFS) in 2019. The expected budget for the Phase II program is $5,000,000.

TECHNICAL SUMMARY

PROPERTY DESCRIPTION AND LOCATION

The Project is located in northeastern Ontario, approximately 40 km south of the town of Moosonee. Access to the Property is by helicopter year-round and bush roads from Moosonee during the winter months It is centred at approximately Latitude 50°50'69" N and Longitude 80°40'48" W within 1:50,000 scale NTS map sheet 42I/15 (Meengan Creek).

LAND TENURE

The Project consists of a single mining lease covering an area of 2,585.148 ha. The lease includes both mining and surface rights. It was issued on March 1, 2008 and expires on February 28, 2018 and is renewable.

EXISTING INFRASTRUCTURE

There is no permanent infrastructure on the Property except for the historical underground excavations which consist of a 133 ft (40.54 m) shaft and a 100 ft (30.5 m) crosscut.

HISTORY

From April to June 1965, Canadian Aero Mineral Surveys Limited (Canadian Aero) was contracted to fly a combined magnetic-electromagnetic (EM)-radiometric survey over an area including the licences of occupation held by Consolidated Morrison Explorations Limited (Consolidated Morrison), Argor Explorations Limited (Argor Explorations), and Goldray Mines Limited (Goldray). A total of approximately 3,059 ln-km were flown at an azimuth of N045°W and at a nominal flight line spacing of approximately 400 m. A total of 46 anomalous zones consisting of clusters of individual anomalies of various intensities and magnetic correlation were detected, including three high priority areas.

From June to August 1965, as a follow-up to the airborne survey, a helicopter-supported geological mapping program was carried out by Argor Explorations on behalf of the concession holders to establish the regional geological controls and investigate the cause of specific magnetic anomalies.

From June to October 1965, Huntec Limited (Huntec) was contracted to complete ground geophysical surveys over several airborne geophysical anomalies. Geophysical surveys consisted of vertical loop electromagnetic (VLEM), horizontal loop electromagnetic (HLEM), magnetic, and refraction seismics. A total of 27 anomalies or anomaly complexes identified by these surveys were selected for diamond drill testing from 1965 to May 1969. In total, 49 holes totalling 32,041 ft (9,765.6 m) were drilled. A number of conductors were defined, two of which (the Alpha A and Gamma targets on the Consolidated Morrison concession) were recommended for drilling. Additional geophysical surveying was recommended for several other targets prior to defining drill targets.

One of the magnetic anomalies, the Alpha-B, was found to be caused by a niobium-bearing carbonatite complex. In 1966, 18 holes were drilled and niobium mineralization was traced over a strike length of 7,800 ft (2,377 m). An additional 67 holes were drilled in 1967, bringing the number of holes drilled to 85 for a total of 47,625 ft (14,514 m) in outlining the deposit to a maximum depth of 900 ft (274.3 m). Niobium mineralization was encountered between sections 8+00S and 40+00N but the mineralized carbonatite remained open to the north.

Fifteen soil test holes were drilled during this period to investigate the stability of the glacial overburden and Paleozoic sedimentary cover, which together average approximately 100 ft (30.5 m) over the Precambrian basement.

In 1968, a test shaft was sunk in the central part of the mineralized body and a 250 ton bulk sample of niobium-bearing carbonatite was mined for metallurgical testing. The shaft was sunk to 133 ft (40.54 m) and a 100 ft (30.5 m) crosscut was driven.

In 1967, Canadian Bechtel Limited (Bechtel) completed a preliminary mining appraisal on the Argor deposit. The study considered three scenarios 1) mining the entire orebody by open pit, 2) mining the entire orebody by underground methods, and 3) mining the south end of the orebody by open pit followed by underground mining of the northwest limb. The assessment of the three scenarios was based on annual tonnage sufficient to produce 7.5 million pounds of Nb_2O_5 for 20 years with an overall mill recovery of 75%. Bechtel estimated "geological ore reserves" of 61,560,000 tons grading 0.52% Nb_2O_5. This estimate was prepared prior to the implementation of National Instrument 43-101 and is considered to be historical in nature and should not be relied upon. This historical resource estimate is superseded by RPA's estimate presented in this report.

In 1979, Bechtel updated the feasibility study.

GEOLOGY AND MINERALIZATION

The James Bay niobium deposit is hosted by the Argor Carbonatite Complex and occurs in the northern portion of the KSZ of the Superior Province. Numerous alkalic and carbonatite intrusions occur along this structure which extends from the east shore of Lake Superior northeast to James Bay. Rocks in the general area of the Property are characterized by granulite facies rank gneisses and a pervasive north- to northeast-trending fault pattern.

The carbonatite complex is overlain by approximately 10 m of overburden and 20 m of Lower Devonian rocks of the Sextant Formation consisting of poorly bedded sandstone, mudstone, siltstone, and loosely cemented conglomerate.

The Argor Carbonatite Complex appears to be a dyke-like body with a long axis striking north. The enclosing gneisses are described as mylonitic or augen gneisses.

The principal niobium-bearing mineral is pyrochlore but niobium also occurs, to a much lesser extent, in the mineral columbite.

The main pyrochlore-bearing phases of the carbonatite complex include lineated dolomitic carbonatite (Unit 5), calcite-dolomite carbonatite breccia (Unit 6), massive calcite-dolomite carbonatite (Unit 7), and “crushed” dolomitic carbonatite (Unit 8).

Significant pyrochlore mineralization occurs only in sodium- and magnesium-rich phases of the carbonatite. The highest-grade mineralization occurs in a mixed dolomite-calcite host (Unit 6). The pure dolomitic host (Unit 5) produces intermediate grades and pure calcite (Units 2, 7, and 9) is normally low in grade or barren.

The columbite occurs along the eastern side of the complex over a strike length of 120 m in the crushed dolomitic carbonatite (Unit 8). The columbite is totally or partially pseudomorphic after pyrochlore. The columbite may occur in the core of the crystal, on the rim of the crystal, or completely replaces the pyrochlore. The columbite does not appear to be restricted to any one rock unit, but it does appear to be related to fracturing and hematitic alteration.

Pale green fluor-variety of apatite is universally present in all rock units within the carbonatite-pyroxenite complex. Usually, the highest-grade bands of pyrochlore-bearing carbonatite also contains abnormally high quantities of apatite, while the converse is not true.

EXPLORATION STATUS

The James Bay niobium deposit is at the Mineral Resource development stage. The remainder of the Property is at an early exploration stage.

MINERAL RESOURCES

The Mineral Resources conform to CIM (2014) definitions and are summarized in Table 1-1. RPA considers the Mineral Resources of the James Bay Project to be amenable to underground extraction. The Mineral Resource estimate has an effective date of November 8, 2017 and excludes a portion of the deposit designated as part of the crown pillar.

RPA evaluated the Mineral Resources through database compilation and verification, defining the mineralization domains and constructing wireframes, capping and compositing data for geostatistical analysis and variography, selection of estimation strategy and estimation parameters, block modelling and grade interpolation, block model validation, classification of Mineral Resources, assessment of reasonable prospects for eventual economic extraction, and selection of reporting assumptions.

RPA used Leapfrog software to create a three-dimensional geological model from core log information. Mineralization was modelled at an approximate modelling threshold of 0.3% Nb_2O_5. It was determined that capping was not required due to the disseminated nature of the niobium and the overall grade distribution. Prior to grade interpolation, the assay data within each of the individual mineralized grade shells were combined into 10 ft long downhole composites, based on the analysis of the predominant sampling length, the style of mineralization, and continuity of grade. Grade estimation was carried out in three passes with the first pass using full variogram ranges for the search, twice the variogram range for the second pass, and 2.5 times the variogram range for the third pass.

The block model was validated using volumetric comparison of the blocks versus wireframes, a QQ plot of 2017 resampling versus historical data, comparison of block grades by the primary ordinary kriging estimator to results from inverse distance cubed and nearest neighbour estimates, swath plot comparisons, visual inspection of block grades versus composite grades, and statistical comparison of block grades to assay and composite grades. A cut-off grade of 0.3% Nb_2O_5 was calculated using an average operating cost of C$70/t, a metallurgical recovery of 70%, and a niobium price of US$40.0 per kg with a US$/C$ exchange rate of 1:1.2.

MINERAL RESERVES

There are no current Mineral Reserves estimated on the Property.

2 INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by NioBay Metals Inc. (NioBay) to prepare an independent Technical Report on the James Bay Niobium Project (the Project or the Property), located in Cochrane District, northeastern Ontario. The purpose of this report is to support the disclosure on an initial Mineral Resource estimate. This Technical Report conforms to NI 43-101 Standards of Disclosure for Mineral Projects. RPA visited the Property on September 27, 2017.

NioBay is a Montreal-based company formed in January 1954 as Exploration Minière du Nord Inc. and was subsequently known as MDN Inc. (MDN). NioBay is a reporting issuer in British Columbia, Alberta, Ontario, and Quebec. The common shares of NioBay trade on the TSX Venture Exchange and the company is under the jurisdiction of the *Autorité des marchés financiers du Québec*.

Apart from the James Bay Niobium Project, NioBay has an option to acquire a large land position in La Peltrie Township in northwestern Quebec with potential to host volcanogenic massive sulphide (VMS) mineralization and controls a property in Crevier Township, Lac St. Jean area, Quebec with the potential to host niobium-tantalum mineralization.

Currently, the major asset associated with the Project is a strategic land position covering prospective lithologies and structures. The Project hosts the James Bay niobium deposit (historically referred to as the Argor deposit), which is at the resource definition stage, as well as a large land position which merits additional exploration.

Since acquiring the Property, NioBay has completed a re-logging program of historical core, check sampling, and preliminary metallurgical testwork on a composite sample taken from historical drill core.

SOURCES OF INFORMATION

A site visit to the James Bay Niobium Project was carried out by Paul Chamois, M.Sc.(A), P.Geo., Principal Geologist with RPA, on September 27, 2017. During the visit, Mr. Chamois inspected the historical shaft site, examined core from historical drilling programs stored in

Moosonee, confirmed the local geological setting, investigated factors that might affect the Project, and collected core samples from historical drill holes for bulk density determination.

During the preparation of this report and the site visit, discussions were held with personnel from NioBay:

- Claude Dufresne, P.Eng., President and CEO
- Jacquelin Gauthier, P.Geo., Senior Technical Advisor

Ms. El Rassi prepared Sections 12 and 14 and contributed to Sections 1, 25, and 26. Mr. Chamois prepared Sections 2 to 11, 13, 15 to 24, and 27 and contributed to Sections 1, 25, and 26.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.

LIST OF ABBREVIATIONS

Units of measurement used in this report conform to the metric system. The resource estimate is based on an Imperial mine grid and has been completed using Imperial units including short tons and feet. All currency in this report is Canadian dollars (C$) unless otherwise noted.

a	annum
A	ampere
bbl	barrels
btu	British thermal units
°C	degree Celsius
C$	Canadian dollars
cal	calorie
cfm	cubic feet per minute
cm	centimetre
cm^2	square centimetre
d	day
dia	diameter
dmt	dry metric tonne
dwt	dead-weight ton
°F	degree Fahrenheit
ft	foot
ft^2	square foot
ft^3	cubic foot
ft/s	foot per second
g	gram
G	giga (billion)
Gal	Imperial gallon
g/L	gram per litre
Gpm	Imperial gallons per minute
g/t	gram per tonne
gr/ft^3	grain per cubic foot
gr/m^3	grain per cubic metre
ha	hectare
hp	horsepower
hr	hour
Hz	hertz
in.	inch
in^2	square inch
J	joule
k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometre
km^2	square kilometre
km/h	kilometre per hour
kPa	kilopascal
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
L	litre
lb	pound
L/s	litres per second
m	metre
M	mega (million); molar
m^2	square metre
m^3	cubic metre
µ	micron
MASL	metres above sea level
µg	microgram
m^3/h	cubic metres per hour
mi	mile
min	minute
µm	micrometre
mm	millimetre
mph	miles per hour
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
RL	relative elevation
s	second
st	short ton
stpa	short ton per year
stpd	short ton per day
t	metric tonne
tpa	metric tonne per year
tpd	metric tonne per day
US$	United States dollar
USg	United States gallon
USgpm	US gallon per minute
V	volt
W	watt
wmt	wet metric tonne
wt%	weight percent
yd^3	cubic yard
yr	year

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by RPA for NioBay. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by NioBay and other third-party sources.

For the purpose of this report, RPA has relied on ownership information provided by NioBay. RPA has not researched property title or mineral rights for the James Bay Niobium Project and expresses no opinion as to the ownership status of the property. RPA did review the status of Project mining lease on the web site of the Ontario Ministry of Northern Development and Mines (https://www.mci.mndm.gov.on.ca). The information for the Project lease is as noted in Section 4 of this report as of September 13, 2017, the date of RPA's review.

Except for the purposes legislated under provincial securities laws, any use of this report by any third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

The James Bay Niobium Project is located in northeastern Ontario, approximately 40 km south of the town of Moosonee and approximately 640 km north of Toronto (Figure 4-1). It is located in the West of Marberg Creek Area and West of Flinch Lake Area, District of Cochrane, within 1:50,000 scale National Topographic System (NTS) sheet 42I/15 (Meengan Creek). The Project consists of a single, heptagonally shaped mining lease which extends over a distance of 9.36 km in a north-northeasterly direction and covers an area of approximately 2,585.1 ha. The center of the mining lease is located at approximately Latitude 50°50’69” N and Longitude 80°40’48” W. The centre of the currently defined mineralization is located at approximately Latitude 50°43’31” N and Longitude 80°34’46” W (Berger, Singer and Orris, 2009).

LAND TENURE

The Property consists of a single mining lease (Lease 19586 or Claim CLM11) covering an area of 2,585.148 ha (Figure 4-2). The lease includes both mining and surface rights. It was issued on March 1, 2008 and expires on February 28, 2018, and is renewable.

The annual mining rental costs due annually on Lease 19586 total $7,755.54.

On June 7, 2016, MDN, a predecessor company to NioBay, announced that it had signed a definitive property purchase agreement to acquire a 100% interest in the Project from Barrick Gold Corporation, James Bay Columbium Ltd. and Goldcorp Inc. (collectively the Vendors). In consideration for acquiring the Project, MDN agreed to make a one-time cash payment of $25,000 and issue 5,000,000 common shares to the Vendors. MDN’s interest in the Project is subject to a 2% net smelter return (NSR) royalty with MDN having the right to buy-back half the royalty (1%) at any time for $2,000,000 (in constant 2016 dollars, subject to a cap of $3,000,000). The Vendors retained the right to re-acquire a 51% interest in the Project for 2.5 times MDN’s expenditures should one or more deposits containing at least two million ounces of gold and/or gold equivalent ounces of resources in aggregate be established. The back-in right does not apply to the niobium content. On June 28, 2016, MDN announced that the transaction had closed. On September 2, 2016, MDN announced a name change to NioBay Metals Inc.

MINERAL RIGHTS

In Canada, natural resources fall under provincial jurisdiction. In the Province of Ontario, the management of mineral resources and the granting of mining rights for mineral substances and their use are regulated by the Ontario Mining Act and administered by the Ministry of Northern Development and Mines (MNDM). Mineral rights are owned by the Crown and are distinct from surface rights.

ROYALTIES AND OTHER ENCUMBRANCES

Except for the NSR royalty mentioned above, RPA is not aware of any other royalties due, back-in rights, or other obligations or encumbrances by virtue of any underlying agreements.

PERMITTING

The MNDM is the principal agency responsible for implementing the provincial Mining Act and regulating the mining industry in Ontario. It is involved in the permitting and approvals process throughout the lifecycle of a mine.

Given the Property's early stage of development, permits, approval applications, and reporting requirements for MNDM may include:

- Aboriginal Consultation Reports
- Exploration Permits
- Exploration Plans

RPA is not aware of any environmental liabilities on the property. NioBay has all required permits to conduct the proposed work on the Property. RPA is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property other than the consultation process with the Moose Factory First Nation (MCFN). Status of the consultation process is provided in Section 20 Environmental Studies, Permitting, and Social or Community Impact.

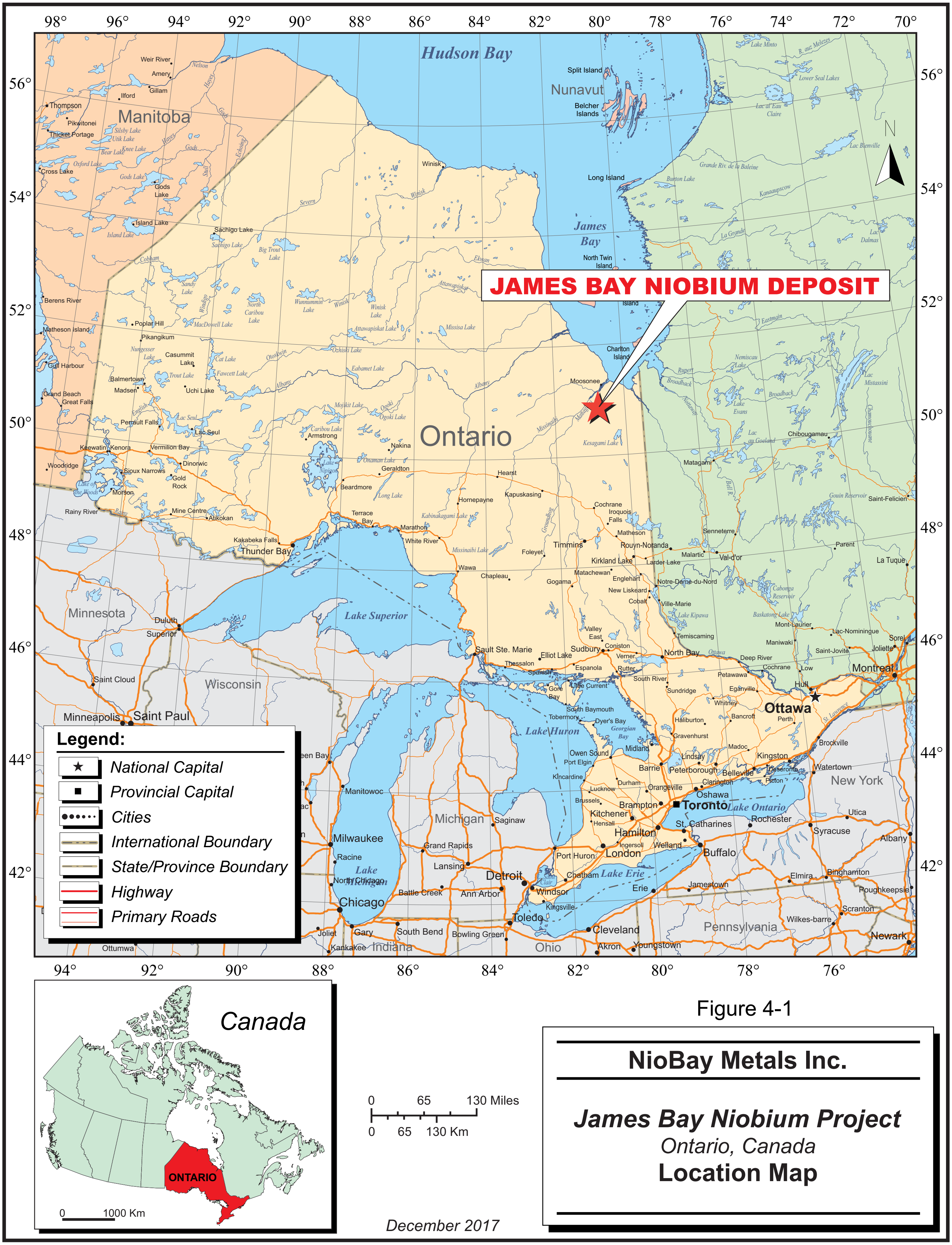

Figure 4-1

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Location Map

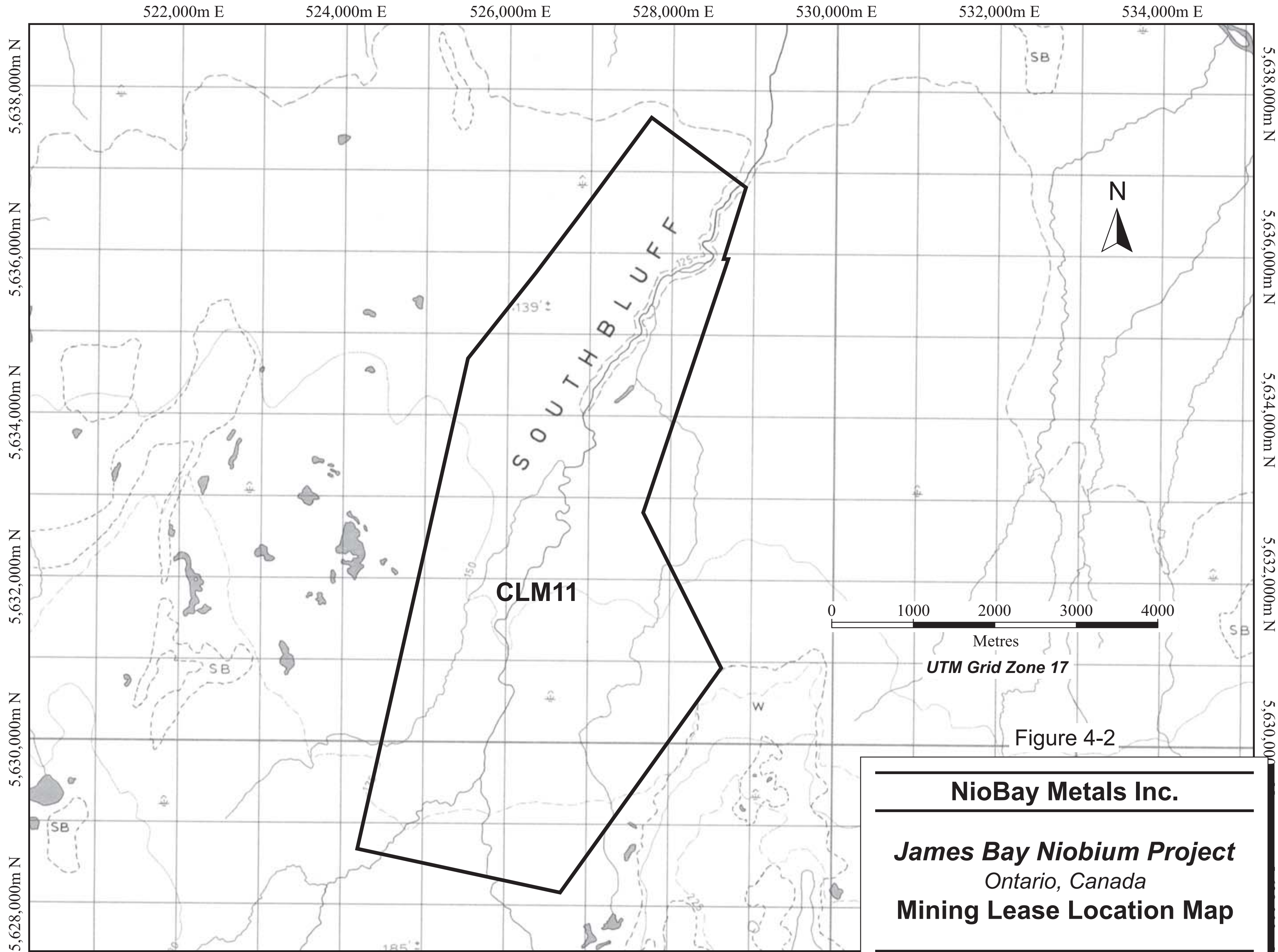

Figure 4-2

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Mining Lease Location Map

December 2017

42 I/15 Base Map Source: © Canada Copyrights Reserved 1973.

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5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

ACCESSIBILITY

The Project is located approximately 40 km south of the town of Moosonee which has a population of 1,725 according to the 2011 census. Moosonee is connected to Cochrane, Ontario by the Ontario Northland Railway which provides six day a week passenger service and twice weekly freight service. Moosonee also benefits from daily commercial flights from Timmins. The Wetum winter road links Moose Factory to the provincial road system at Otter Rapids seasonally, approximately 149 km to the south. Access to the Property is by helicopter year-round and bush roads from Moosonee during the winter months. Helicopters are available for charter in Timmins.

CLIMATE

The Property lies within the James Bay Lowland ecoregion of the Hudson Bay Plain ecozone and is marked by brief and warm summers and cold and snowy winters. The average mean daily temperature in July ranges from 12°C to 16°C and in January it hovers around -25°C to -23°C (Marshall and Schutt, 1999).

Table 5-1 illustrates the major climatic data for the closest weather station located at Moosonee, approximately 40 km to the north.

TABLE 5-1 SUMMARY OF MOOSONEE CLIMATIC DATA
NioBay Metals Inc. – James Bay Niobium Project

Description	Value
Mean January Temperature	-20.0°C
Mean July Temperature	15.8°C
Extreme Maximum Temperature	37.8°
Extreme Minimum Temperature	-48.9°C
Average Annual Precipitation	703.6 mm
Average Annual Rainfall	502.6 mm
Average Annual Snowfall	226.8 cm

Source: Environment Canada

Despite the harsh climatic conditions, geophysical surveying and diamond drilling can be performed on a year-round basis. Geological mapping and geochemical sampling are typically restricted to the months of May through to October.

LOCAL RESOURCES

Various services including temporary accommodations, medical services, a post office, fuel (gas diesel and propane) stations, and some heavy equipment and machinery shops are available in Moosonee. A greater range of general services are available in Cochrane and specialized services including trained manpower and contractors are available in Timmins. Moosonee is connected to the provincial power grid system by a 115 kV high tension line from the 182 MW Otter Rapids generating station located on the Abitibi River, approximately mid-way between Cochrane and Moosonee.

INFRASTRUCTURE

There is no permanent infrastructure on the Property except for the historical underground excavations which consist of a 133 ft (40.54 m) shaft and a 100 ft (30.5 m) crosscut. The Property is located approximately 46 km east of the Ontario Northland Railway which links Cochrane to Moosonee. Figure 5-1 illustrates the infrastructure in the vicinity of the Project.

PHYSIOGRAPHY

The area is poorly drained, flat and dominated by extensive wetlands. The elevation on the Property varies from approximately 35 MASL to 45 MASL.

Treed-open fen (28.6%) and treed-open bog (38.9%) comprise the primary vegetation found in the James Bay Lowland ecoregion. Coniferous forest is the predominant forest class (12.6%), with black spruce usually being the most dominant tree species, followed by sparse forest (7.6%). Well-developed forests are usually limited to alongside rivers and creeks. Open water covers 5.6% of the area (EEM Inc., 2017).

The region provides habitat for large mammals such as woodland caribou, moose, black bear, lynx, timber wolves, and small mammals including muskrat, ermine, weasel, marten, snowshoe hare, and wolverine. Migratory bird species returning to these lowlands annually to nest include Canada goose, black duck, oldsquaw, king eider, pintail, and whistling swan. Upland bird species such as willow ptarmigan, spruce grouse, snow owl, and ravens are year-round residents.

RPA is of the opinion that, to the extent relevant to the mineral project, there is a sufficiency of surface rights and water.

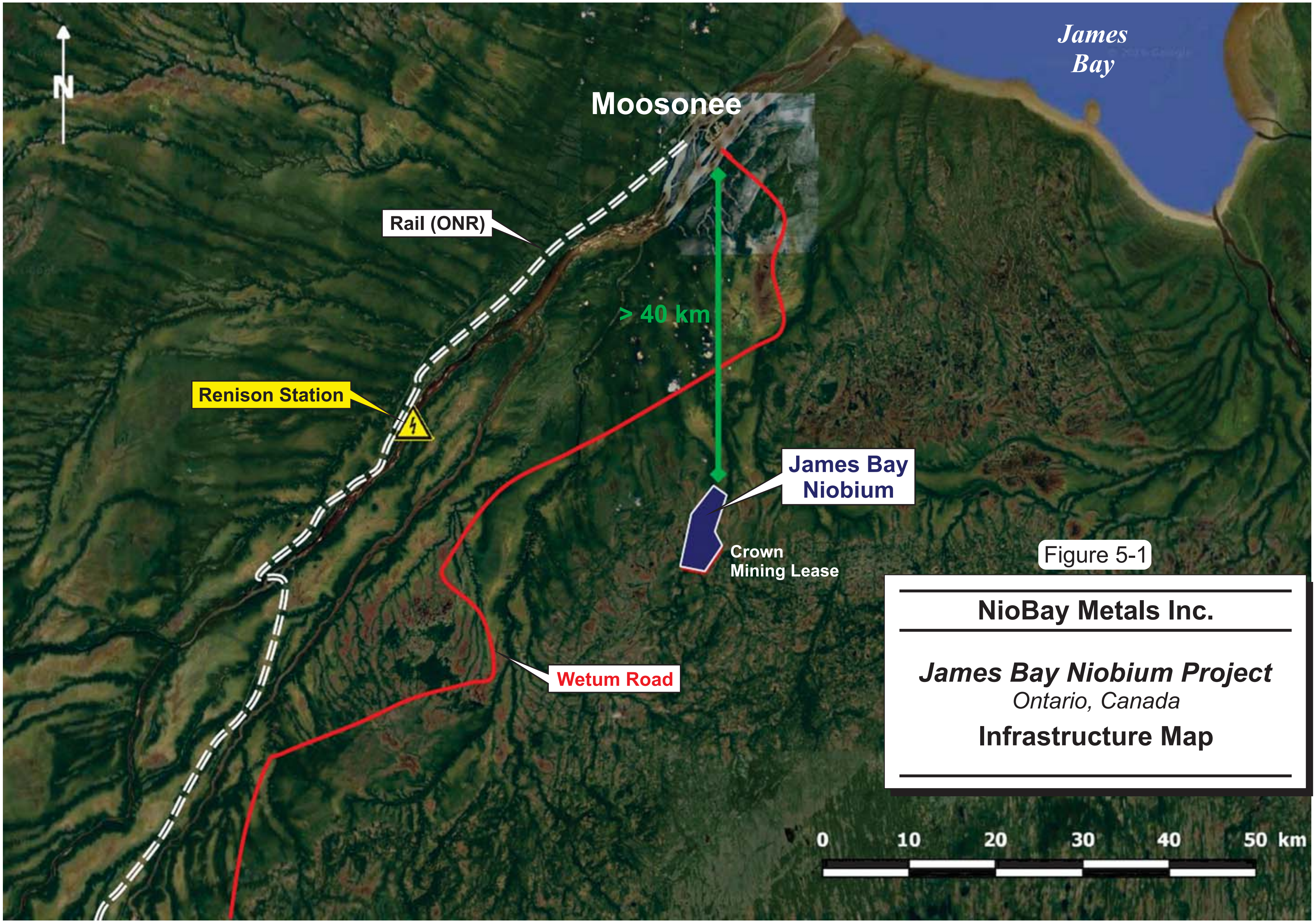


Figure 5-1

NioBay Metals Inc.

James Bay Niobium Project
Ontario, Canada
Infrastructure Map

December 2017

Source: Niobay, 2017.

6 HISTORY

PRIOR OWNERSHIP

Contiguous mining concessions #13758, #13759, and #13760 were held by Consolidated Morrison Explorations Ltd. (Consolidated Morrison), Argor Explorations Ltd. (Argor Explorations), and Goldray Mines Ltd. (Goldray) as of 1965, respectively. Ownership of these concessions was eventually consolidated and held by Barrick Gold Corporation (60%), Goldcorp Inc. (9%), and James Bay Columbium/Consolidated Morrison (31%). In June 2016, NioBay entered into an agreement whereby it acquired a 100% interest in the Project, subject to a 2% NSR royalty.

EXPLORATION AND DEVELOPMENT HISTORY

The location of the early ground geophysical surveys and diamond drilling performed in the area of the current Mining Lease is not well documented. Some of the surveys and drill holes mentioned below may in fact not be located on the current Mining Lease.

Historically, little interest had been shown in the James Bay region of northeastern Ontario by mining companies. Some prospecting was done in the Partridge River area in 1929 and 1930. During the 1950s, a thorium prospect was discovered in Pitt Township, southwest of the Project. Later Selco Exploration Inc. (Selco) made a reconnaissance survey along the French River for diamonds. A subsidiary of de Beers, Hard Metals, continued the work initiated by Selco, with negative results (Boyko, 1966).

The following is taken primarily from Stockford (1970) unless otherwise indicated.

In 1965, a consortium of companies including Argor Explorations Limited (Argor Explorations), Consolidated Morrison Explorations Limited (Consolidated Morrison), and Goldray Mines Limited (Goldray) were awarded three licences of occupation, each covering 64,000 acres (25,900 ha) and covering some 60 miles in length by three to seven miles wide. The initial financial support for the Project was provided by Imperial Oil Enterprises Ltd. which earned a 60% interest in the licence areas and claim holdings in the vicinity.

From April to June 1965, Canadian Aero Mineral Surveys Limited (Canadian Aero) was contracted to fly a combined magnetic-electromagnetic (EM)-radiometric survey over an area including the licences of occupation held by Consolidated Morrison, Argor Explorations, and Goldray. A total of approximately 3,059 line-km were flown at an azimuth of N045°W and at a nominal flight line spacing of approximately 400 m. A total of 46 anomalous zones consisting of clusters of individual anomalies of various intensities and magnetic correlation were detected, including three high priority areas (Wagg, 1966).

From June to August 1965, as a follow-up to the airborne survey, a helicopter-supported geological mapping program was carried out by Argor Explorations on behalf of the concession holders to establish the regional geological controls and investigate the cause of specific magnetic anomalies.

From June to October 1965, Huntec Limited (Huntec) was contracted to complete ground geophysical surveys over several airborne geophysical anomalies. Geophysical surveys consisted of vertical loop electromagnetic (VLEM), horizontal loop electromagnetic (HLEM), magnetic, and refraction seismics. A total of 27 anomalies or anomaly complexes identified by these surveys were selected for diamond drill testing from 1965 to May 1969. In total, 49 holes totalling 32,041 ft (9,765.6 m) were drilled. A number of conductors were defined, two of which (the Alpha A and Gamma targets on the Consolidated Morrison concession) were recommended for drilling. Additional geophysical surveying was recommended for several other targets prior to defining drill targets (Patterson and Lane, 1966).

One of the magnetic anomalies, the Alpha-B, was found to be caused by a niobium-bearing carbonatite complex. In 1966, 18 holes were drilled and niobium mineralization was traced over a strike length of 7,800 ft (2,377 m). An additional 67 holes were drilled in 1967, bringing the number of holes drilled to 85 for a total of 47,625 ft (14,514 m) in outlining the deposit to a maximum depth of 900 ft (274.3 m). Niobium mineralization was encountered between sections 8+00S and 40+00N but the mineralized carbonatite remained open to the north (Stockford, 1972).

Fifteen soil test holes were drilled during this period to investigate the stability of the glacial overburden and Paleozoic sedimentary cover, which together average approximately 100 ft (30.5 m) over the Precambrian basement.

In 1968, a test shaft was sunk in the central part of the mineralized body and a 250-ton bulk sample of niobium-bearing carbonatite was mined for metallurgical testing. The shaft was sunk to 133 ft (40.54 m) and a 100 ft (30.5 m) crosscut was driven.

In 1967, Canadian Bechtel Limited (Bechtel) completed a preliminary mining appraisal on the Argor deposit. The study considered three scenarios 1) mining the entire orebody by open pit, 2) mining the entire orebody by underground methods, and 3) mining the south end of the orebody by open pit followed by underground mining of the northwest limb. The assessment of the three scenarios was based on annual tonnage sufficient to produce 7.5 million pounds of Nb_2O_5 for 20 years with an overall mill recovery of 75%.

From June to October 1968, Huntec completed approximately 87.5 ln-km of reconnaissance HLEM and ground magnetics in the area of the Goldray #2 anomaly. Two distinct conductors were defined and recommended for diamond drilling (Patterson, 1969).

In 1969, McPhar Geophysics (McPhar) completed ground magnetic and EM surveys over five airborne anomalies on behalf of Argor Explorations. Two strong conductors corresponding to Anomalies “P” and “G” were defined and recommended for drilling.

In early 1970, Bergmann (1970) reported on ground magnetic and electromagnetic surveys completed by Prospecting Geophysics Ltd. (Prospecting Geophysics) to recover airborne geophysical anomalies on behalf of Argor Explorations. Several conductors were identified and two (Anomalies “A” and “B”) were recommended for drilling.

In late 1970, Questor Surveys Limited (Questor) flew a combined magnetic and EM (Mark IV INPUT) survey totalling approximately 264 ln-km on behalf of Argor Explorations over an area northwest of Kesagami Lake. A total of 13 conductors were detected, most of which were recommended for either VLEM or HLEM follow-up (De Carle, 1970).

In 1979, Bechtel updated the feasibility study.

HISTORICAL RESOURCE ESTIMATES

In July 1967, Bechtel estimated “geological ore reserves” on behalf of Argor Explorations. Between sections 6+00S and 18+00N, Bechtel estimated 61,560,000 tons grading 0.52% Nb_2O_5 for the pyrochlore and columbite mineralized zones (Canadian Bechtel Limited, 1967).

This estimate was prepared prior to the implementation of National Instrument 43-101 and is considered to be historical in nature and should not be relied upon. A qualified person has not completed sufficient work to classify the historical estimate as a current Mineral Resource or Mineral Reserve and NioBay is not treating the historical estimate as current Mineral Resources or Mineral Reserves. This historical estimate is a good indication of significant mineralization on the Property.

PAST PRODUCTION

With the exception of the bulk sample taken in 1968, there has been no past production from the James Bay Niobium Project.

7 GEOLOGICAL SETTING AND MINERALIZATION

REGIONAL GEOLOGY

According to Sage (1991), the James Bay Niobium Project lies at the northern portion of the Kapuskasing Structural Zone (KSZ). The following description of the regional geology is taken from Sage (1991).

The KSZ extends from the east shore of Lake Superior northeast to James Bay. The KSZ is poorly defined along the east shore of Lake Superior but becomes better defined towards James Bay. The KSZ crosscuts an east-trending fabric within Archean rocks of the Superior Province and is sub-parallel to the Trans-Superior Tectonic Zone (TSTZ).

The KSZ is characterized by a north-northeast-striking linear aeromagnetic pattern (400 to 600 gammas above regional background) and positive gravity highs (up to 20 mgal) (Innis 1960; ODM-GSC 1970; GSC 1984). Numerous alkalic and carbonatite intrusions occur along this structure.

The KSZ has been interpreted as an upwarp of the Conrad Discontinuity (Wilson and Brisbin 1965; Bennett et al. 1967; Thurston et al. 1977), a product of collision of the Churchill and Superior cratons in Paleoproterozoic time (Gibb 1978), and as a deep transcurrent shear (Watson 1980). More recently, Percival and Card (1983) have proposed that the KSZ is an east-verging thrust fault which has exposed an oblique section through 20 km of uplifted Archean crust. Granulite-facies rocks of the KSZ are juxtaposed against greenschist-facies rocks of the Abitibi Sub-province along the Ivanhoe Lake cataclastic zone. The KSZ is characterized by a high-grade gneiss terrain and grades westward into a central gneiss terrain and then into low-grade terrain of east-west-striking linear belts composed of supracrustal rocks.

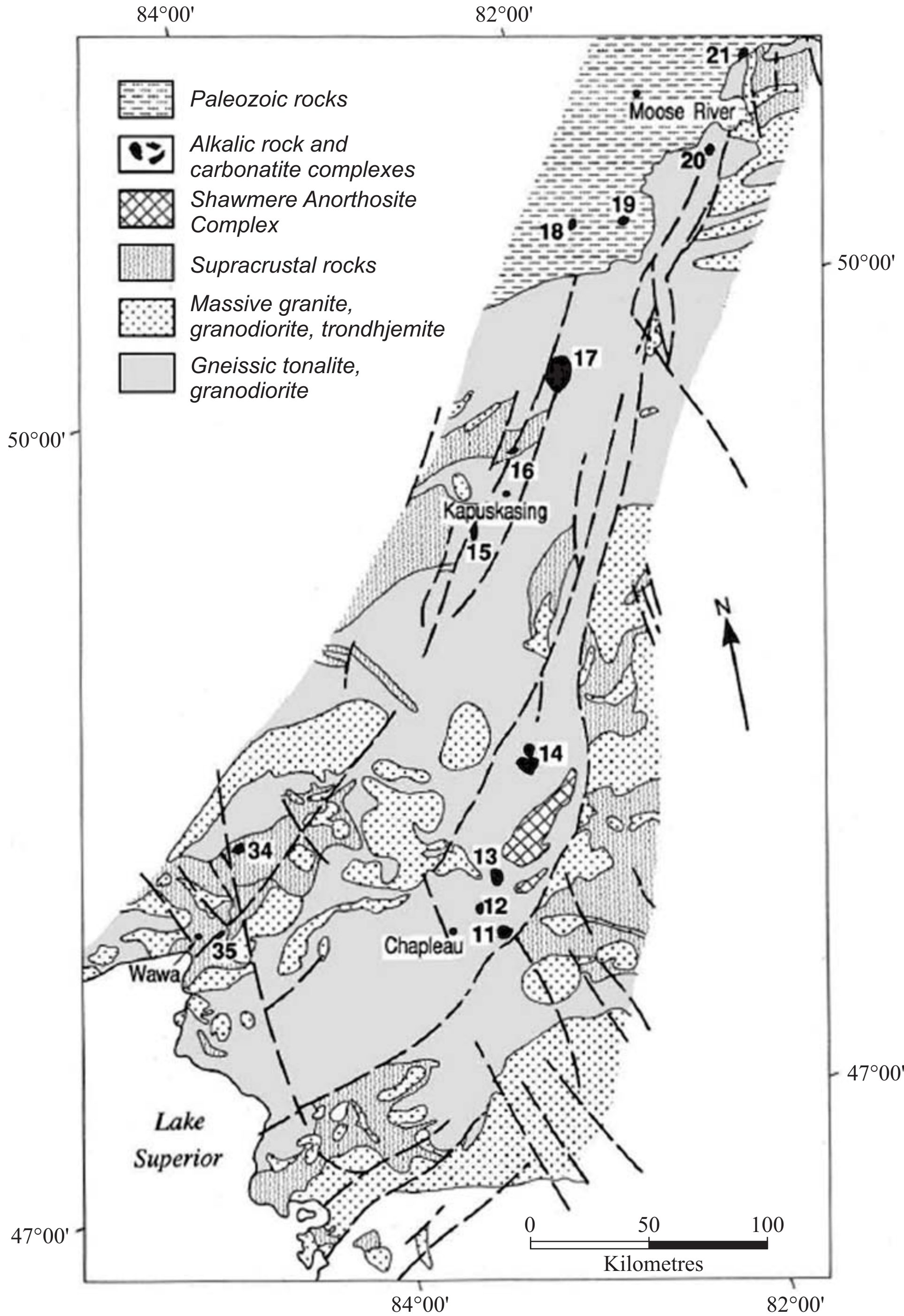
In addition to the major fault which forms the east boundary of the KSZ, three major northeast-striking faults dip 60° to 70° northwest and are present within the uplift (Percival and McGrath 1986). These internal faults are west-side-down with displacement of 7 km to 10 km and result from a late tensional event that followed the compressional uplift (Percival and McGrath 1986; Percival 1987).

Northey and West (1986) have interpreted seismic refraction data to indicate a crustal thickness of 48 km below the KSZ, which thins slightly to the west and the east. The interpretation of seismic data is consistent with the upthrust of mid-crustal rocks along a west-dipping listric fault (Northey and West, 1986; Boland et al., 1988).

The precise age of the KSZ is uncertain (Watson 1980; Percival and Card 1983). The 1,800 to 1,900 Ma carbonatite intrusions are exposed at a high structural level and are enclosed within high-grade deep level gneisses. The KSZ has therefore formed prior to the 1,800 to 1,900 Ma carbonatite intrusion event; however, the KSZ remains seismically active (Forsyth and Morel, 1982).

Alkaline magmatism along the KSZ took place during the Penokean and Grenville-Keweenawan orogenic events and in the Neoproterozoic to Early Cambrian and Jurassic periods. Woolley (1989) has documented the worldwide spatial and temporal distribution of carbonatite with doming, linear structures, and orogenesis.

Figure 7-1 illustrates the regional geology of the KSZ and indicates the location of the James Bay Niobium Project (indicated as the Argor Carbonatite Complex #21).



NOTE: *Kapuskasing Structural Zone (KSZ) and location of alkalic rock and carbonatite intrusions (geology modified from Card, 1982).* ***11***-*Lackner Lake Alkalic Complex;* ***12***-*Borden Township Carbonatite Complex;* ***13***-*Nemegosenda Lake Alkalic Complex;* ***14***-*Shenango Township alkalic rock;* ***15***-*Cargill Township Carbonatite Complex;* ***16*** *Teetzel Township Carbonatite;* ***17***-*Clay-Howells Alkalic Complex;* ***18***-*Hecla-Kilmer Alkalic Complex;* ***19***-*Valentine Township Carbonatite Complex;* ***20***-*Goldray Carbonatite Complex;* ***21***-*Argor Carbonatite Complex;* ***34***-*Herman Lake Alkalic Complex;* ***35***- *Firesand River Carbonatite Complex.*

Figure 7-1

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Regional Geology

December 2017

Source: Ontario Geology Survey, Special Volume 4 Part 1, 1991.

LOCAL GEOLOGY

The following description of the local geology is abridged from Sage (1988).

The James Bay niobium deposit is hosted by the Argor Carbonatite Complex and occurs in the northern portion of the KSZ of the Superior Province. Rocks in the general area are characterized by granulite facies rank gneisses and a pervasive north- to northeast-trending fault pattern (Bennett et al., 1967).

The carbonatite complex is overlain by approximately 9 m of overburden and 21 m of Lower Devonian rocks of the Sextant Formation consisting of poorly bedded sandstone, mudstone, siltstone, and loosely cemented conglomerate (Stockford, 1972).

EARLY PRECAMBRIAN (ARCHEAN)

GNEISS

In proximity to the carbonatite complex, Stockford (1972) reported the presence of garnet-hornblende-feldspar gneiss and augen gneiss. The gneisses contain up to 20% quartz, up to 50% plagioclase, 10% to 15% biotite, 10% to 20% hornblende, 5% sericite, and 5% carbonate (Stockford, 1970). Stockford observed that nepheline-bearing rocks and evidence of fenitization are absent. The reported presence of carbonate and possibly sericite in the gneisses suggests some weakly developed metasomatic activity.

Twyman (1983) reported the presence of fine to medium grained, light grey syenitic dykes with a phaneritic to porphyritic-phaneritic texture. The feldspars are microcline perthite or orthoclase and albite. Calcite occurs interstitially to the feldspars. The mafic minerals reported by Twyman include biotite, pyroxene (salite to sodic salite), and local arfvedsonite. The relationship of the syenite to the carbonatite is unknown, but Twyman (1983) considered it to be older than the complex.

GABBRO DYKES

Stockford (1972) reported that gabbroic dykes cutting the gneisses east of the carbonatite complex appear to have been crushed and metamorphosed along with the gneisses. He reported that the dykes consist of plagioclase, feldspar, hornblende, augite and garnet, with accessory apatite, sphene, quartz, chlorite, calcite, pyrite, and magnetite. Stockford (1970) reported that the mode of the gabbro dykes is 30% to 35% plagioclase, 30% to 40%

hornblende, 10% to 15% augite, and up to 25% garnet. A lamprophyre dyke was reported in drill core by Stockford (1972), although he stated that lamprophyres are uncommon in the area.

MIDDLE PRECAMBRIAN (PROTEROZOIC) - ARGOR CARBONATITE COMPLEX

PYROXENITE-HORNBLENDITE

This phase of the Argor Carbonatite Complex is not well represented in the drill core examined. Hornblende is dominant over clinopyroxene and the pyroxenite and hornblendite appear to grade into each other. While some hornblende is undoubtedly primary, other hornblende clearly formed as a replacement of the clinopyroxene. The pyroxenite and hornblendite are likely part of the same lithologic unit and part of the same magmatic phase. Because of the intimate relationship between the two rock types, they are discussed as one unit. Stockford (1972) described the unit as pyroxenite and he also interpreted the hornblendite to have formed by alteration of the pyroxene. Pyroxenite-hornblendite drill core is black to dark green in colour.

In thin section the rock is fine to coarse grained, massive, inequigranular seriate, allotriomorphic, with straight to curved grain boundaries. Several specimens have a weakly developed granoblastic texture and several appear to have been weakly deformed.

SILICOCARBONATITE

The limited number of silicocarbonatite specimens examined appear to be possible cumulate phases of the carbonatite magma, however, some may be reaction products between sovite and other rocks. Drill core representative of this lithology is grey in colour or mottled grey and black.

Samples from the western side of the complex were described by Twyman (1983) as hybrid rocks with mylonitic fabric and are likely silicocarbonatite. Twyman investigated the possibility of a genetic link between carbonate and silicate magmas. On the basis of observed mineral disequilibrium, Twyman concluded the silicocarbonatite rocks examined by him were the result of assimilation or reaction of carbonatite magma with the enclosing rocks. Microprobe analyses of biotite indicated Al content intermediate between silicate and carbonatite rocks; microprobe analyses of amphibole indicated high Fe content which would have resulted from reaction with a carbonatite magma.

SOVITE AND MINOR RAUHAUGITE

Sovite contains in excess of 50% carbonate. The vast majority of the diamond drilling completed on this complex intersected this lithology since it is host to the niobium mineralization. Rocks of this grouping are grey to white in colour. No attempt was made to estimate the dolomite-calcite ratios in these rocks.

Twyman (1983) reported dolomite (rauhaugite) interstitial to calcite (sovite), implying that both carbonates crystallized simultaneously or that dolomite formed somewhat later. Two types of dolomite were reported by Twyman (1983): (1) a lineated variety composed of clear, anhedral to subhedral, elongated, interlocking tabular crystals; and (2) a fine grained recrystallized variety with irregular grain boundaries. The lineated variety is interlayered with the sovite and the fine-grained variety occurs along intrusive contacts.

Microprobe analyses of carbonate, presented by Twyman (1983), indicate that dolomite at the Argor Carbonatite Complex has a Mn enrichment trend while dolomite at the Cargill complex displays a constant Mn content. At both complexes, the carbonate contains minor Mg, Fe, Mn and Sr, but the Argor rocks are richer in Fe. Twyman reported that the Fe enrichment trends in dolomite are compatible with chemical variations in associated amphiboles and biotites.

The minor element trends in dolomite within sovites and rauhaugites are similar, indicating that the sovites and rauhaugites formed at the same time (Twyman, 1983).

Stockford (1972) subdivided rocks in this group into five subunits based on texture, colour, and calcite-dolomite ratios. Stockford's (1972) efforts were directed to close identification of the pyrochlore-bearing carbonatite. While the pyrochlore is the essential economic mineral, it is nonetheless a minor accessory phase within the rock. Stockford (1972) places the pyrochlore content at 1.0% for the potentially economic portion of the carbonatite. Texturally or mineralogically, there is no difference between sovite with and without pyrochlore.

Twyman (1983) reported the presence of olivine sovite and provided a chemical analysis of this rock type. The olivine sovite occurs only on the western side of the complex, does not occur with dolomite, and has been interpreted to be an early phase of the carbonatite magma.

Pyrochlore occurs as anhedral to sharply euhedral grains that commonly contain rounded, irregular grains of carbonate. The mineral is red-brown to grey in colour. Its high relief and isotropic nature make it relatively easy to distinguish from other minor mineral phases. The mineral often appears crudely zoned from red-brown cores to grey rims, however, the reverse zoning pattern has also been observed. The zonation implies compositional variation.

GEOCHRONOLOGY

The Argor Carbonatite Complex has been dated at 1655 Ma by K-Ar isotopic techniques on biotite (Gittins et al., 1967). Most Middle Precambrian (Proterozoic) complexes have isotopic ages of 1,800 Ma.

METAMORPHISM

The Argor Carbonatite Complex displays all variations, from a well-developed granoblastic texture with curved grain boundaries typical of carbonatite rocks, to one that is very fine to fine-grained recrystallized with serrate to lobate grain boundaries. Relatively undeformed carbonate alternates with deformed carbonate, suggesting that deformation and recrystallization has occurred in zones within the carbonatite, likely due to dynamo-thermal metamorphism associated with fault movement.

Stockford (1972) reported the absence of fenitization presumably on the basis of the absence of green to blue-green soda-iron amphiboles and pyroxenes within the enclosing gneissic wall rocks. The presence of carbonate, the alteration of pyroxene to amphibole and amphibole to biotite-phlogopite in the pyroxenite rocks, is interpreted to represent metasomatism of the pyroxenite by alkali-rich, aqueous, carbonate-rich fluids similar, if not identical, to a fenitizing liquid. The pyroxenite is, however, an early crystallizing phase of the carbonatite complex and not part of the much older wall rock assemblage.

Stockford (1972) reported the presence of sodic amphiboles in a mylonitic gneiss at the pyroxenite-gneiss contact on the east side of the complex. These sodic amphiboles may be indicative of more typical fenitization developed within restricted zones of greater permeability. Carbonate along fractures in the gneisses was reported by Stockford (1972) to occur for distances of up to a few hundred metres from the carbonatite contact. This is considered by Sage (1988) to be due to either the effect of a fenitizing liquid in a distal setting, or to a fenitizing fluid at relatively low temperatures, in essence, under hydrothermal conditions.

STRUCTURAL GEOLOGY

REGIONAL SETTING

The Argor Carbonatite Complex is located in the north portion of the KSZ of the Superior Province of the Canadian Shield. This KSZ is characterized geophysically by a north northeast-trending zone of gravity highs and pronounced linear aeromagnetic trends (Innes 1960; ODM-GSC 1970). This anomalous gravity zone has been interpreted to be due to an upwarp in the Conrad discontinuity caused by major regional faulting and the formation of a complex horst structure (Wilson and Brisbin, 1965; Bennett et al., 1967). This upthrown block is characterized by rocks that have locally reached the granulite facies rank of metamorphism (Bennett et al,. 1967; Thurston et al., 1977).

The KSZ has been interpreted by Percival and Card (1983) to be an oblique section through 20 km of the Archean crust. The structural zone has been uplifted along a northeast-striking, northwest-dipping thrust fault. Along the east side of the structural zone, high-grade rocks are thrust against low-grade rocks. To the west, the high-grade rocks grade into low-grade rocks over a distance exceeding 100 km. Thrusting has exposed the Conrad Discontinuity within the KSZ (Percival, 1986).

LOCAL STRUCTURES

Stockford (1972) indicated that the Argor Carbonatite Complex was emplaced into a series of northeast- and north-trending faults. The enclosing gneisses are described as mylonitic or augen gneisses and minor faulting along the east contact has been reported (Stockford, 1972). Stockford (1972) indicated the Argor Carbonatite Complex to be a dyke-like body with a long axis striking north.

The body occurs in a north-trending fault zone, north of the junction of a northeast- and a north-trending zone of faulting. The intrusion has not been totally delineated in strike length. It is known to be approximately 1,440 m long and remains open to the north. The complex appears to have a minimum width of approximately 360 m in the area of pyrochlore mineralization. Pyrochlore mineralization has been identified to a maximum depth of 270 m. The zone of pyrochlore mineralization occurs in the southern portion of the complex and, in plan view, it covers a maximum area approximately 900 m long and 180 m wide.

It is unknown whether the complex was originally emplaced as a dyke-like body or as a more circular stock typical of most carbonatite intrusions, and then subjected to faulting and deformation to produce its present shape.

Sage (1988) suspects that the body may have originally been more elliptical in shape with its long axis parallel to the faults that controlled its emplacement. This elliptical shape has been modified to a dyke-like plan view by subsequent fault movements.

The carbonatite displays a mineralogical variation which imparts a banding to the rock. In addition, the elongate minerals, amphibole and apatite, have their long axes subparallel to each other and define a lineation in the plane of the banding. The attitude of the banding is steep to vertical and contacts appear conformable (Stockford, 1972).

Stockford (1972) reported a zone of crushed dolomitic carbonatite (Zone 8) in the approximate centre of the carbonate phase of the complex. This zone of crushed dolomitic carbonate consists of crushed and recrystallized carbonate in a turbid groundmass of carbonate, chlorite, and hematite (Stockford, 1972). He reported that accessory apatite, feldspar, pyrite, and pyrochlore-columbite are also present. Amphibole crystals within this rock unit are contorted and minor molybdenite has been recognized (Stockford, 1972).

Stockford (1972) has interpreted the deformation textures to be the result of the pulsating emplacement of the carbonatite magma as a crystal mush. The Argor Carbonatite Complex has been emplaced into a fault zone as have nearly all of the other carbonatite complexes of this age group. According to Sage (1988), most Proterozoic complexes occur in rocks cut by faults and display evidence of deformation and recrystallization. Sage (1988) considers the deformation-recrystallization textures to be due to dynamo-thermal metamorphism associated with fault movement subsequent to emplacement and crystallization.

Based on its re-logging of the historical core, NioBay is of the opinion that the carbonatite is undeformed and that the deformation textures reported in the literature are related to magmatic processes and events (Gauthier, 2017, pers. comm.).

PROPERTY GEOLOGY

A more detailed description of the lithologies found in the immediate vicinity of the deposit are taken from Stockford (1972). A property geology map, showing the lithologies, is provided in Figure 7-2.

PYROXENITE (UNIT NO. 1)

Pyroxenite is a medium to coarsely crystalline, dark green ultramafic rock which appears to have been the earliest intrusive phase in the complex. The field terms, “pyroxenite” or “hornblendite”, have generally been used, although the original composition was probably pyroxenitic.

Mineralogically, it consists of hornblende, diopside and augite, coarse biotite after hornblende, and variable calcite. Accessory minerals include sphene, apatite, coarse titaniferous magnetite, and minor sulphides (1% to 2% pyrite and pyrrhotite with occasional chalcopyrite). Zircon is fairly common, particularly where the carbonate content increases. Thin-section studies indicate that hornblende is often secondary after pyroxene, occurring as uralitic rims and cleavage replacements, although much of the amphibole is clearly primary as well.

Pyroxenite is interbanded with barren carbonatite along the west side of the complex. A narrow band also extends between mineralized carbonatite and mylonitic gneiss along the southeast boundary from 8+00S to 00+00. Boundaries of the pyroxenite have not yet been delimited to the north, south, and west of the niobium-bearing carbonatite.

At least one age of barren, calcitic carbonatite (Unit No. 2) has invaded the pyroxenite and consequently all combinations between massive pyroxenite and massive carbonatite and their mixed counterparts are seen in the complex.

Frequent inclusions and bands of hybrid material are apparent within the pyroxenite and barren carbonatite phases. These hybrid zones, which consist of pink or grey feldspar, biotite mica and carbonate, are presumed to be xenoliths of gneissic country rock, partially digested by the intrusive magma. Additional petrographic work is required to determine the detailed mineralogy of this type of material.

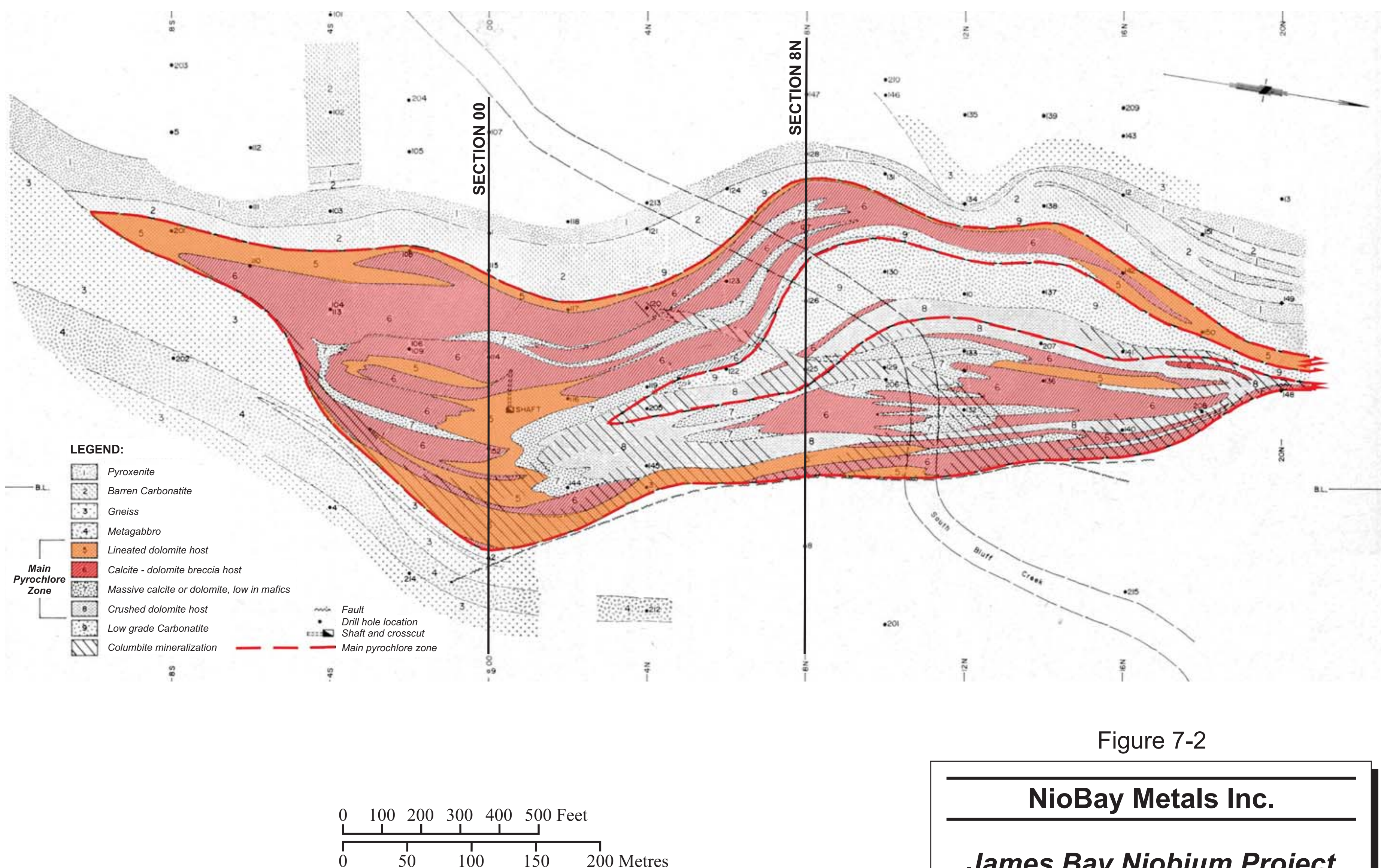


Figure 7-2

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Property Geology

December 2017

Source: NioBay Metals Powerpoint Presentation, 2017.

AMPHIBOLE-BIOTITE CARBONATITE (UNITS NO. 2 AND 9)

Intrusion of the first carbonatite phase followed the pyroxenite. Brecciation and veining of the pyroxenite by carbonate support this theory. The primary constituent of the rock is calcite (generally 60% to 80%) with variable quantities of the following minerals: 5% to 10% hornblende, 5% to 15% pale green apatite, 2% to 10% titaniferous magnetite, 2% to 15% biotite, 1% to 2% pyrrhotite, up to 1% zircon and occasional olivine.

The amphibole-biotite carbonatite is white to grey, coarsely crystalline and massive to well banded. Rolled crystal aggregates of carbonatite enclosed in a carbonate groundmass are thought to be indicative of pulsating movement during periods of intrusion and cooling.

Rock Unit No. 9 is interpreted as being a contact phase between Units 2 and 5 along the western boundary of the pyrochlore zone and in the centre of the intrusive north of section 4+00N. This phase appears to have been subjected to soda metasomatism and contains soda amphibole instead of hornblende and phlogopite in place of biotite. The unit is distinctly pinkish or mauve-grey in colour, coarser grained and contains scattered grains of dark red-brown pyrochlore. This unit, which rarely grades more than 0.20% Nb_2O_5, could alternatively be a separate intrusive carbonatite phase.

Partial sideritization of the carbonate and chloritization of ferromagnesian minerals has occurred near the Precambrian surface.

GNEISS (UNIT NO. 3)

Only the eastern gneiss-carbonatite contact has been outlined to the south of section l0+00N; both east and west contacts have been intersected to the north. The country gneisses consist of quartz, plagioclase feldspar, hornblende and biotite-chlorite, with accessory amounts of sericite, carbonate, magnetite, zircon, sphene, apatite, epidote, and garnet. Minor pyrite and pyrrhotite have also been noted.

A narrow zone of chloritized gneiss extends along the eastern contact of the carbonatite from 00+00 to 16+00N. Minor faulting along this contact appears to have caused some fracturing of the eastern limb of the carbonatite in this area. There is local evidence of intense crushing and mylonitization of the gneiss, with local well-developed augen textures. It is unlikely that the augen textures would have been produced by intrusion of the carbonatite; it seems more probable that these structures were already in existence before intrusion.

Most of the carbonate in the gneisses occupies minute fractures extending for several hundred feet away from the carbonatite contact.

METAGABBRO (UNIT NO. 4)

Dykes of gabbroic composition are found to the east of the carbonatite intrusion within the gneisses. Knowledge of these dykes is limited due to lack of detailed drilling, however, they generally appear to have been metamorphosed and crushed along with the gneisses.

The main constituents are plagioclase feldspar, hornblende, augite, and 5% to 2·5% garnet. Accessory minerals include apatite, sphene, quartz, chlorite, calcite, pyrite, and magnetite. Notably absent in the country rocks are lamprophyre dykes which are commonly associated with carbonatites, although one isolated occurrence was noted in a drill hole 2.4 km north of the main anomaly.

PYROCHLORE CARBONATITE (UNITS NO. 5 TO 8)

Rock Units 5 through 8, described in the following paragraphs, constitute the main pyrochlore-bearing carbonatite. The various rock units reflect the different textures and compositions of the carbonate hosts encountered in drill core. As such they indicate mappable units containing fairly predictable niobium grades and possibly represent several different ages of carbonatite intrusion.

Thin sections indicate that the carbonate in Unit 5 is clear and unstrained, although distinctly lineated parallel to the dip and strike of the contacts. It is most likely that this lineated, dolomitic unit is the contact zone between Units No. 2 and No. 6, along the east and west margins of the pyrochlore zone and between No. 6 and No. 8 in the centre of the mass. The mineral constituents of the rock are 60% to 80% pale grey, medium to coarse-grained dolomite, 5% to 10% sodic amphibole (riebeckite), 5% to 15% apatite, 5% to 10% phlogopite, 2% to 15% magnetite, 1% to 2% pyrrhotite, and 0.5% to 1% pyrochlore, with occasional epidote and zircon.

The host dolomite occurs as elongated crystals which, together with parallel orientation of riebeckite, apatite, and mica, impart the distinct wavy lineation to the rock.

Sideritization has taken place along the surface of the carbonatite. It is visualized as a layer of varying depth - up to three metres in the test shaft - which has been affected by groundwater and oxidation. The source of secondary iron appears to have been the ferruginous sediments above and/or magnetite in the dolomitic host rock. The dolomite has presumably been stained and partially replaced by siderite, particularly along fracture planes. There is no evidence in underground exposures to suggest a separate primary mass of siderite.

The pyrochlore content in this rock is usually uniform, with grades averaging between 0.3% and 0.5% Nb_2O_5, and is generally the pale honey-coloured variety occurring as octahedra 0.1 mm to 4.0 mm in size. The heart of the intrusion appears to be a solidified mush of medium to coarse-grained brecciated carbonatite (Unit No. 6), so-called because of the frequent occurrence of rolled crystalline aggregates of carbonate rock within a carbonate groundmass. The unit consists of 50% to 70% grey to pinkish, mixed calcite and dolomite, 5% to 15% riebeckite, 5% to 15% phlogopite, 2% to 10% magnetite (hematite along east side of deposit), 5% to 20% apatite, 1% to 2% pyrrhotite, 0.5% to 3% pyrochlore, and up to 3% zircon. This rock type is the host for the best grade of columbium mineralization, with assays ranging up to a maximum of nearly 3% Nb_2O_5 over three metres. Segregation of accessory minerals into wavy bands is a feature of the rock, although the lineation is less distinct than in the dolomitic type (Unit No. 5). Pyrochlore is generally light to dark brown in colour and individual crystals frequently exhibit internal zoning. Pyrochlore is generally accompanied by riebeckite, although many exceptions to this rule have been found. Crystals range in size from 0.2 cm to 2.0 cm and are easily identified by their resinous lustre and octahedral crystal form, sometimes modified by cube faces.

Almost massive concentrations of mica appear locally as rolled blocks or inclusions up to a few metres across. Where feldspar is present, these have been termed "hybrid zones" and are possibly remnant xenoliths of country rock, as seen in rock Unit No. 2.

Bands of medium to coarse-grained sovite (Unit No. 7), which are almost lacking in riebeckite and magnetite, have been identified as distinct units within rock Unit No. 6. The pyrochlore content is erratic and normally low in tenor. The massive sovite contains between 5% and 10% apatite and 0 to 15% coarse phlogopite.

A disturbed and crushed dolomitic zone (Unit No. 8), interpreted as being the final phase of intrusion, is the most difficult rock unit to correlate between drill holes. However, it could represent the central core of the original intrusive which has been squeezed, recrystallized, and hydrothermally altered. The mineral assemblage in the unit is quite different from other phases within the complex. It consists mainly of crushed, coarsely recrystallized dolomite enclosed in a dirty groundmass of fine carbonate, chlorite and, locally, hematite and is generally low in sodic amphibole content. Accessory minerals include apatite, feldspar, and pyrite, with erratic pyrochlore and/or columbite and scattered molybdenite.

Figures 7-3 and 7-4 illustrate geological sections with composite intersection grades for Sections 0+00 and 8+00N, respectively.

RPA

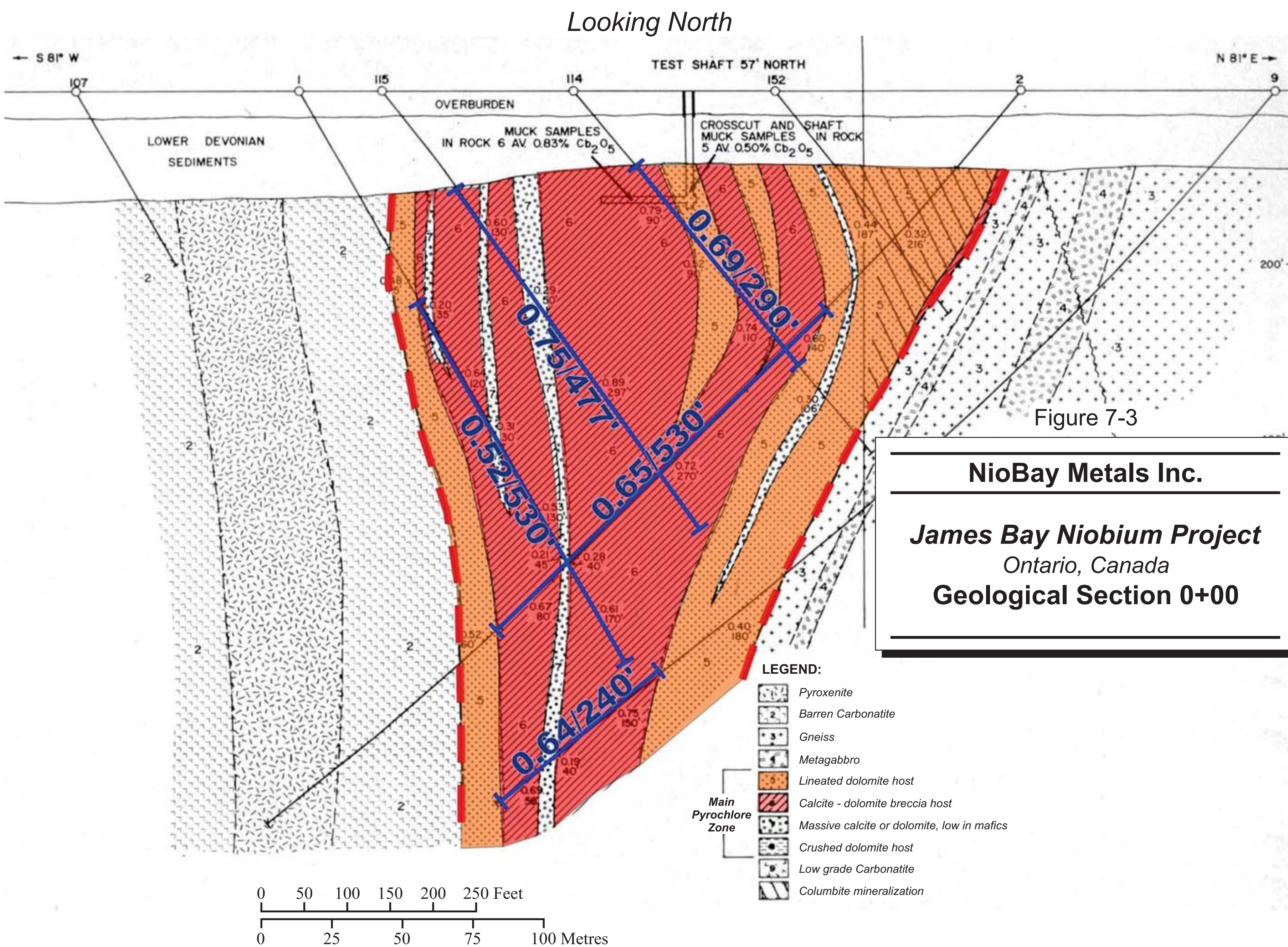


Figure 7-3

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Geological Section 0+00

December 2017

Source: NioBay Metals Powerpoint Presentation, 2017.

www.rpacan.com

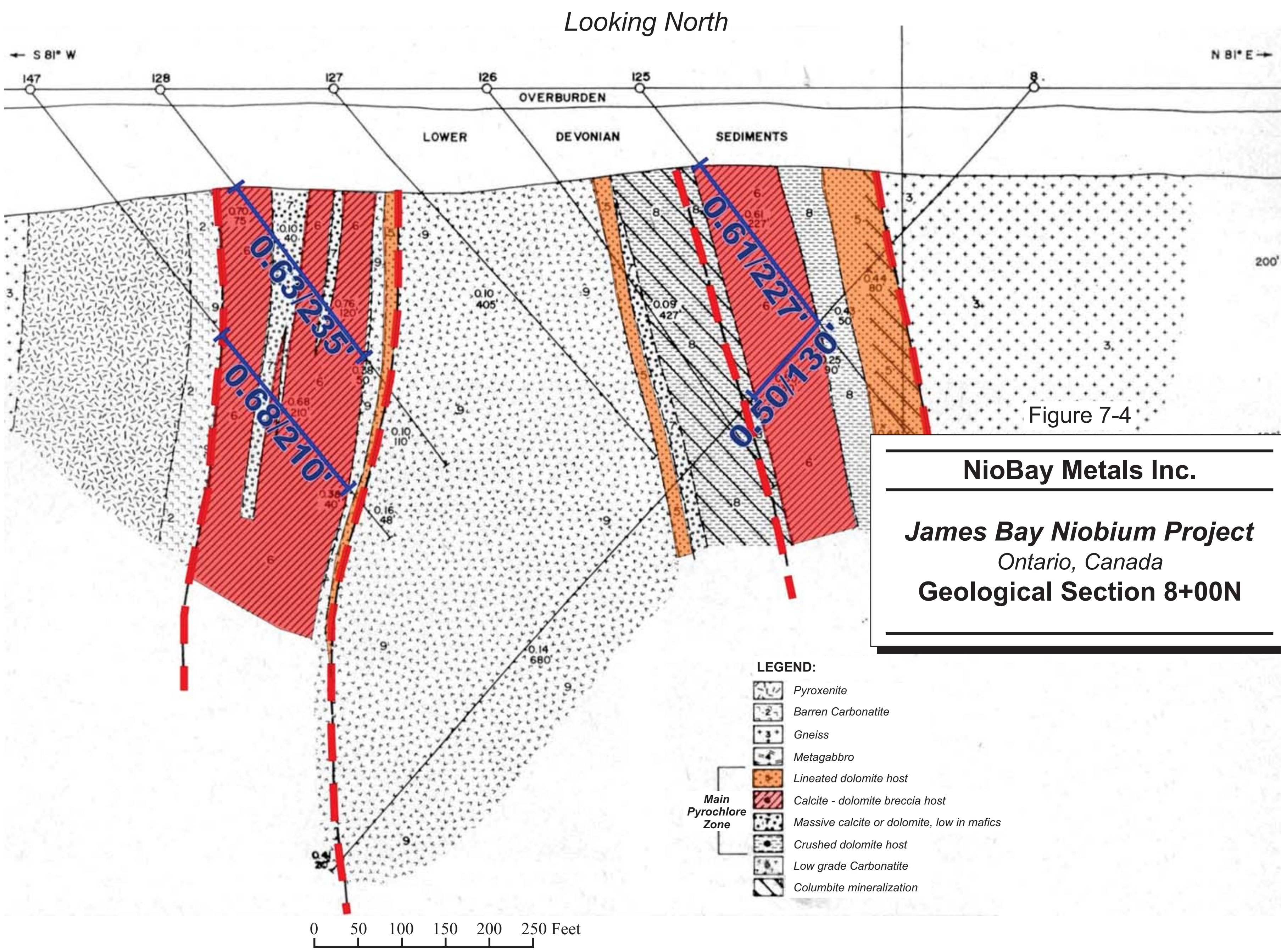


Figure 7-4

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Geological Section 8+00N

December 2017

Source: NioBay Metals Powerpoint Presentation, 2017.

MINERALIZATION

The following is taken from Stockford (1972).

PYROCHLORE

Pyrochlore, the main mineral of economic interest, occurs as discrete octahedral crystals in carbonatite. It is usually accompanied by, and sometimes enclosed in, apatite, riebeckite, magnetite, and phlogopite. Although these accompanying minerals seem to be essential to pyrochlore occurrences when considering the carbonatite as a whole, the columbium mineral does occur locally on its own, within a pure carbonate host.

Pyrochlore varies in colour from a pale honey to dark brown or reddish, and frequently displays spectacular zoning. Preliminary electron-microprobe studies by Dr. J. Gittins at the University of Toronto were carried out on seven pyrochlore crystals to determine the difference in composition of various zones, if any. He found that the most striking features were the compositional simplicity, homogeneity despite the colour variation and the absence of tantalum. Some of the darker areas were assumed to be iron-rich, but further work is required to verify this fact.

The microprobe studies indicate that the pyrochlore ranges in composition from 57% to 65% Nb_2O_5 and contains minor quantities of the following compounds: 0.8% to 2.0% TiO_2; 0 to 0.4% FeO; 0.01% to 4.0% Al_2O_3; 13% to 16% CaO; 6% to 14% Na_2O. Most of the crystals were found to contain Ce (0.5% Ce_2O_3) and half contained La (0.04% La_2O_3). Other elements searched for but not detected were U, Th, Zr, Ta, Ba, Eu, and Sr. Historical ore dressing tests on the core and bulk sample indicated that a concentrate averaging 64% Nb_2O_5 could be produced from the deposit.

COLUMBITE

Columbite, $FeNb_2O_6$, occurs along the eastern side of the deposit and in the transgressive crushed dolomite zone between sections 4+00N and 8+00N. The mineral totally or partially pseudomorphs pyrochlore and is typically earthy and dark brown to black in colour. Individual crystals of pyrochlore have been replaced by columbite in various ways - central cores, inner zones, outer rims, or total crystals. Columbite is not restricted to any one rock unit within the complex, but appears to be associated with fracturing and hematitic alteration.

APATITE

The pale green, fluor-variety of apatite is universally present in all rock units within the carbonatite-pyroxenite complex. Usually, the best-grade bands of pyrochlore carbonatite also contain abnormally high quantities of apatite, while the converse is not true. The mineral occurs as fine to coarse-grained, hexagonal prisms aligned parallel to the wavy foliation. Assays for phosphate content from cross-cut samples indicated an apatite range of 6% to 10%.

MAGNETITE

Titaniferous magnetite, like apatite, is present in all units within the intrusive, and also in the gneissic country rocks to a lesser degree. It is most abundant in the pyroxenitic phase (No. 1) and in the barren carbonatite (No. 2); the magnetite content of the pyrochlore zone rarely exceeds 5%. Hematite or martite are dominant over magnetite along the east side of the deposit and in brecciated sections of the crushed dolomite zone in association with minor, late-stage quartz.

Submicroscopic hydrothermal hematite could also account for the reddish colouring observed in some of the mylonitic gneisses.

SULPHIDES

Up to 2% primary pyrrhotite is evenly distributed throughout all intrusive units with the exception of the crushed dolomite zone, where pyrite is dominant. Molybdenite occurs only in the crushed dolomite (No. 8), as discrete, scaley grains, in sub-economic quantities. Both molybdenite and pyrite may have been primary constituents of the last intrusive phase, or they could represent a later stage of hydrothermal mineralization.

Chalcopyrite, of minor importance, occurs in the pyroxenite in association with pyrite and pyrrhotite.

8 DEPOSIT TYPES

The following is taken from Richardson and Birkett (1996).

Carbonatite-associated deposits include a variety of mineral deposits that occur both within and in close spatial association with carbonatites and related alkalic silicate rocks. Carbonatite-associated deposits are mined for rare-earth elements (REEs), niobium, iron, copper, apatite, vermiculite, and fluorite. By-products include barite, zircon, or baddeleyite, tantalum, uranium, platinum group elements, silver, and gold. In some complexes, calcite-rich carbonatite is mined as a source of lime to produce Portland cement.

Carbonatites are igneous rocks which contain at least 50% modal carbonate minerals, mainly calcite, dolomite, ankerite, or sodium- and potassium-bearing carbonates. Other minerals commonly present include diopside, sodic pyroxenes or amphiboles, phlogopite, apatite, and olivine. A large number of rare or exotic minerals also occur in carbonatites.

Carbonatites occur mainly as intrusive bodies of generally modest dimensions (as much as a few tens of square kilometres) and to a lesser extent as volcanic rocks which are associated with a wide range of alkalic silicate rocks (syenites, nepheline syenites, nephelinites, ijolites, urtites, pyroxenites, etc.). Carbonatites are generally surrounded by an aureole of metasomatically altered rocks called fenites produced by the reaction of country rocks with peralkaline fluids released from the carbonatite complex.

Carbonatite-associated deposits can be subdivided into magmatic and metasomatic types. Magmatic deposits are formed through processes associated with the crystallization of carbonatites, whereas metasomatic deposits form by the reaction of fluids released during crystallization with pre-existing carbonatite or country rocks.

Many carbonatite-associated deposits are relatively small, in the order of tens of thousands to hundreds of thousands of tonnes, however, significant production of phosphate, niobium, and rare earth oxides is derived from larger, higher grade deposits in Brazil, Canada and South Africa, which vary greatly in size and grade.

Most carbonatite complexes occur in relatively stable, intra-plate areas. The regional distribution of these complexes is controlled by major tectonic features. About half the known carbonatites are located in topographic highs or domes and are bounded by zones of crustal-scale faulting (Wooley, 1989). Other major controls on carbonatite emplacement are major faults, anorogenic rifts, and the intersection of major faults. A few carbonatites are found near plate margins and may be linked with orogenic activity or plate separation. Because carbonatites generally occur in clusters or in provinces that display episodic magmatic activity, physical and/or chemical properties of lithospheric plates may exert some control on their location and genesis (Wooley, 1989).

There appears to have been a gradual increase in carbonatite magmatism with time. Dates fall into groups that generally correspond to major orogenic and tectonic events (Wooley, 1989). Identified age groups include; 1) a mid-Proterozoic group (1,800-1,550 Ma) that corresponds to the Hudsonian and Svecokarelian orogenies in North America and Europe, respectively; 2) a mid- to late Proterozoic group corresponding to the Grenville orogeny (peak at ca. 1,100 Ma); 3) a group between 750 Ma and 500 Ma, and 4) a major period starting at 200 Ma. A few carbonatites of Archean age are known.

Carbonatites may consist of a number of intrusive phases with different textural and mineralogical characteristics. Early phases typically consist mainly of calcite, do not contain peralkaline pyroxenes or amphiboles, and contain associated apatite + magnetite ± pyrochlore mineralization. Later phases, which may contain dolomite, ankerite and siderite, in addition to calcite, are commonly enriched in pyrochlore. Many very late stage carbonatites contain only trace, or no, Nb mineralization and are enriched in primary REE-bearing minerals.

Economic mineralization in carbonatites is generally associated with plutonic carbonatite phases, not with lavas. Magmatic carbonatite deposits generally occur in small (3 km to 5 km) plug-like and cressentic bodies in composite plutons with coeval silica-undersaturated mafic and/or ultramafic rocks. Mineralization is commonly related to magmatic layering, and flow structures with the host rocks. The deposits are commonly groups of lenses or irregular ore shoots that, in plan, have crescent-shaped or annular forms. In section, these deposits generally have steep dips, parallel to the walls of the intrusive complex, and may extend to great depths.

Metasomatic carbonatite deposits typically have the form of 1) dykes and dilatant veins of ankerite or dolomite, with or without calcite; 2) thin hydrothermal veins; 3) stockworks, and 4) replacement bodies rich in calcite and dolomite or ankerite. Veins and dykes which locally form radial or annular patterns, commonly crosscut consanguineous fenitized alkaline lithologies and adjacent country rocks.

9 EXPLORATION

NioBay recovered all historical drill logs, collar survey data, historical assay certificates, and vertical drill sections with assays and geological interpretation from the archives of James Bay Columbium Ltd., one of the previous owners of the Property. All the existing historical drill core was stored in a secure building in Moosonee.

During the fall of 2016, NioBay undertook a program of core re-logging and check sampling to confirm the historical results on the Property.

NioBay selected two holes on each of six vertical sections located at 400 ft spacing for a total of twelve holes for the re-logging and check sampling study. The sections involved are Sections 400S, 00, 400N, 800N, 1200N, and 1600N. NioBay re-analyzed all of the remaining core, with the exception of a 3 inch character sample for each sampled interval. Samples were typically 10 ft in length with some samples measuring not less than 5 ft. In some instances, previous sampling for metallurgical testing during the 1960s left only 25% of the split core available for re-assaying.

A total of 629 samples, exclusive of blanks and Certified Reference Material (CRM or standards), were taken for analysis

Table 9-1 illustrates the composite results of the original sampling and the results of the check sampling for the corresponding intervals.

TABLE 9-1 CORE RE-SAMPLING RESULTS
NioBay Metals Inc. - James Bay Niobium Project

Drill Hole	From (ft)	To (ft)	Length (ft)	1967 (% Nb_2O_5)	2017 (% Nb_2O_5)
66-2	117.0	915.0	798.0	0.55	0.56
incl.	333.0	915.0	581.5	0.64	0.65
incl.	395.0	695.0	300.0	0.74	0.79
66-10	140.0	800.0	660.0	0.44	0.41
incl.	540.0	580.0	40.0	0.85	0.93
incl.	690.0	740.0	50.0	0.66	0.65
66-12	255.0	393.2	138.2	0.56	0.50

Drill Hole	From (ft)	To (ft)	Length (ft)	1967 (% Nb_2O_5)	2017 (% Nb_2O_5)
	665.0	735.0	70.0	0.49	0.47
	945.0	115.0	205.0	0.41	0.36
67-101	820.0	1,120.0	300.0	0.57	0.51
67-103	160.0	600.0	440.0	0.54	0.53
incl.	260.0	400.0	140.0	0.77	0.74
67-115	150.0	617.0	467.0	0.76	0.74
incl.	320.0	617.0	297.0	0.89	0.85
67-119	150.0	586.0	436.0	0.39	0.38
incl.	300.0	380.0	80.0	0.55	0.54
67-121	250.0	570.0	320.0	0.50	0.39
incl.	358.0	560.0	202.0	0.64	0.61
67-125	113.0	548.8	435.8	0.49	0.48
incl.	113.0	350.0	237.0	0.60	0.59
67-135	450.0	560.0	110.0	0.49	0.46
67-142	400.0	564.0	164.0	0.38	0.38
67-147	350.0	610.0	260.0	0.62	0.60
incl.	370.0	480.0	110.0	0.80	0.74

The results of the check sampling program suggest that, while there is moderate variation over individual sample intervals, the overall average grades over larger intervals are comparable.

10 DRILLING

NioBay has completed no drilling on the Property as of the effective date of this report. The historical drilling is described in Section 6.

Figure 10-1 shows the location of historical drilling used in Mineral Resource estimation.

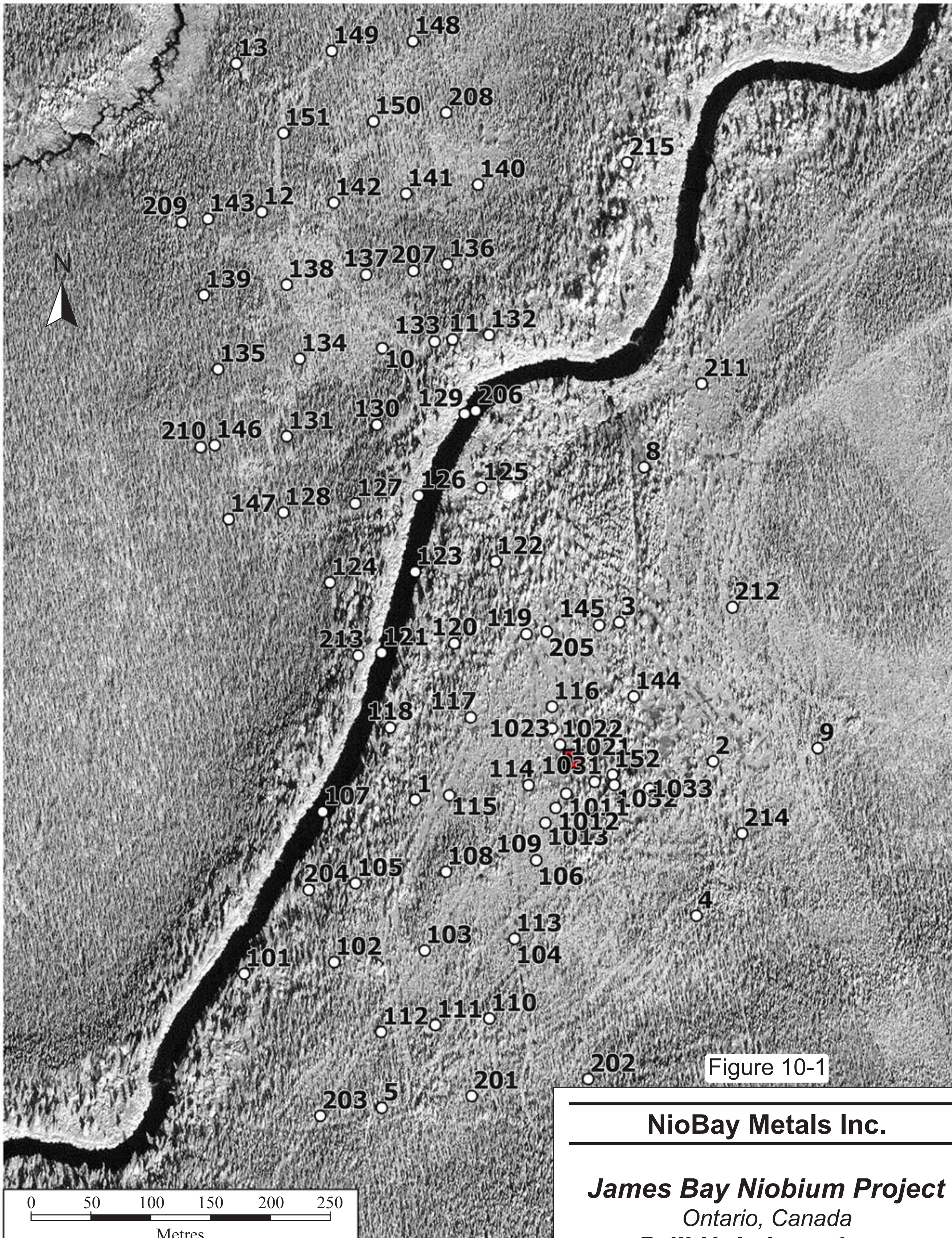


Figure 10-1

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Drill Hole Locations

December 2017

Source: NioBay Metals, 2017.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The core from the historical drilling on the Property was continuously stored in a secure building in Moosonee.

Samples taken during the 2016 check sampling program were bagged on site and were assigned a unique sample number. The samples were first transported on two stretch wrapped pallets by NioBay personnel to NioBay's warehouse in Montreal where standards were inserted into the sample sequence. The samples were then bagged, stretch wrapped on pallets, and sent directly to SGS Minerals in Lakefield, Ontario, by courier for processing and analysis. SGS Minerals in Lakefield is Accredited Laboratory No. 184 and conforms with requirements of CAN-P-1579, CAN-P-4E (ISO/TEC 17025:2005).

At Lakefield, core samples were dried and weighed, then crushed to 90% passing 2 mm, split into representative sub-samples using a riffle (or rotary) splitter, dry screened to -180 mesh and a 500 g sample pulverized to 85% passing 75 microns according to SGS sample preparation code PRP91.

Samples were routinely analyzed for a suite of 12 major oxides including Al_2O_3, CaO, Cr_2O_3, K_2O, MgO, MnO, Na_2O, P_2O_5, Fe_2O_3, SiO_2, TiO_2 and V_2O_5 and loss on ignition (LOI) as well as Nb_2O_5. Analyses were done by the borate fusion/X-ray fluorescence (XRF) method (SGS lab code GO XRF76V).

NioBay and RPA are independent of SGS Minerals.

In RPA's opinion, the sample preparation, analysis, and security procedures at the James Bay Niobium Project are adequate for use in the estimation of Mineral Resources.

QUALITY ASSURANCE AND QUALITY CONTROL

In 2016, NioBay initiated a Quality Assurance and Quality Control (QA/QC) program that includes the systematic use of CRMs and blanks. No field, coarse reject, or pulp duplicate samples were collected during the 2016 check sampling program. RPA is unaware of QA/QC results collected by previous operators.

BLANKS

The regular submission of blank material is used to assess contamination during sample preparation and to identify sample numbering errors. NioBay's QA/QC protocol calls for blanks to be inserted into the sample stream at a rate of approximately 1 in 20.

The blank material used by NioBay consisted of decorative calcite acquired from a local hardware store in Moosonee which was expected to have a very low Nb_2O_5 content.

RPA received results for 28 analyses of blanks. All the blanks from 11 of the 12 holes analyzed returned values of less than 0.01% Nb_2O_5. Four of the five blanks from hole 66-2 returned values ranging from 0.05% Nb_2O_5 to 0.94% Nb_2O_5 suggesting either contamination at the laboratory or, more likely, sample mis-numbering. RPA recommends that NioBay investigate the associated sample batches from hole 66-2 and reanalyze if necessary.

CERTIFIED REFERENCE MATERIAL (STANDARDS)

Results for the regular submission of CRMs are used to identify issues with specific sample batches and long-term biases associated with the regular assay laboratory.

NioBay acquired two non-certified standards from GéoMéga Resources Inc. (GéoMéga). GéoMéga is in the process of developing the Montviel REE-Nb deposit located approximately 125 km north-northeast of Lebel-sur-Quévillon, Québec and developed in-house standard material for its internal purposes.

Table 11-1 documents the composition of the standards acquired from GéoMéga.

TABLE 11-1 STANDARDS
NioBay Metals Inc. – James Bay Niobium Project

	Low Standard (S4) Nb (ppm)	High Standard (S5) Nb (%)
Mean	75.36	0.845
Variance	2.43	0.000025
Std. Dev. (S)	1.56	0.005
Rel. Std. Dev. (%)	2.07	0.59

The results for 24 of the 27 standards were reasonable, however, three standards show significant differences from the expected value. RPA recommends that NioBay investigate the associated sample batches and reanalyze if necessary.

ENHANCEMENTS TO QA/QC PROGRAM

RPA recommends several enhancements to the QA/QC protocol for use during the drilling programs recommended in this report including the acquisition of certified standards and blank material.

Furthermore, RPA recommends including the regular submission of pulp duplicates to an alternative laboratory and a temporary coarse reject duplicate analysis program. NioBay should also implement a QA data monitoring system used to detect failed batches, and in turn, identify sample batches for reanalysis.

Pulp duplicates are submitted to a second laboratory to make an additional assessment of laboratory bias. The primary laboratory should be instructed to prepare one pulp duplicate for every 50 samples. These should be forwarded to an alternative laboratory for analysis using similar digestion and analysis methods as used by primary laboratory.

Reject duplicates consist of a second split of the crushed sample, and should be prepared and analyzed at the primary laboratory. The split should be taken using the same method and have the same weight as the original sample. RPA recommends an initial test program of 50 reject duplicates of samples over a range of grades. Results from the reject duplicate QC program will determine if the splitting procedures are applied consistently and are appropriate. NioBay should then continue to submit one coarse reject duplicate every 50 samples.

In RPA's opinion, the QA/QC program as designed and implemented by NioBay is adequate and the assay results within the database are suitable for use in a Mineral Resource estimate.

12 DATA VERIFICATION

SITE VISIT

Paul Chamois, P. Geo., Principal Geologist with RPA and an independent QP, visited the Project on September 27, 2017. During the visit, Mr. Chamois examined the historical shaft site on the Property, examined core from historical drilling programs stored in Moosonee, identified pyrochlore mineralization in the historical core, confirmed the local geological setting, and investigated factors that might affect the Project.

While on the site visit, Mr. Chamois also collected 21 samples of split core from mineralized intersections for bulk density determinations by the water immersion method. The core samples were transported to Toronto by Mr. Chamois and expedited to SGS Minerals in Lakefield, Ontario by courier where the bulk density determinations were made (SGS lab code G PHY04V). Table 12-1 lists the results of the determinations.

TABLE 12-1 BULK DENSITY
NioBay Metals Inc. - James Bay Niobium Project

Sample No.	Hole	Sample Interval (ft) From	To	Nb_2O_5 (%)	Density (g/cm^3)
133357	66-05	420	430	0.41	3.05
133358	66-04	1,045	1,055	0.43	3.21
133359	66-10	160	170	0.64	2.93
133360	66-10	160	170	0.64	2.85
133361	67-137	840	850	0.60	2.90
133362	67-131	180	190	0.51	2.88
133363	67-129	340	350	0.98	2.92
133364	67-124	370	380	0.27	2.67
133365	67-105	360	370	0.29	2.87
133366	67-120	350	360	1.00	2.94
133367	67-120	850	860	0.98	2.89
133368	67-135	610	620	0.14	2.84
133369	67-119	330	340	0.72	3.03
133370	67-119	160	170	0.34	3.02
133371	66-10	760	770	0.30	3.02
133372	66-01	285	290	0.35	2.83
133373	67-114	210	220	0.37	3.00
133374	67-118	380	390	0.75	2.97

Sample No.	Hole	Sample Interval (ft) From	To	Nb_2O_5 (%)	Density (g/cm^3)
133375	67-144	130	140	1.17	2.83
133376	67-118	630	630	0.59	2.93
133377	66-01	385	390	0.55	2.96

DATA VERIFICATION

RPA extracted 422 samples from the 2016 check sampling results, representing approximately 67% of the total samples, and compared them to the original assay certificates. No errors were found.

RPA is of the opinion that the database verification procedures for the James Bay Niobium Project comply with industry standards and are adequate for the purposes of Mineral Resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The following summary of historical and recent metallurgical testwork completed on material from the Property is taken from Pelletier (2017).

HISTORICAL WORK

Extensive laboratory process testwork has been done in the past including:

- Heavy liquid separation
- Gravity separation (tabling, jigging and spiralling)
- Magnetic and electrostatic separation
- Flotation (direct and dual flotation)

The results of the historic work suggest that part of the material could be removed before the flotation process with a positive impact to the process plant size and cost. The dual flotation provides better results than direct flotation. Based on the laboratory results, a pilot plant test was carried out on a bulk sample from underground. The sample combined part of the muck coming from the shaft sinking and a cross-cut over 100 ft long at 122 ft below the surface. The sample assayed 0.72% Nb_2O_5, which is higher than the average grade reported for the historic resource estimate (0.55% Nb_2O_5). The total amount of sample sent to SGS Lakefield for the pilot plant was 250 tons and another 18 tons were sent to the Ontario Research Centre (ORC).

MINERALOGY

The historical mineralogy indicated that only two niobium-bearing minerals were present: sodium pyrochlore (a fluocalciopyrochlore salt $(NaCa)_2$ $(NbTi)_2$ $(O,F)_7$) and columbite ($FeNb_2O_6$).

PILOT PLANT TESTWORK

Grinding test investigation included wet autogenous and dry autogenous grinding. Wet rod mill was suggested but not investigated. Results suggest that wet autogenous grinding produced a desirable size distribution and pebble size. Grinding tests were carried out at the ORC.

A detailed pilot plant program was conducted at Lakefield Research (now SGS Minerals) to assess the final plant flowsheet and pilot plant design criteria. The pilot plant consisted of the following:

- Grinding and gravity separation
- Magnetic separation
- Calcite flotation
- Pyrochlore flotation
- Reverse sulphide flotation
- Acid leach
- Tabling

Results from the pilot plant were:

- 45% of the initial mass was removed with niobium losses of 4% to 5%.
- A final niobium concentrate of 64% Nb_2O_5 was produced at a niobium recovery of 79%.
- Two types of concentrate were produced; a low and higher silica content (grade 1 with max 1% SiO_2 and grade 2 with max 4% SiO_2)

Despite the positive results achieved, the final process flowsheet was complicated and included a number of cleaning stages, a regrinding stage, and a tabling stage. It may be challenging to operate and control the niobium losses. Some of the reagents are hazardous (HF) or obsolete. With the current evolution in niobium ore processing during the last four decades, it appears that this process flowsheet needs to be revisited and possibly simplified.

Table 13-1 lists the quality of the niobium concentrates produced from the historical testwork.

TABLE 13-1 HISTORIC NIOBIUM CONCENTRATES
NioBay Metals Inc. – James Bay Niobium Project

	High Grade	Low Grade
Distribution	41%	59%
Nb_2O_5	67.7%	62.3%
Ta_2O_5	0.49%	0.50%
Fe_2O_5	1.24%	3.45%
SrO	1.11%	1.01%
Pb	0.04%	0.03%
As	Nil	Nil
SnO_2	0.02%	0.01%
TiO_2	1.76%	2.73%
SiO_2	0.68%	2.90%
CaO	15.7%	13.6%
MgO	0.26%	0.69%
BaO	---	---
Na_2O	7.31%	7.28%
Al_2O_3	0.04%	0.13%
S	0.05%	0.06
P_2O_5	0.08	0.23
MnO	0.01	0.03

CURRENT WORK

The 2017 test work was performed on a representative composite sample of coarse reject material from the 2016 core sampling program.

HEAVY LIQUID SEPARATION

Heavy liquid separation provided excellent results with 90% of Nb_2O_5 concentrate in 5% mass pull at an SG cutting point of 3.5. These results suggest a good liberation of the niobium mineral and open the possibility of gravity concentration inside the process flowsheet. Historical process flowsheets used gravity separation to remove up to 40% of the mass prior to flotation with limited niobium losses.

QEMSCAN

Advanced mineralogy available today reveals a good liberation of most of the mineral in the samples. QEMSCAN results combined with the heavy liquid separation results indicate that a better niobium recovery can be achieved at the Project compared to other niobium deposits. The main niobium mineral at the Project is pyrochlore (87%), with columbite accounting for only 9.6%. The niobium-bearing pyrochlore is easier to recover than columbite. The best result is achieved using niobium liberation, with approximately 95% of the niobium mineral free or liberated. This result can explain the historical niobium recovery achieved. The other critical minerals in the niobium processing are also well liberated. The theoretical grade recovery curve provides other details in the potential niobium recovery. It can also explain the potential for gangue rejection by gravimetry.

TABLE 13-2 MINERAL LIBERATION
NioBay Metals Inc. – James Bay Niobium Project

Species	Free	Liberated	Total Free and Liberated
Niobium	71.1%	23.8%	94.9%
Silica	89.5%	5.6%	95.1%
Apatite	97.2%	1.4%	98.6%
Sulphide	87.5%	4.1%	91.6%
Fe Oxide	68.7%	26.5%	95.2%

TESTWORK

The work performed in 2017 is referred to as preliminary process testwork.

A master composite was prepared based on the results of re-assaying of 12 historical drill holes. The grade of the master composite approximates the historical grade used in the feasibility study and is estimated to be 0.56% Nb_2O_5. All of the testwork was done on the master composite. Table 13-3 lists the grade of the master composite estimate and direct assay grade.

TABLE 13-3 MASTER COMPOSITE
NioBay Metals Inc. – James Bay Niobium Project

	Estimate	Direct Assay
Nb_2O_5	0.56	0.59
SiO_2	4.64	4.74
Al_2O_3	0.55	0.54
Fe_2O_3	8.96	8.79
MgO	6.54	6.37
CaO	38.20	38.40
Na_2O	0.53	0.53
K_2O	0.46	0.44
TiO_2	0.22	0.25
P_2O_5	3.29	3.33
MnO	0.75	0.75
S	0.49	0.47

The testwork included:

- Completion of head grade assay for 12 holes including major elements to understand the variability of the principal elements/contaminants
- Heavy liquid separation
- QEMSCAN mineralogy
- Gravity separation (2)
- Flotation tests (10)

The flotation testwork used the dual flotation system with mainly the new approach developed over time. A typical reagents scheme was used. The pH regulation was done using fluosilicic and oxalic acids that are less corrosive and hazardous than hydrofluoric acid (HF). Ten flotation tests were completed and the results appear to be in line with the historical data. The tests were done in open circuit and the final results will need to be confirmed by locked cycle and possibly pilot plant tests. The test identified one major issue, that is, the silica concentration remains relatively high or close to the upper limit.

The results achieved are higher in terms of Nb_2O_5 recovery than any other niobium operation. The actual flowsheet is simplified compared to the historical one. The gravity tests failed to reproduce the historical results. For the current testing, it was decided to complete the flotation test on the entire sample without any mass removal by gravity. The gravity separation will be reviewed in a future testwork phase, considering its impact on process plant and capital cost as well as the flotation.

The proposed process flowsheet includes:

- Grinding to 100% 200 microns or 300 microns
- Desliming
- Magnetic separation
- Sulphide flotation
- Mica flotation
- Carbonate flotation
- Niobium flotation

The concentrates produced ranged from 56% to 59% Nb_2O_5 with Nb_2O_5 recovery between 68% and 77% in open circuit. The main contamination grades meet specifications except for silica. TiO_2 ranges from 3.9% to 6.0%, P_2O_5 is low at 0.12% to 0.14% (the HCl leaching cost will be low), the sulphide S ranges from 0.04% to 0.8%. At present, no secondary sulphide flotation appears necessary on the final concentrate. For the silica, the lower grade achieved was 3.21% SiO_2 up to 4.5% SiO_2 in the next best flotation test. Presently this is the main issue to address in the next phase of testwork. The historical flowsheet included many stages of cleaner and gravity separation. Characterization on the concentrate will be carried out to find the best alternative to resolve this issue.

Table 13-4 lists the typical preliminary open circuit flotation results:

TABLE 13-4 PRELIMINARY FLOTATION TEST RESULTS
NioBay Metals Inc. – James Bay Niobium Project

	F1	F2	F6
Distribution			
Nb_2O_5	58.9%	55.7%	56.3%
Nb_2O_5 recovery (final conc)	67.7%	68.3%	73.9%
Nb_2O_5 recovery (rougher conc)	86.6%	87.8%	85.0%
Fe_2O_3	6.81%	8.33%	7.74%
P_2O_5	0.14%	0.13%	0.13%
TiO_2	3.91%	6.56%	6.01%
SiO_2	3.21%	4.00%	4.45%
S	---	0.06%	0.04%

CONCLUSIONS

Extensive historical testwork has been completed for the Project and good recovery has been achieved. Multiple cleaning, however, reveals that the control of the silica, and to some extent sulphur, remains complicated and requires the use of gravity table to achieve these results. It was proposed in 2016 to revisit all the processes to see if it was possible to reduce and simplify the number of cleaning stages and the overall processing.

Preliminary testwork was carried out in 2017 on historical samples available. Despite limited testwork, good results have been achieved. Silica remains the main area of concern and will require attention in the next phase of testwork. The sulphur issue appears to be well controlled in the current testwork program by using a different flotation approach than in the past. The sulphur grade in the concentrate is well below the target limit. Additional testing on fresh material is recommended to verify the 2017 testwork results. Variability testwork should be carried out to develop the final flowsheet. The testwork program should be completed with a pilot plant run with all the processing stages to understand the impact of recirculation and water management.

Gravity concentration testwork should be carried out to verify the historical result of approximately 40% mass pull being removed with limited Nb_2O_5 losses (4% to 5% Nb_2O_5 recovery). If the gravity test proves to be successful, the new process flowsheet will need to be validated on the reduced mass circuit feed.

14 MINERAL RESOURCE ESTIMATE

SUMMARY

The Mineral Resource estimate reported herein is a reasonable representation of the global Mineral Resources of the Project at the current level of sampling. The Mineral Resources conform to Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves dated May 10, 2014 (CIM (2014) definitions) and are reported in accordance with the Canadian Securities Administrators' National Instrument 43-101. Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. RPA considers the Mineral Resources of the James Bay Project to be amenable to underground extraction. A summary of the Mineral Resources is presented in Table 14-1. Note that the estimate is reported in short tons. RPA has excluded approximately 7.1 million tons averaging 0.52% Nb_2O_5 situated in a 150 ft thick crown pillar.

TABLE 14-1 MINERAL RESOURCES, NOVEMBER 8, 2017
NioBay Metals Inc. – James Bay Niobium Project

Classification	Tonnage (M st)	Grade (%Nb_2O_5)	Contained Nb_2O_5 (M lb)
Indicated	25.5	0.53	271
Inferred	25.3	0.51	259

Notes:
1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported at a cut-off grade of 0.3% Nb_2O_5 based on an underground mining operating cost of C$70/t and a metallurgical recovery of 70%.
3. Mineral Resources are estimated using a long-term niobium price of US$40 per kg and a US$/C$ exchange rate of 1:1.2.
4. A tonnage factor of 12.2 ft^3/ton (2.93 g/cm^3) was used.
5. A minimum mining width of approximately 25 ft was used to build the resource wireframes.
6. Resources situated in a 150 ft thick crown pillar have been excluded.

Leapfrog Geo software (version 4.1) was used to construct the geological solids. GEOVIA GEMS (Gems) software (version 6.8) was used to prepare assay data for geostatistical analysis, construct the block model, estimate niobium oxide grades, and tabulate Mineral Resources.

RPA is not aware of any environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors that could materially affect the Mineral Resource estimate.

MINERAL RESOURCE ESTIMATION METHODOLOGY

The evaluation of Mineral Resources involved the following procedures:

- Database compilation and verification
- Definition of mineralized domains and construction of wireframes
- Data conditioning (capping and compositing) for geostatistical analysis and variography
- Selection of estimation strategy and estimation parameters
- Block modelling and grade interpolation
- Validation, classification, and tabulation
- Assessment of “reasonable prospects for eventual economic extraction” and selection of reporting assumptions
- Preparation of the Mineral Resource Statement

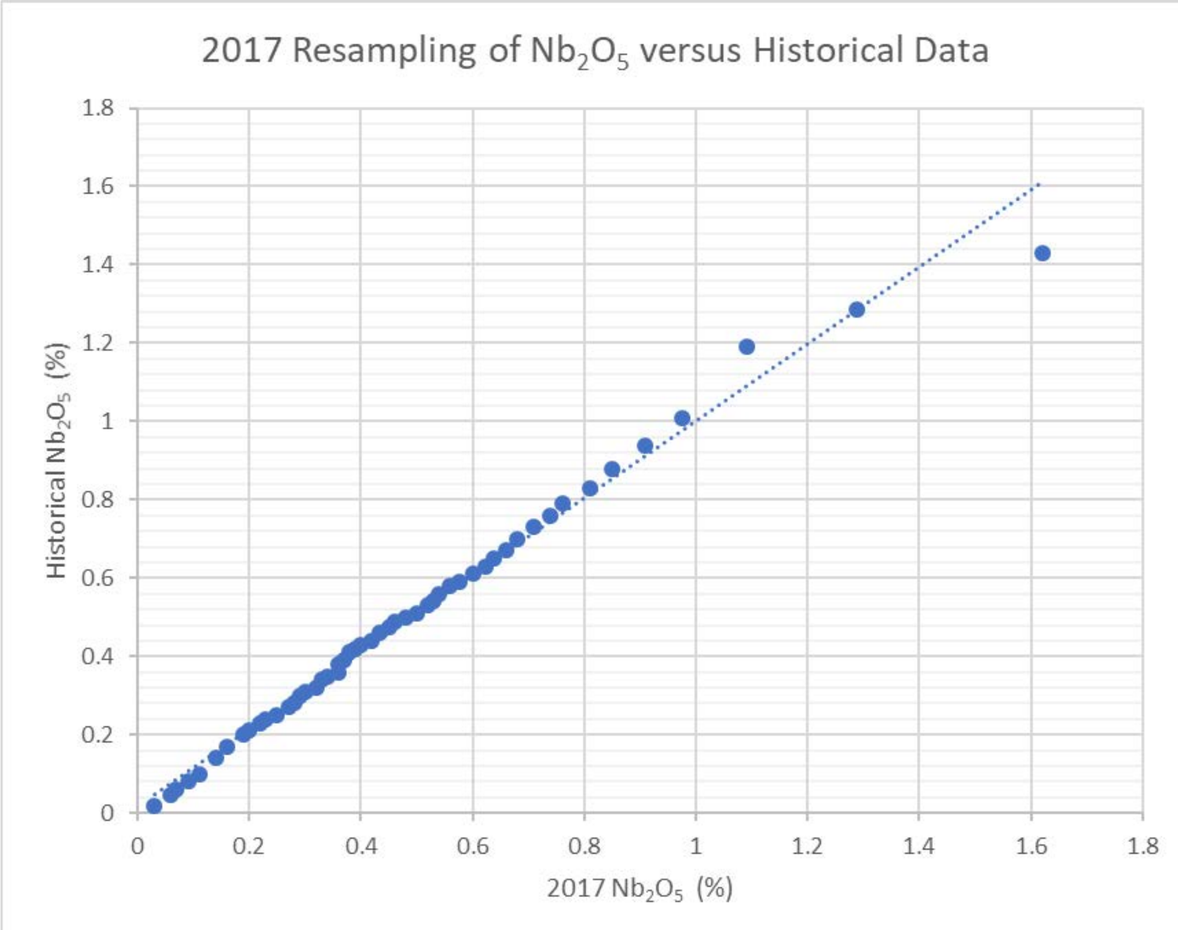
RESOURCE DATABASE

NioBay provided assay and logging data as separate multi-tab Excel files containing log information for each core borehole. The data include location, survey, lithology, mineralogy and assays. RPA combined the individual logs for import into Leapfrog software.

The data used to estimate Mineral Resources include 79 core boreholes (43,405 ft), all of which are located within the resource model area. The data include 2,517 assays, of which 56 have a value of zero for Nb_2O_5.

NioBay re-logged and re-assayed 12 boreholes completed in the 1960s to confirm that the historical borehole data can be used to support a new Mineral Resource estimate without drilling any new holes. In RPA’s opinion, there is a good correlation of the historical and resampled Nb_2O_5 values (Figure 14-1).

FIGURE 14-1 QQ PLOT OF THE HISTORICAL AND RESAMPLED DATA



RPA conducted a limited number of checks on the resource database, including a search for unique, missing, and overlapping intervals, a total depth comparison, and a visual search for extreme or deviant survey values. As part of the review of the data, RPA compared the Excel files with scanned copies of the original paper logs. No errors were encountered.

The resource database is considered by RPA to be sufficiently reliable for grade modelling and Mineral Resource estimation.

GEOLOGICAL INTERPRETATION AND MODELLING

RPA used Leapfrog software to create a three-dimensional geological model from core log information. As part of the modelling routine, RPA simplified original logging codes into seven main geological groups:

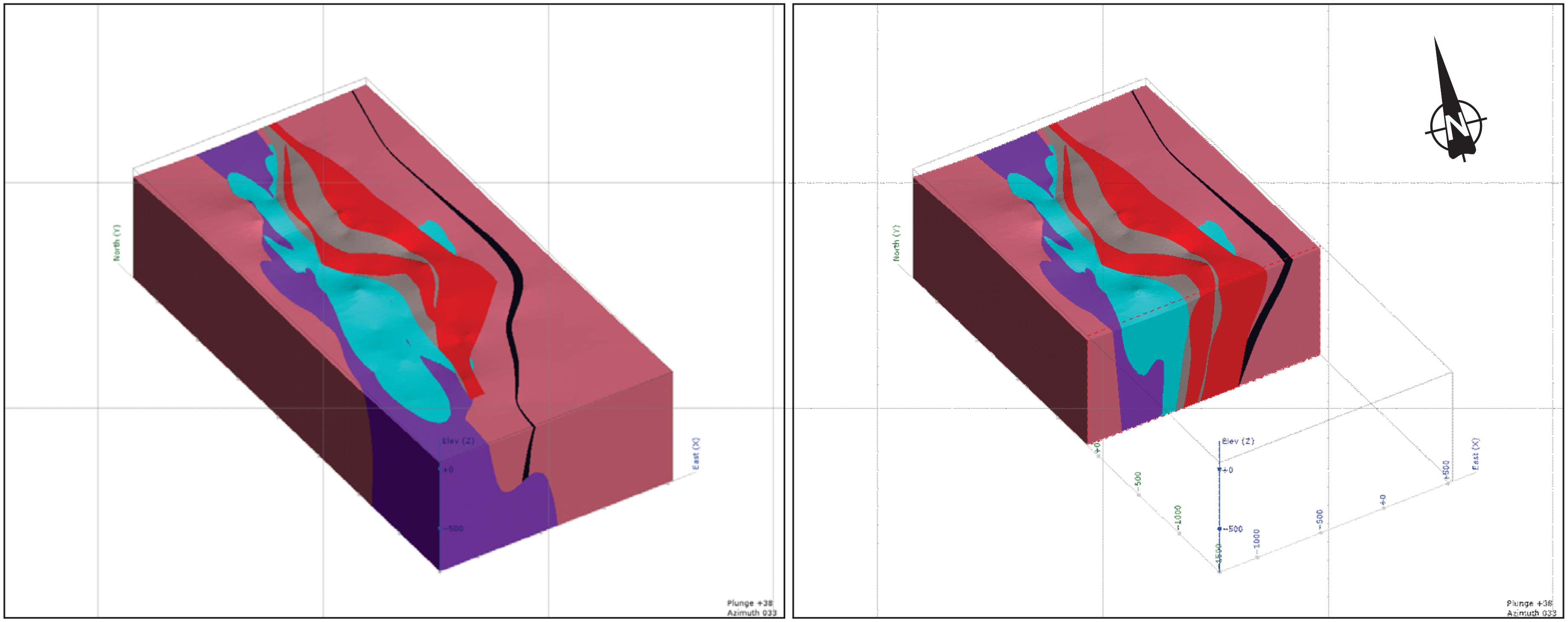
1. Overburden
2. Sediments
3. Gneiss
4. Gabbro
5. Pyroxenite
6. Carbonatite
7. Pyrochlore

Niobium mineralization occurs only in the pyrochlore, in which RPA defined two zones of enriched mineralization separated by internal waste. The two domains join at the south end to form a single body. RPA retained the two-domain differentiation for modelling purposes. Mineralization was modelled at an approximate modelling threshold of 0.3% Nb_2O_5 (Figure 14-2). Based on the combined geological and mineralization model, RPA assigned rock codes to seven geological domains, two mineralization domains, and one waste domain (Table 14-2).

TABLE 14-2 DOMAIN CODES
NioBay Metals Inc. – James Bay Niobium Project

Domain	Rock Code
Lithology	
Gneiss	11
Gabbro	22
Pyroxenite	33
Carbonatite	44
Pyrochlore	55
Sediments	66
Overburden	77
Mineralization	
Internal Waste	99
Western Zone	200
Eastern Zone	100

Looking Northeast



Legend:

- *Gneiss*
- *Gabbro*
- *Mineralized Pyrochlore*
- *Internal Waste*
- *Barren Carbonatite*
- *Pyroxenite*

0 500 1000 1500 2000
Feet

Figure 14-2

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Lithological Model

December 2017

Source: RPA, 2017.

EXPLORATORY DATA ANALYSIS (EDA) – ASSAYS

Niobium assays located inside the wireframe models were tagged with domain identifiers and exported for statistical analysis. Results were used to help verify the modelling process. Descriptive statistics by domain are summarized in Table 14-3.

TABLE 14-3 STATISTICAL SUMMARY OF NB_2O_5 ASSAY DATA
NioBay Metals Inc. – James Bay Niobium Project

Domain	Count	Min (%Nb_2O_5)	Max (%Nb_2O_5)	Mean (%Nb_2O_5)	Variance	Std. Dev (%Nb_2O_5)	CV
Eastern Zone (100)	1,439	0.01	2.66	0.53	0.07	0.27	0.51
Western Zone (200)	377	0.00	1.77	0.53	0.07	0.26	0.51
Internal Waste	557	0.00	0.90	0.14	0.01	0.13	0.89
Total	2,373	0.00	2.66	0.44	0.09	0.29	0.67

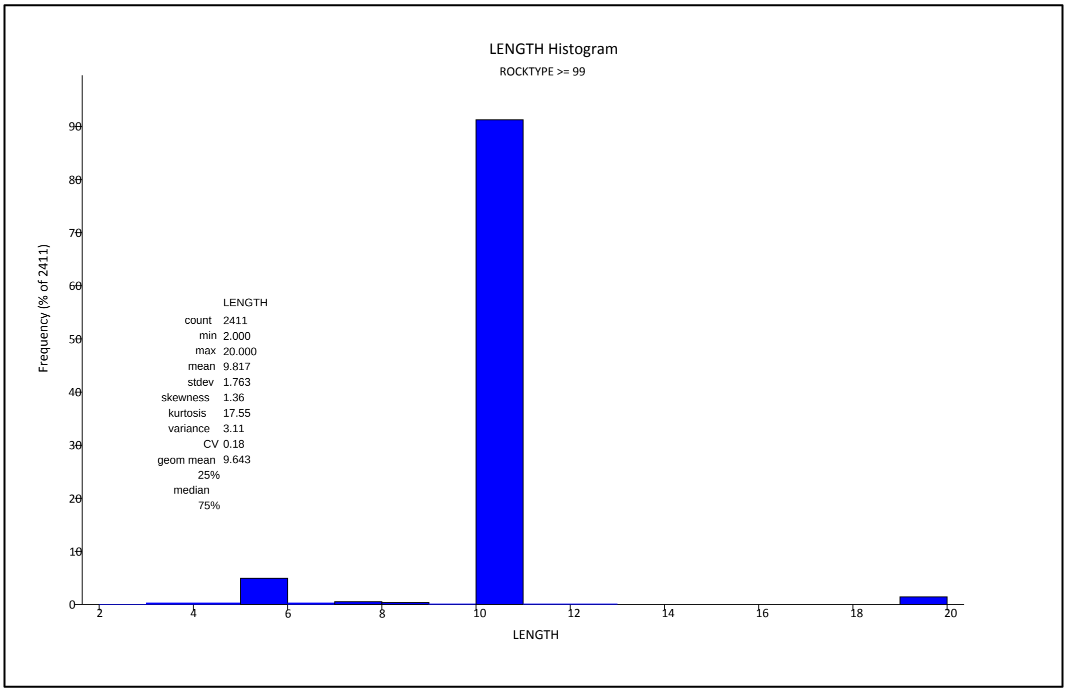
CAPPING HIGH GRADE VALUES

Extreme high-grade values, called “outliers”, can lead to overestimation of grade in the block model. RPA performed a capping analysis comprising decile analysis, histograms, log probability plots, and cutting curves. Considering the disseminated nature of the niobium distribution and the overall grade distribution, RPA is of the opinion that capping is not necessary for this deposit.

EXPLORATORY DATA ANALYSIS - COMPOSITES

Prior to grade interpolation, the assay data within each of the individual mineralized grade shells were combined into 10 ft long downhole composites. The composite length was chosen based on the analysis of the predominant sampling length, the style of mineralization, and continuity of grade. Sample lengths vary considerably and range from 2 ft to 20 ft within the wireframe models, with 98% of the samples taken at ten ft lengths (Figure 14-3). Assays within the wireframe domains were composited in Gems, starting at the first mineralized wireframe boundary from the collar and resetting at each new wireframe boundary. Since assay intervals cross lithological contacts, the created composites contain a small number of residuals with lengths less than ten feet.

FIGURE 14-3 HISTOGRAM OF JAMES BAY NIOBIUM SAMPLING LENGTH



Based on the composite length analysis summarized in Table 14-4, RPA elected to remove composites less than three feet from the estimation process. The descriptive statistics for composites used for resource estimation are presented in Table 14-5.

TABLE 14-4 RESIDUAL COMPOSITES ANALYSIS
NioBay Metals Inc – James Bay Niobium Project

Residuals (ft)	Count	Vein Mean ($\%Nb_2O_5$)	Percent
0 to 1	2	0.13	0.08%
0 to 2	11	0.22	0.45%
0 to 3	18	0.27	0.82%
Total Interval Length (Inc. Residuals)			23,785
Total Composite Length (No Residuals)			23,756

TABLE 14-5 DESCRIPTIVE STATISTICS OF NB_2O_5 COMPOSITES
NioBay Metals Inc – James Bay Niobium Project

Domain	Count	Min ($\%Nb_2O_5$)	Max ($\%Nb_2O_5$)	Mean ($\%Nb_2O_5$)	Variance	Std. Dev ($\%Nb_2O_5$)	CV
100	1,305	0.00	2.23	0.53	0.07	0.26	0.49
200	483	0.01	1.77	0.53	0.06	0.24	0.46
Total	1,788	0.00	2.23	0.53	0.07	0.26	0.49

BLOCK MODEL PARAMETERS

Leapfrog wireframes were imported into Gems in order to estimate the Mineral Resources. A block model was created using Gems. The block model was not rotated. Block model coordinates are based on the local mine grid. Table 14-6 summarizes the block model definition. The block model fully encloses the modelled resource wireframes.

TABLE 14-6 BLOCK MODEL DIMENSIONS
NioBay Metals Inc. – James Bay Niobium Project

	Block Size (ft)	Origin (ft)	Block Count
X	10	-1,000	120
Y	10	-1,100	350
Z	10	-1,050	120

Block model attributes are summarized in Table 14-7.

TABLE 14-7 BLOCK MODEL ATTRIBUTES
NioBay Metals Inc. – James Bay Niobium Project

Variables	Default	Type	Description
Rock Type	0	Integer	Rock codes assigned to each domain
Density	0	Double	Density
Percent	0	Double	Percent of block inside the wireframe
OK_50_6C_UP	0	Double	Nb_2O_5 Grade using Ordinary Kriging
ID3	0	Double	Nb_2O_5 Grade using Inverse Distance Power 3
CLASS	0	Integer	Resource Classification
NN	0	Double	Nb_2O_5 Grade using Nearest Neighbour
DIST	0	Single	Distance to the closest sample
No Comp	0	Integer	Number of samples
No Holes	0	Integer	Number of holes
KV	0	Single	Kriging variance
PASS	0	Integer	Pass number

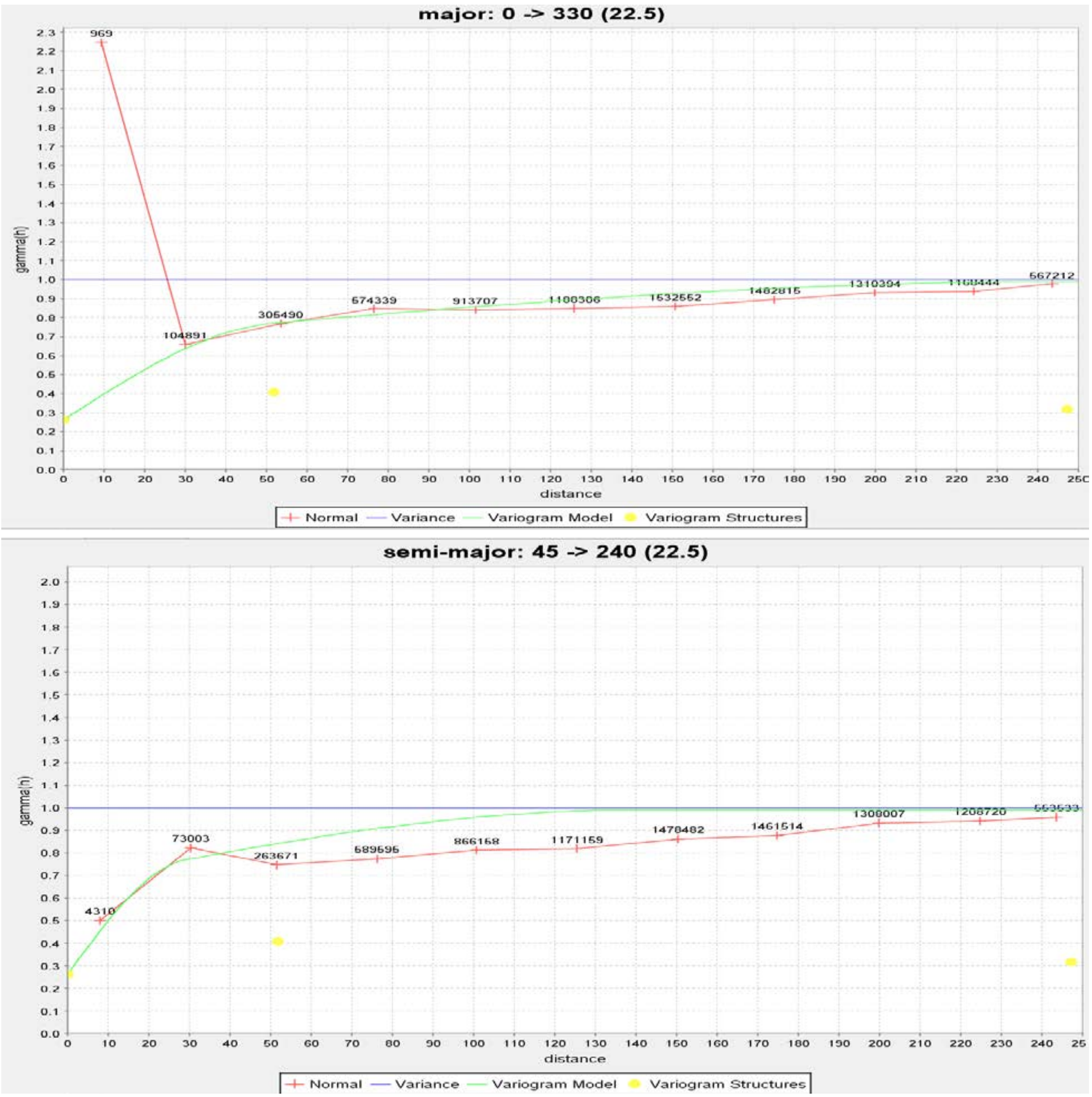
VARIOGRAPHY

Variogram analyses were completed with Gems for both domains using the 10 ft composites. RPA modelled the variograms using two spherical structures with a nugget effect of between 0% and 0.1% of the sill (Figure 14-4). A summary of the variogram parameters is shown in Table 14-8.

TABLE 14-8 VARIOGRAPHY OF THE NIOBIUM MINERALIZATION
NioBay Metals Inc – James Bay Niobium Project

Nugget	Rotation			First Structure (ft)					Second Structure (ft)				
	Azimuth	Dip	Plunge	Sill	X	Y	Z	Type	Sill	X	Y	Z	Type
0.02	188	55	8	0.78	112	85	67	Sph	0.20	310	235	187	Sph

FIGURE 14-4 NIOBIUM DIRECTIONAL VARIOGRAMS



TONNAGE FACTOR

During the site visit, RPA collected 21 independent samples to determine density of the niobium mineralization. RPA assigned the average value of 12.2 ft³/ton (2.93 g/cm³) to material in the pyrochlore domain. Table 14-9 shows summary statistics for density data provided by NioBay.

TABLE 14-9 SUMMARY STATISTICS - DENSITY
NioBay Metals Inc. – James Bay Niobium Project

Parameter	Value
Count	21
Max	3.21
Min	2.67
Average	2.93
Variance	0.01
Std. Dev.	0.11

NIOBIUM GRADE ESTIMATION

The primary grade interpolation used an Ordinary Kriging estimator (OK) of the 10 ft long composites based on a minimum of six and a maximum of twelve composites in the first pass, a minimum of four and a maximum of 12 composites in the second pass, and a minimum of two and a maximum of 15 composites in the third estimation run. The first and second estimation runs required composites from at least two boreholes to interpolate block grades. Search ellipse dimensions were chosen following a review of variography and interpolation efficiency. Estimation was performed in three passes, with the first pass using full variogram ranges for the search, twice the variogram range for the second pass, and 2.5 times the variogram range for the third pass. Soft boundaries were used between the mineralized domains. The resource wireframes were split into four search domains. Table 14-10 summarizes interpolation parameters for all three passes.

TABLE 14-10 BLOCK MODEL INTERPOLATION PARAMETERS
NioBay Metals Inc. – James Bay Niobium Project

Orientation (ADA*)	Parameter	Pass 1	Pass 2	Pass 3
215, 56, 35 195, 56, 15 180, 56, 0 140, 56, -40	Min. No. Comps.	6	4	2
	Max. No. Comps.	12	12	15
	Max. Comps. Per Drill Hole	5	5	0
	Major (ft)	300	600	750
	Semi-Major (ft)	210	420	525
	Minor (ft)	50	140	150

* Gems convention: Principal Azimuth, Dip, Secondary Azimuth

Grade interpolation was carried out using OK, inverse distance to the power of 3 (ID^3) and nearest neighbour (NN) on mineralized domain.

BLOCK MODEL VALIDATION

RPA validated the block model using the following methods:

- Comparison of block model versus resource wireframe volumes
- Comparison of block grade estimation by the primary OK estimator to results from ID^3 and NN estimates
- Swath plots of composite grades versus OK, ID^3, and NN swath plots of composite grades versus ID^3 and NN
- Visual inspection of block grades versus composite grades on plans, vertical sections, and longitudinal sections
- Statistical comparison of block grades to assay and composite grades

Since the percent values were used to report the mineral resources, the volume of the wireframes matches the volume of the blocks.

The volumetric comparison of the blocks versus the domain wireframes match very closely (Table 14-11).

TABLE 14-11 BLOCK VERSUS WIREFRAME VOLUMES
NioBay Metals Inc. – James Bay Niobium Project

Domain Number	Wireframe Volume (000 ft^3)	Block Volume (000 ft^3)	Volume Difference (%)
100	728,717	727,121	0.2%
200	268,335	267,210	0.4%

Comparing the swath plots of the estimated block grades using ID^3 and NN (Figures 14-5 to 14-7) show that there is slight smoothing using the OK interpolant as expected. Since the OK results are very similar to the ID^3 results, RPA decided to use the blocks estimated by the OK method for the mineral resource reporting. The swath plots compare the mean block grades estimated by the three interpolation methods to the composite grades in the X, Y, and Z directions.

FIGURE 14-5 EAST SWATH PLOT

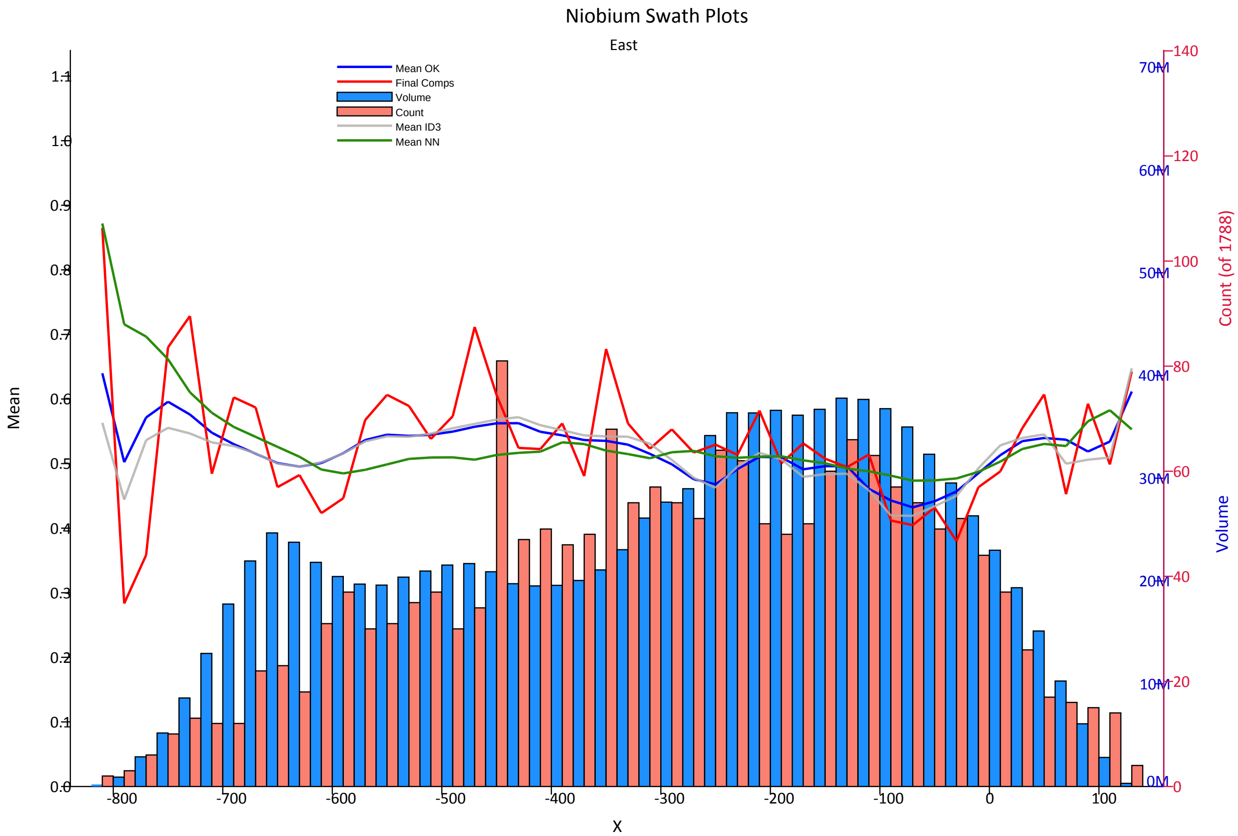


FIGURE 14-6 NORTH SWATH PLOT

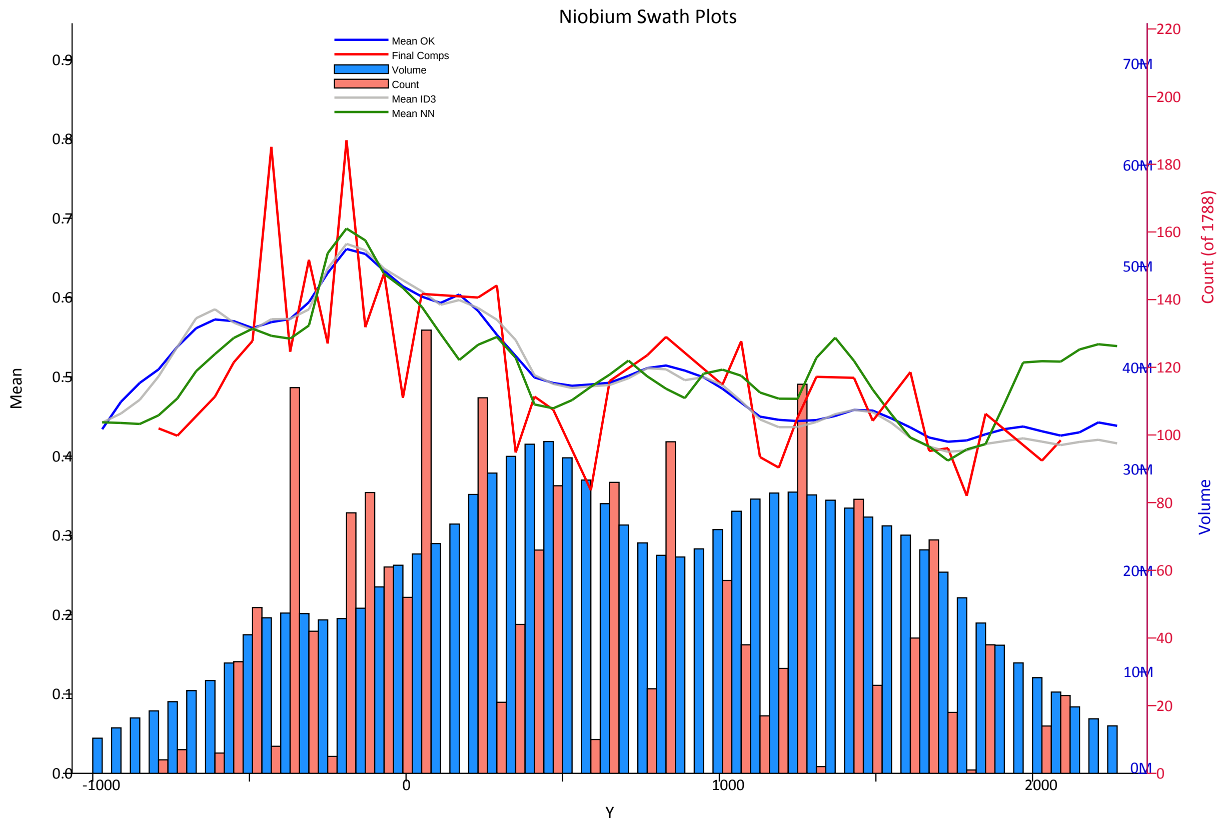
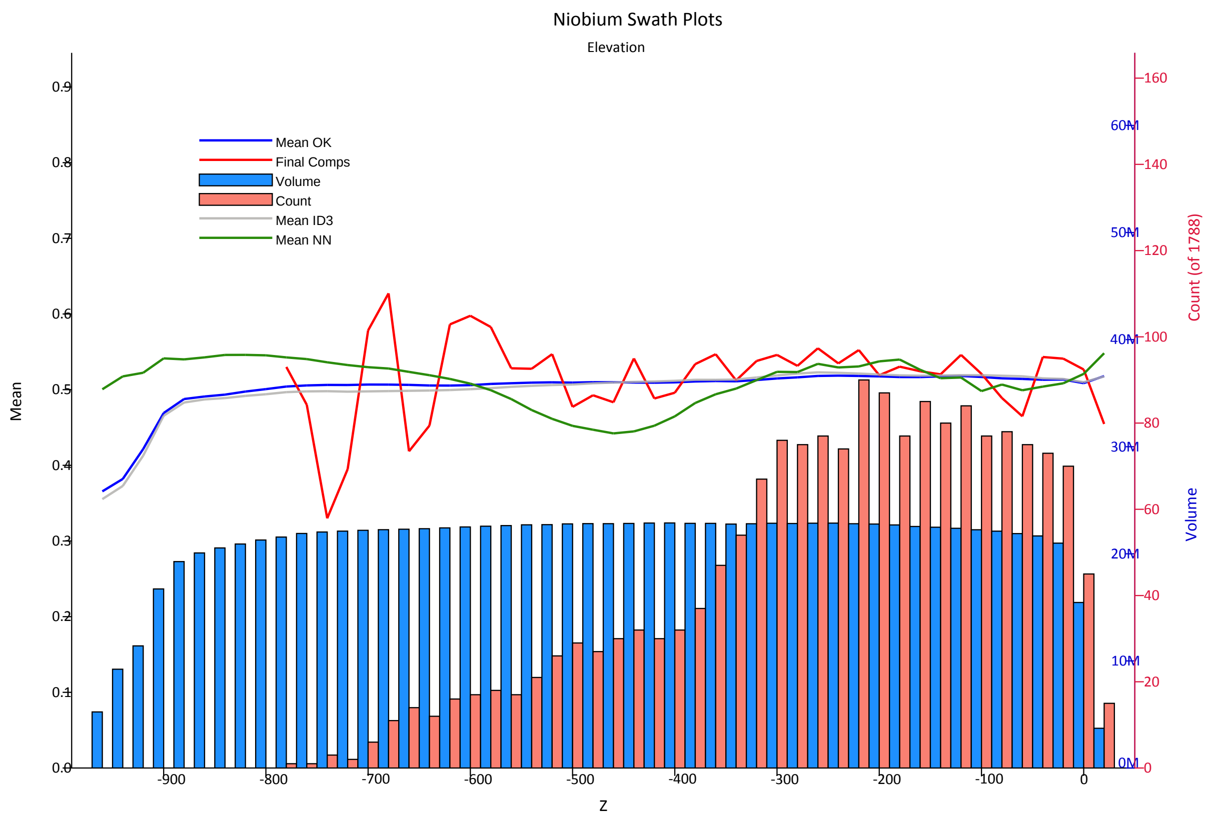


FIGURE 14-7 VERTICAL SWATH PLOT



The visual inspection of the block grades versus the composite data on sections and level plans indicates that the OK interpolation perfomed well (Figures 14-8 to 14-12).

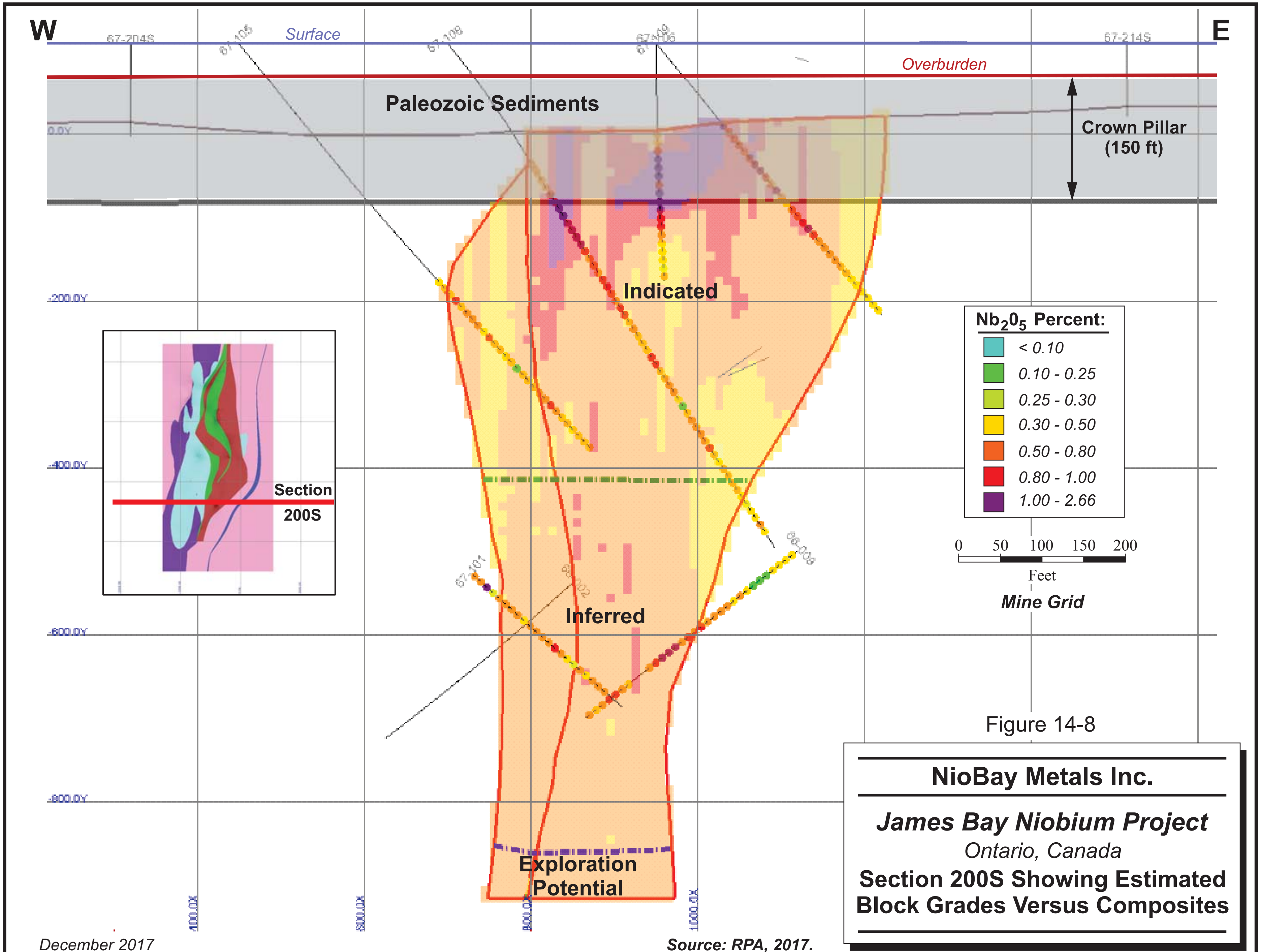


Figure 14-8

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Section 200S Showing Estimated Block Grades Versus Composites

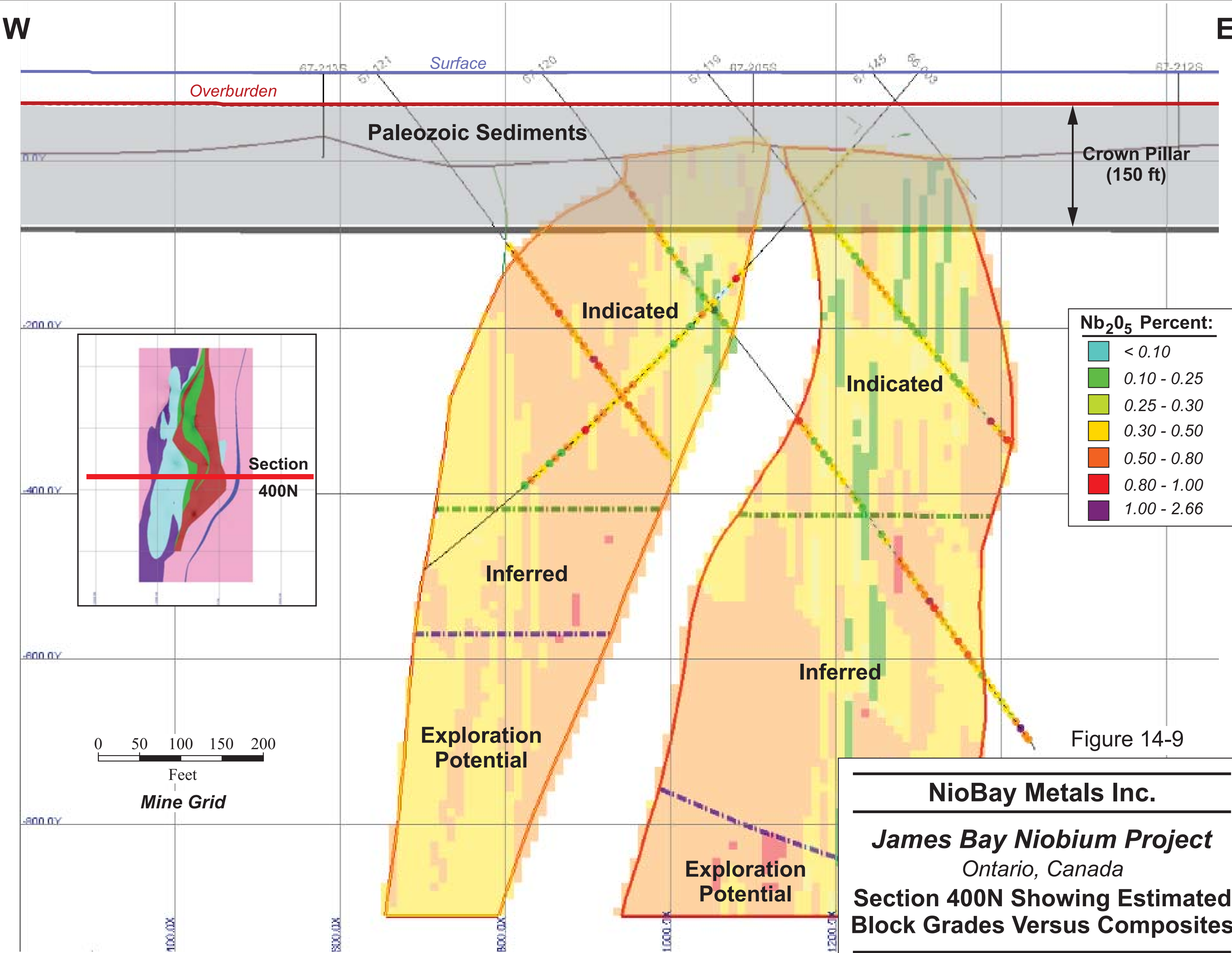


Figure 14-9

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Section 400N Showing Estimated Block Grades Versus Composites

December 2017

Source: RPA, 2017.

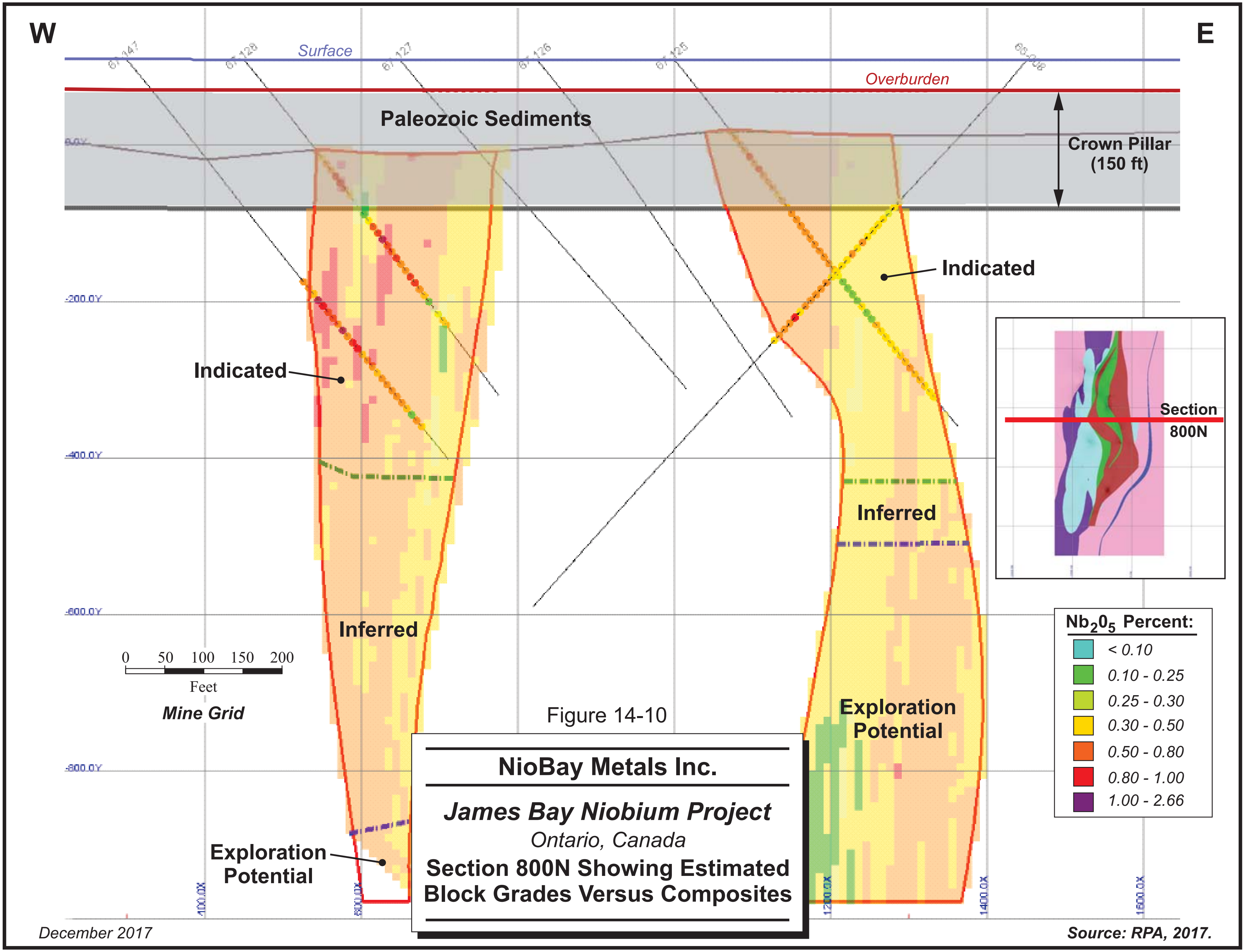


Figure 14-10

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Section 800N Showing Estimated Block Grades Versus Composites

www.rpacan.com

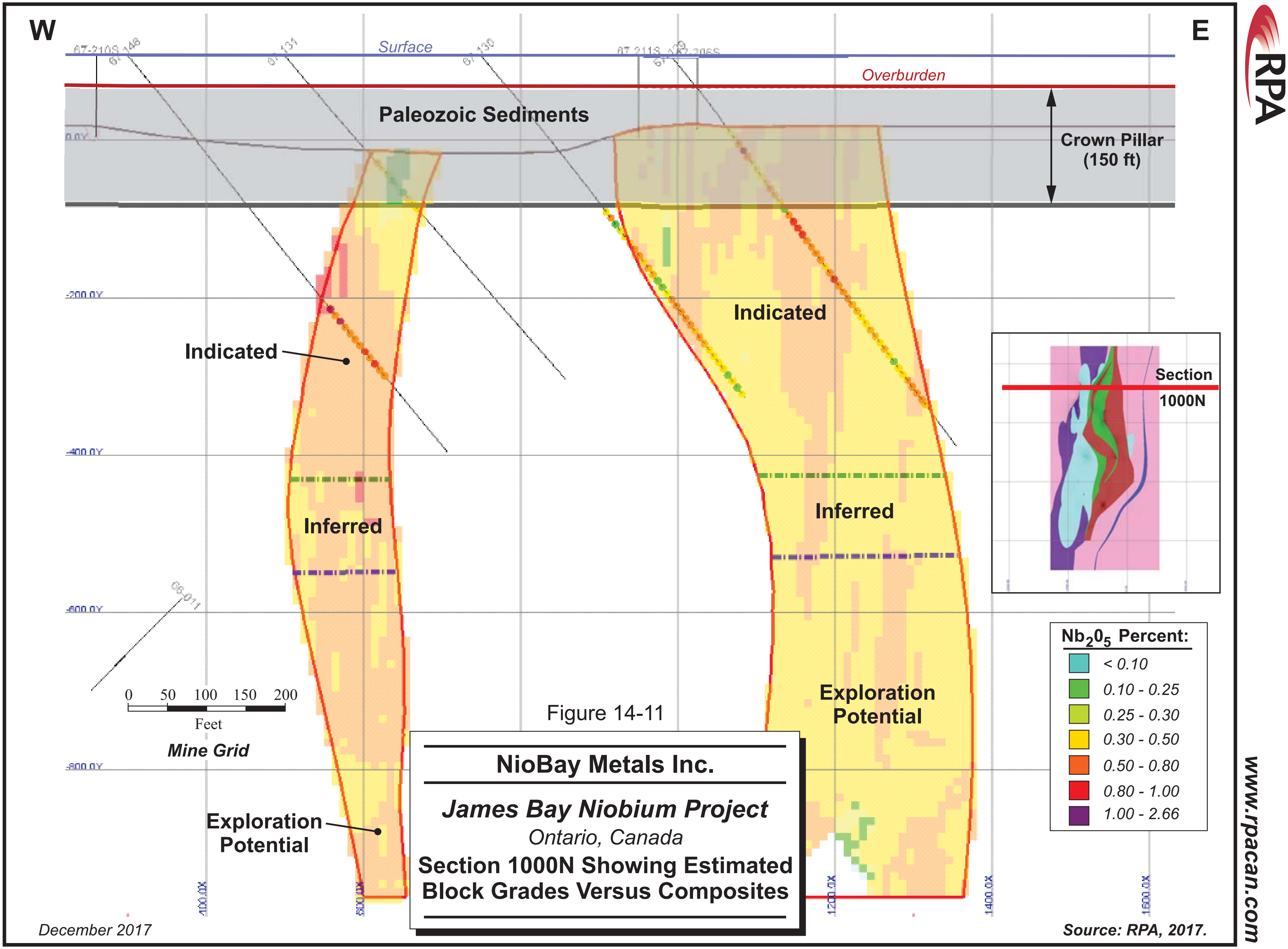


Figure 14-11

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Section 1000N Showing Estimated Block Grades Versus Composites

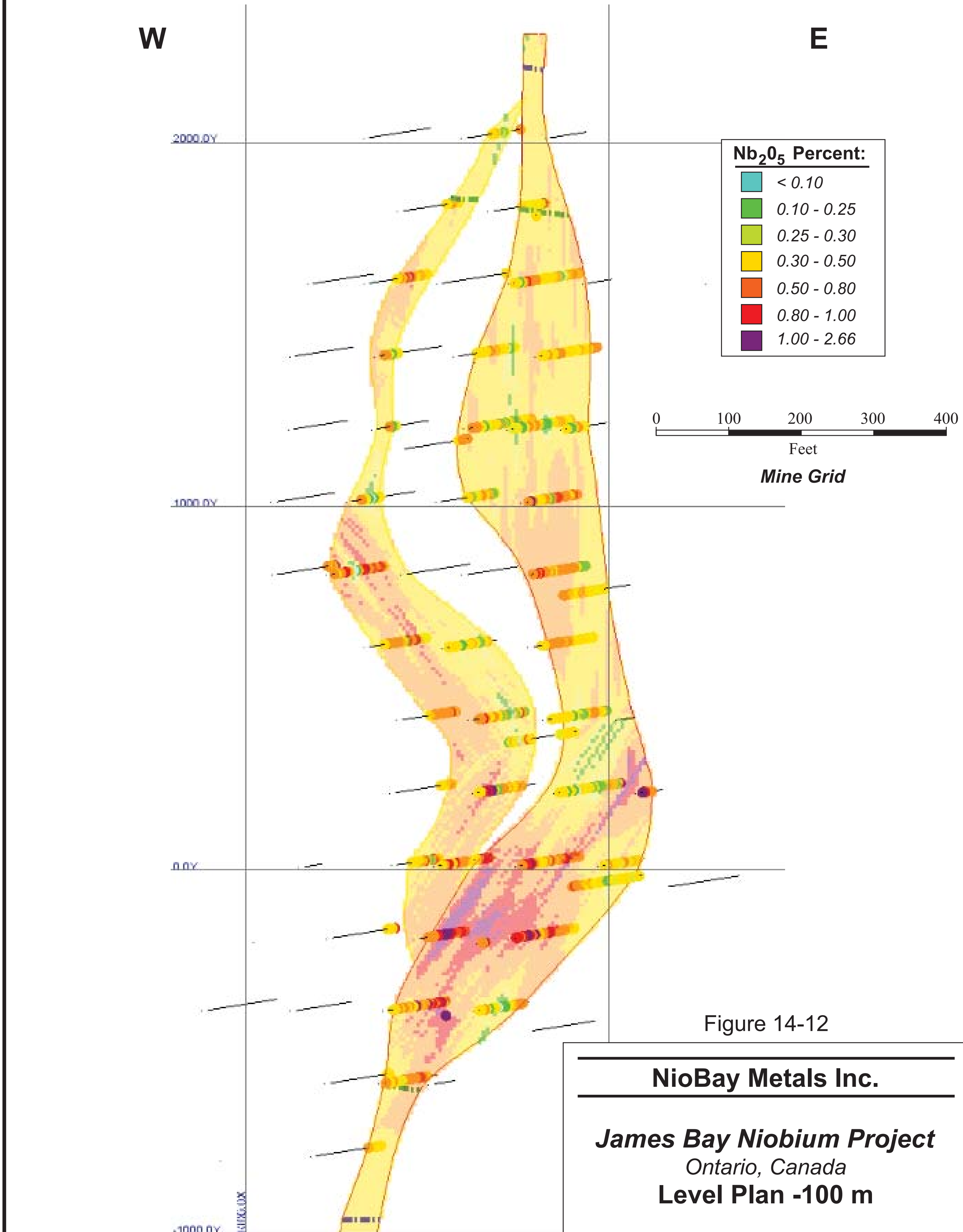


Figure 14-12

NiοBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

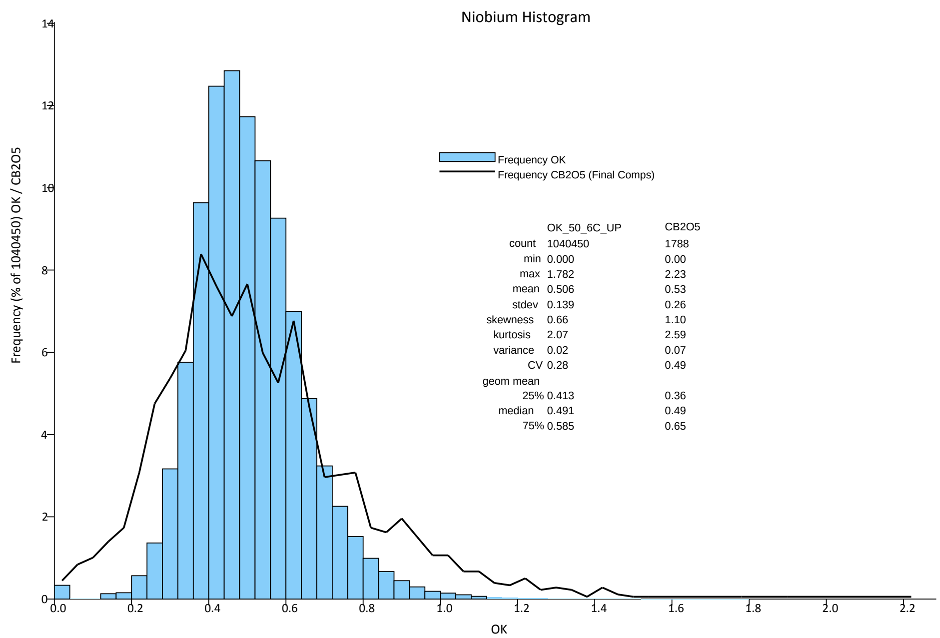
Level Plan -100 m

December 2017

Source: RPA, 2017.

In addition to the visual inspection of block grades to composite data, Figure 14-13 shows a statistical analysis in histogram format.

FIGURE 14-13 HISTOGRAMS OF THE ESTIMATED BLOCK GRADES



Descriptive statistics of the block model are illustrated in Table 14-12, and a comparison of the minimum, maximum, and mean of the assay, composite, and block grades is presented in Table 14-13.

TABLE 14-12 BASIC STATISTICS OF NB_2O_5 BLOCK GRADES
NioBay Metals Inc. – James Bay Niobium Project

Domain	Count	Min ($\%Nb_2O_5$)	Max ($\%Nb_2O_5$)	Mean ($\%Nb_2O_5$)	Variance	Std. Dev. ($\%Nb_2O_5$)	CV
100	758,505	0.00	1.78	0.51	0.02	0.15	0.29
200	281,945	0.00	1.39	0.51	0.02	0.12	0.25

TABLE 14-13 COMPARISON OF ASSAY, COMPOSITE AND BLOCK GRADES
NioBay Metals Inc. – James Bay Niobium Project

Domain	Assay			Composites			Block Model		
	Min ($\%Nb_2O_5$)	Max ($\%Nb_2O_5$)	Mean ($\%Nb_2O_5$)	Min ($\%Nb_2O_5$)	Max ($\%Nb_2O_5$)	Mean ($\%Nb_2O_5$)	Min ($\%Nb_2O_5$)	Max ($\%Nb_2O_5$)	Mean ($\%Nb_2O_5$)
100	0.01	2.66	0.53	0.00	2.23	0.53	0.00	1.78	0.51
200	0.00	1.77	0.53	0.01	1.77	0.53	0.00	1.39	0.51

CUT-OFF GRADE

The cut-off grade calculation was based on an average underground operating cost of C$70/t, metallurgical recovery of 70%, and niobium price of US$40 per kg with a US$/C$ exchange rate of 1:1.2.

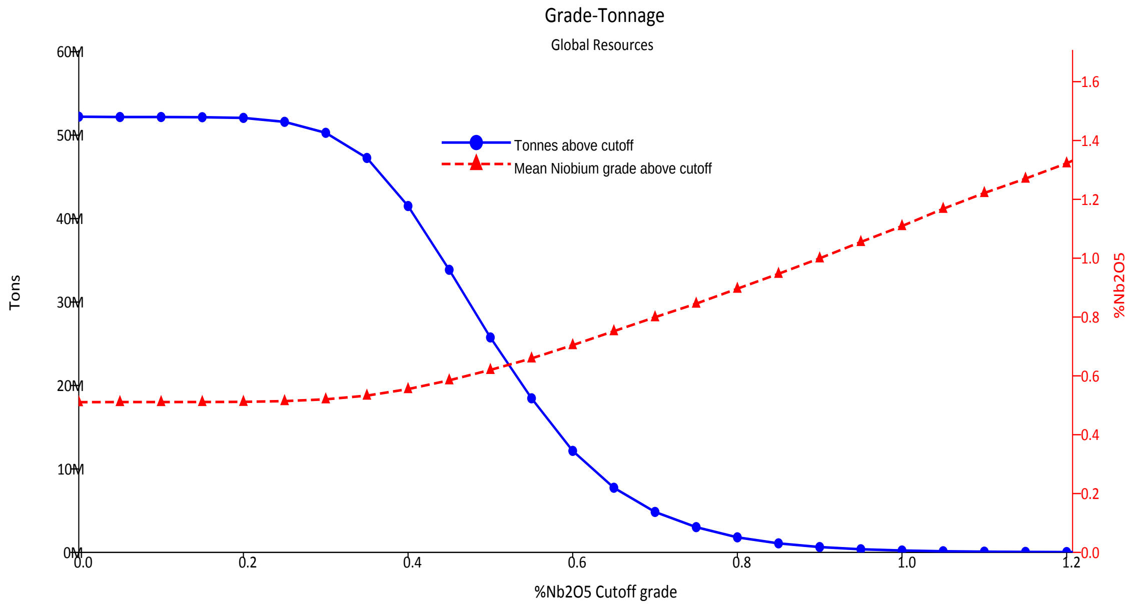
Table 14-14 shows the sensitivity of the block grade estimates to a range of cut-off grades both above and below the 0.3% Nb_2O_5 resource cut-off grade. The Indicated resource grade increases significantly from 0.53% Nb_2O_5 to 0.64% Nb_2O_5 when the cut-off grade is raised to 0.5% Nb_2O_5. At a zero cut-off grade, the Indicated mineralization grade is essentially the same as at the 0.3% Nb_2O_5 cut-off grade, and the tonnage increase is very minor relative to the Indicated resource because the mineralization wireframes were built based on approximately a 0.3% Nb_2O_5 cut-off grade. This means that there is only a small amount of low grade mineralization present in the mineralization wireframes and that reporting the resources at a zero cut-off grade or a 0.3% Nb_2O_5 cut-off grade does not make much difference. Approximately two million tons of low grade material within the wireframes are below the 0.3% Nb_2O_5 resource cut-off grade and were not reported as part of the Mineral Resource. RPA reviewed the location of this material and determined that it was relatively contiguous and could be avoided in the case of underground mining.

TABLE 14-14 MINERAL RESOURCE SENSITIVITY TO CUT-OFF GRADE
NioBay Metals Inc. – James Bay Niobium Project

Indicated				Inferred			
Cut-off (%Nb_2O_5)	**Tons (M st)**	**Grade (%Nb_2O_5)**	**Contained Nb_2O_5 (M lb)**	**Cut-off (%Nb_2O_5)**	**Tons (M st)**	**Grade (%Nb_2O_5)**	**Contained Nb_2O_5 (M lb)**
0.0	26.4	0.52	276	0.0	26.3	0.50	264
0.1	26.4	0.52	276	0.1	26.3	0.50	264
0.2	26.4	0.52	276	0.2	26.2	0.50	264
0.3	**25.5**	**0.53**	**271**	**0.3**	**25.3**	**0.51**	**259**
0.4	21.0	0.57	239	0.4	20.9	0.54	228
0.5	13.5	0.64	171	0.5	12.5	0.61	152
0.6	6.8	0.72	98	0.6	5.4	0.68	74
0.7	3.1	0.82	51	0.7	1.7	0.77	27
0.8	1.4	0.91	25	0.8	0.4	0.86	7

A tonnage grade curve for the global resource is provided in Figure 14-14. Again, it shows that the tons and grades are insensitive to cut-off grades below 0.3% Nb_2O_5 but very sensitive to cut-off grades greater than 0.3% Nb_2O_5.

FIGURE 14-14 MINERAL RESOURCE SENSITIVITY TO CUT-OFF GRADE

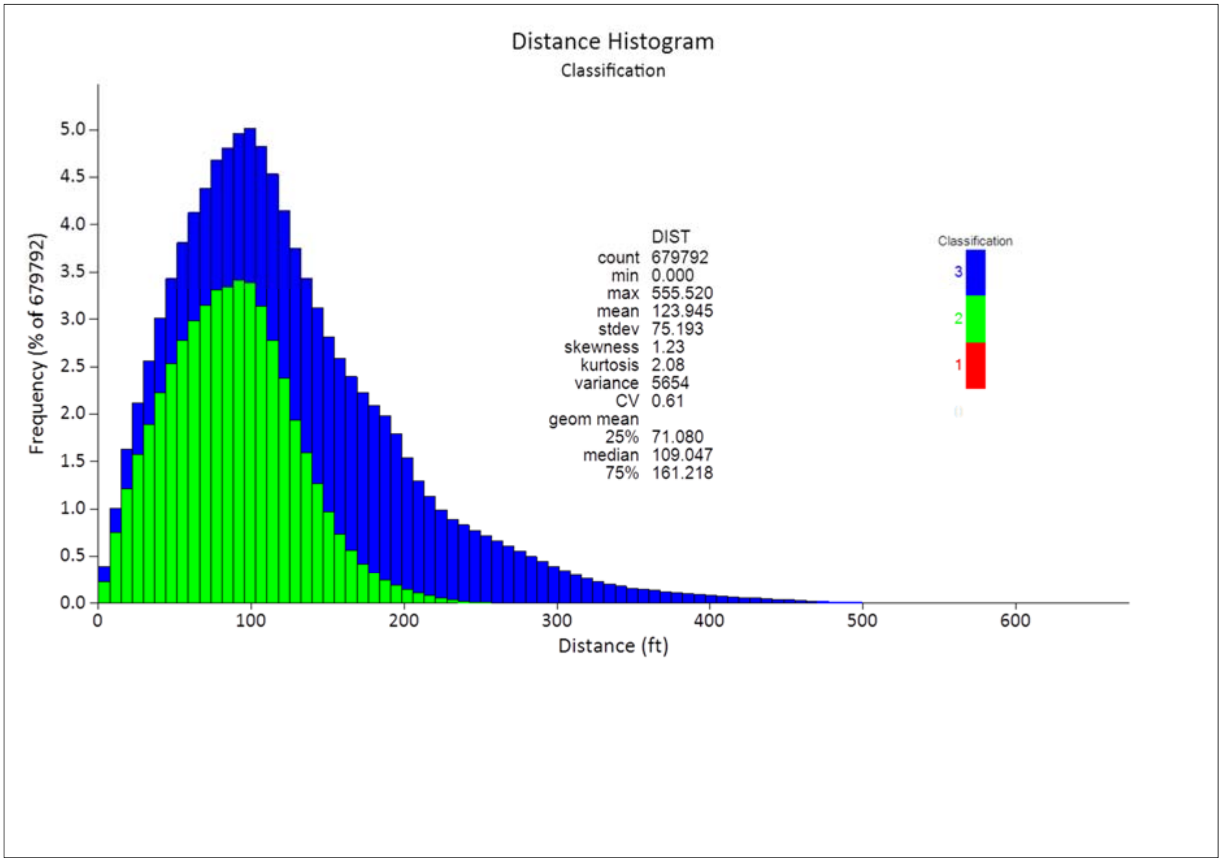


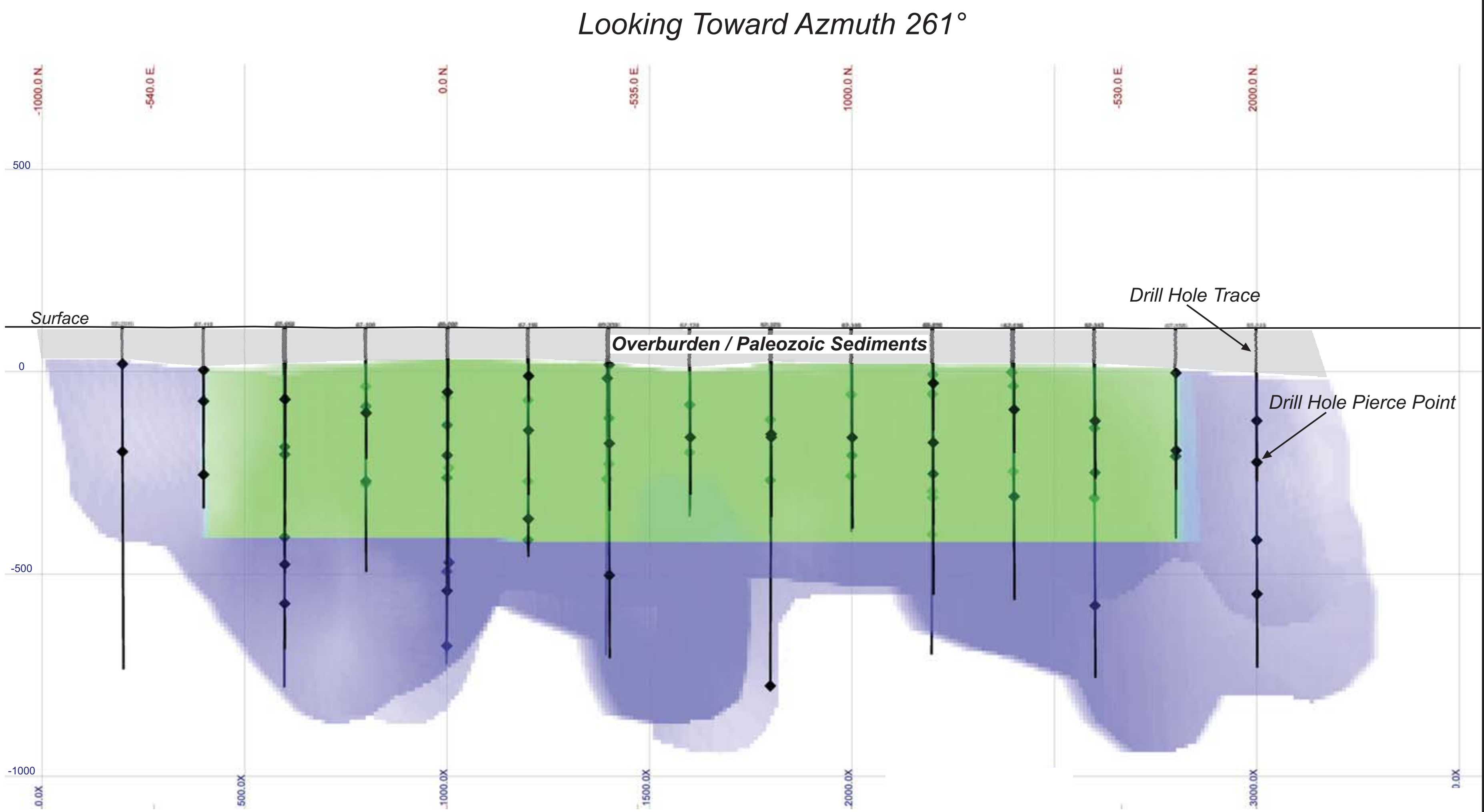
CLASSIFICATION

Definitions for resource categories used in this report are consistent with CIM (2014) definitions incorporated by reference into National Instrument 43-101. In the CIM classification, a Mineral Resource is defined as "a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity, and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling." Mineral Resources are classified into Measured, Indicated, and Inferred categories.

The basis for the classification is a distance based scheme using the relative confidence expressed by the range of the variograms, distance to nearest neighbour, and apparent continuity of mineralization. RPA manually defined the portions of the deposit supported by drill hole spacing up to approximately 200 ft and 400 ft and classified these areas as Indicated and Inferred Resources, respectively (Figures 14-15 and 14-16).

FIGURE 14-15 HISTOGRAMS OF THE CLASSIFIED BLOCKS VERSUS DISTANCE TO THE COMPOSITES





Classification:

- *Indicated*
- *Inferred*

0 250 500 750 1000

Feet

December 2017

Source: RPA, 2017.

Figure 14-16

NioBay Metals Inc.

James Bay Niobium Project

Ontario, Canada

Longitudinal Section Showing Classification

15 MINERAL RESERVE ESTIMATE

There are no current Mineral Reserves estimated on the James Bay Niobium Project.

16 MINING METHODS

This section is not applicable.

17 RECOVERY METHODS

This section is not applicable.

18 PROJECT INFRASTRUCTURE

This section is not applicable.

19 MARKET STUDIES AND CONTRACTS

The following is taken from Camet (2017).

Niobium is a niche metal present in a variety of minerals, the most commercially important of which is pyrochlore which accounts for as much as 97% of global niobium supply. There are currently only three significant producers of pyrochlore: CBMM and China Molybdenum (CMOC) in Brazil; and Niobec in Canada. All three convert their mine output to ferro-niobium prior to sale, mostly into export markets and on a yearly contract basis. CBMM, a privately owned company, is by far the largest producer of ferro-niobium in the world and, unlike CMOC and Niobec, CBMM also supplies a range of other downstream products like niobium oxide and niobium metals. Its share of the global niobium products market has peaked at 85%.

Niobium is used in a variety of forms but by far the most important in terms of tonnage is standard-grade ferro-niobium, which has applications in steelmaking, most notably in high-strength low-alloy (HSLA) and stainless steels. This market accounts for approximately 90% of niobium usage. Niobium is added in very small amounts (usually in the order of 0.05%) as a grain refiner to produce high-quality steels for use in gas pipelines, automobiles, construction, stainless steels, and other applications.

Two factors are essentially impacting the ferro-niobium demands; i) increase in overall steel production with an associated increase in production of high strength steels and ii) a rise in the intensity of use of niobium in the steel industry. Traditionally steel production growth has always been the greatest contributor to niobium consumption growth, but with moderate steel production forecasts, the greatest potential for niobium consumption growth lies in an increase of intensity of use which is currently approximately 50 grams per tonne of steel. China, which represents nearly half of the world steel output, is a key region for future ferro-niobium consumption. Chinese GDP growth is forecasted to slow down in the upcoming years which could negatively affect the rate of increase in ferro-niobium consumption. On the other hand, the importance of construction and pipeline steels produced in China combined with new regulations in construction material quality could push Chinese niobium requirements to new heights.

Camet forecasts that the world consumption for ferro-niobium will rise from an estimated 82,000 tonnes in 2016 to approximately 100,000 tonnes in 2020. With the upcoming expansions announced by the two Brazilian producers and one or two probable niobium projects around the world, the market will remain in oversupply for several years. Presently at 125,000 tonnes of ferro-niobium production, capacity is expected to reach 150,000 tonnes by 2020.

With only three main producers of ferro-niobium in the world, prices have been historically very stable at approximately $40/kg before falling to a low of $30/kg and currently at approximately $35/kg. Camet believes that there is still room for price increases without affecting the demand. Market trends and industry sources indicate that prices are heading towards $45/kg in the medium to long term.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The following is taken from EEM, Inc (2017).

REQUIREMENTS

The Government of Canada has a constitutional duty to consult, and where appropriate, accommodate Aboriginal groups when it considers resource development projects that might adversely impact potential or established Aboriginal or treaty rights. While third parties such as project proponents do not have a legal obligation to consult Aboriginal groups in most Canadian jurisdictions, in practice the Crown may delegate some responsibility for consultation to third parties to collect information about how the impacts of project development may affect potential or established Aboriginal or Treaty rights.

PROVINCIAL REQUIREMENTS

At the provincial level, the MNDM has established requirements to ensure that project proponents consider Aboriginal consultation throughout the project lifecycle. MNDM has identified Moose Cree First Nation (MCFN) as the only Aboriginal community that must be consulted for the Project. As part of the consultation process, NioBay is required to:

- Provide further details to MCFN about the company's proposed exploration activities;
- Gather information from MCFN about whether or how the proposed activities have the potential to adversely affect the communities' Aboriginal or treaty rights;
- Discuss with MCFN, and MNDM if appropriate, ways to avoid, eliminate, or minimize any concerns raised;
- Seek further direction or advice from MNDM, if needed; and
- Document the process and decisions made and report to MNDM.

NioBay is required to submit regular Aboriginal Consultation Reports as part of the MNDM's reporting requirements once the consultation process has begun. If the Project progresses to the advanced exploration and production stages of the project lifecycle, NioBay will be required to submit regular Aboriginal Consultation Plans and Aboriginal Consultation Reports to MNDM, including plans and reports about Closure Plan consultation.

Despite a number of requests, the leadership of MCFN has to this day refused to open a dialogue with NioBay and to discuss their concerns associated with the exploration program and the Project. The MNDM is taking steps to organize a meeting with representatives of the MCFN to address any concerns they may have about the proposed drilling campaign. NioBay will continue to hold discussions with the local community members and government officials and will maintain its efforts to engage with the MCFN leadership.

FEDERAL REQUIREMENTS

At the federal level, the Canadian Environmental Assessment Act will be triggered if the Project Description submitted to Canadian Environmental Assessment Agency (CEAA) includes one or more physical activities defined in *the Inclusion List Regulations or Regulations Designating Physical Activities*. The federal CEAA process requires proponents to undertake consultation with First Nations, the public, and other stakeholders to promote meaningful public participation before and during the environmental assessment process. CEAA also requires project proponents to collect and/or facilitate the collection of traditional and community knowledge (mainly related to land use and ecological value) relative to the proposed project area. First Nations communities that are included within the scope of the federal environmental assessment are determined by project-specific CEAA guidelines and often lie outside of the project's perceived immediate area of influence.

PLANS, NEGOTIATIONS, AND AGREEMENTS

Above and beyond its legal obligations, NioBay is committed to building lasting relationships with Project partners and stakeholders based on the principles of transparency, trust, and mutual respect to ensure the maximum possible local benefit from the Project. NioBay recognizes that the Project is situated in the Traditional Home Lands of the MCFN and is committed to fully respecting MCFN's traditional land, culture, environment, and water.

Although NioBay has been contacted by a number of Moose Cree band members who are interested in learning more about the Project, NioBay is seeking permission from MCFN's leadership to hold an information session in Moose Factory. The company wishes to emphasize that the Project would be an underground mine located outside the North French River watershed and that it will have a minimal impact on traditional harvesting activities and to the environment. The Project would create important economic benefits to MCFN members in the short, medium, and long term. Due to the proximity of the Project to Moose Factory and

Moosonee, daily transport services would allow all local workers to return to their homes and families at the end of the workday.

NioBay is interested in entering into a partnership agreement with MCFN for Project development and ownership. As part of such a partnership agreement, some of the aspects of the Project that NioBay would like to discuss with MCFN include:

- Project monitoring and mitigation
- Bird and wildlife conservation
- Support for the community, including traditional concerns
- Employment
- Contracting and procurement opportunities
- Apprenticeship, training, and career development opportunities
- Any other issues of importance to MCFN, as identified during consultation and negotiation

21 CAPITAL AND OPERATING COSTS

This section is not applicable.

22 ECONOMIC ANALYSIS

This section is not applicable.

23 ADJACENT PROPERTIES

There are no properties adjacent to the James Bay Niobium Project.

24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

The James Bay Niobium Project is hosted by the Argor Carbonatite Complex which occurs within the northern portion of the KSZ. The KSZ crosscuts an east-trending fabric within the Archean rocks of the Superior Province and is sub-parallel to the TSTZ. Numerous alkalic and carbonatite intrusions occur along and within the KSZ.

Pyrochlore and, to a lesser extent, columbite, are the economic minerals of interest and are hosted predominantly by the sovite phase of the carbonatite.

Extensive work during the mid to late 1960s resulted in a historical Mineral Resource estimate and feasibility study. The Property has been dormant since 1969. Re-sampling of the historical diamond drill core by NioBay has confirmed that, despite some variation at the individual sample level, the overall grade over wide intervals is similar to historical values.

Preliminary testwork on a composite sample consisting of core from 12 historical drill holes included gravity, flotation, QEMSCAN mineralogy, and heavy liquid separation tests. Although preliminary and subject to verification, the results proved encouraging. Additional testwork on fresh material is recommended.

Historical diamond drilling has outlined mineralization with three-dimensional continuity, and size and grades that can potentially be extracted economically.

Mineral Resources were estimated and classified by RPA following CIM (2014) definitions. At a cut-off grade of 0.3% Nb_2O_5, Indicated Mineral Resources are estimated to total 25.5 million tonnes grading 0.53% Nb_2O_5 containing approximately 271 million pounds of niobium oxide. Inferred Mineral Resources are estimated to total 25.3 million tonnes grading 0.51 Nb_2O_5 containing 259 million pounds of niobium oxide.

RPA is of the opinion that there is excellent exploration potential to increase the Mineral Resource at depth with more diamond drilling.

The MNDM has identified Moose Cree First Nation (MCFN) as the only Aboriginal community that must be consulted for the Project. Despite a number of requests, the leadership of MCFN has to this day refused to open a dialogue with NioBay and to discuss their concerns associated with the exploration program and the Project. The MNDM is taking steps to organize a meeting with representatives of the MCFN to address any concerns they may have about the proposed drilling campaign. NioBay will continue to hold discussions with the local community members and government officials and will maintain its efforts to engage with the MCFN leadership.

26 RECOMMENDATIONS

RPA is of the opinion that the James Bay Niobium Project hosts a significant niobium mineralized system, there is good potential to increase the resource base, and additional exploration and technical studies are warranted.

RPA has reviewed and concurs with NioBay's proposed exploration programs and budgets. Phase I of the recommended work program will include 4,000 m of drilling focussed on upgrading portions of the Inferred Resources to Indicated Resources and extending the Mineral Resources at depth, as well as environmental, engineering, and metallurgical studies required to support a PEA in 2018.

Details of the recommended Phase I program can be found in Table 26-1.

TABLE 26-1 PROPOSED BUDGET – PHASE I
NioBay Metals Inc. – James Bay Niobium Project

Item	C$
PHASE I	
Head Office Expenses & Property Holding Costs	100,000
Project Management & Staff Cost	200,000
Travel Expenses	25,000
Diamond Drilling (4,000 m)	800,000
Analyses	50,000
Helicopter Support	150,000
Permitting & Environmental Studies	50,000
Resource Estimate Update	50,000
Camp/Accommodations	50,000
Metallurgical Testwork	200,000
Preliminary Economic Assessment Report	150,000
Social/Consultation	50,000
Subtotal	1,875,000
Contingency	125,000
TOTAL	**2,000,000**

The Phase I exploration program is contingent on consultations with MCFN and NioBay receiving an exploration permit from the Ministry of Northern Development and Mines (MNDM).

A Phase II exploration program, contingent on the results of Phase I, will include diamond drilling and technical studies required to support a PFS in 2019. The expected budget for the Phase II program is $5,000,000.

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28 DATE AND SIGNATURE PAGE

This report titled "Technical Report on the James Bay Niobium Project, Cochrane District, Northeastern Ontario, Canada" and dated December 12, 2017 was prepared and signed by the following authors:

(Signed and Sealed) "*Dorota El Rassi*"

Dated at Toronto, ON December 12, 2017	Dorota El Rassi, M.Sc., P.Eng. Senior Associate Geologist

(Signed and Sealed) "*Paul Chamois*"

Dated at Toronto, ON December 12, 2017	Paul Chamois, M.Sc.(A), P.Geo. Principal Geologist

29 CERTIFICATE OF QUALIFIED PERSON

DOROTA EL RASSI

I, Dorota El Rassi, P.Eng., as an author of this report entitled “Technical Report on the James Bay Niobium Project, Cochrane District, Northeastern Ontario, Canada” prepared for NioBay Metals Inc. and dated December 12, 2017, do hereby certify that:

1. I am an Associate Senior Geological Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON M5J 2H7.

2. I am a graduate of the University of Toronto in 1997 with a B.A.Sc.(Hons.) degree in Geological and Mining Engineering and in 2000 with a M.Sc. degree in Geology and Mechanical Engineering.

3. I am registered as a Professional Geological Engineer in the Province of Ontario (Reg.# 100012348). I have worked as a geologist for a total of 19 years since my graduation. My relevant experience for the purpose of the Technical Report is:
   - Review and report on exploration and mining projects for due diligence and regulatory requirements
   - Mineral Resource estimates on a variety of commodities including gold, silver, copper, nickel, zinc, PGE, and industrial mineral deposits
   - Experienced user of Gemcom, Leapfrog, Phinar’s x10-Geo, and Gslib software

4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

5. I did not visit the James Bay Niobium Project.

6. I am responsible for Sections 12 and 14 and contributed to Sections 1, 25, and 26 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have had no prior involvement with the property that is the subject of the Technical Report.

9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At 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.

Dated this 12th day of December, 2017

(Signed and Sealed) “*Dorota El Rassi*”

Dorota El Rassi, P.Eng.

PAUL CHAMOIS

I, Paul Chamois, M.Sc.(A), P.Geo., as an author of this report entitled “Technical Report on the James Bay Niobium Project, Cochrane District, Northeastern Ontario, Canada” prepared for NioBay Metals Inc. and dated December 12, 2017, do hereby certify that:

1. I am a Principal Geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON M5J 2H7.

2. I am a graduate of Carleton University, Ottawa, Ontario, Canada in 1977 with a Bachelor of Science (Honours) in Geology degree and McGill University, Montreal, Quebec, Canada in 1979 with a Master of Science (Applied) in Mineral Exploration degree.

3. I am registered as a Professional Geoscientist in the Province of Ontario (Reg. #0771), in the Province of Newfoundland and Labrador (Reg. #03480), and in the Province of Saskatchewan (Reg. #14155). I have worked as a geologist for a total of 35 years since my graduation. My relevant experience for the purpose of this Technical Report is:
   - Review and report on exploration and mining projects for due diligence and regulatory requirements
   - Vice President – Exploration with a Canadian mineral exploration and development company responsible for technical aspects of exploration programs and evaluation of new property submissions
   - District Geologist with a major Canadian mining company in charge of technical and budgetary aspects of exploration programs in Eastern Canada
   - Project Geologist with a major Canadian mining company responsible for field mapping and sampling, area selection and management of drilling programs across Ontario and Quebec
   - B.Sc. thesis on petrography and chemistry of the Clay-Howells Alkalic Complex, Ontario, 1977

4. I have read the definition of “qualified person” set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and my past relevant experience, I fulfill the requirements to be a ‘qualified person” for the purpose of NI 43-101.

5. I visited the James Bay Niobium Project on September 27, 2017.

6. I am responsible for Sections 2 to 11, 13, 15 to 24, and 27 and contributed to Sections 1, 25, and 26 of the Technical Report.

7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.

8. I have not had prior involvement with the property that is the subject of the Technical Report

9. I have read NI 43-101 and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At 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.

Dated this 12th day of December, 2017

(Signed and Sealed) "*Paul Chamois*"

Paul Chamois, M. Sc.(A), P.Geo.