James Bay Niobium PEA Delivers an After-Tax NPV(8%) of $1.0 Billion and IRR of 27.5%

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MONTREAL, Oct. 13, 2020 - Niobay Metals Inc. (“NioBay” or the “Company”) (TSX-V: NBY) is pleased to announce results of an independent Preliminary Economic Assessment (the “PEA’’) for its wholly-owned James Bay Niobium project (the “Project”), located 40 km south of the island of Moose Factory, Northern Ontario. The PEA was prepared with independent engineering firm G Mining Services Inc. (“G Mining”).

A conference call will be held on Wednesday, October 14th at 16:00 EST. Dial-in information can be found below.

Because of the geometry and location of the deposit, three mining scenarios were evaluated i.e. open pit (scenario #1), underground (scenario #3) and a hybrid of both mining methods (scenario #2). Details of the financial and technical highlights of all three scenarios are available on the NioBay website at http://niobaymetals.com/wp/en/home-2/

Table 1: PEA Highlights (all figures in CAD$ unless otherwise noted)

	Open Pit only	Underground
Pre-Tax Internal Rate of Return (IRR)	28.9%	38.0%
Pre-Tax Net Present Value (NPV) 8%	$1,208 M	$1,477 M
Pre-Tax Payback (years)	2.6 years	2.6 years
After-Tax Internal Rate of Return (IRR)	21.6%	27.5%
After-Tax Net Present Value (NPV) 8%	$758 M	$1,000 M
After-Tax Payback (years)	3.1 years	3.1 years
Pre-Production CAPEX (incl 25% Contingency)	$532.5 M	$532.5 M
Average Annual LOM Niobium Production	6,230 t Nb	6,230 t Nb
Mine Life	20 years	20 years
Total Mineral Resources Mined	50.6 Mt	50.6 Mt
Average Grade Mined	0.51 % Nb_2O_5	0.51 % Nb_2O_5
Gross Revenue After Royalties (LOM)	$3,260 M	$3,260 M
After-tax Operating Cash Flow (LOM)	$2,596 M	$2,596 M
C1 Costs over LOM*	US$10.16 / kg Nb $68.98/t	US$10.16 / kg Nb $68.98/t
All-in Costs (sustaining CAPEX + Closure + OPEX)	US$21.52/kg Nb $70.98 / t	US$21.52/kg Nb $70.98 / t
LOM Niobium Price	US$45/kg Nb	US$45/kg Nb
Exchange Rate (CAD/USD)	1.30	1.30

*C1 Cost is mine site, transport, marketing and royalty

Claude Dufresne, President & CEO, commented: *We are very pleased to finally be able to demonstrate the value of the James Bay Project as highlighted with the PEA. All three scenarios deliver robust returns but also provide strong and long-term economic opportunities to shareholders and to local stakeholders.”*

Claude Dufresne continued: *“We are excited to move to the next phase that will include a definition*

drilling program, baseline and technical studies, and strengthen our engagement and business relationship with Moose Cree First Nation and other stakeholders.”

Conference Call Details

Participant Toll Free Dial-in Number:	+1(833) 900-1546
Participant International Dial-in Number:	+1(236) 712-2464

An operator will direct participants to the call.

The conference call replay will be available from 1:00 p.m. (Eastern time) on October 14, 2020 until 11:59 p.m. (Eastern time) on October 21, 2020 with the following dial in numbers: 1-(800) 585-8367 (North American toll free) or 1-(416) 621-4642, access code 9182784. The replay will also be available on our website at www.niobaymetals.com.

Table 2: Capital Costs

Capital Costs by Area (in CAD$M)	Open Pit	OP + UG	Underground
Infrastructure	133,575	133,575	112,615
Power & Electrical	31,485	31,485	31,485
Water & Tailings	31,413	13,575	20,482
Mining U/G	-	-	117,729
Mining Pre-production	31,312	31,338	-
Mining Equipment OP	29,405	29,405	-
Process Plant	69,985	69,985	99,985
Other Equipment	5,613	5,614	5,612
Total Direct	332,788	314,977	387,908
Construction Indirect	35,018	32,699	34,772
General Services	40,406	37,730	40,122
Pre-Prod, Startup, Commission	150	150	150
Contingency	102,090	96,389	115,738
Total Indirect	177,664	166,968	190,782
Total CAPEX	510,452	481,945	578,691
Sustaining Costs	283,163	359,123	416,080
Closure Costs	32,418	23,992	20,692

Table 3: Operating Costs

Operating Costs by Area ($/t)	Open Pit	OP + UG	Underground
Mining Costs*	12.13	26.42	29.44
Processing Costs	14.60	14.62	14.62
Converter Costs	11.48	12.76	12.89
G&A	10.00	10.00	10.00
Total	48.48	63.85	66.94
US$/ kg Nb	16.10	18.45	19.11

*Unit mining cost of $4.43/t based on 1.8 strip ratio and including stockpile rehandle.

Opportunities to Enhance Value

Trade-off studies will be performed to determine the most suitable mining scenario among the three contemplated. Below are examples of items and programs to enhance the Project’s value to be included in an eventual Feasibility Study:

- Initial metallurgical results indicate that there is a likelihood to improve the overall recovery rate above 80%.
- The Federal & Provincial governments announced a billion-dollar program to support infrastructure development in northern Ontario. We believe capital costs associated with the road access and powerline may qualify for these types of programs.
- Future drilling programs will test the high-grade zone raking north as described below.
- Geotechnical studies and drilling will be required to establish design criteria for open pit slopes which could potentially steepen angles and reduce the strip ratio (scenarios #1 and #2). Similarly, for the underground, the crown pillar thickness will be evaluated, and could potential be reduced increasing ore recovery (scenario #3).
- Incorporation of automation to reduce personnel requirements (scenarios #2 and #3).
- Mine production is limited to a maximum of 5% of the ferro-niobium world market share. However, the deposit is suitable to provide additional material to market to maintain market share in a growing market.

Exploration Potential

- The last winter’s drilling program clearly demonstrated a large high-grade zone raking 20 to 30 degrees to the north in the center of the deposit. The results of these seven (7) drill-holes produced an increase of 40% of the Indicated Resources and a 17% in the Inferred category.
- Niobay management believes that this high-grade zone could continue to extend at depth under a series of shallow historical drill holes to the north. This sector will be a high priority target for the next drilling campaign.
- If this geological hypothesis is confirmed, such a high-grade zone could be beneficial to the underground scenario and will be fully evaluated by Niobay.
- This fall Niobay will perform a detailed aero-magnetic survey of the entire property including the mining license and the 306 surrounding new claims. This survey will help better understand the attitude of the different lithologies of the area and could reveal other exploration targets, knowing that carbonatites in the world have a strong tendency to be found in clusters.

Sensitivity

The James Bay Project is expected to be a long-term robust operation and profitable at a variety of prices and assumptions. The niobium price used in the PEA is based on the expected mid-term (five years) price and supported by other niobium projects’ price assumptions. Two lower price stress test scenarios were run to better ascertain the viability of the Project.

Table 4: Sensitivity to Metal Price

Scenarios	Niobium Price (US$/kg)		
	45	50*	55
Open Pit Scenario			
After-Tax NPV 8% (C$ M)	1,[illegible]	1,[illegible]	1,[illegible]
After-Tax IRR (%)	[illegible]%	[illegible]%	[illegible]%
After-Tax Payback (yrs)	[illegible]	[illegible]	[illegible]
Open Pit & Underground			
After-Tax NPV 8% (C$ M)	[illegible]	[illegible]	[illegible]
After-Tax IRR (%)	[illegible]%	[illegible]%	[illegible]%
After-Tax Payback (yrs)	[illegible]	[illegible]	[illegible]
Underground			
After-Tax NPV 8% (C$ M)	[illegible]	[illegible]	[illegible]
After-Tax IRR (%)	[illegible]%	[illegible]%	[illegible]%
After-Tax Payback (yrs)	[illegible]	[illegible]	[illegible]

* Base case scenario price assumption

Mining

- The PEA considers open pit mining under scenario 1 using and owner operated fleet. Open pit mining is possible given that the orebody sub-crops in the basement formation overlain by sediments and overburden ranging from 10 to 20m in thickness. A stream flows over the deposit which will require relocation to the north outside of the mining footprint by the third year of operation.
- The open pit will be mined for 24years during which time low grade material will be stockpiled and processed at the end of the mine life. A cut-off grade of 0.12% Nb_2O_5 was applied for the open pit resulting in 70.8Mt of mill feed. A total of 198Mt of material will be mined for an average LOM strip ratio of 1.8.
- During pre-production a total of 5Mt is mined to supply construction materials for the TSF and to strip overburden. The initial mining rate is then established at 7Mt/yr for the first 4 years and increases to a peak of 10Mt/yr by the 8^{th} year of operation.
- The mining fleet will consist of 64t rigid trucks matched with hydraulic excavators with $7m^3$ buckets supported by front-end loaders.

Metallurgy and Processing

- The selected process has been developed using available technology and retaining some aspects of past work done. The process flowsheet and design criteria are based on the interpretation of preliminary metallurgical test work results and industry practice. The process scenario description is for a nominal throughput of 2.4 Mt/yr and a process plant availability of 93 %. The scenario retained includes an intermediary gravity circuit removing close to 42 % of the mass with limited niobium losses. This particularity of the process minimizes energy requirements and considerably reduces the volume of pulp thereby lowering reagent costs. The reagents consumption has been estimated on the preliminary metallurgical results.
- The low grinding index of the ore and coarse grind required for good liberation of the niobium mineral minimizes the power requirement for grinding. A total of 1900 kw has been estimated for the entire grinding stage to prepare the ore for processing. The process will have two stages of grinding with the gravity interstage followed by pulp desliming, magnetic separation, three steps of specific minerals removal prior to the niobium flotation. The niobium concentrate will be leached, filtered and a gravity separation will be done to generate two different concentrate grades. The final concentrates will be dried and bagged to respond to the feed of a converter process.
- A series of metallurgical tests were performed at SGS Lakefield during the year with results confirming a recovery rate of 78% and high niobium grade in the concentrate and low impurities, item as the pilot plant results performed in the 1960’s.

Proposed Infrastructure

- Access to the mine site will be via a 38km all season road from Moose River East bank south of Moosonee. A 4.0km one lane tunnel is planned to cross Moose River and a final 2.6km road segment will connect to the existing road to Moosonee near the Hydro One Renison substation. From Moosonee, the Ontario Northland Railway connects to Cochrane and from there onto the Ontario Highway 11.
- Power will be provided from the Hydro One grid with a connection from the Renison substation. This substation provided power onto the Five Nations Energy Inc. transmission line servicing the now closed DeBeers Victor Diamond Mine.

- The mining activities and processing facility will be supported by ancillaries located at site including a maintenance shop, warehouse, mine dry, explosives storage, fuel storage, administration building, and an operations camp. Other infrastructure is planned to be in Moosonee such as a material transit terminal, laboratory, and administrative building for support functions such as accounting, human resources and other.

Environment and Closure Plan

- It is anticipated that the Project will require a review under the Federal Impact Assessment Act coordinated along with provincial Class Environmental Assessment. The Company would be proposing the active participation of identified impacted First Nation communities in the design, baseline data collection and follow up environmental monitoring. Only under Scenario #1 is there anticipated to be a federal Department of Fisheries and Oceans permit for a creek re-alignment. Examples of other provincial permits that will be required would include: Permit(s) to Take Water; Lands and Rivers Improvement Act; Environmental Compliance Approval(s)(air and water).
- In Ontario, a mine must file a Closure Plan prior to commencing construction. It is anticipated that with the active participation of identified impacted First Nation communities, the Closure Plan will be integrated into the mine design and initial environmental approvals. The Closure Plan must also include financial assurance that the operation will be closed out and remediated.

Stakeholder Engagement

- As a catchall, Stakeholder Engagement will include individuals and communities interested in or impacted by the potential development. However, there will be a distinct negotiated engagement plan with potentially impacted First Nation communities. This is in recognition of their established Treaty and Aboriginal Rights.
- NioBay will collaborate with the First Nation community(ies) to design a plan of engagement to ensure that the environmental approvals are fully aligned with their values. The Company has negotiated a Protection Agreement with Moose Cree First Nation.
- As future exploration and/or baseline environmental work proceeds, the Moose Cree First Nation may want another longer-term agreement that speaks to both their environmental and business involvement with the Project.

Mineral Resource Estimation (MRE) Highlights

- Indicated Mineral Resource: 29.7 Mt grading 0.53 %Nb_2O_5 representing approximately 47% of the declare tonnage in the RPA 2020 MRE.
- Inferred Mineral Resource: 33.8 Mt grading 0.52 %Nb_2O_5 representing approximately 53% of the declare tonnage in the RPA 2020 MRE.
- A 46 meters thick mineralized crown pillar representing 7.2Mt grading 0.5% Nb_2O_5 is excluded from the MRE of 2020.

The updated Mineral Resource estimate prepared by RPA is summarized in Table 4. 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).

TABLE 4: MINERAL RESOURCE ESTIMATE AS OF JULY 9, 2020 AS REPORTED BY RPA

Category	Tonnage (Mt)	Grade (% Nb_2O_5)	Contained Nb_2O_5 (M kg)
Indicated	29.7	0.53	158
Inferred	33.8	0.52	177

Notes:

1. CIM (2014) definitions were followed for Mineral Resources.
2. Mineral Resources are reported using a cut-off grade of 0.3% Nb_2O_5 based on an underground mining scenario, an 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 minimum mining width of approximately 7.5 m was used.
5. Bulk density is 2.93 t/m^3.
6. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.
7. Resources situated in a 46 m thick crown pillar have been excluded.
8. Numbers may not add due to rounding.

The PEA is preliminary in nature, includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Independent Qualified Persons

This PEA was prepared for NioBay by G Mining Services, and other industry consultants, all Qualitied Persons (“QP”) under National Instrument 43-101. The study was coordinated by the Company CEO Claude Dufresne P.Eng.. The QPs have reviewed and approved the content of this press release. The Company and independent QPs include:

Louis-Pierre Gignac P. Eng, M.Sc.A, CFA, Antoine Champagne P. Eng, Paul Murphy, P. Eng. and Carl

Michaud P. Eng. (G Mining Services Inc)

Jacquelin Gauthier, P. Geo (Niobay Metals Inc.), Pierre Pelletier P. Eng (Consultant Metallurgy)

About NioBay Metals Inc.

Niobay Metals Inc. is a mining exploration company holding a 100% interest in the James Bay Niobium Project located 45 km south of Moosonee, in the James Bay Lowlands in Ontario. NioBay also holds a 72.5% interest in the Crevier niobium and tantalum project located in Quebec and a 47% direct participation in mineral titles situated in the Chibougamau, Quebec, under a joint venture agreement with SOQUEM.

Cautionary Statement

The reader is advised that the PEA summarized in this press release is preliminary in nature and is intended to provide an initial, high-level review of the project’s economic potential and design options. The PEA mine plan and economic model includes numerous assumptions and the use of Inferred Resources. Inferred Resources are considered to be too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the PEA will be realized.

Certain statements contained in this press release constitute forward-looking information under the provisions of Canadian securities laws. Such statements are necessarily based upon a number of beliefs, assumptions, and opinions of management on the date the statements are made and are subject to numerous risks and uncertainties that could cause actual results and future events to differ materially from those anticipated or projected. The Company undertakes no obligation to update these forward-looking statements in the event that management's beliefs, estimates or opinions, or other factors should change, except as required by law.

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