La Loutre Graphite Project

N.I. 43-101 Technical Report & Preliminary Economic Assessment

Quebec, Canada

Effective Date: July 27, 2021

Prepared for: Lomiko Metals Inc.

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Surrey, British Columbia, Canada
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Ms. Sue Bird, P.Eng., Moose Mountain Technical Services
Mr. Greg Trout, P.Eng., Moose Mountain Technical Services
Mr. Oliver Peters, P.Eng., Metpro Management Inc.

CERTIFICATE OF QUALIFIED PERSON
Tommaso Robert Raponi

I, Tommaso Robert Raponi, P.Eng., certify that I am employed as Principal Metallurgist with Ausenco Engineering Canada Inc. ("Ausenco"), with an office address of 11 King Street West, Suite 1500, Toronto, Ontario, M5H 4C7. This certificate applies to the technical report titled "Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project," that has an effective date of July 27, 2021 (the "Technical Report").

I graduated from University of Toronto, Toronto, Ontario in 1984 with a Bachelor of Applied Science in Geological Engineering. I am a Professional Engineer registered with the Professional Engineers Ontario (No. 90225970), Engineers and Geoscientists British Columbia (No. 23536) and NWT and Nunavut Association of Professional Engineers and Geoscientists (No. L4508N) and Ordre des ingénieurs du Québec (permit No. 6043399). I have practiced my profession for over 36 years in various positions and have worked as an independent consultant since 2016.

I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.

I have never visited the La Loutre property. I am responsible for sections 1.1-1.3, 1.14, 1.15. 1.16, 1.18 (except 1.18.1), 1.19, 1.20, 1.21.1.4, 1.21.1.5, 1.21.2.6, 1.21.2.7, 1.22, 1.23.5, 2, 3, 4, 17, 18.1-18.5 (except 18.2.2), 19, 21.1, 21.2.1, 21.2.2, 21.2.4-21.2.7, 21.2.8.2, 21.2.9, 21.3 (except 21.3.3), 22, 25.1, 25.2, 25.9, 25.10, 25.12-25.14, 25.15.1.5, 25.15.1.6, 25.15.2.6, 25.15.2.7, 26.1, and 26.6 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have not been previously involved with the La Loutre Graphite Project.

I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 10, 2021

"Signed and sealed"

Tommaso Robert Raponi, P.Eng.

CERTIFICATE OF QUALIFIED PERSON
Ali Hooshiar

I, Ali Hooshiar, P.Eng., certify that I am employed as Geotechnical Mining Engineer with Ausenco Engineering Canada Inc. (“Ausenco”), with an office address of 855 Homer Street, Vancouver, British Columbia, Canada, V6B 2W2. This certificate applies to the technical report titled “Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project,” that has an effective date of July 27, 2021 (the “Technical Report”).

I graduated from Sharif University of Technology with BSc and MSc in Materials Science and Engineering in 2003 and 2006, respectively, and the University of Alberta in 2011 with a PhD in Materials Engineering. I am a Professional Engineer registered with the Engineers and Geoscientists British Columbia (No. 40965), Engineers Yukon, and OIQ (No. 6043599). I have practiced my profession for 18 years with experience in designing tailings and waste rock storage facilities as well as managing geotechnical field investigation and lab testing programs for mining projects across the globe. A summary of the more recent portion of my professional career is as follows:

- Geotechnical Mining Engineer, Ausenco, Canada 2018-present
- Geotechnical Mining Engineer, AECOM, Canada 2013-2017
- Senior Geotechnical Consultant, SRK Consulting Inc., Canada 2011-2013

I have read the definition of “Qualified Person” set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects (“NI 43-101”) and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for those sections of the Technical Report that I am responsible for preparing.

I have never visited the La Loutre property. I am responsible for 1.23.4-1.23.7, 16.3, 18.6-18.8, 26.5, 26.7, and 26.8 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have not been previously involved with the La Loutre Graphite Project.

I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 10, 2021

“Signed and sealed”

Ali Hooshiar, P.Eng.

CERTIFICATE OF QUALIFIED PERSON
Scott Weston

I, Scott Weston, P.Geo., certify that I am employed as Vice Principal of Business Development with Hemmera Envirochem Inc., with an office address of 4730 Kingsway, Burnaby, British Columbia, V5H 9C6. This certificate applies to the technical report titled "Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project," that has an effective date of July 27, 2021 (the "Technical Report").

I graduated from University of British Columbia, Vancouver, BC, Canada, in 1995 with a Bachelors of Science, Physical Geography, and from Royal Roads University, Victoria, BC, Canada, in 2003 with a Masters of Science, Environment and Management. I am a Professional Geoscientist of Engineers and Geoscientists British Columbia; No. 124888. I have practiced my profession for 25 years.

I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.

I have never visited the La Loutre property. I am responsible for 1.4, 1.17, 1.21.1.3, 1.21.2.4, 1.23.8, 5, 20, 25.11, 25.15.1.3, 25.15.2.4, and 26.9 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have not been previously involved with the La Loutre Graphite Project.

I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 10, 2021

"Signed and sealed"

Scott Weston, P.Geo.

CERTIFICATE OF QUALIFIED PERSON

Sue Bird

I, Sue Bird, P.Eng., certify that I am employed as a Principal and V.P. with Moose Mountain Technical Services ("MMTS"), with an office address of #210 1510 2nd St North Cranbrook BC, V1C 3L2. This certificate applies to the technical report titled "Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project," that has an effective date of July 27, 2021 (the "Technical Report").

I graduated from Queen's University, Kingston, Ontario, in 1993 with a Master of Science degree in Mining, the University of British Columbia in 1990 with a Master of Science degree in Geology, and Queen's University with a Bachelor of Science in Geological Engineering in 1989. I am a Professional Engineer in the Province of British Columbia (No. 25007). I have practiced my profession for over 28 years. I have been directly involved in many similar projects in Canada and abroad.

I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.

I have never visited the La Loutre property. I am responsible for 1.5-1.10, 1.12, 1.21.1.1, 1.21.2.1, 1.21.2.2, 1.23.1, 6-12, 14, 25.3, 25.4, 25.6, 25.7, 25.15.1.1, 25.15.2.1, 25.15.2.2, and 26.2 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have not been previously involved with the La Loutre Graphite Project.

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Dated: September 10, 2021

"Signed and sealed"

Sue Bird, P.Eng.

CERTIFICATE OF QUALIFIED PERSON

Greg Trout

I, Greg Trout, P.Eng., certify that I am employed as Principal of Moose Mountain Technical Services ("MMTS"), with an office address of #210 1510 2nd St North Cranbrook BC, V1C 3L2. This certificate applies to the technical report titled "Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project," that has an effective date of July 27, 2021 (the "Technical Report").

I graduated from the University of Saskatchewan, Saskatoon, Saskatchewan, in 1982 with a Bachelor of Science degree in Civil Engineering. I am a Professional Engineer of the Province of Alberta (No. 97358). I have practiced my profession for 39 years. I have been directly involved in the mining industry, in design, operation, and evaluation of open pit mines for more than 35 years.

I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.

I visited the La Loutre property and the core sheds in Val D'Or between June 1, 2021 and June 2, 2021 for a visit duration of one day at each site. I am responsible for 1.13, 1.18.1, 1.21.1.2, 1.21.2.3, 1.23.2, 16.1-16.2, 16.4-16.9, 18.2.2, 21.2.3, 21.2.8.1, 21.3.3, 25.8, 25.15.1.2, 25.15.2.3, and 26.3 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have not been previously involved with the La Loutre Graphite Project.

I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 10, 2021

"Signed and sealed"

Greg Trout, P.Eng.

CERTIFICATE OF QUALIFIED PERSON
Oliver Peters

I, Oliver Peters, P.Eng., certify that I am employed as Principal Metallurgist with Metpro Management Incorporated ("Metpro"), with an office address of 102 Milroy Drive, Peterborough, Ontario, K9H 7T2. This certificate applies to the technical report titled "Technical Report on the Preliminary Economic Assessment for the La Loutre Graphite Project," that has an effective date of July 27, 2021 (the "Technical Report").

I graduated from Technical University of Aachen, Germany in 1998 with a Master's degree in Mineral Processing. I am a Professional Engineer of Ontario (membership No. 100078050). I have practiced my profession for 22 years. My relevant experience in the graphite field includes the process development for over 25 graphite projects over the past 10 years.

I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.

I have never visited the La Loutre property. I am responsible for sections 1.11, 1.21.1.4, 1.21.2.5, 1.23.3, 13, 25.5, 25.15.1.4, 25.15.2.5, and 26.4 of the Technical Report.

I am independent of Lomiko Metals Inc. as independence is defined in Section 1.5 of NI 43–101. I have been involved with the La Loutre Graphite Project as co-author of the following technical report:

- Turcot, B., Servelle, G., Peters, O., 2016: Technical Report and Mineral Resource Estimate for the La Loutre Property, report prepared for Canada Strategic Metals Inc. and Lomiko Metals Inc., effective date January 15, 2016.

I have read NI 43–101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 10, 2021

"Signed and sealed"

Oliver Peters, P.Eng.

Important Notice

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1 SUMMARY

1.1 Introduction

Ausenco Engineering Canada Inc. (Ausenco) has prepared a preliminary economic assessment (PEA) report for Lomiko Metals Inc. (Lomiko) on the La Loutre Graphite (La Loutre) project located in the Laurentian region of Quebec. The report was prepared in accordance with the Canadian disclosure requirements of National Instrument 43-101 (N.I. 43-101) and Form 43-101 F1.

The responsibility of the engineering consultants are as follows:

- Ausenco was commissioned by Lomiko to manage and coordinate the work related to the N.I. 43-101 as lead study consultant. Ausenco also developed the PEA level design and cost estimating of the process plant, surface infrastructure, and design of the waste disposal facility (WDF).
- Hemmera Envirochem Inc. (Hemmera), an Ausenco company, was engaged to conduct water management and environmental studies, as well as planning, assessment, licensing, and permitting.
- Moose Mountain Technical Services (MMTS) was commissioned to complete the quality assurance and quality control (QA/QC) analyses, mineral resource estimates, supervise geology inputs, and to design the open pit mine plan, mine production schedule, and mine capital and operating costs.
- Metpro Management Inc. (Metpro) was engaged to manage and interpret metallurgical testing performed by SGS.

Readers are cautioned that the PEA report is preliminary in nature.

1.2 Property Description and Location

The La Loutre property is located in the Laurentians administrative region (known as the Laurentides) in Québec, Canada. It is approximately 30 km west-southwest of the city of Mont-Tremblant (about 45 km by road) and 180 km northwest of Montreal. The nearest community is Duhamel, 5 km to the west. The property location is shown in Figure 1-1.

From Montreal, the property is accessible by driving north on Highway 15, then onto Highway 117 to St-Jovite and finally heading west onto Highway 323 for 40 km to Lac des Plages. Once there, a series of secondary roads and forestry roads lead to the property.

Figure 1-1: Property Location

Source: Lomiko Metals, 2021

1.3 Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

Land surface rights are managed by the province and are separate from mining titles which are granted for mine exploration, development, and production. The company controls 48 claims, 42 of which have a 1.5% Net Smelter Return (NSR).

Lomiko owns 100% of the project as of March 29, 2021, having paid $1,125,000 to Canada Strategic Metals Inc. There are no other agreements governing the project.

1.4 Accessibility, Climate, Local Resources, Infrastructure & Physiology

1.4.1 Accessibility

The La Loutre property is accessible from Route 323 by driving north from Montreal on Highway 15, then onto Highway 117 to St-Jovite and finally turning left or west onto Highway 323 for 40 km to Lac des Plages. Highway 323 crosses the municipalities of Brébeuf and Amherst prior to reaching Lac des Plages. Once there, a series of secondary roads and forestry roads lead to the property via Legget Road along Sioui Lake and Lac La Loutre. Legget Road is accessed between Lac des Plages located 10 km to the east and Lac Simon located 7 km to the west.

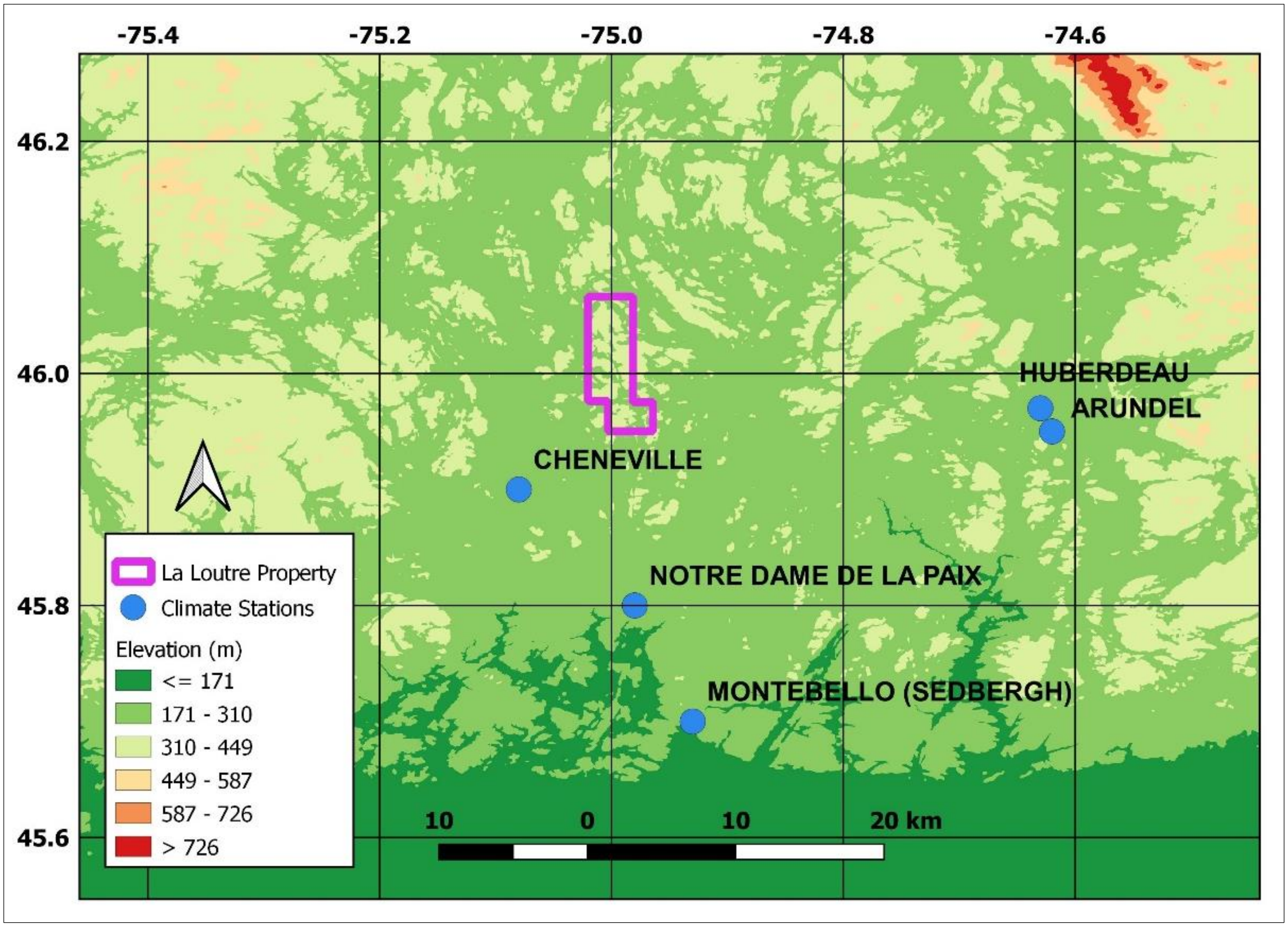
1.4.2 Climate

The climate of the region where the La Loutre property is located ranges between temperate to humid continental, based on Koppen classification[1] (Geographical Branch, 1957). The month with the highest temperature is July (18.9°C) and the month with the lowest temperature is January (-12.5°C) (Environment Canada climate normal at Cheneville station). The temperature is above freezing for approximately 176 days annually. Total average annual precipitation is 1,090 mm, of which 81% is rain and 19% is snow. It precipitates almost 170 days per year with 15 rainy days in June, and 13 snowy days in January.

The climate stations close to the project site with sufficient minimum data history (40 years) are: Cheneville, Notre Dame de la Paix, Huberdeau, Montebello (Sedbergh) and Arundel. Figure 1-2 depicts their location.

[1] Atlas of Canada, 3rd Edition (1957)

Figure 1-2 Project Location and Nearby Climate Stations



1.4.3 Local Resources and Infrastructure

The main administrative center in the area is Mont Tremblant, 40 km northeast of the La Loutre property. Heavy machinery, fuel and other equipment and services can be sourced there. Specialized mining equipment would most probably be obtained from Mont-Laurier (100 km northwest of the property), Montreal, or Val-d'Or. Mining expertise exists in Mont-Laurier and in the mining center of Val-d'Or, located 450 km northwest of the property. A number of mining and mineral exploration companies have offices located in Val-d'Or. Available resources include assayers, civil construction companies, diamond drilling, engineering firms, freight, geophysics contractors, land surveyors, mining contractors, and mining suppliers.

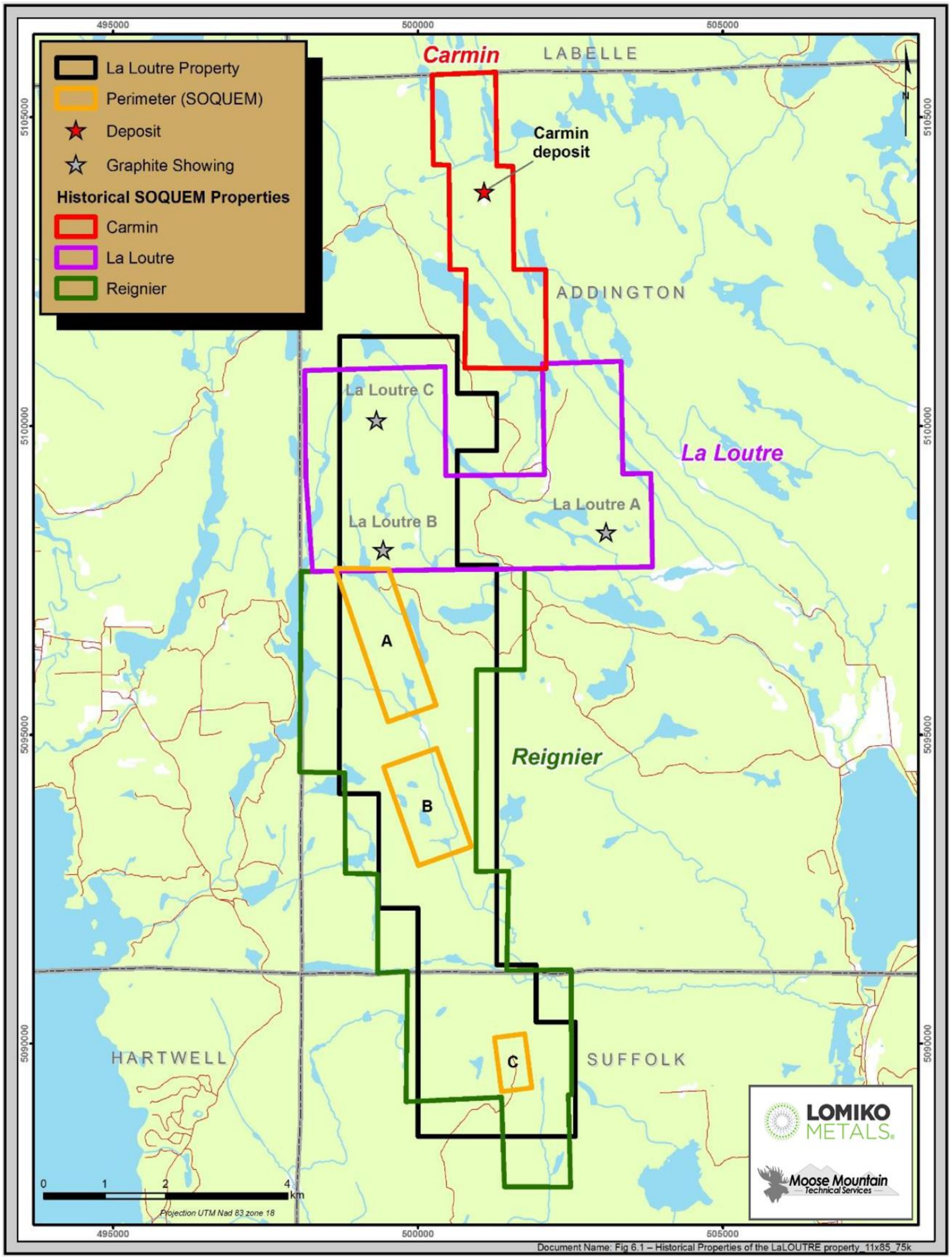
1.4.4 Physiography

The topography of the La Loutre is gently undulated with an average elevation of 300 meters above sea level (masl) within a range of 280 and 360 masl. There are some bedrock outcrops but are hidden by leaves and a thin veneer of overburden. The thin overburden is almost entirely composed of glacial sand, gravel and pebbles. There is virtually no arable land in the region. The vegetation consists mainly of mixed forest dominated by pine, spruce, cedar and different deciduous tree species. Hills are generally covered in deciduous trees with steep sides up to 10 meters in height, whereas the intervening valleys have swamps, lakes and stream populated by coniferous species. Hills are between 400 and 900 meters wide, whereas valleys are 100 to 500 meters wide. Hills and valleys are oriented both northwest-southeast and northeast-southwest.

1.5 History

The property was originally staked by SOQUEM in 1988 based on airborne magnetic and electromagnetic (REXHEM IV) surveys and a review of local graphite occurrences. In the summer of 1989, a geological reconnaissance program was carried out in the areas hosting the La Loutre A, B and C REXHEM anomalies as shown in Figure 1-3 (Saindon and Dumont, 1989). From 1989 through 1992, exploration activities conducted by SOQUEM included airborne magnetic and electromagnetic (EM) surveys, ground EM surveys, outcrop mapping, geologic surveying, and trenching identified several areas. Two of these areas are the Battery Zone and the Electric Vehicle (EV) Zone, which are the deposits included in the resource estimate.

Figure 1-3 Location of the Current La Loutre Property (black) with respect to the Historic SOQUEM Properties



Source: Saindon and Dumont, 1989

1.6 Geological Setting and Mineralization

The property consists of a unit of biotite gneiss (±diopside). Quartzite constitutes a significant part of outcrops on the property. Diopside-scapolite-bearing calc-silicate rocks, marbles and other lithological units of sillimanite-biotite gneiss and sillimanite-garnet gneiss are less abundant than biotite gneiss with which they generally alternate as lit-par-lit. The marbles are observed at only a few places on the property. Some outcrops of amphibolite were also observed. Orthogneiss is found along the edge of the eastern part of the property. Diabase dykes cut all previous units.

The sedimentary sequence consists principally of a thick paragneiss unit intercalated with thin units of quartzite and marble. Bedding has an orientation of N150° and a dip ranging from 30° to 50° in the Battery Zone. Mineralization in the EV Zone strikes at about 155 degrees with strike lengths up to 750 m and domains dipping 35 degrees to 45 degrees.

The mineralized zones were interpreted based on the Graphite grade information from drill holes and guided by quartzite and marble distribution patterns. There are 22 high-grade zones and 5 low-grade zones encompassing the high-grade zones interpreted in the Battery Zone. Mineralization in the Battery Zone strikes along an average trend of N150° and an average dip of 45° and is generally stratigraphically concordant with quartzite and marble. Graphite flakes occur disseminated in the graphitic paragneiss in variable concentrations. Low-grade zones are wide (10 to 150 m) and long (strike length up to 1,000 m) in the Battery Zone. The paragneiss associated with the low-grade zones contains more quartz than the paragneiss associated with the high-grade zones, and consequently have a paler colour.

The EV Zone was interpreted in section and in three dimensions using Implicit Modelling. Fifteen distinct domains have been interpreted with the graphite grades generally higher than in the Battery Zone. Mineralization strikes at about 155 degrees with strike lengths up to 750 m and domains dipping 35 degrees to 45 degrees.

1.7 Exploration

Exploration by Canada Rare Earths Inc. (now Canada Strategic Metals Inc. (“Canada Strategic”)) from 2012 included airborne time-domain electromagnetic TDEM methods and magnetic surveys. The area covered yielded a multitude of EM conductors over most parts of the flight-line grid (Létourneau and Paul, 2012).

Consul-Teck Mineral Exploration Services (Consul-Teck) conducted a surface prospecting and geological mapping program in the summer of 2012, guided by the historical SOQUEM results for the area and results from the 2012 airborne TDEM and magnetic survey. Consul-Teck’s geologists completed the geological mapping at 1:10,000 scale, accompanied by bedrock sampling to evaluate the graphitic carbon grades within each lithology (Turcotte, et al., 2016). The Reignier A area corresponds to an area measuring 2,800 m by 900 m, oriented N160° along a “major lineament” beginning at Lac Bélanger and passing alongside Lac Tallulah. According to Dupuy’s report, the lithological units visually contained about 2% to 10% graphite. Consul-Teck collected and assayed 49 grab samples from the Reignier A area, obtaining grades from 0.16% to 18.08% graphitic carbon (Cg). This geological reconnaissance work led to the discovery of the Graphene-Battery (“Battery”) Zone (Turcotte, et al., 2016).

During the summer of 2013, channel sampling was carried out on outcrops of a graphitic horizon hosted by paragneiss and quartzite. Consult-Teck also conducted a sampling program near the grab sample with a reported grade of 22.04% Cg in 2012 on the EV Zone. The purpose was to better define the surface graphitic carbon zone outlined in 2012. The seven 2013 grab samples returned grades ranging from 0.65% to 17.25% Cg.

In 2015, 58 new samples were collected from the Battery Zone to better define the graphite zone outlined at surface in 2012. The 2015 grab samples returned grades ranging from 0.21% to 18.45% Cg.

In the EV Zone, five samples collected directly on the showing in 2015 assayed 22.40% to 26.20% Cg. Another five samples were collected to the south-southeast of the EV Zone discovery site, returning grades ranging from 14.05% to 21.10% Cg. In addition, to the east of the showing, two samples with elevated graphite grades (10.90% and 27.90% Cg) were obtained in graphite-bearing paragneiss.

1.8 Drilling

Drilling on the property was done by Canada Strategic Metals Inc. ("Canada Strategic") from 2013 to 2016 in the Battery Zone. The Electric Vehicle (EV) Zone was drilled in 2017 and 2019 by Lomiko and Québec Precious Metals. There are 62 drill holes for 8,218 m of drilling in the Battery Zone and 49 drill holes for 6,942 m drilling in the EV Zone.

1.9 Sample Preparation, Analyses, and Security

Between 2014 and 2016, Consul-Teck managed the drilling and sampling program for Canada Strategic (Lavallée, 2015; Lavallée, 2016; Lavallée, 2017). In 2019 Consul-Teck managed the drilling and sampling program for Québec Precious Metals and Lomiko (Lavallée, 2019).

The chain of custody procedures described by Consul-Teck appear adequate and do not appear to pose a material risk. After an analysis of the sampling, preparation, analysis and QAQC program at La Loutre, the QP concludes that the history of sampling, preparation, analysis, and security programs are appropriate.

1.10 Data Verification

Certificate checks of approximately 12% of the data were completed by MMTS with no errors found. Database verification was performed with checks made to the integrity of the drill hole database with only minor errors/overlaps noted and corrected. Check assays from the 2016 program were reviewed with no bias revealed. In the opinion of the QP, the La Loutre database is adequate and sufficient in quality to be used for resource estimation.

1.11 Mineral Processing and Metallurgical Testwork

A flowsheet development program was carried by SGS Canada in Lakefield, Ontario. The metallurgical program included open-circuit rougher, cleaner, and variability flotation tests, scoping-level comminution tests, and static environmental tests. Further, a locked-cycle test simulated closed-circuit flotation performance of the proposed flowsheet.

Four variability composites were evaluated both individually as variability composites and as a blended master composite. The head grades of the individual composites ranged between 3.15% C(g) and 14.2% C(g) and the master composite graded 7.63% C(g).

The comminution tests placed the La Loutre mineralization into the very soft to soft category with low to medium abrasivity.

The process development program culminated in a flowsheet that employs standard mineral processing equipment and ensures maximum process flexibility to address any variation in feed composition. The process includes comminution equipment that enables liberation of graphite flakes from attached and interlayered gangue minerals.

The locked cycle test produced a combined concentrate grade of 97.7% C(t) and a total carbon recovery of 93.5%. The flake size distribution of the combined concentrate is presented in Table 1-1. Over 10% of the concentrate mass reported to the +48 mesh products and another 21.6% of the mass was contained in the –48/+80 mesh product. Even the smallest size fraction of –325 mesh still produced a very good grade of 96.0% C(t).

Table 1-1: Size Fraction Analysis of Combined Concentrate of LCT

Size (Mesh)	Size (μm)	Mass (%)	C(t) (%)	C(t) Distribution (%)
+32	+500	1.0	97.6	1.0
+48	+300	9.8	97.4	9.7
+80	+180	21.6	98.0	21.7
+100	+150	10.8	98.2	10.9
+150	+106	17.5	98.1	17.5
+200	+75	13.0	98.3	13.1
+325	+45	13.5	98.1	13.6
-325	-45	12.8	96.0	12.5

Open circuit variability flotation tests produced consistent metallurgical results with combined concentrate grades between 97.6% and 98.6% C(t). Although the testing demonstrated that 97% C(t) can be achieved, additional testing is required as well as market investigation to determine accurate pricing at 97% C(t).

Net acid generation (NAG) and modified acid base accounting (ABA) tests classified the desulphurized graphite flotation tailings as non-potentially-acid-generating (NPAG) with abundant neutralization potential derived almost entirely from carbonate mineral sources.

1.12 Mineral Resource Estimate

The total mineral resource estimate is summarized in Table 1-2 with the base case cut-off highlighted.

A Lerchs-Grossman resource pit has been constructed using the 150% pit case based on prices, off-site costs, metallurgical recovery, and graphite prices used for the economic analysis, thus confining the resource to a pit shape that has "reasonable prospects of eventual economic extraction". The cut-off grade is based on a processing cost of C$11.85/t; general and administrative (G&A) costs of C$2.37/t; and an exchange rate of 1.33 (CAD:USD) as found in the table notes. A cut-off value of 1.5% has been used for the resource estimate base case, which is expected to more than cover the process and G&A costs.

The mineral resource estimate includes inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 1-2: La Loutre Resource Estimate (Effective Date: May 14, 2021)

Class	Cutoff (%)	EV Deposit		Battery Deposit		Total		
		Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Graphite (kt)
Indicated	1	8,321	6.38	15,889	3.32	24,210	4.37	1,057.9
	1.5	8,158	6.48	15,007	3.44	23,165	4.51	1,044.3
	2	7,792	6.70	12,622	3.75	20,414	4.88	995.5
	3	6,768	7.33	4,529	6.16	11,297	6.86	774.6
	5	4,443	9.17	2,394	8.27	6,837	8.85	605.4
Inferred	1	13,114	5.71	38,273	3.10	51,387	3.77	1,936.4
	1.5	12,829	5.81	33,992	3.33	46,821	4.01	1,877.9
	2	12,273	5.99	27,775	3.69	40,048	4.39	1,759.5
	3	9,645	6.92	10,311	5.92	19,956	6.40	1,277.6
	5	5,833	8.99	5,687	7.58	11,520	8.29	955.2

Notes:
1. Resources are reported using the 2014 CIM Definition Standards and were estimated using the 2019 CIM Best Practices Guidelines.
2. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
3. The mineral resource has been confined by a pit that reflects “reasonable prospects of eventual economic extraction” using the following assumptions: exchange rate CAD:USD=1.33; weighted average price of graphite of US$890/t; 100% payable; off-site costs including transportation and insurance of C$39.42/t; a 1.0% NSR royalty; and metallurgical recoveries of 95%.
4. Pit slope angles are 45° below overburden, 20° in overburden.
5. The specific gravity of the deposit is 2.86 in unmineralized and low-grade zones and 2.78 in high-grade zones (within solids above a 4% graphite grade).
6. Numbers may not add due to rounding.

Factors that could affect the mineral resource estimate include commodity price and exchange rate assumptions; pit slope angles; assumptions used in generating the LG pit shell, including metal recoveries; and mining and process cost assumptions. The QP is not aware of any environmental, permitting, legal, title, taxation, socioeconomic, marketing, political, or other relevant factors that could materially affect the mineral resource estimate.

1.13 Mining Methods

The PEA design is based on a conventional truck-shovel open pit mining operation within two distinct zones, the Battery (B) Zone and the Electric Vehicle (EV) Zone. The open pit analysis results in two distinct open pits within each zone.

Mine operations are is expected to consist of drilling 140 mm diameter blast holes, blasting with a bulk emulsion, and loading the material into 60-tonnne off-road trucks with hydraulic shovels and front end loaders. Resources above a 2.5% Cg cut-off grade will be delivered to the primary crusher or stockpiled. Waste rock will be placed inside the limits of the co-disposal facility adjacent to the EV pits or and subsequent backfilled into backfilling the EV North pit. Mining will be supported by a fleet of track bulldozers, rubber-tired bulldozers, motor graders, and water trucks to maintain the working areas of the pit, stockpiles, and haul roads.

The general parameter that guided the development of the mining plan is the production of 100 kilo tonnes (kt) of sellable saleable product annually with no expansion of the plant in later years. This results in a nominal mill capacity design of 4,200 tonnes per day (t/d), Based on the mining plan developed for this study, the commercial life of the project is 15 years after a one-year pre-production period. Measured, indicated, and inferred mineral resources are considered as potential plant feed. The mine resource by phase is shown in Table 1-3.

Table 1-3: Mine Resource by Phase

Description	Unit	EV-N1	EV-N2	EV-S	B-N	B-S	Total
Resource	kt	6,267	4,596	3,058	3,598	4,355	21,874
Cg Grade	%	7.90	7.41	5.81	6.93	5.74	6.90
Cg Grade (Diluted)	%	7.65	7.22	5.77	6.36	5.56	6.67
Waste	kt	19,967	20,924	4,823	25,712	14,299	85,726
Overburden	kt	733	299	286	727	625	2,670
Strip Ratio (w/o)	t/t	3.30	4.62	1.67	7.35	3.43	4.04

1.14 Recovery Methods

The plant and its associated services facilities is designed to process the material from the mine to produce dried graphite concentrate and filtered tailings. On the process flowsheet, the run-of-mine (ROM) plant feed is crushed by a jaw crusher, stockpiled, and then reclaimed to feed a semi-autogenous grinding (SAG) mill. The SAG mill product undergoes rougher and scavenger flotation before being ground in a polishing mill. The slurry undergoes various additional stages of flotation with a second intermediate polishing grind.

The flotation concentrate is then screened and classified; the oversize is sent to the coarse concentrate stirred mill and the undersize to the fine concentrate stirred mill. Once scrubbed, the coarse concentrate passes through two additional cleaning flotation circuits whereas the fine concentrate is subject to three cleaning stages. The concentrates are recombined and pumped to the graphite filter press, where they are dewatered. The dewatered product is dried in a propane-fired dryer to 0.3 %w/w H_2O, and the graphite flakes are screened into three different sizes and bagged. An overview of the process is shown in Figure 1-4.

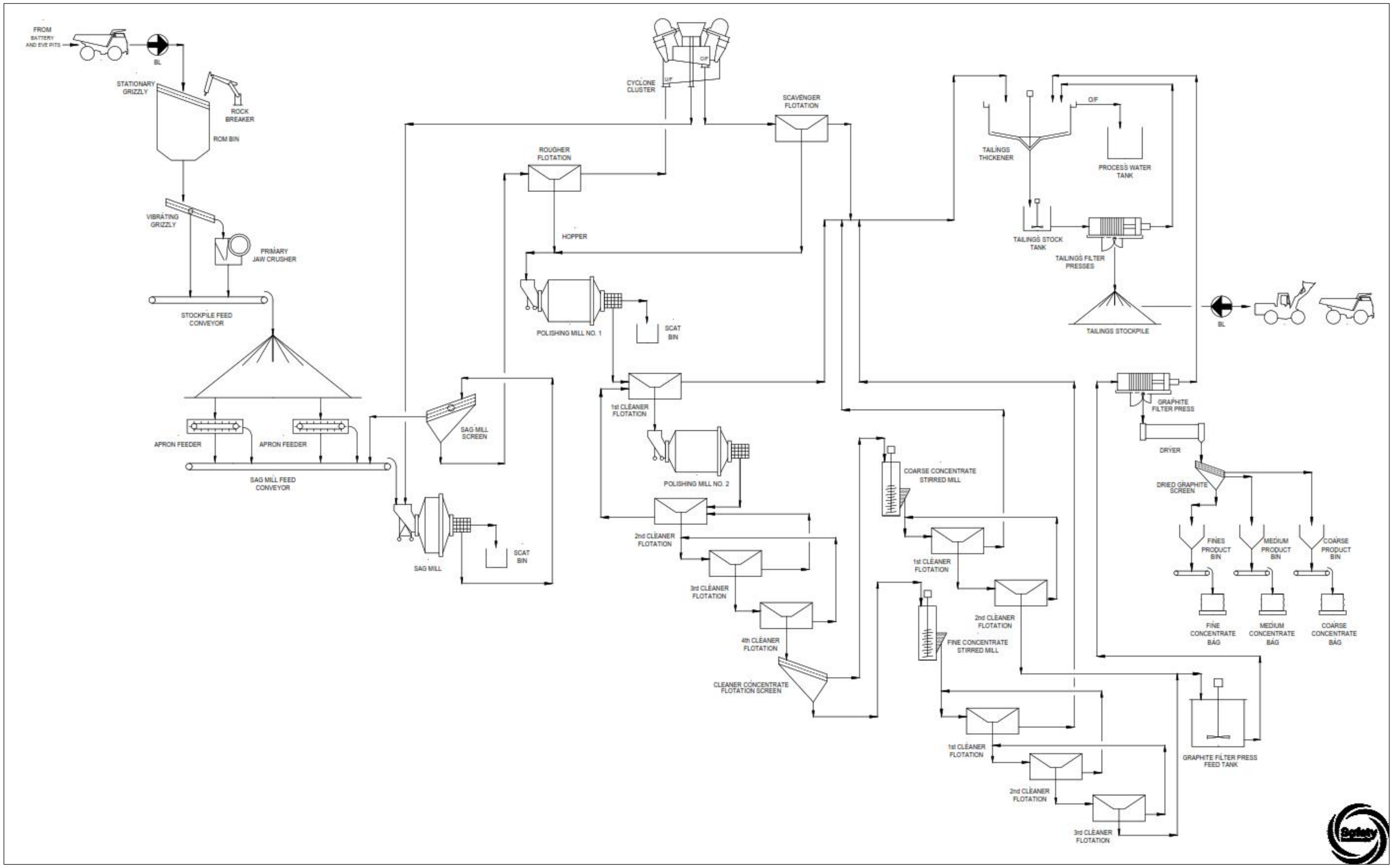
The tailings from the scavenger flotation, primary flotation, and coarse and fine flotation circuits are combined and thickened in a tailings thickener. The thickener overflow is collected in the process water tank and reused throughout the plant. Thickener underflow is pumped to the tailings filter press, where it is dewatered. Filtered tailings are loaded onto trucks and transported to the co-disposal site for deposition and co-mingling with waste rock.

The process plant has a capacity of 4,110 t/d of ore (1.5 Mt/a) with an average plant feed grade of 6.76% graphitic carbon (Cg). The plant recovers 93.5% of this graphite, producing a product with a grade of 95% Cg.

The key criteria selected for the base plant design are:

- plant throughput rate of 4,110 t/d
- crushing plant availability of 70%, resulting in 6,132 hours of operation per year
- grinding, flotation, filtration, drying, and packaging availability of 92%, equating to 8,059 hours of operation per year

Figure 1-4: Overall Process Flowsheet



Source: Ausenco, 2021

1.15 Project Infrastructure

The La Loutre property is located in the Laurentians administrative region (known as the Laurentides) in Québec, Canada. It is approximately 30 km west-southwest of the city of Mont-Tremblant (about 45 km by road) and 180 km northwest of Montreal. The nearest community is Duhamel, 5 km to the west.

Infrastructure to support the La Loutre project will consist of site civil work, site facilities/building, a water system, and site electrical. These are indicated in Figure 1-5.

Site civil work includes designs for the following infrastructure:

- light vehicle and heavy equipment roads
- access road
- overburden stripping and stockpiling
- mine facility platforms and process facility platforms
- water management collection ponds
- Waste Disposal Facility (WDF), consisting of a Waste Rock Faciltity (WRF) and Co-Disposal Storage Facility (CDSF)

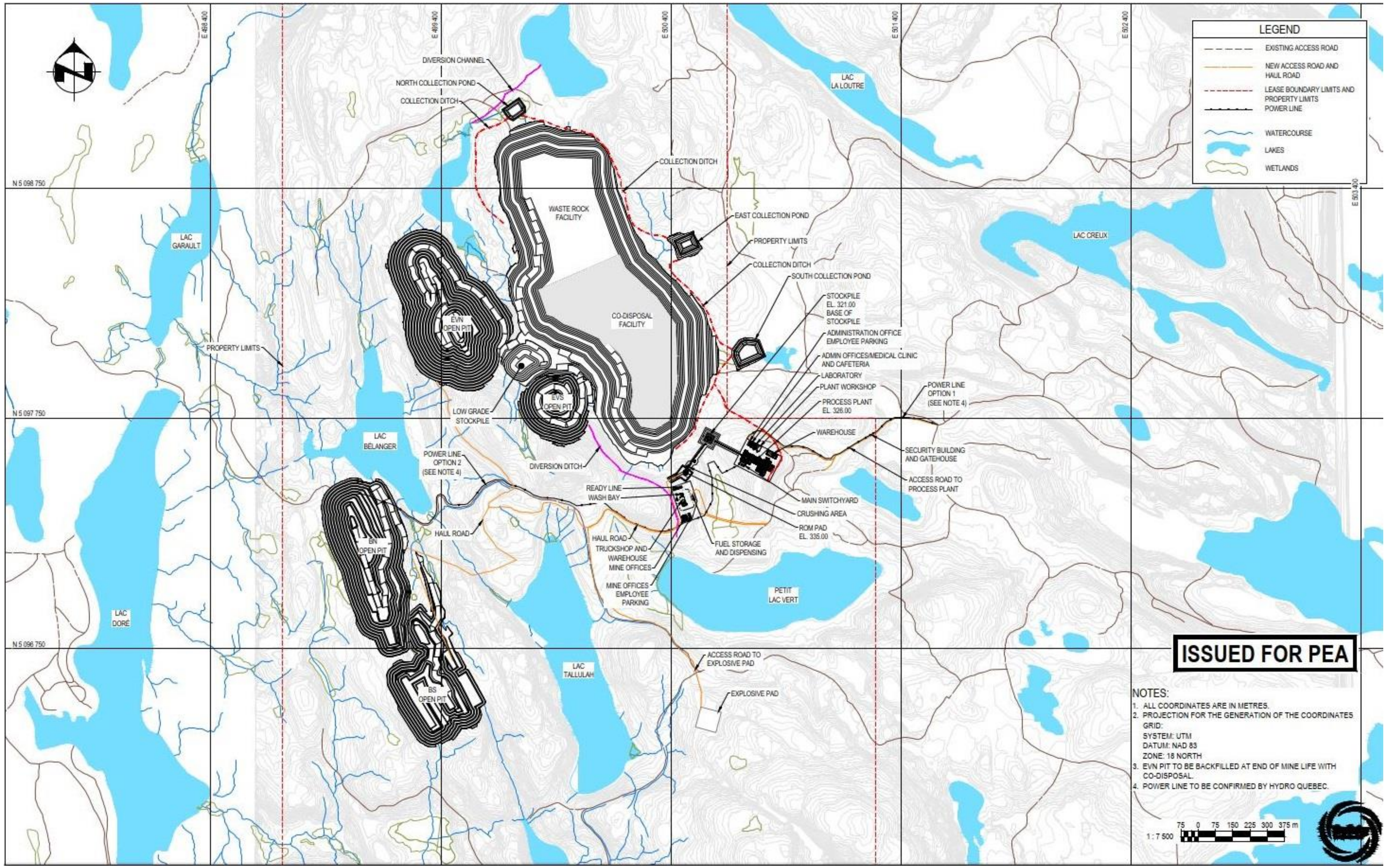
Site facilities will include both mine facilities and process facilities, as follows:

- The mine facilities will include the administration offices, truckshop and warehouse, mine workshop, mine dry, and miscellaneous facilities.
- The process facilities will include the process plant, crusher facility, process plant workshop and warehouse, and assay laboratory.
- Both the mine facilities and process facilities will be serviced with potable water, fire protection, compressed air, power, diesel, communication, and sanitary systems.

The Waste Disposal Faciltity (WDF) is divided into two parts: the waste rock facility (WRF) at the northern end, and the co-disposal storage facility (CDSF) at the southern end. The co-disposal facility consists of co-mingled waste rock and filtered tailings.

The design standards for the CDSF are based on the relevant federal and provincial construction guidelines for mining tailings storage facilities in Canada. The CDSF has been classified as “significant” under CDA guidelines since this structure does not impound water or saturated tailings. Similarly, the design of the WRF is based on general guidelines for waste rock facilities.

Figure 1-5: Overall Site Layout



Source: Ausenco, 2021

1.16 Markets and Contracts

Lomiko has not carried out any market studies or secured any contracts or off-take agreements for product purchase. It is expected that metallurgical testwork will be carried out during the pre-feasibility study to confirm the suitability of La Loutre graphite being upgraded to spherical graphite for lithium-ion battery use and other value-added products.

1.17 Environmental, Permitting and Social Considerations

The La Loutre property covers 25.1 km^2 of land located in the Petite Nation territory of the Outaouais region. The site is located in the Collines du lac Nominingue (3b) ecoregion. The area has a mixed deciduous forest stand composition. This deciduous forest habitat is dominated by stands of Sugar maple (Acer saccharum), followed by over 10 other broadleaf tree species. Within the project area, there is potential for 22 species of wildlife that are either on the susceptible, threatened, or vulnerable list. Two are amphibians, four are reptiles, eight are mammals and eight are bird species. The project area is situated in white-tailed deer wintering habitat.

The project site is in the Petite Nation watershed region. There are five major lakes to which both intermittent and perennial tributaries from the project site flow. These are Lac Bélanger, Lac Doré, Petit Lac Vert, Lac Tallulah and Lac Garault.

Three fish species were found within Lac Bélanger, which were the Pearl dace (*Semotilus margarita*), Redbelly dace (*Phonixus eos)* and Fathead minnow (*Pimephales promelas*). Electrofishing was done in an unnamed perennial stream flowing south from Lac Garault to Lac Doré, and two fish species were identified. One was the Fallfish (S*emotilus corporalis*) and the Common creek chub (*Semotilus atromaculatus)*.

Baseline studies in the project site have begun in August 2021 and will collect wetland, fish, hydrology, hydrogeology and water quality data.

1.17.1 Closure and Reclamation Considerations

A Closure Plan will be prepared and submitted for the project at a later stage in parallel with the Environmental Assessment process and mine permitting. The aim of site closure is to return the site to a satisfactory condition through the following:

- eliminating unacceptable health hazards and ensuring public safety
- limiting the production and spread of contaminants that could damage the receiving environment and, in the long term, aiming to eliminate all forms of maintenance and monitoring
- returning the site to a condition in which it is visually acceptable (reclamation)
- returning the infrastructure areas (excluding the tailings impoundment and waste rock piles) to a state that is compatible with future use (rehabilitation)

1.17.2 Permitting Considerations

Since the daily feed rate to the plant will not be above 5,000 t/d, a Federal Environmental Assessment process is not required for the project. On the provincial side, Section 2, Paragraph 22 of Part II of Schedule 1 of the Regulation respecting the environmental impact assessment and review of certain projects (c. Q-2, r. 23.1) applies to the La Loutre project:

> "(2) the establishment of a mine whose maximum daily capacity for extracting any other metal ore is equal to or greater than 2,000 metric tons."

The projects listed in Schedule 1 are subject to the environmental impact assessment and review procedure provided for in Subdivision 4 of Division II of Chapter IV of title I of the *Environmental Quality Act* (c. Q-2), to the extent provided therein, and must obtained an authorization from the government.

In addition to this, a variety of permits will have to be obtained from both federal and provincial entities, such as a *Fisheries Act* permit for impacts to fish habitat from the Department of Fisheries and Oceans and an authorization and compensation plan for impacts on wetlands from the Ministry of the Environment and Fight against Climate Change in Québec.

1.17.3 Social Considerations

The La Loutre project is located in the Administrative Region of Outaouais, the Regional County Municipality of Papineau and the Municipality of Lac-des-Plages. The zoning of the project site is split between 14-R (recreotourism) and 6-F (forestry). There is a fishing and hunting outfitter located to the north of the project site and the project site is used for logging, hunting and fishing. The project site is not on any agricultural lands overseen by the CPTAQ.

The project site is located within the Kitigan Zibi Anishinabeg (KZA) First Nations territory. The KZA First Nations are part of the Algonquin Nation and the KZA territory is situated within the Outaouais and Laurentides regions.

Within the framework of the Environmental Impact Assessment and Review Procedure (EIARP) in Southern Québec, various mechanisms have been set up to promote public participation and address public concerns regarding projects likely to have an impact on physical, biological and human environments.

Stakeholder consultation and information dissemination was started in Summer 2021. Lomiko will hold public participation activities in the Fall of 2021.

1.18 Capital and Operating Cost

The capital cost estimate conforms to Class 5 guidelines for a conceptual study estimate with a ±50% accuracy according to the Association for the Advancement of Cost Engineering International (AACE international). The costs are expressed in Q2 2021 Canadian dollars (C$ or CAD).

Table 1-4 provides a summary of the initial capital costs and sustaining capital costs for each of the major WBS areas. The total initial capital cost of the La Loutre project is C$236.14 million.

Table 1-4: Capital Cost Summary

Description	Initial (C$M)	Sustaining (C$M)	Total Capital (C$M)
Area 1000 – Mining	29.42	24.06	53.48
Area 2000 – On Site Infrastructure	28.89		28.89
Area 3000 – Process Plant	79.12		79.12
Area 4000 – Off Site Infrastructure	6.81	13.65	20.46
Area 5000 – Project Indirects	16.17		16.17
Area 6000 – Project Delivery	25.24		25.24
Area 7000 – Owner's Costs	14.42		14.42
Area 8000 – Provisions	36.06		36.06
Total	236.14	37.17	279.84

1.18.1 Mining

The mine capital cost estimate includes purchasing of mine equipment, grubbing, clearing, and the construction of initial haul roads. Unit costs for clearing and grubbing are based on MMTS benchmarking for similar-sized projects. Sustaining capital for subsequent clearing, grubbing, and haul roads is included in the mine operating costs. Equipment costs are based on the MMTS database and include delivery and assembly on site. Capital leasing of equipment has not been used in this study. The pre-production mining cost is developed from base principles utilized for the mine operating costs.

1.18.2 Process Plant and Infrastructure

Major process equipment was sized using process design criteria, the mass balance, and a subsequent mechanical equipment list. Process equipment costs were derived and factored from recent similar projects and recent budget quotes in the Ausenco database. Delivery and installation of process equipment is a factored cost relative to the equipment purchase price. Bulk earthworks for the plant site, mine ancillary buildings, waste disposal facility, and water management infrastructure were developed based on semi-detailed cut-and-fill volumes based on site layout. The unit rates were benchmarked based on recent projects.

1.18.3 Project Indirects, Project Delivery, Owner's Costs and Contingency

Indirect costs include first fills and initial charges, freight and logistics, spares, temporary construction facilities, and commissioning representatives and assistance.

Project delivery includes engineering, procurement and construction management services, environmental services, and commissioning services.

Owners' costs pertain to project staffing and expenses, pre-production labour, home office project management, and home office financial, legal, and insurance.

Contingency is included to address anticipated fluctuations between the estimated and actual costs of materials and equipment. The level of contingency is determined from total installed costs based on each area's level of uncertainty

1.18.4 Sustaining Capital

Mine sustaining costs consist of additional mining equipment in the first five years and replacement in subsequent years, as well as the management of the waste disposal facility (WDF). The total sustaining capital cost incurred over the life-of-mine is C$37.71 million. The sustaining costs are outlined in Table 1-4.

1.18.5 Closure Costs

Closure costs were estimated at C$5.64 million. This cost is directly included in the financial model.

1.19 Operating Cost Estimates

The operating cost estimate was developed in Q2 2021 Canadian dollars (C$ or CAD) to a level of accuracy of ±50% from Ausenco's in-house database of projects and studies and experience from similar operations. The operating cost estimate includes mining, processing, and G&A costs.

The overall operating cost is $30.42/t of ore milled, as summarised in Table 1-5.

Table 1-5: Operating Cost Estimate Summary

Operating Cost	Unit Cost (C$/t Processed)
Mining	16.2
Processing	11.85
Labour	3.48
Power	1.28
Reagents	1.15
Steel Consumables	1.79
Maintenance	0.78
Lab Services	0.70
Mobile Equipment	0.51
Co-Disposal Mobile Equipment	1.85
Site G&A	2.37
Total	30.42

1.20 Economic Analysis

An economic analysis was performed assuming an 8% discount rate. Cash flows have been discounted to the start of construction (June 30, 2024), assuming the project execution decision will be made and major project financing will be carried out at this time.

The pre-tax net present value (NPV) is C$314 million; the internal rate of return (IRR) is 28.3%; and payback period is 3.3 years. On a post-tax basis, the NPV discounted at 8% is C$186 million; the IRR is 21.5%; and the payback period is 4.2 years.

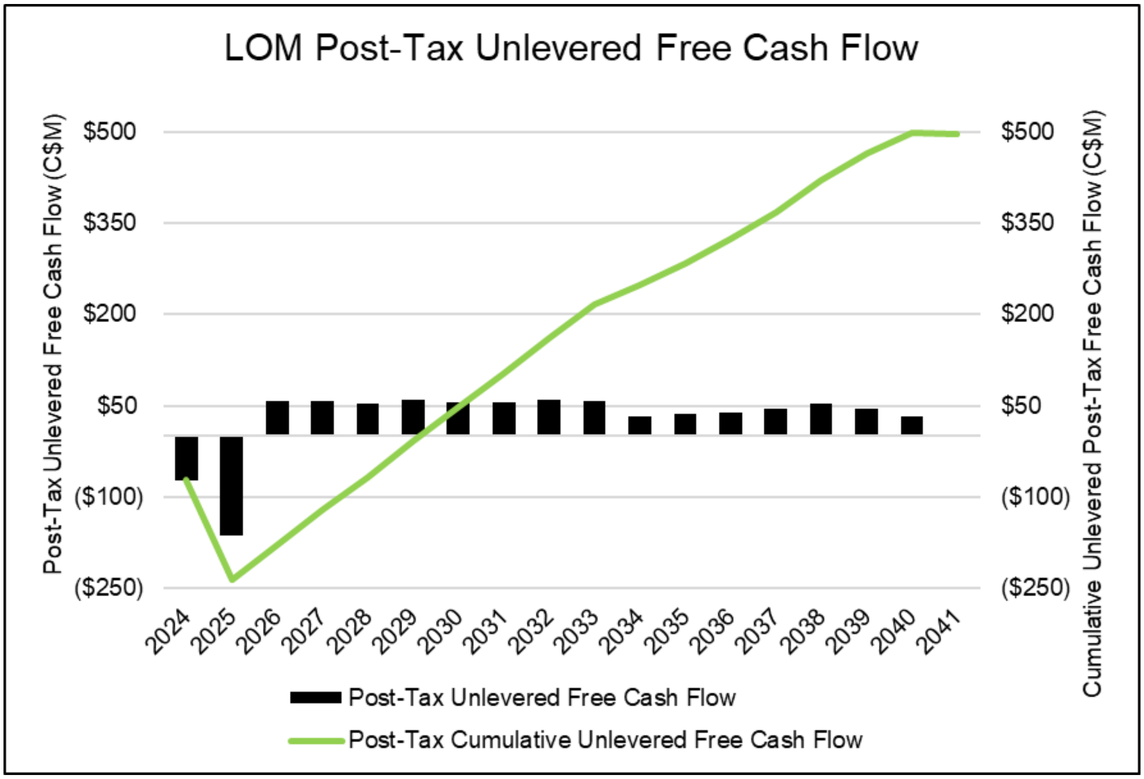
A summary of project economics is listed in Table 1-6Table 1-6 and shown graphically in Figure 1-6.

Table 1-6: Summary of Project LOM Cash Flow Assumptions & Results

General		LOM Total / Avg.
Graphite Concentrate Price (US$/t)		$916
Mine Life (years)		14.74
Total Waste Tonnes Mined (kt)		88,396
Total Mill Feed Tonnes (kt)		21,874
Production		
Mill Head Grade (%)		6.67%
Mill Recovery Rate (%)		94%
Total Mill Tonnes Recovered (Mt)		21.9
Total Average Annual Production (Mt)		97.4
Operating Costs		
Mining Cost (C$/t Milled)		$16.2
Processing Cost (C$/t Milled)		$11.9
G&A Cost (C$/t Milled)		$2.4
Total Operating Costs (C$/t Milled)		$30.4
Cash Costs (US$/t Concentrate)		$385.5
AISC (US$/t Concentrate)		$406.1
Capital Costs		
Initial Capital (C$M)		$236
Sustaining Capital (C$M)		$38
Closure Costs (C$M)		$6
Salvage Costs (C$M)		($4)
Financials	**Pre-Tax**	**Post-Tax**
NPV (8%) (C$M)	$314	$186
IRR (%)	28.3%	21.5%
Payback (years)	3.3	4.2

Notes: * Cash costs consist of mining costs, processing costs, mine-level G&A, refining charges, and royalties. ** AISC includes cash costs plus sustaining capital, closure costs, and salvage value.

Figure 1-6: Project Economics



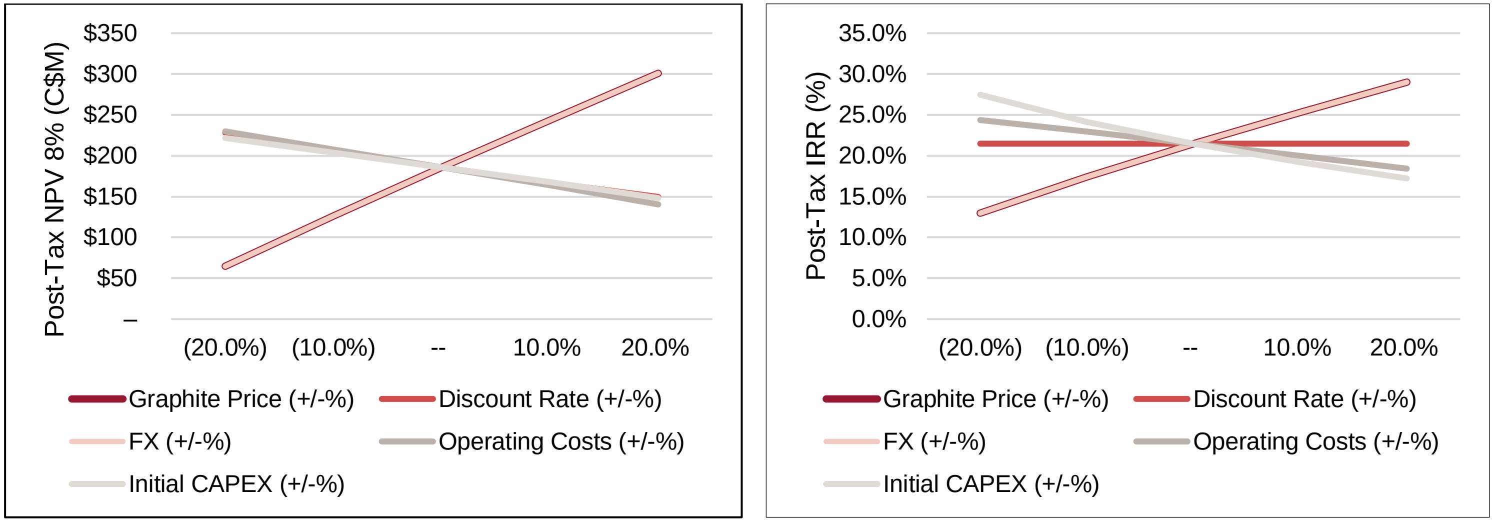
Source: Ausenco, 2021

1.20.1 Sensitivity Analysis

A sensitivity analysis was conducted on the base case pre-tax and post-tax NPV and IRR of the project, using the following variables: graphite concentrate price, discount rate, foreign exchange, operating costs, and initial capital costs.

Figure 1-7 shows the post-tax sensitivity analysis results.

Figure 1-7: Post-Tax NPV & IRR Sensitivity Results



Source: Ausenco, 2021

1.21 Risks and Opportunities

1.21.1 Risks

1.21.1.1 Geology and Resource Modelling

Risks to the resource estimate include potential changes to the geological model affecting the continuity of mineralization and potential increased dilution during mining.

1.21.1.2 Mining

Geotechnical drilling and evaluations may flatten regions of highwalls.

1.21.1.3 Environmental, Social and Permitting

From a social perspective, public perception of the project is a risk that can be turned into an opportunity with efficient consultation and public participation. Wetland impacts will need authorization and permitting, but early alternative selection and reduction of impacts will turn this risk into an opportunity.

The environmental assessment process is an element of risk.

1.21.1.4 Metallurgy

The process flowsheet and conditions were developed using a composite with a limited number of samples. Hence, the metallurgical response of a composite that represents the entire life of mine may deviate from the results obtained for the master composite. However, the consistent metallurgical results for the highly different variability samples reduces this risk.

1.21.1.5 Recovery Methods

The selected full-scale equipment may not be capable to reproduce the results that were obtained on a laboratory scale. To reduce the risk, vendor testing of critical unit processes is recommended during the next phases of project development.

1.21.1.6 Project Infrastructure

A preliminary geochemical characterization was scoped for La Loutre in April 2021 to assess whether there is risk of acid formation for the waste materials, and to a lesser extent, metal leaching behaviour. Although a geochemical program was developed during the PEA, results were not obtained prior to filing date. However, initial geochemical testing of the tailings was conducted as part of the metallurgical test work results. It was determined at this time that the tailings is non-acid generating. Therefore, we have assumed at this point the tailings are non-acid-generating until there is geochemical testing on the tailings and during closure a cap (i.e., encapsulation).

1.21.2 Opportunities

1.21.2.1 Exploration

Exploration activities are likely to identify additional mineralization that could provide additional resources within the known mineralized units, as well as in additional mineralization to the south indicated by geophysical surveys and surface sampling. Extension of the modelled domains and exploration drilling to follow up on these anomalies could enhance overall project economics.

1.21.2.2 Resource Modelling

Infill drilling at each of the deposits could upgrade the classification from inferred resources to provide additional measured and indicated resources.

1.21.2.3 Mining

Geotechnical evaluations may steepen the overall highwall in areas reducing the strip ratio and producing larger economic pits. Trade off study may extend the mine life by expanding the mill feed after year 15 and processing stockpiled feed below the study cut off grade of 2.5% Cg.

1.21.2.4 Environmental, Social and Permitting

From a social perspective, public perception of the project is a risk that can be turned into an opportunity with efficient consultation and public participation. Wetland impacts will need authorization and permitting, but early alternative selection and reduction of impacts will turn this risk into an opportunity.

1.21.2.5 Metallurgy

The flowsheet has been designed to maximize process flexibility to facilitate mill feed with significant variation. This flexibility also facilitates the ability to achieve different grade targets by adjusting the specific energy input in the polishing and stirred media mills. As a consequence, the plant can respond to changing market conditions by raising or lowering the concentrate grades of the +80 mesh and –80 mesh concentrate streams.

1.21.2.6 Recovery Methods

The process flowsheet is based on preliminary information and is conceptual in nature. As additional metallurgical testing is completed, the results will contribute to optimizing flotation and grinding equipment selections. By optimizing grind size fed to the first stage of flotation, product flake size recovery is maximized. Through the optimization of the hydrocyclone circulating load, the product particle size distribution may be improved, increasing product value.

1.21.2.7 Project Infrastructure

Ausenco has identified that expansion of the geochemical characterization program would benefit the project. The following activities may reduce costs and reduce risks associated with geochemical evolution and potentially acid metaliferous drainage or neutral mine drainage. The following activities are recommended: 1. Rock type discretisation and mapping, 2. Geochemical program expansion to sample and analyze each rock type 3. Broaden the ABA and characterisation program for tailings 4. Increase the number of kinetic cells to include elevated risk materials (the current cell includes a composite of 8 samples broadly indicative of the waste sampled) 5. Produce greater confidence in mineralogy via XRD testing on both tailings and waste rock. These opportunities will serve to derisk the project in terms of geochemical performance, including creating an opportunity for differential waste type management, or including engineered approaches to elevated risk material types.

1.22 Interpretation and Conclusions

Geology and mineralization at the La Loutre property have been mapped through a variety of methods. The interpreted geology has been used to create the domains of graphite mineralization at the Battery and EV Zones. A total of 22 high-grade and five low-grade domains at Battery and 15 domains above 1.0% graphite at EV have been used to develop the mineral resource estimate.

Baseline studies at the Project site began in August 2021, collecting wetland, fish, hydrology, hydrogeology, and water quality data. Since the ore production capacity is not expected to be above 5,000 t/d, a Federal Environmental Assessment process for the Project is not planned. On the provincial side, the Project is subject to the environmental impact assessment and review procedure and must obtained an authorization from the Government.

The total indicated mineral resources at a cut off grade of 1.5% C(g) is estimated at 23.1 Mt at an average grade of 4.51% C(g) for a total of 1.04 Mt of graphite. At the same cut off grade, additional inferred mineral resources are estimated to be 46.8 Mt at a grade of 4.01% C(g) for a total of 1.88 Mt graphite.

Based on the assumptions and parameters presented in this report, the PEA shows positive economics (i.e., C$186 M post-tax NPV (8%), 21.5% post-tax IRR, and 4.2-year post-tax payback period on all invested capital). The PEA supports that additional detailed studies are warranted.

1.23 Recommendations

Considering the positive outcome to this report, it is recommended to continue developing the project through additional studies, as outlined below. Table 1-7 summarizes the proposed budget to advance the project through the next study stage.

Table 1-7: Proposed Budget Summary

Description	Cost (C$)
Resource Drilling	3,500,000
Mining & Mining Geotechnical	750,000
Metallurgy	600,000
Infrastructure Geotechnical	950,000
Power	50,000
Waste Disposal Facility	400,000
Environmental	2,000,000
Pre-feasibility Study Budget	1,000,000
Total Recommended Study Budget	**9,250,000**

1.23.1 Resource Drilling

The present PEA considers production from the Battery and EV deposits. Infill drilling is recommended in order to upgrade the inferred resource to the "measured plus indicated" category. The current geological interpretation and graphite interpolations and pit size are limited by the extent of drilling. Drilling both these deposits to the northwest and southeast could extend the mineralized envelopes. Further exploration of mineralized zones not currently modelled is also recommended in areas currently known as the "Reignier B" and "Reignier C" zones. Further surface exploration between these two zones may also extend the mineralization several kilometers to the south.

Table 1-8 summarizes the proposed drill expenditures for infill drilling and exploration for the next two phases of drilling.

Table 1-8: Exploration and Drilling Budget – Phase 1 & 2

Phase	Description	Metreage (m)	Budget (C$M)
1	Surface exploration of known mineralization		$0.2
	Infill drilling to upgrade from inferred to indicated	12,000	$1.8
2	Surface exploration south of resource		$0.2
	Exploration drilling	9,000	$1.3

1.23.2 Mining & Mining Geotechnical

The following work is recommended in the next project phase to advance the mining design:

- geotechnical drilling, evaluation, and recommendations
- trade-off study comparing 40 t trucks to 60 t trucks
- trade-off study for electrification of pits and sizing of equipment
- trade-off study on stockpiling and processing low-grade graphite (below 2.5%) that could materially extend life of mine

The cost of geotechnical drilling and evaluation is estimated at $500,000. The cost of the trade-off studies is estimated at $250,000.

1.23.3 Metallurgical Testwork

The following recommendations are made for the next phase of metallurgical development:

- comprehensive comminution testing on domain samples
- process flowsheet optimization with a master composite that is representative of the mine plan
- variability flotation tests using domain and mine plan composites
- develop a grinding energy versus concentrate grade relationship for the best grinding media; this will allow a more accurate prediction of the required attrition mill grinding energy as a function of the final concentrate grade
- bulk flotation to produce concentrate for marketing initiatives and value-added investigations
- value-added process investigation and development
- additional static and dynamic environmental tests on tailings with and without a desulphurization stage

The cost for the comminution and flotation components of the recommendation is estimated at $200,000. The cost of the value-added process development will depend on the targeted markets and could range between $100,000 and $400,000.

1.23.4 Infrastructure Geotechnical

The following activities are recommended to support the design of the site infrastructure into the next phase of the project:

- Geotechnical site investigations should be carried out at the most optimal surface infrastructure site location to characterize the foundation requirements associated with the proposed surface infrastructure facilities. This program includes a field campaign and laboratory program. The field program should include surface mapping, a drilling program and a test pit program. Samples taken from the field program will be tested in a laboratory to develop design geotechnical parameters. In addition, samples of waste rock (core) and tailings will also be tested in a laboratory to develop geotechnical design parameters. The cost of the geotechnical field and laboratory program is approximately $350,000.
- Geotechnical mine investigations should be carried out to develop the hydrogeology and geotechnical parameters for the open pits. This program includes a drilling champaign and laboratory program to develop pit slope and pit dewatering design parameters. The cost of the geotechnical field and laboratory program is approximately $600,000.

1.23.5 Power

The final routing of the incoming high-voltage Hydro Québec power lines should be studied further in terms of both design and community acceptance. Two scenarios of power transmission line routing should be considered: (1) implementing the CHE 235 line coming from the west (to be constructed and upgraded); and (2) implementing the CHE (Neville) 236 line coming from east. The cost of this is approximately $50,000.

1.23.6 Water Management

The results of the study indicated that early in the mining operation there may not be sufficient makeup water available from pits, stockpile, and collection pond, as they are not yet fully constructed. Consequently, makeup water will need to be supplied from a freshwater source (i.e., several lake and ponds in the vicinity of the mine facilities). Using groundwater from wells is not recommended unless sufficient investigations are completed. During the pre-feasibility study, detailed water balance analysis will be required to review the availability of makeup water throughout the life of mine.

During peak operations, however, there will be a significant amount of surplus water which should be managed. Depending on the quality of collected water, the surplus water should be chemically or physically treated before it is discharged into the environment.

1.23.7 Waste Disposal Facility

A more detailed evaluation of WDF development needs to be carried out in the next project phase. This should include optimization of waste rock and tailings placement (stacking plan), foundation design, surface and seepage water management, and physical and geochemical stability.

1.23.8 Environmental, Social and Permitting

It is recommended that environmental baseline studies be undertaken to characterize the wetlands, water resources, and fish habitat to advance the project toward the environmental assessment process. Stakeholder consultation will also be carried out in the Fall 2021.

2 INTRODUCTION

2.1 Introduction

Ausenco Engineering Canada Inc. (Ausenco) has prepared a preliminary economic assessment (PEA) report for Lomiko Metals Inc. (Lomiko) on the La Loutre Graphite (La Loutre) project located in the Laurentian region of Quebec. The report, dated September 10th, 2021, was prepared in compliance with the Canadian disclosure requirements of National Instrument 43-101 (N.I. 43-101) and Form 43-101 F1.

The responsibility of the engineering consultants are as follows:

- Ausenco was commissioned by Lomiko to manage and coordinate the work related to the N.I. 43-101 as lead study consultant. Ausenco also developed the PEA level design and cost estimating of the process plant, surface infrastructure, and design of the waste disposal facility (WDF).
- Hemmera Envirochem Inc. (Hemmera), an Ausenco company, was engaged to conduct water management and environmental studies, planning, assessment, licensing, and permitting.
- Moose Mountain Technical Services (MMTS) was commissioned to complete the quality assurance and quality control (QA/QC) analyses, mineral resource estimates, supervise geology inputs, and to design the open pit mine plan, mine production schedule, and mine capital and operating costs.
- Metpro Management Inc. (Metpro) was engaged to manage and interpret metallurgical testing completed by SGS.

Readers are cautioned that the PEA report is preliminary in nature

2.2 Terms of Reference

The La Loutre project consists of an open pit mine and an associated processing facility along with on-site and off-site infrastructure to support the operation. The operation is designed to have an open pit mine with a plant potential of 4,110 tonnes per day (t/d). This technical report was prepared to provide sufficient information to determine the economic feasibility of developing the La Loutre property.

This report supports disclosures by Lomiko in a news release dated July 29, 2021 entitled “Lomiko Metals Inc. Delivers Positive PEA For La Loutre Graphite Project”. All measurement units used in this report are SI units unless otherwise noted. Currency is expressed in Canadian dollars (C$ or CAD) unless otherwise noted.

Mineral resources are reported in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum’s “Definition Standards for Mineral Resources and Mineral Reserves” (2014) and “Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines” (2019).

2.3 Qualified Persons

The following individuals serve as qualified persons (QPs) for this technical report as defined in N.I. 43-101, Standards of Disclosure for Mineral Projects, and in compliance with Form 43-101F1:

- Mr. Tommaso Robert Raponi, P.Eng., Senior Mineral Processing Specialist, Ausenco
- Mr. Ali Hooshiar, P. Eng., Geotechnical Engineer, Ausenco
- Mr. Scott Weston, P. Geo., Vice President – Business Development, Hemmera
- Ms. Sue Bird, P.Eng., Principal and V.P., MMTS
- Mr. Greg Trout, P.Eng., Principal, MMTS
- Mr. Oliver Peters, P.Eng., Principal Metallurgist, Metpro Management

Table 2-1 on the following page lists the sections for which each QP is responsible.

2.4 Site Visits and Scope of Personal Inspection

The QPs have contributed to the technical report as follows:

- Tommaso "Robert" Raponi of Ausenco for recovery methods, plant and infrastructure capital and operating costs and study coordination. Mr. Raponi did not visit the property.
- Ali Hooshiar of Ausenco for the waste disposal facility design. Mr. Hooshiar has not visited the property.
- Scott Weston of Hemmera for environmental permitting and social considerations. Mr. Weston has not visited the property.
- Sue Bird of MMTS for geology, deposit model, exploration, drilling, sample preparation and analysis, data verification, and mineral resource estimates. Ms. Bird has not visited the property.
- Greg Trout of MMTS for mining methods. Mr. Trout visited the property between June 1, 2021and June 2, 2021, and toured the property with Hubert Chicoine. During the visit, locations were confirmed for four drill hole collars with a handheld GPS device. The core shack was visited, and drilling and sampling protocols were reviewed and confirmed. The core boxes in the storage facility in Val D'Or were also observed.
- Oliver Peters of Metpro for mineral processing and metallurgical testing. Mr. Peters did not visit the property.

2.5 Effective Dates

The effective date of the report and financial analysis is July 27, 2021. The mineral resource estimate effective date is May 14, 2021.

2.6 Information Sources and References

This report is based on internal company reports, maps, published government reports, and public information, as listed in Section 27 of this report. It is also based on the information cited in Section 3.

2.7 Previous Technical Reports

The following previous technical report was used to support the writing of this report:

Turcot, B., Servelle, G., Peters, O., 2016: Technical Report and Mineral Resource Estimate for the La Loutre Property, report prepared for Canada Strategic Metals Inc. and Lomiko Metals Inc., effective date January 15, 2016.

Table 2-1: List of Qualified Persons and Respective Report Sections

Person	Professional Designation	Position	Employer	Report Sections
Tommaso Robert Raponi	P.Eng. (QC)	Principal Metallurgist	Ausenco	1.1-1.3, 1.14, 1.15. 1.16, 1.18 (except 1.18.1), 1.19, 1.20, 1.21.1.4, 1.21.1.5, 1.21.2.6, 1.21.2.7, 1.22, 1.23.5, 2, 3, 4, 17, 18.1-18.5 (except 18.2.2), 19, 21.1, 21.2.1, 21.2.2, 21.2.4-21.2.7, 21.2.8.2, 21.2.9, 21.3 (except 21.3.3), 22, 25.1, 25.2, 25.9, 25.10, 25.12-25.14, 25.15.1.5, 25.15.1.6, 25.15.2.6, 25.15.2.7, 26.1, and 26.6
Ali Hooshiar	P.Eng. (QC)	Geotechnical Engineer	Ausenco	1.23.4-1.23.7, 16.3, 18.6-18.8, 26.5, 26.7, and 26.8
Scott Weston	P.Geo. (BC)	Vice President – Business Development	Hemmera	1.4, 1.17, 1.21.1.3, 1.21.2.4, 1.23.8, 5, 20, 25.11, 25.15.1.3, 25.15.2.4, and 26.9
Sue Bird	P.Eng. (BC)	Principal and V.P.	MMTS	1.5-1.10, 1.12, 1.21.1.1, 1.21.2.1, 1.21.2.2, 1.23.1, 6-12, 14, 25.3, 25.4, 25.6, 25.7, 25.15.1.1, 25.15.2.1, 25.15.2.2, and 26.2
Greg Trout	P.Eng. (AB)	Principal	MMTS	1.13, 1.18.1, 1.21.1.2, 1.21.2.3, 1.23.2, 16.1-16.2, 16.4-16.9, 18.2.2, 21.2.3, 21.2.8.1, 21.3.3, 25.8, 25.15.1.2, 25.15.2.3, and 26.3
Oliver Peters	P.Eng. (ON)	Principal Metallurgist	Metpro	1.11, 1.21.1.4, 1.21.2.5, 1.23.3, 13, 25.5, 25.15.1.4, 25.15.2.5, and 26.4

2.8 Abbreviations

Table 2-2: Abbreviations

Abbreviation	Meaning	Abbreviation	Meaning
μm	micron	km	kilometer
°C	degree Celsius	km^2	square kilometer
°F	degree Fahrenheit	L	Litre

Abbreviation	Meaning	Abbreviation	Meaning
°	azimuth/dip in degrees	m	meter
µg	microgram	M	mega (million)
a	annum	Mt	million tonnes
Au	gold	m^2	square meter
C$ or CAD	Canadian dollars	m^3	cubic meter
cal	calorie	min	Minute
cm	centimetre	masl	metres above sea level
d	day	mm	millimeter
ft	foot or feet	oz/t, oz/st	ounce per short ton
g	gram	oz	Troy ounce (31.1035 g)
G	giga (billion)	ppb	parts per billion
g/L	gram per litre	ppm	part per million
g/t	gram per tonne	s	Second
ha	hectare	ton, st	short ton
hp	horse power	t, tonne	metric tonne
in	inch or inches	US$ or USD	United States dollar
kg	kilogram	y	year

Source: Ausenco (2021).

3 RELIANCE ON OTHER EXPERTS

3.1 Introduction

The QPs have relied upon the following other expert reports, which provided information regarding mineral rights, surface rights, property agreements, and taxation for sections of this report.

3.2 Mineral Tenure, Land Surface Rights, Water Rights, Royalties and Property Agreements

Lomiko supplied information about mining titles, option agreements, royalty agreements, environmental liabilities and permits. The QPs are not qualified to express any legal opinion with respect to the property titles or current ownership and possible litigation. A description of such agreements, the property, and ownership thereof, is provided for general information purposes only. In this regard, the QPs have relied on information supplied by Lomiko and the work of experts they understand to be appropriately qualified.

This information is used in Chapter 4 (Property Description and Location) of the report. The information is also used in support of the mineral resource estimate in Chapter 14, and the financial analysis in Chapter 22.

3.3 Taxation

The QPs have fully relied upon, and disclaim responsibility for, information supplied by Lomiko staff and experts retained by Lomiko for information related to taxation as applied to the financial model as follows:

DMCL Charted Professional Accountants, 2021. Taxation Information in the N.I. 43-101 Technical Report prepared by Ausenco Engineering Canada for Lomiko Metals Inc.

This information is used in support of the financial analysis in Chapter 22.

3.4 Markets

The QPs have fully relied upon, and disclaim responsibility for information supplied by Lomiko staff and experts retained by Lomiko for information related to graphite concentrate pricing provided by Benchmark Minerals Intelligence.

Concentrate pricing was received from Benchmark Mineral Intelligence on June 30, 2021. Pricing was based upon the Benchmark Mineral Intelligence 'Flake Graphite Price Forecast – Q2 -2021.

This information is used in Sections 19, 22, and 25.14 of the report.

Mineral market pricing is a specialized business requiring knowledge of supply and demand, economic activity and other factors that are highly specialized and requires an extensive global database that is outside of the purview of a QP.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Property in Laurentide Administrative Region

The La Loutre property is located in the Laurentides administrative region (known as the Laurentians) in Québec, Canada (see Figure 4-1 on the following page). It is approximately 30 km west-southwest of the city of Mont-Tremblant (about 45 km by road). The property is approximately 180 km northwest of Montreal, which can be accessed via Highway A15, Highway 117 and Highway 327. The approximate centroid of the La Loutre property is at 75°00'00"W and 46°00'30"N (UTM coordinates: 500300E and 5095000N, NAD 83, Zone 18). The nearest community is Duhamel, 5 km to the west. The property lies in the townships of Addington and Suffolk on NTS maps sheets 31G/14, 31G/15, 31J/02 and 31J/03.

4.2 Project Ownership

On February 27, 2012, Canada Rare Earths Inc. (now Canada Strategic Metals Inc. ("Canada Strategic")) acquired the La Loutre property from three people (the "Vendors"): Jean-Sébastien Lavallée (33.33%; president and CEO of Canada Strategic), Jean-Raymond Lavallée (33.33%), and Michel Robert (33.33%). At that time, the La Loutre property consisted of one block of 42 mining claims covering an aggregate area of 2,508.97 ha. Canada Rare Earths Inc. had an option to earn a 100% interest in the La Loutre property by making the following payments and issuing the following common shares to the Vendors:

- C$15,000 upon signing the letter agreement (paid)
- C$15,000 and 1,000,000 common shares on receipt of the Toronto Venture Exchange (TSX-V) acceptance of the agreement
- C$15,000 six months from TSX-V acceptance
- C$15,000 and 500,000 common shares 12 months from TSX-V acceptance
- C$15,000 and 500,000 common shares 18 months from TSX-V acceptance

According to the terms of the agreement, Canada Rare Earths Inc. was obliged to spend a minimum of C$100,000 on exploration on the La Loutre property during the 12-month period from the date of TSX-V acceptance. The Vendors retained a 1.5% net smelting royalty (NSR) on the La Loutre property, 0.5% of which could be purchased by Canada Rare Earths Inc. for C$500,000.

On June 27, 2013, Canada Strategic announced that it had negotiated an amendment to the outstanding property option agreement with the Vendors. The two payments of C$15,000, originally due 6 and 12 months from the date of the TSX-V approval (which was received on March 16, 2012), were cancelled and in lieu thereof, Canada Strategic agreed to issue to the Vendors 1,100,000 shares on the day that is 12 months from the date of the TSX-V approval. Furthermore, it was agreed that the fourth payment of C$15,000, which was due on the day that is 18 months from the date TSX-V approval was received, may be paid in common shares at a price per share equal to the market price of the issuer's shares on the TSX-V on the date the amount is payable, subject to the minimum price allowed under the policies of the TSX-V. All other terms of the agreement remained unchanged. The terms of the option had been paid in full and Québec Precious Metals became the 100% owner of the project subject to Net Smelter Returns (NSRs) of 1.5%. The holders of the NSR are Michel Robert, JS Lavallee and Jean-Raymond Lavallee.

Lomiko has increased its ownership of the La Loutre project from 80% to 100% having paid the sum of $1,125,000 to the vendor Québec Precious Minerals Corporation. This acquisition was deemed complete with property transfer on March 29, 2021. There are no other agreements in place.

Figure 4-1: Property Location

Source: Lomiko Metals, 2021

4.3 Property Agreements

4.3.1 2014 Agreement between Canada Strategic and Lomiko

On September 23, 2014, Canada Strategic announced that it had signed an agreement with Lomiko for a 40% undivided interest in the La Loutre property. According to the agreement, Lomiko could acquire the 40% undivided interest by paying C$12,500 upon signing the Agreement (non-refundable); by issuing an aggregate of 1,250,000 common shares of Lomiko at a deemed price of C$0.07 per share within 10 business days following the effective date of the agreement; and by incurring C$500,000 in exploration expenditures no later than the first anniversary of the effective date.

Lomiko has completed all the terms of the 2014 Agreement. Thus, at the date of completion, Canada Strategic held a 60% undivided interest in the La Loutre property and Lomiko the remaining 40%.

4.3.2 2015 Agreement between Canada Strategic and Lomiko

On February 9, 2015, Canada Strategic and Lomiko agreed to the terms of an additional option pursuant to which Lomiko shall have the exclusive right and option to acquire an additional 40% undivided interest in the La Loutre property and an 80% undivided interest in the Lac des Iles property (located near Mont-Laurier) in exchange for a cash payment of $1,010,000, the issuance of 3,000,000 common shares of Lomiko, and the funding of $1.75 million in exploration expenditures over a two-year period. The terms of the option were completed.

4.3.3 New Claims Staked by Canada Strategic

On July 29, 2015, Canada Strategic added six new claims (358.32 ha) to the La Loutre property by electronic map designation. These claims were included in the previous agreement between Canada Strategic and Lomiko. These claims have no underlying royalty.

4.3.4 2017 Agreement between Canada Strategic and Lomiko

Lomiko and Canada Strategic amended the property agreement of February 9, 2015, and on the La Loutre and Lac des Iles property allowing Lomiko to acquire up to a 100% interest in the project from Canada Strategic. Lomiko would be required to issue 950,000 shares and complete $1,125,00 of exploration expenditures by December 31, 2020.

4.3.5 2020 Agreement between Québec Precious Metals and Lomiko

Lomiko and Québec Precious Metals again amended the Property Agreement to extend the deadline for additional exploration expenditures totalling $1,125,000 on the La Loutre project, the Lac des Iles project, and/or other designated properties as mutually agreed to by Lomiko and Québec Precious Metals by December 31, 2021. Lomiko was to pay 1,000,000 common shares, completed June 2020. A cash payment in lieu of exploration was paid February 1, 2021 to complete the 100% option.

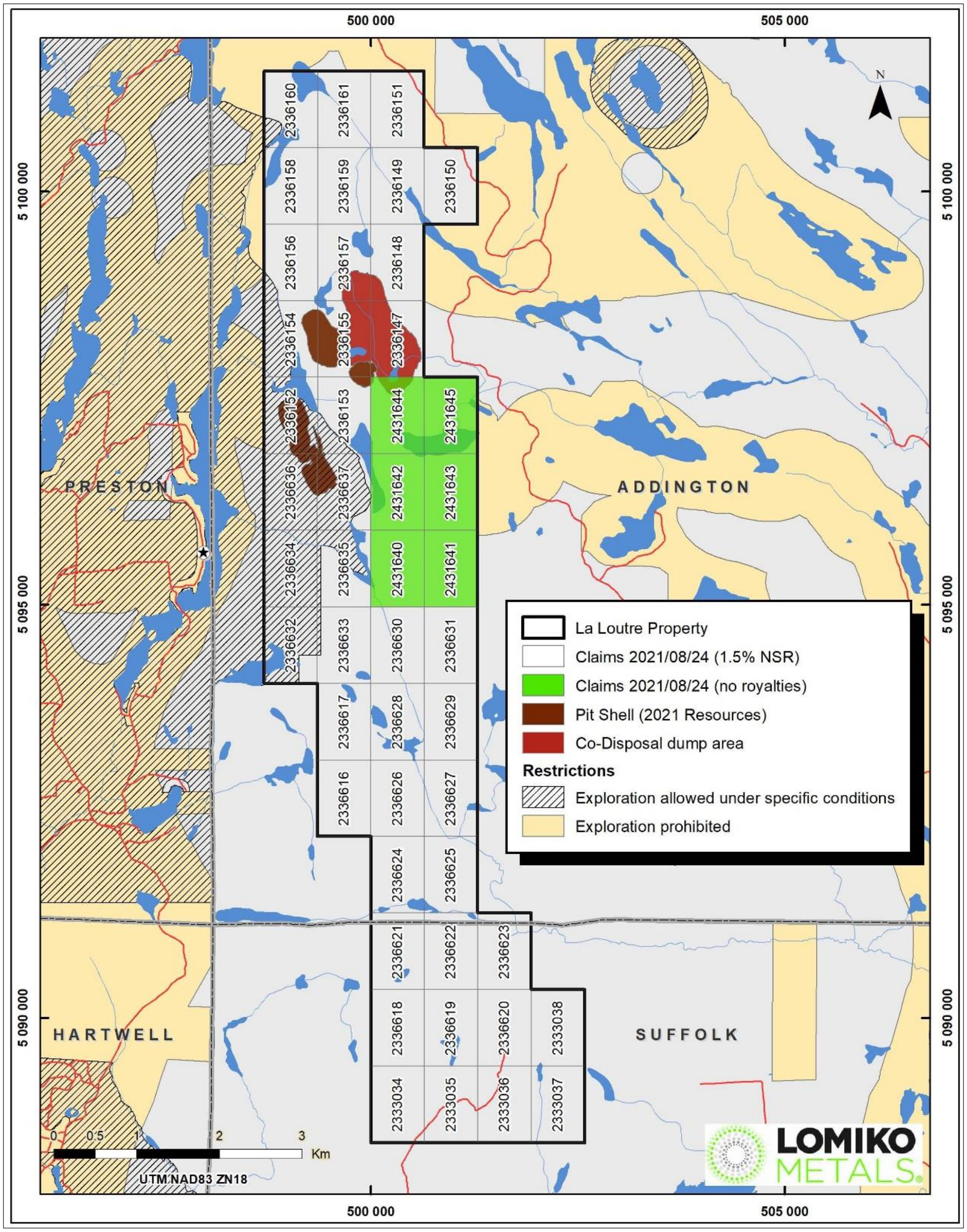
4.4 Mineral Tenure

In the Province of Québec, claims are now referred to as "map-designated" claims. These predetermined claims each measure 30° longitude by 30° latitude. Claims can be acquired for a fee using an online form on the GESTIM website (https://gestim.mines.gouv.qc.ca). Claims are valid for a period of two years, after which a certain amount of accumulated work credits on the claims is required for renewal in addition to a renewal fee.

All 48 claims comprising the La Loutre Claim Block are 100% owned by Lomiko. A sufficient number of credits, $1007,408.87, has been obtained to satisfy the statutory work obligations needed to renew the entire La Loutre Claim Block until after March 2023. An amount of $3,216.00 will be required to renew all claims forming the La Loutre Claim Block for an additional two years following their present expiry date. Work necessary for renewal is $82,800.00.

The information, downloaded from the GESTIM website on August 24, 2021 concerning the claims of the La Loutre Block, such as work credits required for renewal, credits accumulated from recent work, claim size and expiry date, is presented in Table 4-1. All mining titles are in good standing according to the GESTIM database. A detailed list of mining titles, ownership, royalties and expiration dates is provided on Figure 4-2 and in Table 4-1.

Figure 4-2: Mineral Tenure Plan



Source: Lomiko Metals, 2021

Table 4-1: List of Mining Titles

Claim Number	NTS Sheet	Range	Lot	Expiration Date	Area (ha)	Work Credits	Work Req'd for Renewal	Renewal Fees	Royalty
2431640	32J02	2	1	July 28, 2022	59.73	$110.25	$1,200.00	$67.00	
2431641	32J02	2	2	July 28, 2022	59.73	$110.25	$1,200.00	$67.00	
2431642	32J02	3	1	July 28, 2022	59.72	$110.25	$1,200.00	$67.00	
2431643	32J02	3	2	July 28, 2022	59.72	$110.25	$1,200.00	$67.00	
2431644	32J02	4	1	July 28, 2022	59.71	$110.25	$1,200.00	$67.00	
2431645	32J02	4	2	July 28, 2022	59.71	$110.25	$1,200.00	$67.00	
2333034	31G15	25	1	March 1, 2023	59.79	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2333035	31G15	25	2	March 1, 2023	59.79	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2333036	31G15	25	3	March 1, 2023	59.79	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2333037	31G15	25	4	March 1, 2023	59.79	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2333038	31G15	26	4	March 1, 2023	59.79	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336147	31J02	5	1	March 15, 2023	59.70	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336148	31J02	6	1	March 15, 2023	59.70	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336149	31J02	7	1	March 15, 2023	59.69	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336150	31J02	7	2	March 15, 2023	59.69	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336151	31J02	8	1	March 15, 2023	59.68	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336152	31J03	4	59	March 15, 2023	59.71	$188,612.06	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336153	31J03	4	60	March 15, 2023	59.71	$39,572.21	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336154	31J03	5	59	March 15, 2023	59.70	$106,995.39	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336155	31J03	5	60	March 15, 2023	59.70	$614,953.73	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336156	31J03	6	59	March 15, 2023	59.70	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336157	31J03	6	60	March 15, 2023	59.70	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336158	31J03	7	59	March 15, 2023	59.69	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336159	31J03	7	60	March 15, 2023	59.69	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336160	31J03	8	59	March 15, 2023	59.68	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336161	31J03	8	60	March 15, 2023	59.68	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336616	31G14	29	60	March 19, 2023	59.76	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336617	31G14	30	60	March 19, 2023	59.75	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336618	31G15	26	1	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336619	31G15	26	2	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336620	31G15	26	3	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336621	31G15	27	1	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336622	31G15	27	2	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336623	31G15	27	3	March 19, 2023	59.78	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336624	31G15	28	1	March 19, 2023	59.77	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336625	31G15	28	2	March 19, 2023	59.77	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336626	31G15	29	1	March 19, 2023	59.76	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336627	31G15	29	2	March 19, 2023	59.76	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336628	31G15	30	1	March 19, 2023	59.75	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336629	31G15	30	2	March 19, 2023	59.75	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336630	31J02	1	1	March 19, 2023	59.74	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336631	31J02	1	2	March 19, 2023	59.74	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336632	31J03	1	59	March 19, 2023	59.74	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336633	31J03	1	60	March 19, 2023	59.74	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336634	31J03	2	59	March 19, 2023	59.73	$0.00	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336635	31J03	2	60	March 19, 2023	59.73	$94.07	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000

Claim Number	NTS Sheet	Range	Lot	Expiration Date	Area (ha)	Work Credits	Work Req'd for Renewal	Renewal Fees	Royalty
2336636	31J03	3	59	March 19, 2023	59.72	$46,202.25	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
2336637	31J03	3	60	March 19, 2023	59.72	$10,317.69	$1,800.00	$67.00	1.5% NSR, of which 0.5% may be purchased for $500,000
Total					2867.29	$1,0007,408.87	$82,800.00	$3,216.00	

4.5 Surface Rights

The following discussion on mining rights in the province of Québec was mostly summarized from Guzun (2012), Gagné and Masson (2013), and from the Act to Amend the Mining Act (Bill 70; the "Amending Act") assented on December 10, 2013 (National Assembly, 2013).

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

4.5.1 The Claim

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

4.5.2 The Mining Lease

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

4.5.3 The Mining Concession

Mining concessions are extraction (production) mining titles which give their holder the exclusive right to mine mineral substances (other than surface mineral substances, petroleum, natural gas and brine).

Mining concessions were issued prior to January 1, 1966. After that date, grants of mining concessions were replaced by grants of mining leases. Although similar in certain respects to mining leases, mining concessions granted broader surface and mining rights and are not limited in time. A grantee must commence mining operations within five years from December 10, 2013. As is the case for a holder of a mining lease, a grantee may be required by the government, on reasonable grounds, to maximize the economic spinoffs within Québec of mining the mineral resources authorized under the concession. It must also, within three years of commencing mining operations and every 20 years thereafter, send the Ministry a scoping and market study regarding processing in Québec.

4.5.4 Mining Title Status

Mining title status for the La Loutre property was supplied by A. Paul Gill, CEO of Lomiko, who verified the status of all mining titles in consultation with Jean-Sebastian Lavallée, former President and CEO of Canada Strategic and former QP for the La Loutre project. Canada Strategic is the predecessor of Québec Precious Metals, the current optionee. By using GESTIM, the Québec government's online claim management system at the following address, http://gestim.mines.gouv.qc.ca (via Internet Explorer browser only, Mr. Gill has provided confirmation from MERN (transfer document of March 29, 2021) that 100% of the property has been transferred to Lomiko from Québec Precious Metals, subject to a 1.5% NSR..

The La Loutre property consists of one block of 48 claims staked by electronic map designation, covering an aggregate area of 2,867.29 ha (Figure 4 2). All the mining claims are registered 100% in the name of Lomiko Metals Inc.., All mining titles are in good standing according to the GESTIM database.

4.6 Water Rights

Not applicable.

4.7 Royalties and Encumbrances

Of the 48 claims staked by the company, 42 are subject to a 1.5% NSR. Six are free of NSR payments.

4.8 Comments on Property Description and Location

The property is approximately 180 km northwest of Montreal, which can be accessed via Highway A15, Highway 117 and Highway 327. For more details on property location, refer to Section 4.2.

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

5.1 Accessibility

The La Loutre property is accessible from Route 323 by driving north from Montreal on Highway 15, then onto Highway 117 to St-Jovite and finally turning left or west onto Highway 323 for 40 km to Lac des Plages. Highway 323 crosses the municipalities of Brébeuf and Amherst prior to reaching Lac des Plages. Once there, a series of secondary roads and forestry roads lead to the property via Legget Road along Sioui Lake and Lac La Loutre. Legget Road is accessed between Lac des Plages located 10 km to the east and Lac Simon located 7 km to the west.

5.2 Climate

The climate of the region where the La Loutre property is located ranges between temperate to humid continental, based on Koppen classification[2] (Natural Resources Canada, 1957). The month with the highest temperature is July (18.9°C) and the month with the lowest temperature is January (-12.5°C) (Environment Canada climate normal at Cheneville station). The temperature is above freezing for approximately 176 days annually. Total average annual precipitation is 1,090 mm, of which 81% is rain and 19% is snow. It precipitates almost 170 days per year with 15 rainy days in June, and 13 snowy days in January.

The climate stations close to the project site with sufficient minimum data history (40 years) are: Cheneville, Notre Dame de la Paix, Huberdeau, Montebello (Sedbergh) and Arundel. Table 5-1 shows a brief description of their geographical location relative to the site and their data history period; Figure 5-1 depicts their location.

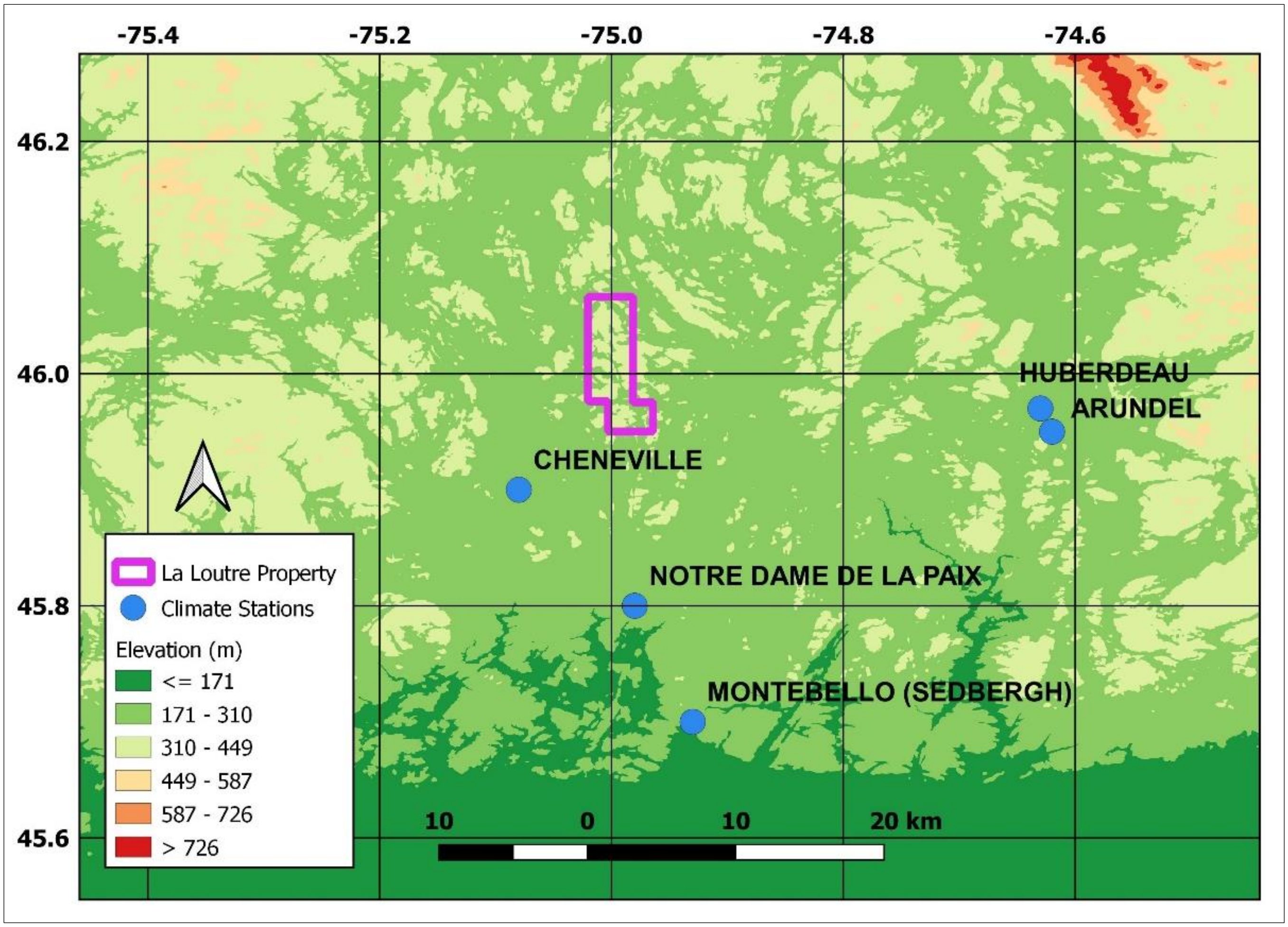
Table 5-1: Climate Stations Near the La Loutre Project

Station Name	Station ID	Distance to Center of site (km)	Elevation (m)	Latitude (DD)	Longitude (DD)	First Year	Last Year
Cheneville	5586	9	222.5	45.9	-75.08	1964	2020
Notre Dame de la Paix	5619	18	183	45.8	-74.98	1979	2020
Huberdeau	5593	28	213.4	45.97	-74.63	1913	1980
Montebello (Sedbergh)	5612	29	196.6	45.7	-74.93	1956	2015
Arundel	5575	30	191.4	45.95	-74.62	1963	2020

Climate normal and intensity-duration-frequency (IDF) curves are available on the Environment Canada website for the Cheneville station. Climate indicators have been calculated from the monthly time-series for the remaining four stations.

[2] Atlas of Canada, 3rd Edition (1957)

Figure 5-1: Project Location and Nearby Climate Stations



Source: Hemmera, 2021

The climate normal and summary of monthly average hydrologic-related data are summarized in Tables 5-2 to 5-6.

Table 5-2: Cheneville Climate Normal (Monthly Values)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Daily Average (°C)	-12.5	-10	-4	4.6	11.2	16.5	18.9	17.8	13.2	6.5	0.1	-7.8	4.5
Daily Maximum (°C)	-6.9	-3.9	1.9	10.6	17.9	23.1	25.3	24.2	19.2	11.5	4.1	-3.3	10.3
Daily Minimum (°C)	-18.1	-16.2	-10	-1.5	4.5	9.9	12.4	11.3	7.1	1.5	-4	-12.2	-1.3
Rainfall (mm)	22.1	24.6	35	77.6	92.5	94.3	110.1	112.7	101.4	106.7	82.3	30.3	889.7
Snowfall (cm)	50.4	42	34.6	4.4	0	0	0	0	0.1	2.2	18.2	49.4	201.4
Precipitation (mm)	72.6	66.6	69.6	82.1	92.5	94.3	110.1	112.7	101.5	108.9	100.5	79.7	1091.1
Average Snow Depth (cm)	33	42	38	5	0	0	0	0	0	0	2	17	11
Extreme Snow Depth (cm)	110	108	123	90	0	0	0	0	2	8	50	100	

Table 5-3: Notre Dame de la Paix Station Average Climate Indicators (Daily Measurements)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Temperature (°C)	-11.7	-9.8	-3.9	4.8	11.7	16.8	19.1	17.9	13.4	6.8	0.5	-7.8	4.8
Maximum Temperature (°C)	-6.3	-4.0	1.8	10.2	18.4	23.2	25.7	24.4	19.6	11.9	4.5	-2.9	10.5
Minimum Temperature (°C)	-17.0	-15.7	-9.4	-1.0	5.1	10.4	12.9	11.6	7.3	1.7	-3.8	-12.1	-0.8
Rainfall (mm)	0.8	0.5	1.1	2.5	2.9	3.3	3.4	3.2	3.3	3.2	2.3	0.9	822
Snowfall (cm)	1.4	1.5	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.5	181
Precipitation (mm)	2.2	2.0	2.0	2.7	2.9	3.3	3.4	3.2	3.3	3.2	2.8	2.5	1004
Maximum Rain (mm)	43	34	35	45	49	56	82	62	100	76	47	51	
Maximum Snowfall (cm)	20	40	38	20	3	0	0	0	0	16	32	35	
Average Snow Depth (cm)	30	42	33	2	0	0	0	0	0	0	1	13	10

Table 5-4: Huberdeau Station Average Monthly Climate Indicators (Daily Measurements)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Temperature (°C)	-11.6	-10.8	-4.1	3.9	11.0	16.4	18.9	17.5	13.0	7.0	0.0	-8.6	4.4
Maximum Temperature (°C)	-6.0	-4.5	1.6	9.6	17.8	22.8	25.2	23.9	18.9	12.3	3.9	-4.0	10.1
Minimum Temperature (°C)	-17.2	-17.1	-9.7	-1.7	4.4	10.0	12.5	11.1	7.1	1.7	-3.9	-13.1	-1.3
Rainfall (mm)	0.7	0.4	1.0	1.9	2.4	3.3	3.1	3.0	3.1	2.6	2.0	0.8	725
Snowfall (cm)	1.7	1.7	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.8	1.8	219
Precipitation (mm)	2.4	2.1	2.0	2.1	2.4	3.3	3.1	3.0	3.1	2.6	2.7	2.6	945
Maximum Rain (mm)	42	54	85	45	46	101	74	65	57	58	49	45	
Maximum Snow (cm)	46	45	44	25	6	0	0	0	0	15	27	43	

Table 5-5: Montebello Station Average Monthly Climate Indicators (Daily Measurements)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Temperature (°C)	-11.4	-9.9	-3.3	5.0	11.9	16.7	19.2	18.0	13.4	6.9	0.5	-7.7	5.0
Maximum Temperature (°C)	-6.5	-4.6	1.9	10.6	18.3	22.7	25.1	23.8	18.9	11.7	4.3	-3.4	10.2
Minimum Temperature (°C)	-16.3	-15.2	-8.5	-0.6	5.6	10.7	13.3	12.1	7.9	2.2	-3.3	-11.9	-0.3
Rainfall (mm)	0.9	0.7	1.2	2.6	3.0	3.6	3.5	3.5	3.7	3.3	2.7	1.3	899
Snowfall (cm)	1.9	1.8	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.7	2.0	236
Precipitation (mm)	2.8	2.5	2.3	2.9	3.0	3.6	3.5	3.5	3.7	3.3	3.4	3.3	1136
Maximum Rain (mm)	53	57	40	43	71	68	72	83	107	60	60	51	
Maximum Snow (cm)	39	52	58	28	4	0	0	0	0	20	35	55	
Average Snow Depth (cm)	30.4	41.7	38.4	5.7	0.0	0.0	0.0	0.0	0.0	0.1	1.8	15.7	11.1

Table 5-6: Arundel Station Average Monthly Climate Indicators (Daily Measurements)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Temperature (°C)	-13.7	-11.3	-4.7	3.9	11.3	15.9	18.7	17.4	11.8	5.6	-0.5	-9.6	3.7
Maximum Temperature (°C)	-7.5	-4.7	1.5	10.1	18.3	22.6	25.3	23.9	17.7	10.7	3.6	-4.2	9.8
Minimum Temperature (°C)	-19.9	-17.8	-10.7	-2.3	4.3	9.1	12.0	11.0	5.9	0.3	-4.7	-15.1	-2.3
Rainfall (mm)	0.5	0.5	1.2	2.0	2.9	3.1	2.5	3.3	3.0	3.1	2.4	0.7	755
Snowfall (cm)	1.9	1.5	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.7	2.1	227
Precipitation (mm)	2.4	2.0	2.2	2.3	2.9	3.1	2.5	3.3	3.0	3.2	3.0	2.9	983
Maximum Rain (mm)	29.2	33	33	32	34.5	49	51	67.2	50.8	50.8	57.9	23.4	
Maximum Snow (cm)	50.8	31	30.2	43.7	6	0	0	0	0	11.4	25.4	41.7	
Average Snow Depth (cm)	35.5	51.3	48.5	5.5	0.0	0.0	0.0	0.0	0.0	0.1	1.2	14.1	13.0

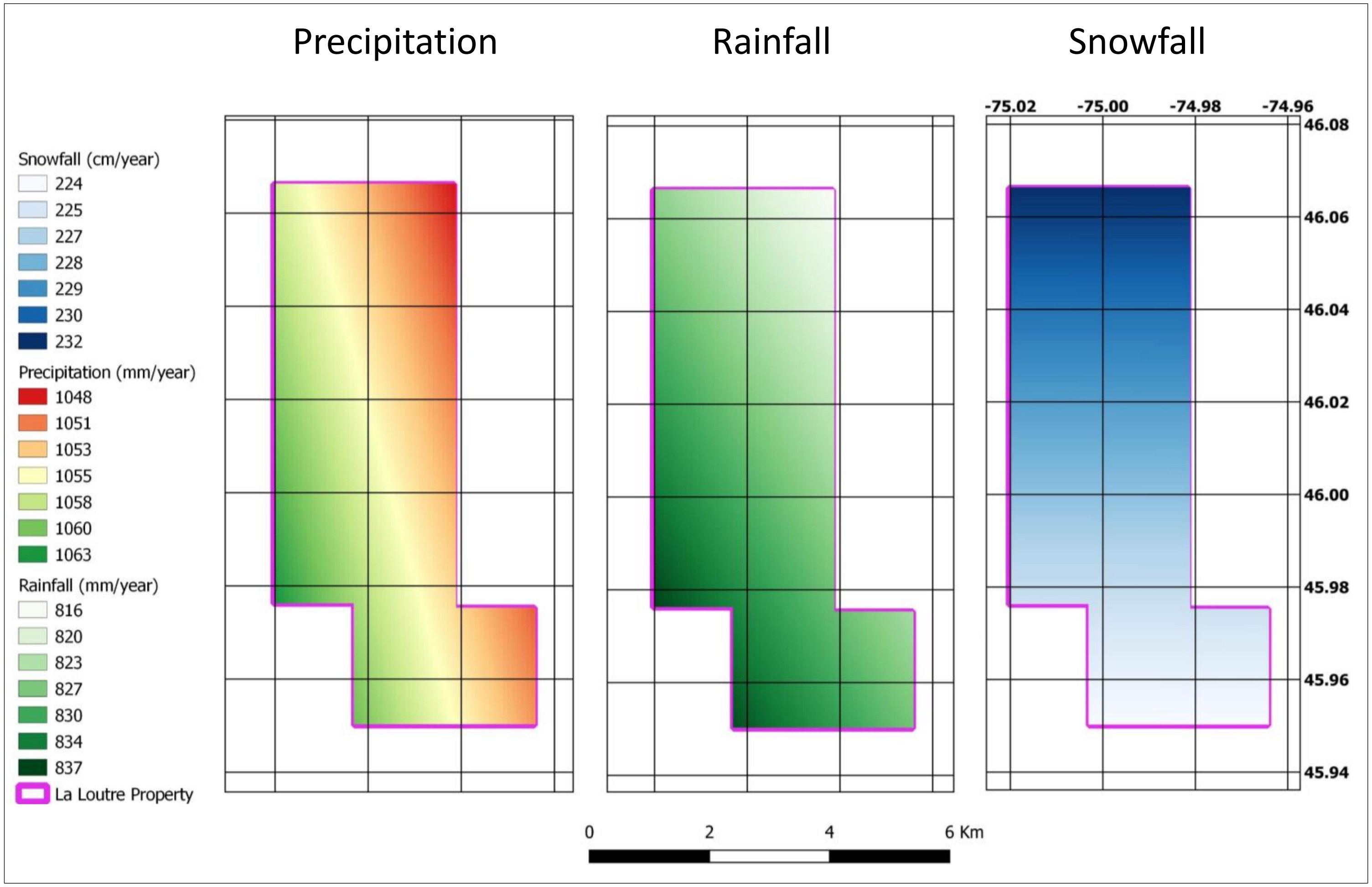
Average monthly and annual values of rainfall and snowfall have been interpolated over the project site (Table 5-7) using the long-term measurements of rainfall and snowfall and the cubic spline method (Figure 5-2). As shown in the figure, total precipitation increases about 1.5% in the southwest direction. Based on the different climate stations close to the La Loutre property, these components of the precipitation are interpolated over the project site.

Table 5-7: Interpolated Rainfall, Snowfall and Total Precipitation Over La Loutre

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Rainfall (mm)	22.9	17.2	33.3	70.8	85.1	99.9	103	101.2	99.8	94.8	71.4	27.5	827
Snowfall (cm)	54.2	52.3	34.7	7.3	0.0	0.0	0.0	0.0	0.0	1.9	21.4	56.1	228
Total Precipitation (mm)	73.4	66.0	65.9	78.4	87.2	102	106	103.6	102.1	97.8	92.1	81.1	1055

Evaporation data is not available for climate stations close to the site. The average evapotranspiration (ET) at this site is estimated at between 400 to 500 mm/year based on the approximate location of the La Loutre property (Figure 5-3) on the Canadian average annual ET map.

Figure 5-2: Interpolated Annual Snowfall, Rainfall and Total Precipitation over La Loutre



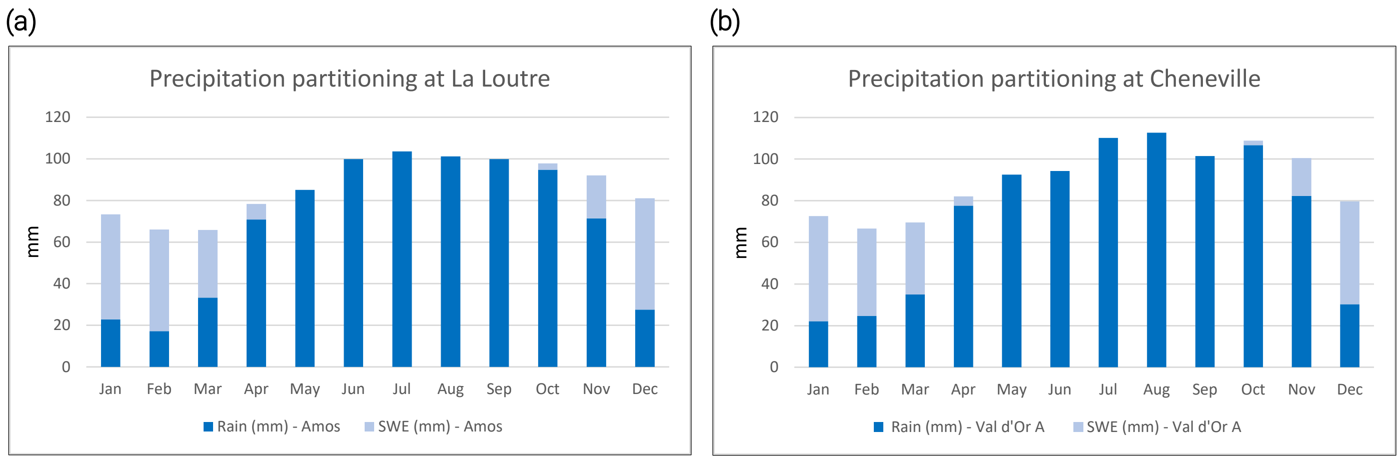
Source: Hemmera, 2021

Figure 5-3: Average Annual Evapotranspiration over Canadian Landmass (1981-2010)

Source: Statistics Canada, Environment, Energy and Transportation, 2017

Monthly precipitation and its partitioning between rain and snow is shown in Figure 5-4. Precipitation is highest during the warmer months from May to October.

Figure 5-4: Monthly Average Precipitation and Partitioning into Rain and Snow for (a) La Loutre Property and (b) Cheneville Station



Source: Environment and Climate Change Canada historic weather datasets)[3]

The extreme precipitation events for the La Loutre site were estimated based on the IDF curves optioned from Environment Canada (Appendix A) for the closest climate station which is Cheneville (code: 7031375). Table 5-8 summarizes storm events for various return periods.

Table 5-8: Precipitation Depths of Extreme Storm Events for the Cheneville Station

Station	Event Duration	Precipitation Depth (mm)					
		2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
Cheneville (7031375)	5 min	6.9	9.1	10.6	12.5	13.8	15.2
	10 min	10.3	13.4	15.4	18.0	19.9	21.8
	15 min	12.3	15.7	17.9	20.8	22.9	25.0
	30 min	17.2	22.3	25.7	20.0	33.2	36.4
	1 hours	21.9	28.8	33.4	39.1	43.4	47.7
	2 hours	26.8	36.1	42.3	50.1	55.8	61.6
	6 hours	35.7	48.3	56.7	67.3	75.1	82.9
	12 hours	41.9	55.2	64.1	75.3	83.5	91.8
	24 hours	48.0	62.7	72.4	84.7	93.8	102.9

[3] Averaging is done for the total historical measurement period at respective stations.

5.3 Local Resources and Infrastructure

The main administrative center in the area is Mont Tremblant, 40 km northeast of the La Loutre property. Heavy machinery, fuel and other equipment and services can be sourced there. Specialized mining equipment would most probably be obtained from Mont-Laurier (100 km northwest of the property), Montreal, or Val-d'Or. Mining expertise exists in Mont-Laurier and in the mining center of Val-d'Or, located 450 km northwest of the property. A number of mining and mineral exploration companies have offices located in Val-d'Or. Available resources include assayers, civil construction companies, diamond drilling, engineering firms, freight, geophysics contractors, land surveyors, mining contractors, and mining suppliers.

5.4 Physiography

The topography of the La Loutre is gently undulated with an average elevation of 300 meters above sea level (masl) within a range of 280 and 360 masl. There are some bedrock outcrops but are hidden by leaves and a thin veneer of overburden. The thin overburden is almost entirely composed of glacial sand, gravel and pebbles. There is virtually no arable land in the region. The vegetation consists mainly of mixed forest dominated by pine, spruce, cedar and different deciduous tree species. Hills are generally covered in deciduous trees with steep sides up to 10 meters in height, whereas the intervening valleys have swamps, lakes and stream populated by coniferous species. Hills are between 400 and 900 meters wide, whereas valleys are 100 to 500 meters wide. Hills and valleys are oriented both northwest-southeast and northeast-southwest.

5.5 Seismicity

The La Loutre property is located in the Western Québec Seismic Zone. The Western Québec Seismic Zone constitutes a vast territory that encloses the Ottawa Valley from Montreal to Temiscaming, as well as the Laurentians and Eastern Ontario. The urban areas of Montreal, Ottawa-Hull and Cornwall are located in this zone.

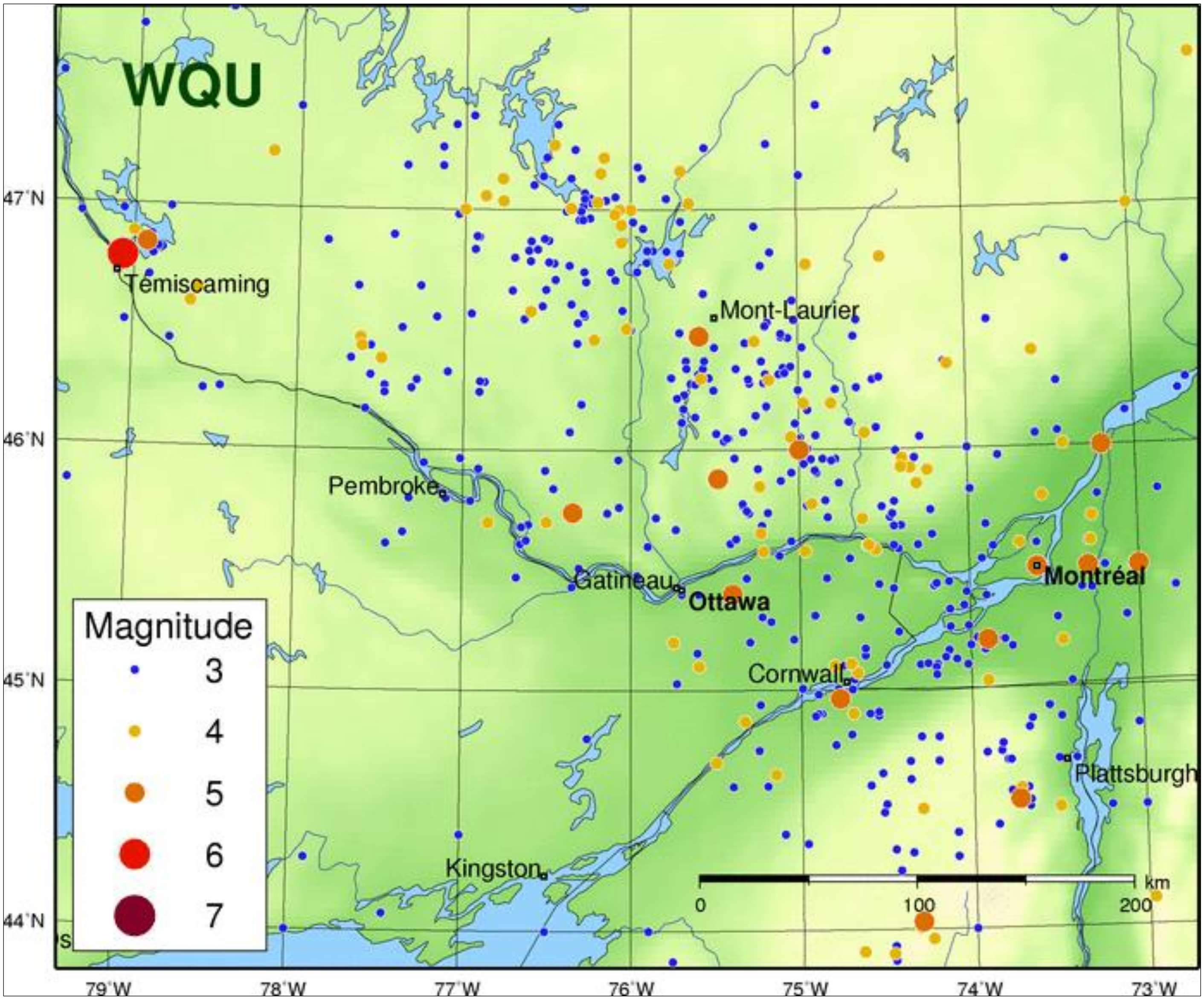
The pattern of historical seismic activity recorded by the Canadian seismograph network since the beginning of the century shows the earthquakes concentrating in two sub-zones: one along the Ottawa River and the second along a more active Montreal-Maniwaki axis.

Historically, earthquakes in Western Québec have been of a magnitude of 4 and 5. Figure 5-5 depicts earthquake magnitudes and their location in Western Québec.

From time to time, the area is also shaken by weaker earthquakes felt by the local population. In 1990, a 5-magnitude earthquake took place near Mont-Laurier, Québec. In 1996 and 1997, two earthquakes of magnitudes 4.4 and 4.3 occurred near Ste-Agathe-des-Monts, Québec. An earthquake occurs in the Western Québec Seismic Zone every five days on average.

Eastern Canada is located in a stable continental region on the North American Plate and, as a consequence, has a relatively low rate of earthquake activity.

Figure 5-5: Earthquake Activity in Western Québec Seismic Zone



Source: Natural Resources Canada, Earthquakes Canada website, as accessed on July 20, 2021.

6 HISTORY

The property was originally staked by SOQUEM in 1988 based on airborne magnetic and electromagnetic (REXHEM IV) surveys and a review of local graphite occurrences. In the summer of 1989, a geological reconnaissance program was carried out in the areas hosting the La Loutre A, B and C REXHEM anomalies as shown in Figure 6-1 (Saindon and Dumont, 1989). As part of the program, a ground Beep Mat EM survey was carried out on the anomalies, with lines spaced 100 m apart (Levesque and Marchand, 1989). This ground exploration work led to the discovery of three new graphite showings corresponding to the A, B and C anomalies. The La Loutre A showing to the southeast consisted of two outcrops, some 250 m apart, containing more than 10% graphite. The conductor outlined by the Beep Mat survey indicated a possible continuity of the graphite horizon over a length of 1,200 m and a width of 100 m. The La Loutre B showing to the southwest consisted of boulders containing more than 10% graphite, within a conductive sector measuring 500 m by 150 m. The La Loutre C showing was characterized by quartz-feldspar gneiss containing 1% to 2% graphite.

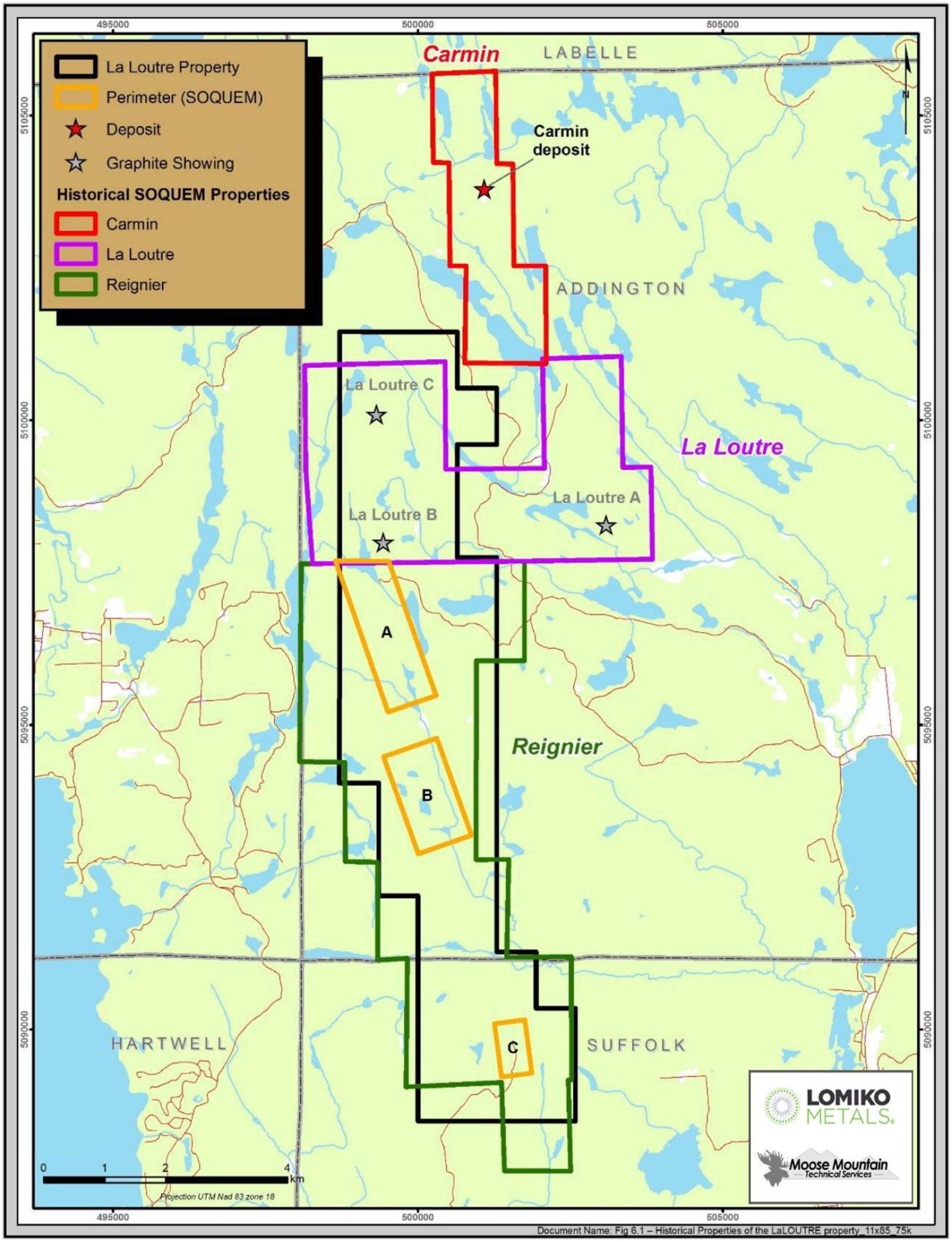
During the summer of 1990, a grid was cut at La Loutre A consisting of 11.5 km of lines spaced 50 m apart. A ground Beep Mat EM survey was performed on the lines and also between them. A small geological survey was carried out around the La Loutre A showing. Seven sites were blasted to explain the conductor detected by the Beep Mat. No samples were assayed (Turcotte et al., 2016).

A grid was also cut on the La Loutre B showing, consisting of 2.2 km of lines spaced 25 m apart. The entire grid was prospected using a Beep Mat. Some outcrops were mapped. In four separate places, up to 5% graphite was observed. The mineralization was usually found in pyroxene gneiss, but no samples were assayed (Turcotte et al., 2016).

In 1990, SOQUEM staked the Reignier property to the south of the former La Loutre property and within the current La Loutre property, as illustrated in Figure 6-1. In 1991, a geological survey (scale of 1:10,000) was carried out on the property, as was a Beep Mat EM survey accompanied by prospecting. Small manual trenches were dug on the best Beep Mat conductors. No assay results were reported. Based on the exploration work to date on the property, three major targets were identified (the Reignier A, Reignier B and Reignier C areas). These three areas strike N150° along a major lineament. The lithological units found in the three areas contained 2% to 10% graphite (visual estimates). La Loutre B is the location of the current Electric Vehicle (EV) Zone and Reignier A is the location of the current Battery (B) Zone which are the subjects of this report.

Exploration work by SOQUEM ceased in 1992 (Turcotte et al., 2016).

Figure 6-1: Location of the Current La Loutre Property (black) with respect to the Historic SOQUEM Properties



Source: Saindon and Dumont, 1989

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The La Loutre property is located in the eastern part of the Central Metasedimentary Belt (CMB), as illustrated in Error! Reference source not found.. The following description of the CMB is slightly modified from Corriveau and van Breemen (2000) and Corriveau (2013), and from Turcotte et al. (2016).

The CMB in the western Grenville Province extends southward from western Québec into Ontario and New York State (Wynne-Edwards, 1972). In Québec, the CMB includes Mesoproterozoic supracrustal and intrusive upper amphibolite- to granulite-facies rocks metamorphosed between 1.2 and 1.18 Ga. These rocks structurally overlap the gneiss units that form the pre-Grenvillian margin of Laurentia (the allochthonous polycyclic belt/Central Gneiss Belt). The CMB is subdivided into two domains: an NNE-trending marble-rich domain to the west, bordered by a quartzite-rich domain to the east.

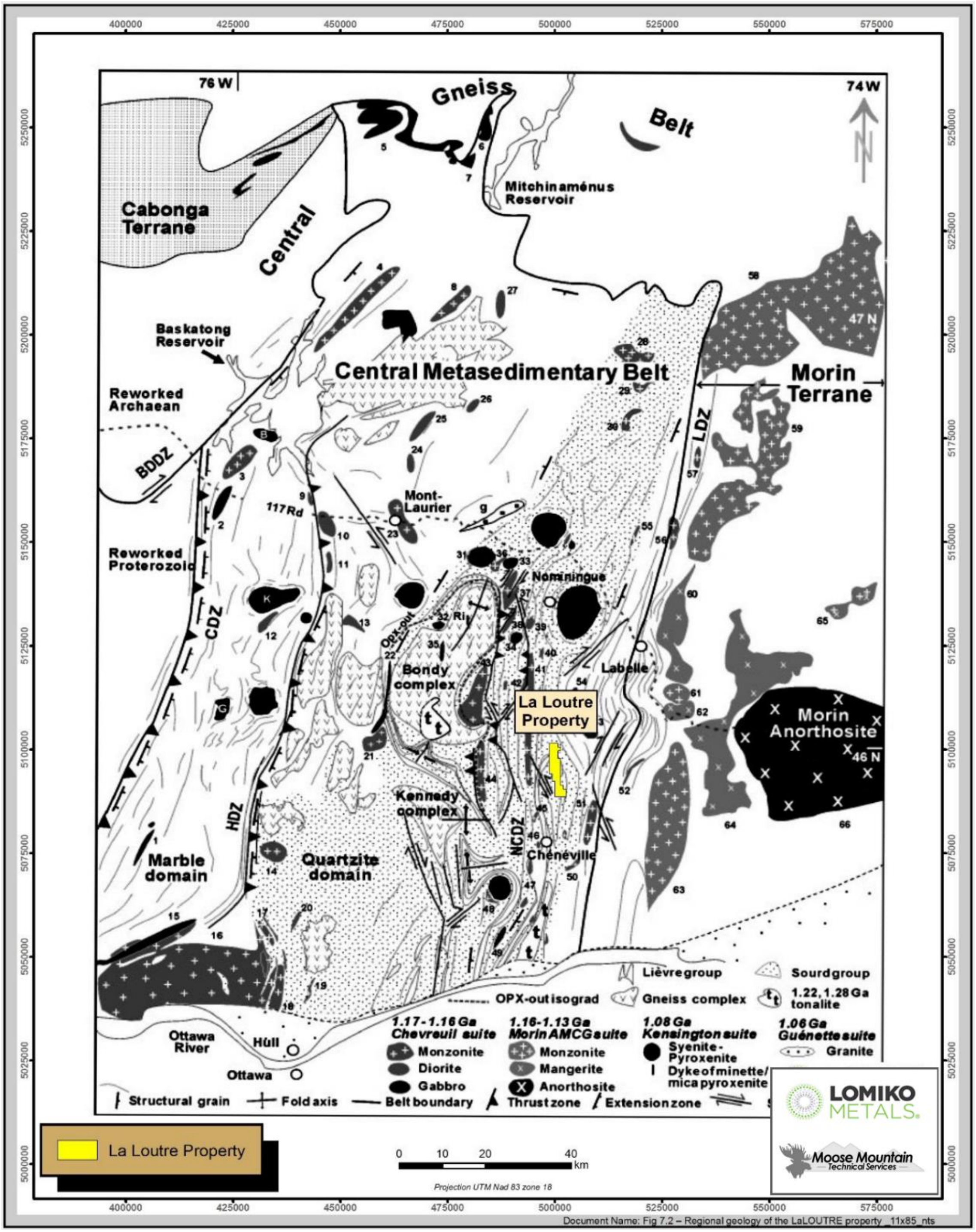
At the main marble and quartzite domain interface, domain-bounding fabrics dip to the west, the quartzite package projecting structurally beneath marble. Complexes of quartzofeldspathic gneiss with metatonalite intrusions occur in both domains (Wynne-Edwards et al. 1966; Corriveau et al. 1996, 1998); their domal structures and distribution suggest they represent windows of a major lithotectonic domain structurally underlying the quartzite and marble domains (Corriveau and Morin, 2000).

Granitic to tonalitic gneiss complexes form a series of domes structurally below the marble and quartzite assemblages. The Bondy gneiss complex, dated at between 1.3 and 1.4 Ga, hosts a Cu-Au-iron oxide-rich hydrothermal system that has been metamorphosed to granulite facies.

Once metamorphosed, the marble, quartzite, and felsic gneiss rock packages had contrasting mechanical properties, which resulted in distinct rheological behaviour and, consequently, a range of non-reactivated to completely overprinted orogenic segments (Corriveau et al., 1998). A high-pressure (P>800 MPa) assemblage of orthopyroxene–sillimanite–cordierite (Carrington and Harley, 1995) occurs within the gneissic fabric of the Bondy complex. The assemblage reveals that peak pressure was achieved during foliation development (~950°C at ~1000 MPa) (Boggs, 1996), recording the first and main phase of crustal thickening in the CMB. Metamorphic conditions preserved across the belt range from ~650°C and ~600 MPa along its western boundary, to ~750°C and ~800 MPa in the marble domain, ~950°C and ~1000 MPa in the Bondy gneiss complex, and ~725°C and ~850 MPa along its eastern boundary (Indares and Martignole, 1990; Boggs, 1996). This record is diachronous and registers the successive imprint of strongly partitioned orogenic pulses, instead of differential unroofing or tectonic telescoping of blocks affected by a single metamorphic event (Corriveau et al., 1998).

To the east, the CMB is tectonically bounded against the Morin terrane north-northeast-striking, subvertical, amphibolite- to granulite-facies Labelle Deformation Zone, ~150 km long and up to 10 km wide (Martignole and Corriveau, 1991; Martignole et al., 2000). Developed adjacent to and merging northward with the Labelle Deformation Zone is the Nominingue-Cheneville Deformation Zone ("lineament" of Dimroth, 1966). This zone is recognized as a steeply dipping, north-trending zone, ~10 km wide and at least 40 km long, of ductile strain at mid- to upper-amphibolite grade (Dupuy et al., 1989; Corriveau and Jourdain, 1993; Corriveau and Madore, 1994). Anastomosing conjugate shear zones (NNE dextral; SSE sinistral) locally transpose the N-S foliation of the gneiss in the Nominingue-Cheneville and Labelle zones (Rivard et al., 1999).

Figure 7-1: Regional Geology Plan



Source: Turcotte, 2016

7.2 Project Geology

The La Loutre property is located within the Nominingue-Cheneville Deformation Zone (NCDZ), a 10 km-wide ductile shear zone at amphibolite facies with lit-par-lit injections of monzonite and diorite among Mesoproterozoic porphyroclastic paragneiss as illustrated in Figure 7-1. The NCDZ is a N-S zone dipping steeply to the west. It extends southward toward the Ottawa River and is likely an extension of the high-strain zone observed to the south by Dupuy et al. (1989) in the Gatineau area. Dimroth (1966) first identified this zone and considered it an important structural frontier in the Grenville Province of Québec. It could very well be the most western component of the Labelle Deformation Zone. This corridor comprises discontinuous anastomosing shear zones with sinistral or eastward-thrusting sense of movement. The intensity (or timing) of the deformation varies from east to west. To the west, a large proportion of monzonitic sheets and their dykes have retained their magmatic foliation and the pegmatite dykes are straight, or only slightly sigmoidal. To the east, however, the microdiorite and pegmatite dykes are mylonitized (Turcotte et al., 2016).

Paragneisses in the region of the NCDZ are Mesoproterozoic in age and belong to the quartzite-rich domain that characterizes the eastern part of the CMD. Quartzite and impure quartzite (with minor biotite, feldspars, garnet, magnetite, muscovite or orthopyroxene) occur as folded and boudinaged layers intercalated, at outcrop and map scales, with quartzofeldspathic, graphitic or biotite gneisses, marble, calc-silicate rocks and metapelites. Fe-sulphides and tourmaline are common in the area; they are disseminated in paragneisses or occur in late quartz veins.

In the NCDZ, the 1165 Ma magmatism is characterized by concordant sheets of monzonite and diorite, 10 m to kilometers in thickness (Corriveau and van Breemen, 1994). These plutonic bodies are intercalated with and emplaced as lit-par-lit injections in mylonitic paragneisses at amphibolite facies (Corriveau, 1991; Corriveau et al., 1994). Evidence of assimilation, magma mixing, syntectonic emplacement and skarn formation are common in this corridor. Where monzonite has been greatly sheared, it is transformed into biotite and garnet gneisses and includes intercalation of calc-silicate rocks for which gabbro is a likely protolith.

Apart from the monzonitic masses described above, the 1165 Ma magmatism occurs as lamprophyre dykes with a net-veined texture and biotite phenocrysts. These dykes crosscut the orthogneisses and the tonalite and consist of centimeter- to decimeter-scale round masses of lamprophyre in a granitic matrix. These two components are locally separated by zones of anhydrous reaction. The lamprophyric dykes occur as injections in the heart of pegmatite dykes; contacts are very irregular and lobed. Pillowing and boudinaging occurred before solidification. The pegmatite dykes have straight contacts with their country rock.

These rocks have been regionally metamorphosed to granulite facies around 1185 Ma (Corriveau and van Breemen, 1994); retrogression to amphibolite facies is thorough along the NCDZ.

Regional foliation is marked by gneiss, ribbon structure and preferential orientation of tabular minerals. Lineations are defined by the preferred orientation of minerals and mineral aggregates, such as quartz in granitic veins and sillimanite in metapelites. The S1 foliation defined by the gneissosity is commonly tightly to isoclinally folded (F2 folds); an axial planar schistosity S2 is rarely developed. Mafic dykes at amphibolite facies crosscut the F2 folds; they are themselves tightly to openly folded (F3 folds) and have a strong mineral lineation commonly parallel to the lineation in the country rock. The monzonitic and dioritic magmatism and associated net-veined microdioritic dykes represent an important time marker in the area. The dykes crosscut the gneissosity S1 and F2 folds, and the porphyroclastic gneisses of the Nominingue-Cheneville high-strain zone; they are openly to tightly folded (F3) or sheared with hornblende aligned parallel to fold axes in dykes and mineral lineations in host rocks.

7.3 Property Geology

The property consists of a unit of biotite gneiss (±diopside). Quartzite constitutes a significant part of outcrops on the property. Diopside-scapolite-bearing calc-silicate rocks, marbles and other lithological units of sillimanite-biotite gneiss and sillimanite-garnet gneiss are less abundant than biotite gneiss with which they generally alternate as lit-par-lit. The marbles are observed at only a few places on the property. Some outcrops of amphibolite were also observed. Orthogneiss is found along the edge of the eastern part of the property. Diabase dykes cut all previous units.

The paragneisses contain significant biotite and are generally oxidized to a grey-brown color, and are schistose, locally displaying ribboning. On fresh surface, the rock appears grey-black to brownish-gray. They contain biotite, phlogopite, quartz, feldspar, garnet and pyroxene (augite), with occasional sillimanite, 1% to 2% pyrrhotite and 1% to 10% graphite. The biotite content is variable and ranges from 10% to 30%.

Quartzites are generally quite massive, greyish and feature granoblastic texture. On fresh surface, the rock tends to be light grey to greyish white with a predominance of quartz and minor feldspar, pyroxene (augite) and carbonate. Others show quartz-feldspar or quartz-dominant compositions or median compositions between pelitic gneiss and pure quartzite. Generally, no graphite is observed within the quartzite, but in cases where graphite was observed, notably in drill core, it could represent remobilized graphite from adjacent paragneiss.

Marbles tend to be layered, greyish creamy color on outcrop and have a granoblastic texture. Fresh surfaces are more greyish white in color, consisting of carbonate (mostly calcite) with minor quartz, feldspar, phlogopite, pyrite and graphite. Locally they have a higher content of quartz, up to 70% pyroxene (augite) in places and are very coarse grained; they are termed calc-silicate rocks.

7.4 Mineralization

The sedimentary sequence consists principally of a thick paragneiss unit intercalated with thin units of quartzite and marble. Bedding has an orientation of N150° and a dip ranging from 30° to 50° in the Battery Zone. Quartzites reach up to 1,000 m in strike length continuity, and are generally thin (typically several meters thick, exceptionally to 100 m). Globally, the graphitic carbon grade (Cg) of the quartzite is below 1%, but in some cases, higher Cg grades occur in quartzite near its contact with paragneiss. Marble consists of thin units with lateral footprint of more than 1,000 m. Marble units do not contain significant Cg grades.

The mineralized zones were interpreted based on the graphite grade information from drill holes and guided by quartzite and marble distribution patterns. There are 22 high-grade (HG) zones and 5 low-grade (LG) zones encompassing the HG zones interpreted in the Battery Zone. Mineralization in the Battery Zone strikes along an average trend of N150° and an average dip of 45° is generally stratigraphically concordant with quartzite and marble. Graphite flakes occur disseminated in the graphitic paragneiss, in variable concentration. LG zones are wide (10 to 150 m) and long (strike length up to 1,000 m) in the Battery Zone. The paragneiss associated with the LG zones contains more quartz than the paragneiss associated with the high-grade zones, and consequently have a paler colour.

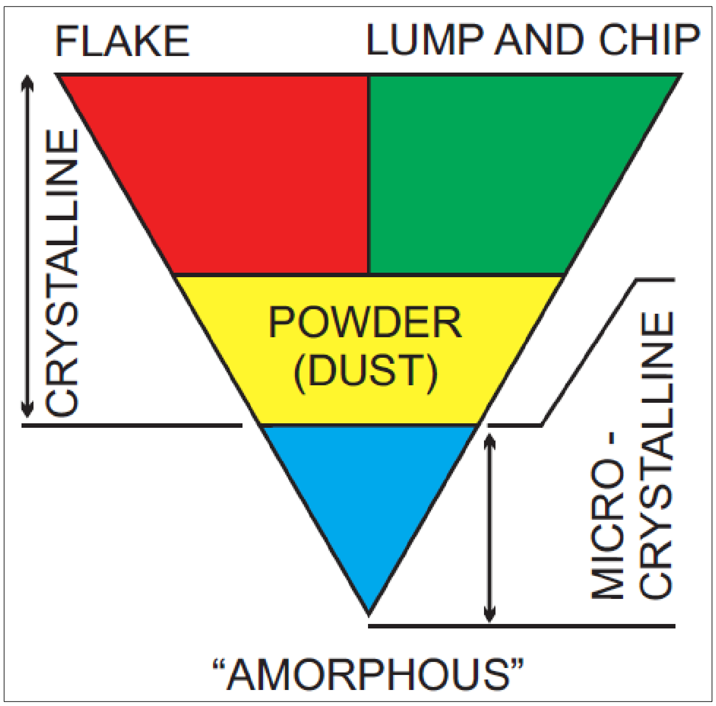
The Electric Vehicle (EV) Zone was interpreted in section and in three dimensions using implicit modelling. Fifteen distinct domains have been interpreted with the graphite grades generally higher than at the Battery Zone. Mineralization strikes at about 155° with strike lengths up to 750 m and domains dipping 35° to 45°.

8 DEPOSIT TYPE

Natural graphite deposits of economic interest are grouped into three main categories, as noted below and illustrated in Figure 8-1:

- microcrystalline
- vein graphite (lump and chip)
- crystalline flake graphite

Figure 8-1: Main Categories of Natural Graphite Currently Available



Source: Modified from Simandl et al.,1995

The mineralized zones on the La Loutre property belong to the crystalline flake graphite deposit type. Flake graphite can occur in marble, paragneiss, iron formation, quartzite, pegmatite, syenite and serpentinized ultramafics (Simandl et al., 1995). The most common hosts for economically significant crystalline flake deposits are paragneiss and marble that were subjected to upper amphibolite to granulite facies metamorphism.

The highest graphite grades in paragneiss-hosted deposits tend to occur along or near paragneiss-marble contacts. Most crystalline flake graphite deposits are mined in open pits. Crystalline flake graphite concentrate consists of flakes typically larger than 200 mesh (equivalent to 74 µm); fines produced during milling may be sold as graphite powder or dust.

9 EXPLORATION

Following of the acquisition of the La Loutre property, Canada Rare Earths Inc. (now Canada Strategic Metals Inc. ("Canada Strategic")) conducted various types of exploration work on the property, as described below.

9.1 Helicopter-Borne TDEM and Magnetic Survey

In May 2012, Geophysics GPR International Inc. (GPR) flew a helicopter-borne time-domain electromagnetic (GPRTEM) and magnetic survey for Canada Rare Earths Inc. (Létourneau and Paul, 2012). The survey was composed of one block for a minimum coverage of 439 km. The GPRTEM system is a high-resolution time-domain electromagnetic system with a large penetration. The directions of the flight lines were E-W and tie lines were N-S, with respect to UTM coordinates.

As shown in Figures 9-1 and 9-2 on the following pages, the area covered by GPR's survey yielded a multitude of EM conductors over most parts of the flight-line grid (Létourneau and Paul, 2012). These conductors are enclosed within a wide N-S conductive zone. Generally, a thick body geometry or flat-dipping signature was recognized on the profiles. A significant number of selected EM anomalies have strong amplitudes. The conductors show a wide range of amplitudes, from 12 to 35 off-time channels on 35 total channels. The calculated time constant (Tau) shows values less than 1 millisecond. A total of 409 EM anomalies were selected based on shape. These were divided into seven categories, including a very weak and poorly defined anomaly category named "possible anomaly".

9.2 Surface Sampling and Geological Mapping

9.2.1 2012 Exploration Program

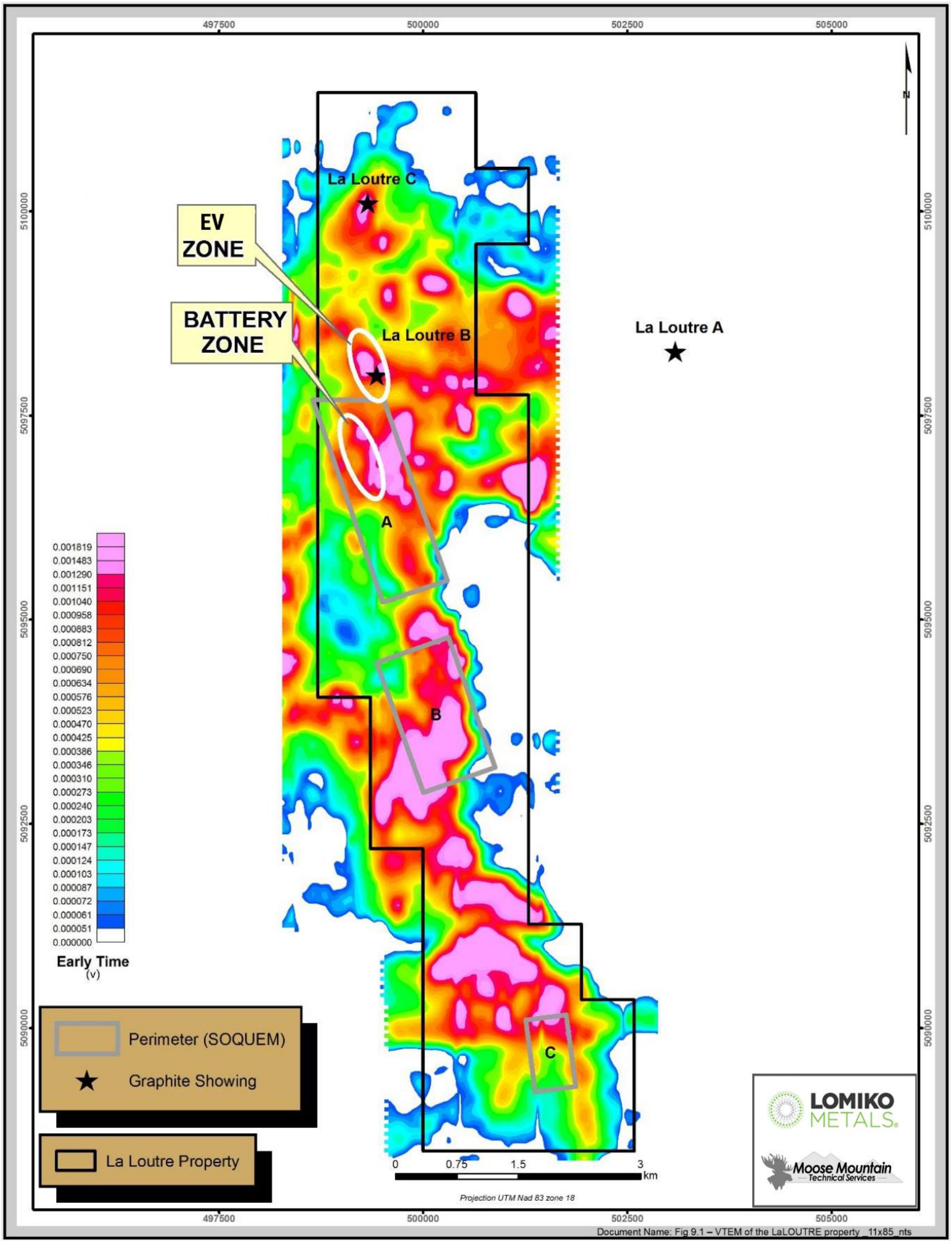
Consul-Teck Mineral Exploration Services (Consul-Teck) conducted a surface prospecting and geological mapping program in the summer of 2012, guided by the historical SOQUEM results for the area and results from the 2012 airborne DTEM and magnetic survey. Consul-Teck's geologists completed the geological mapping at 1:10,000 scale, accompanied by bedrock sampling to evaluate the graphitic carbon grades within each lithology (Turcotte et al., 2016).

The first two areas investigated by Consult-Teck were the areas of the La Loutre B and C showings as shown in Figure 9-3. The 1988 REXHEM (Saindon and Dumont, 1989) and 2012 time-domain electromagnetic (TDEM) anomalies (Létourneau and Paul, 2012) were verified in the field on both showings. In the vicinity of the La Loutre C showing, the main lithology observed was the paragneiss accompanied by beds of quartzite. Some outcrops of marble and amphibolite were also found. Six grab samples were collected and assayed, yielding graphitic carbon grades ranging from 0.8 to 1.7% Cg (Turcotte, et al., 2016). In the vicinity of the La Loutre B showing, the main lithology was paragneiss accompanied by beds of quartzite and marble. Sixteen grab samples were collected by Consul-Teck. The samples returned grades ranging from 0.3% to 22.04% Cg. The La Loutre B geological reconnaissance program led to the discovery of the Electric Vehicle (EV) Zone (Turcotte et al., 2016).

Also investigated by Consul-Teck were the Reignier "A", "B" and "C" areas which had been outlined by Dupuy (1991) following the historical exploration work on SOQUEM's former Reignier property. The main lithology observed by Consul-Teck's geologists in all three perimeters was paragneiss accompanied by beds of quartzite and marble.

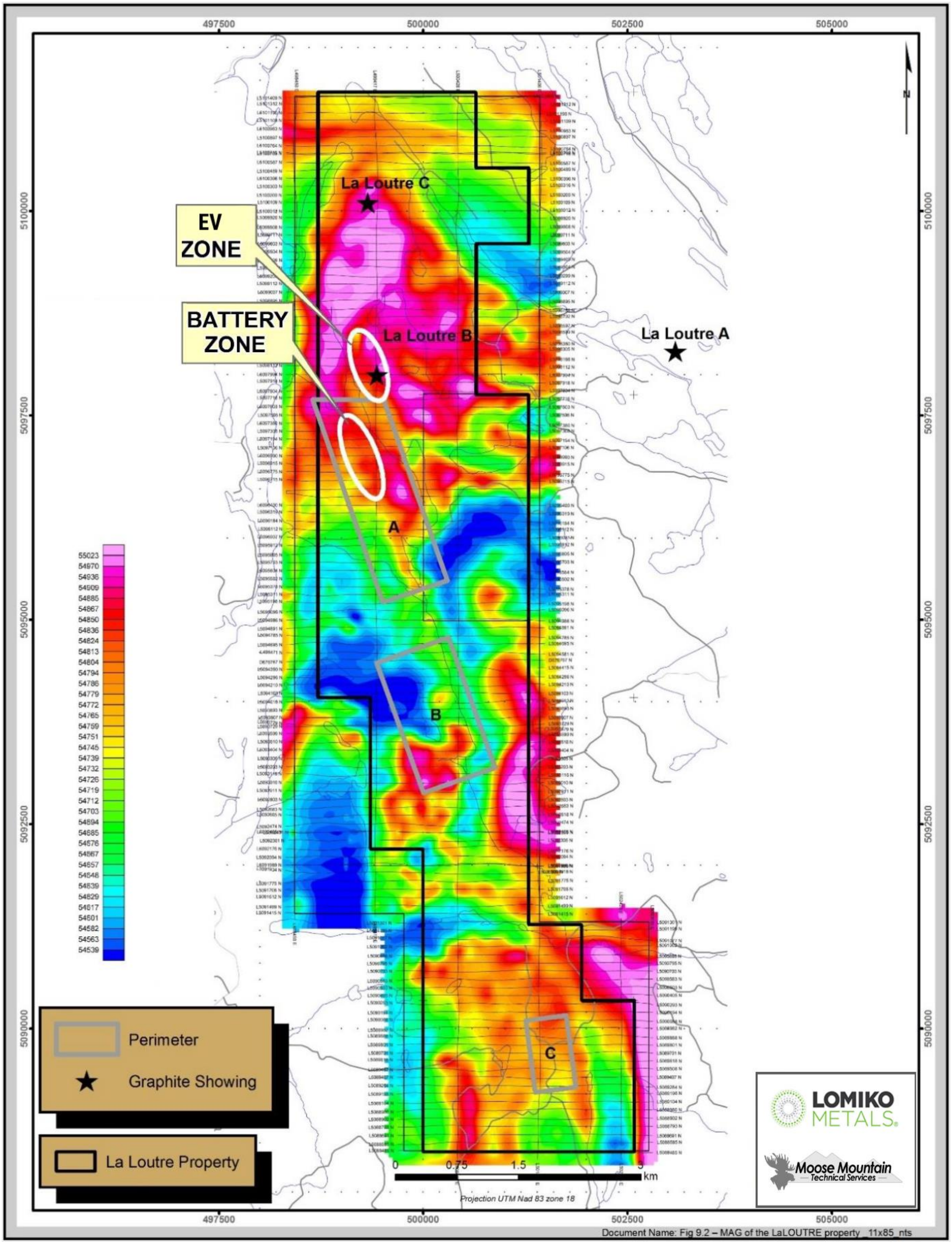
The Reignier A area corresponds to an area measuring 2,800 m by 900 m, oriented N160° along a "major lineament" beginning at Lac Bélanger and passing alongside Lac Tallulah. According to Dupuy's report, the lithological units visually contained about 2% to 10% graphite. Consul-Teck collected and assayed 49 grab samples from the Reignier A area, obtaining grades from 0.16% to 18.08% Cg. This geological reconnaissance work led to the discovery of the Graphene-Battery Zone (Turcotte et al., 2016).

Figure 9-1: Map of the 2012 TDEM Survey (Early-Time EM Anomalies)



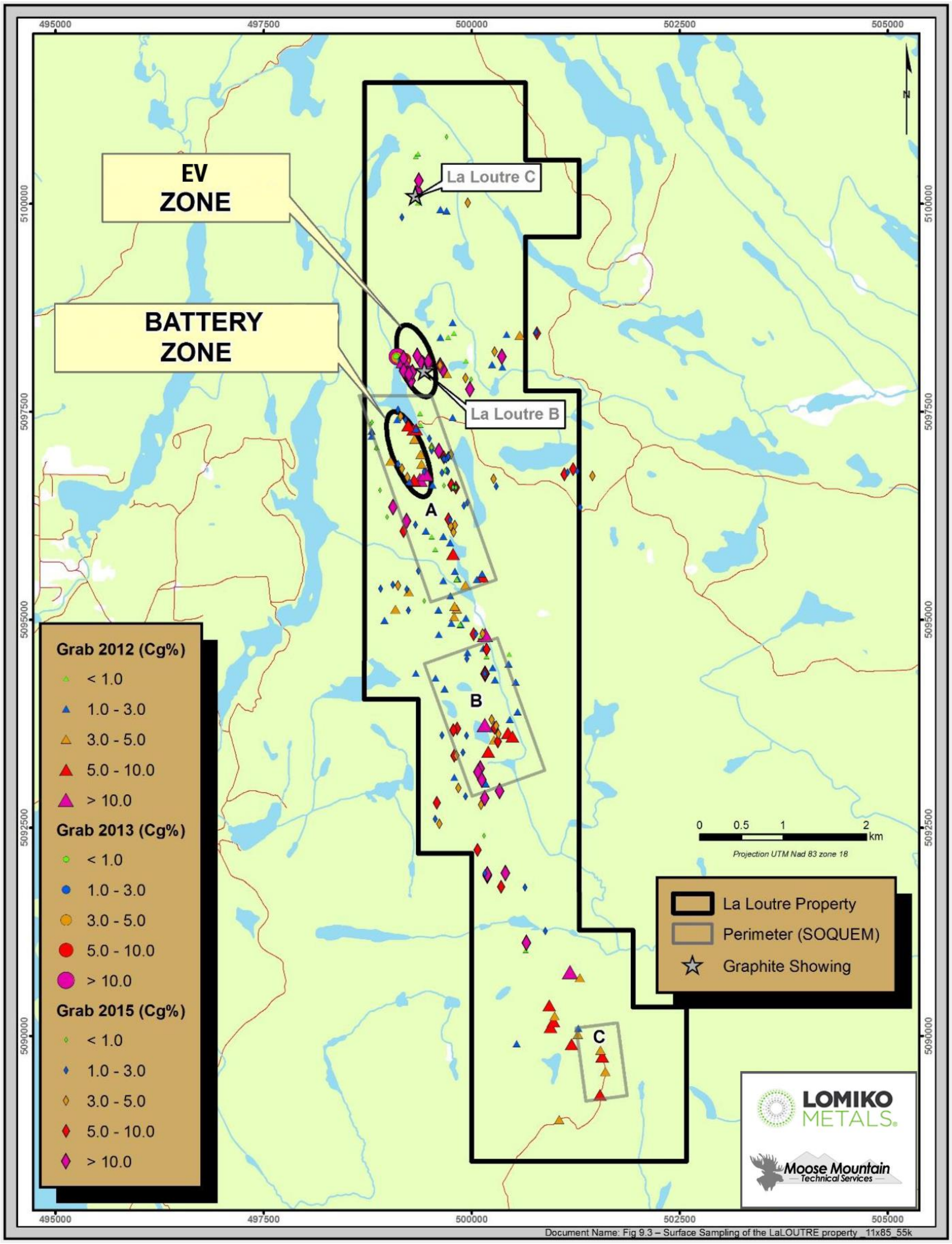
Source: Létourneau and Paul, 2012

Figure 9-2: Map of the 2012 Airborne Magnetic Survey (Total Magnetic Intensity Map)



Source: Létourneau and Paul, 2012

Figure 9-3: Grab Samples Collected by Consul-Teck on the La Loutre Property between 2012 and 2015



Source: MMTS, 2021

The Reignier B area corresponds to an area measuring 1,600 m by 900 m, also oriented N160° along the "major lineament"; its position is about 600 m to the southeast and along strike of the Reignier A area. Consul-Teck collected and assayed eighteen grab samples from the Reignier B area obtaining grades of 0.94% to 10.19% Cg.

The Reignier C area corresponds to an area measuring 1,600 m by 900 m also oriented N160° along the "major lineament"; its position is about 3,200 m to the south and along strike of the Reignier B area. Consul-Teck collected and assayed sixteen grab samples from the Reignier C area, obtaining grades of 0.78% to 18.04% Cg.

9.2.2 2013 Exploration Program

During the summer of 2013, channel sampling was carried out on outcrops of a graphitic horizon hosted by paragneiss and quartzite. Stripping work was not done. Six channels, sawed over an 80m length of outcrops in the area of Lac Bélanger, were sampled in 1 m lengths for a total of 25 samples, with results as summarized in Table 9-1 (Turcotte et al., 2016).

Table 9-1: Channel Sampling and Assay Results from the La Loutre Property

	Samples	Length (m)	% Cg
Channel No.1	P115701	1.0	1.82
	P115702	1.0	1.54
	P115703	1.0	2.04
	P115704	1.0	2.26
	P115705	1.0	1.96
	P115706	1.0	1.65
	TOTAL	6.0	1.88
Channel No.2	P115707	1.0	6.72
	P115708	1.0	2.15
	P115709	1.0	2.08
	P115710	1.0	1.8
	P115711	1.0	2.44
	TOTAL	5.0	3.04
Channel No.3	P115712	1.0	2.6
	P115713	1.0	2.42
	P115714	1.0	1.29
	P115715	1.0	2.04
	P115716	1.0	2.49
	P115717	1.0	5.26
	TOTAL	6.0	2.68
Channel No.4	P115718	1.0	7.76
	P115719	1.0	3.00
	P115720	1.0	0.49
	TOTAL	3.0	3.75
Channel No.5	P115721	1.0	0.44
	P115722	1.0	0.44
	P115723	1.0	1.66
	P115724	1.0	1.91
	TOTAL	4.0	1.11
Channel No.6	P115725	1.0	1.78

Consult-Teck also conducted a sampling program near the grab sample with a reported grade of 22.04% Cg in 2012 on the EV Zone. The purpose was to better define the surface graphitic carbon zone outlined in 2012. The seven 2013 grab samples returned grades ranging from 0.65% to 17.25% Cg.

9.2.3 2015 Exploration Program

Consul-Teck conducted a surface prospecting and geological mapping program in the summer of 2015 using a team of one geologist and one technician. Prospecting and geological mapping were guided by the 2012 and 2013 field results.

Consul-Teck revisited the area of the La Loutre C Showing where previous grab samples yielded grades ranging from 0.8% to 1.7% Cg. Six new samples were collected and assayed, returning grades from 1.00% to 27.10% Cg. The location of the best assays corresponds to the position of the La Loutre C Showing as identified by SOQUEM, where three of the historical samples had assayed 16.85%, 21.40% and 27.10% Cg.

Consul-Teck also revisited the area of the La Loutre B showing (EV Zone), where the 2012 samples had returned grades ranging from 0.3% to 22.04% Cg. In 2015, 25 grab samples were collected. The geological reconnaissance and sample work confirmed the presence of the La Loutre B showing as identified by SOQUEM. Five samples collected directly on the showing assayed 22.40% to 26.20% Cg. Another five samples were collected to the south-southeast of the EV Zone discovery site, returning grades ranging from 14.05% to 21.10% Cg. In addition, to the east of the La Loutre B Showing, two samples with elevated graphite grades (10.90% and 27.90% Cg) were obtained in graphite-bearing paragneiss.

The third area revisited by Consul-Teck was the Graphene-Battery Zone (now called Graphene Zone). In 2015, 58 new samples were collected from this area to better define the graphite zone outlined at surface in 2012. The 2015 grab samples returned grades ranging from 0.21% to 18.45% Cg.

The final area revisited by Consul-Teck consisted of the Reignier B area where grab sampling had returned grades of 0.94% to 10.19% Cg in 2012. In 2015, 39 new samples were collected in this area to better define the graphite zone outlined at surface in 2012. The 2015 grab samples returned grades ranging from 0.72% to 16.95% Cg (Turcotte et al., 2016).

10 DRILLING

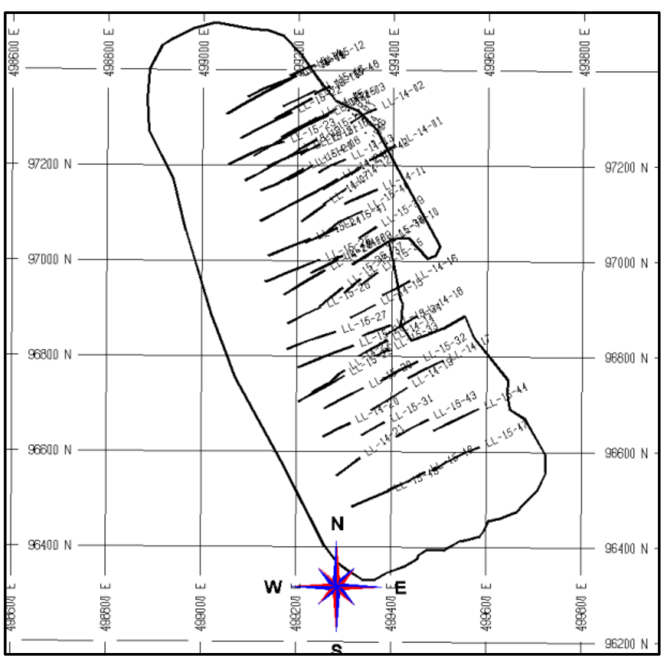
10.1 Summary of Drilling

A summary of drilling data included in the resource database for each deposit is given in Table 10-1. The collar locations of drill holes in the Battery (B) and Electric Vehicle (EV) deposits are given in Figures 10-1 and 10-2, respectively. All drilling programs were managed by Consul-Teck of Val-d'Or (Québec), and completed under contract by Forages Val-d'Or and was NQ sized.

Table 10-1: Summary of Drilling – All Zones

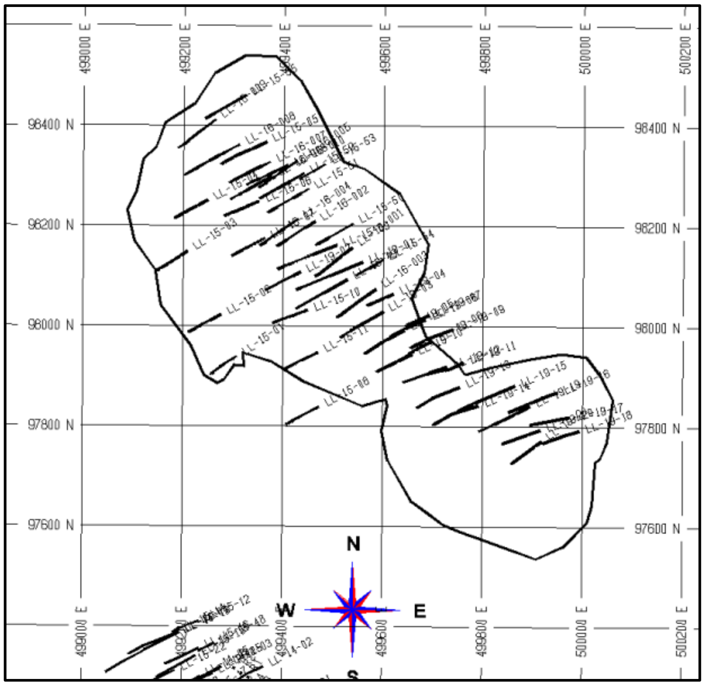
Operator	Year	Battery			EV		Total	
		Channels	No. Holes	Length (m)	No. Holes	Length (m)	No. Holes	Length (m)
Canada Strategic Metals	2013	6	-	25.0	-	-	6	25.0
	2014	-	25	3,137.3	-	-	25	3,137.3
	2015	-	37	5,056.0	18	2,406	55	7,462.0
	2016	-	-	-	10	1,551	10	1,551.0
Lomiko and Québec Precious Metals	2019	-	-	-	21	2,985	21	2,985.0
	Total	6	62	8,218.3	49	6,942	117	15,160.3

Figure 10-1: Collar Locations of Drill Holes in the Battery Deposit



Source: MMTS, 2021

Figure 10-2: Collar Locations of Drill Holes in the EV Deposit



Source: MMTS, 2021

Consul-Teck spotted the drill hole locations using a hand-help GPS and marked them with black felt pens on wood stakes. The Forages drilling team included one drill with two persons on each 12-hour shift. Each three-meter section of drill core was placed in core boxes, sealed shut and transported to the core logging facility in Val-d'Or.

10.2 Canada Strategic Metals, 2013-2019

Drilling in 2014 included 25 holes totalling 3,137 m in the Battery deposit on graphitic horizons identified by field mapping and previous sampling. Individual holes were drilled at -50º, oriented northeast, and were between 36 and 291 m in length. Significant intersections include:

- 9.37% Cg over 13.5 m and 8.42% Cg over 26.4 m in LL-14-05
- 9.02% over 14.7 m and 10.2% over 8 m in LL-14-14
- 11.18% Cg over 10.6 m in LL-14-19
- 11.23% Cg over 10.7 m in LL-14-23 (Lavallée, 2015)

Drilling in 2015 included both Battery and EV deposits, for a total of 55 holes and 7,462 m. Holes were drilled at -50º, oriented northeast, and were between 51 and 252 m in length. Significant intervals in the EV deposit include:

- 9% Cg over 90.75 m in LL-15-09 including 47.8 m at 13.66% Cg

- 14.64% Cg over 6.85 m in LL-15-05

Significant intersections in the Battery deposit include:

- 10.99% Cg over 14.30 m in LL-15-16
- 16.86% Cg over 4.0 m in LL15-19
- 10.82% Cg over 7.4 m in LL15-20 (Lavallée, 2016)

Drilling in 2016 was solely focused on EV with 10 holes totaling 1,551 m. Drill Holes were drilled at -50º, oriented northeast, with an azimuth of 60º and between 147 and 201 m in length, testing the extent of the graphitic mineralization. Eight of the 10 drill holes encountered significant graphite values. Significant intersections include:

- 16.81% Cg over 44.1 m in hole LL-16-001
- 17.98% Cg over 22.3 m in hole LL-16-002
- 14.56% Cg over 110.8 m in hole LL-16-03
- 13.09% Cg over 31.5 m in hole LL-16-006 (Lavallée, 2017)

10.3 Lomiko and Québec Precious Metals, 2019

The joint venture drilled 21 NQ-sized holes totalling 2,985 m between February 7 and March 15, 2019. The program was designed to identify further extensions toward the southeast in the EV deposit, also known as the "Refractory" Zone. This deposit appears as a moderately dipped lens approximately 200 m wide and 900 m long at depth of 120 m.

Significant intersections include:

- 9.89% Cg over 103.5 m in DDH LL-19-01
- 3.73% Cg over 130.1 m in DDH LL-19-03
- 4.8% Cg over 116.9 m in DDH LL-19-15
- 7.56% Cg over 47.30 m in DDH LL-19-17
- 7.14% Cg over 87.9 m in DDH LL-19-16
- 2.73% Cg over 54 m in DDH LL-19-08
- 12.38% Cg over 16.30 m in DDH LL-19-18 (Lavallée, 2019)

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Sampling and Analysis

11.1.1 2014-2016 Sampling and Analysis

Between 2014 and 2016, Consul-Teck managed the drilling and sampling program for Canada Strategic Metals (Lavallée, 2015; Lavallée, 2016; Lavallée, 2017). The core was delivered from site to the Consul-Teck Exploration facility in Val-d'Or, Québec. The boxes were opened and inventoried to confirm length, numbering and sequencing. The core was logged for geology and marked to identify mineralized sample intervals, typically of 0.5 to 1.5 m.

The core was cut in half with a rock saw, with one-half put into a tagged sample bag, matching the tag on the sample interval of the other half, which was retained in the core box. Core duplicates and blanks were recorded and entered into the sample stream at a rate of one of each in a set of 30 samples. The blank material used in 2014 is reported to be CDN-BL-10 provided by CDN Resource Laboratories Ltd. in British Columbia.

The sample bags were closed, stapled and packed in a larger nylon bag with approximately eight other samples. The larger bags were tagged with all sample numbers and delivered directly to the ALS Minerals laboratory in Val-d'Or, Québec.

Sample preparation at ALS in Val-d'Or included weighing, drying, and crushing to 70% minus 2 mm. One split sample was pulverized to 85% passing 75 µm. The excess material was stored as coarse rejects. Samples were analyzed for graphite content at the ALS Vancouver laboratory using leach with HCl, roasting, and induction furnace/infrared analysis with a LECO instrument. ALS is and independent laboratory certified to ISO/IEC 17025:2005 standards.

11.1.2 2019 Sampling and Analysis

In 2019 Consul-Tech managed the drilling and sampling program for Québec Precious Metals and Lomiko (Lavallée, 2019). Sampling, preparation and analysis were conducted following the same protocols as in previous years, again with ALS as the primary laboratory. In 2019, however, two standards were included in the Consul-Tech-inserted QAQC samples. CDN-GR-1, with an expected value of 3.12% graphite, and CDN-GR-4, with expected value of 1.01% graphite, were provided by CDN Resource Laboratories.

11.2 Quality Assurance and Quality Control

The assay database, including both primary assays and QAQC sample results, was received by MMTS on March 11, 2021. The number of assays and QAQC samples in the database (see Table 11-1 for a summary) shows that the percent of included QAQC samples is 4.6% in Battery and 8% in EV. Both are below industry standards of 12% to 15%. However, the increased rate of 10% in 2019, the most recent drilling in EV, indicates the problem is known and is being addressed. Similarly, the lack of certified reference materials (CRMs or "standards") in the earlier drilling was addressed in 2019.

Table 11-1: QAQC Sample Summary (All Areas and Years)

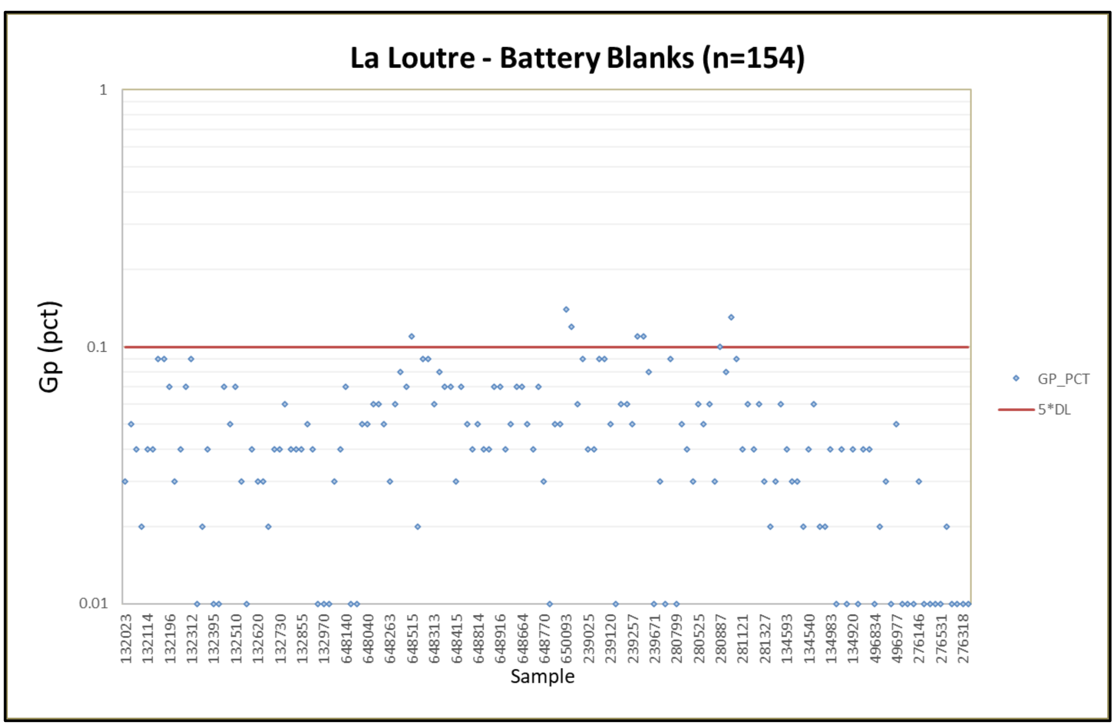
Deposit	Year	Primary Assays	Blank	Core Duplicates	CRMs	QAQC total	% QAQC
Battery	2013	25					0.0
	2014	2,011	84	84		168	7.7
	2015	3,832	70	46		116	2.9
	All	5,868	154	130		284	4.6
EV	2015	887	18	14		32	3.5
	2016	421	20	21		41	8.9
	2019	1,674	46	47	93	186	10.0
	All	2,982	84	82	93	259	8.0
All	Total	8,850	238	212	93	543	5.8

11.2.1 Battery QAQC Analysis and Results

11.2.1.1 Battery Blanks

Assay results of the 154 samples of blanks included in the Battery assay stream are plotted in Error! Reference source not found.. The failure criteria is five times the detection limit (DL) of 0.02% as indicated by the red line in the plot. It can be seen there are six failures for a failure rate of 3.9%. Three of the six samples, all in 2015, follow runs of samples with high assay values indicating potential contamination. However, because the assays are less than 10*DL, this is not considered significant.

Figure 11-1: Battery Blanks



Source: MMTS, 2021

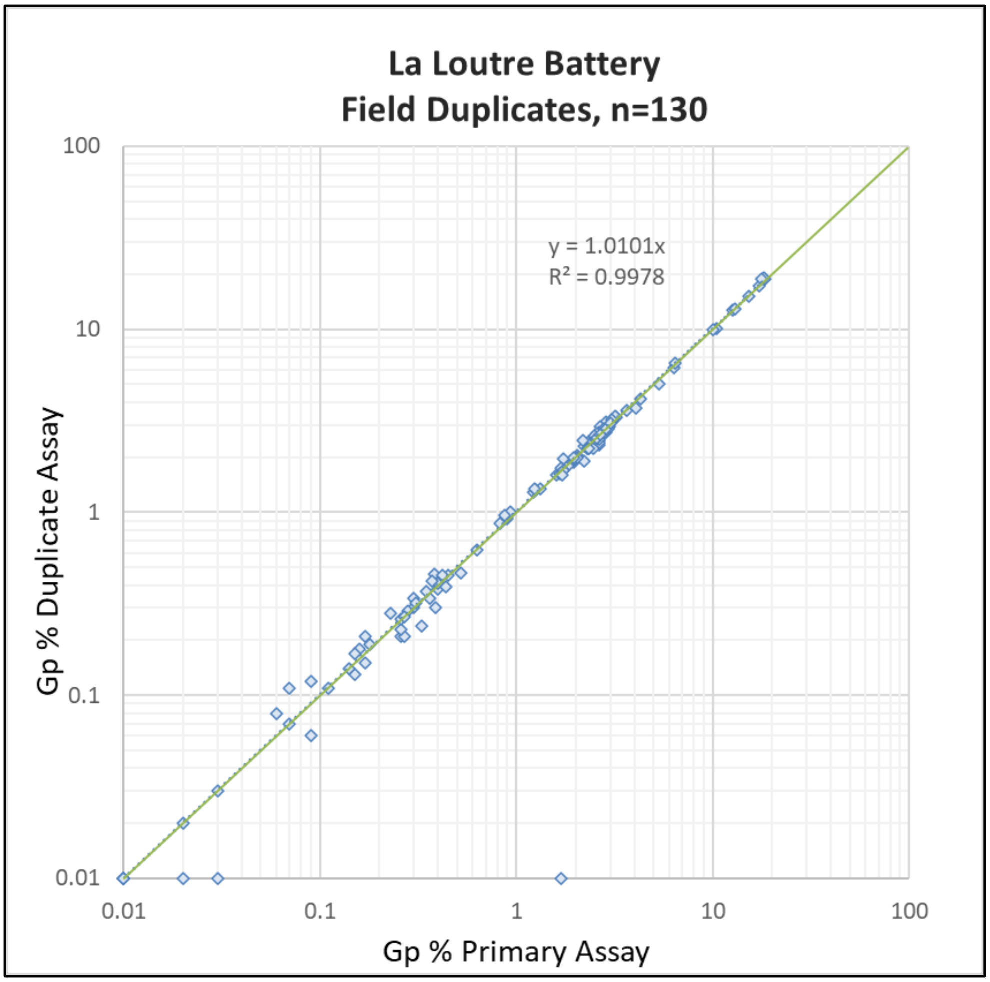
11.2.1.2 Battery Certified Reference Materials

CRM samples were not included in drilling from the Battery deposit. The lack of CRMs is mitigated by the check assays performed in 2016 (refer to Chapter 12 for details).

11.2.1.3 Battery Duplicates

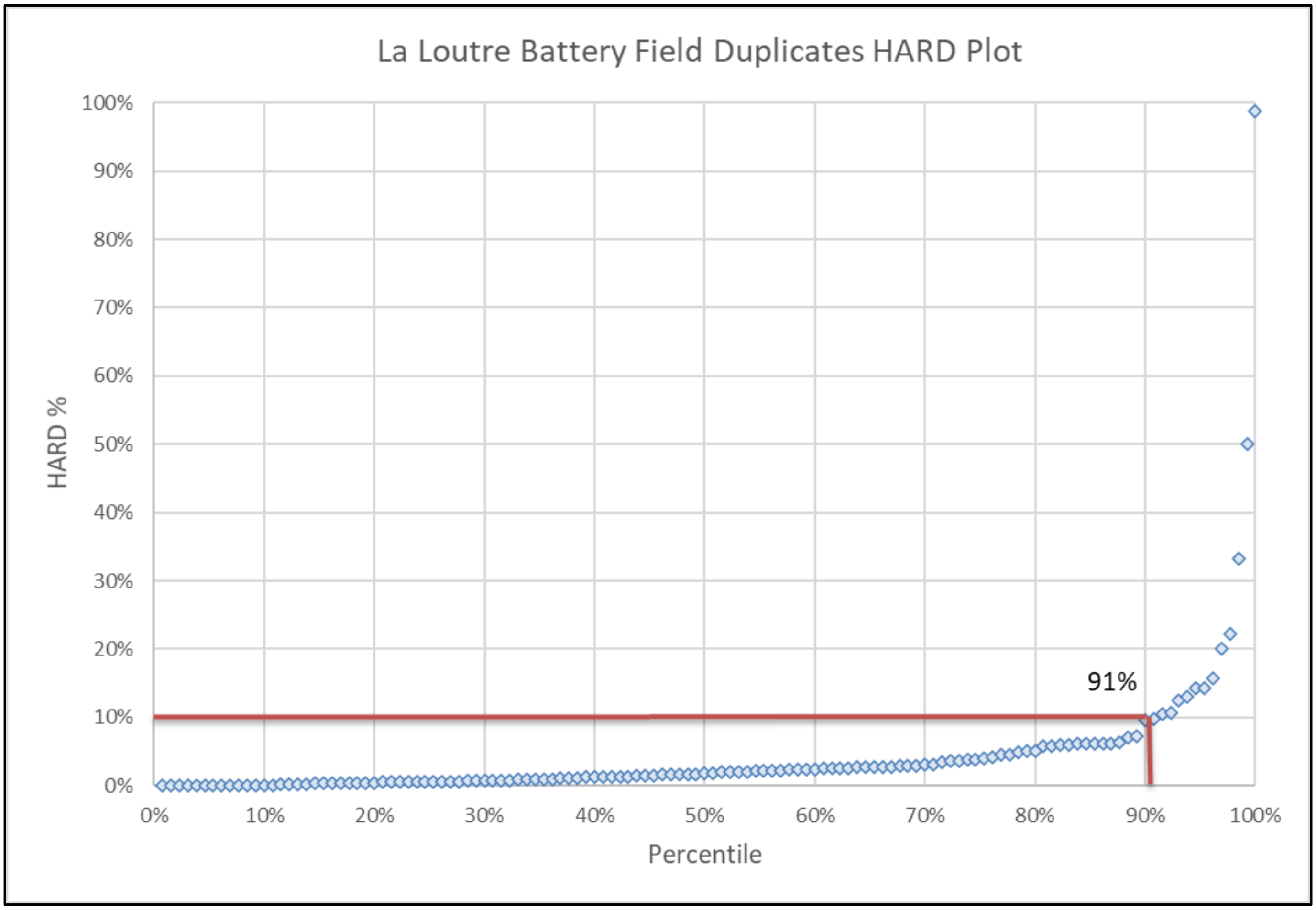
A total of 140 core duplicates were included in drilling in Battery in 2014 and 2015. A scatterplot showing the assays of the duplicate pairs is given in Figure 11-2. This plot shows the pairs to be close to each other with a slope near 1.0 and a high coefficient of correlation for the best fit line. The half absolute relative difference (HARD) plot is given in Figure 11-3 which shows that 91% of duplicate pairs have less than 10% HARD. The industry standard expectation for field duplicates is that 70% have less than 10% HARD. Therefore, this high value indicates very good duplicate results and little heterogeneity in the core samples.

Figure 11-2: Battery Field Duplicates Scatterplot



Source: MMTS, 2021

Figure 11-3: Battery Field Duplicate HARD Plot



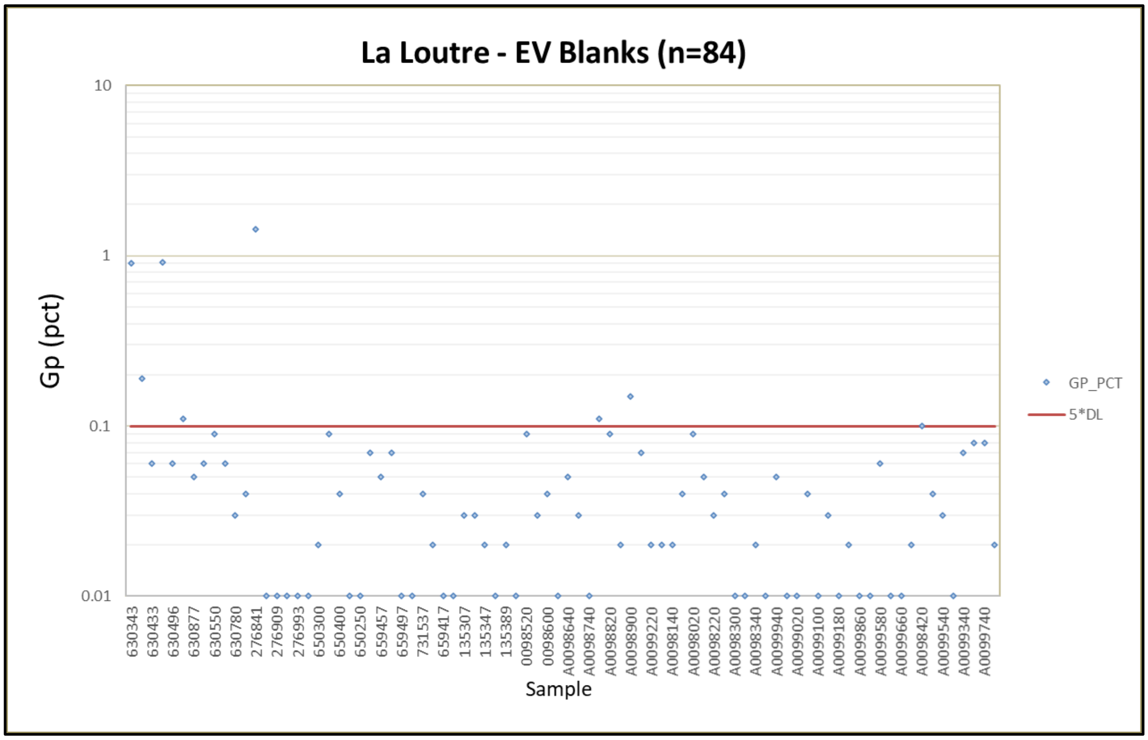
Source: MMTS, 2021

11.2.2 EV QAQC Analysis and Results

11.2.2.1 EV Blanks

Assay results of the 84 samples of blanks included in the Electric Vehicle (EV) sample stream are presented against the 5*DL criteria in Figure 11-4, which indicates that there are seven failures for a failure rate of 8.3%. Three of the seven failures are above 10*DL. The failed sample, with a graphite percentage of 1.44, follows a sample of small received weight with an assay value less than detection limit, indicating this sample may have been mislabeled and that the previous sample may be the blank material. The other two high fails, with values of 0.91% and 0.92% graphite, do not follow samples of high assay values or have neighbouring samples with small weights. The blank results from EV point towards a clerical issue rather than a contamination issue, and as the most egregious failures occurred in 2015, after which the problem appears to have been addressed.

Figure 11-4: EV Blanks



Source: MMTS, 2021

11.2.2.2 EV Certified Reference Materials

Ninety-three samples from two different CRMs were included in the 2019 drilling in EV. The results are presented in Table 11-2. The failure rate of 24% for CDN-GR-1 is higher than desired and indicates there is a potential slight high bias to these samples or to assays in this range. The results for CDN-GR-4 show acceptable results.

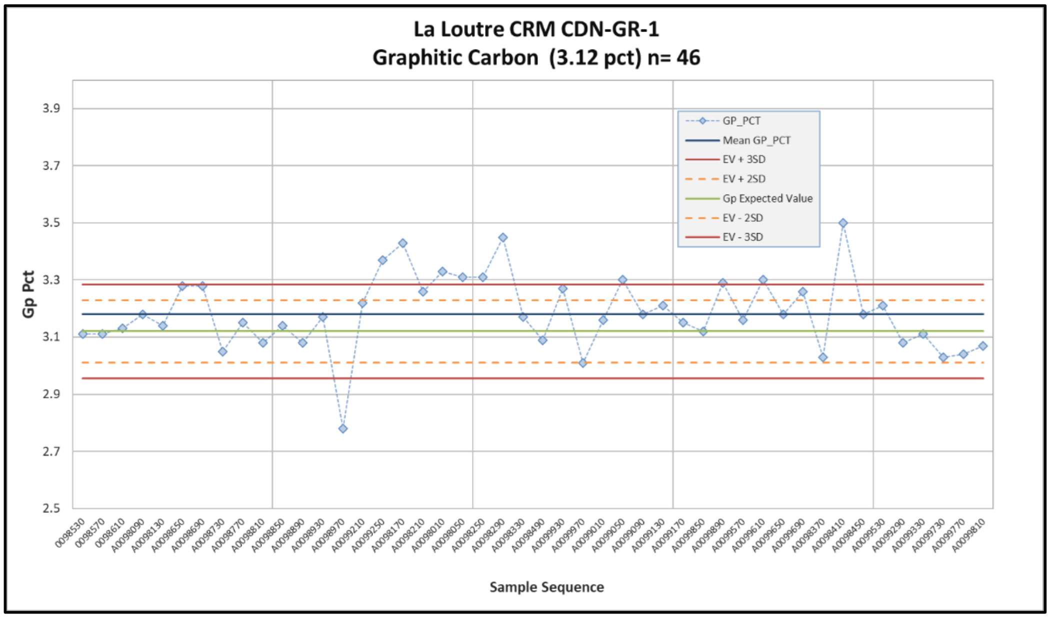
Table 11-2: EV Certified Reference Materials Results

CRM	GP Average	GP Std Dev	CV	Expected Value	Low Fails	High Fails	Samples	% Fail
CDN-GR-1	3.184	0.130	4.1%	3.12	1	10	46	23.9
CDN-GR-4	1.029	0.062	6.0%	1.01	1	1	47	4.3
Total					2	11	93	14.0

The process control chart for CDN-GR-1 (see Figure 11-5) illustrates the trend of the results. The higher-than-expected results are mostly clustered and may indicate a problem that was successfully addressed at the lab as a result of internal controls. The percent error of the mean of the assays compared to the expected value is 2%.

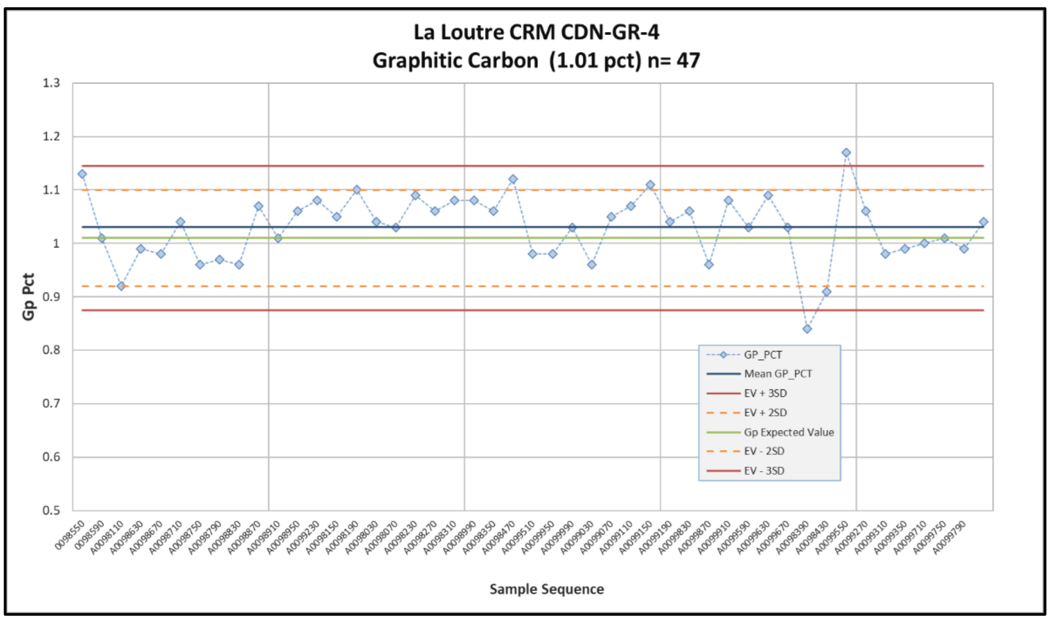
The higher-than-desired failure rate for one CRM in EV is not considered material at this time; the mean values of the CRMs are sufficiently close to the expected value, and the failures generally occur in zone with trace graphite. Further attention to CRMs, and re-assays for failures, is recommended for any future exploration.

Figure 11-5: CRM Results for CDN-GR-1 (Expected Value = 3.12%) in EV



Source: MMTS, 2021

Figure 11-6: CRM Results for CDN-GR-4 (Expected Value = 1.01%) in EV

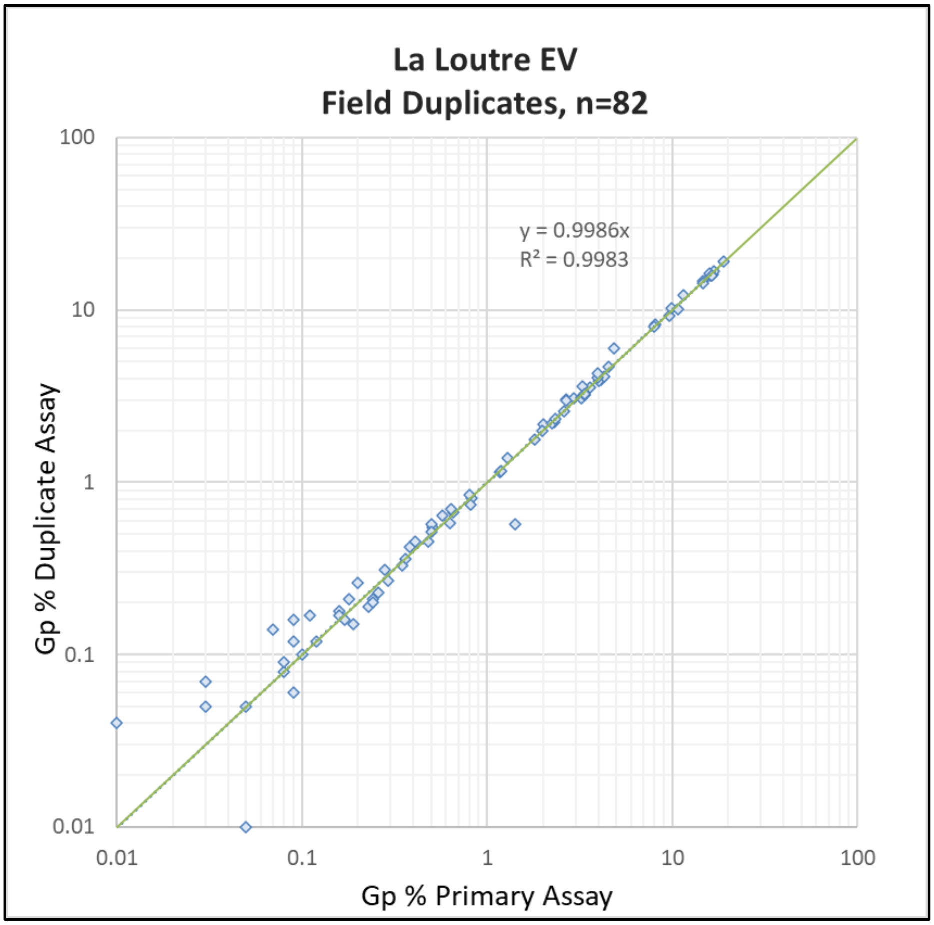


Source: MMTS, 2021

11.2.2.3 Electric Vehicle (EV) Duplicates

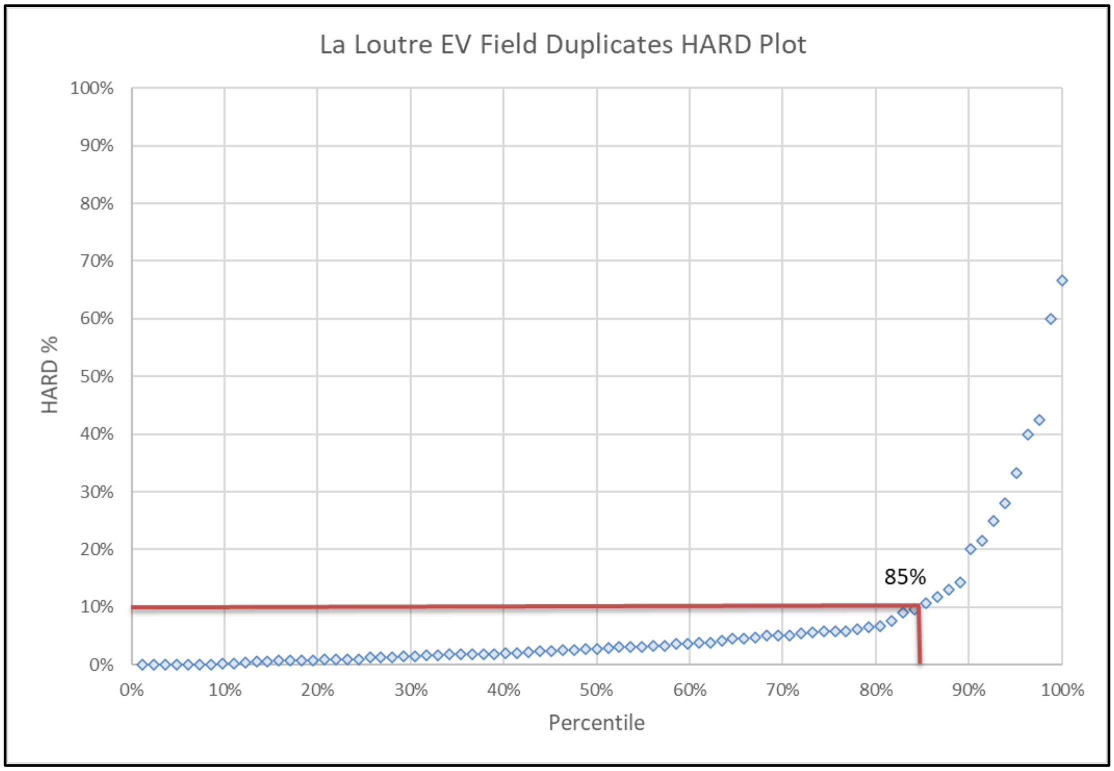
A total of 82 field duplicates were included in drilling in the EV deposit in 2015, 2016 and 2019. A scatterplot of the assays of the duplicate pairs in Figure 11-7 shows the pairs to be close to each other with a slope near 1.0 and high coefficient of correlation for the best-fit line. The HARD plot in Figure 11-8 illustrates that 85% of duplicate pairs have less than 10% HARD. As in the Battery deposit, the duplicates show better-than-required correlation but with more heterogeneity in the core samples in EV than in Battery.

Figure 11-7: EV Field Duplicate Scatterplot



Source: MMTS, 2021

Figure 11-8: EV Field Duplicates HARD Plot



Source: MMTS, 2021

11.3 Sample Security

The chain-of-custody procedures described by Consul-Teck appear adequate and do not appear to pose a material risk.

11.4 Comments on Sample Preparation, Analyses and Security

After reviewing the sampling, preparation, analysis and QAQC program at the La Loutre project, the QP concludes the following:

- The sampling, preparation, analysis and security programs are appropriate.
- The inclusion rate of QAQC samples is lower than the industry-recommended standard, which is two CRMs of different grades, one blank, one field duplicate and one preparation duplicate in each batch of 40 samples, comprising 12.5% of the total sample database. It is encouraged to include QAQC samples at a higher rate for future exploration.
- There is no indication in the failures checked that any re-assays were submitted due to control sample failures. Greater attention to re-assays of failed control samples and neighbouring samples is encouraged for future exploration.

12 DATA VERIFICATION

12.1 Site Visit

Greg Trout, a qualified person according to N.I. 43-101 guidelines, visited the La Loutre project site on June 1, 2021 and toured the property with Hubert Chicoine. During the visit, locations were confirmed for four drill hole collars with a handheld GPS device. The core shack was visited and drilling and sampling protocols were reviewed and confirmed. The core boxes in the storage facility in Val D'Or were observed.

12.1.1 Certificate Checks

The assay database referenced 121 certificates, all of which were included in PDF format in the drilling and compilation reports provided (Lavallée, 2015, 2016, 2017 and 2019). The database is properly appended with certificate numbers for all sample entries. Of the 8,850 primary assays in the database, 1,063 were checked for a total of 12%. No errors were found on certificate checks.

12.1.2 Database Verification Performed by the QP

The database assay was checked when it was loaded into MineSight® for geological and grade modelling. There were no rejected data, no missing or zero depth surveys, and no overlaps. One channel sample from 2013 that was deeper than the collar file depth was corrected. Checking of the collars confirmed locations to match the topography and coincided with the previously modelled graphite shapes and grades.

12.2 2016 Check Assays

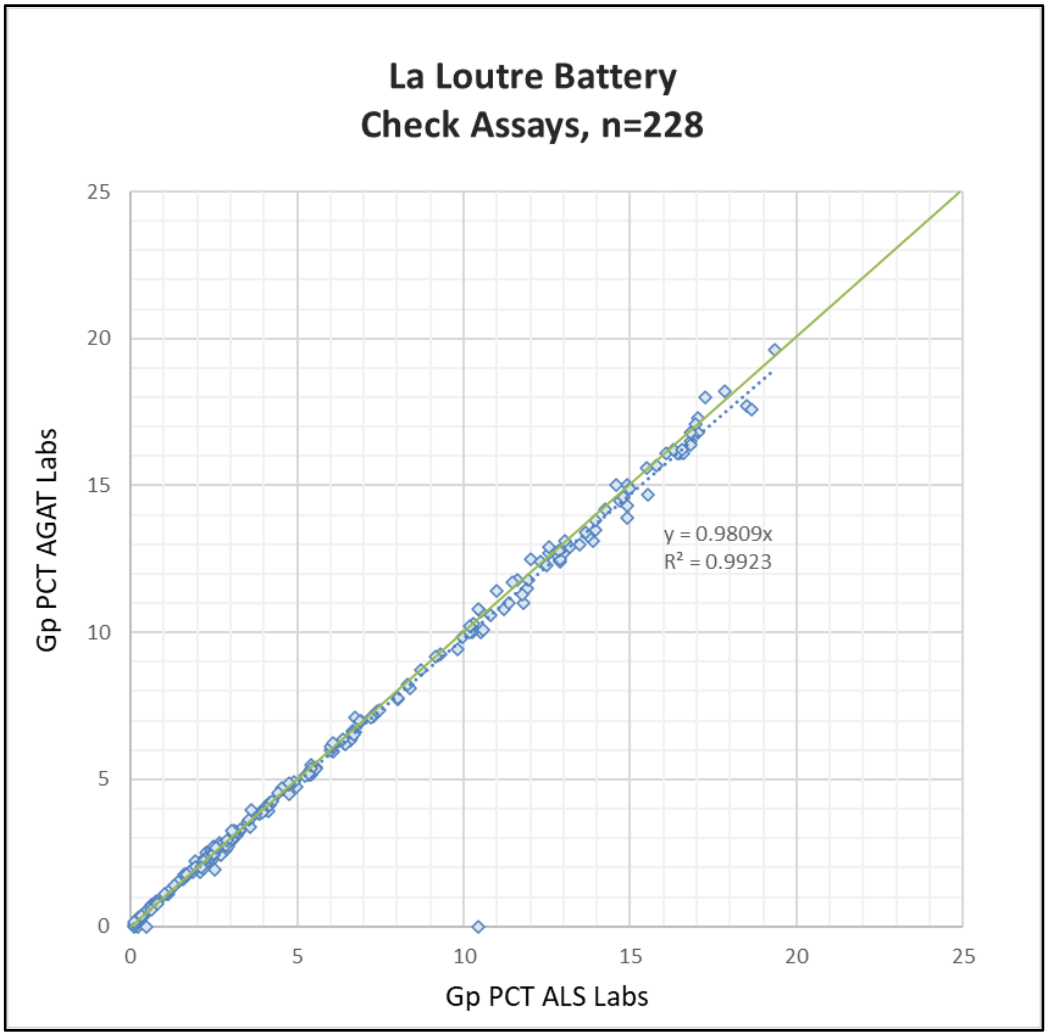
In 2016, pulps from the 2014-2015 drilling programs that were stored by Canada Strategic were selected for check assays (Turcotte et al., 2016). The duplicate samples were analyzed by the LECO method at the AGAT Laboratory in Mississauga, Ontario. A total of 240 sample are reported on certificates. The results of the simple statistics of the duplicate pairs (see Table 12-1) show that for both areas, the means and standard deviation are very similar.

Table 12-1: 2016 Check Assay Results

	Lab	Battery	EV
Duplicate Pairs		228	12
Average % Graphitic Carbon	ALS	6.43	10.80
	AGAT	6.42	10.90
% Difference		-0.04%	0.88%
Standard Deviation	ALS	5.30	6.60
	AGAT	5.22	6.53

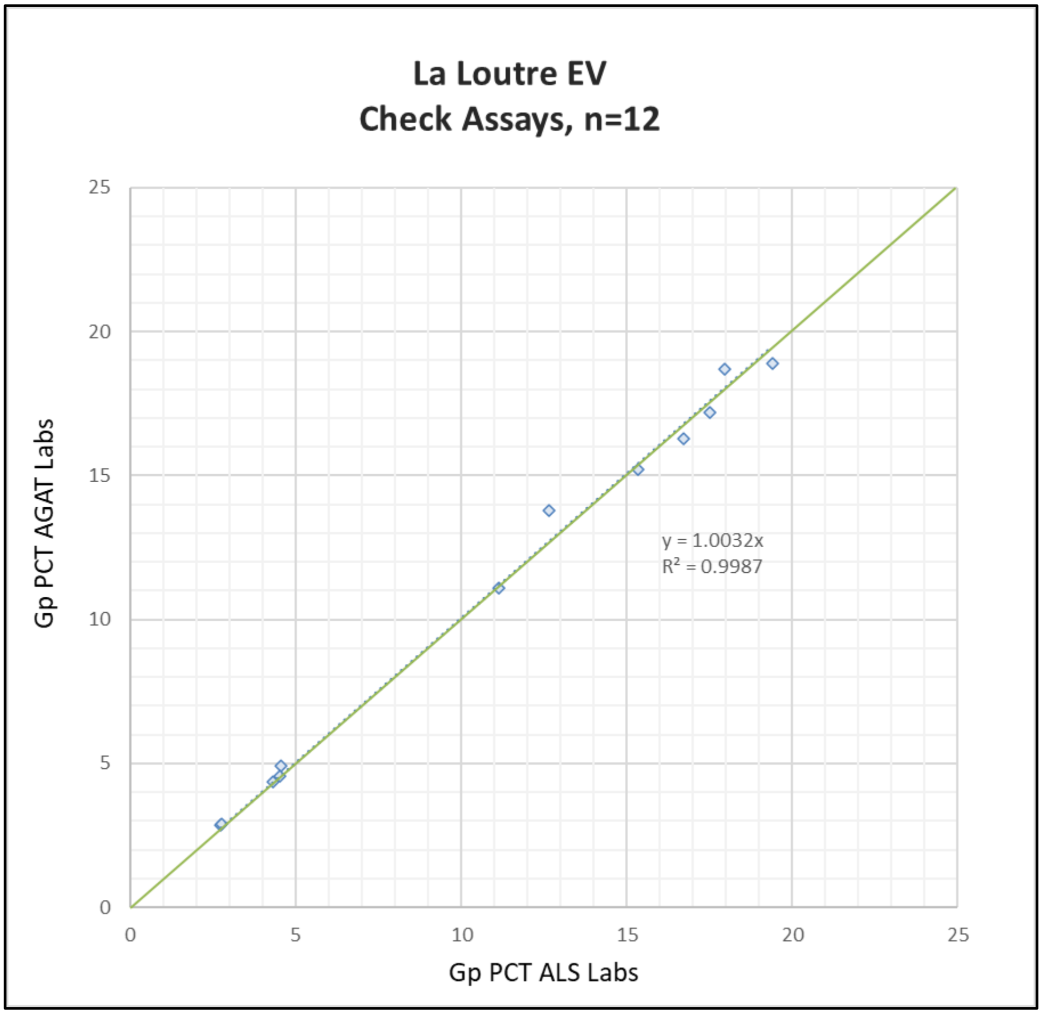
Scatterplots of the duplicate pairs are provided in Figures 12-1 and 12-2 for the Battery and Electric Vehicle (EV) deposits, respectively. In both cases, the duplicate pairs are seen to plot close to each other with no observable bias as demonstrated by the slope of the best-fit line close to 1.0 and to have a high coefficient of correlation.

Figure 12-1: 2016 Check Assays, Battery



Source: MMTS, 2021

Figure 12-2: 2016 Check Assays, EV



Source: MMTS, 2021

12.3 Comments on Data Verification

It is the opinion of the QP that the La Loutre database is adequate and sufficient in quality to be used for resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

A metallurgical process development program was completed on samples from the La Loutre Graphite (La Loutre) project in Québec, Canada. The test program was completed at SGS Lakefield, Ontario.

The metallurgical program consisted of sample preparation, comminution tests, flowsheet development tests, and preliminary static environmental tests. The primary objectives of the program were as follows:

- develop a flowsheet and conditions for the La Loutre mineralization that maximize the graphite concentrate grade and graphite recovery into a flotation concentrate, while minimizing flake degradation
- simulate closed-circuit performance with a locked cycle flotation test
- explore the potential of producing a non-acid generating low-sulphur tailings product through desulphurization of the graphite circuit tailings.

13.2 Metallurgical Test Program

13.2.1 Sample Preparation and Characterization

Approximately 60 kg of the La Loutre mineralization was provided in four composites weighing about 27 kg each. Initially, 17 kg was extracted from each composite and combined to form the Electric Vehicle composite (EV) and the Battery composite (B) as shown in Table 13-1. Sub-samples were extracted from the EV and B composites for comminution tests. Further, 5 kg of the EV and the B composites were then combined into a master composite.

Table 13-1: Metallurgical Composites

Area Composite	Domain Composite ID	Global Composite
17 kg LL-15-09	34 kg EV Composite	10 kg Master Composite
17 kg LL-19-17		
17 kg LL-15-24	34 kg B Composite	
17 kg LL-15-38		

The four original composites were submitted for chemical analysis. The results of the carbon speciation and sulphur analysis for the four composites and the calculated master composite are presented in Table 13-2. The total carbon grade ranged between 4.07% C(t) for the LL-15-38 composite and 14.0% C(t) for the LL-15-09 composite. All four composites contained a substantial amount of carbonates, which contributed to the lower graphitic carbon content of 3.15% C(g) in the LL-15-38 composite to 14.2% C(g) in the LL-15-09 composite. The sulphur content in the composites ranged between 1.81% S in the LL-19-17 composite and 2.38% S in the LL-15-38 composite. This sulphur content suggests that the flotation tailings will likely be acid generating unless a desulphurization circuit is included to separate the sulphide minerals from the remaining gangue minerals.

Table 13-2: Carbon Speciation and Total Sulphur Analysis (all Values in %)

Global Composite	C(t)	C(g)	CO_3	S
LL-15-09	14.0	14.2	4.50	2.23
LL-19-17	6.73	5.19	8.42	1.81
LL-15-24	9.20	6.44	13.8	2.10
LL-15-38	4.07	3.15	3.92	2.38
Master Composite (Calculated)	8.50	7.25	7.66	2.13

The whole rock analysis and ICP-OES scan results for the four composites and the calculated master composite are shown in Table 13-3 and Table 13-4, respectively. Silica, aluminum oxides, and iron oxides are the most abundant minerals in the four composites, accounting for over 71% of the mass in the LL-15-38 composite. Note that the whole rock analysis results are reported as the most common oxides, although the elements could be associated with other minerals. An XRD analysis would be required to determine the mineral composition of the sample.

Table 13-3: Whole Rock Analysis (all Values in %)

Global Composite	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O
LL-15-09	45.3	9.54	5.47	2.80	10.5	0.90	3.66
LL-19-17	47.6	6.45	3.99	7.68	14.9	1.16	3.11
LL-15-24	37.1	10.0	5.98	3.05	19.3	0.77	3.48
LL-15-38	49.8	14.0	7.41	2.90	10.7	1.06	3.93
Master Comp. (calc.)	45.0	10.0	5.71	4.11	13.9	0.97	3.55
Global Composite	**TiO_2**	**P_2O_5**	**MnO**	**Cr_2O_3**	**V_2O_5**	**LOI**	**Sum**
LL-15-09	0.85	0.49	0.05	0.02	0.02	19.0	98.6
LL-19-17	0.50	1.16	0.06	0.01	<0.01	10.9	97.6
LL-15-24	0.70	0.23	0.05	0.02	0.01	15.1	95.9
LL-15-38	0.90	0.14	0.04	0.02	0.02	6.77	97.7
Master Comp. (calc.)	0.74	0.51	0.05	0.02	0.02	12.9	97.5

Table 13-4: ICP-Scan (all Values in g/t)

Global Composite	Ag	As	Ba	Be	Bi	Cd	Co	Cu	Li	Mo
LL-15-09	<2	<30	581	1.53	<20	<2	26	66.7	<20	<5
LL-19-17	<2	<30	193	1.13	<20	<2	14	30.4	<20	<5
LL-15-24	<2	<30	271	1.44	<20	<2	20	44.1	<20	<5
LL-15-38	<2	<30	370	1.93	<20	<2	23	55.1	<20	<5
Master Comp. (calc.)	<2	<30	354	1.51	<20	<2	21	49.1	<20	<5
Global Composite	**Ni**	**Pb**	**Sb**	**Se**	**Sn**	**Sr**	**Ti**	**U**	**Y**	**Zn**
LL-15-09	52	<20	<10	<30	<20	225	<30	<20	24.8	62
LL-19-17	25	<20	<10	<30	<20	143	<30	<20	19.6	34
LL-15-24	43	<20	<10	<30	<20	443	<30	<20	23.3	33
LL-15-38	44	<20	<10	<30	<20	350	<30	<20	28.8	64
Master Comp. (calc.)	41	<20	<10	<30	<20	290	<30	<20	24.1	48

Most deleterious elements such as arsenic or cadmium were below the detection limits. Overall, the levels of impurities identified by the ICP-OES scan were generally low.

13.2.2 Comminution Tests

Bond abrasion and Bond ball mill grindability tests were carried out on the battery and refractory composites. The Bond ball mill grindability test was carried out at a custom screen size of 300 microns (μm) rather than the standard screen size of 150 μm. The coarser screen size was selected suitable rougher and scavenger conditions were developed and a primary grind size target of P_{80} = 180 to 200 μm was established. Tailoring the screen size to the expected grind target ensures a more accurate determination of the required comminution energy. The results of the four communication tests are presented in Table 13-5.

Table 13-5: Comminution Test Results

Composite ID	Bond Abrasion Index (g)	Bond Ball Mill Working Index (kWh/t) (metric)
B	0.220	11.2
EV	0.163	6.9

In terms of the grinding energy requirements, the EV composite is extremely soft and even the B composite would be considered soft. This low grinding energy requirement will result in favourable grinding energy costs.

The abrasivity of the La Loutre mineralization falls into the low to medium range. The bond abrasion index helps to predict the wear rates of mill liners and grinding media.

13.2.3 Process Development Flotation Tests

The metallurgical process development program consisted of 12 batch cleaner flotation tests. The first six tests evaluated the primary cleaning circuit configuration and the balance of the tests explored secondary cleaning. A summary of pertinent conditions of the first six tests is provided in Table 13-6.

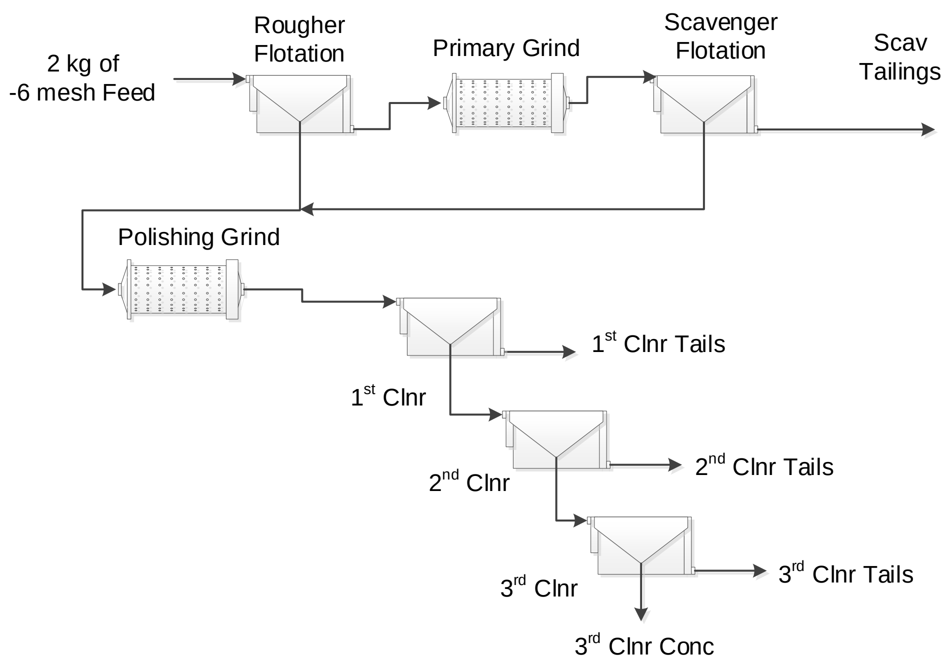
Table 13-6: Metallurgical Testwork Summary Table (F1 to F6)

Test	Composite	Flowsheet	Polishing Time
F1	B	Single polish	30 min
F2	EV	Single polish	30 min
F3	B	Single polish	45 min
F4	EV	Single polish	45 min
F5	B	Two-stage polish	30 min + 30 min
F6	EV	Two-stage polish	30 min + 30 min

The flowsheet that was used in tests F1 to F4 is depicted in Figure 13-1. The test charge of -6 mesh (-3.35 mm) ore is subjected to rougher flotation. The rougher flotation tailings are reground to a P_{80} of 180 to 200 μm followed by scavenger flotation to maximize the overall graphite recovery. The scavenger grind size target was determined based on observations made during the first two tests. The combined rougher and scavenger concentrate is processed in a polishing mill with ceramic media and the mill discharge is upgraded in three stages of cleaning to reject liberated gangue minerals.

The only modification in tests F5 and F6 was the addition of a second polishing mill treating the first cleaner concentrate followed by three cleaning stages.

Figure 13-1: Primary Cleaning Circuit Flowsheet (F1 to F4)



Source: Metpro, 2021

A summary of the mass balances of tests F1 to F6 is presented in Table 13-7. Test 1 and Test 2 employed identical conditions for the two composites with a polishing time of 30 minutes. The combined concentrate grade of the B and EV composites was 80.9% C(t) and 78.5% C(t), respectively. The open circuit total carbon recoveries were high at 95.7% and 93.6% for the BG and EV composites, respectively.

Owing to the low concentrate grades, the polishing times were increased to 45 minutes in the following two tests, F3 and F4. While the third cleaner concentrate grade for the EV composite improved from 78.5% C(t) in test F2 to 90.2% C(t) in test F4, the BG composite yielded only a very small improvement of 0.3% to 81.2% C(t). It became apparent at this point that a single polishing stage would not be suitable to achieve acceptable concentrate grades.

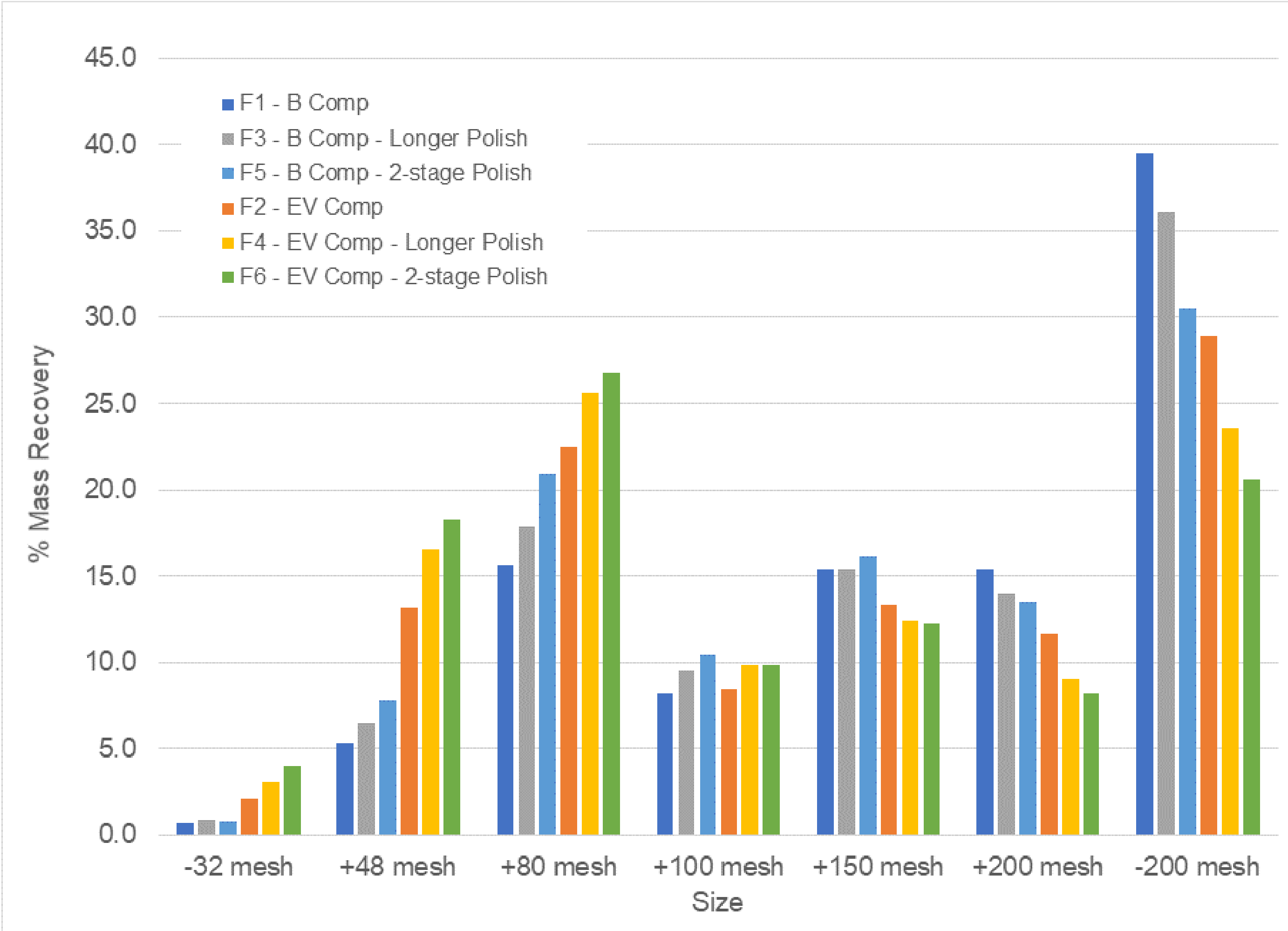
The last two primary cleaning tests included two polishing grinds with one cleaner flotation stage between the two polishing stages to remove liberated gangue minerals. This flowsheet variant proved more successful in that the fourth cleaner concentrate of the B and EV tests yielded total carbon grades of 94.8% and 94.7% C(t), respectively. The open circuit stage recovery decreased slightly for the B composite to 91.8% but more significantly to 85.7% for the EV composite.

To properly assess the performance of the cleaning circuit, the final concentrate of each test was submitted for a size fraction analysis (SFA). The mass distribution into the different size fractions and the associated total carbon grades are presented in Figure 13-2 and Figure 13-3, respectively.

Table 13-7: Primary Cleaning Tests

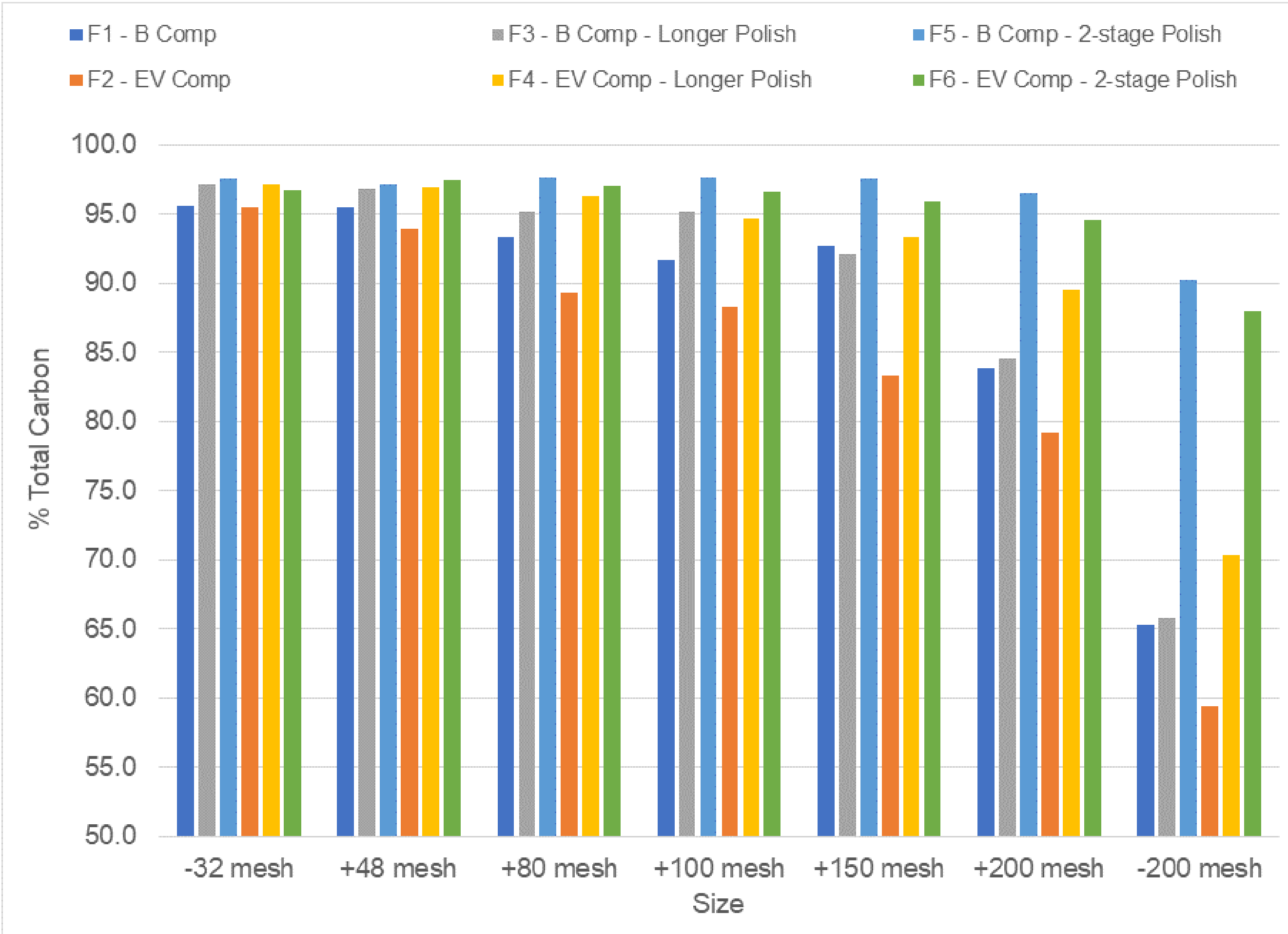
Test	Product	Mass (%)	C(t) (%)	C(t) Distribution (%)
F1 BG Comp 30 min Polish	Third Cleaner Concentrate	11.9	80.9	95.7
	Second Cleaner Concentrate	12.5	77.1	95.9
	First Cleaner Concentrate	14.5	66.6	96.3
	Rougher & Scavenger Concentrate	28.5	34.4	97.8
	Scavenger Tails	71.5	0.31	2.2
	Head (Calculated)	100.0	10.0	100.0
F2 EV Comp 30 min Polish	Third Cleaner Concentrate	6.1	78.5	93.6
	Second Cleaner Concentrate	6.4	75.2	93.8
	First Cleaner Concentrate	7.6	63.1	94.3
	Rougher & Scavenger Concentrate	20.8	23.9	97.4
	Scavenger Tails	79.2	0.17	2.6
	Head (Calculated)	100.0	5.10	100.0
F3 BG Comp 45 min Polish	Third Cleaner Concentrate	11.5	81.2	94.6
	Second Cleaner Concentrate	12.1	77.2	94.9
	First Cleaner Concentrate	15.0	62.6	95.5
	Rougher & Scavenger Concentrate	32.8	29.2	97.3
	Scavenger Tails	67.2	0.39	2.7
	Head (Calculated)	100.0	9.83	100.0
F4 EV Comp 45 min Polish	Third Cleaner Concentrate	5.2	90.2	91.6
	Second Cleaner Concentrate	6.3	75.6	92.7
	First Cleaner Concentrate	6.5	73.2	92.8
	Rougher & Scavenger Concentrate	17.1	28.4	95.0
	Scavenger Tails	82.9	0.31	5.0
	Head (Calculated)	100.0	5.11	100.0
F5 BG Comp 30 min + 30 min Polish	Fourth Cleaner Concentrate	9.7	94.8	91.8
	Third Cleaner Concentrate	9.9	93.2	92.0
	Second Cleaner Concentrate	10.5	88.0	92.2
	First Cleaner Concentrate	13.9	66.7	92.7
	Rougher & Scavenger Concentrate	27.6	34.2	94.2
	Scavenger Tails	72.4	0.80	5.8
	Head (Calculated)	100.0	10.0	100.0
F6 EV Comp 30 min + 30 min Polish	Fourth Cleaner Concentrate	4.7	94.7	85.7
	Third Cleaner Concentrate	4.8	93.5	85.9
	Second Cleaner Concentrate	5.0	89.8	86.2
	First Cleaner Concentrate	6.5	70.1	86.6
	Rougher & Scavenger Concentrate	15.3	30.3	88.6
	Scavenger Tails	84.7	0.70	11.4
	Head (Calculated)	100.0	5.22	100.0

Figure 13-2: Mass Distribution of Third and Fourth Cleaner Concentrates (F1 to F6)



Source: Metpro, 2021

Figure 13-3: Total Carbon Grade Profile of Third and Fourth Cleaner Concentrates (F1 to F6)



Source: Metpro, 2021

The size distribution chart reveals that the lower-grade EV composite produced an overall coarser concentrate product with substantially more mass in the +80 mesh (+180 µm) size fraction. Interestingly, the flake size distribution coarsened with longer polishing times and reached a maximum in tests F5 and F6 with two stages of polishing. This observation can be explained with the fact that the flowsheet with two polishing stages was more effective in depressing fine entrained and poorly liberated gangue particles.

The grade profile illustrates the impact of the polishing grind on the grades of the smaller flake sizes. While the coarse flakes achieve high total carbon grades with only 30 minutes of polishing, the medium and small flakes benefited from longer polishing times and two polishing stages.

Based on the results of the first six cleaner flotation tests, a decision was made to proceed with the flowsheet that employs two polishing stages. The secondary cleaner tests included classification of the fourth cleaner concentrate at 80 mesh (180 µm) followed by stirred media milling (SMM) and cleaner flotation of the screen oversize and undersize fractions. One set of tests employed ceramic media in the SMM (F7 and F8) and the second set of tests used steel media (F9 and F10). The final two tests of the development program, F11 and F12, evaluated two additional polishing stages after the primary cleaning circuit for a total of four polishing stages. The pertinent conditions of the six secondary cleaning tests are presented in Table 13-8.

Table 13-8: Metallurgical Testwork Summary Table (F7 to F12)

Test	Composite	Flowsheet	Grind Times Time
F7	BG	Coarse & Fine SMM (Ceramic Media)	30/30/5/10
F8	EV	Coarse & Fine SMM (Ceramic Media)	30/30/5/10
F9	BG	Coarse & Fine SMM (Steel Media)	30/30/5/10
F10	EV	Coarse & Fine SMM (Steel Media)	30/30/5/10
F11	BG	Four-Stage Polish	30/30/30/30
F12	EV	Four-Stage Polish	30/30/30/30

A summary of the mass balances for the six secondary cleaner tests is shown in Table 13-9. The final concentrate grades ranged between 97.0% C(t) for the EV composite and four stages of polishing and 98.3% for the EV composite with SMM grinding with ceramic media. Overall, the final concentrate grades varied only marginal between the two composites and the different secondary cleaning conditions. While SMM grinding with ceramic media produced a 0.5% higher concentrate grade for the EV composite, test F9 with steel media outperformed the test with ceramic media by 0.4% for the B composite. However, the small differences in grades fall well within the normal test-to-test variance and the analytical measurement uncertainties.

In terms of open circuit recoveries, the six tests produced more variation. The lowest recovery of 81.6% was obtained with the EV composite in test F10 using the SMM grinding and steel media. The highest open circuit carbon recovery was achieved in test F12 with four stages of polishing and the BG composite.

Most of the losses were associated with the scavenger tailings and the cleaner stage recovery is a better indication of the cleaner performance. For the lower-grade EV composite, the open circuit cleaner stage recovery ranged between 89% and 94%. Incidentally, the test that produced the overall lowest total carbon recovery into the final concentrate, produced the highest cleaner stage recovery for the EV composite. The cleaner stage recoveries for the higher-grade B composite varied between 92% and 95%.

Based on the graphite concentrate grades and recoveries, the three different test conditions evaluated in tests F7 to F12 produced comparable results and no clear benefit could be identified for any of the flowsheet variants.

Table 13-9: Secondary Cleaning Tests

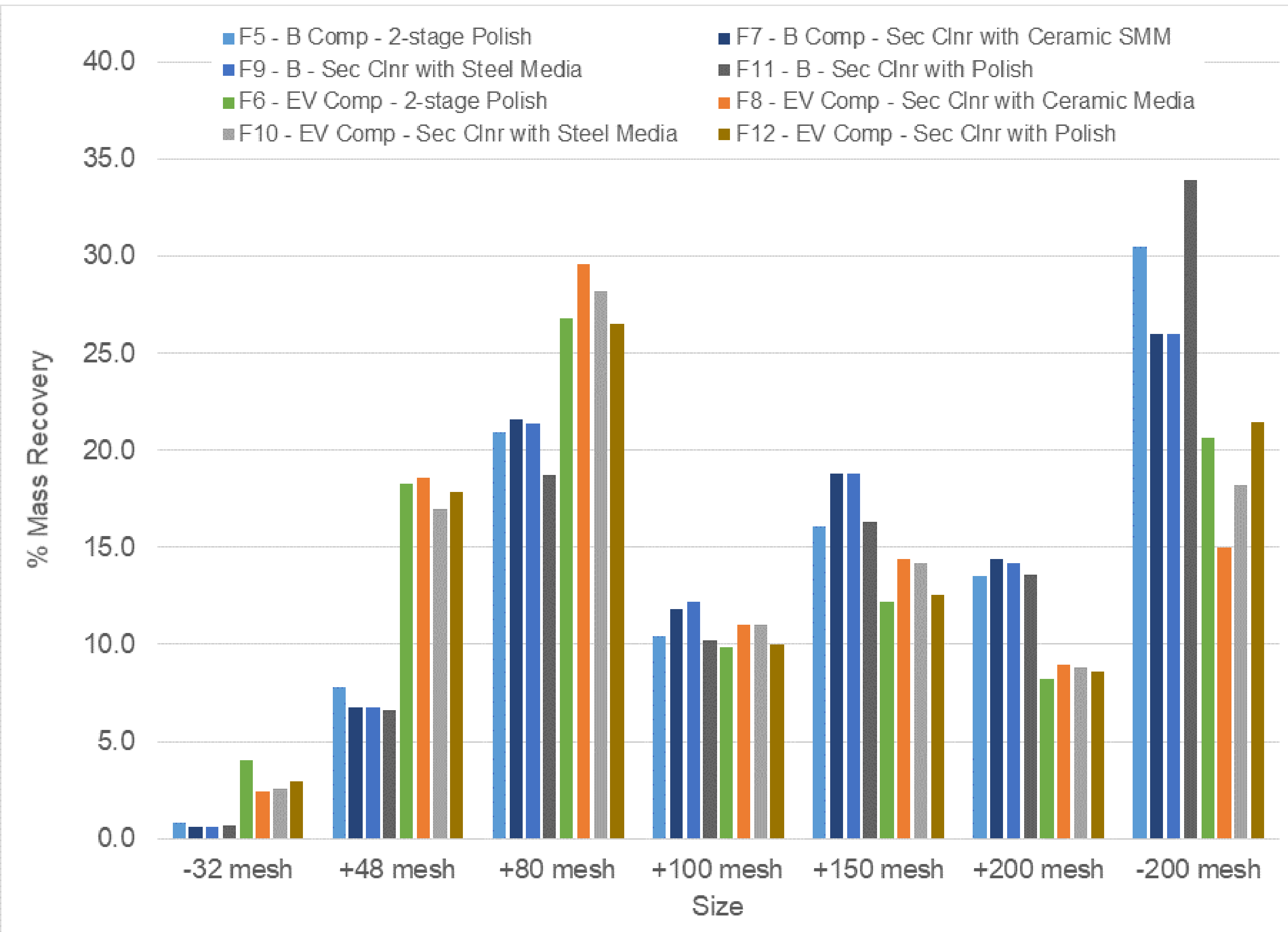
Test	Product	Mass (%)	C(t) (%)	C(t) Distribution (%)
F7 B Comp Coarse & Fine SMM Ceramic Media 30/30/5/10 minutes	Combined Concentrate	9.1	97.4	82.3
	+80 mesh Feed	3.7	93.3	34.2
	-80 mesh Feed	6.5	89.9	58.4
	Fourth Cleaner Concentrate	10.2	91.1	92.6
	Third Cleaner Concentrate	10.4	89.3	93.3
	Second Cleaner Concentrate	11.3	83.3	93.8
	First Cleaner Concentrate	15.8	59.8	94.4
	Rougher & Scavenger Concentrate	32.5	29.7	93.5
	Scavenger Tails	67.5	0.52	3.5
	Head (Calculated)	100.0	10.0	100.0
F8 EV Comp Coarse & Fine SMM Ceramic Media 30/30/5/10 minutes	Combined Concentrate	4.6	98.3	82.3
	+80 mesh Feed	2.7	97.0	50.0
	-80 mesh Feed	2.3	90.2	39.4
	Fourth Cleaner Concentrate	4.9	93.9	89.4
	Third Cleaner Concentrate	5.0	92.7	89.6
	Second Cleaner Concentrate	5.3	88.4	89.9
	First Cleaner Concentrate	7.0	66.7	90.3
	Rougher & Scavenger Concentrate	16.9	28.3	92.4
	Scavenger Tails	83.1	0.47	7.6
	Head (Calculated)	100.0	5.17	100.0
F9 B Comp Coarse & Fine SMM Steel Media 30/30/5/10 minutes	Combined Concentrate	9.2	97.8	89.0
	+80 mesh Feed	3.3	97.7	32.2
	-80 mesh Feed	6.4	92.3	58.5
	Fourth Cleaner Concentrate	9.7	94.2	90.7
	Third Cleaner Concentrate	9.9	92.7	91.0
	Second Cleaner Concentrate	10.5	87.8	91.2
	First Cleaner Concentrate	13.7	67.8	91.7
	Rougher & Scavenger Concentrate	28.3	33.3	93.4
	Scavenger Tails	71.7	0.21	6.6
	Head (Calculated)	100.0	10.1	100.0
F10 EV Comp Coarse & Fine SMM Steel Media 30/30/5/10 minutes	Combined Concentrate	4.5	97.8	81.6
	+80 mesh Feed	2.6	96.3	46.3
	-80 mesh Feed	2.2	92.7	37.6
	Fourth Cleaner Concentrate	4.8	94.6	84.0
	Third Cleaner Concentrate	4.9	93.4	84.4
	Second Cleaner Concentrate	5.1	90.0	84.6
	First Cleaner Concentrate	6.3	73.4	85.0
	Rougher & Scavenger Concentrate	14.5	32.7	86.8
	Scavenger Tails	85.5	0.29	13.2
	Head (Calculated)	100.0	5.44	100
Test	**Product**	**Mass (%)**	**C(t) (%)**	**C(t) Distribution (%)**
F11 B Comp 4 stage Polish 30/30/30/30 minutes	Sixth Cleaner Concentrate	9.7	97.0	94.6
	Fifth Cleaner Concentrate	9.7	96.7	94.9
	Fourth Cleaner Concentrate	9.9	96.0	95.3
	Third Cleaner Concentrate	10.2	92.9	95.5
	Second Cleaner Concentrate	11.6	82.1	95.9
	First Cleaner Concentrate	18.1	53.1	96.6
	Rougher & Scavenger Concentrate	36.2	27.0	98.6
	Scavenger Tails	63.8	0.21	1.4
	Head (Calculated)	100.0	9.92	100.0
F12 EV Comp 4 stage Polish 30/30/30/30 minutes	Sixth Cleaner Concentrate	4.8	97.1	90.3
	Fifth Cleaner Concentrate	4.8	96.8	91.2
	Fourth Cleaner Concentrate	4.9	96.5	91.5
	Third Cleaner Concentrate	5.0	96.1	91.8
	Second Cleaner Concentrate	5.3	89.1	92.3
	First Cleaner Concentrate	7.5	63.4	92.9
	Rougher & Scavenger Concentrate	21.4	23.2	96.3
	Scavenger Tails	78.6	0.24	3.7
	Head (Calculated)	100.0	5.14	100.0

In order to assess the quality of the final concentrates, they were submitted for an SFA. The mass distribution and associated total carbon grades for the six concentrates are presented in Figure 13-4 and Figure 13-5, respectively.

In terms of mass distribution, the secondary cleaner tests produced minimum degradation of the larger flakes. Little difference was noted between the two tests employing the SMM with ceramic and steel media. For the seven size fractions, the mass recoveries into a specific size fraction did not vary by more than 0.4% for the B composite. A higher degree of degradation was observed for the four stages of polishing with only 26.0% reporting to the +80 mesh size fractions compared to 28.8% and 29.0% of the mass for the two tests using the SMM.

For the EV composite, test F8 produced the highest mass recovery into the +80 mesh size fractions at 50.6%. The second SMM test with steel media and the secondary cleaner test with four stages of polishing produced similar results at 47.8% and 47.3% mass recovery into the +80 mesh size fractions, respectively.

Figure 13-4: Mass Distribution of Final Concentrates (F5 to F12)

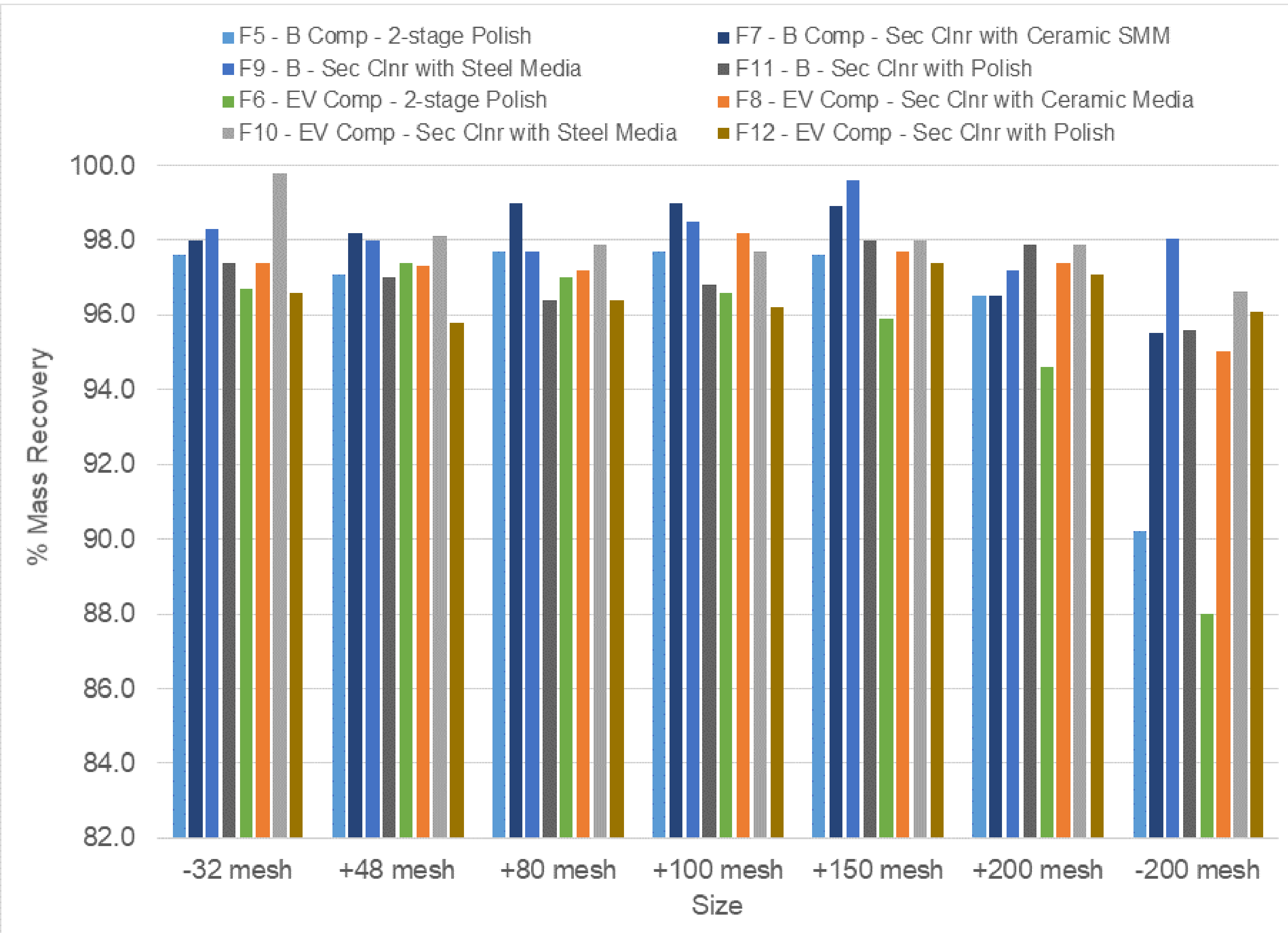


Source: Metpro, 2021

While the total carbon grades were typically above 95% for all size fractions greater than 200 mesh, small differences were noted for the six tests. The SMM tests outperformed the four stages of polishing for both the B and the EV composites. The type of grinding media in the SMM did not appear to have an impact on the total carbon grades of the size fractions.

Although the results of the secondary cleaner tests were quite similar, a small advantage of the SMM over four stages of polishing could be identified. The grinding media in the SMM had no measurable impact on the flake size distribution or total carbon grades of the various size fractions. However, considering that a commercial operation is expected to choose ceramic media due to lower iron entrainment and wear rates, the locked cycle tests and variability flotation tests were carried out with ceramic media in the SMM.

Figure 13-5: Total Carbon Grade Profile of Final Concentrates (F5 to F12)



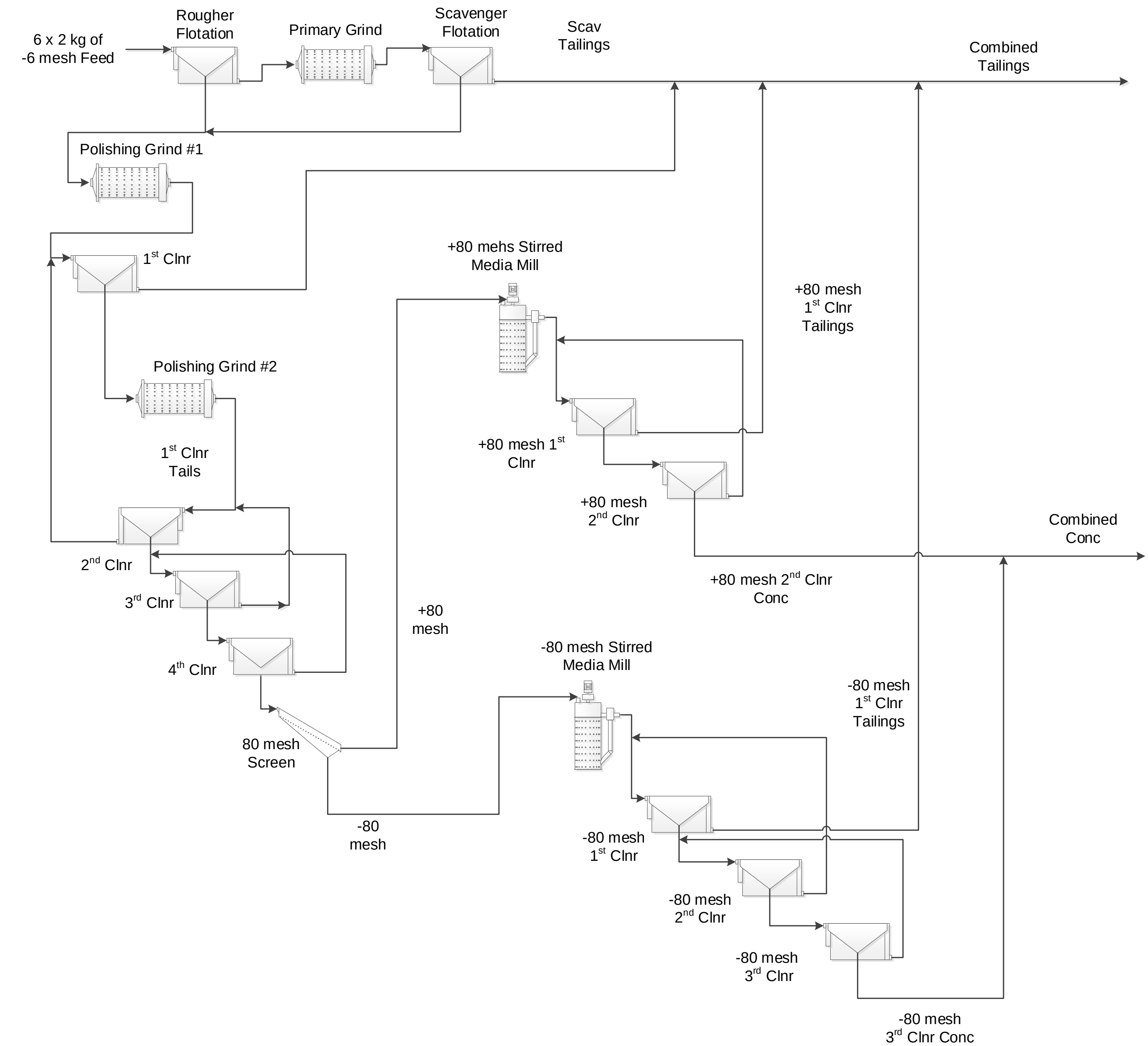
Source: Metpro, 2021

13.2.4 Locked Cycle Flotation Test

After completion of the process development program, the proposed flowsheet and conditions were evaluated in a locked cycle flotation test (LCT). This type of test simulates a closed-circuit performance of a process by cycling the intermediate tailings stream from one cycle to the next cycle of the test. The mass balances generated from LCTs are more representative of the metallurgical response that can be expected during commercial operation since it contains only final concentrate and tailings streams. Only four cycles were completed since graphite flowsheets tend to reach stability much quicker than base metal flowsheets due to a very high cleaner stage recovery.

The flowsheet that was employed in the LCT is depicted in Figure 13-6. The process generates a +80 mesh second cleaner concentrate and a -80 mesh third cleaner concentrate, which are combined into a final concentrate. The process also generates four tailings streams, namely a scavenger tailings, first cleaner tailings, +80 mesh first cleaner tailings, and -80 mesh first cleaner tailings. The sum of these four individual tailings streams forms the combined tailings product.

Figure 13-6: Locked Cycle Test Flowsheet



Source: Metpro, 2021

The mass balance of the LCT cycles B to D is presented in Table 13-10. The combined concentrate graded 98.5% C(t) at a total carbon recovery of 93.5%. Most of the graphite losses occurred in the rougher/scavenger and primary cleaning circuit and totaled 5.6%. The carbon stage recovery in the secondary cleaning circuits was very high and produced combined carbon losses of only 0.8% into the combined +80 mesh and -80 mesh first cleaner tailings.

Table 13-10: Locked Cycle Mass Balance

Sample ID	Weight (%)	C(t) (%)	C(t) Distribution (%)
Combined Concentrate	7.2	98.5	93.5
+80 mesh Second Cleaner Concentrate	2.9	99.0	37.1
+80 mesh First Cleaner Tails	0.1	34.9	0.3
-80 mesh Third Cleaner Concentrate	4.4	98.1	56.4
-80 mesh First Cleaner Tails	0.4	9.64	0.5
First Cleaner Tails	22.3	1.26	3.7
Scavenger Tails	69.9	0.21	1.9
Head (Calculated)	100.0	7.63	100.0

The size fraction analysis results of the combined concentrate of the LCT are shown in Table 13-11. The large and jumbo flake sizes of -48 mesh (-300 μm)/+80 mesh (+180 μm) and +48 mesh contained 10.8% and 21.6% of the concentrate mass, respectively, with total carbon grades of 97.4% to 97.6% C(t). The balance of the concentrate mass reported to the -80 mesh size fraction at a combined concentrate grade of 97.7% C(t). Even the smallest flake size of -325 mesh (-45 μm) yielded a high grade of 96.0% (t).

Table 13-11: Size Fraction Analysis of Combined Concentrate of LCT

Size (Mesh)	Size (μm)	Mass (%)	C(t) (%)	C(t) Distribution (%)
+32	+500	1.0	97.6	1.0
+48	+300	9.8	97.4	9.7
+80	+180	21.6	98.0	21.7
+100	+150	10.8	98.2	10.9
+150	+106	17.5	98.1	17.5
+200	+75	13.0	98.3	13.1
+325	+45	13.5	98.1	13.6
-325	-45	12.8	96.0	12.5

13.2.5 Metallurgical Variability Flotation Tests

The four composites that were used to generate the Master composite were subjected to variability flotation tests. The purpose of the tests was to validate the robustness of the proposed flowsheet. The test employed the same conditions as the locked cycle flotation tests.

A summary of the mass balances of the four tests is presented in Table 13-12. The combined graphite concentrate graded between 97.6% C(t) for the LL-15-38 composite and 98.6% C(t) for the LL-19-17 composite. The narrow range of the combined concentrate confirms the suitability of the flowsheet and conditions for the four variability composites.

The open circuit graphite recovery ranged between 73.7% for the LL-15-38 composite and 83.8% for the LL-19-17 composite. It should be noted that the same primary grind time for the four composites resulted in a range of non-mags P_{80} of 177 μm for the LL-19-17 composite and 329 μm for the LL-15-24 composite. Hence, a coarser primary grind size may have contributed to the increased graphite loss of the LL-15-38 composite (P_{80} = 250 μm). The open circuit cleaner recovery was consistently high for all four composites at 89.5% to 92.6%.

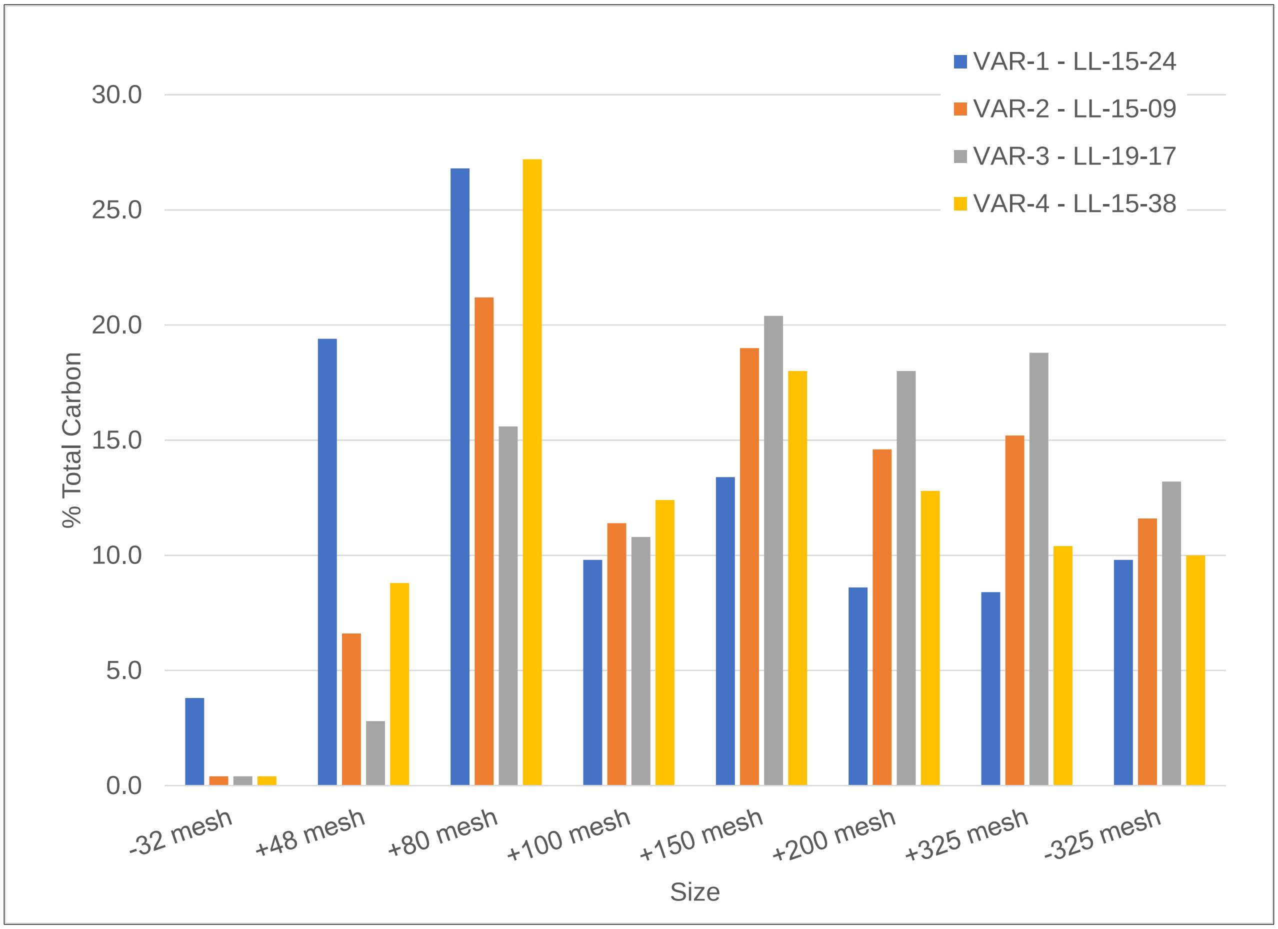
Table 13-12: Variability Flotation Results

Test ID	Product	Mass(%)	Total Carbon (%)	Distribution (%)
VAR-1	Combined Concentrate	6.4	98.1	85.3
	+80 mesh Feed	3.9	97.5	51.1
	-80 mesh Feed	2.9	91.5	35.2
	Fourth Cleaner Concentrate	6.7	94.9	86.3
	Third Cleaner Concentrate	6.9	94.1	87.3
	Second Cleaner Concentrate	7.1	91.3	87.9
	First Cleaner Concentrate	8.7	75.5	89.2
	Rougher & Scavenger Concentrate	17.1	39.9	92.1
	Scavenger Tails	82.9	0.11	7.9
	Head (Calculated)	100.0	7.41	100.0
VAR-2	Combined Concentrate	13.0	97.7	86.7
	+80 mesh Feed	4.6	96.9	30.7
	-80 mesh Feed	9.6	87.9	57.7
	Fourth Cleaner Concentrate	14.3	90.8	88.3
	Third Cleaner Concentrate	14.8	88.4	89.6
	Second Cleaner Concentrate	16.7	80.9	92.2
	First Cleaner Concentrate	23.6	58.4	94.1
	Rougher & Scavenger Concentrate	42.9	33.0	96.4
	Scavenger Tails	57.1	0.12	3.6
	Head (Calculated)	100.0	14.66	100.0
VAR-3	Combined Concentrate	4.9	98.6	83.8
	+80 mesh Feed	1.3	98.3	21.4
	-80 mesh Feed	3.9	97.2	65.8
	Fourth Cleaner Concentrate	5.2	97.5	87.2
	Third Cleaner Concentrate	5.3	97.0	88.3
	Second Cleaner Concentrate	5.5	94.0	89.2
	First Cleaner Concentrate	7.0	74.9	90.3
	Rougher & Scavenger Concentrate	20.9	26.0	93.4
	Scavenger Tails	79.1	0.09	6.6
	Head (Calculated)	100.0	5.82	100.0
VAR-4	Combined Concentrate	2.6	97.6	73.7
	+80 mesh Feed	1.2	96.2	34.1
	-80 mesh Feed	1.6	92.9	44.3
	Fourth Cleaner Concentrate	2.8	94.3	78.3
	Third Cleaner Concentrate	2.9	93.7	78.8
	Second Cleaner Concentrate	3.0	89.3	79.3
	First Cleaner Concentrate	4.4	61.1	80.0
	Rougher & Scavenger Concentrate	16.0	17.5	82.4
	Scavenger Tails	84.0	0.19	17.6
	Head (Calculated)	100.0	3.40	100.0

The mass distribution of the combined graphite concentrate and the total carbon grades of the individual size fractions of the four variability flotation tests are presented in Figure 13-7 and Figure 13-8, respectively. The LL-15-24 composite produced a significantly higher mass recovery into the +48 mesh size fractions of 23.2% compared to 3.2% to 9.2% for the other three composites. The LL-15-24 also yielded a higher -48/+80 mesh mass recovery of 26.8%, which was only exceeded slightly by the LL-15-38 composite with 27.2% of the mass reporting to this size fraction. The LL-19-17 composite displayed the finest concentrate product with only 3.2% and 15.6% of the mass reporting to the +48 mesh and-48/-80 mesh products.

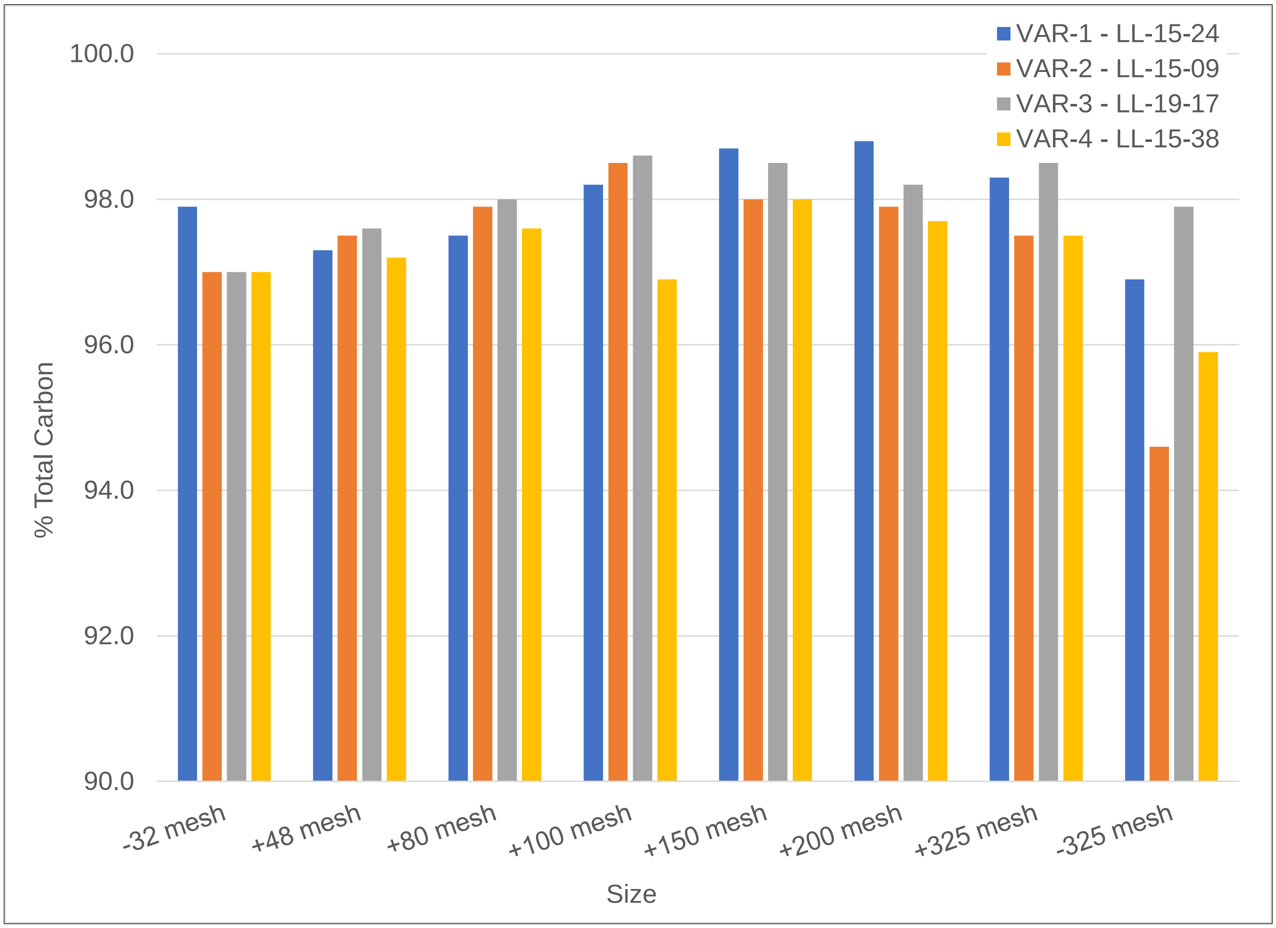
The total carbon grades were relatively consistent for all four composites with total carbon grades of at least 96.9% C(t) in all size fractions above 325 mesh. Even the smallest size fraction of -325 mesh produced grades between 94.6% for the LL-15-09 composite and 97.9% C(t) for the LL-19-17 composite.

Figure 13-7: Flake Size Distribution of Graphite Concentrates (VAR-1 to VAR-4)



Source: Metpro, 2021

Figure 13-8: Total Carbon Grade Profile of Graphite Concentrates (VAR-1 to VAR-4)



Source: Metpro, 2021

13.2.6 Static Environmental Tests

The graphite scavenger tailings of the variability composites were subjected to a desulphurization stage to determine if non-acid-generating tailings can be generated. The desulphurization stage consisted of a sulphide rougher flotation stage using potassium amyl xanthate (PAX) as the collector followed by magnetic separation at 7,000 Gauss.

The mass recovery into the combined sulphide rougher and magnetics product ranged between 17.2% for the LL-19-17 composite and 33.9% for the LL-15-38 composite. The non-magnetics of the four tests were submitted for net acid generation (NAG) and modified acid base accounting (ABA) tests. The results of the NAG and ABA tests are presented in Table 13-13 and Table 13-14, respectively.

The sulphur content of the non-magnetic stream ranged between 0.036% S for the LL-15-24 composite and 0.278% S for the LL-15-38 composite. In the case of the LL-15-38, the concentration of sulphide sulphur was only 0.12% S. The carbonate concentration in the four variability composites ranged between 5.33% CO_3 for the LL-15-38 composite and 18.3% for the LL-15-24 composite.

Based on the results of both the NAG and ABA tests, all four variability samples are classified as not potentially acid-generating (NPAG) with abundant neutralization potential derived almost entirely from carbonate mineral sources.

Table 13-13: Net Acid Generation Results

Parameter	Unit	LL-15-24	LL-15-09	LL-19-17	LL-15.38
Final pH	-	11.35	11.33	11.34	11.23
Vol NaOH to pH 4.5	ml	0	0	0	0
Vol NaOH to pH 7.0	ml	0	0	0	0
NAG (pH 4.5)	kg H_2SO_4/t	0	0	0	0
NAG (pH 7.0)	kg H_2SO_4/t	0	0	0	0

Table 13-14: Modified Acid Base Accounting Result

Parameter	Unit	LL-15-24	LL-15-09	LL-19-17	LL-15-38
Paste pH	-	8.98	9.21	9.57	8.94
Fizz Rate		4	4	4	4
HCL Added	ml	180.0	85.0	120.0	60.
HCl	normality	0.10	0.10	0.10	0.10
NaOH	normality	0.10	0.10	0.10	0.10
Vol NaOH to pH=8.3	ml	53.0	25.4	40.1	23.0
Final pH	-	1.61	1.72	1.63	1.65
NP	t $CaCO_3$/1000 t	313	147	200	92.9
AP	t $CaCO_3$/1000 t	1.25	1.25	1.25	3.75
NET NP	t $CaCO_3$/1000 t	250	118	160	24.8
S	%	0.054	0.059	0.036	0.278
Acid Leachable SO_4-S	%	<0.05	<0.04	<0.04	0.16
Sulphide	%	<0.04	0.04	0.04	0.12
C	%	3.79	1.70	2.25	1.20
CO_3	%	18.3	7.83	11.0	5.33
CO_3 NP (Calculated)	t $CaCO_3$/1000 t	307	130	183	88.5
CO_3 Net NP (Calculated)	t $CaCO_3$/1000 t	306	129	181	84.7
CO_3 NP/AP (Calculated)	Ratio	246	104	146	23.6
NP attributed to CO_3	%	98	88	91	95

14 MINERAL RESOURCE ESTIMATE

14.1 La Loutre Graphite Resource Estimate

Lomiko's La Loutre project includes the Battery and the Electric Vehicle (EV) graphite deposits. The total mineral resource estimate (MRE) is summarized in Table 14-1 with the base case cut-off highlighted.

A Lerchs-Grossman (LG) resource pit has been constructed using the 150% pit case based on the prices, off-site costs, metallurgical recovery, and graphite prices used for the economic analysis thus confining the resource to a pit shape that reflects "reasonable prospects of eventual economic extraction". The cut-off grade is based on a processing cost of C$11.85/t; a general and administrative (G&A) cost of C$2.37/t, and an exchange rate of 1.33 (CAD:USD). A cut-off value of 1.5% has been used for the base case of the resource estimate, which more than covers the process and G&A costs.

These mineral resource estimates include inferred mineral resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as mineral reserves. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 14-1: La Loutre Resource Estimate (Effective Date: May 14, 2021)

Class	Cutoff (%)	EV Deposit		Battery Deposit		Total		
		Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Run-of-Mine Tonnage (kt)	In-Situ Grade Graphite (%)	Graphite (kt)
Indicated	1	8,321	6.38	15,889	3.32	24,210	4.37	1,057.9
	1.5	8,158	6.48	15,007	3.44	23,165	4.51	1,044.3
	2	7,792	6.70	12,622	3.75	20,414	4.88	995.5
	3	6,768	7.33	4,529	6.16	11,297	6.86	774.6
	5	4,443	9.17	2,394	8.27	6,837	8.85	605.4
Inferred	1	13,114	5.71	38,273	3.10	51,387	3.77	1,936.4
	1.5	12,829	5.81	33,992	3.33	46,821	4.01	1,877.9
	2	12,273	5.99	27,775	3.69	40,048	4.39	1,759.5
	3	9,645	6.92	10,311	5.92	19,956	6.40	1,277.6
	5	5,833	8.99	5,687	7.58	11,520	8.29	955.2

Notes:
1. Resources are reported using the 2014 CIM Definition Standards and were estimated using the 2019 CIM Best Practices Guidelines.
2. Mineral resources that are not mineral reserves do not have demonstrated economic viability.
3. The mineral resource has been confined by a "reasonable prospects of eventual economic extraction" pit using the following assumptions: exchange rate CAD:USD=1.33; weighted average price of graphite of US$890/t; 100% payable; off-site costs including transportation and insurance of C$39.42/t; a 1.0% NSR royalty; and metallurgical recoveries of 95%.
4. Pit slope angles are 45° below overburden, 20° in overburden.
5. The specific gravity of the deposit is 2.86 in unmineralized and low-grade zones and 2.78 in high-grade zones (within solids above a 4% graphite grade).
6. Numbers may not add due to rounding.

Factors that could affect the mineral resource estimate include commodity price and exchange rate assumptions; pit slope angles; assumptions used in generating the LG pit shell, including metal recoveries; and mining and process cost assumptions. The QP is not aware of any environmental, permitting, legal, title, taxation, socioeconomic, marketing, political, or other relevant factors that could materially affect the mineral resource estimate.

14.2 Key Assumptions and Data used in the Resource Estimate

The drill hole database within the block model boundaries that is used in the resource estimate is summarized in Table 14-2.

Table 14-2: Summary of Drill Hole (DH) Data by Deposit and Year

Year	Battery				EV				Total			
	DH	Length (m)	Assays	Interval (m)	DH	Length (m)	Assays	Interval (m)	DH	Length (m)	Assays	Interval (m)
2013	6	25.0	25	25.00					6	25.0	25	25.00
2014	25	3,137.3	2,011	2,667.50					25	3,137.3	2,011	2,667.50
2015	37	5,056.0	3,832	4,702.05	18	2,406	887	1,240.0	55	7,462.0	4,719	5,942.05
2016					10	1,551	421	621.6	10	1,551.0	421	621.60
2019					21	2,985	1,674	2,412.1	21	2,985.0	1,674	2,412.10
Total	68	8,218.3	5,868	7,394.55	49	6,942	2,982	4,273.7	117	15,160.3	8,850	11,668.25

Assay data was checked for inconsistencies when the data was loaded. This included duplicate collar checks, missing collar checks, missing surveys, assay interval overlaps. The data was also checked to ensure that it matched the topography and previous geological shapes. No material errors were found. Minor corrections to assay intervals were made prior to the final database load.

14.3 Assay Data

Assay data statistics are provided in Tables 14-3 and 14-4 for the EV and Battery zones, respectively.

The assay data is compared to the composited data to ensure that no bias or error has been introduced during the compositing process. The mean grades in the table below show differences of zero or very close to zero, indicating compositing is representative of the assay data. Also illustrated in the tables is the very low coefficient of variation (CV) for each domain. Because of this, and also considering a review of the cumulative probability plots which showed no significant outliers overall, capping was not used. To reduce the influence of some higher-grade values, “outlier restriction” of these high-grade composites has been used during interpolation as discussed in the Section 14.8.

Table 14-3: Assay and Composites Data Comparison – EV Deposit

Domain	Assays					Composites					Diff. (%)
	No. Samples	Min.	Max.	Wtd. Mean	Wtd. CV	No. Samples	Min.	Max.	Wtd. Mean	Wtd. CV	
1	16	2.3	19.75	10.54	0.63	14	2.3	2.3	10.54	0.549	0.0
2	34	0.25	12.65	3.284	0.829	29	0.25	0.25	3.284	0.812	0.0
3	30	0.28	18.8	3.587	1.117	24	0.38	0.38	3.588	0.997	0.0
4	113	0.06	16.4	3.301	0.653	107	0.44	0.44	3.301	0.594	0.0
5	228	0.01	20.9	6.509	0.948	218	0.01	0.01	6.509	0.935	0.0
6	20	1.14	16.3	4.286	0.98	18	1.27	1.27	4.286	0.92	0.0
7	17	0.38	6.7	2.831	0.568	17	0.38	0.38	2.831	0.568	0.0
8	122	0.12	22.1	8.6	0.809	119	0.2	0.2	8.601	0.804	0.0
9	52	2.46	17.95	4.86	0.839	51	2.46	2.46	4.861	0.767	0.0
10	160	0.03	21.8	6.846	0.814	157	0.03	0.03	6.846	0.804	0.0
11	430	0.22	21.5	6.81	0.832	421	0.45	0.45	6.81	0.824	0.0
12	98	0.41	17.75	5.171	0.911	96	0.41	0.41	5.171	0.907	0.0
13	126	0.34	21.6	9.029	0.768	121	0.34	0.34	9.029	0.754	0.0
14	109	0.13	15.1	2.925	1.162	104	0.13	0.13	2.925	1.095	0.0
15	66	0.37	16.75	3.443	1.144	64	0.72	0.72	3.443	1.12	0.0

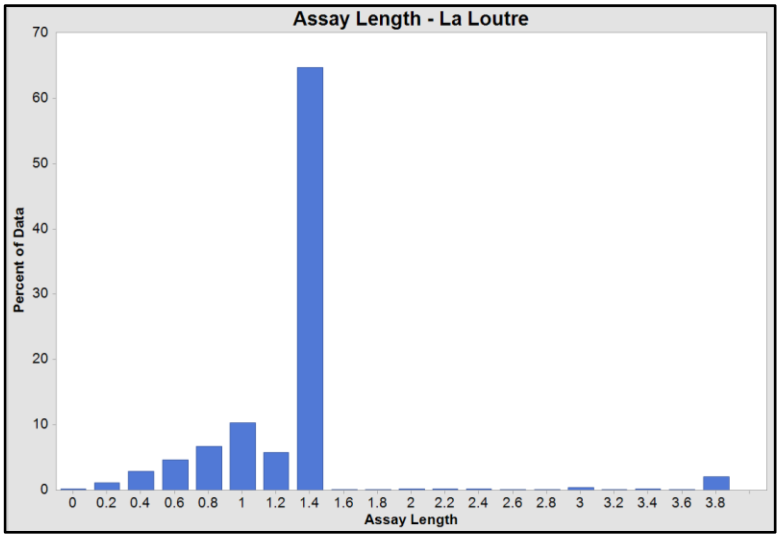
Table 14-4: Assay and Composites Data Comparison – Battery Deposit

Domain	Assays					Composites					Diff. (%)
	No. Samples	Min.	Max.	Wtd. Mean	Wtd. CV	No. Samples	Min.	Max.	Wtd. Mean	Wtd. CV	
101	161	0.09	19.35	7.005	0.777	128	0.11	19.35	7.006	0.703	0.0
102	103	1.31	17.55	6.808	0.697	88	1.94	17.27	6.808	0.602	0.0
103	34	2.28	18.7	6.266	0.763	27	2.38	17.37	6.267	0.64	0.0
104	39	0.16	18.3	9.896	0.576	30	0.16	17.33	9.896	0.496	0.0
105	4	1.49	10.5	5.338	0.707	3	1.49	9.52	5.338	0.648	0.0
106	56	0.01	16.9	5.19	1.016	40	0.01	16.84	5.19	0.861	0.0
107	90	0.11	19.2	5.868	0.731	70	1.48	15.97	5.868	0.594	0.0
108	3	2.41	5.1	3.798	0.309	2	2.88	4.94	3.796	0.27	0.0
109	34	0.12	18.65	4.455	0.816	28	0.73	15.98	4.454	0.621	0.0
110	186	0.03	18.5	5.038	0.751	144	0.23	17.28	5.038	0.665	0.0
111	7	0.25	4.19	3.159	0.294	6	2.3	4.02	3.159	0.176	0.0
112	67	0.31	14.75	4.409	0.57	51	2.22	14.75	4.409	0.497	0.0
113	24	0.08	14.25	5.04	0.806	16	1.69	12.07	5.04	0.721	0.0
114	28	0.99	16.5	5.929	0.81	24	1.29	16.5	5.929	0.772	0.0
115	35	1.85	4.85	3.34	0.182	31	2.37	4.66	3.34	0.168	0.0
116	17	0.75	16.3	6.74	0.679	14	2.85	15.65	6.74	0.636	0.0
117	13	0.06	12.5	5.736	0.782	9	1.13	12.5	5.735	0.684	0.0
118	62	0.15	19.4	7.729	0.687	46	0.23	19.4	7.73	0.64	0.0
119	16	0.12	9.16	3.714	0.656	11	1.07	6.34	3.713	0.42	0.0
120	49	0.34	18.5	6.194	0.783	39	1.51	18.05	6.194	0.707	0.0
121	4	0.16	4.08	2.455	0.668	3	0.72	4.07	2.456	0.586	0.0
122	41	0.53	4.38	1.582	0.491	39	0.53	3.64	1.582	0.47	0.0
123	1880	0.01	17.85	1.892	0.685	1637	0.01	15.25	1.892	0.633	0.0
124	46	0.03	0.58	0.2	0.543	40	0.03	0.4	0.2	0.461	0.0
125	17	0.04	10.65	1.765	1.043	14	0.06	3.27	1.765	0.699	0.0
126	78	0.01	3.68	0.933	0.894	62	0.01	2.54	0.933	0.792	0.0
127	10	0.05	1.97	0.395	1.532	9	0.05	1.97	0.395	1.535	0.0

14.4 Compositing

Compositing has been done using 1.5 m lengths with intervals less than 0.75 added to the previous composited. This is based on the block size of 3.0 m as well as the prevalent assay length, as shown in Figure 14-1.

Figure 14-1: Assay Length

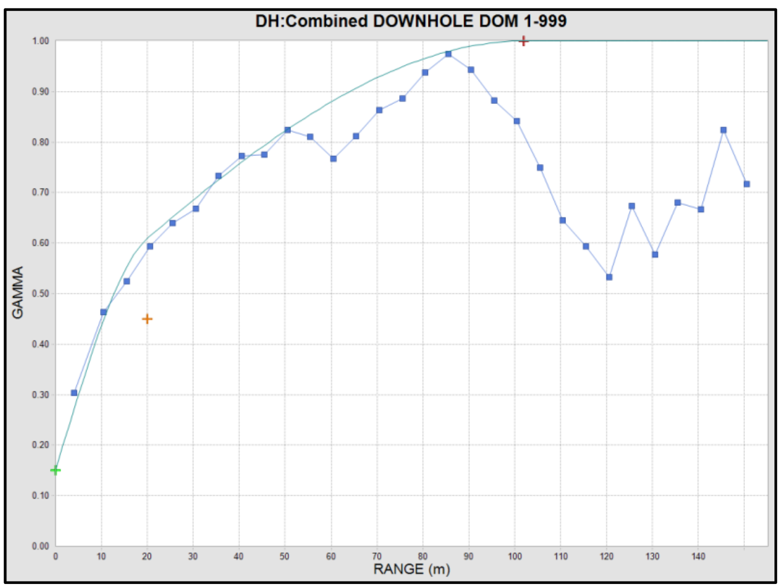


Source: MMTS, 2021

14.5 Variography

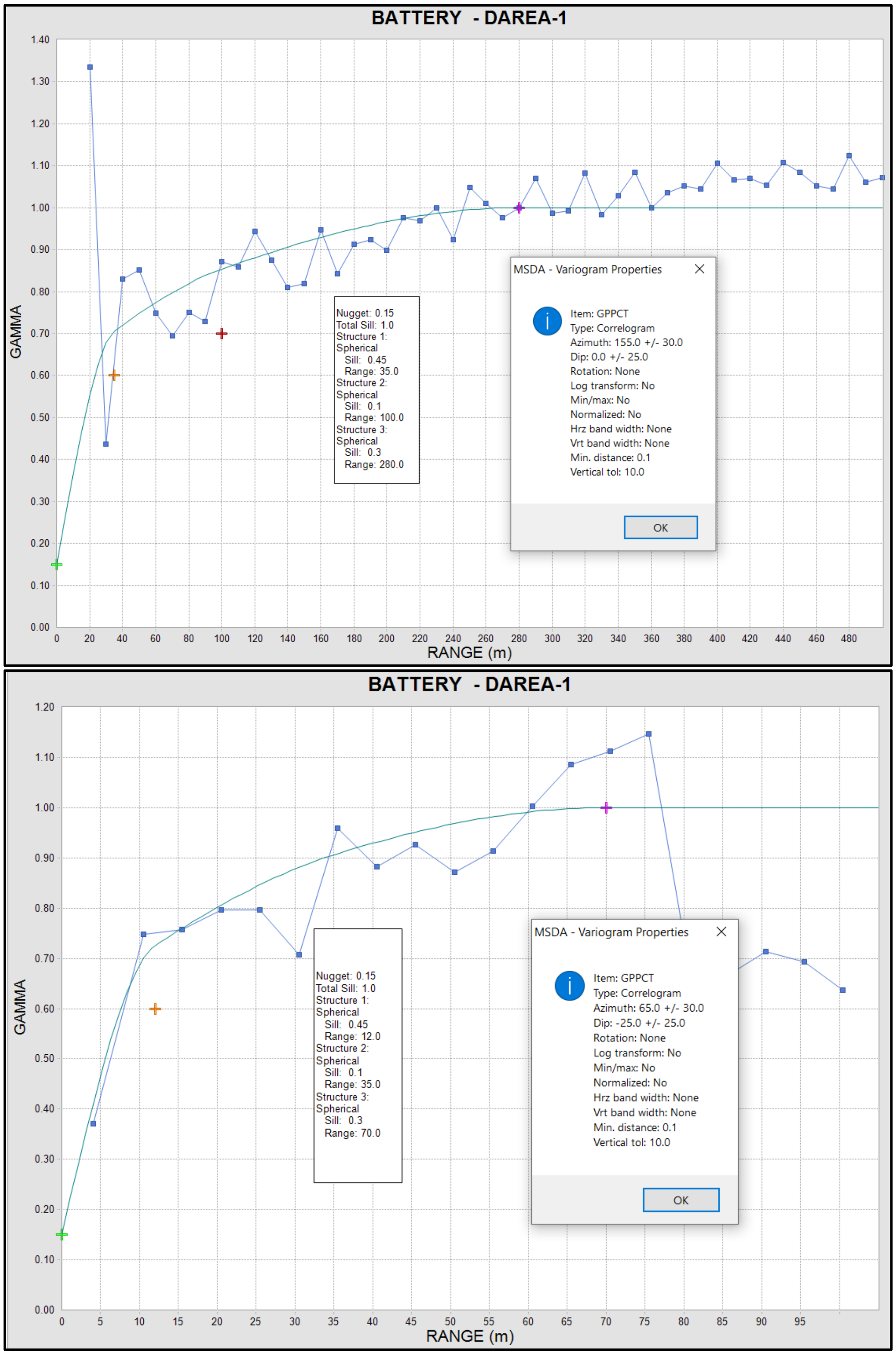
Correlograms were completed on the composited data by combining domains with similar orientation to obtain sufficient data for meaningful variograms. The nugget value has been determined using the downhole variogram for all domains together as illustrated in Figure 14-2. The Battery deposit was divided into three areas of varying orientations. Examples of the variogram models for each of the Battery and EV zones are provided in Figures 14-3 and 14-4, respectively.

Figure 14-2: Downhole Variogram for All Mineralized Domains



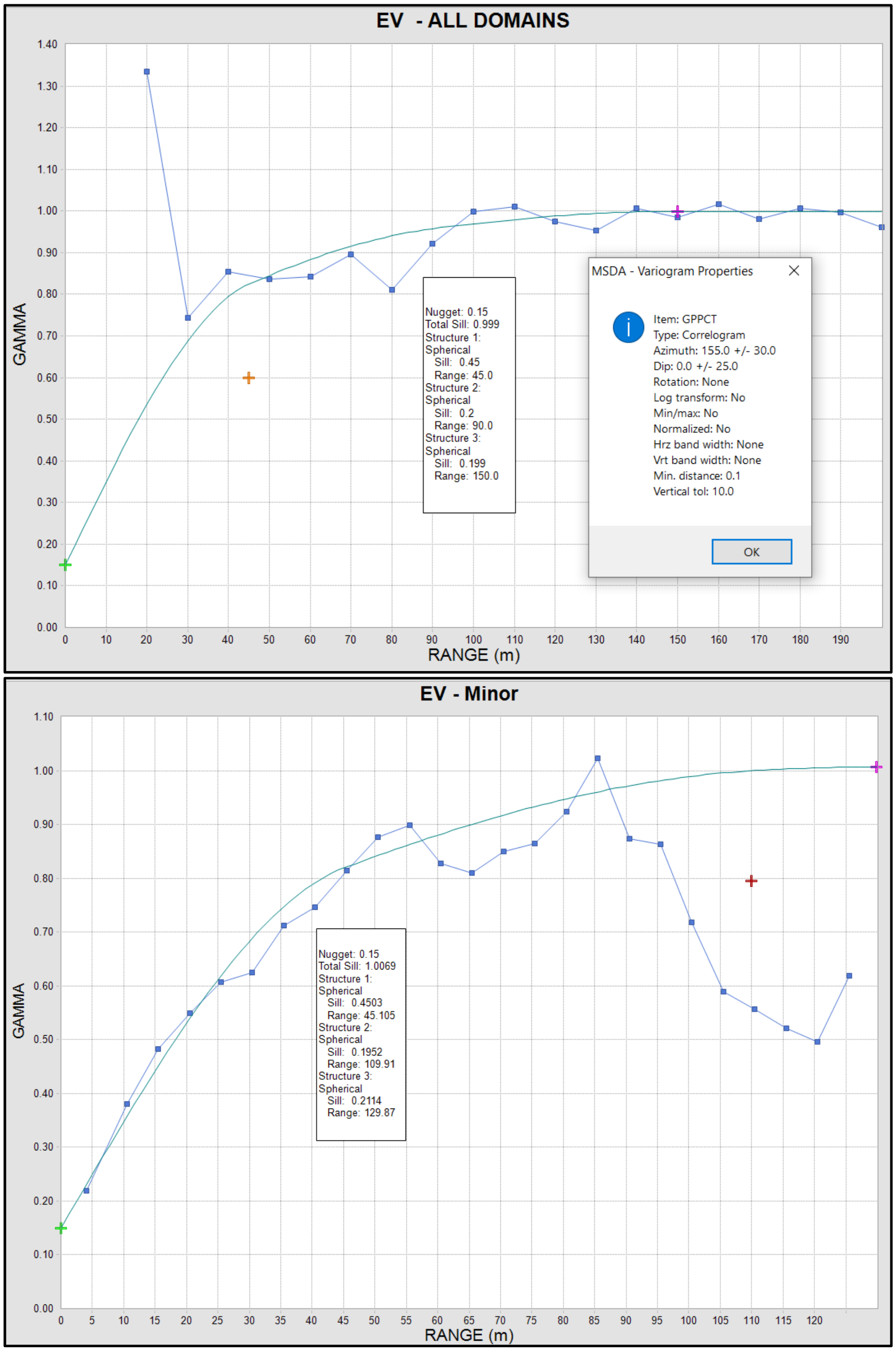
Source: MMTS, 2021

Figure 14-3: Battery Variography – Area 1 Major and Minor Axes



Source: MMTS, 2021

Figure 14-4: EV Variography – Major and Minor Axes



Source: MMTS, 2021

Tables 14-5 and 14-6 summarize the variogram parameters for the Battery and EV zones, respectively.

Table 14-5: Variography for Battery

DAREA	Rotation (GSLIB-MS)		Axis	Total Range (m)	Nugget	Sill1	Sill2	Sill3	Range 1 (m)	Range 2 (m)	Range 3 (m)
1	ROT	155	Major	280	0.15	0.45	0.1	0.3	35	100	280
	DIPN	0	Minor	70					12	35	70
	DIPE	-25	Vert	60					10	45	60
2	ROT	155	Major	280	0.15	0.45	0.2	0.2	15	80	280
	DIPN	0	Minor	100					30	50	100
	DIPE	-45	Vert	80					10	40	80
3	ROT	155	Major	260	0.15	0.45	0.2	0.2	40	150	260
	DIPN	0	Minor	140					40	90	140
	DIPE	-55	Vert	100					15	45	100

Table 14-6: Variography for EV

Rotation (GSLIB-MS)		Axis	Total Range (m)	Nugget	Sill1	Sill2	Sill3	Range 1 (m)	Range 2 (m)	Range 3 (m)
ROT	155	Major	120	0.15	0.45	0.2	0.2	10	50	120
DIPN	0	Minor	150					45	90	150
DIPE	-40	Vert	45					5	15	45

14.6 Model Build

The block model contains both deposits and has the location and dimensions summarized in Table 14-7. The block model is a rotated model and is a percent model with up to two mineralized zones per block. The graphite grade within each mineralized domains and percent of each domain within the block is stored. The final graphite grade is the weighted average of the mineralized of the block.

Table 14-7: Block Model Extents and Rotation

Hinge Point	Lower Left Corner	Minimum	Maximum	Length	# Blocks
Easting	499200	0	1800	1800	600
Northing	96000	0	2502	2502	834
Elevation	-100	-100	500	600	200
Rotation	-30 (counterclockwise)				

14.7 Search Parameters

Search parameters are based on the variography and are summarized in Table 14-8 to Table 14-10.

Table 14-8: Search Orientation and Distances for Battery

DAREA	Rotation	Distance 1	Distance 2	Distance 3	Distance 4	Distance 5
1	155	35	70	140	280	560
	0	12	24	48	70	140
	-25	10	20	40	60	120
2	155	15	30	60	280	560
	0	25	50	75	100	200
	-45	10	20	40	80	160
3	155	40	80	160	260	390
	0	35	70	105	140	210
	-55	15	30	60	100	150

Table 14-9: Search Orientation and Distances for EV

Rotation	Distance 1	Distance 2	Distance 3	Distance 4	Distance 5
155	10	20	40	120	240
0	37.5	75	112.5	150	300
-40	5	10	20	45	90

Table 14-10: Additional Sample Selection Criteria by Pass – both Zones

Selection Criteria	Pass				
	1	2	3	4	5
Minimum No. Composites	4	4	4	4	2
Maximum No. Composites	16	16	16	16	8
Maximum / Drill Hole	3	3	3	3	2
Maximum / Quadrant	2	2	2	N/A	N/A

14.8 Outlier Restriction

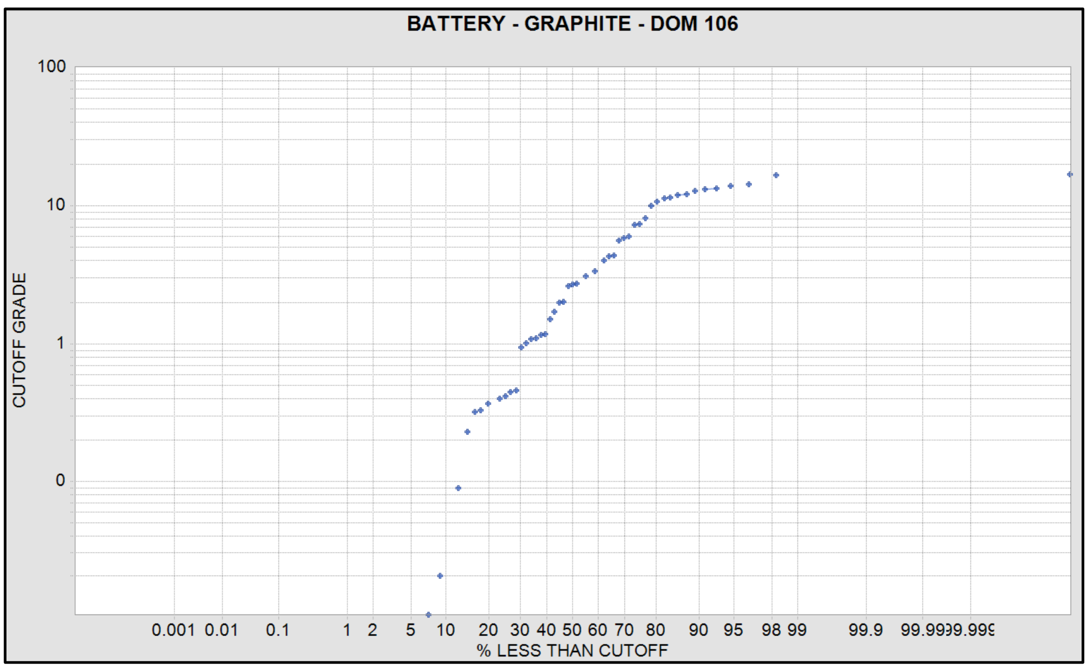
Higher-grade outliers have been looked at by domain to determine outliers. Table 14-11 summarizes the outlier restrictions used by domain. Composite values above this value have been restricted to only influence blocks within 5 m of the sample location. The outlier values have been based on cumulative probability plots (CPPs) of the graphite grade, with examples illustrated in Figures 14-5 through 14-7.

Validation of the model was an iterative procedure with search parameters and outlier restriction adjusted to be sure the model gave reasonable results when compared to the data on a domain-by-domain basis.

Table 14-11: Outlier Restriction Values by Domain

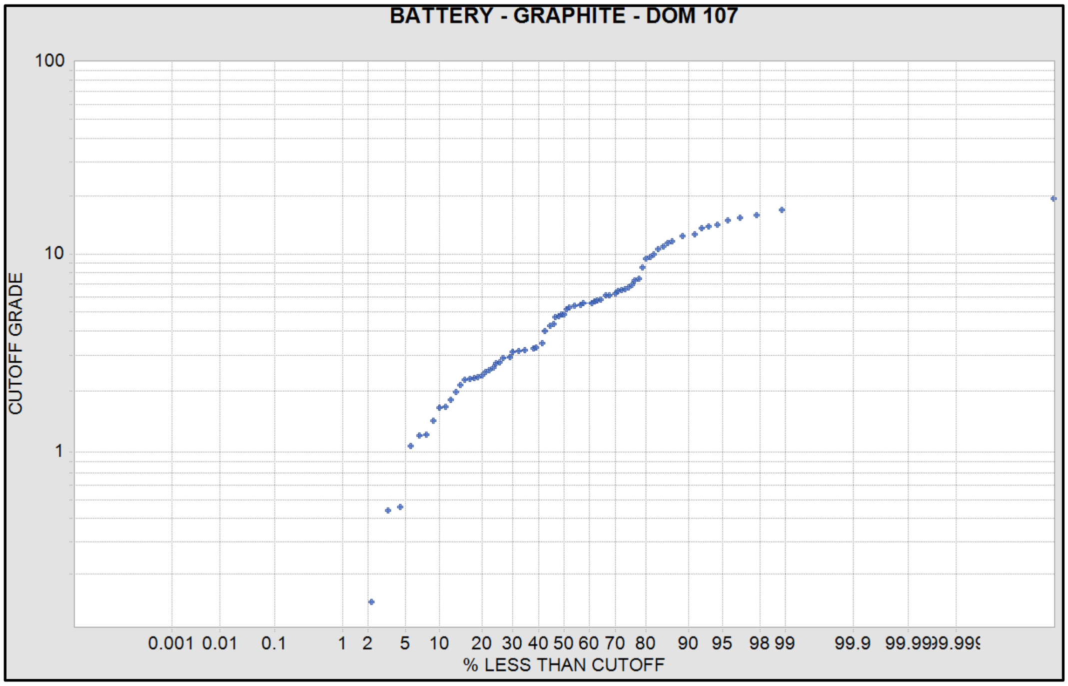
EV		Battery			
Domain	Outlier	Domain	Outlier	Domain	Outlier
1	15	101	17	116	20
2	6	102	20	117	10
3	10	103	10	118	20
4	6	104	15	119	20
5	20	105	20	120	15
6	20	106	10	121	4
7	5	107	15	122	20
8	20	108	20	123	20
9	15	109	20	124	20
10	20	110	20	125	2
11	20	111	20	126	20
12	20	112	9	127	20
13	20	113	20		
14	20	114	20		
15	20	115	20		

Figure 14-5: CPP of Domain 106 with Outlier at 10% Graphite



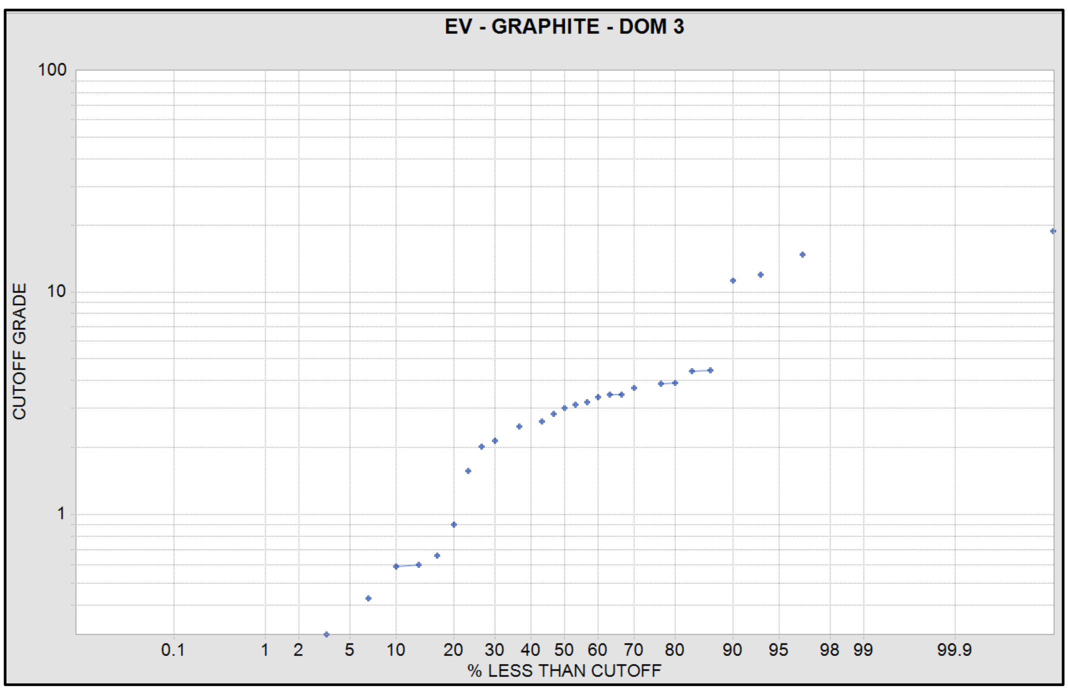
Source: MMTS, 2021

Figure 14-6: CPP of Domain 106 with Outlier at 15% Graphite



Source: MMTS, 2021

Figure 14-7: CPP of Domain 106 with Outlier at 10% Graphite

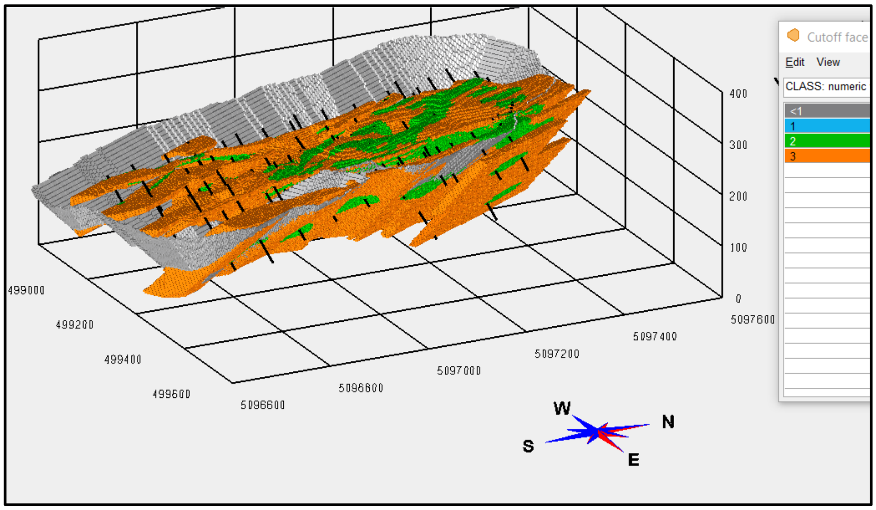


Source: MMTS, 2021

14.9 Classification

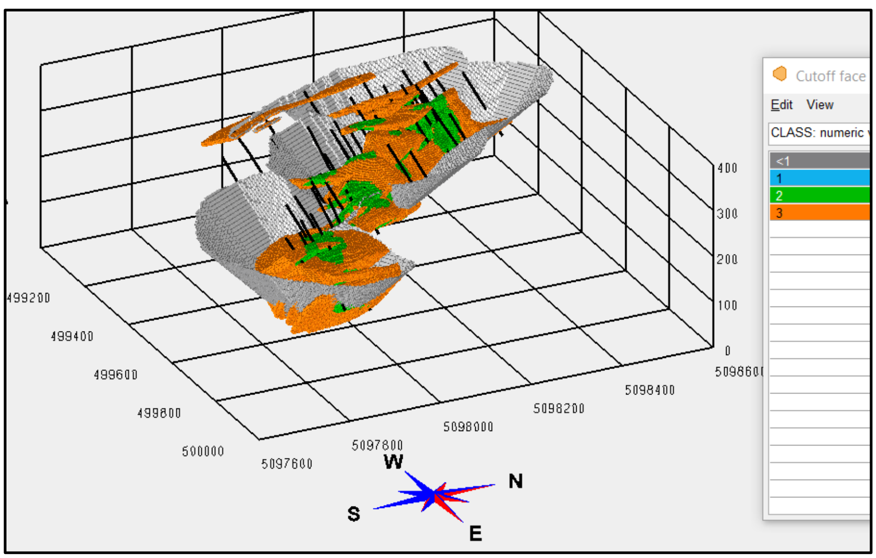
Classification is based on variography. Inferred blocks musts be interpolated in Pass 1 through 4. Indicated blocks must be interpolated between Pass 1 and 4 as well as have the average distance to two drill holes of less than 30 m for the EV deposit, and less than 60 m for the Battery deposit. Figures 14-8 and 14-9 illustrate the block classification with the drill hole data for the Battery and EV zones, respectively. Blocks with CLASS=2 are indicated and blocks with CLASS=3 are inferred.

Figure 14-8: Classification – Battery



Source: MMTS, 2021

Figure 14-9: Classification – EV



Source: MMTS, 2021

14.10 Model Validation

14.10.1 Global Grade Comparison

The global model mean grade comparison for each deposit (see Table 14-12) shows the model mean grades compare well at zero cut-off with difference of 2% and less than 1% for the EV and Battery deposits respectively.

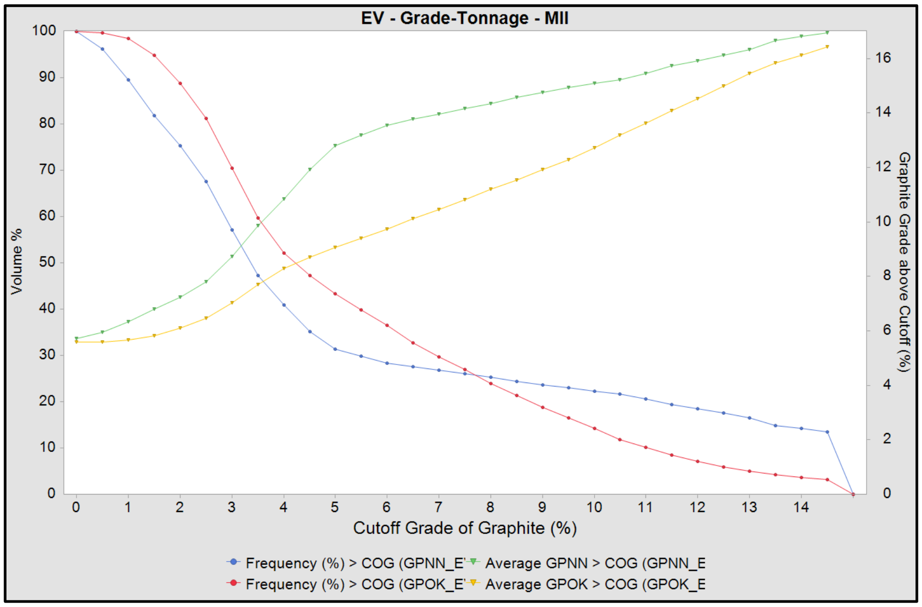
Table 14-12: Global Model Comparison to De-clustered Composite Data at Zero Cut-off

Parameter	EV		Battery	
	OK	NN	OK	NN
Number of Samples	496055	496055	1957246	1957246
Number of Missing Samples	0	0	0	0
Minimum	0	0	0	0
Maximum	20.36	22.1	18.33	19.4
Mean	5.493	5.612	1.683	1.692
Weighted Mean	5.758	5.888	1.617	1.627
Weighted CV	0.653	0.947	1.265	1.419
Difference (%)	-2.3%		-0.6%	

14.10.2 Grade-Tonnage Curves

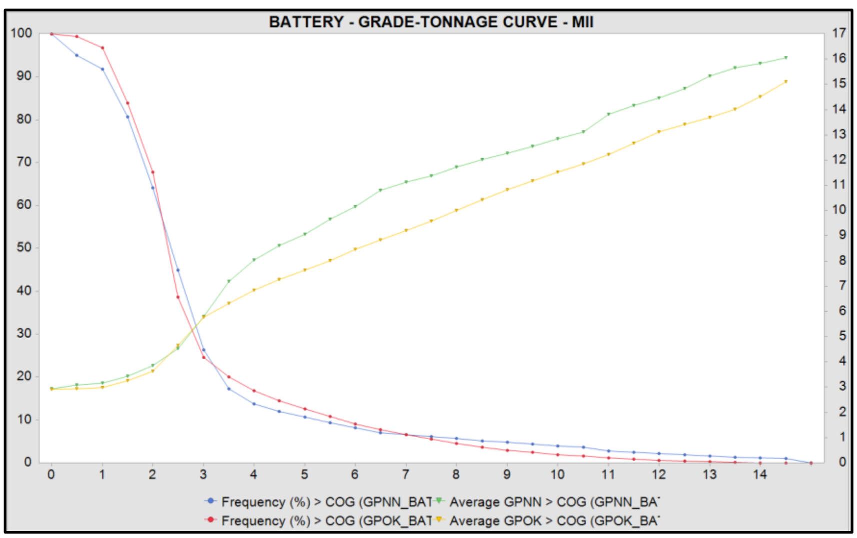
To ensure that a reasonable comparison of model tonnage and grades remains throughout the grade distribution, grade-tonnage curves of the OK modelled grades and de-clustered composites (NN model) have been created. Figures 14-10 and 14-11 illustrate this comparison for EV and Battery, respectively. The curve comparisons illustrate that the OK modelled grades remain below the NN grades throughout the grade distribution with a corresponding increase in volume to account for model smoothing.

Figure 14-10: Grade-Tonnage Curve – EV



Source: MMTS, 2021

Figure 14-11: Grade-Tonnage Curve – Battery

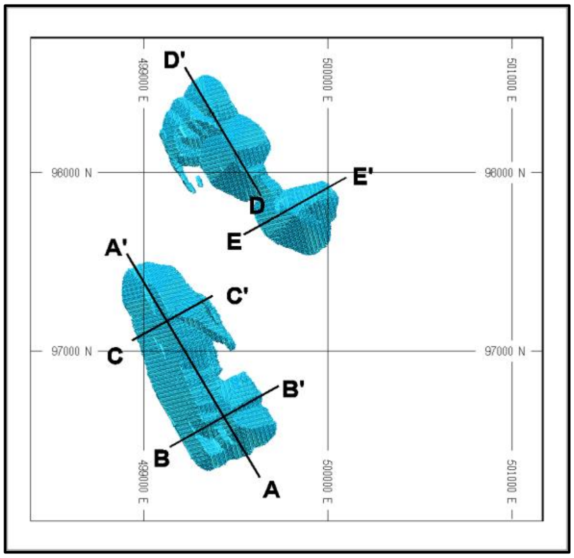


Source: MMTS, 2021

14.11 Visual Validation

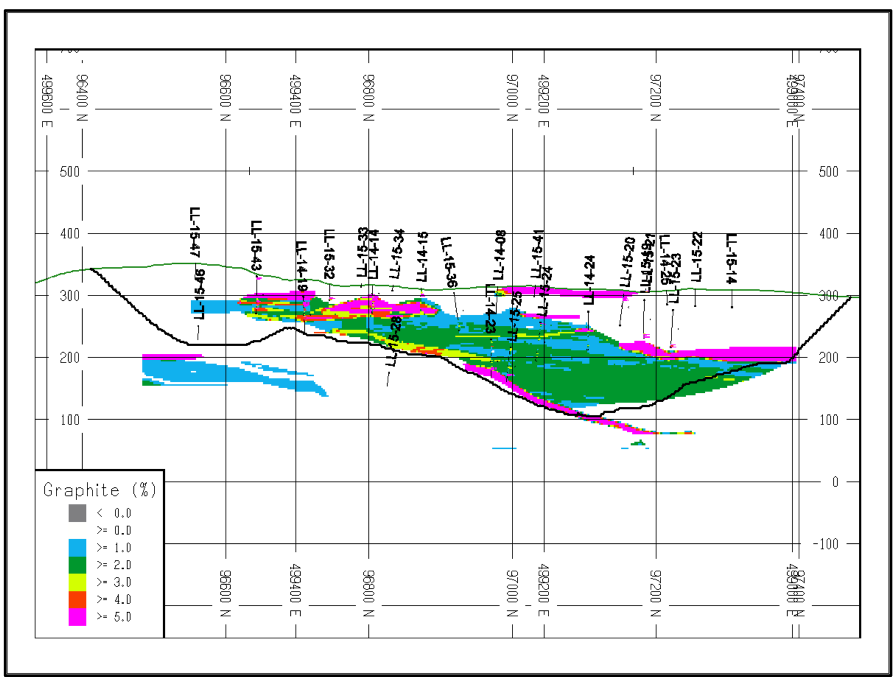
Section plots have been created across each deposit to ensure that the modelled grades match the data. The section locations are shown in plan view with the resource pit shapes for Battery (in the southwest) and EV (northeast) in Figure 14-12. Section A-A', B-B' and C-C' for the Battery deposit are shown in Figures 14-13 through 14-15 illustrating the modelled graphite grades match the assay graphite grades. Figures 14-16 and 14-17 are sections through the EV Zone that also illustrate matching assays and modelled grades.

Figure 14-12: Plan View of Resource Pits and Section Lines



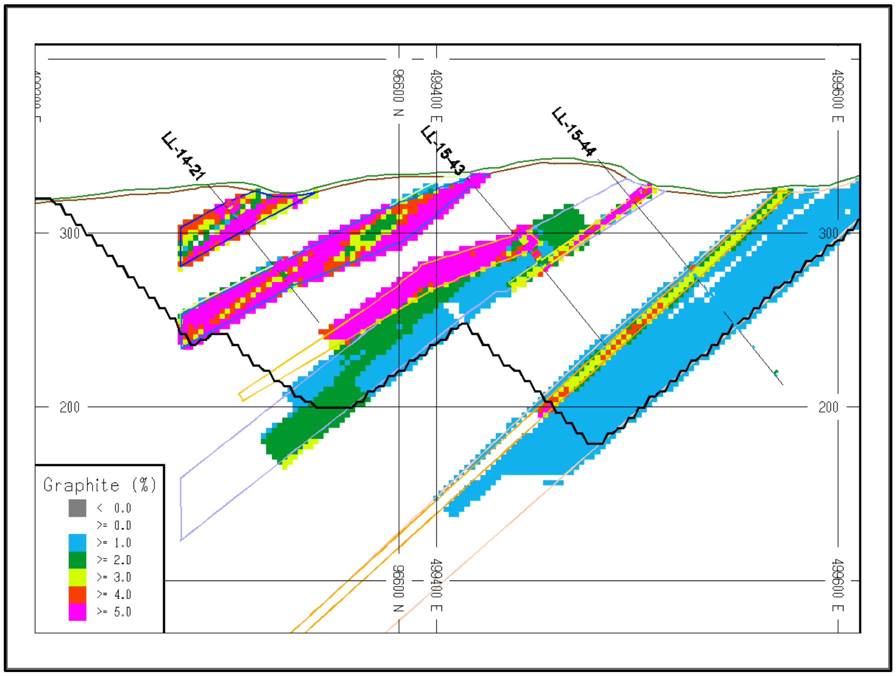
Source: MMTS, 2021

Figure 14-13: Long Section A-A' – Battery – Drill Holes ±25 m



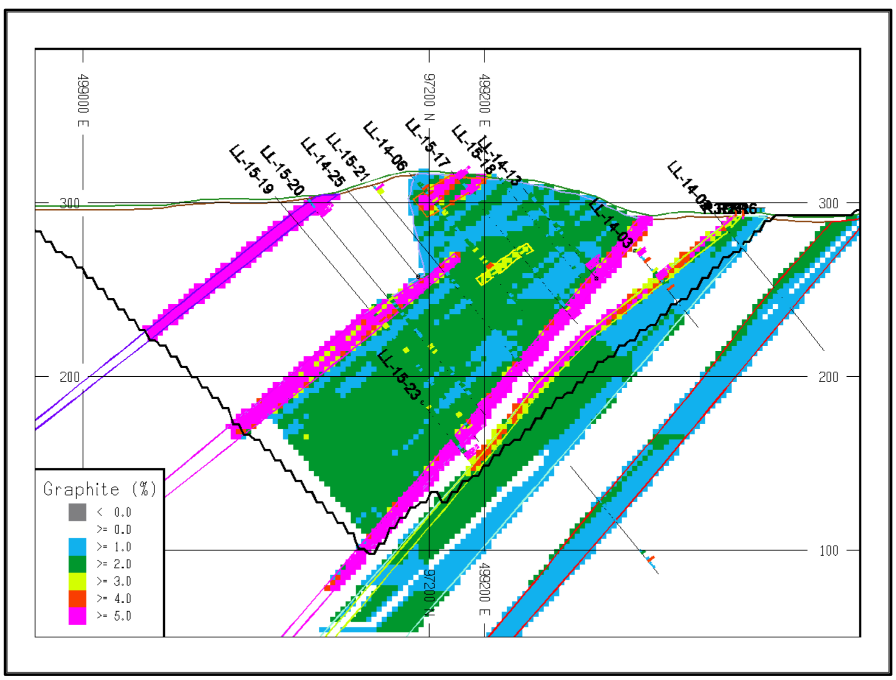
Source: MMTS, 2021

Figure 14-14: Battery – Section B-B' – Drill Holes ±50 m



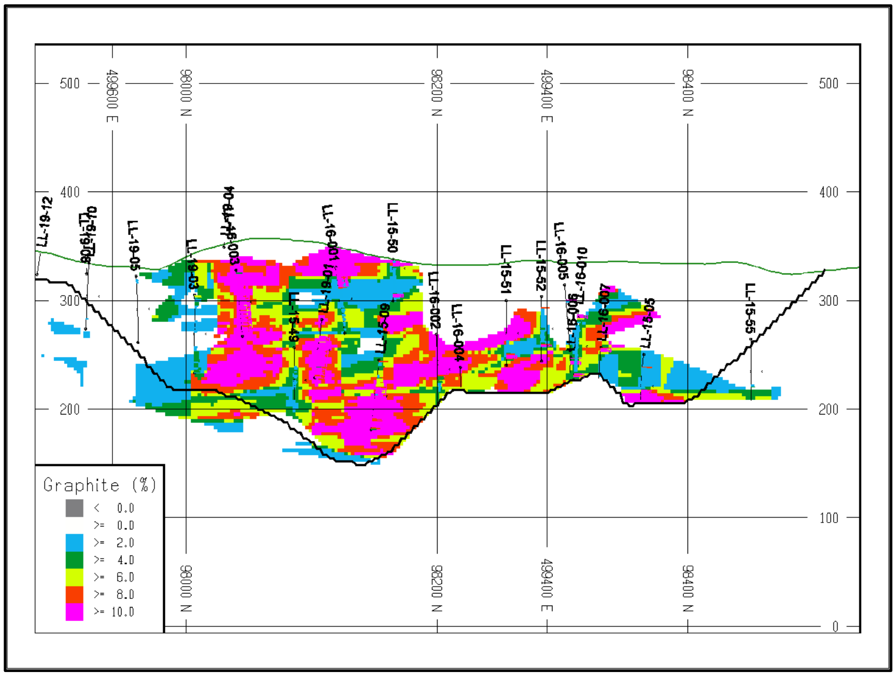
Source: MMTS, 2021

Figure 14-15: Battery – Section C-C' – Drill Holes ±50 m



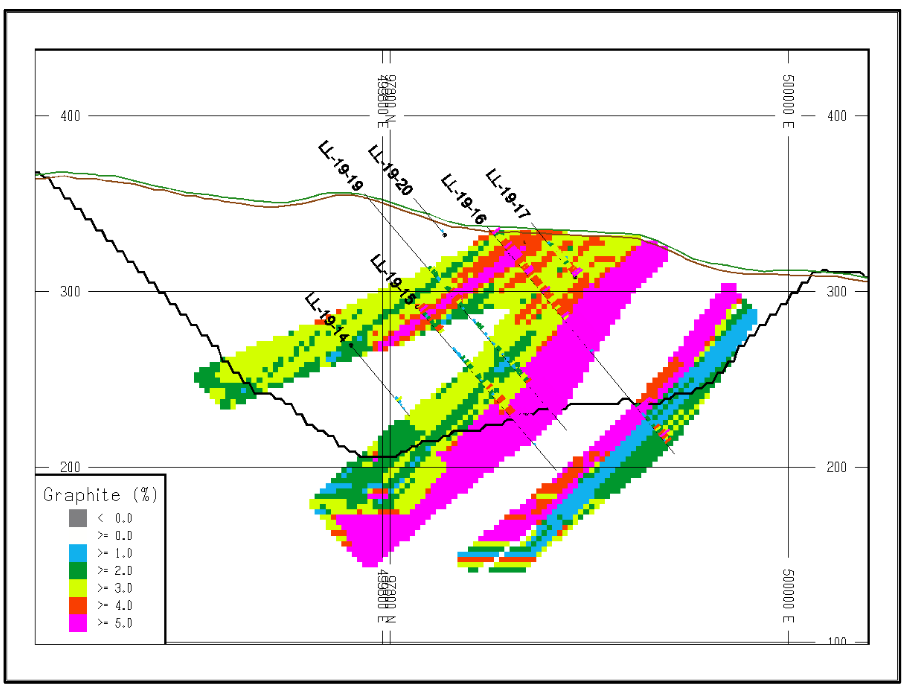
Source: MMTS, 2021

Figure 14-16: EV – Long Section D-D' – Drill Holes ±25 m



Source: MMTS, 2021

Figure 14-17: EV – Section E-E' – Drill Holes ±50 m



Source: MMTS, 2021

14.12 Reasonable Prospects of Eventual Economic Extraction

Open pits are created using LG pit optimization, which has been done on a series of pits with varying price assumptions. The base case price, cost, smelter terms, and recoveries are summarized in Table 14-13. The exchange rate (CAD:USD) used is 1.33.

Table 14-13: Summary of Base Case Economic Inputs

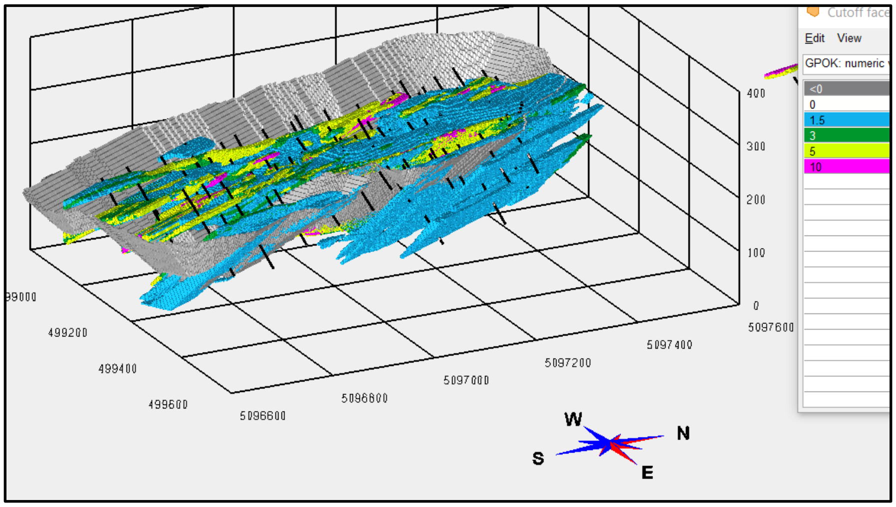
Parameter	Value	Unit
Graphite Price	$890.00	US$/t
Graphite Price	$1,186.67	C$/t
Off-site Costs	$37.42	C$/t
Insurance	$2.00	C$/t
Net Graphite Price	$1,147.25	C$/t
Payable	100	%
NSR royalty	1	%
Metallurgical recovery	95	%
Lerchs-Grossman Input Cost		
Processing	11.85	C$/t
General & Administrative	2.37	C$/t processed
Total	14.22	C$/t processed
Mining	3.31	C$/t mined

The resulting NSR equation in Canadian dollars is:

$$NSR = GraphiteGrade * 95\% * \$1,147.25 * 99\%$$

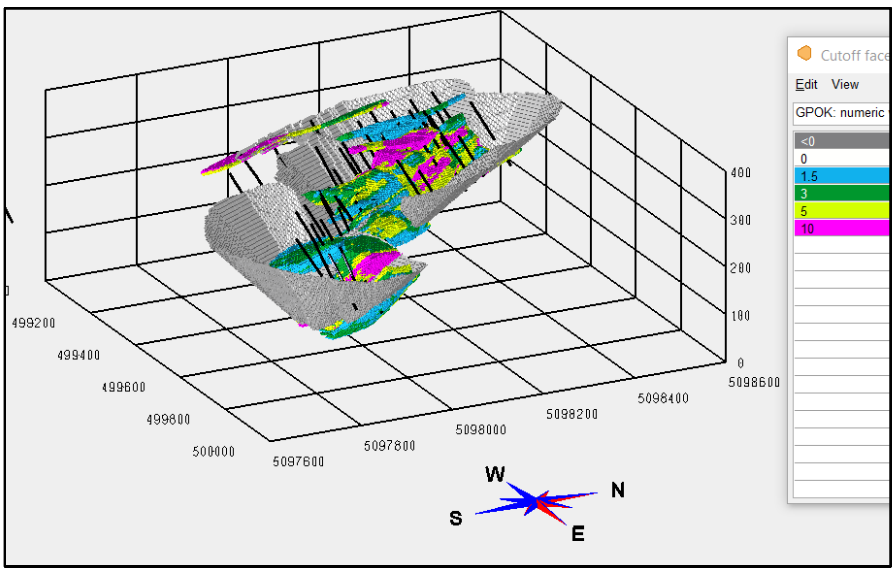
The resource pit case chosen for the reasonable prospect of eventual economic extraction is the 150% NSR pit case. The resulting pit is illustrated in Figures 14-18 and 14-19 for the Battery and EV zones, respectively. The figures also plot the blocks above a cut-off of 1.5% graphite. The 1.5% graphite cut-off has a value greater than that required for processing and G&A costs using the price and recovery assumption defined above.

Figure 14-18: 3D View of the Resource Pits with Blocks Above 1.5% Graphite – Battery



Source: MMTS, 2021

Figure 14-19: 3D View of the Resource Pits with Blocks Above 1.5% Graphite – EV



Source: MMTS, 2021

14.13 Factors That May Affect the Mineral Resource Estimate

Areas of uncertainty that may materially impact the mineral resource estimate include assumptions about the following:

- commodity price
- metal recovery

- mining and processing costs

The QP knows of no other factors or issues that materially affect the estimate other than the normal risks faced by mining projects in the province regarding environmental, permitting, taxation, socio-economic, marketing, and political factors.

15 MINERAL RESERVE ESTIMATE

This chapter is not applicable.

16 MINING METHODS

16.1 Overview Process Design

A PEA production schedule, based on a 1,500,000 t/a mill feed rate, has been developed for the La Loutre project based on an open pit mine plan. Mining will be carried out by the owner-operator through a 365-day operation. The pit phases are engineered based on the results of an economic pit limit analysis.

Several factors are considered when establishing an appropriate mining and processing rate. Key factors include the following:

- Resource Size – A planned mine life is ideally set at 12.5 to 20 years; beyond this, time-value discounting shows an insignificant contribution to the NPV of the project at discount rates of 8% or higher.
- Capital Payback – Capital investment typically is targeted at projects with a payback period of two to five years or shorter.
- Operational Constraints – Power, water, or supplies and services for support of operations can limit production.
- Site Delivery Constraints – Physical size and weight of equipment and shipping limits can determine the maximum size of units that can be delivered to site.
- Project Financial Performance:
  - Generally, economies of scale can be realized at higher production rates and lead to reduced unit operating costs. These are tempered to the above-mentioned physical and operational constraints and flexibility issues.
  - Generally higher tonnage throughputs require more capital and the size of the project is reflected in the initial investment. Economies of scale can still apply where some access and construction issues have a high fixed component regardless of the size of size of the project.

Higher production rates generally pay back fixed capital earlier and provide a higher rate of return on capital, which improves project NPV. The PEA throughput has been set at 1,500,000 t/a and sets the mine life at 14.7 years

16.2 Geotechnical Considerations

A pit slope geotechnical assessment has not yet been carried out. The PEA overall pit slope angle design basis is assumed to be 45 degrees.

16.3 Hydrogeological Considerations

Site-specific groundwater information was not available for the PEA; groundwater occurrence and properties were inferred from topography and stratigraphy. Groundwater in the mining areas is largely bedrock-hosted as there is generally a thin veneer (2 to 3 m thick) of overburden material that is likely unsaturated except for the GRA pit, which mines through a wetland on its western boundary. The proximity of Lac Bélanger and a small lake north of the EVN pits will potentially provide an ongoing recharge source to these pits and the GRA pit.

Pit inflow estimates were made using the 2D analytical model of Marinelli & Niccoli (2000) with a lower and upper estimate based on increasing hydraulic conductivity by an order of magnitude and doubling recharge for the upper case. The inflow predictions are based on the assumption of low to moderately conductive bedrock materials and recharge to groundwater of between 10% and 20% of mean annual precipitation. The proposed pit dimensions and assumed hydraulic parameters, based on literature values for igneous and metamorphic rocks, was used to estimate the average daily inflow at maximum pit development (see Table 16-1). The inflow estimates include 80% of mean annual precipitation falling into the pits that may need to be managed as contact water.

Table 16-1: Total Contact Water Estimates

Case	EVN	EVS	GRA	GRB
Lower Case (m^3/d)	1,975	1,220	2,679	1,764
Upper Case (m^3/d)	5,784	2,541	4,654	3,460

Pit dewatering can likely be achieved through a combination of vertical and horizontal dewatering wells depending on the geotechnical conditions and proximity of recharge sources (i.e., lakes). The inflow estimates will be updated in future studies using data collected during baseline and geotechnical investigations.

16.4 Open Pit

The mine planning work for this study is based on the 3D block model (3DBM) created by Moose Mountain Technical Services (MMTS). Mine planning for the La Loutre property is based on work done with MineSight®, a suite of software proven in the industry. The work includes adding engineering items to the resource model, pit optimization (MineSight Economic Planner [MS-EP]), detailed pit design, and optimized production scheduling (MinePlan Schedule Optimizer [MPSO]). In addition to the geological information used for the block model, other data used for the mine planning included the base economic parameters, mining cost data derived from similar sized projects, estimated pit slope angles (PSAs), projected project recoveries, plant costs, and throughput rates.

16.4.1 Pit Optimization

16.4.1.1 Key Assumptions/Basis of Estimate

The initial assumptions used for the economic shell analysis are listed in Table 16-2. Ore cut-off grades (COGs) are based on the net smelter return (NSR) in dollars per tonne, which is determined using net smelter prices (NSPs). The NSR (net of off-site concentrate and smelter charges (if any) and including onsite mill recovery) is used as a cut-off item for break-even ore/waste selection.

Table 16-2: Assumptions for Economic Shell Analysis

Item	Value	Unit	Distribution by % wt
+50 mesh	$1,234.91	US$/t	10.8
+80 mesh	$973.75	US$/t	21.6
+100 mesh	$860.00	US$/t	10.8
-100 mesh	$797.50	US$/t	56.8
Weighted Average Avg Price	$889.56	US$/t	
Forex	1.27		
Weighted Average Price	$1,129.74	C$/t	
Graphite Payable	100.0	%	
Concentrate Transport	26.77	C$/t	
Royalty	1.5	%	
NSP Calculation	$1,086.43	C$/t	
Loss	calculated		
Dilution	calculated		
Mining Cost	3.10	C$/t mined	
Graphite Process Recovery	95	%	
Process Costs	12.00	C$/t mined	
G&A and Site Costs	2.00	C$/t mined	

16.4.1.2 Ore Loss and Dilution

The model is a percentage block on a 3 m x 3 m x 3 m block size. This block size is to calculate loss and dilution, while 6 m benches are used for scheduling.

It was determined that the ability to identify and clean to graphite-bearing strata is unlikely based on field observations of core. Blasthole assays will be used to determine the waste/mineralized material boundaries for material designations on the pit bench for daily operations. To model this method of ore control, all percentage blocks with less than 100% ore were converted to whole block grades using weighted average of the mineralized SG and unmineralized SG.

A loss and dilution based on 0.5 m loss and dilution on each contact face was then applied to all blocks that had contact faces with blocks below cut-off. The calculation of dilution percentage is based on volumetrics of 0.5 m x 3 m x 3 m impact on a 3 m x 3 m x 3 m block. As more faces are in contact, the dilution is assumed to be on adjacent faces and the resulting dilution percentage is calculated. The dilution grade applied is the average grade of the low-grade and zero-grade contact block.

16.4.1.3 Pit Slopes

For this study an overall pit slope of 45 degrees was used for all areas. The pit design parameters used a bench face angle of 70 degrees with 12 m bench heights between approximately 8 m wide catch bench.

The average depth of overburden is 2.5 m and a catch berm and shallower angle are not included in the pit shapes.

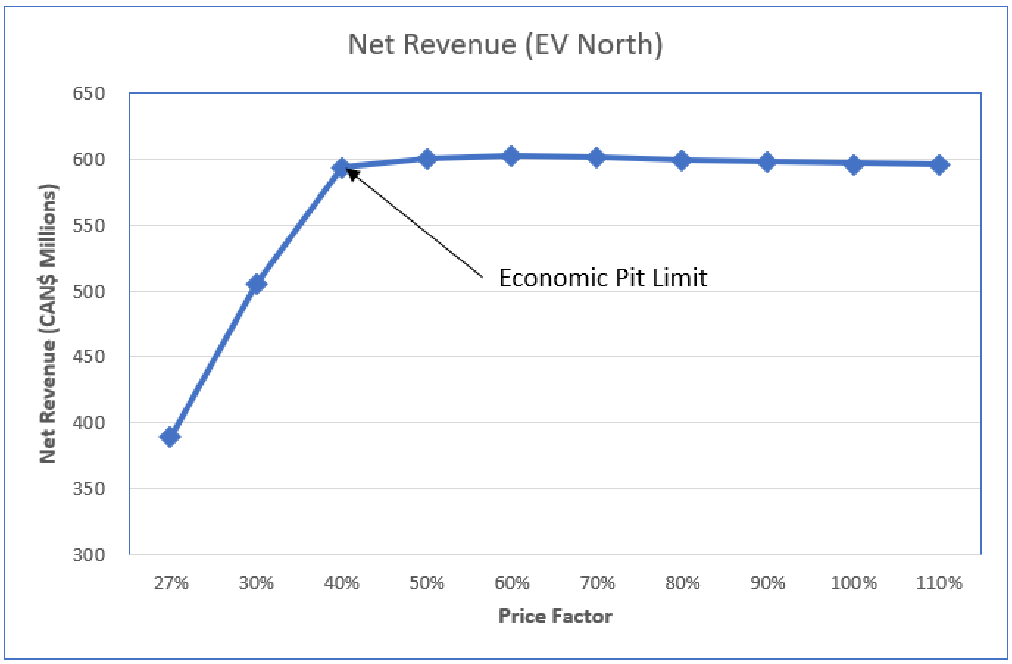
16.4.2 Economic Shell and Phase Selection

A series of LG pit shells were generated using MineSight® MSEP using a cut-off grade of 1.5% contained graphene (Cg), C$1,086/t NSR, $3.10/t mined mining cost, $12/t milled processing cost, and $2.00/t milled G&A cost.

The sensitivities for the Electric Vehicle (EV) and Battery zones were run separately. Additionally, the smaller pit (EV South) required a 38-degree slope to better accommodate the number of roads required. The net revenue calculation is based on revenue of 95% recovery of contained graphene at an NSR of $1,086 less the mining cost (waste and ore) and processing cost of the ore. For comparative purposes the price for product was held constant at C$1086/t.

EV North analysis indicates using an economic pit limit at 40% of NSR price as shown in Figure 16-1.

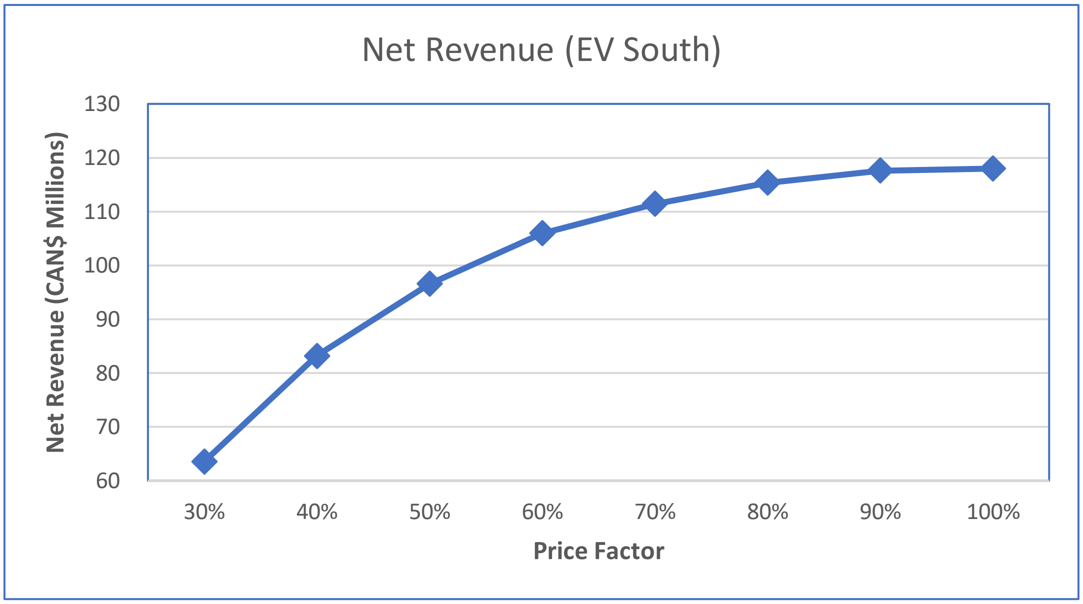
Figure 16-1: Economic Shell Sensitivity – EV North Zone



Source: MMTS, 2021

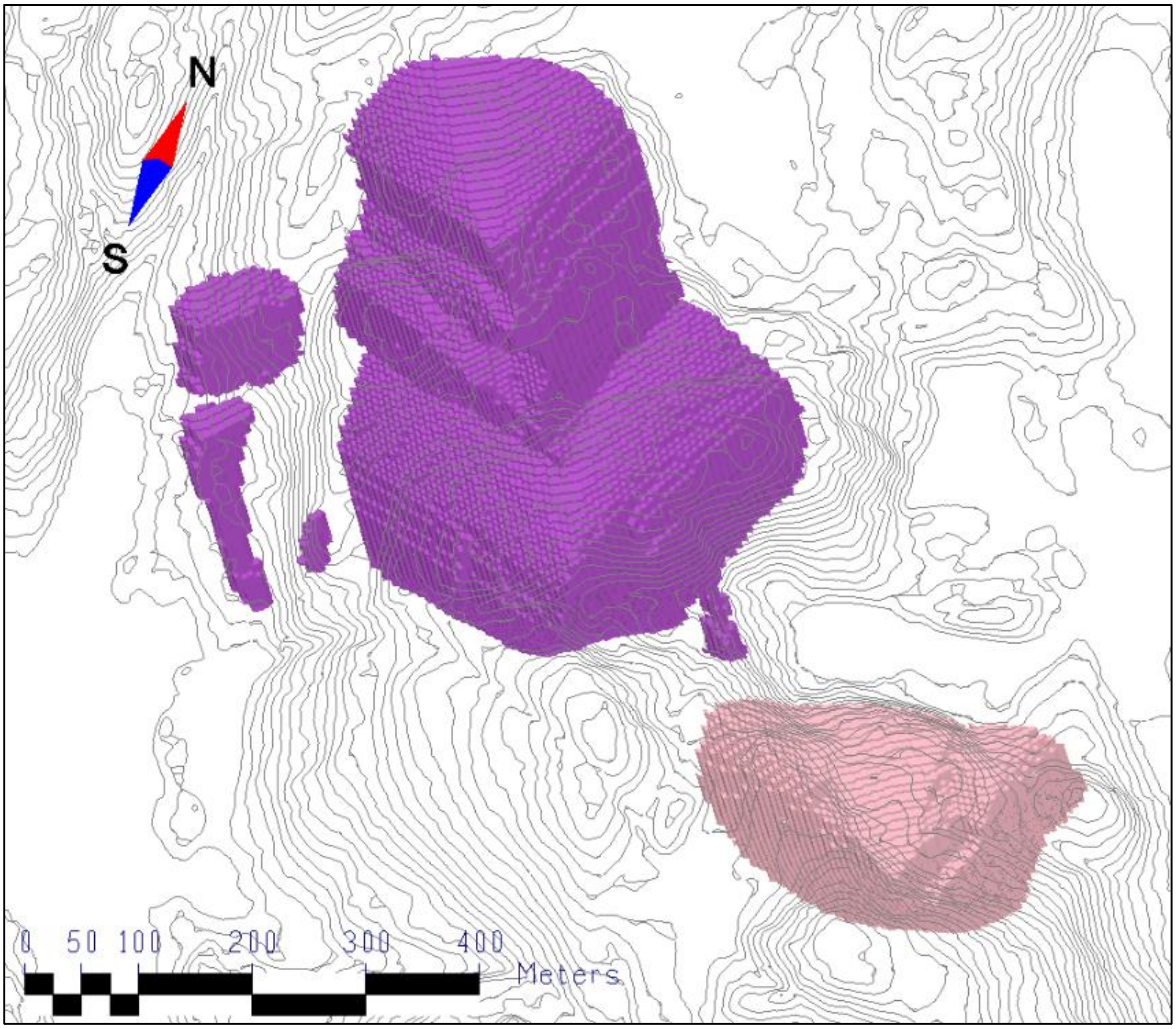
The EV South analysis indicates using an economic pit limit at 70% price factor, at 38-degree overall slope angle as shown in Figure 16-2.

Figure 16-2: Economic Shell Sensitivity – EV South Zone



An oblique view of EV North and EV South is shown in Figure 16-3.

Figure 16-3: Oblique View of the EV North and South selected LG Pit Limit Shells

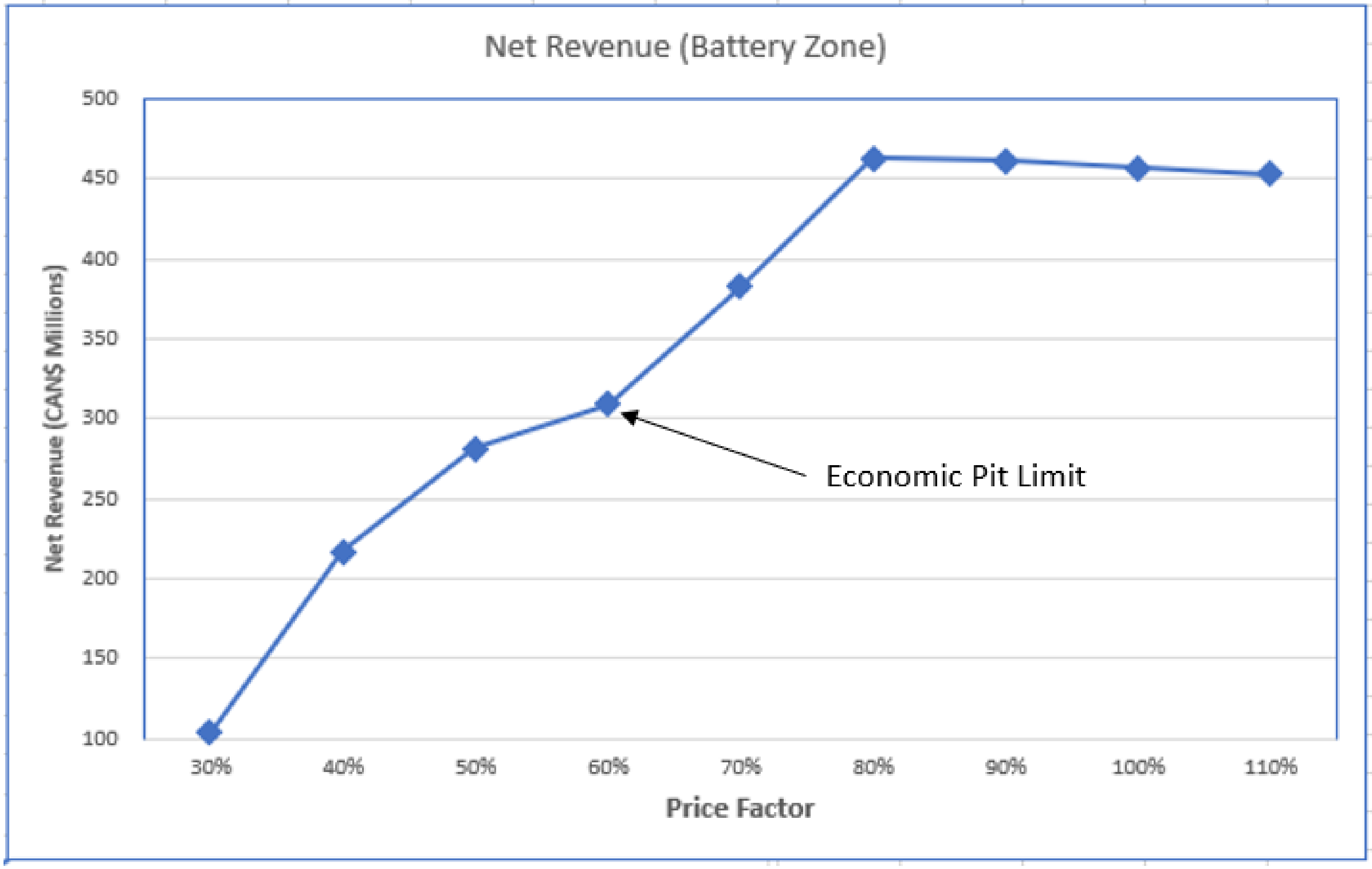


Source: MMTS, 2021

The Battery Zone economic shell indicates two distinct inflection points. The 50% inflection point was chosen for this study based on current waste space capacity. The next inflection at the 80% of base price case has a lower grade Cg in situ and would require a significant increase in plant capacity after Year 15. This expansion opportunity to process additional ore should be evaluated in a future trade-off study. This sensitivity analysis is shown in Figure 16-4.

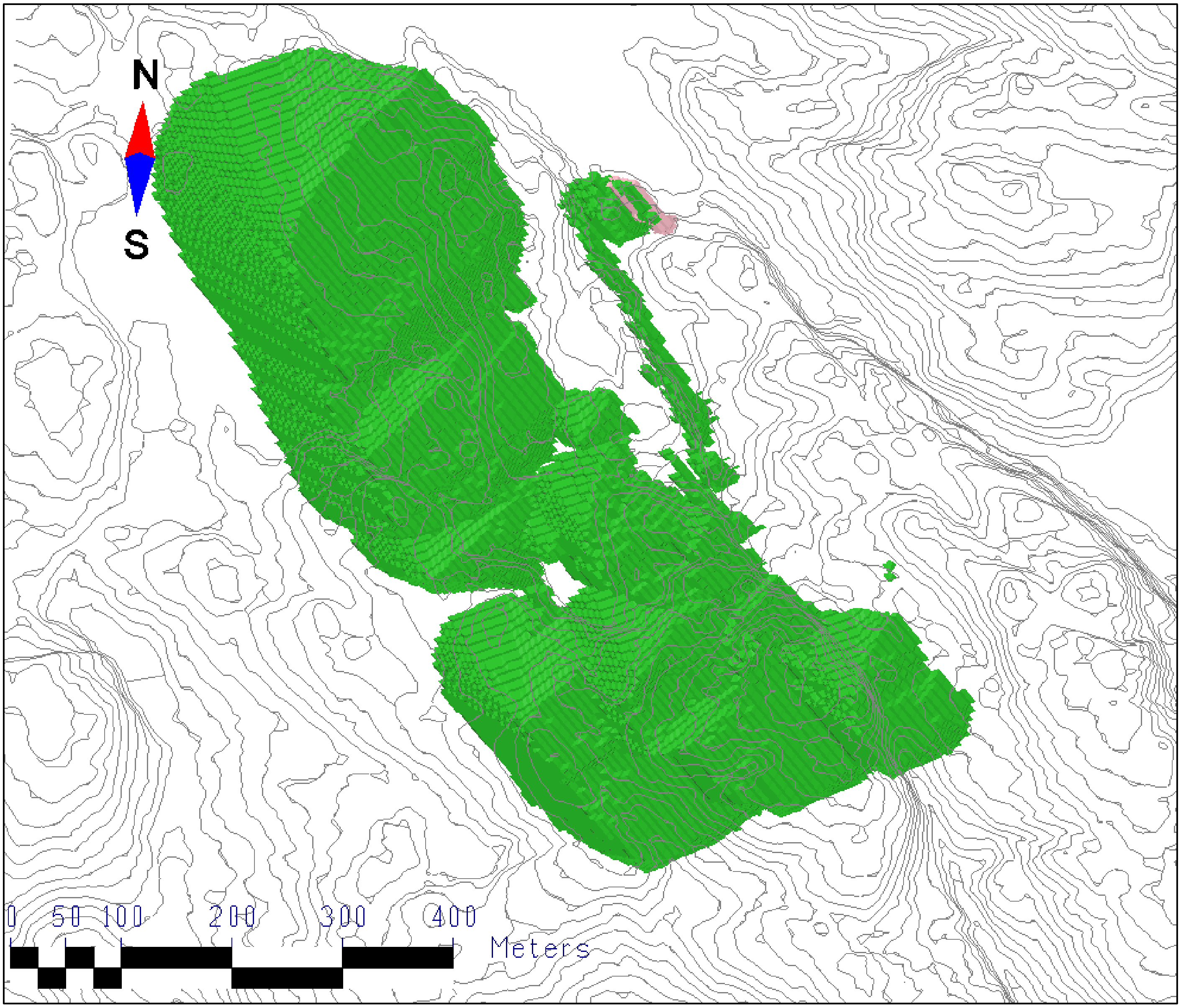
An oblique view of the Battery Zone is shown in Figure 16-5. The relative location of all zones is shown in Figure 16-6.

Figure 16-4: Economic Shell Sensitivity Battery Zone



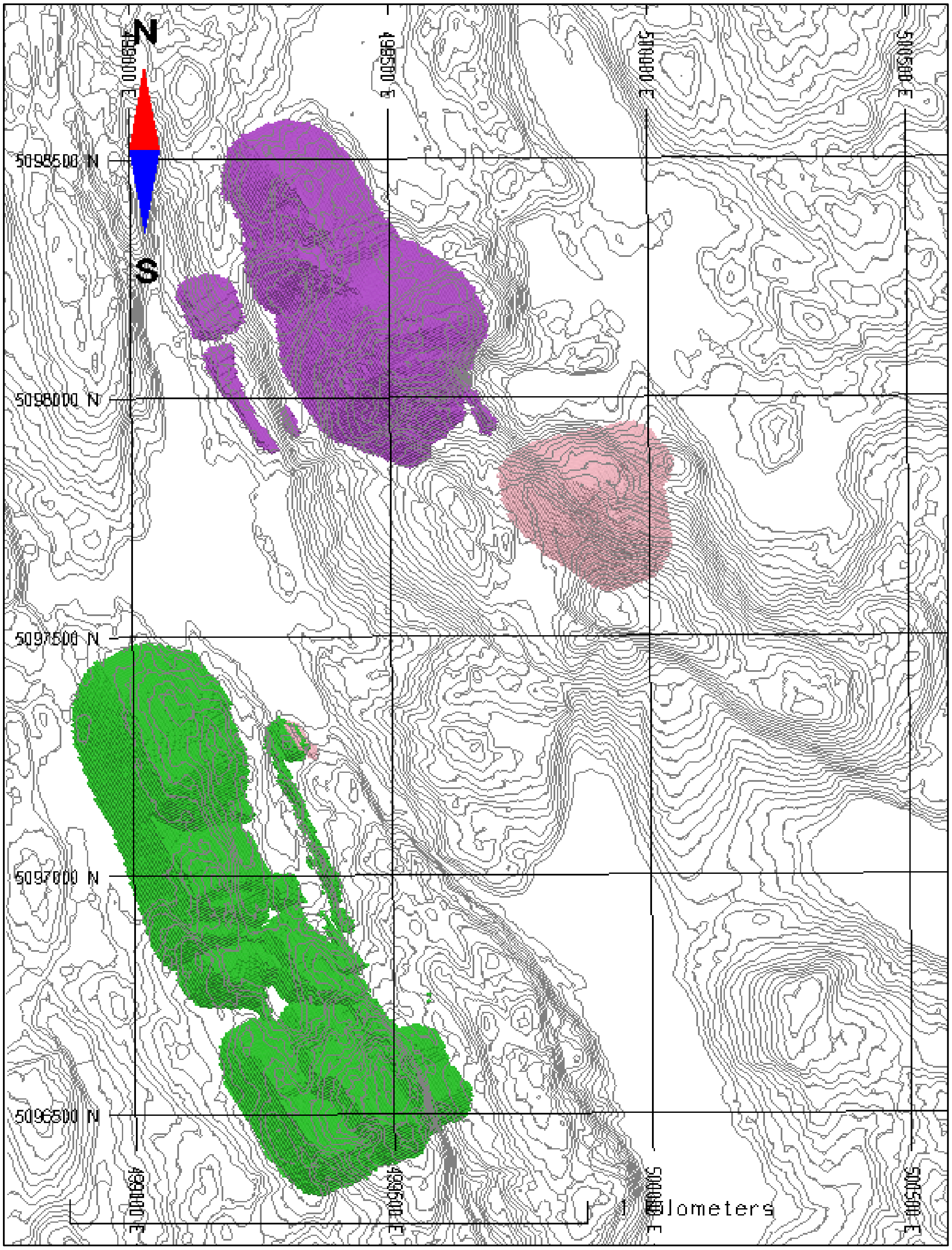
Source: MMTS, 2021

Figure 16-5: Oblique View of the Battery Zone Selected LG Pit Limit Shell



Source: MMTS, 2021

Figure 16-6: Plan View of Economic Shells used for Pit Designs



Source: MMTS, 2021

16.4.3 Pit Design

16.4.3.1 Overview

MMTS has completed pit designs that demonstrate the viability of accessing and mining economic resources at the La Loutre property. The designs utilize estimated geotechnical parameters, suitable road widths for the equipment size, and minimum mining widths based on efficient operation for the size of mining equipment chosen for the project.

Mining is anticipated to be carried out by owner-operator mine equipment (60-tonne payload trucks). Haul road design widths have been assumed as follows:

- double-lane highwall haul road allowance of 20.5 m
- single-lane highwall haul road allowance of 15 m

Haul road widths are dictated by equipment size. One-way haul roads must have a travel surface more than twice the width of the widest haul vehicle. Two-way roads require a running surface more than three times the width of the widest vehicle that will use the road. One-way roads are not normally employed for main, long-term haul routes because they limit the safe bypassing of trucks and consequently lead to reduced productivity. However, one-way roads are an appropriate option for low volume traffic flow or shorter-term operations.

A minimum mining width between pit phases is reserved to maintain a suitable mining platform for efficient mining operations. This width is established based on equipment size and operating characteristics. For this study, the minimum mining width generally conforms to 40 m.

Roads are designed at a maximum grade of 10%. Steeper single-lane roads (12%) are utilized for the last two bench accesses.

Pit designs are based on the digging reach of the excavators (6 m operating bench) with double benching between highwall berms. The berms therefore are separated vertically by 12 m.

16.4.3.2 Results of Design

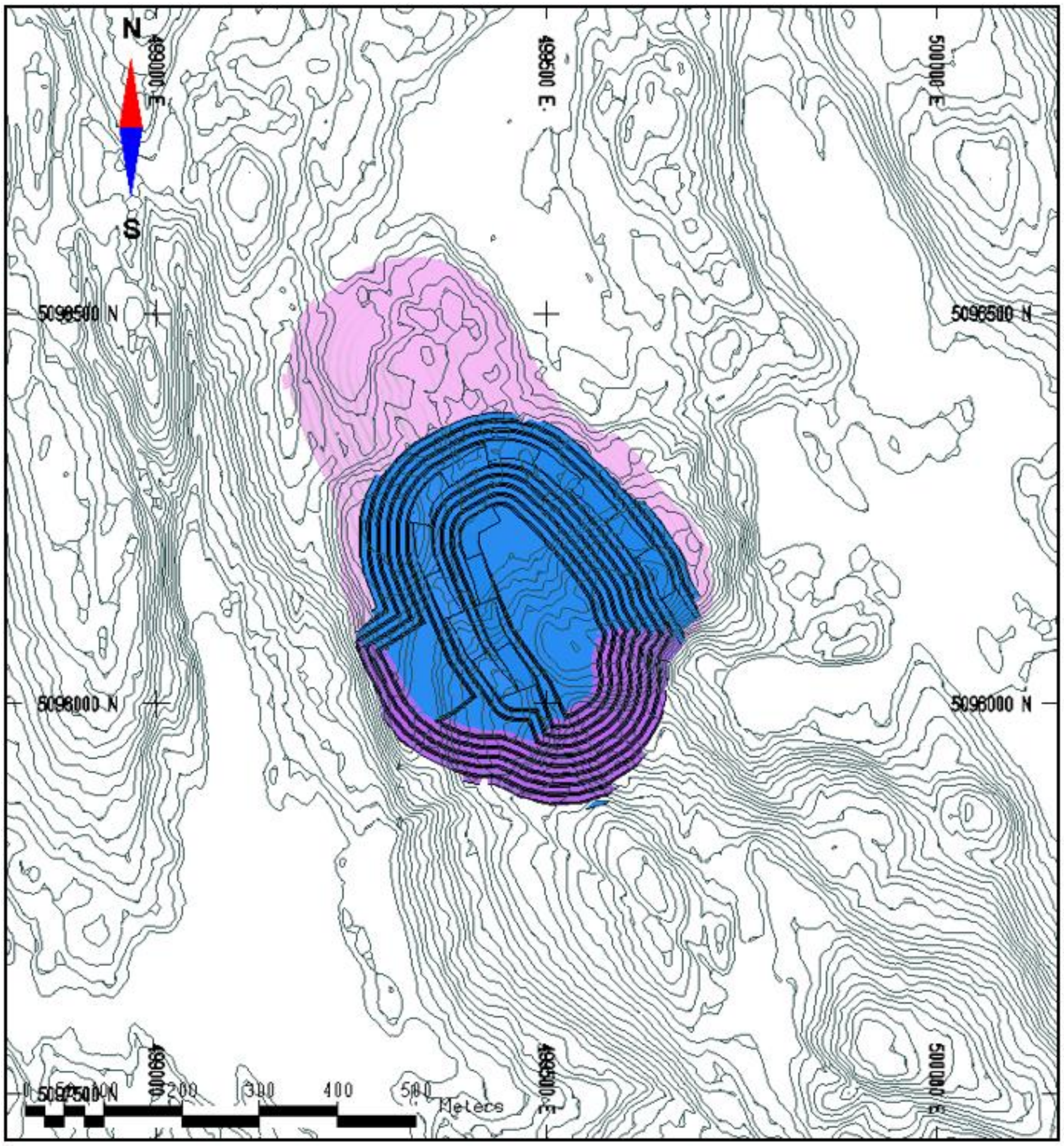
The description of the detailed pit designs and phases in this section uses the following naming conventions:

- The EV Zone is divided into two pit areas, North and South.
- The EV North pit includes a starter pit designated with the number “1” (i.e., EV-N1) while the total pit is designated with the number “2” (i.e., EV-N2)
- The EV South Zone has a small pit (designated “EV-S”) with a 38-degree overall slope to accommodate multiple roads on each highwall.
- The Battery Zone is developed as two pits, designated as “B North” (i.e., B-N) and “B South” (i.e., B-S).

16.4.3.2.1 PIT EV-N1

Pit EV-N1 is a starter phase that mines the south end of the EV total pit. The south wall is common with the total pit and pushbacks are designed on the east and west sides. Initial access is established via an external haul road. The pit is mined to a bottom elevation of 233 m. Waste is hauled to the waste area to the east of the pit area. A plan view of the EV-N1 pit with the total pit limit in shadow is provided in Figure 16-7.

Figure 16-7: Plan View of Starter Pit EV-N1 with Total Pit Outline

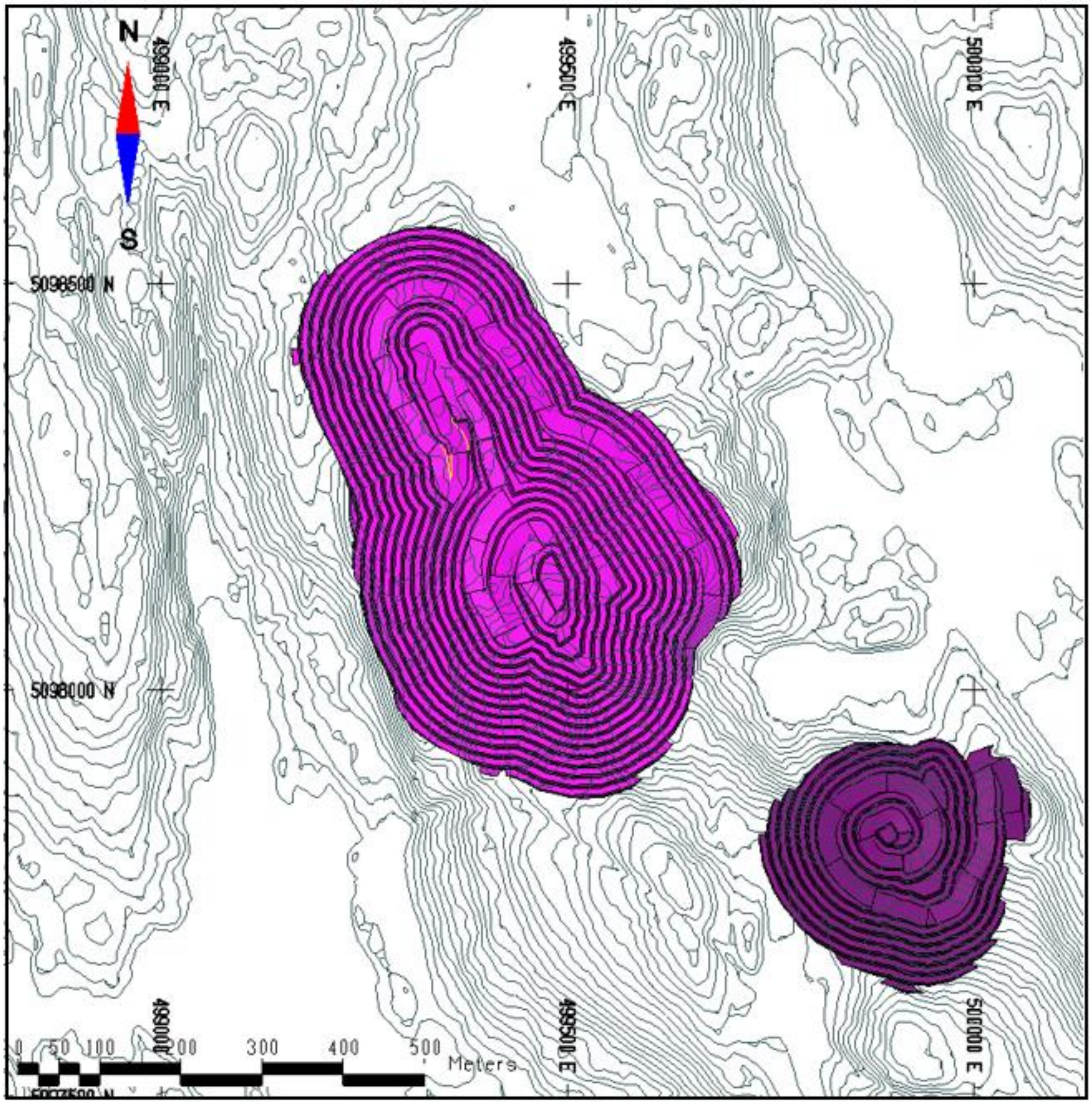


Source: MMTS, 2021

16.4.3.2.2 Pits EV-N2 and EV-S

Pit EV-N2 mines the completion of EV North Zone. EV-S is a small pit based on a 38-degree slope economic shell. This pit has a small, moderately low-grade pit. EV-N2 and EV-S are shown on Figure 16-8.

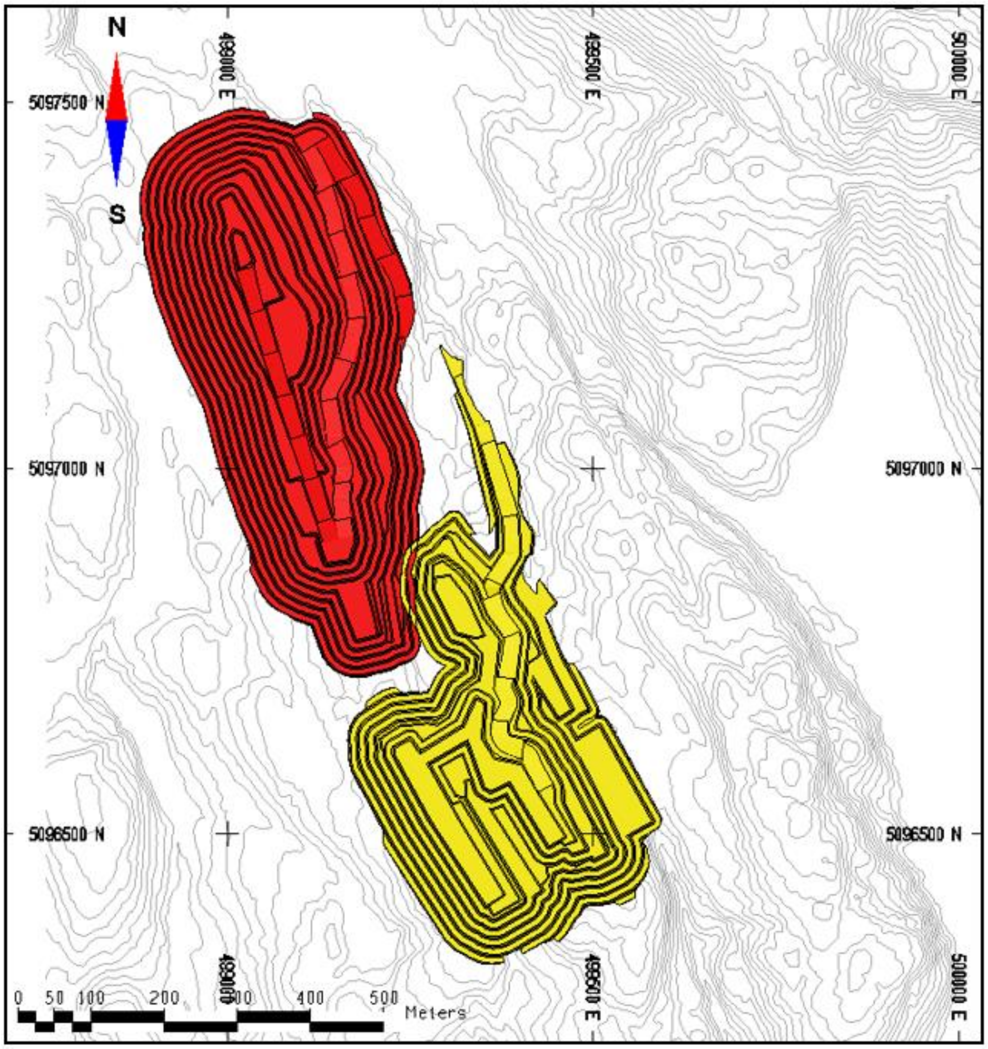
Figure 16-8: Plan View of Pit EV-N2 and EV-S



Source: MMTS, 2021

B-N and B-S of the Battery economic pit shell can be mined independently of each other. These pits are shown in Figure 16-9.

Figure 16-9: Plan View of Pit B-N and B-S



Source: MMTS, 2021

The resource by pit and phase is summarized in Table 16-3.

Table 16-3: Mine Resource by Phase

Description	Unit	EV-N1	EV-N2	EV-S	B-N	B-S	Total
Indicated Resource	kt	3,118	1,964	1,437	1,283	873	8,675
Cg Grade	%	7.72	7.55	5.96	7.05	5.24	7.04
Cg Grade (Diluted)	%	7.48	7.34	5.88	6.40	5.10	6.78
Inferred Resource	kt	3,149	2,632	1,621	2,315	3,482	13,199
Cg Grade	%	8.0782	7.3055	5.8091	6.8635	5.8654	6.8400
Cg Grade (Diluted)	%	7.8183	7.1305	5.6725	6.3378	5.6753	6.5900
Total Resource	kt	6,267	4,596	3,058	3,598	4,355	21,874
Cg Grade	%	7.90	7.41	5.88	6.93	5.74	6.92
Cg Grade (Diluted)	%	7.65	7.22	5.77	6.36	5.56	6.67
Waste	kt	19,967	20,924	4,823	25,712	14,299	85,726
Overburden*	kt	733	299	286	727	625	2,670
Strip Ratio (w/o)	t/t	3.30	4.62	1.67	7.35	3.43	4.04

*Overburden is 2-3m of broken and weathered rock overlaying more competent material.

16.4.4 Waste Rock Dumps

In the mine plan, waste rock is placed in dumps as close to the mining areas as possible in an area that enables the waste rock to contain, and be co-disposed with, mill tailings. All dump designs assume a natural angle of repose of 37° and allow for reclamation angle of 26°. A 30% swell factor is applied to in-situ volumes to calculate the loose volume requiring placement. Bottom-up construction methods have been assumed for the construction of waste rock dumps to maximize dump stability.

16.4.5 Consideration of Marginal Cut-off Grades

Marginal cut-off grade 1.50% Cg has been calculated based on the cost and revenue in Table 16-4.

Table 16-4: Inputs for Cut-off Cg%

Item	Value	Unit
NSP Calculation	1,086.43	C$/t
Mining Cost	3.10	C$/t mined
Graphite Process Recovery	95	%
Process Costs	12.00	C$/t milled
G&A and Site Costs	2.00	C$/t milled

16.4.6 Operational Cut-off Grades

The operational constraint of maintaining a feed rate of 1,500,000 t/a and producing 100 kt of product annually required maximizing feed grade through the first 15 years life of mine. Due to limited area available for long term low-grade stockpiles, the operational cut-off for this study was raised from 1.5% Cg to 2.5% Cg. The processing of low-grade mill feed below 2.5% Cg would not occur until year 15 and later and would require notable increase in mill throughput to continue producing at or near the 100 kt annually. For the purposes of this study no stockpiling of mill feed below 2.5% has been included.

The economic trade-off study of a lower cut-off is recommended in the next phase. A south section of the external dump may be designated for a long-term very low-grade stockpile.

16.4.7 Grade Control and Production Monitoring

Grade control will be based on sampling drill holes and delineating ore from waste-based cut-off grades. The percentage model was modified to whole block grades to reflect the proposed grade control method.

16.4.8 Dilution and Mine Losses

In an open pit mining operation, it is not possible to accurately separate the mill feed from waste because of the use of large-scale mining equipment and drilling and blasting. In order to account for mining dilution, MMTS uses contact block evaluation to apply loss and dilution. It is assumed there will be a 0.5 m loss of ore and added dilution on each face of a block that is in contact with another block that is below cut-off. The grade of the dilution material is calculated as the average of the below cut-off grade blocks. In the case of blocks with less than 100% ore, the in-situ grade is diluted in the same manner for whole blocks and then the resultant grade is converted to a whole block grade. This method best represents how the grade control will be applied and results in lowering the Cg grade of the mineral resource from 6.90% to 6.67%.

16.5 Production Schedule

The mine production schedule (see Table 16-5) is developed using annual production requirements, mine operating considerations, product prices, recoveries, destination capacities, equipment performance and operating costs. The following schedule characteristics are applied:

- Pre-production occurs one year ahead of mill operations and entails building haul roads to access the top of the pits and excavating waste rock to build stockpile base for the pre-production stockpile production. Pre-production is required to expose ore for mill start-up
- Annual mill feed of 1,500,000 t/a is targeted.
- A mill ramp-up of 66% design capacity for the first quarter; 80% for the second quarter; and full capacity thereafter has been assumed for this study.
- Low-grade stockpiling has been used to maintain elevated mill feed grades during the first eight years.

Pit phase progression is limited to no more than eight full benches in each year.

Table 16-5: Production Schedule

Period	Mill Feed	CG (Diluted)	EVN1		EVN2		EVS		BN	BS	To Stockpile	From Stockpile	Waste Rock	Overburden
			To Mill	To Stockpile	To Mill	To Stockpile	To Mill	To Stockpile	To Mill	To Mill				
	kt	%	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt
Y-1				193							193		2,296	511
Q1	249	8.16	249										1,638	263
Q2	300	8.21	300										1,850	0
Q3	370	7.83	370										1,769	11
Q4	375	7.65	375										1,720	23
Y2	1,500	7.36	1,475		25								7,762	296
Y3	1,500	7.20	1,313		180							7	8,058	0
Y4	1,500	7.61	1,007	126	493	172					298		6,885	117
Y5	1,500	7.39	538	36	836	258			15	111	293		6,407	0
Y6	1,500	7.13	271	13	614	49	147	161	300	68	223	100	5,502	775
Y7	1,500	7.40			1,069				385	46			5,899	201
Y8	1,500	7.59			900				282	318			6,100	0
Y9	1,500	5.25					690		180	630			5,640	460
Y10	1,500	5.41					340		264	896			6,088	12
Y11	1,500	5.91					152		498	850			6,100	0
Y12	1,500	5.90					711		205	584			3,220	0
Y13	1,494	6.51					736		285	473			3,226	0
Y14	1,497	5.63					122		511	379		485	2,969	0
Y15	1,089	5.73							674			415	2,599	0
Total	21,874	6.67	5,898	175	4,117	479	2,898	161	3,599	4,355	1,007	1,007	85,726	2,670

16.6 Mining Sequence

16.6.1 Year -1

Initial mining will be in the Electric Vehicle North 1 (EVN1) starter pit. Overburden will be stockpiled at the northeast edge of the pit adjacent to the waste rock facility (WRF) location. Waste will be used to build stockpile pad just north of the crusher location within the co-disposal area of the waste facility. High-grade ore will be stockpiled in the location to be used as supplemental feed in Year 6.

16.6.2 Years 1 to 3

Mining continues in the EVN1 starter pit, which remains the primary source of mill feed during this period. Mining in Electric Vehicle North 2 (EVN2) begins in Year 2 with primarily waste mining while providing a minor amount of mill feed. Approximately 50% of the waste rock be hauled to the north of the WRF to begin building the facility to its ultimate design. The remaining 50% will be used for co-disposal closer to the mill. Year 3 mine development is illustrated in Figure 16-10.

16.6.3 Years 4 to 6

Mining in EVN1 continues to supply two-thirds of the mill feed in Year 4 and is completed in Year 6. Mining in EVN2 provides an average of 40% of mill feed during this period. Strategic stockpiling of low-grade material (below 3.5% Cg) allows the mill feed grade to remain at target. During this period, 800 kt of low-grade ore is stockpiled immediately south of the pit exit, minimizing the haul distance for stockpiling in the early years. Approximately 50% of the waste rock continues to be hauled to the north, advancing most of the ultimate height of the WRF towards the south. This will facilitate early reclamation of approximately two-thirds of the final design. The remaining 50% continues to build the co-disposal zone near the mill.

Access to the B Zone and some overburden removal begins Year 4. Pre-stripping of overburden and waste commences in EVS to prepare to supplement mill feed in Year 6 waste from the EVS and the B pits. Waste from this development is hauled to the WRF.

The high grade stockpile from Yr-1 is used during this period.

16.6.4 Years 7 to 8

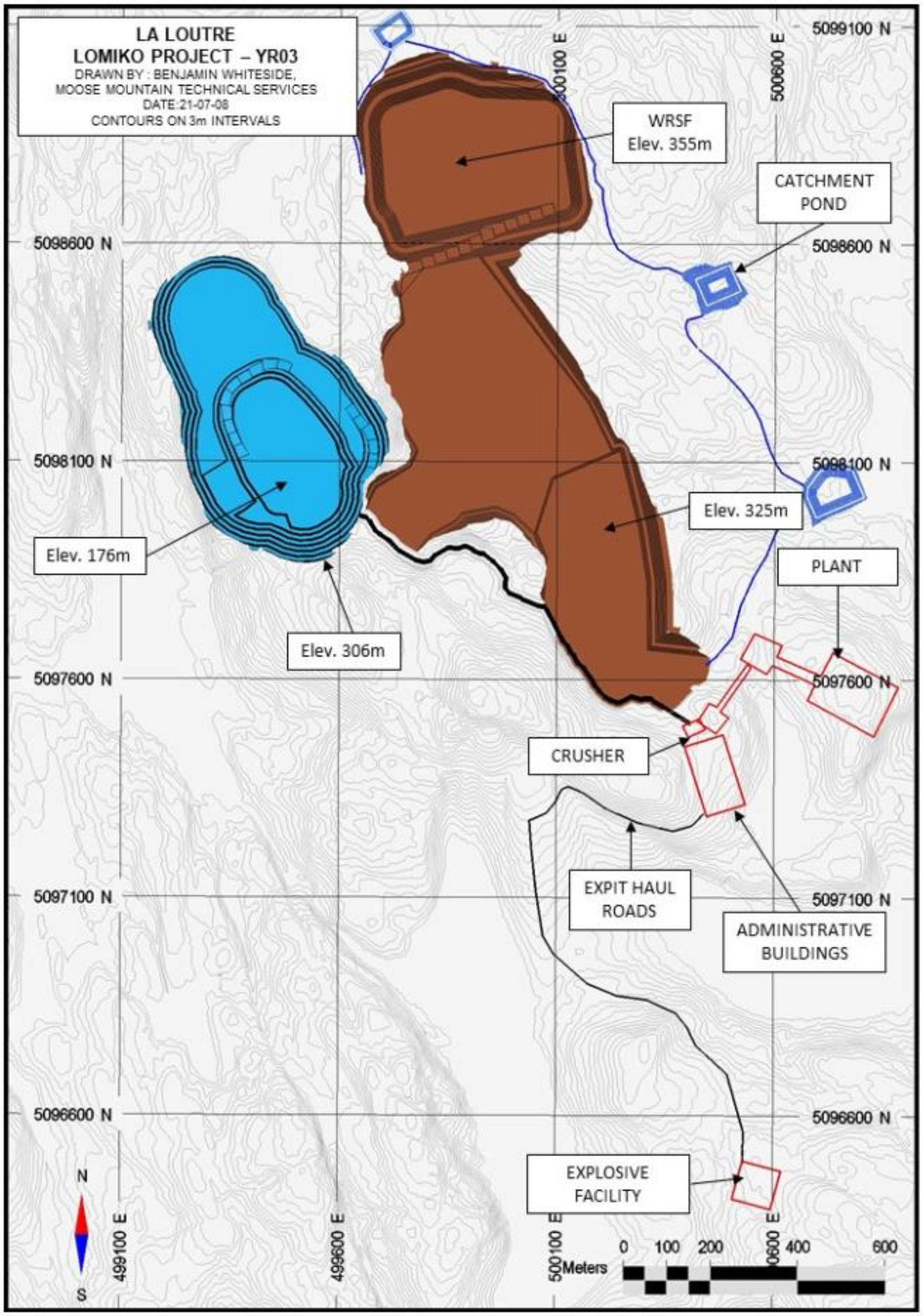
Mining in EVN2 is completed in Year 8. Placement of all waste continues to the WRF. No strategic stockpiling of low-grade mill feed is required to maintain an elevated mill feed grade. The WRF is built to limits in Year 7 and final lifts begin. Mining the BN and BS pits provides additional mill feed; the waste is hauled to achieve a final lift elevation of approximately 370 m on the WRF.

16.6.5 Year 9

Mining is concentrated in the BN, BS and EVS pits. Waste is hauled to backfill the EVN pit along with tailings.

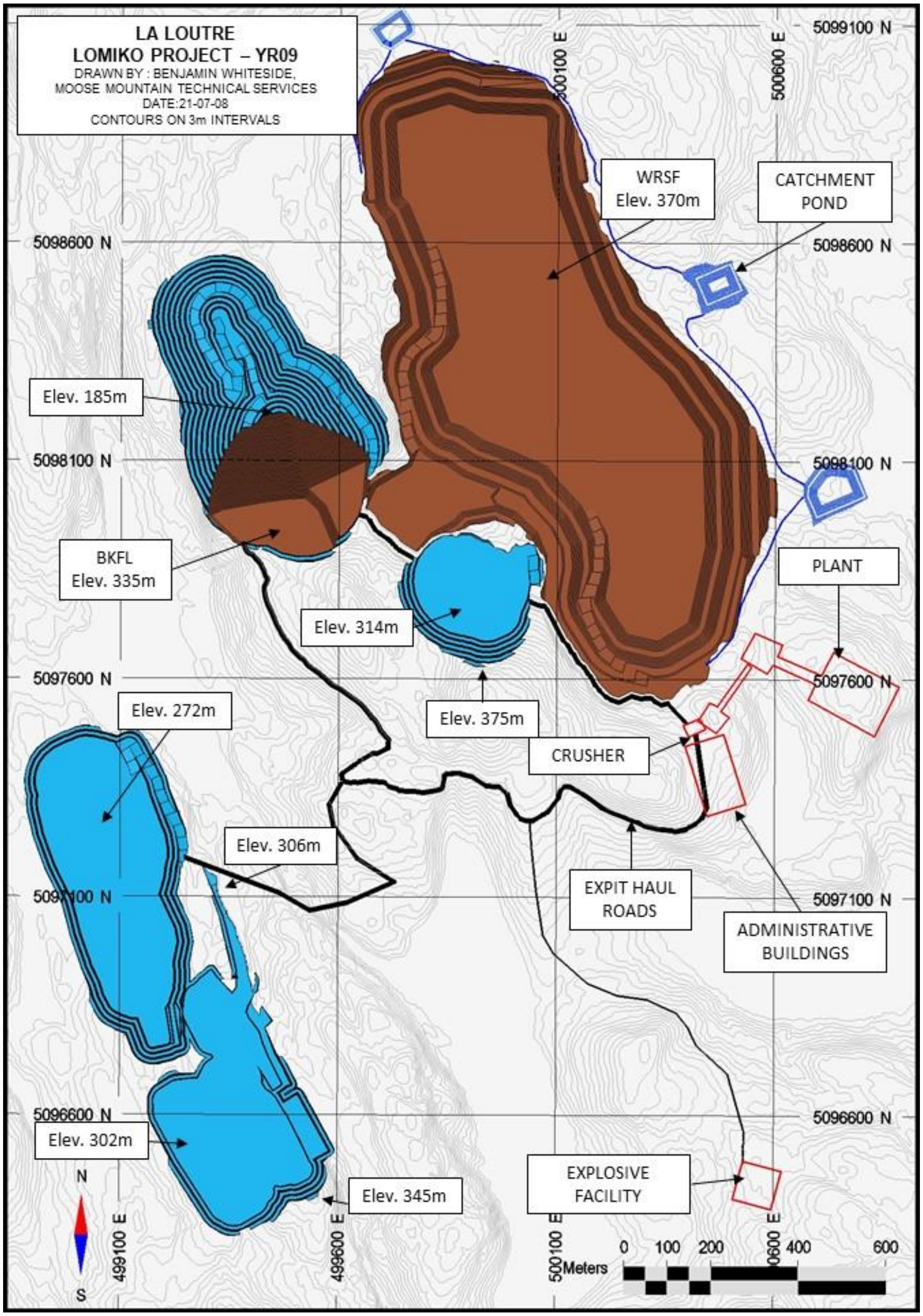
The mill feed grade drops from an average of 7.45% Cg during the first eight years to 5.5% to 6% Cg for the duration of mine life. Mine development in Year 9 is shown in Figure 16-11.

Figure 16-10: Year 3 Mine Development



Source: MMTS, 2021

Figure 16-11: Year 9 Mine Development

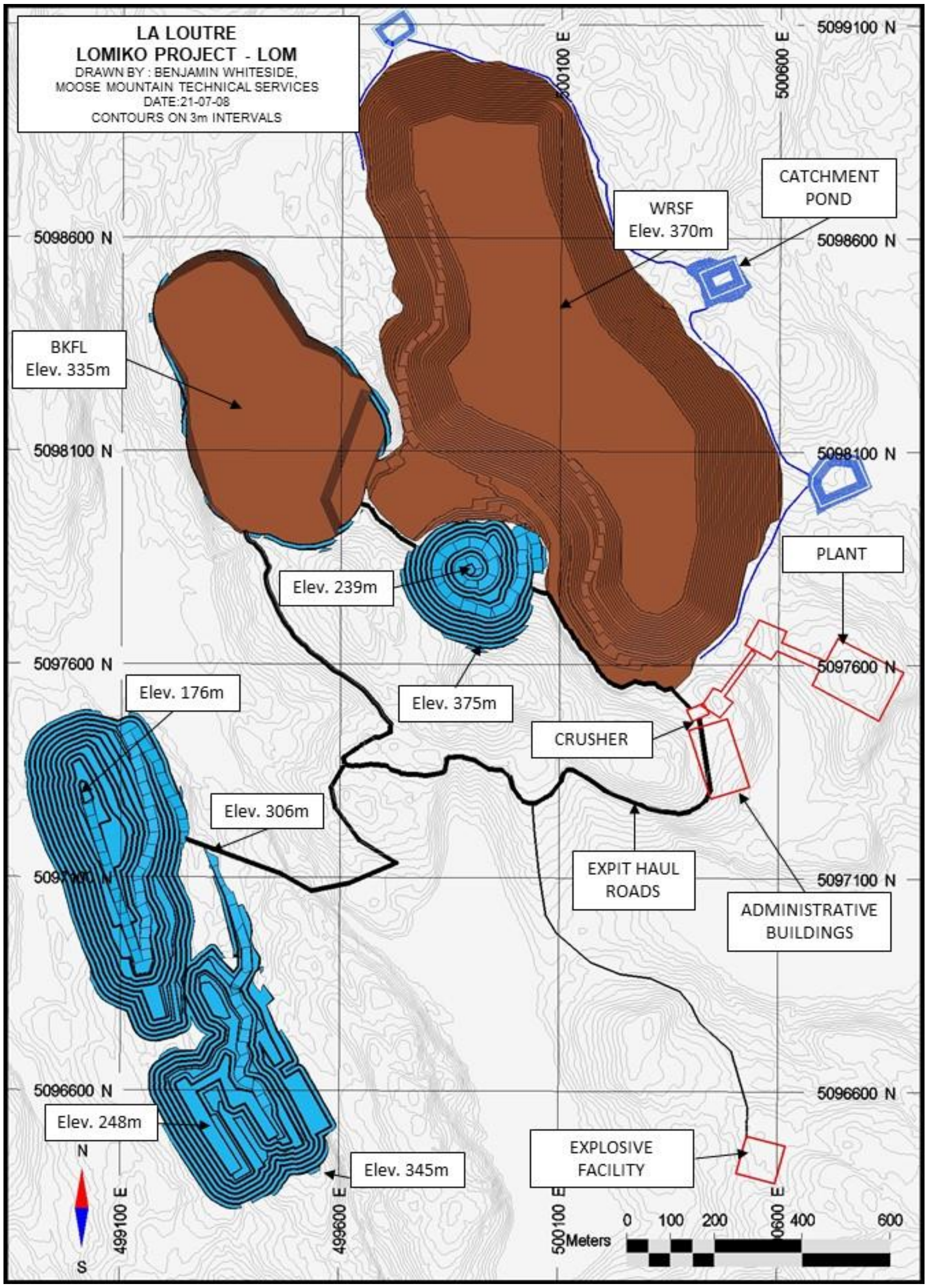


Source: MMTS, 2021

16.6.6 Years 10 to 15

Mining continues in the BN, BS and EVS pits. Waste is co-disposed by end-dumping into the EVN pit. Material from the co-disposal zone is used to backfill the EVN pit. Additionally, the WRF will be reclaimed during this period of active mining to reduce reclamation costs at mine closure. The end-of-mine development scenario is shown in Figure 16-12.

Figure 16-12: End-of-Mine Development



Source: MMTS, 2021

16.7 Blasting and Explosives

In-situ rock will require drilling and blasting to create suitable fragmentation for efficient loading and hauling of both mill feed and waste material. Digging limits between mill feed and waste rock will be defined in the blasted muck pile through blasthole assays and grade control technicians.

Areas will be prepared on the bench floor blast patterns in the in-situ rock. The spacing and burden between blast holes is assumed at 4.2 m for 6 m benches. Dozers will be used to establish initial benches for the upper portions of each phase. Drill ramps will be cut between benches where the outside holes on established benches do not meet the burden and spacing requirement of the pattern for the next bench below. Drills should be fitted with automatic samplers to provide ore grade control samples from drill cuttings in the ore zones. These samples will be used in the ore control system (OCS) for blast hole kriging to define the ore/waste boundaries on the bench as well as stockpile grade bins for the grade control system to the mill.

Blast hole drills of 140 mm bit size will be used for production drilling, both in ore and waste. These parameters will be re-evaluated in the future with a detailed blasting study, using site-specific rock strength parameters.

The explosives contractor will supply and store bulk explosives on site. The explosives contractor’s employees will deliver explosives to the blast hole.

Specifications for blasting plant and explosives storage magazines and the locations of these facilities must adhere to regulations from the Explosives Act of Canada as published by the Explosives Regulatory Division of Natural Resources Canada, and regulations as published by the Ministry of Labour, Employment and Social Solidarity in Quebec (in particular, the Regulation respecting occupational health and safety in mines in Quebec).

Loading of the explosives will be done in bulk with loading trucks provided by the explosive’s supplier. The explosives product will use both ANFO and emulsion as required.

16.8 Mining Equipment

Mine equipment costs are listed in Table 16-6 on the following page.

16.9 Comments on Mining Methods

The equipment size of 60-tonne trucks was chosen prior to cycle time analysis and was predicated on an average of 30-minute cycle times to calculate a fleet between 10 and 20 trucks. The results of this study indicate that a fleet size of eight trucks is required. A trade-off study to evaluate the use of smaller, (40-tonne approximately) trucks against the 60t trucks is recommended during the next study, as this would reduce the road width and waste mining while increasing the number of units and operators required.

Table 16-6: Summary of Mining Equipment Required

Equipment Type	No. of Units
Epiroc D65 DTH Drill, Tracked, 115-140 mm	2
CAT 988K Wheel Loader, 7 m^3 Bucket	1
CAT 395F Hydraulic Excavator, 4.5 m^3 Bucket	2
CAT 775G Hauler, 60 tonne Payload	8
CAT 16M Motor Grader, 4.3 m Blade	1
CAT 745C Water/Gravel Truck	1
CAT D8T Track Dozer, 233 kW	2
CAT 966L Wheel Loader, 4.5 m^3 Bucket	1
CAT 349F L Hydraulic Excavator, 3 m^3 Bucket	1
Fuel/Lube Truck	1
Ford Transit - Shuttle Van	1
Pickup Trucks	8
Light Plants	6
Water Pumps, 150 m^3/h	2
Kenworth T370 Dump Truck	2
Emergency Response Vehicle	1
Kenworth T370 Flatbed Picker Truck	1
Kenworth T800 Maintenance Truck	2
Altec AC30-101B Mobile 30 tonne Crane	1
55-ton Float Trailer	1
Forklift and Tire Handler	1
Mobile Steam Cleaner	1

17 RECOVERY METHODS

17.1 Overview

This chapter outlines the overall selected process flowsheet. The unit operations were selected based on the outcome of testwork, preliminary financial evaluations, and comparisons to similar Canadian projects. The process plant has is designed to process 4,110 t/d (1.5 Mt/a), while recovering 93.5% of the graphite from the feed on average.

17.2 Process Flowsheet

The La Loutre processing facility design is based on generating a graphite product containing 95% graphitic carbon (Cg) from an ore containing 6.76% Cg. The testing demonstrated that 97% Cg can be achieved, but additional testing and market investigation is required to determine accurate pricing at 97% Cg. Therefore, a 95% product grade was selected for the purpose of this technical report. To achieve this grade, the process plant includes the following:

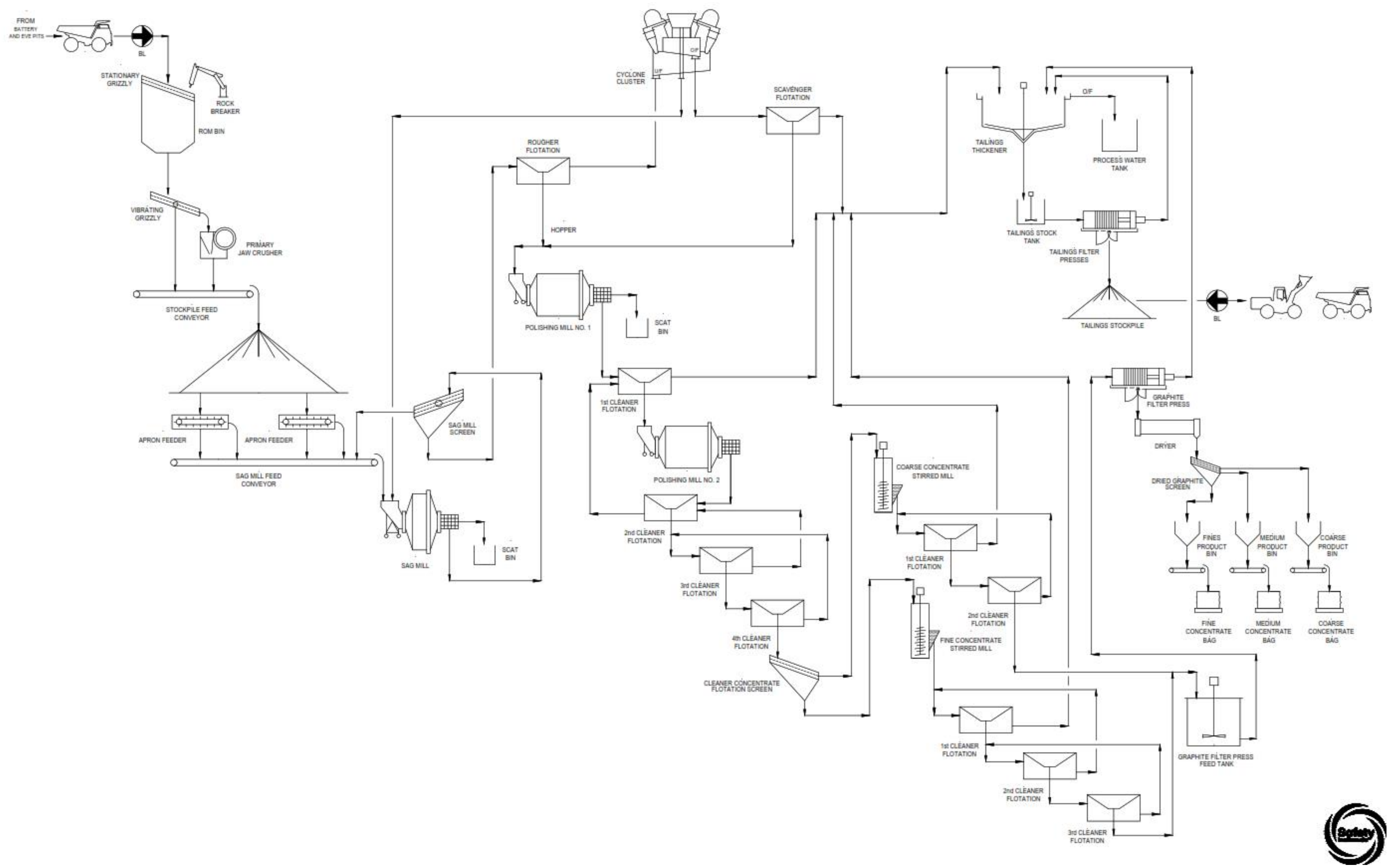
- primary crushing of run-of-mine (ROM) feed
- covered crushed material stockpile to provide buffer capacity for the process plant
- semi-autogenous grinding (SAG) mill with discharge classification screen
- rougher flotation with cyclone classification followed by scavenger flotation
- combined concentrate cleaning with polishing grind
- concentrate classification with coarse and fine concentrate polishing grinding and cleaning
- concentrate filtration, drying, screening, and bagging
- tailings thickening, filtration, and disposal
- reagent storage and distribution
- water services
- potable water treatment and distribution
- air services

An overall flowsheet is shown in Figure 17-1.

17.3 Plant Design

The process plant has been designed to treat material from the Battery and Electric Vehicle (EV) deposits. Production from the two deposits will be processed as a blended feed to the plant according to the mining schedule. The key process design criteria for the mineral processing facility are listed in Table 17-1, which also summarizes the grade and recovery data.

Figure 17-1: Process Flowsheet



Source: Ausenco, 2021

Table 17-1: Process Design Criteria Summary

Criteria	Unit	Value
Annual Throughput (Design)	t/a	1,500,000
Daily Throughput (Design)	t/d	4,110
Operating Days per Year	d	365
Operating Availability – Crushing	%	70
Operating Availability – Grinding	%	92
Tailings filter availability, per filter, average	%	90
Operating Hours – Crushing	h/y	6,132
Operating Hours – Grinding	h/y	8,059
Design Throughput – Crushing	t/h (dry)	244.6
Design Throughput – Milling	t/h (dry)	186.1
ROM Head Grade, LOM (Average)	% Cg	6.76
Recovery – Overall	%	93.5
Crushing		
Primary Crusher	type	Jaw Crusher
Crushing Feed Size, 100% Passing	mm	600
Crushing Product Size, 80% Passing	mm	50
Crushing Work Index	kWh/t	13.1
Crushed Ore Stockpile Residence Time (live)	h	12
Grinding		
Grinding Circuit Type	-	SAG mill closed with screen
Bond Ball Mill Work Index	kWh/t	10.86
Grinding Product Size, 80% Passing	µm	240
Rougher/Scavenger Flotation		
Type of Rougher Cells	-	Flash Flotation Cell
Number of Rougher Cells	#	3
Rougher Flotation Residence Time, Design	min	12
Rougher Concentrate Grade	%	25
Hydrocyclone Circulating Load, Design	%	350
Type of Scavenger Cells	-	Tank Cell
Number of Scavenger Cells	#	2
Scavenger Flotation Residence Time, Design	min	8
Scavenger Concentrate Grade	%	25
Primary Flotation		
Number of Polishing Mills	#	2
Polishing Mill	type	Ball Mill without Lifters
Number of Circuits	#	4
Total Number of Tanks	#	8

Criteria	Unit	Value
Total Residence Time, Design	min	40
Final Concentrate Grade	%	94.7
Coarse Flotation		
Number of Circuits	#	2
Total Number of Tanks	#	4
Total Residence Time, Design	min	4
Stirred Mill	type	Vertical stirred mill
Concentrate Grade	%	99.0
Fine Flotation		
Number of Circuits	#	3
Total Number of Tanks	#	9
Total Residence Time, Design	min	10
Stirred Mill	type	Vertical stirred mill
Concentrate Grade	%	97.9
Tailings		
Tailings Thickener Underflow Density	% w/w solids	65
Tailings Filter Cake Moisture	% w/w solids	80
Tailings Filter Availability		
Concentrate Drying & Bagging		
Concentrate Filter Cake Moisture	% w/w solids	85
Product Moisture Content	% w/w moisture	<0.3%
Graphite Concentrate Storage Time	days	3
Graphite Package Size	t	1

17.3.1 Crushing Circuit

ROM production is delivered by haul truck and dumped through a static grizzly and into a ROM bin where production from the battery and EV deposits will feed the crushing circuit. A hydraulic rock breaker is used to break oversized rocks on the static grizzly. ROM stockpiles can be blended as required to stabilize feed grade and material hardness when deposits are being mined simultaneously.

The material from the ROM bin feeds a vibrating grizzly feeder with an 80 mm aperture, where an estimated 64% w/w of the feed is by-passed to the stockpile feed conveyor while the remainder is fed to the jaw crusher. The primary crusher is a single toggle jaw crusher operating with a closed side setting (CSS) of 80 mm. The crushing circuit product is designed to achieve an 80% passing size of 50 mm. The primary crusher product is combined with the vibrating grizzly undersize and conveyed to a covered stockpile.

17.3.2 Stockpiling and Reclaim

The crushing product stockpile is designed to have a live retention of 24 hours, resulting in a live capacity of 4,110 tonnes. Its total capacity is 10,274 tonnes. The stockpile ensures the processing plant operates independently of the mining and crushing activities, providing constant feed to the grinding circuit.

The material is reclaimed from the stockpile by two apron feeders that discharge onto the SAG mill feed conveyor. Each feeder has been designed and selected to be capable of reclaiming the entirety of the reclaim stream in the event the other is offline for maintenance purposes.

17.3.3 Grinding Circuit

The grinding circuit consists of a SAG mill in closed circuit with two vibrating classification screens operating in parallel. The grinding circuit aims to produce a product with an 80% passing size (P_{80}) of 240 µm. The SAG mill slurry discharges through a trommel, where the oversize is screened and sent to scat bins. Trommel undersize discharges onto one of the two SAG mill classification screens.

The vibrating classification screens have 3 mm apertures and retain and recycle 40% w/w of the SAG mill fresh feed back to the SAG mill feed conveyor. The remaining undersized material is pumped to the rougher.

17.3.4 Rougher and Scavenger Flotation Circuit

The rougher flotation circuit minimizes flake degradation by removing any large flakes as early in the process as possible. Diesel fuel oil (DFO)and methyl isobutyl carbinol (MIBC) are added as collector and frother, respectively. DFO and MIBC are the only flotation reagents used in the process and are used in every stage. The rougher circuit includes three flash flotation cells in series, which provide a total of 12 minutes of retention time. The rougher concentrate exiting the circuit is expected to contain 25% Cg and is transferred to the primary cleaner flotation circuit. The rougher tails are expected to contain approximately 2.3% Cg and are directed to the rougher cyclone pumpbox.

Water is added to the cyclone feed pumpbox to obtain the required cyclone feed density of 45% (w/w). The diluted rougher tails are then pumped to the cyclone, from where the underflow is recycled to the SAG mill and the overflow is sent to scavenger flotation.

The scavenger flotation circuit is designed to float the remaining graphite and includes two flotation cells, providing a retention time of 8 minutes. The scavenger concentrate is expected to contain 25% Cg and is combined with the rougher concentrate and sent to the first polishing mill. The scavenger tails are expected to contain 0.22% Cg and are pumped to the tailings thickener.

17.3.5 Primary Cleaner Flotation Circuit

The primary cleaner flotation circuit comprises a polishing mill followed by the first cleaner flotation circuit, which feeds a second polishing mill. The second polishing mill is then followed by the three additional stages of cleaner flotation.

The rougher and scavenger combined concentrate is fed to the first polishing mill in order to remove contaminants from the surface of the graphite flakes using ceramic media. The slurry exits the polishing mill through a trommel and is fed to the first cleaner flotation circuit. The trommel oversize is screened into a scat bin.

The first cleaner flotation circuit includes two flotation cells, where the slurry remains for a total of 12 minutes. This circuit is expected to increase the concentrate grade from 25% Cg to 65% Cg. The first cleaner tailings are combined with the scavenger tailings in the tailings thickener.

The first cleaner concentrate is fed to the second polishing mill, which also uses ceramic material to remove gangue materials from the graphite flakes and polish the graphite flake surfaces. The second polishing mill discharges into the second cleaner circuit, comprised of two flotation tank cells. The slurry remains in the second cleaner circuit for 12 minutes. The concentrate is discharged with a grade of 88.9% Cg and sent to the third cleaner circuit while the tailings are recycled to the first cleaner circuit.

The third cleaner flotation circuit includes two flotation tank cells with a total retention time of eight minutes. The concentrate exits the cleaner at a grade of 93.0% Cg and is fed to the final coarse cleaner circuit, while the tailings are recycled and fed to the second cleaner along with the first cleaner concentrate.

The fourth coarse cleaner flotation circuit is comprised of two tank cells with a total retention time of eight minutes. The cleaner tails are combined with the second cleaner circuit concentrate and recycled to the third cleaner circuit. The final cleaner flotation concentrate, exiting at a grade of 94.7% Cg, is fed to a static classification screen. At 80 mesh (177 µm), 63% of the fourth cleaner concentrate passes to the fine fraction (-80 mesh), and the remainder is retained and sent to the coarse fraction (+80 mesh). Each screen fraction then reports to its own additional flotation line running in parallel with each other.

17.3.6 +80-Mesh Flotation

The fourth cleaner concentrate flotation screen oversize is pumped to the coarse concentrate stirred mill for a surface preparation prior to flotation. The +80-mesh flotation circuit is comprised of two circuits, both of which include two tank flotation cells. The total residence time for the +80-mesh flotation circuit is four minutes. The tailings from the first cleaner are combined with the scavenger and coarse flotation tailings and pumped to the tailings thickener, while the tailings from the second cleaner circuit are recycled to the first circuit.

The concentrate exits the +80-mesh flotation with a minimum grade of 95.0% Cg and is then re-combined with the -80-mesh flotation concentrate in the graphite filter press feed tank.

17.3.7 -80-Mesh Flotation

The 80-mesh screen undersize is fed to the fine concentrate stirred mill. From there, the slurry passes through three flotation circuits, each comprised of three tank cells, amounting to a total residence time of ten minutes. The tailings from the second and third cleaner circuits are returned to each of their previous circuits, while the tailings from the first flotation circuit report to the tailings thickener.

The -80-mesh flotation concentrate achieves the product grade of 95% Cg and is fed to the graphite filter press feed tank, where it is recombined with the +80-mesh concentrate.

17.3.8 Graphite Dewatering

The combined concentrate is pumped from the graphite filter press feed tank to a plate and frame filter press. The filter press dewaters the graphite from 35% solids (w/w) to 85% solids (w/w). The dewatered product is processed through a propane fired rotary kiln dryer, where it is dried to 0.3% water (w/w).

17.3.9 Graphite Screening and Bagging

The process is designed to produce three graphite product sizes: coarse (+50 mesh or 297 µm), intermediate (-50 mesh, +100 mesh or 149 µm), and fine flakes (-100 mesh). The dried product from the rotary kiln is screened in a double-deck screen, as the oversize product of the top deck is collected in the coarse flake graphite bin, the oversize of the bottom deck is collected in the intermediate flake graphite bin, and the screen undersize is collected in the fine flake graphite bin. A conveying system is located below each bin to transport the product to the bagging system. Each product bag has a capacity of 1 t of dried graphite.

17.3.10 Tailings Thickening, Filtration, and Disposal

The tailings from the scavenger, primary cleaner, +80-mesh cleaner, and the -80-mesh cleaner are combined and pumped to the tailings thickener. A high-rate tailings thickener is used to dewater the slurry to 65% solids (w/w). The thickener underflow is pumped to the tailings stock tank where it remains for an average of 12 hours, while the overflow is sent to the process water tank.

The tailings stock tank feeds the tailings filter presses. The tailings are dewatered to 20% moisture and dropped on the filtered tailings storage bunker. A front-end loader loads the tailings into dump trucks for transport and co-disposal with mine waste rock. The filtrate is then recycled to the tailings thickener.

17.3.11 Consumables and Reagents

The following reagent systems are required for the mechanical and chemical treatment of the ROM material:

- SAG mill media – grinding media required in the SAG mill
- Stirred mill media – grinding media required in the vertical stirred mills
- MIBC – used as a frother in flotation circuits
- DFO – used as a collector in flotation circuits
- Propane – used as a fuel in the rotary kiln dryer
- Flocculant – used as a thickening aid in the tailings thickener

17.4 Product/Materials Handling

Industry-standard material handling equipment will be used throughout the process plant. ROM production is first hauled to the mill in 60-tonne haul trucks. Conveyors are used to transport the crushed material and apron feeders are used to reclaim the ore from the stockpile. Operations within grinding and flotation are slurry based and pumps are used for transport within unit operations. Graphite concentrate is filtered and dried. Dry concentrate is conveyed into the screening and bagging system, whereas the filtered tailings are trucked to a co-disposal stockpile.

17.5 Energy, Water, and Process Materials Requirements

17.5.1 Energy Requirements

The installed process electrical was estimated at 8,325 kW with an estimated consumed power of 6,248 kW and corresponding annual energy requirement of 54,698 MWh.

The volume of propane required to fuel the graphite concentrate dryer was benchmarked against a similar sized project. An estimated 1349 m^3 of liquid propane will be required per year.

17.5.2 Raw Water Supply

Raw water will be supplied from Lac Petit Vert to a raw water storage tank. Raw water will be used for all purposes requiring clean water with low dissolved solids and low salt content in the following areas:

- gland water for pumps
- reagent makeup
- cooling water for mill motors

17.5.3 Process Water Supply

The tailings thickener overflow water is stored in the process water tank and is distributed from there to different addition points throughout the processing plant. The SAG mill, SAG mill screen, flotation cells, polishing mills, +80 mesh screen, and the stirred mills require the addition of process water.

Raw water will be used to provide additional makeup water requirements.

17.6 Comments on Recovery Methods

The process flowsheet was developed based on preliminary testing and published data on similar operations. The test data supports the design concentrate grades and recoveries. Product size distributions have been estimated based on particle-size distributions in the samples tested. Limited comminution testing was performed; this should be further explored in future project phases in order to support the crushing and grinding circuit designs. The concentrate mass pulls and recoveries for each flotation circuit were provided by the locked cycle tests (LCT). The percent passing to the coarse fraction of the 80-mesh screen was also determined through the analysis of the LCT results. No testwork was performed on the dried graphite flake particle size distribution. This should be further explored to validate the product sizing screen particle distribution assumptions, which will allow for more accurate packaging and storing design criteria.

18 PROJECT INFRASTRUCTURE

18.1 Introduction

Infrastructure to support the La Loutre project will consist of site civil work, process buildings and non-process buildings, water management, a waste rock and co-disposal storage facility, and electrical power distribution.

Mine facilities and process facilities will include services with potable water, fire protection, compressed air, power, diesel, communication, and sanitary systems. An overall site layout is shown in Figure 18-1.

The processing plant and the co-disposal storage facility will be located on site, along with most ancillary project infrastructure. Infrastructure for the project will include the following:

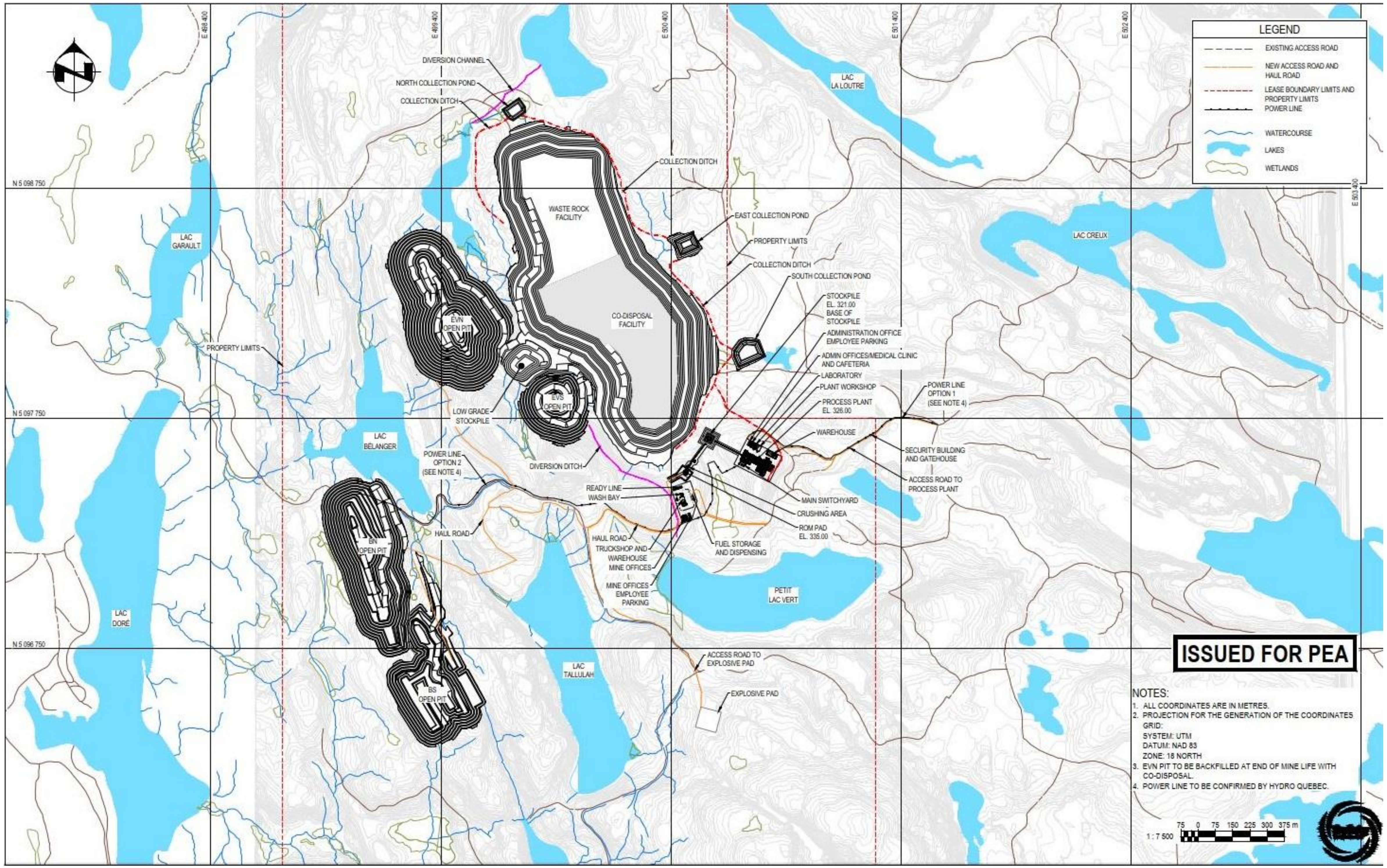
- process plant, including crushing, stockpile, and mill
- process and non-process (ancillary) buildings
- access roads
- high-voltage (HV) substation and site-wide electrical distribution
- fuel storage and dispensing area
- Waste disposal facility (WDF), consisting of a waste rock facility (WRF) and co-disposal storage facility (CDSF).
- water management ditches and collection ponds

18.1.1 Layout Development

Locating the site facilities was based on the following considerations:

- within the claim boundary
- most appropriate location for co-disposal facility
- suitable geotechnical conditions
- stockpiles and waste tock facilities are near mine pits to reduce haul distances
- process plant is in an area with low risk of flooding
- administration, processing plant and offices are in close proximity to limit travel distances

Figure 18-1: Overall Site Layout



Source: Ausenco, 2021

18.1.2 Site Preparation

Forest clearing and topsoil removal will be required for the processing plant, mining pits, stockpiling areas, and other buildings and facilities.

Existing roads connected to the project site enable access to the properties. Typical method of clearing and topsoil removal, excavation, drains, safety bunds and aggregates will be employed to construct additional roads and upgrade existing roads as required.

18.2 Access Roads

18.2.1 Existing Roads

The property is located in the Laurentides administrative region (also known as the Laurentians) in the province of Québec, Canada. The area is approximately 30 km west-southwest of the city of Mont-Tremblant (about 45 km by road). The nearest community is Duhamel, 5 km to the west.

18.2.2 Mine Haul Roads

Mine haul roads will be approximately 21 m wide and will be constructed as new roads prior to the start of mining activity. Initial haul road construction will be between the ROM pad and Electric Vehicle pit; roads will later be constructed to link the Battery Zone to the ROM pad.

18.3 Crushing and Process Plant Buildings

The process plant will be located on the La Loutre property. Crushing and process plant buildings are summarized in Table 18-1 and described in the following sections.

Table 18-1: Crushing and Process Plant Buildings

WBS Code	Description	Construction	L (m)	W (m)	H (m)	Area (m^2)
3110	Primary Crusher	Pre-engineered	15.0	13.0	20.0	195
3210	Stockpiling & Reclaim	Fabric	44.0	44.0	20.0	1,936
3310	Grinding	Pre-engineered	35.0	30.0	25.0	1,050
3410	Flotation	Pre-engineered	65.0	30.0	20.0	1,950
3710	Concentrate Drying	Pre-engineered	31.0	30.0	25.0	930
3810	Tailings	Pre-engineered	28.0	17.0	18.0	476

18.3.1 Primary Crusher Area and Stockpile & Reclaim Building

Crushing area buildings will be of a pre-engineered modular design equipped with dust collection systems. The primary crushing building will house the ROM hopper and will be equipped with a static grizzly, vibrating grizzly feeder, primary jaw crusher, chutes and additional platework. The rock breaker will also be within the building. In addition, access platforms and reinforced concrete will be utilized for the pad to support the primary jaw crusher.

A fabric building cover and concrete reclaim tunnel will be used for the mill feed stockpile.

18.3.2 Processing Plant Buildings

The process plant complex comprises four separate buildings, as follows:

- grinding and gravity building
- flotation building
- concentrate drying building
- tailings building

Large-scale buildings will be constructed from pre-engineered metal, supported on reinforced concrete footings and are complete with concrete slabs and pedestals. To account for winter conditions, buildings will be built with insulated metal panel (IMP) roof and wall cladding. Area cranes will be available for equipment servicing in the process plant.

The mill building includes a ground floor and one elevated concrete floor. The equipment will be accessed by purpose-built mezzanine platforms for maintenance, service, and sampling.

The grinding building will contain the SAG and polishing mills, cyclone feed hopper/pumps, cyclone cluster, and trash screen.

The flotation building will contain the tanks required by the rougher and scavenger flotation circuits, primary flotation circuit tanks, 80-mesh flotation sorting screen, concentrate stirred mills, and the tanks designed for the two concentrate flotation circuits. The flotation building will also house the ancillary equipment for these circuits, including pumps.

The concentrate drying building will contain the graphite filter press feed tank, graphite filter press, rotary kiln dryer, dried graphite screen, three product size bins and three product size bulk bag areas, along with their respective transfer conveyors.

The tailings building will contain the tailings stock tank, tailings filter feed pumps, and tailings filter presses. The tailings thickener will be located outside, adjacent to the process plant.

18.4 Non-Process (Ancillary) Buildings

Plant ancillary buildings are described in the following subsections. Refer to Table 18-2 for details regarding non-process (ancillary) buildings.

Table 18-2: Non-Process (Ancillary) Buildings

WBS Code	Description	Construction	L (m)	W (m)	H (m)	Area (m^2)
1630	Mining Truck Shop / Wash Bay	Fabric	56.0	17.0	11.0	952
1640	Mine Dry and Office	Fabric	56.0	17.0	11.0	418
2410	Plant Maintenance Workshop	Fabric	25.0	13.0	6.0	325
2420	Process Area Warehouse	Fabric	30.0	30.0	6.0	900
2430	Administration Offices and Dry Facilities	Modular	19.0	15.0	3.0	285
2440	Security Gatehouse	Modular	18	4	3	67
2450	Laboratory	Modular	35.0	5.0	5.0	175

18.4.1 Mine Truck Shop & Truck Wash Bay

A truck maintenance facility that will service the mining fleet's 60-tonne trucks is located southeast of the open pit and southwest of the process plant. For the 4,200 t/d operation, only three truck bays plus a wash bay will be required. The building type will be a fabric covered building. The tire yard is located beside the truck shop.

18.4.2 Plant Maintenance Workshop

The plant maintenance shop will be located close to the process plant. Buildings will have a reinforced concrete raft foundation and fabric.

18.4.3 Process Area Warehouse

The process area warehouse will be located close to the process plant. Buildings will have a reinforced concrete raft foundation and fabric. 1t super sacs containing graphite product will be stacked in two levels, with up to two days of bulk bag product storage capacity. In addition, the warehouse will be used to store reagents in 1 m3 totes. Diesel fuel as a reagent will be stored in a small tank outside the Mill.

18.4.4 Administration Offices and Dry Facilities

New administrative offices will be located near the process plant. Buildings will have a single-storey, prefabricated modular design on precast concrete footings. The administrative building will include offices, meeting rooms, lunchroom, washrooms, men's and women's dry, lockers, first-aid, and showers, and will be equipped with heating, ventilation and air conditioning (HVAC).

18.4.5 Security Gatehouse

The security gatehouse will be a small, prefabricated building with a single-boom gate located south of the process plant near the east entrance. Site inductions for visitors and new employees can be conducted at this point.

18.4.6 Laboratory

The laboratory will be a prefabricated, single-storey, modular building on precast concrete blocks.

18.4.7 Explosive Storage Facility

A suitable location to store explosives was identified south of the mine truck shop based on minimum allowable distances defined by Natural Resources Canada. Regular deliveries will minimize the number of explosives stored on site

18.5 Project Support Infrastructure

18.5.1 Power Supply & Electrical

Processing and mining activities will require significant power. Two scenarios of power transmission lines operated by Hydro Québec will be considered, as follows:

- a CHE 235 line from the west to be constructed and upgraded to provide 7 MW on three stages with a short circuit rated at 45 MVA
- a CHE (Neville) 236 line from the east to provide 7 MW—the path for this line is built already with a short circuit rated at 35 MVA

The process plant and mine will be powered by a new on-site substation with a tie-in possibly to a 66 kV powerlines and property-wide reticulation. Peak demand is estimated at 7 MW. Emergency power will be provided by emergency diesel generators.

18.5.2 Water Supply

18.5.2.1 Raw Water Supply

Raw water is supplied from Petit Lac Vert to a raw water storage tank. Raw water is used for all purposes requiring clean water with low dissolved solids and low salt content in the following areas:

- gland water for pumps
- reagent makeup
- cooling water for mill motors

Raw water from Petit Lac Vert will be used to provide additional makeup water requirements of approximately 40 m^3/h.

18.5.2.2 Process Water Supply

The tailings thickener overflow water is stored in the process water tank before being distributed to different addition points throughout the processing plant. The SAG mill, SAG mill screen, flotation cells, polishing mills, +80 mesh screen, and stirred mills require the addition of process water.

18.5.2.3 Potable Water

Fresh water supplied by local wells will be treated with a pre-packaged potable water system for drinking, cooking, and showers. It will also be used for emergency shower and eyewash stations throughout the plant. The facility will be located near the administration area.

The facility will consist of a modular potable water treatment plant, day tank, and buried distribution pipes around the facilities. The potable water distribution piping network at the site will be plastic thermally insulated and installed beneath the frost line.

Fresh water will be pumped to the potable water system for treatment and distribution. The potable water system will treat water to the local potable water standard. The system will be shop-mounted on skids and delivered to site as a containerized system. Once on site, these modules will be connected to the distribution network.

18.5.2.4 Sewage Treatment

Provisions for the sewage treatment system have been included in the design. A buried sewer-pipe reticulation network will collect sewage from the various buildings across the administration and crushing area facilities into a combined main system that flows to the plant area and discharges to a sewage treatment plant (STP). This system will treat incoming water to the required criteria for treated water discharge/infiltrate into the natural environment. Solids will be collected and transported off site to the appropriate waste management facility.

The STP will include the following unit operations:

- septic tank
- equalization tank with raw water pumps
- membrane bio-reactor system (MBR)
- aeration system
- activated sludge treatment process
- ultra-filtration with membranes

The treatment system will be shop-mounted on skids and delivered to site as a containerized system.

18.5.2.5 Fire Water

Raw water will be the prime source of fire water at the site. Fire water is contained in the raw water storage tank. The total volume of the tank is estimated to be 1000 m^3, of which 800 m^3 is designated for fire water and 200 m^3 for raw water distribution. Level controls will ensure that the level of the tank does not fall below the 800 m^3 volume mark.

The raw water tank will be installed at the administration area and will provide two hours of fire water storage. The fire water tanks will be heated and insulated as per the requirements of NFPA 22. Each tank will be equipped with a circulation pump to equalize the temperature inside the tank. The tank level is maintained using makeup water supplied from Petit Lac Vert.

Provisions for one fire pump station has been included for fire water flows. The pump station will have two fire pumps, with one on standby. A fire main system with continued recirculation will be provided. The fire main system provides the fire protection to all site buildings and facilities. It will be an insulated shallow buried system, with continuous water circulation to prevent freeze-up.

The fire service main will be installed to supply water to the dry-barrel hydrants, standpipes, and hose reel stations from the water reserve. The fire water piping system will be independent from any industrial water network. Fire water pipe sections will be designed to deliver the required flows and delivery pressure at any location.

Standpipe systems, including hose stations, will be provided throughout the site and plant buildings as required by regulatory and fire insurance.

Fire sprinkler protection will be provided as required by code and fire insurance, including the site administration area, laboratory, plant workshop and warehouse, fire pump station, and mine truck shop and dry. In addition, a foam/water system will be provided for the diesel fuel tank farm.

18.5.3 Mine Dewatering

The dewatering system includes pumps and piping required to maintain dry working conditions in the mine area. Electric pumps will lift the water to the pit rim, from where it will be discharged to the collection ditches and collection ponds by gravity.

18.5.4 Fuel Storage and Distribution

One 102,000 L double-walled fuel tank and dispensing station is located adjacent to the mine truck shop facilities. Diesel fuel will be delivered to each station via tanker truck from a local supplier. Total on-site storage is estimated at 6 days of steady-state operations.

Regular light vehicles will be refuelled off site. Larger mining equipment, including haul trucks, will be refuelled either by fuel delivery vehicles or at the dispensing station adjacent the mine truck shop facility.

All storage and refuelling areas will be protected with a concrete-lined and bunded area, with drains connected to the oil–water separators.

18.6 Waste Disposal Facilities (WDF)

A preliminary siting and waste material deposition trade-off study was carried out to evaluate potential sites and disposal methods for tailings and waste rock. For tailings, Ausenco looked at both wet and filtered tailings deposition and identified several potential storage sites. However, based on the site's proximity to local communities and potential environmental impacts, it was decided to move forward with a filtered tailings storage option. It was also decided to progress with co-disposal of filtered tailings and waste rock to minimize environmental impacts and improve the short- and long-term physical stability of the two waste streams.

The waste disposal facility (WDF) is divided into two sections: the waste rock facility (WRF) at the northern end and the co-disposal storage facility (CDSF) at the southern end. The CDSF is designed to consist of co-mingled waste rock and filtered tailings

The primary design objectives for the WRF and CDSF are the secure confinement of waste rock and filtered tailings and the protection of regional groundwater and surface water during mine operations and in the long term (post-closure). The design of the WDF and water management facilities has taken into account the following:

- staged development of the facility over the life of the project
- flexibility to accommodate operational variability in the waste rock and filtered tailings (filter plant shutdowns and ore variability, along with placement during variable climate conditions)
- control, collection, and removal of contract water from the facility during operations for reuse as process water to the maximum practical extent

Approximately 40.1 Mm^3 of mine waste will be stored within the WDF, including 15.1 Mm^3 of filtered tailings and 9.7 Mm^3 of waste rock in the CDSF, and 15.3 Mm^3 of waste rock in the WRF. The CDSF is not expected to behave like a conventional mine waste facility because of the large proportion of stored filtered tailings in the southern section and will be constructed with both temporary and permanent embankments to provide stability for the overall structure. The construction of embankments will provide a number of benefits, as follows:

- Filtered tailings that do not meet moisture content or density targets will not have an impact on overall stability of the facility.
- The primary requirement for the filtered tailings will be the ability to transport the material to the facility and trafficability for subsequent placement utilizing the crests of the embankments.
- The embankment provide protection against erosion of the tailings due to surface runoff.

The general arrangement of the WDF is shown on Figure 18-1.

Haul trucks will place waste rock in the WRF in thick lifts in the northern end of the facility. The overall exterior slope will be 2:1 (H:V).

Surface water management for the WDF consists of a series of collection channel and collection ponds to convey contact surface water from the WDF to these ponds. Currently the ponds are designed to capture sediment and release the water into the environment. The channels and ponds are design for the 1:100-year, 24-hour storm event.

18.6.1 Hazard Classification

The design standards for the CDSF are based on the relevant federal and provincial guidelines for construction of mining tailings storage facilities in Canada. The following regulations and guidelines were used to determine the dam hazard classification and suggested minimum target levels for some design criteria, such as the inflow design flood (IDF) and earthquake design ground motion (EDGM): T*echnical Bulletin – Application of Dam Safety Guidelines to Mining Dams (CDA, 2019)*.

The CDSF has been classified as “significant” under CDA guidelines since this structure does not impound water or saturated tailings. The recommended IDF during operations is defined as between the 1:100-year return period flood and 1:1,000-year return period flood for a “significant” dam classification. The 1:100-year, 24-hour event will be considered, given the CDSF is not an impounding structure and has contact water diversion channels located at the toe of the facility that conveys surface runoff to collection ponds. EDGM parameters have been determined for the CDSF using estimates from the Natural Resources Canada (NRCan) seismic hazard calculator. The design earthquake is characterized as between the 1:100-year return period seismic event and 1:1,000-year return period seismic event for a "significant" dam classification. The subsequent peak ground acceleration for the 1:1000-year event is 0.178 g.

18.6.2 Tailings and Waste Rock Characteristics

The tailings are classified as a non-plastic inorganic silt with a low permeability when compacted at the proposed filtered moisture content. The assumed tailings in-situ dry density for the CDSF is 1.65 t/m^3, with a friction angle of 31° and cohesion of 0 kPa. The waste rock is classified as a mixture of material sizes ranging from boulders to silt with a high permeability when compacted. The assumed waste rock in-situ dry density for the CDSF is 2.1 t/m^3, with a friction angle of 31° and cohesion of 100 kPa.

18.6.3 Facility Design

The WDF footprint will be logged and cleared for foundation preparation and embankment construction. Basin preparation will include the removal of soft overburden material from low points within the topography. Soft overburden materials will be removed beneath the embankment foundations prior to fill placement. The focus of material removal is expected to be within low points. It is assumed that less than an average 0.5 m of overburden removal will be required over the footprint of the facility.

The CDSF will initially be constructed as internal cells until the ultimate exterior waste rock embankments are reached. The construction of cells will minimize disturbance during the pre-production and operational periods. The exterior embankment will be constructed using downstream raise methodology that provides the most stable configuration of all embankment raise methods. A foundation drainage network will be developed within the base of the facility using selective placement of waste rock wrapped in a non-woven geotextile fabric.

The embankments will be constructed with overall 1.25:1 (H:V) interior slopes and 2:1 (H:V) exterior slopes based on stability analyses. This will provide a factor of safety (FoS) that is ≥ 1.3 operations and 1.5 post-closure, and a pseudo-static FoS of ≥ 1. The construction of the temporary and permanent embankments will be completed with waste rock from open pit operations. Waste rock for the embankments will be transported using haul trucks, and will be spread and compacted with dozers and compactors into thick lifts.

The filtered tailings will be transported by haul trucks from the process plant to the CDSF. The filtered tailings will be spread and compacted into thin lifts behind temporary and permanent embankments. Instrumentation and monitoring will be required to assess the performance of embankments.

The WDF will be constructed to a maximum height of 370 masl. The highest exterior slope of the WDF will be 80 m on the southeast side.

18.6.4 Monitoring

Instrumentation and monitoring will be required to assess embankment performance. Vibrating wire piezometers will be installed to monitor pore pressure within the WDF and permanent embankment fill materials, and slope inclinometers and survey monuments will be installed in the permanent embankments to monitor slope movement and deformation.

18.7 Water Management

18.7.1 Water Management Structures

Several water management structures are proposed for project, as follows:

- Diversion channels are required to divert the clean flow of existing watercourses. The channels will separate the streamflow from the active areas and avoid mixing with contact water. If the water quality from the co-disposal facility is not environmentally harmful, the design criterion for diversion channels would be the conveyance of a 1:2,000-year, 24-hour event; otherwise, the design criterion would be 1:200-year, 24-hour event.

- Diversion ditches are required to divert clean runoff away from the facilities and minimize the amount of contact runoff to be collected and managed. The primary design criteria for the diversion ditches is the conveyance of a 1:100-year, 24-hour peak flow without overflow.

- Collection ditches collect contact runoff from the plant site, water rock storage facilities and overburden storages that are not diverted by the diversion ditches. The primary design criteria for collection ditches is the conveyance of a 1:100-year, 24-hour peak flow without overflow.

- Collection ponds store contact runoff from the collection ditches. The stored contact water should be either treated and released to the environment or reused for process purposes. The primary design criteria for the collection ponds is to store the 1:100-year flood with a minimum freeboard of 0.5 m.

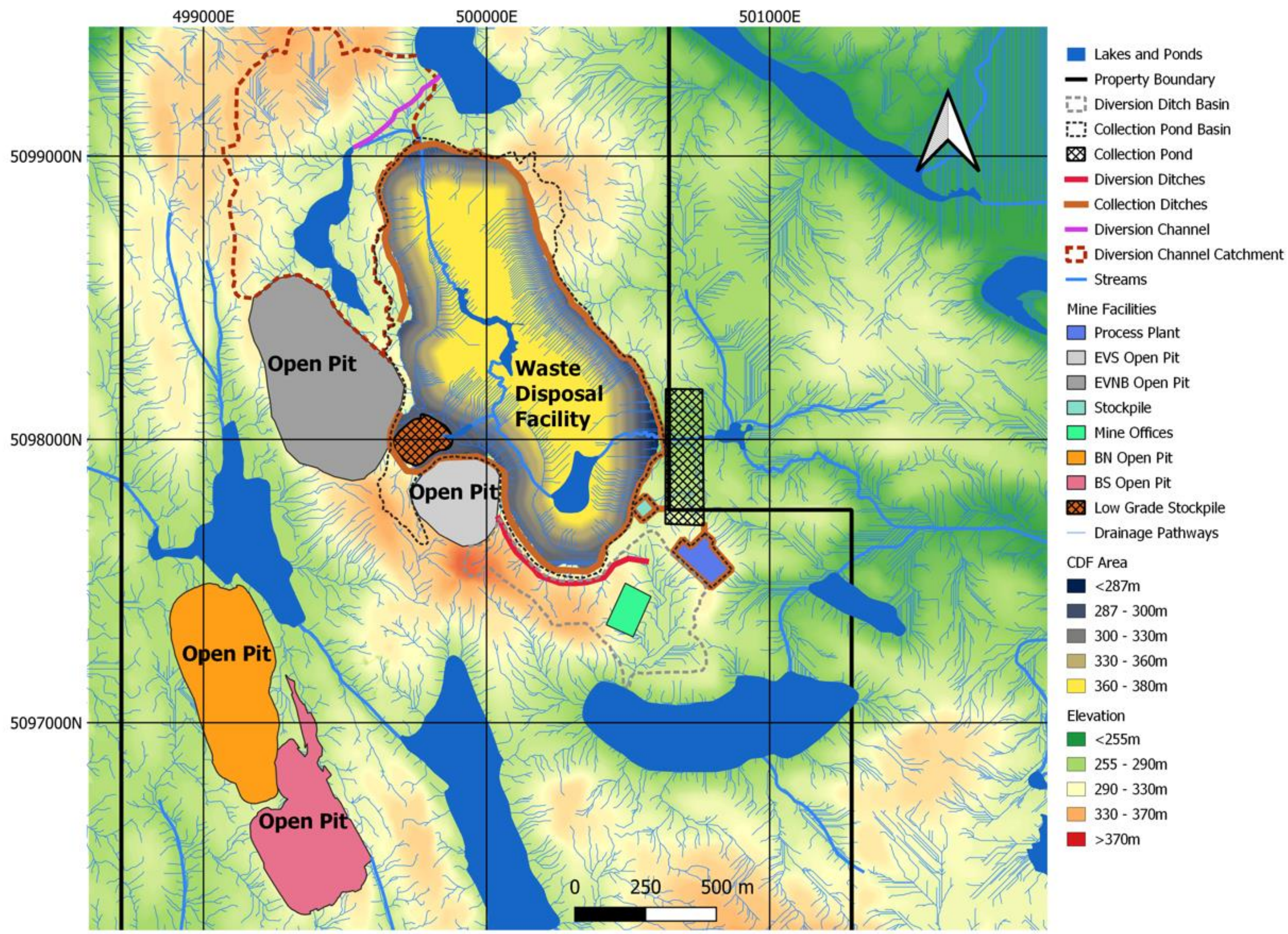
An existing stream segment flows southward through the proposed waste disposal facility (WDF). A short diversion channel directing flow on the northern side of the WDF to a pond (500 m west of Lac La Loutre) is proposed to divert surface water toward a neighbouring sub-catchment, crossing the topographic divide shown in Figure 18-2.

An approximately 650 m long diversion ditch along the southern limits of the WDF was designed to divert the catchment in the southern side of the co-disposal facility toward a stream flowing south (Figure 18-2).

A collection system, including two main ditches, was designed around the WDF area. The contact water will be retained in a collection pond east of the WDF and adjacent to the process plant.

Figure 18-2 shows the proposed alignments and delineated catchments for the diversion channel, diversion ditches, collection ditches, and a collection pond.

Figure 18-2: Water Management Structures within the Property



Source: Hemmera, 2021

18.7.2 Hydrology Analysis

Rainfall runoff modelling using HEC-HMS (version 4.7.1), developed by U.S. Army Corps of Engineers, was completed to estimate the design peak flows for sizing the water management structures. The US Soil Conservation Service (SCS) unit hydrograph method was applied to determine the runoff hydrograph for the design rainstorm. The SCS Type II distribution was selected to define the distribution of design rainfall over 24 hours, which will be partly altered during construction. SCS curve numbers for forest landcovers, gravel and pond areas were set to 77, 87 and 99, respectively, based on TR-55 (Cronshey, 1986). Based on provincial soil surveys, site soil is classified as fine sandy loam with moderate infiltration and runoff potential. Soil Type B, representing soil composed of shallow loess and sandy loam, was chosen for the study area.

LiDAR elevation measurements were used to delineate drainage pathways and catchments for diversion and collection water structures. Stream (watercourse) information was extracted from the Environment Canada database.

The physical characteristics of the proposed diversion and collection ditches are presented in Table 18-3. Catchment time of concentration was calculated as the average of concentration times using different empirical equations.

Table 18-3: Characteristics of Diversion and Collection Ditches

Channel or Ditch		Catchment Area (ha)	Flow Path Length (m)	Minimum Elevation (m)	Maximum Elevation (m)	Drainage Path Slope (m/m)	Time of Concentration (min)	Lag Time (min)
Diversion Channel		52.6	1010	310	311	0.001	101	61
Diversion Ditch		21.3	1341	310	344	0.025	47	28
Collection Ditch	South of WDF	65.1	2391	310	317	0.007	105	63
	East of WDF	35	2268	310	318	0.007	99	59

The corresponding peak flows and volumes for the diversion and collection structures are presented in Table 18-4.

Table 18-4: Peak Flow of the Water Structure Catchments within the La Loutre Mine Project

Channel or Ditch		Catchment Area (ha)	Design Event	Peak Flow (m^3/s)	Event Volume (m^3)
Diversion Channel		52.6	2000-year, 24-hour	4.8	49,200
Diversion Ditch		21.3	100-year, 24-hour	1.8	11,700
Collection Ditch	South of WDF	65.1	100-year, 24-hour	4.3	45,000
	East of WDF	35	100-year, 24-hour	2.4	24,200
Collection Ditch	South of WDF	65.1	25-year, 24-hour	4.1	37,000
	East of WDF	35	25-year, 24-hour	2.1	19,900

The results of the hydrologic modelling were used to preliminarily size the water management structures of the La Loutre mine site. Based on design event peak flows, channel and ditch cross-sections were designed as presented in Table 18-5.

Table 18-5: Conceptual Design for the Diversion Channel

Channel or Ditch		Channel Shape	Side Slope	Design Event	Peak Flow (m^3/s)	Design Channel Depth (m)	Bottom Width (m)	Bottom Grade (m/m)
Diversion Channel		Trapezoidal	2H:1V	2000-year, 24-hour	4.8	1.5	1.0	0.004
Diversion Ditch		Trapezoidal	2H:1V	100-year, 24-hour	1.8	0.8	0.5	0.036
Collection Ditch	South of WDF	Trapezoidal	2H:1V	100-year, 24-hour	4.3	1.4	0.5	0.010
	East of WDF	Trapezoidal	2H:1V	100-year, 24-hour	2.4	1.2	0.5	0.008

The collection pond, retaining the contact runoff from the WDF and other areas of the mine site was sized based on the extreme 100-year, 24-hour storm event. The modelled flood volume for this pond was 69,200 m^3. Accounting for the sediment layer and freeboard, the practical volume for collection pond is approximately 126,000 m^3. To provide enough time for sediments to settle, a 5:1 (length to width) ratio was determined for the pond. The pond was therefore sized to be 107 to 535 m. Based on the current location of mine facilities, the area between process plant, stockpile and property boundary is not large enough to build the collection pond on the property. The proposed option is located partly on the property, but requires acquiring a portion of the neighbouring property.

The excavation volume for the water management structures was provided considering the contingency in Table 18-6. As a result, the total volumes for constructing the water management structures are 568,000 m^3 of excavation (cut) and 45,000 m^3 of fill material.

Table 18-6: Excavation and Fill Estimates for Water Management Structures

Channel, Ditch or Pond		Channel Properties						Earthwork Volume (m^3)	
		Shape	Side Slope	Length (m)	Minimum Elevation (m)	Maximum Elevation (m)	Top Width (m)	Cut	Fill
Diversion Channel		Trapezoidal	2H:1V	249	310	311	7	4,191	62
Diversion Ditch		Trapezoidal	2H:1V	1,208	300	344	3.7	21,057	6,750
Collection Ditch	South of WDF	Trapezoidal	2H:1V	1,645	301	317	6.1	121,752	11,031
	East of WDF	Trapezoidal	2H:1V	2,256	301	318	5.3	132,911	14,296
Collection Pond		Trapezoidal	2H:1V	107 m x 535 m				125,939	-
Total Earthwork Estimate with 40% Contingency								568,189	44,995

18.8 Site-Wide Water Balance

A preliminary site-wide water balance analysis was performed for the La Loutre mine. The process plant water requirement was compared to the available water from various sources to assess the makeup water requirement. The three main water sources are as follows:

- tailings reclaim water
- groundwater inflow to mining pits
- surface runoff from precipitation

The process mass balance indicates approximately 1000 m^3/d (43 m^3/h) of water in tailings is transferred to the co-disposal facility. Approximately 50% of the water in tailings is assumed to enter the collection pond via seepage assuming 20% loss to evaporation and 30% retention as void water. Based on the assumption above, the monthly distribution of excess water in the WDF is presented in Table 18-7. It should be noted that these calculations were made assuming the process plant is operating at full capacity and the pits at fully developed extents. During earlier stages of operation, less water and solids are entering the facility.

Contact water from the WDF area and pits could possibly be used for operation purposes. The major component of contact water is the groundwater inflow and surface runoff to the pits. According to the Pit Inflow Report (Hemmera, 2021), lower- and upper-case inflows from all the pits were estimated 7,638 and 16,434 m^3/d, respectively. Pit inflows will be pumped out of the pits, collected, and treated if the water quality is not acceptable for release to the environment.

The mining sequence and pit dewatering strategies will effectively reduce the total groundwater inflows in earlier stages of the operation.

Table 18-7: Makeup Water Available from Various Sources

Water Component	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Contact Water from Pits												
EVN (m^3/month)	161,705	146,056	161,701	156,492	161,712	156,505	161,722	161,721	156,505	161,718	156,500	161,709
EVS (m^3/month)	73,448	66,340	73,444	71,082	73,455	71,095	73,465	73,464	71,095	73,461	71,090	73,452
GRA (m^3/month)	68,457	61,832	68,453	66,252	68,464	66,265	68,474	68,473	66,265	68,470	66,260	68,461
GRB (m^3/month)	95,396	86,164	95,392	92,322	95,403	92,335	95,413	95,412	92,335	95,409	92,330	95,400
Contact Water from Co-Disposal Facility												
Collected Excess Water (m^3/month)	11,829	10,281	11,829	11,313	11,829	11,313	11,829	11,829	11,313	11,829	11,313	11,829
Direct Pond Runoff* (m^3/month)	1,634	1,302	1,468	2,160	2,735	2,835	3,709	3,853	3,233	3,643	3,178	2,027
Total Contact Water (m^3/month)	412,467	371,973	412,285	399,622	413,598	400,348	414,613	414,752	400,746	414,529	400,670	412,877

Note: Lake evaporation is assumed to be 500 mm/year and is deducted from the precipitation to estimate runoff on the collection ponds.

As shown, if all the pits are mined simultaneously, a surplus of approximately 14,000 m^3/d of water will need to be managed. However, in early operations, there may not be enough makeup water available from contact water ponds. Should the water quality in the contact water ponds not be suitable for use in the process plant, it may need to be treated before use as makeup water. Alternatively, the makeup water could be supplied from a fresh water source (there are several lakes and ponds in the vicinity). Groundwater supply wells are unlikely to meet the freshwater makeup requirements but may be suitable to supply potable water. During the pre-feasibility study, a detailed water balance analysis is required to review the availability of makeup water through the life of mine.

19 MARKET STUDIES AND CONTRACTS

19.1 Market Studies

Lomiko commissioned Benchmark Mineral Intelligence to provide forecasted pricing for expected flake graphite sizes; from the "Flake Graphite Forecast – Q1 2021" (Benchmark Mineral Intelligence, 2021), several points were made, as summarized below.

19.1.1 Supply Forecast, 2020-2040

In 2021, natural flake production is expected to reach almost 900 kt. The re-starting of operations at Syrah and new production ramp-up elsewhere are expected to push graphite production up from the lows of 830 kt in 2020 to almost 900 kt in 2021. It should be noted that this number remains behind 2019 production levels (i.e., 971 kt).

19.1.2 Demand Forecast, 2020-2040

Total battery demand is expected to reach 312 GWh in 2021, an increase of 41% over 2020, with Electric Vehicle demand set to top 223 GWh, which is bigger than the total demand in the previous 12 months.

Benchmark Mineral Intelligence's base case forecasts a 25% CAGR in flake graphite demand over the next 10 years.

19.2 Commodity Price Projections

Commodity prices were also provided by Benchmark Mineral Intelligence. Flake graphite sizes and prices (see Table 19-1) were provided for increments of five years for the next ten years.

Table 19-1: Graphite Price Forecast – Q1, 2021 BMI[4]

Mesh Size	Average 15-year Price (US$/t)	% Distribution	Weighted-Average Price (US$/t)
+50	1,211	11	106.10
+80	987	22	212.10
+100	893	11	96.40
-100	837	57	475.40
	Average	100	890.00

Note: These prices were averaged over a 15-year period and used in the financial model.

19.3 Contracts

There have not been any contracts issued based on the completed PEA. No future production has committed to any buyers as straight sales or in the form of off-take agreements.

[4] Calculated from Benchmark Mineral Intelligence Flake Graphite Price Index – Q1, 2021.

19.4 Comments on Market Studies and Contracts

Market studies will commence during the pre-feasibility study. Further metallurgical testing of concentrate from La Loutre will be carried out to determine if value-added products such as spherical graphite can be produced.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Baseline and Supporting Studies

The environmental information provided in this chapter was collected from public databases and the preliminary field inventories and environmental surveys (baseline studies) undertaken in 2015 at the La Loutre site.

The following environmental components were surveyed:

- biological components (flora, fauna, species at risk, etc.)
- faunal species composition at Lac Bélanger
- hydrological conditions
- surface water conditions at and near Lac Bélanger

Figure 20-1 on the following page presents the La Loutre project site for reference.

20.1.1 Biophysical Setting

The following sub-sections summarize the project site's current biophysical environmental conditions. Unless mentioned otherwise, the information comes from studies conducted by WSP (2015). Figure 20-2 presents a summary of the biophysical features at the project site.

20.1.1.1 Vegetation

The La Loutre property covers 25.1 km^2 of land in the Petite Nation territory of the Outaouais region. The site is located in the Collines du lac Nominingue (3b) ecoregion (Données Quebec, 2020). The WSP report focused on an 825-hectare study area in the middle of the La Loutre property.

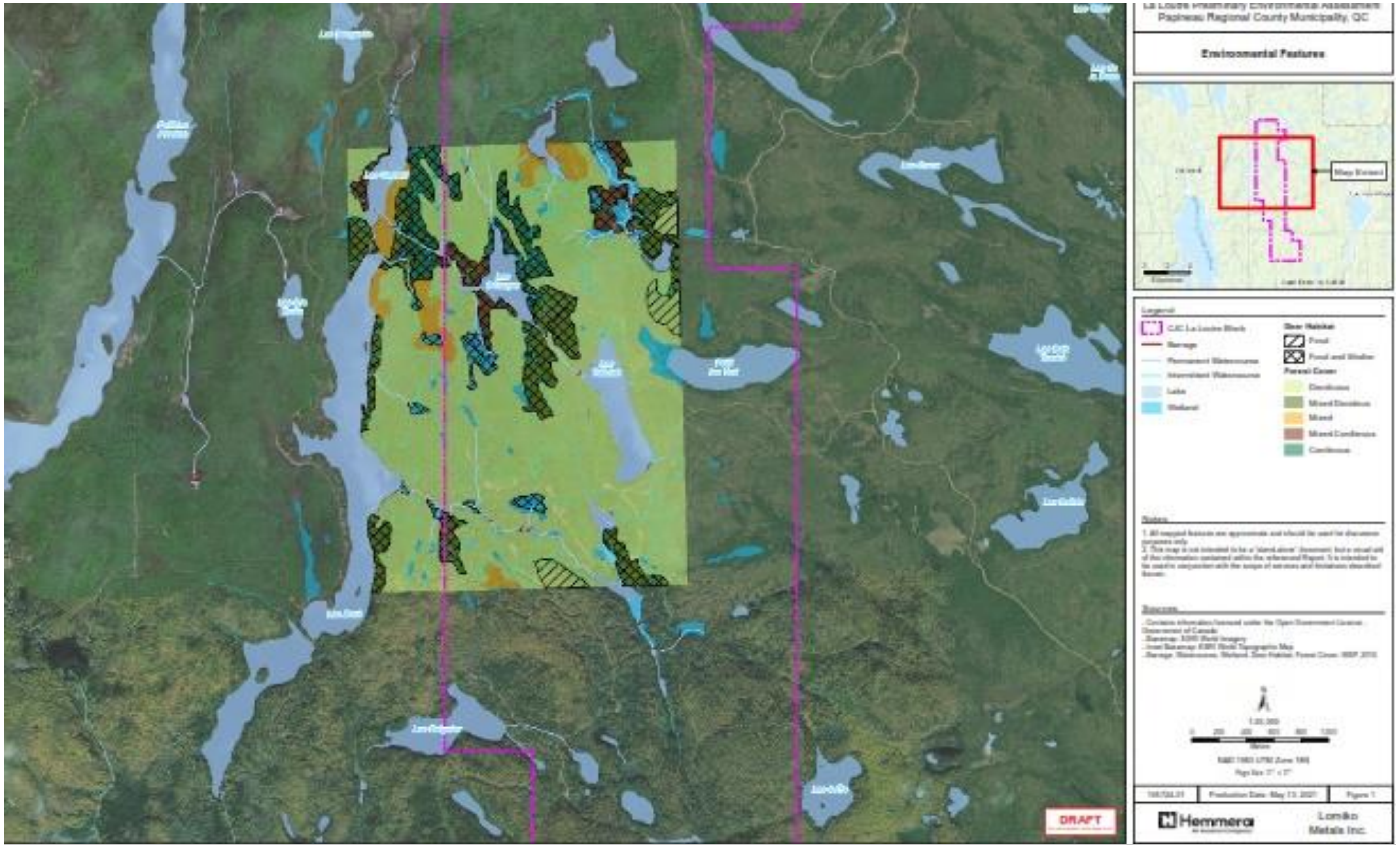
Using the study area as a sample site, the area has a mixed deciduous forest stand composition. This deciduous forest habitat is dominated with stands of Sugar maple (*Acer saccharum*), followed by over 10 other broadleaf tree species (Données Quebec, 2020).

Within the study area, WSP identified 15 flora species that are within the susceptible, threatened, or vulnerable list. Within the 15 plant species, one is listed as threatened, being Striped Coral Root (*Corallorhiza striata var. Striata*) and three are vulnerable, being Wild leek (*Allium tricoccum*), Downy rattlesnake plantain (*Goodyera pubescens*) and Squawroot *(Conopholis americana*). The other 11 species are listed as potentially threatened or susceptible (WSP, 2015).

Figure 20-1: La Loutre Property and Project Site

Source: Hemmera, 2021

Figure 20-2: Biophysical Features



Source: Hemmera. 2021

In terms of aquatic flora species, a report done by the Municipality of Duhamel and Organisme de bassins versants des rivières Rouge, Petite Nation et Saumon (OBV RPNS) identified 25 aquatic plant species in the largest lake located in the La Loutre property, Lac Doré (Baltzar et al., 2017). Of the 25 aquatic plant species, one is labelled as vulnerable in the conservation list: the northeastern bladderwort (*Utricularia resupinata*).

20.1.1.2 Wildlife

Within the 825-hectare study area, 22 species were identified within the susceptible, threatened, or vulnerable list. Two are amphibians, four reptiles, eight mammals and eight bird species. Two species which are considered threatened, are the Red-headed woodpecker (*melanerpes erythrocephalius*) and the Cerulean Warbler (*dendrocia cerculea),* and the two species considered vulnerable are the wood turtle *(gylptemys insculpta*) and the Bicknell's Thrush (*catharus bicknelli*). The other 18 species are species potentially threatened or susceptible (MFFP, 2015) (WSP, 2015).

The study area is situated in White tailed deer wintering habitat, covering a total of 152.47 ha of potential shelter and food habitat. This would be an 18% representation of the total study area (WSP, 2015).

20.1.1.3 Aquatic Fauna Composition

All hydrological, aquatic species, and surface water analyses done by WSP were conducted in Lac Bélanger, which is situated in the middle of the study area. Three benthic species were found within Lac Bélanger, which include molluscs, arthropods and nematode species. Three fish species were found within the lake, which were the Pearl dace (*Semotilus margarita*), Redbelly dace (*Phonixus eos)* and Fathead minnow (*Pimephales promelas*). Electrofishing was done in an unnamed perennial stream flowing south from Lac Garault to Lac Doré, and two fish species were identified. One was the Fallfish (S*emotilus corporalis*) and the Common creek chub (*Semotilus atromaculatus)*. The middle to north section of the unnamed perennial stream is identified as wetland (swamp) habitat (WSP, 2015).

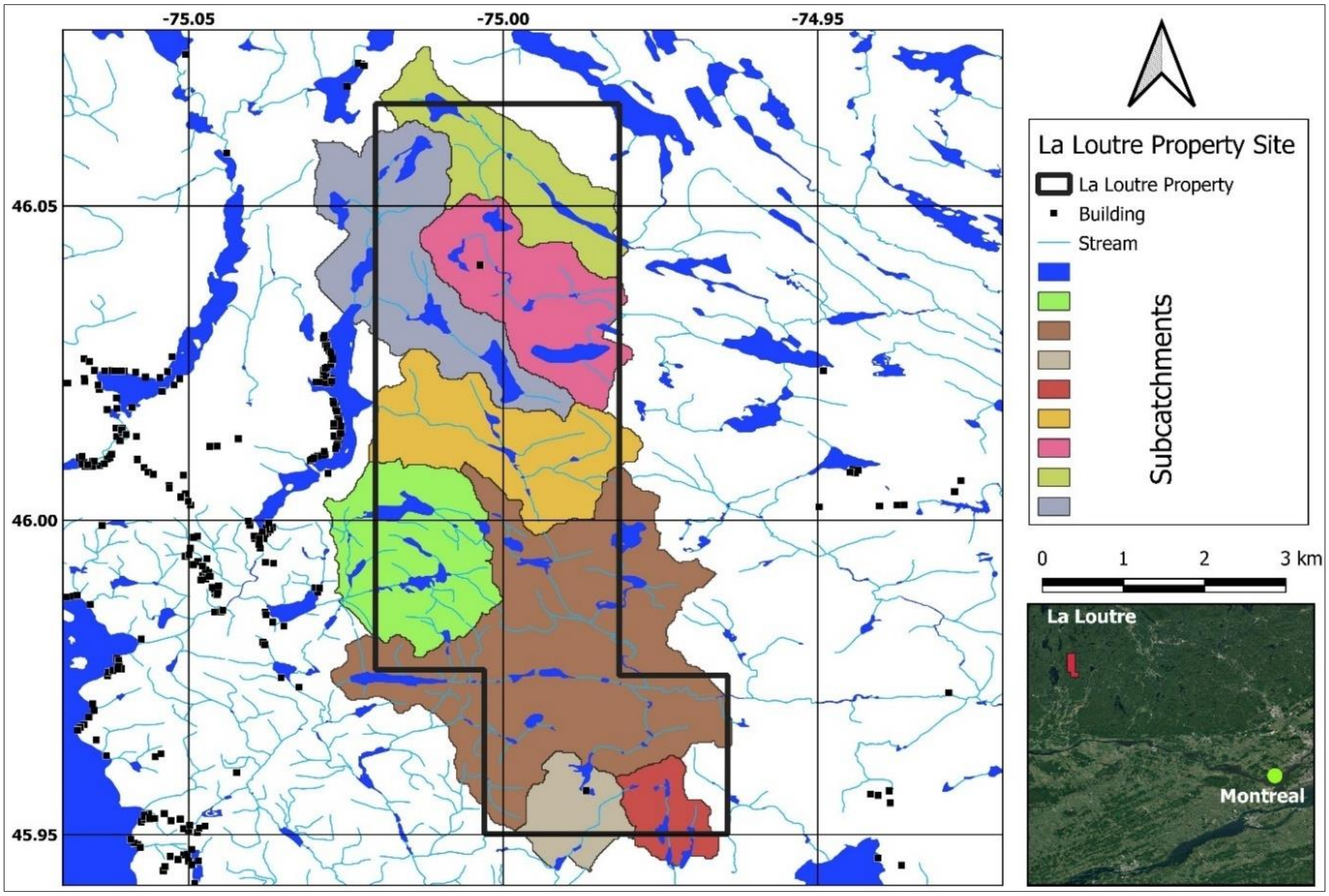
20.1.1.4 Hydrology

The property is located 16 km east of Papineau-Labelle Wildlife Reserve, 5 km east of Duhamel and 9 km northeast of Cheneville in the Province of Québec. Land elevation changes within the property is considerable (ranging between 260 to 390 m). More than ten small lakes and ponds are located within the property limit (between 0.02 to 0.3 km^2 in size), which are fed by surface runoff and groundwater convergence.

The catchment boundary and the major drainage paths within the project site were delineated through GIS analysis of publicly available National Topographic Survey of Canada (NTS) 1:50,000 scale.

The main hydrological features are shown on Figure 20-3. The project site is in the Petite Nation watershed region, which encompasses an area 2,250 km^2 (Baltzar et al, 2017). There are five major lakes into which both intermittent and perennial tributaries from the project site flow. These are Lac Bélanger, Lac Doré, Petit Lac Vert, Lac Tallulah and Lac Garault. Using LIDAR imagery, WSP was able to identify coverage of waterbodies and wetlands within the study area. Lake waterbodies cover 11% of the total study area, whereas wetland ecosystems (bogs, swamps, marshes) cover another 6% of area (WSP, 2015).

Figure 20-3: Main Hydraulic Features



Source: Hemmera, 2021

20.1.1.5 Surface Water

Two monitoring stations were installed within Lac Bélanger. Station 1 (St-1) using a sonde multiparameter YSI meter to collect continuous water quality data and a Secchi disc to measure turbidity. The variables that were measured included temperature (°C), conductivity (us/cm), turbidity (measured in dissolved organic carbon units, mg/L), phosphorus concentrations (µg/L) and dissolved oxygen (mg/L). Station 2 (St-2) was installed in a nearby tributary and measured phosphorus concentrations and chlorophyll a levels. Water samples were also taken at both stations and were sent to the laboratory for further analysis.

Using dissolved organic carbon measurements, being the principal method in accurate water colour readings, readings came out to 4.55 mg/L. These are low colour readings which equate to healthy turbidity levels in the lake.

Lac Bélanger is a thermal stratified lake with three distinct layers. At the 3 m mark, the metalimnion, temperatures reached highs of 25°C. At the 8 m mark, where the hypolimnion starts, temperatures drop to 6°C. Measurements done at the 20 m mark come out to 4°C, so consistent temperatures beyond 8 m are evident.

Dissolved oxygen levels follow a different pattern, with 8 mg/L within the epilimnion at the 3 m depth mark, increasing to 15 mg/L at the 4 m mark within the metalimnion and decreasing slowly to 0 levels at 20 m.

Conductivity levels were between 44 and 59 µs/cm. With these values, lower conductivity levels equal a small quantity of dissolved minerals and ions present in the water.

Phosphorus concentrations were also measured in both St-1 and Station 2 (St-2), St-1 having 5.08 µg/L and St-2 having 7.1 µg /L. Lower levels in ST-1 are normal, being characterized as an oligotrophic lake. St-2 has higher levels, due to higher phosphoric sedimentation and microorganism utilization.

Lastly, chlorophyll a levels were measured, as they are important in algae and aquatic species growth within waterbodies. St-2 had low levels at 0.36 ug/L, which helps the case for oligotrophic lake classification.

Upon finalizing all variables measured from the two stations within Lac Bélanger, the lake was finally classified using the Carlson Index, which takes three main variables required for classification—transparency (or turbidity), chlorophyll and phosphorous levels—averages them together, and determines a class based on a scale of 0 to 100. Using the index, one can conclude that Lac Bélanger is identified as an oligotrophic lake (WSP, 2015).

20.1.2 Socioeconomic Setting

20.1.2.1 Administrative Location

The La Loutre project is located in the Administrative Region of Outaouais, the Regional County Municipality (MRC) of Papineau, and the Municipality of Lac-des-Plages (see Figure 20-4). The municipal zoning is split between recreotourism, and forestry over the project site. The project site is not within agricultural lands overseen by the CPTAQ.

20.1.2.2 Land Use

Lac Doré, located just west of the project site, has over 60 cabins along its shoreline (see Figure 20-1) and is used for recreotourism. Because the drainage basin for Lac Doré and the Doré Creek extends within the project site, there will be an emphasis on water and waste management practices to avoid impacts to the lake.

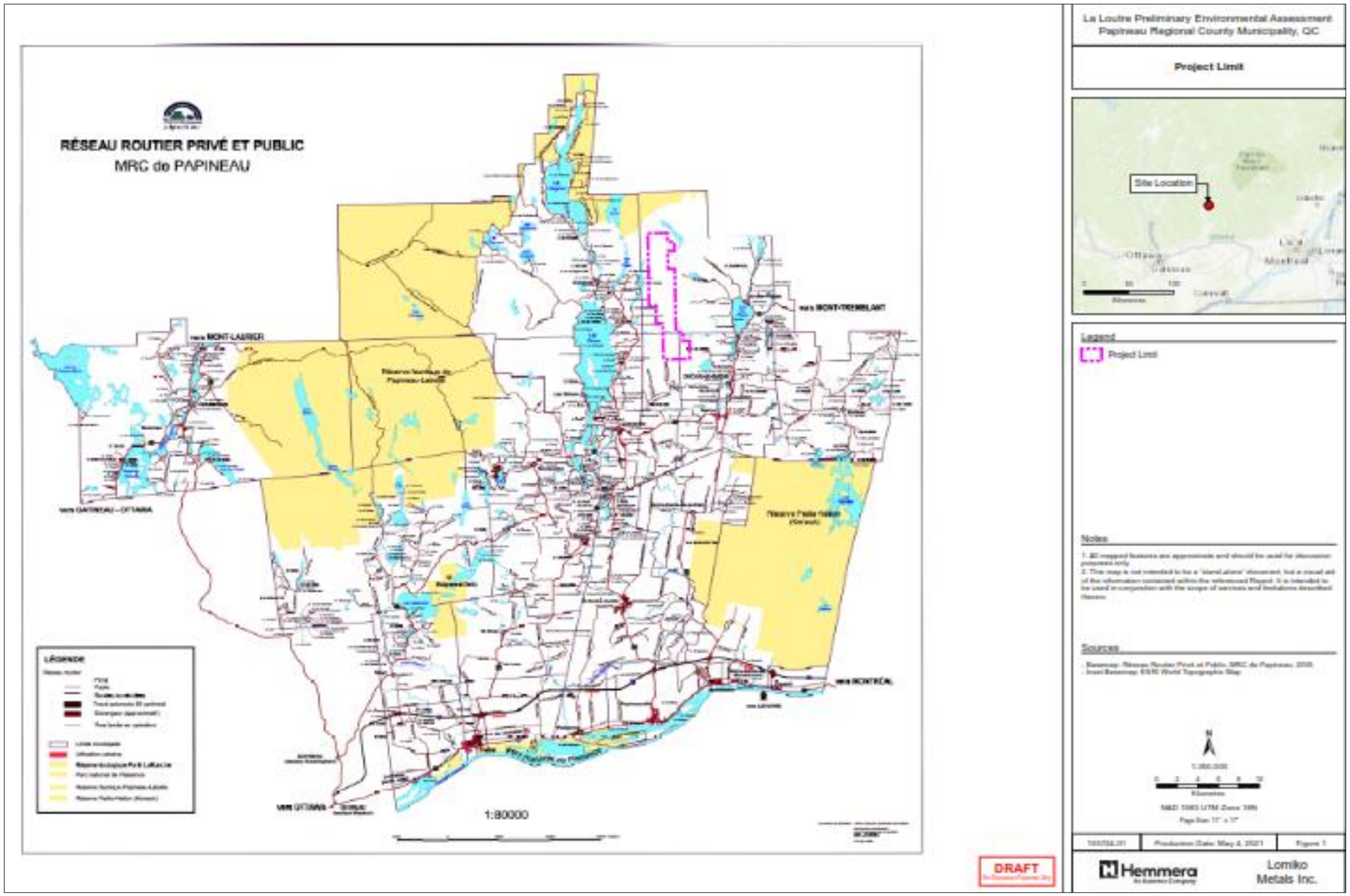
The zoning of the project site is split between 14-R (recreotourism) and 6-F (forestry). There is a fishing and hunting outfitter located to the north of the project site. The project site is used for logging, hunting and fishing.

The major transportation route in the vicinity of the project site is the Trans-Canada Highway Route 117 which passes 25 km northeast and Autoroute de l'Outaouais (Autoroute 50) 32 km south of the site.

20.1.2.3 First Nations

The project site is located within the Kitigan Zibi Anishinabeg (KZA) First Nations territory. The KZA First Nations are part of the Algonquin Nation and the KZA territory is situated within the Outaouais and Laurentides regions. No official agreement has been made between the KZA First Nations and Lomiko. Lomiko will start consultation and cooperation with the KZA First Nation group now and throughout the project. Within the KZA Economic Development Plan, there has been push back from focus groups and survey respondents within the Algonquin community, with 44% voting against mining within the territory. However, 47% provide no indication of their view about mining and indicate all opportunities for development should be open for discussion. The plan describes the potential in economic growth with mining projects, and emphasizes the need for educational outreach programs to give communities a better understanding on mining development (Kitigan Zibi Anishnabeg, 2021).

Figure 20-4: Municipal and Administrative Setting



Source: Hemmera, 2021

20.1.3 Environmental Risks and Opportunities

Based on the information review, and the permitting roadmap presented in Section 20.3, the environmental and socioeconomic risks and opportunities associated to the project at this stage are:

- impact to wetlands and hydric environment
- conflict of use within the hunting area
- transportation corridor socioeconomic impact

In light of these, an alternatives assessment has already been performed for the tailings management facility in order to limit footprint and environmental impacts. One of four options was chosen: a comingled tailings and waste rock option which will remove the need for separate waste rock storage facilities. It was also the option with the least wetland and hydric environment impacts.

In order to continue identifying risks and opportunities, the project will commence baseline studies on the road to the environmental assessment process in accordance with the *Environmental Quality Act* and its regulations.

20.1 Waste Management and Water Management

20.1.1 Waste Rock and Tailings Management

An alternatives assessment has already been performed for the waste disposal facility (waste rock and filtered tailings) in order to limit footprint and environmental impacts. One of four options was chosen: a co-disposal tailings and waste rock option that will remove the need for separate waste rock storage facilities. It was the option with the least wetland and hydric environment impacts. The WDF will meet the requirements of Directive 019 sur l'industrie manière.

20.1.1.1 Geochemical Characterization

A preliminary geochemical characterization was scoped for La Loutre in April 2021 by Hemmera Envirochem to assess whether there is risk of acid formation for the waste materials, and to a lesser extent, metal leaching behaviour.

Material handling costs are elevated if there is a tendency for the waste to generate acid. The testing suite, therefore, focusses on acid mine drainage (AMD) risks. The geochemical program meets the requirements for Guide de caractérisation des résidus miniers et minerai du MELCC (June 2020).

The drill core database that was assessed to determine the quantities of ore and waste and the lithological breakdown of each material is shown in Table 20-1.

Table 20-1: Lithology Volumes and Sample Representation

Lithology	Ore (tonnes)	Proportion	Samples (No.)	Waste (tonnes)	Proportion	Samples (No.)
OB	0	0.0	0	1,130,970	0.03	1
Waste	0	0.0	0	21,392,324	0.57	14
Marble	0	0.0	0	4,590	0.00	0
ENV	24,253,786	0.7	3	2,471,882	0.07	2
Quartz	86,723	0.0	0	11,128,813	0.30	7
Zone	11,015,402	0.3	2	1,408,867	0.04	1
Total	35,355,911		5	37,537,446		25

20.1.1.2 Analytical Testing

The analytical testing listed below has been suggested, but not yet carried out.

Static Testing

- modified ABA with siderite correction, paste pH, fizz test
- total sulphur by Leco furnace
- sulphate-sulphur by HCl leach
- total inorganic carbon
- metals by multi-acid digest with ICP-MS finish
- mercury by cold vapour
- 3:1 shake flask extraction with general parameters, ICP-MS and Hg
- paste pH
- paste electrical conductivity (EC)

Kinetic Testing

- humidity cell testing
- size fraction analysis
- weekly maintenance and sampling
- pH, conductivity, acidity, alkalinity
- sulphate Cl, F
- NO_2, NO_3, NH_3/NH_4
- ICP-MS + Hg

Mineralogical Testing

- XRD with Rietveld refinement

At the time of reporting, the samples have been collected and delivered to the laboratory, but testing has not begun.

20.2 Closure and Reclamation Planning

Under the *Mining Act*, anyone who engages in mining exploration work or mining operations determined by regulation must submit a rehabilitation and restoration plan (subsequently referred to as "closure plan") regarding end land use for approval by the Ministère de l'Énergie et des Ressources naturelles (MERN). Approval is conditional upon a favourable opinion from the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC).

To help companies prepare these plans, the MERN, working with the MELCC, has produced guidelines for preparing mine closure plans in Québec. The guidelines were updated in 2017 to reflect amendments to the Act and regulations, and knowledge development in mining reclamation. It contains links to the legislation, regulations, directives and guides that must be considered when preparing a closure plan.

Closure plans filed and approved after December 10, 2013, are made public in accordance with Section 215 of the *Mining Act*. They are available via the mining title management system GESTIM, in the "Mining Site" section.

The MERN oversees and takes over the reclamation, care and maintenance and environmental monitoring of abandoned mining sites in Québec. Significant efforts have already been made to develop effective, economical and reclamation measures. Design engineering is performed using the best practices and are specific to each mine site characteristics, including water balance, chemical stability, physical stability, underground water levels, and so on. In some cases, and where possible, reclamation work is performed with technologies that use waste materials such as forest biomass, sludge from water treatment plants, paper mill sludge or ash from cogeneration plants. This helps to reduce reclamation costs and is entirely consistent with the precepts of sustainable development.

In Québec, mine reclamation work is intended to restore the site to an acceptable environmental standard for productive use. This involves:

- eliminating unacceptable risks to public health and safety
- limiting the production and spread of contaminants that may damage the receiving environment, and attempting to eliminate all forms of long-term care and maintenance
- reclaimed the site to a visually acceptable standard
- rehabilitated the infrastructure area to be compatible with future use

20.2.1 Closure and Reclamation Plans

This section presents the closure requirements that the La Loutre project will follow. The content has been extracted from the guidelines for preparing mine closure plans in Québec.

20.2.1.1 Definition of Satisfactory Condition

The aim of site closure is to return the site to a satisfactory condition by:

- eliminating unacceptable health hazards and ensuring public safety
- limiting the production and spread of contaminants that could damage the receiving environment and, in the long term, aiming to eliminate all forms of maintenance and monitoring
- returning the site to a condition in which it is visually acceptable (reclamation)
- returning the infrastructure areas (excluding the tailings impoundment and waste rock piles) to a state that is compatible with future use (rehabilitation)

20.2.1.2 Revegetation

All areas affected by mining operations (for example, building sites, tailings impoundments, waste rock piles, and road surfaces and shoulders) must be revegetated to control erosion and to return the site to a natural appearance that blends with its surroundings.

Revegetation of the site must be able to attain a satisfactory condition; that is, once planted, the vegetation must be hardy, viable in the long term, and able to grow without fertilizer or maintenance. Indigenous plants, herbaceous plants or shrubs are recommended. At operating mine sites, the proponent must provide a report written by an agronomist belonging to a professional order confirming the adequacy of the conditions to support sustainable vegetation in all revegetated parts of the site.

20.2.1.3 Buildings and Surface Infrastructure

All buildings and surface infrastructure must be dismantled, including electrical and support infrastructure, unless the proponent can show that they are necessary to achieve and maintain a satisfactory condition, to monitor and maintain infrastructure, or to support the area's socio-economic development.

When buildings and surface infrastructure are dismantled, the foundations must be razed to the ground.

Concrete foundations in the ground may remain if:

- they are free of contamination and drilled with holes or broken up to allow efficient drainage, and covered by a material that promotes the growth of self-sufficient vegetation;
- they pose no risk to the environment.

The management of any materials produced by the dismantling work must comply with applicable laws and regulations, notably the regulation respecting the landfilling and incineration of residual materials (RLIRM) (Chapter Q-2, r. 19) and the good practices guide for managing dismantling materials, available in French from the MDDELCC (La gestion des matériaux de démantèlement – Guide de bonnes pratiques).

20.2.1.4 Transportation Infrastructure

The main road access to the mine site must be kept in good condition, along with secondary roads used to monitor and maintain mine site infrastructure.

Where existing roads or railway lines are deemed no longer necessary, the land must be reclaimed as follows:

- any tailings, waste rock or other contaminated material used in their construction must be removed and properly managed in accordance with applicable regulations
- bridges and culverts must be removed to restore the natural flow; the banks of rivers and streams must be stabilized by planting vegetation
- road drainage ditches must be filled in unless they are needed to access the site; natural flow should be restored and backfilled surfaces should be levelled and planted to prevent any erosion
- ditches left in place must be stabilized; suitable granular material or riprap must be used if there is potential for erosion or where ditch design requires it
- in general, road surfaces and shoulders must be scarified, levelled, planted and landscaped to prevent erosion

20.2.1.5 Surface Equipment and Heavy Machinery

Ore processing equipment (grinding mills, flotation cells, cyanidation tanks, thickeners, etc.) and heavy machinery (motor vehicles, drills, shovels, etc.) must be removed from the site.

20.2.1.6 Accumulation Areas

The reclamation of accumulation areas must attain technical, environmental and social objectives. Containment structures, waste rock piles, tailings areas, and all retention structures related to the site must be stable.

Accumulation areas must be reclaimed to a state in which effluents satisfy post-closure criteria and all applicable provincial and federal laws and regulations. Finally, reclamation must consider the potential future uses for the site and the reclaimed areas must blend in with the landscape.

These reclamation objectives are inextricably linked and involve different disciplines. For example, the physical stability of infrastructure primarily deals with geotechnics, whereas the chemical stability of tailings and waste rock deals with geochemistry. Reclamation techniques may affect wildlife, plants and the social environment.

Experts from each discipline must work together to develop scenarios that will lead to the best solutions that meet all reclamation objectives for the accumulation areas.

20.2.1.7 Physical Stability

20.2.1.7.1 General Information

The choice of design criteria and reclamation techniques for accumulation areas must minimize the risks related to the physical integrity and possible failure of the infrastructure. At all times, the infrastructure must be stable, safe and compatible with the surroundings. Technical studies demonstrating stability must be carried out by an engineer with recognized expertise and adequate education and knowledge for the type of study to be signed.

The studies must incorporate the following:

- climatic conditions, including the effects of critical events and the notion of climate change
- the geotechnical properties of the waste rock, tailings, foundation soils and any construction materials to be used (for potentially high-risk infrastructure, these properties must be properly characterized according to industry standards)
- the specificities of the accumulation area, such as topography, hydrology, hydrogeology, underlying soils (foundation soils), seismic effects, characterization and instrument data, etc.

Following closure, a dike or any other structure designed to retain water that receives new natural inputs may be subject to the *Dam Safety Act* (chapter S-3.1.01) and the Dam Safety Regulation (chapter S-3.1.01, r. 1). Therefore, insofar as the proponent intends to maintain such structures, the dam safety department (Direction de la sécurité des barrages) of the MDDELCC must be consulted before carrying out closure work.

20.2.1.7.2 Geotechnical Characterization

The proponent must set up on-site testing equipment and collect data to assess the geotechnical properties of materials currently stored or to be stored in accumulation areas. The proponent must develop an instrumentation and sampling program in which stratigraphic units are well represented and the installed instruments and collected samples are adequate and sufficiently representative for characterization of the materials. The choice of materials and the selection of samples and representative tests must be supervised by an engineer with recognized expertise and adequate education and knowledge for a geotechnical characterization study. The geotechnical characterization of materials must be carried out according to industry-accepted work specifications, such as those set forth in the Canadian Foundation Engineering Manual. In specific cases, the MERN reserves the right to request additional characterization tests.

20.2.1.7.3 Waste Disposal Facility (WDF)

The process for selecting the location of the WDF must be the subject of an options analysis. For all options studied, the design must consider realistic potential reclamation scenarios. The design and operation of the WDF has an impact on the choice of reclamation technique. Certain waste rock/tailings management methods can reduce the geotechnical risks associated with WDF and, in some cases, closure costs. For example:

- moving waste rock and tailings into the pit, if applicable
- pile construction using benches and compacted layers

- various methods for co-depositing tailings and waste rock that can help improve the geotechnical stability of the pile

20.2.1.8 Chemical Stability

20.2.1.8.1 General Information

The reclamation of the WDF must prevent the generation of acid mine drainage (AMD) and contaminated neutral drainage (CND). Reclamation activities must also prevent contaminated water from entering the receiving environment and allow for the collection and treatment of such water. In all cases, mining effluents must at least meet the requirements set forth in D019 and the Metal and Diamond Mining Effluent Regulations (MDMER). The main factors in attaining chemical stability objectives for tailings and waste rock are as follows:

- the relevant education and expertise of the professionals responsible for the geochemical characterization protocol for tailings and waste rock (sample selection, choice of tests and analysis of the results)
- the recognition of climatic conditions and the physical characteristics of the accumulation area (e.g., precipitation, temperature, topography, hydrology, hydrogeology and soil properties)
- tailings and waste rock management methods implemented during the operations phase that are consistent with the planned approach of the design phase, including the use of progressive reclamation; design changes must be implemented and incorporated into the tailings and waste rock management method in response to the specific characteristics of the site and any advances in knowledge
- controls on geochemical behaviour, which also take into account geotechnical behaviour (stability)

The reclamation of accumulation areas is preferably implemented while the mine is operating. When possible, this should be specified as a design parameter to encourage the adoption of progressive reclamation and to reduce the potential for AMD and CND.

20.2.1.8.2 Geochemical Characterization

The proponent must collect data to assess the acid-generating and leaching potential of all waste rock and tailings stored or to be stored in accumulation areas. The proponent must justify the selected sampling protocol and demonstrate that geological units are adequately represented in collected samples. Lithology identification and sample selection must be supervised by a geologist or a geological engineer with recognized expertise and adequate education and knowledge in mineralogy and geochemistry. A sufficient and representative number of samples must be selected and analyzed for each zone (lithology), taking into account heterogeneity and uncertainty. Data on the acid-generating and leaching potential of waste rock and tailings must be updated each time the closure plan is revised as mining operations progress. The geochemical characterization of samples must satisfy at all times the specifications of D019. In specific cases, the MERN reserves the right to request additional characterization tests.

20.2.1.8.3 Waste Disposal Facility (WDF)

Some available reclamation techniques for waste materials (tailings and waste rock) can minimize the potential for AMD and CND. Certain waste rock/tailings management methods, if implemented during mining operations, can help reduce the risk of generating AMD and CND and thus reduce closure costs, as outlined below:

- Moving waste rock/tailings into the pit, under certain hydrogeochemical conditions and if applicable. For tailings that generate AMD, moving the latter before acid generation begins may facilitate management and closure work.

- Sorting and managing waste rock/tailings according to its acid-generating potential or its metal-leaching potential. Separating problematic materials and placing them in an optimal configuration may help minimize AMD generation and metal leaching.

- The desulphurization of tailings, to separate sulphides and produce tailings with a sufficiently low sulphide content, which will prevent or minimize AMD potential.

Reclamation techniques implemented after mine closure or during mining operations (progressive reclamation) may help reduce the risks associated with geochemical reactions in the WDF. For example:

- Covering waste rock/tailings with layers of geologically derived materials (soil, waste rock, tailings) or with a multilayer covering including a geosynthetic layer when conditions allow. These coverings must be designed to limit water seepage or reduce the flow of oxygen in the waste rock/tailings, thereby limiting the production of contaminated water in the WDF. These coverings must also be designed to yield an adequate factor of safety (FoS) against slope instability, provide protection from erosion, minimize long-term maintenance requirements, maintain long-term stability and integrity, and provide adequate support for vegetation.

- Submerging waste rock/tailings when topographic, hydrologic, hydrogeologic and geochemical conditions allow. Returning waste rock/tailings into the pit), below the water table, can reduce the flow of oxygen in reactive waste rock, thereby limiting sulphide oxidation. This technique must be evaluated to ensure it will not contaminate the groundwater.

20.2.1.9 Reclamation Techniques

The selection reclamation techniques must be proven and suited to the conditions of the site. As needed, several different techniques may be presented to take into account the specificities of the areas to be reclaimed. The design must use the best available reclamation techniques and be both technically and economically realistic. Validation through laboratory and field tests may be required to confirm certain elements of the design. In some cases, modelling may be useful in assessing the effectiveness of specific parameters of the proposed method, and should be performed for a range of conditions. For example, simulations of climate change and geochemical behaviour may be required for the short, medium and long term. Technological innovation is encouraged, but these must be supported by scientific and technical studies conducted by professionals that demonstrate their potential to attain the reclamation objectives, thereby ensuring long-term effectiveness and reliability. Progressive reclamation should be envisioned for all types of mining development. If progressive reclamation is not prioritized, the proponent must provide reasons to justify the decision.

20.2.1.10 Dewatering, Sedimentation and Polishing Basins

Dewatering, sedimentation and polishing basins must be emptied and reclaimed, unless they are still needed. Dikes must be levelled, where applicable. Ideally, the natural flow should be re-established. Where impossible to do so, the proponent must set up a new system to deal with runoff that reproduces the natural flow as faithfully as possible and suits the reclamation technique employed. Treatment sludge and sediments that accumulate on the bottom of basins are considered tailings; they must therefore be stored in the tailings areas or left in place and managed according to the requirements presented in the Guide.

20.2.1.11 Overburden, Mill Feed and Concentrate Storage Areas

Overburden, when removed during mine site preparation, must be managed according to the requirements of Section 2.6 of the D019. Uncontaminated overburden must be kept and used for closure work. If an overburden pile is left in place on the mine site, it must satisfy the same chemical and physical stability criteria as those for tailings areas and waste rock piles. Unused overburden piles must be protected against wind and water erosion using plant cover. Typically, ore and concentrate are temporarily stored in stockpiles near the mill or loading station. These materials must be managed according to the requirements of Section 2.8 of the D019. Following closure work, no ore or concentrate shall remain on the site. The footprint of the stockpiles must be rehabilitated according to the requirements described in the guidelines.

20.2.1.12 Water Collection Systems

Collection systems must be implemented to collect contaminated percolation waters and divert uncontaminated runoff. These systems must require minimal maintenance. Water collection systems that are no longer needed, including ditches and retention basins, must be dismantled and backfilled, if necessary. To promote overflow drainage from the tailings impoundment, drainage culverts and spillways are recommended. These structures must require minimal maintenance. In all cases, collection systems left in place must be stable and safe, requiring minimal maintenance. They must be protected against long-term erosion. Any structure subject to the *Dam Safety Act* (L.R.Q., chapter S-3.1.01) and the Dam Safety Regulation (chapter S-3.1.01, r. 1) must be confirmed by the dam safety department (Direction de la sécurité des barrages) of the MDDELCC.

20.2.1.13 Mining Effluents

Mining effluents must satisfy the discharge requirements of D019 as well as those of the MDMER. Depending on the nature of contamination at the mine site following closure work, other requirements may apply to the final effluent discharge under Section 20 of the *Environment Quality Act*. A permanent active treatment plant cannot constitute a final reclamation measure for mining effluents. However, it can be considered as a temporary measure to enable compliance with discharge standards. A temporary passive system to treat effluents may be included in the final reclamation scenario when the concentration of effluent contaminants allows it.

20.2.1.14 Groundwater

Groundwater quality in the vicinity of any developed area at risk must comply at all times with the protection requirements set forth in D019, as well as those in the rehabilitation plan for contaminated land, if applicable.

20.2.2 Closure Plan Content

The following presents the content required for the La Loutre project closure plan.

- General information
    - summary of the closure plan
    - identity of the proponent
    - resolution of the board of directors

  - location of the property with annexed surface plans
  - geology and mineralogy
  - history of the site
  - authorizations
- Description of mining operations
  - description and nature of current and future mining operations
  - description of buildings and surface infrastructure
  - description of electrical, transportation and support infrastructures
  - description of other buildings
  - accumulation areas
  - description of site water management
  - description of wastewater treatment site
  - storage sites and the waste disposal facility
- Protection, rehabilitation and closure measures
  - work area safety and securement of mine openings
  - dismantling of surface buildings and infrastructure
  - dismantling of electrical, transportation and support infrastructures
  - dismantling of other buildings
  - equipment and heavy machinery disposal
  - reclamation of the accumulation areas (including the WDF)
  - water management infrastructure
  - land rehabilitation (contaminated soils)
  - management and disposal of petroleum products, chemical products, hazardous waste and non-hazardous waste
  - climate change

- Post-closure monitoring and maintenance program, if applicable
  - physical stability monitoring and maintenance
  - environmental monitoring
  - agronomic monitoring and maintenance
- Economic and scheduling consideration
  - detailed cost assessment of closure work
  - implementation schedule for closure work
- Emergency plan
  - measures applicable in case of a temporary shutdown of mining operations

20.2.3 Closure Cost Estimate

The cost of closure work must be based on all quantifiable information available when the closure plan is submitted (Appendix 3 of the guidelines). During subsequent revisions, the cost estimate must become increasingly accurate.

The proponent must assess the cost for mine site closure work in current dollars for all areas of land affected at the end of mine life (including the cost of all studies), and the assessment must cover the mining facilities and accumulation areas. Costs must be detailed for each activity as if all work will be carried out by a third party.

The financial guarantee ensures that funds will be available to carry out the work provided for in the closure plan in the event of default by the proponent. It covers the entire cost of land rehabilitation and reclamation work for the entire mine site as provided for in the closure plan (chapter M-13.1, s. 232.4). The cost of all studies required for the closure of the mine site, including environmental characterization studies, must be considered when calculating the financial guarantee. A proponent who engages or will engage in mining operations must pay the financial guarantee according to the following terms (chapter M-13.1, r. 2, s. 113):

- the guarantee must be paid in three instalments.
- the first payment must be made within 90 days of receiving the plan’s approval.
- each subsequent payment must be made on the anniversary of the plan’s approval.
- the first payment represents 50% of the total amount of the guarantee, and the second and third payments represent 25% each.

20.3 Permitting Considerations

The following sections summarize the federal and provincial environmental regulatory approvals, as well as permits and applicable regulations that will be required to support construction and operation of the project, as currently proposed.

20.3.1 Federal Environmental Permits

20.3.1.1 Federal Impact Assessment

The Physical Activities Regulations (also known as the "Project List") identifies types of projects that may require a federal impact assessment (IA) under the *Impact Assessment Act* (IAA). When the physical activity associated with the carrying out of a proponent's project is described in the Physical Activities Regulations, the proponent must provide the Canadian Impact Assessment Agency (the "Agency") with an Initial Project Description. The applicable sections of the regulations associated with the proposed project are summarized in Table 20-2.

The general Federal IA process, along with key participants, is represented in Figure 20-5. During the planning phase, multiple deliverables are produced, some by the proponent and some by the Agency, in consultation with other federal and provincial entities as well as with First Nations.

The planning phase ends with the publication of the Tailored Impact Statement Guidelines (TISG) document, which covers the content required for the Impact Statement (IS).

The IS is produced by the proponent following the collection of the necessary baseline studies and assessment of impacts. Once it is determined that the IS is complete (comprises all the elements included in the TISG), the Agency will begin the IA phase, or review of the IS. During this time, the Agency along with federal and provincial departments will ask questions and make additional information requests of the proponent. The IA phase ends with the production by the Agency of the Impact Assessment Report.

Finally, the Minister or Governor in Council must make a decision about the project. The public will have multiple opportunities to review project documents and provide feedback at each phase of the process. First Nations will be involved throughout the process by the Agency.

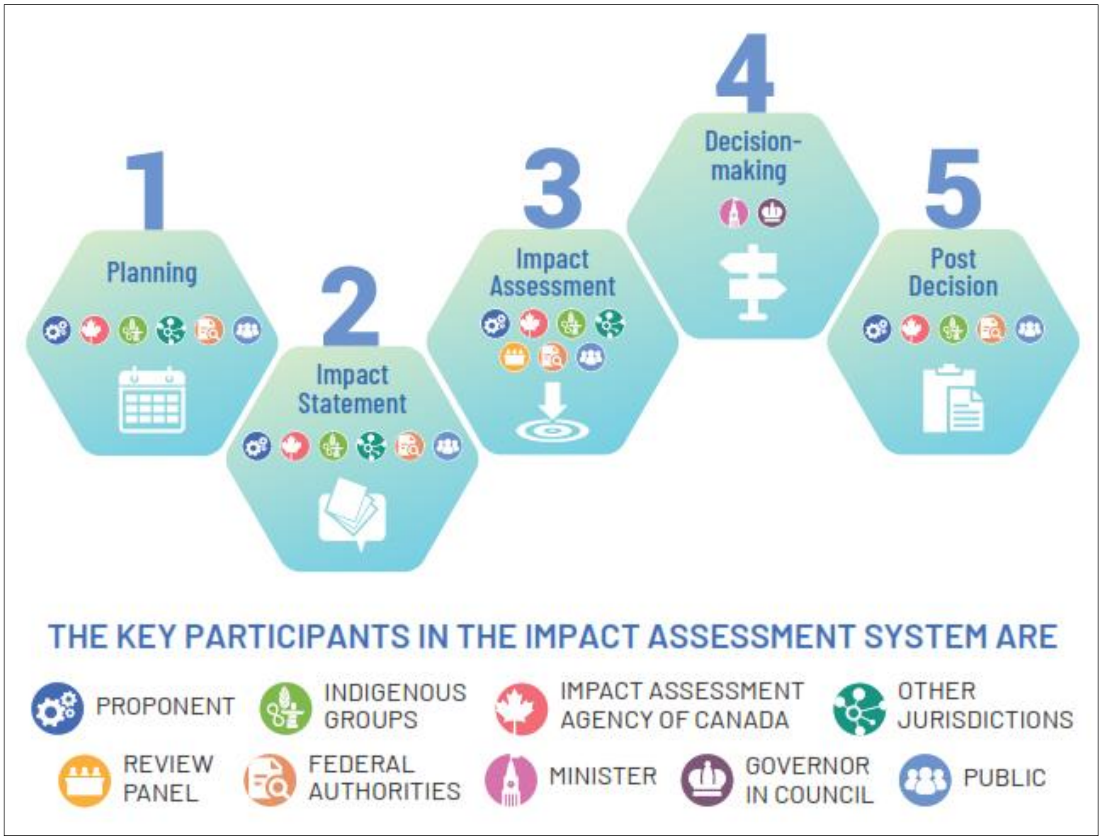
Based on current project definition, it appears that the project does not trigger the Federal Impact Assessment Process because it is not designated as per the Physical Activities Regulations (production rate below trigger).

Table 20-2: Impact Assessment Act, 2019 Regulations Trigger

Physical Activities Regulations (SOR/2019-285)	Project Components / Activities	Applicable
Section 2, Paragraph 18 (c) a new metal mine, other than a rare earth element mine, placer mine or uranium mine, with an ore production capacity of 5,000 t/d or more (d) a new metal mill, other than a uranium mill, with an ore input capacity of 5,000 t/d or more	The ore production capacity will NOT be above 5,000 t/d, estimated at 4,110 t/d (or 1.5 Mt/a)	NO

Source: *Impact Assessment Act*, 2019

Figure 20-5: Federal Impact Assessment Process



Source: IAA Website

There is, however, a potential for the Federal Impact Assessment to be triggered if the Minister decides to designate the project. As per paragraph 9(1) of the IAA:

> "The Minister may, on request or on his or her own initiative, by order, designate a physical activity that is not prescribed by regulations made under paragraph 109(b) if, in his or her opinion, either the carrying out of that physical activity may cause adverse effects within federal jurisdiction or adverse direct or incidental effects, or public concerns related to those effects warrant the designation."

20.3.1.2 Federal Permitting Requirements

The following federal permits may be required for the project.

20.3.1.2.1 Authorization under paragraphs 34.4(2)(b) of the *Fisheries Act*

This authorization is under the responsibility of Fisheries and Oceans Canada (DFO). Subsection 34.4(1) of the *Fisheries Act* prohibits the carrying on of any work, undertaking or activity, other than fishing, that results in the death of fish. Under paragraph 34.4(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans may issue an authorization with conditions relating to the carrying on of the works, undertaking or activity that result in death of fish.

Subsection 35(1) of the *Fisheries Act* prohibits carrying on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat. However, under paragraph 35(2)(b) of the *Fisheries Act*, the Minister of Fisheries and Oceans may issue an authorization with conditions relating to the carrying on of the work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

The Fish and Fish Habitat Protection Program from DFO ensures compliance with the provisions of the *Fisheries Act* and the *Species at Risk Act* (SARA). The program considers any proposed work, undertaking or activity that may result in adverse effects on the fish and its habitat.

An authorization will be required if DFO considers that the project may result in the death of fish or in harmful alteration, disruption or destruction of fish habitat. It should be noted that the new provisions of the *Fisheries Act* regarding the protection of the fish and its habitat came into force on August 28, 2019. Authorization to use waters frequented by fish as a tailings impoundment area under subsection 5(1) of the Metal and Diamond Mining Effluent Regulations

Subsection 36(3) of the *Fisheries Act* prohibits the deposit of deleterious substances into waters frequented by fish unless authorized by regulation. The Metal and Diamond Mining Effluent Regulations (MDMER) authorize the deposit of deleterious substances under specific conditions, and include provisions to allow the use of waters frequented by fish for the disposal of mine waste. In order to authorize the storage of mine waste in waters frequented by fish, an amendment to Schedule 2 of the MDMER is required to designate those waters as Tailings Impoundment Areas (TIA).

Environment and Climate Change Canada (ECCC) is responsible for administering and enforcing the MDMER. DFO provides expert advice to ECCC on fish and its habitat as well as on the compensation plan for habitat loss related to TIAs.

In order to proceed with an amendment to Schedule 2 of the MDMER, the proponent must execute the following:

- identify all water bodies affected by the disposal of mine waste
- confirm the presence or absence of fish in these water bodies
- provide the method used to document the presence or absence of fish
- provide information regarding the connectivity of these water bodies to other water bodies with fish

If the listing of a fish-bearing water body is required, the proponent will develop an Alternatives Assessment Report in accordance with ECCC's Guidelines for the Assessment of Alternatives for Mine Waste Disposal, to demonstrate that the disposal of waste into waters frequented by fish is the best option from an environmental, technical, economic and socio-economic perspective. In addition, the proponent will also develop a Fish Habitat Compensation Plan to compensate for the loss of fish habitat resulting from the disposal of mine waste.

Following the submission of the Alternatives Assessment Report and the Fish Habitat Compensation Plan, ECCC, with DFO's support, will review the information to determine whether it is complete and sufficient to support the amendment to Schedule 2 of the MDMER. During this phase, additional information may be requested from the proponent.

Once the information requirements are complete for both documents, the proponent will participate in consultations (led by ECCC and supported by DFO) with impacted Indigenous groups, local communities and stakeholders relative to the proposed listing of water bodies to Schedule 2 of the MDMER.

20.3.1.2.2 Permit under Subsection 73(1) of the *Species at Risk Act*

Permits are required by those persons conducting activities affecting wildlife species listed on Schedule 1 of SARA as extirpated, endangered, or threatened and which contravene SARA's general prohibitions where they are in force.

Pursuant to Sections 32 and 33 of SARA (general prohibitions), it is prohibited to:

- kill, harm, harass, capture or take an individual of a species listed under SARA as extirpated, endangered or threatened
- possess, collect, buy, sell or trade an individual of a species listed under SARA as extirpated, endangered or threatened, or any part or derivative of such an individual
- damage or destroy the residence of one or more individuals of a listed endangered or threatened species or of a listed extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada

The general prohibitions apply to federal species (migratory birds, as defined by the *Migratory Birds Convention Act*, 1994, and aquatic species covered by the *Fisheries Act*) everywhere in Canada and to other listed species where found on federal land.

Under Sections 34 and 80 of SARA, general prohibitions may apply on lands other than federal lands for species that are not aquatic species or migratory birds protected under the *Migratory Birds Convention Act*, 1994.

Under subsections 58(1) and 61(1) of SARA, no person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species — or of any listed extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.

These restrictions apply if they are triggered by a number of factors, including the following:

- the species is an aquatic species
- the species is a migratory bird protected by the *Migratory Birds Convention Act*, 1994
- the critical habitat (for species that are not aquatic species or migratory bird species) is on federal land, in the exclusive economic zone of Canada or on the continental shelf of Canada

Under Section 61 of SARA, restrictions relative to critical habitat may apply on non-federal lands under an Order in Council.

Under Section 73, the competent minister may enter into an agreement or issue a permit authorizing a person to engage in an activity affecting any listed endangered, threatened, or extirpated species, any part of its critical habitat, or the residences of its individuals, if the proposed activity falls under one or more of the following purposes:

- The activity is scientific research relating to the conservation of the species and conducted by QPs.
- The activity benefits the species or is required to enhance its chance of survival in the wild.
- Affecting the species is incidental to carrying out the activity.

Responsibility for implementing SARA lies with the Ministers responsible for DFO, Parks Canada Agency (PCA) and ECCC, as follows:

- DFO is responsible for considering permit applications with respect to aquatic species (as defined by SARA), other than individuals of species in the waters situated on federal lands administered by the PCA. An "aquatic species" under SARA includes:
  - fish, shellfish, crustaceans and marine animals including any parts thereof;
  - all of their life stages, such as eggs, sperm, spawn, larvae, spat and juvenile stages of fish; and
  - marine plants, including all benthic and detached algae, marine flowering plants, brown algae, red algae, green algae and phytoplankton.
- PCA is responsible for considering permit applications with respect to individuals in or on federal lands administered by PCA, including aquatic species (as defined by SARA) as well as terrestrial species.
- ECCC is responsible for considering permit applications with respect to all individuals that are not under the responsibility of PCA or DFO. This includes all terrestrial species on federal land and any land affected by a protection order issued under SARA, and for migratory birds wherever they are found.

If a competent department issues an authorization, license or permit under another federal Act, authorizing a person or organization to engage in an activity affecting a listed wildlife species, any part of its critical habitat or the residences of its individuals, this authorization, license, or permit can act as a SARA permit, provided that the pre-conditions described under subsection 73(3) of SARA are met.

Proponents must submit an application to the DFO, ECCC or PCA Regional Office in a manner and form satisfactory to these organizations.

To seek a permit under SARA from DFO, the proponent must submit an application to the relevant regional office of the Fish and Fish Habitat Protection. The timing of when the application is submitted is determined by the proponent. If the proponent is also seeking a Fisheries Act authorization, the process to apply for a SARA permit can be combined with the process to seek a Fisheries Act authorization.

To obtain a permit from ECCC, proponents must submit an application using the Species at Risk Permit System found on the Species at Risk Public Registry and provide the required information detailed in the application.

An analysis of the application is conducted by ECCC, PCA, or DFO upon receipt of the application, although there may be occasions when the competent minister will require additional information. A focus of the analysis is on how the application meets the pre-conditions listed under subsection 73(3). Authorizations may be issued only if the competent minister is of the opinion that all three of the following pre-conditions are met:

- All reasonable alternatives to the activity that would reduce the impact on the species have been considered and the best solution has been adopted.
- All feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals.
- The activity will not jeopardize the survival or recovery of the species.

During this analysis stage, and before the regulatory decision, ECCC, PCA or DFO may undertake additional Indigenous consultations, as required under subsections 73(4) and 73(5) or SARA.

The Permits Authorizing an Activity Affecting Listed Wildlife Species Regulations specify that the competent minister must issue a permit or notify the applicant that the permit has been refused within 90 days following the receipt of the application. This time limit is suspended if the application is incomplete and the applicant is notified. The time limit suspension ends when all the information is received from the applicant. The Regulations also specify that the 90-day time limit does not apply in the following circumstances:

- Additional consultations are necessary, including consultations with wildlife management boards and bands under the *Indian Act* which are required by subs. 73(4) and (5) of SARA.
- Another Act of Parliament or land claims agreement requires that a decision be made before the competent minister issues or refuses to issue a permit.
- The terms and conditions of a permit previously issued to the applicant have not been met; the applicant requests or agrees that the time limit not apply.
- The activity described in the permit application is modified before the permit is issued or refused.

For activities requiring a decision under the *Impact Assessment Act* (IAA), permit applications are not subject to the 90-day timeline because another Act of Parliament requires that a decision be made before the competent minister issues or refuses to issue a SARA permit.

These applications can be reviewed concurrently with the impact assessment to facilitate alignment of the authorization securing processes. If fauna and flora surveys are necessary to obtain more baseline information about SARA listed species at risk that may be impacted by a project, SARA permits may be required if these surveys affect individuals of species, their residence or critical habitat (for example, if they require capture, handling, fencing, baiting, disturbing of normal behaviour, etc.). Permit applications for these fauna and flora surveys would be subject to the 90-day timeline. It is the proponent's responsibility to identify and carry out all species at risk surveys necessary to support the permit application and review, and to monitor for additional species being listed during the planning of their project.

20.3.1.2.3 Licenses for Explosive Factories and Magazines Under Subsection 7(1) of the *Explosives Act*

These licences are the responsibility of Natural Resources Canada (NRCan). Under Section 6 of the *Explosives Act*, it is prohibited to make or manufacture any explosive, either wholly or in part, except in a licensed factory or to store any explosive in a magazine that is not a licensed magazine.

Under subsection 7(1)(a), however, the Minister of Natural Resources may issue licences for factories and magazines. The Minister may make any licence, permit or certificate referred to in subsection 7(1) subject to any term or condition, in addition to those prescribed by the regulations, that the Minister considers necessary for the safety of any person or property, including, without limiting the generality of the foregoing, compliance with security or safety standards in respect of any factory or magazine or any class thereof that are supplementary to but not inconsistent with those provided for under paragraph 5 (g.1).

To produce explosives and have bulk explosives delivered, a company must operate under either a licence or a certificate. Depending on a project's explosives supply requirements and, in some cases, the proximity of existing licenced factories, an explosive supplier may apply for Division 1 factory licences (factory with or without a wash bay) or Division 2 manufacturing certificates. Part 5 of the Explosives Regulations, 2013 indicates how to obtain a factory licence or manufacturing certificate and sets out the requirements for manufacturing explosives and how 'manufacturing' is defined.

Division 1 factory licences are issued for the operation of three types of facilities: factory with wash bay, factory without wash bay and factory with temporary structures.

A factory with a wash bay may be used for ANFO bagging, emulsion manufacturing and cartridging of emulsion and has, as a base of operations, all the capabilities necessary to clean, decontaminate and repair mobile process units. Operations allowed at a factory with a wash bay include storing of mobile process units, storing of explosives (bulk and non-bulk), storing of raw materials and the transfer of explosives and raw materials (e.g., ammonium nitrate prill). A 'client site' means a blast site at which a mobile process unit is used to manufacture explosives (e.g., mixing or blending into a borehole) away from a factory or satellite site.

Most open pit mine developments include the construction and operation of on-site factories with wash bays given distance from existing factories and longer-term higher explosives supply requirements. Such facilities, typically emulsion plants, may include a bay for the loading of mobile processing units, fuel phase and ammonium nitrate solution tanks and silos or seacans storing ammonium nitrate prill. A factory with temporary structures may move with the construction of roads or pipelines, or be in a fixed location for a short duration for other construction projects (e.g., hydroelectric power development). Such sites must be supported by existing, licensed factories equipped to properly service the mobile process units located at this type of factory.

Factory licences are renewed for one term only or a maximum of two years. In the case of some mine developments, a factory with temporary structures may proceed the construction of a permanent factory. Satellite sites certificates are issued for occasional and temporary sites allowing the storage and transfer of explosives and raw material. The sites can store up to two mobile process units, the placement of not more than two tankers or vessels (total maximum capacity of 40,000 kg) for the storage of water-based explosives and one storage facility (silos, tankers, designated area) for ammonium nitrate.

Division 2: Manufacturing certificates for blending ANFO by mechanical means are granted to the owners of mines or quarries producing ANFO at a blast site. The blending is usually done on a mobile process unit with the ANFO discharged directly into a borehole at a specified location, mine or quarry owned by the company to which the licence or certificate is issued.

NRCan issues different types of licences for explosives magazines including User, User Zone and Vendor licences. Magazines may also be licenced as part of a factory. Part 6 of the Explosives Regulation, 2013 indicates how to obtain a magazine licence and sets out the requirements for storing explosives in a licensed magazine. In most jurisdictions, magazines located at mine sites and quarries are authorized by provincial or territorial agencies.

Applications for factory licences and certificates are submitted to the Explosives Regulatory Division's Electronic Licence Management System through NRCan eServices Portal.

In the case of factory licences, applications must include, several types of plans or drawings are required including area plan, site plan, building layout, process schematics, and piping, instrumentation and equipment layout drawings. Area plan and detailed site plan show the location of the factory site and any neighbouring vulnerable features or hazardous facilities. Explosives quantity-distance limits are specified in guidelines for bulk explosives and site plans must include information such as distances between explosive operations, including washing/maintenance facilities, AN storage, fuel storage, and magazines; and distances to roads and public thoroughfares, operating pits, mine facilities, and offices/accommodation complexes. In addition, a licence application must be supported by spill contingency, emergency response, security and site evacuation plan together with other documents (e.g., operating procedures).

Applications are reviewed by the Explosives Regulatory Division to ensure that they are complete with all the necessary plans to conform with regulations and guidelines. Division inspectors will request additional information and revisions when there are deficiencies or errors in the applications and supporting information. Licences for factories associated with major projects are usually issued to companies contracted to provide explosives supply and related services. NRCan (Explosives Safety and Security Branch) will engage Indigenous groups once an application is received to determine if there are concerns, questions or requests for more information. If consultation on a licence is requested, NRCan will involve the licence applicant in the process. Although basic information about explosives manufacturing and storage facilities is provided and reviewed during impact assessment processes, licence applicants can provide more detailed information for consultation with Indigenous groups including construction plans and operating procedures for the safe and secure operation of explosives facilities.

NRCan issues factory licences (with or without a wash bay) within 60 days following receipt of a complete application or, for certificates and other licences, within 30 days.

20.3.2 Provincial Environmental Approvals

20.3.2.1 Provincial Environmental Assessment

The proposed mining project is listed in Section 2, Paragraph 22 of Part II of Schedule I of the Regulation respecting the environmental impact assessment and review of certain projects (c. Q-2, r. 23.1):

> "(2) the establishment of a mine whose maximum daily capacity for extracting any other metal ore is equal to or greater than 2,000 metric tons."

The construction of the TSF will also trigger Section 1 of Paragraph 2 of Part II of Schedule I of the Regulation respecting the environmental impact assessment and review of certain projects (c. Q-2, r. 23.1) regarding work in wetlands and bodies of water.

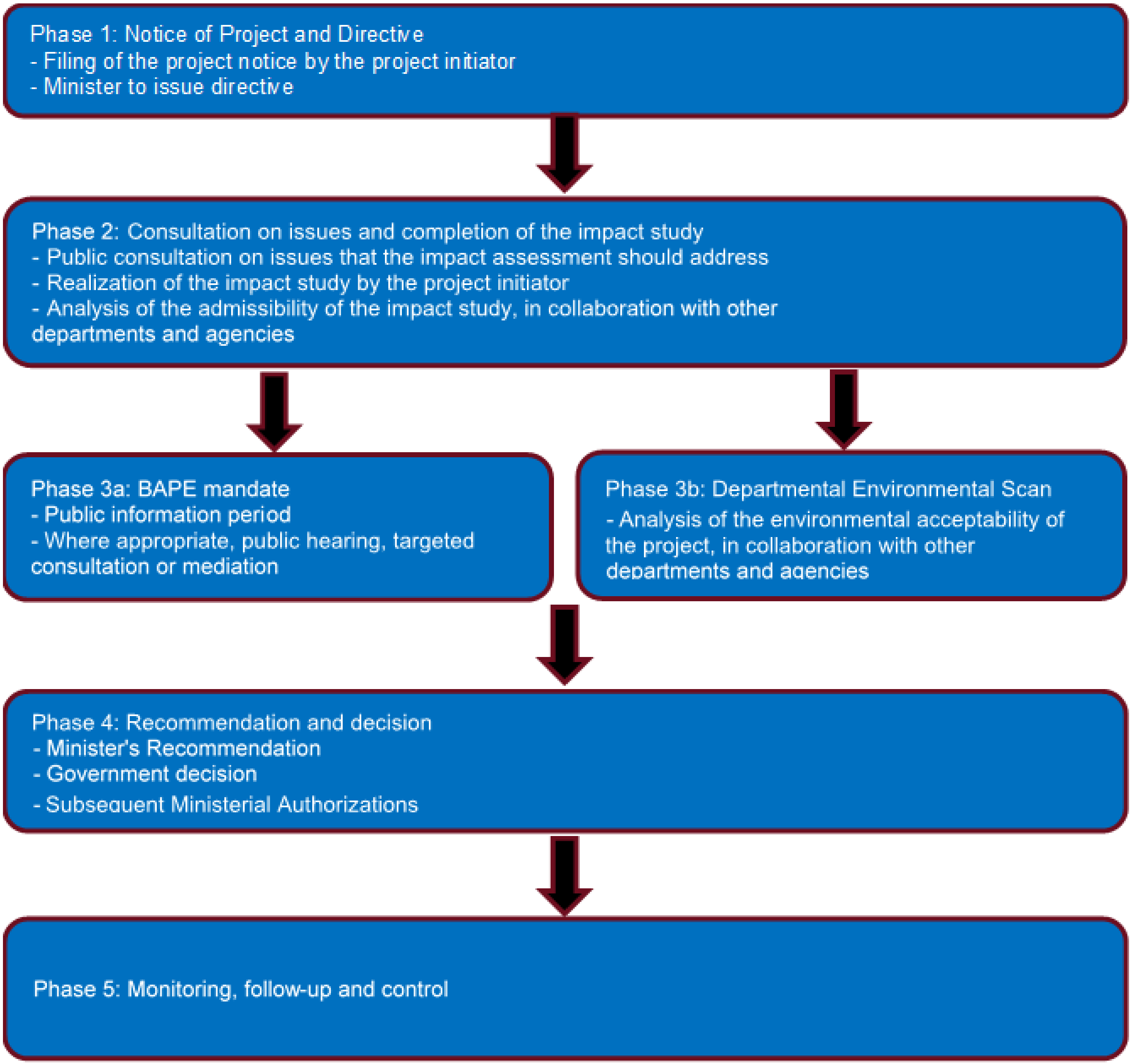
> "(1) dredging, clearing, filling, or levelling off work, for any purpose whatsoever, within the 2-year flood line of a river or lake, over a cumulative distance equal to or greater than 500 m or over a cumulative area equal to or greater than 5,000 m^2, for a same river or lake"

The projects listed in Schedule 1 are subject to the environmental impact assessment and review procedure provided for in Subdivision 4 of Division II of Chapter IV of title I of the Environmental Quality Act (c. Q-2), to the extent provided therein, and must obtained an authorization from the Government.

Following the environmental assessment procedure, the proponent will proceed to the authorization requests for the construction and the exploitation of the project with provincial and municipal authorities.

The Environmental Assessment and Review Process in Québec is summarized in Figure 20-6 and described in the following subsections.

Figure 20-6: The Environmental Impact Assessment and Review Process (EIARP)



Source: MEFCC Website, 2021

20.3.2.1.1 Phase 1 Project Notice and Directive

The initiator of a project notifies the Minister of the Environment and the Fight against Climate Change that he intends to carry out a project by submitting the project notice form.

The Minister then sends a directive specifying the elements that must be included in the Environmental Impact Study (EIS), in particular the context of the project, the public information and consultation process, the description of the project environment, the description of the project variants, the issues, the impact analysis, including the mitigation and compensation measures planned, the preliminary emergency measures plan and the preliminary environmental monitoring and follow-up programs.

20.3.2.1.2 Phase 2 Impact Assessment and Issues Consultation

The proponent conducts its EIS. After receiving the Minister's directive, he must publish a notice announcing the beginning of the environmental assessment of the project.

Following this publication in the Environmental Assessment Registry, any person, group or municipality may submit comments to the Minister on the issues that the impact study should address.

Following this consultation, the Minister transmits to the project proponent and publishes in the Environmental Assessment Registry the comments on the issues raised that are relevant enough to be taken into account in the impact study.

When EIS is filed, it is published in the Environmental Assessment Registry. The Ministry's specialists, in collaboration with those of the departments and agencies concerned, then verify whether the requirements of the directive have been met.

Following this verification, the Ministry may ask the proponent for clarification or additional information on the impact study.

20.3.2.1.3 Phase 3-a Mandate of the BAPE

This phase of the procedure is conducted by the *Bureau d'audiences publiques sur l'environnement* (BAPE). Once the impact study has been deemed admissible, the Minister informs the initiator, who must publish a notice announcing the beginning of the public information period in a daily or weekly newspaper distributed in the region where the project is likely to be carried out. At the same time, the initiator asks the BAPE to announce the beginning of the public information period in a press release. This period lasts 30 days.

It is during this public information period that a person, group, organization or municipality may request in writing that the Minister hold a public consultation or mediation on the project, giving the reasons for their request and their interest in the environment affected by the project. The BAPE makes a recommendation to the Minister on the type of mandate it should be given.

The Minister may, however, mandate the BAPE to hold a public hearing on a project without a prior information period or application, when the holding of such a hearing seems unavoidable due to the nature of the issues raised or when public concerns justify it.

The duration of a public hearing mandate is four months, three months for a focused consultation and two months for a mediation.

Following the public consultation or mediation, BAPE presents its findings and analysis in a report that it sends to the Minister. The latter makes the report public within fifteen days of receiving it.

20.3.2.1.4 Phase 3-b Departmental Environmental Analysis

The Ministry's specialists, in collaboration with those of the other departments and agencies concerned, analyze the project in order to advise the Minister on its environmental acceptability, on whether or not it should be carried out and, if so, on the conditions of authorization.

This analysis takes into account, among other things, the project's rationale, the issues at stake, the apprehended impacts on the receiving environment and the mitigation and compensation measures envisaged, if any.

20.3.2.1.5 Phase 4 Recommendation and decision

Based on the BAPE report (phase 3-a) and the environmental analysis report (phase 3-b), the Minister conducts his analysis and makes a recommendation to the government. The latter renders its decision by decree: it authorizes the project, with or without modifications and under the conditions it determines, or it refuses it. In addition, before the project is carried out, the initiator must submit plans and specifications in order to obtain authorization from the Ministry.

Figure 20-7 on the following page presents the timeline for the EIARP.

The EIARP takes between 13 and 18 months in Québec, following the submission of the EIS and excludes delays when additional information is to be provided by the proponent. Typically, a minimum of 12 months of baseline data is required, then the production of the EIS between 6 months and a year) followed by the EIARP and permitting.

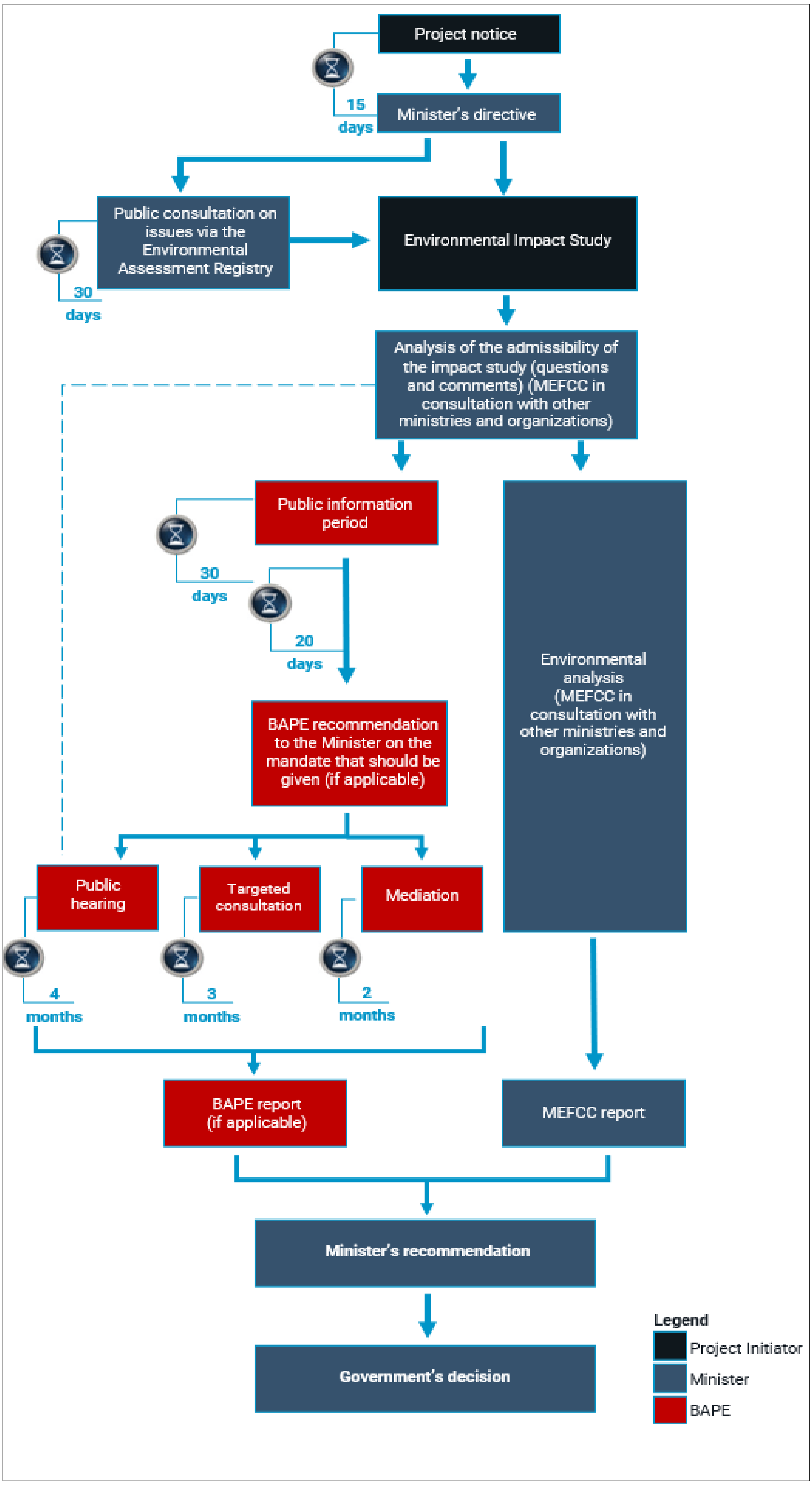
20.3.2.2 Provincial Permitting Requirements

A variety of other provincial and municipal permits will also be required depending on the final design of the mine project components. Table 20-3 presents the potential permits that will be required.

20.3.3 Federal-Provincial Harmonization

The Government of Canada is committed to the principle of one project, one assessment, for projects subject to the federal *Impact Assessment Act* and the review processes of one or more jurisdictions. For any project subject to a federal impact assessment, the IAA requires the Agency to develop an impact assessment cooperation plan that sets out how it will work with other jurisdictions. In this case, should a Federal IA also be triggered, it is believed that the Federal impact assessment process and the Provincial environmental impact assessment and review process will be conducted in compliance with IAA and EQA requirements. The Agency would cooperate with MELCC on information sharing. Wherever possible, information will be shared to optimize exchanges with the proponent and to promote public engagement in the assessment processes.

Figure 20-7: Québec EIARP Timeline



Source: MELCC Website, 2021

Table 20-3: Provincial Permits

Type	Authority	Document to be Filed	Regulatory Reference	Trigger Related to the Project
Government authorization	MELCC	Environmental impact statement prepared in accordance with specific guidelines issued by the MELCC	Environmental Quality Act (EQA), s. 31.1 Regulations for the assessment and review of the environmental impacts of certain projects	Establishment of a metalliferous mine with a daily capacity average extraction rate of 2,000 t/d or more.
Specific authorization to erect or modify a structure, undertake the operation of an industry, carry out an activity or use an industrial process that could affect the quality of the environment	MELCC Regional Management	Application for authorization	EQA, s. 22; EQA, r. 3; Directive 019 on the mining industry	The operation of a mine and the use of an industrial process (ore processing plant) are industrial activities that can modify the quality of the environment.
Authorization to establish a water supply intake	MELCC Regional Management	Application for authorization	EQA, s.32; Directive 019 on the mining industry	The project requires the establishment of a water supply intake.
Specific authorization to erect or alter a structure, undertake the operation of an industry, carry on an activity or use an industrial process that may affect a watercourse, lake or wetland	MELCC Regional Management	Application for authorization Compensation plan for the impairment of target environments	EQA, s. 22; EQA, r.9.1; EQA, r. 35	Project activities, infrastructure and facilities will affect wetlands and water bodies.
Authorization for devices or equipment intended to prevent, reduce or stop the release of contaminants into the atmosphere	MELCC Regional Management	Application for authorization	EQA, s. 22	The project will involve the use of devices and equipment to prevent, reduce or stop the release of contaminants into the atmosphere (e.g., dust collectors). The instrumentation and process detail plans (P&ID) will be defined in a later stage.
Industrial sanitation certificate	MELCC Regional Management	Application for Certification	EQA, s. 31.28; Certification Regulations of sanitation in an industrial environment	Threshold: annual ore extraction capacity exceeding 2,000,000 t per year or annual ore or tailings processing capacity exceeding 50,000 t per year.
Emissions Report		Report	Regulations for the mandatory reporting of certain airborne contaminant emissions.	Any operator that emits to the atmosphere a contaminant listed in Part I of Schedule A in a quantity that meets or exceeds the reporting threshold listed in that Schedule for that contaminant or class of contaminants.
Authorization or permit for any activity involving the withdrawal of groundwater or surface water (dewatering, keeping dry, water supply, etc.)	MELCC Regional Management	Application for authorization	EQA, s. 31.75; EQA, r.35.2; Water Withdrawal and Protection Regulation	Threshold: 75,000 L per day (75 m3/d)
Authorization to carry out an activity likely to modify wildlife habitat	Ministry of Forests, Wildlife and Parks	Application for authorization	Wildlife Conservation and Enhancement Act, s. 128.7; Wildlife Habitat Regulations	The presence of wildlife habitat as defined in the Regulations in the project area was confirmed (fish habitat).
Intervention permit for the cutting of wood for the purpose of carrying out certain mining activities	Ministry of Forests, Wildlife and Parks	Application for a permit	Sustainable Forest Development Act (SFDA), s. 73; Regulation on the sustainable management of forests in the domain of the State	The project requires deforestation.
Authorization to construct or improve a multipurpose road	Ministry of Forests, Wildlife and Parks	Application for a permit	Sustainable Forest Development Act (SFDA, s. 41); Regulation on the sustainable management of forests in the domain of the State	The project requires the construction or improvement of a multi-use road.
Permits for construction and site development	City of Rouyn-Noranda	Application for a permit	Regulation No. 2015-847, s. 46 of c. 4	The project requires the construction of buildings and infrastructure.
Mining lease	MENR	Lease application	Mining Act (MA), s. 100; Mineral Substances (Other than Petroleum, Natural Gas and Brine) Regulations, s. 38	Any person who mines mineral substances, except for surface mineral substances, petroleum, natural gas and brine, shall have previously entered into a mining lease with the Minister.
Approval of the tailings site (waste rock and tailings facility) and the mill site	MERN	Application for approval	SI, ss. 240 and 241 Mineral Substances (Other than Petroleum, Natural Gas and Brine) Regulations, s. 124	The project includes the development of tailings storage areas and a mill.

Type	Authority	Document to be Filed	Regulatory Reference	Trigger Related to the Project
Redevelopment and Restoration Plan Approval	MERN	Application for approval	SI, ss. 232.1 and 232.2; Mineral Substances Regulation other than oil, natural gas and brine, s.109	Must submit a redevelopment and restoration plan to the Minister's approval, projects involving: — any activity related to the extraction of ore or tailings carried out in open air or underground, — processing of ore or tailings; — the development of accumulation areas
Authorization to use public land	MERN	Request for authorization	Law on the Lands of the State Domain, art. 47; Regulation respecting the sale, lease and grant of interests in real property on Crown lands, s. 35	A private use lease is required for areas where surface infrastructures will be built. A specific lease is required for the establishment of a park for to receive the mine tailings.
Explosives permit, including a general permit, permit of deposit and transport permit	Sûreté du Québec	Application for a permit	Explosives Act, s. 2-6	The project requires the installation of a powder magazine, the use and transportation of explosives.
Authorization for road construction if less than 60 m from a watercourse if more than 300 m long	MELCC Regional Management	Application for authorization	EQA, s. 22; Regulations for the application of the LQE	At this time, the project does not include the construction of roads to within 60 m of a watercourse over 300 m in length.

20.4 Social Considerations

20.4.1 Québec Public Participation Guidelines

Within the framework of the Environmental Impact Assessment and Review Procedure (EIARP) in Southern Québec, various mechanisms have been set up to promote public participation and the consideration of public concerns regarding projects likely to have impacts on the physical, biological and human environments. Public participation allows for better identification of project issues and ensures informed decision-making by government. It is possible to obtain information and express a point of view on a project during these phases of the EIARP:

- consultation on the issues that the impact statement should address
- public information period
- public hearing, mediation or targeted consultation

20.4.1.1 Consultation on Issues that the Impact Statement should Address

While increasing the opportunities for public participation in the EIARP, this consultation encourages proponents to take into account the issues considered by the public from the earliest stages of their projects' development. As mentioned in Section 31.3.1 of the *Environmental Quality Act*, any person, group or municipality may submit to the Minister, in writing and within the prescribed time limit, their observations on the issues that the impact study should address. Following this consultation, the Minister communicates to the project proponent the observations on the issues raised that are relevant enough to be taken into account in the impact study and publishes them in the Environmental Assessment Registry.

This electronic consultation is carried out in the Environmental Assessment Registry by means of a form to be completed. Only the comments transmitted through the form will be taken into consideration by the Minister. The duration of this consultation is 30 days. Specific start and end dates for consultation on projects at this stage of the EIARP are listed on the Registry. Comments received after the deadline will not be considered by the Minister.

Comments received during this consultation must identify issues related to the project and the host environment. An issue is a major concern for the government, the scientific community or the population, including the First Nations communities concerned, and whose analysis could influence the government's decision as to whether or not to authorize a project. Each participant is responsible for his or her comments and the accuracy of his or her statements. Only relevant comments from a valid email address may be made public. In addition, the participant may suggest references to the project initiator, but no documents may be attached to the form. Finally, forms that are submitted without being completed will not be considered.

The Minister will publish the relevant comments on the issues that the impact statement should address in their entirety, without correction, in the Environmental Assessment Registry. This information will also be provided to the project proponent. However, the Minister retains the right to remove any comment that contains: abusive, defamatory, discriminatory, rude, crude or offensive commercial or promotional purposes irrelevant confusing or unclear.

20.4.1.2 Public Information Period

When the impact study is deemed admissible, the Minister mandates the *Bureau d'audiences publiques sur l'environnemen*t (BAPE) to hold a public information period. This period lasts 30 days. During this period, documentation on the project is deposited in the consultation centers in the region affected by the project (e.g., municipal library). It is also published on the BAPE website and in the Environmental Assessment Registry. The contact information for the consultation centers is disseminated in press releases, public notices, posters and on Twitter.

The BAPE holds an information session to which the citizens of the area affected by the implementation of a project are invited. At this session, the BAPE explains the EIARP, its role and its mandates, the initiator presents his project and citizens can ask questions.

It is during this 30-day period that a person, group, organization or municipality may request in writing that the Minister hold a public consultation or mediation on the project, stating the reasons for their request and their interest in the environment affected by the project. These requests are deemed confidential until the first public consultation or mediation session is held. They will then be accessible on the BAPE website and on the Environmental Assessment Registry.

Once the public information period is over, the BAPE prepares a report that it sends to the Minister. This report is added to the documentation available to the public on the BAPE website.

The list of projects that are currently the subject of a mandate for a public information period can be consulted on the BAPE website and in the Environmental Assessment Registry

20.4.1.3 Public Inquiry and Hearing, Mediation, or Targeted Consultation

20.4.1.3.1 Inquiry and Public Hearing

When BAPE is mandated to hold an inquiry and a public hearing, its president forms a commission of inquiry composed of one or more commissioners. The public hearing consists of two parts. The first part allows citizens and the commission of inquiry to learn about all aspects and issues of the project. The second part allows the population to express its opinions and concerns. Any citizen can attend the entire hearing. Both parts take place in the project's host community. The BAPE may also use technological means to facilitate public participation.

A minimum period of 21 days elapses between the end of the first part and the beginning of the second part of the public hearing. This period allows citizens to review the documentation filed during the first part of the hearing, to prepare their brief or oral presentation and to notify the commission's secretariat of their intention to submit a brief during the second part of the hearing.

20.4.1.3.2 Mediation

In certain cases, when the Minister deems that the subject matter of the requests for public hearings is appropriate, he may also give BAPE a mediation mandate. This option is preferred when there are few applicants, when the issues raised are limited to nuisance and cohabitation issues and when the justification for the project is not in question.

Mediation is a two-month conflict resolution process based on negotiation that seeks to bring the parties together. In the context of the EIARP, this process can be advantageous when the disputes seem to be satisfactorily resolved by reconciling the interests of the project initiator and those of the applicants.

20.4.1.3.3 Targeted Consultation

The Minister may give BAPE the mandate to hold a targeted consultation if he deems that the nature of the concerns raised justifies it. This approach is preferred when the issues raised by the applications are limited to a small number of concerns and the justification of the project is not questioned.

This type of mandate, which lasts three months, makes it possible to address specific concerns and can be carried out with certain stakeholders in particular (individuals, groups, organizations or municipalities). Unlike the public hearing, the targeted consultation consists of a single part, which combines the questioning of participants on the project and the presentation of opinions and briefs. Any citizen can attend the public sessions held in the project's host community. BAPE may also use technological means to facilitate public participation.

20.4.1.3.4 BAPE Reporting

At the end of each mandate, the BAPE reports to the Minister on its findings and the analysis it has made, within the timeframe prescribed by the Regulation respecting environmental impact assessment and review. From the moment the BAPE submits its report to the Minister, the latter has fifteen days to ask the BAPE to make the report public and to make it public.

The list of projects that are currently the subject of an inquiry and public hearing, mediation or targeted consultation mandate can be consulted on the BAPE website and in the Environmental Assessment Registry.

20.4.2 Québec First Nations Engagement and Consultation

Other than what is described in the above section, the proponent must give priority to the implementation of specific approaches with the First Nations communities concerned and, to the extent possible, mutually agreed upon with these communities.

In all cases, the proponent’s approaches shall remain distinct from the consultations that the Ministry may conduct with First Nations as part of the EIARP.

It should be remembered that the obligation to consult and, if applicable, to accommodation of First Nations communities, which stems from the decisions of the Supreme Court of Canada, is incumbent upon the Government of Québec. In this context, the steps taken by the proponent with First Nations communities will not relieve the government of its consultation obligations.

The following Guide provides guidelines for First Nations engagement around mining projects: *“Document d’information à l’intention des promoteurs et introduction générale aux relations avec les communautés autochtones dans le cadre de projets de mise en valeur des ressources naturelles*, Gouvernement du Québec, 2015.”

20.4.3 Federal Consultation and Engagement

During the planning phase of the federal EA process, both a Public Participation Plan and a First Nations Consultation and Engagement Plan would be produced by the Agency.

The Public Participation Plan explains how to participate in the impact assessment process and provide input. The Agency has the following public participation objectives:

- Members of the public who wish to participate in the impact assessment have the opportunity to do so in an informed manner, with the necessary information.
- The Agency wishes to put in place conditions conducive to the participation of a range of people, including youth, women, seniors and groups with diverse identity profiles.
- The public participates from the outset. Its participation continues on a regular and frequent basis, at each key stage of the process.
- The public participates in the development of key documents, including the Public Participation Plan, the Tailored Impact Statement Guidelines, the proponent's Impact Statement, the Impact Assessment Report and potential conditions.
- Engagement opportunities and mechanisms, selected according to identified needs and interests, include public comment periods, in-person activities and virtual information sessions at key stages of the process.
- Comments received can be found on the Canadian Impact Assessment Registry (the Registry).
- The Agency informs the proponent about the concerns raised by the stakeholders.
- Public views heard throughout the process are documented and inform decision-making.

20.4.4 Federal Indigenous Engagement and Participation Plan

Several Indigenous peoples have established or have potential Aboriginal or Treaty rights in the project's study area. The Government of Canada has the obligation to consult and, if applicable, accommodate Indigenous peoples and communities when contemplating actions that may adversely affect established or potential Aboriginal and treaty rights.

The Indigenous Engagement and Partnership Plan (the Plan) that is prepared by the Agency for the project, would outline opportunities and methods to ensure that meaningful consultations are conducted by the Agency with potentially affected Indigenous peoples. Meaningful consultations are to be conducted throughout the project's impact assessment process, in the spirit of reconciliation towards a renewed nation-to-nation relationship and in accordance with the principles respecting the Government of Canada's relationship with Indigenous peoples.

The project's Indigenous Engagement and Partnership Plan addresses the following:

- the consultation process through which the Agency aims to secure the free, prior and informed consent of Indigenous peoples, among others by collaboratively identifying mitigation measures, complementary measures and accommodation measures to be implemented in order to avoid, minimize, or compensate for potential adverse impacts that may result from the proposed project
- consultation with the Crown on the potential positive and adverse effects (direct and indirect) of the project and the adverse impacts of the project on the rights of the Indigenous peoples of Canada, recognized and affirmed in Section 35 of the *Constitution Act*, 1982 (Section 35 rights)

- engagement of Indigenous peoples regarding Indigenous knowledge and how it can inform the consideration of potential project effects and impacts on the exercise of Aboriginal and treaty rights
- engagement with Indigenous peoples to determine cultural considerations and customs that should be taken into account in project decision-making
- engagement with Indigenous peoples in order to encourage the participation of different subgroups of the population, including women, youth and elders, and to produce disaggregated data
- engagement with Indigenous peoples throughout the impact assessment process, including opportunities to provide comments on key documents and the broader consultation and engagement processes
- engagement with Indigenous peoples to account for the concerns raised regarding the potential effects
- opportunities for cooperation with Indigenous peoples, particularly those who show an interest in parts of the impact assessment
- recognition of the importance of the proponent obtaining the consent of the communities affected by its project before proceeding
- recognition that the impacts of the project will need to be appropriately accommodated before the project is approved
- communication of important information throughout the process, with each community individually
- alignment of federal and provincial processes, as much as possible, to avoid consultation fatigue
- access to all documentation produced by the proponent in both official languages, including technical documents
- access to adequate financial support to enable meaningful participation in the impact assessment process
- for some communities, the own carrying out of the impact assessment that concerns them in order to make more use of their knowledge and understanding of their own realities
- for some communities, the development of an individualized consultation plan

With respect to Crown consultation in relation to the impact assessment of the project, the Agency presents a list of Indigenous peoples for whom the project may adversely affect the exercise of Aboriginal and treaty rights recognized and affirmed by Section 35 of the *Constitution Act*, 1982. While impact assessment is not a rights-determination process, the Crown will consult with the Indigenous peoples listed in the Plan to understand concerns and potential adverse impacts of the project on their exercise of Aboriginal and treaty rights and, where appropriate, accommodate them. These consultations will also form an integral part of the work that will support the assessment of the project.

20.4.5 Consultation and Engagement Activities Completed

Lomiko has started consultation activities with local government stakeholders in July and August 2021. The first open house meeting with the community is planned for September 25, 2021.

21 CAPITAL AND OPERATING COSTS

21.1 Introduction

This chapter provides an overview of the capital and operating cost estimates for open pit mining of the Battery and Electric Vehicle (EV) deposits, as well as the construction of a process plant, waste rock facility (WRF) and co-disposal storage facility (CDSF), and associated infrastructure. According to the PEA design, it is expected that the process plant would have an average capacity of 4,110 t/d (1.5 Mt/a) and the mine will have a life of 14.7 years.

Unless otherwise stated, all costs presented in this chapter are in Q2 2021 Canadian dollars (CAD or C$).

21.2 Capital Costs

21.2.1 Overview

The estimate was developed using Ausenco's in-house database of projects and studies, as well as experience from similar operations. The capital cost estimate conforms to Class 5 guidelines for a preliminary economic assessment with a ±50% accuracy according to the Association for the Advancement of Cost Engineering International (AACE international).

Table 21-1 on the following page provides a summary of the estimate for overall capital cost. The estimate includes costs for mining, on-site infrastructure, process plant, off-site infrastructure, project indirects, project delivery, and Owners' costs. The total initial capital cost is estimated to be C$236.14 million.

21.2.2 Basis of Estimate

The estimate is based on an engineering, procurement, and construction management (EPCM) execution approach. The following information pertains to the estimate:

- Cost estimates are based on Q2 2021 pricing without allowances for inflation.
- The estimate is expressed in Canadian dollars (C$ or CAD).
- For material sourced in US dollars, an exchange rate of 1.33 Canadian dollar per US dollar was assumed.
- The estimate accuracy is ±50%.

Table 21-2 provides an overview of the capital cost estimate basis for the AACE Class 5 PEA.

Table 21-1: Overall Project Capital Cost Summary

Description	Cost (C$M)
Area 1000 – Mining	29.42
Mine Roads and Clearing	1.68
Mine Pre-Production	9.87
Support and Supplies	2.42
Mining and Ancillary Equipment	15.45
Area 2000 – On-Site Infrastructure	28.89
Bulk Earthworks	5.32
Power Supply	7.12
Mobile Maintenance Equipment	1.50
Non-Process Buildings	3.65
Site Water Services	1.36
Site Water Management	4.33
Waste Disposal Facility	5.61
Area 3000 – Process Plant	79.12
Crushing	2.27
Stockpiling & Reclaim	3.68
Grinding and Rougher Flotation	39.62
Coarse Cleaner Flotation	5.38
+80 Mesh Flotation	2.39
-80 Mesh Flotation	4.01
Concentrate Drying and Packaging	8.49
Tailings Area	12.97
Plant Services (Air, Water, Gas Services)	0.31
Area 4000 – Off-Site Infrastructure	6.81
Main Access Road	0.48
High-Voltage Power Supply	6.33
Area 5000 – Project Indirects	16.17
Temporary Construction Facilities/Services	10.00
Commissioning Reps and Assistance	0.75
Spares	1.36
First Fills & Initial Charges	1.36
Freight and Logistics	2.71
Area 6000 – Project Delivery	25.24
Area 7000 – Owners' Costs	14.42
Area 8000 – Provisions	36.06
Contingency	36.06
Total	**236.14**

Table 21-2: Summary of Capital Cost Estimate Basis

Estimate Classification and Industry Comparison	Description
AACE Classification	Class 5
Independent Projects Analysis (IPA) Front-End Loading (FEL) Index	FEL1
Scope Definition Stage	Conceptual
Methodology	Equipment factored from recent similar quotes calculated at WBS Level 1. Additional work packages benchmarked or factored.
Level of Engineering Definition	0% to 5%
Level of Total Contingency	30% to 45%
Predicted Accuracy Range	+20% to +50%
General Project Definition	
Location	Assumed
Scope of Work	General
Facility Breakdown Structure	Outline
Maps and Surveys	None
Soil Tests and Geotechnical	Assumed
Site Visits	None
Constructability Issues	None
Construction Site Agreement	None
Delivery Strategy	
Process	
Plant Capacity	Defined
Metallurgical Testwork	Preliminary engineering and flowsheet testwork
Pilot Plant	Where new technology is being considered
Control Philosophy	None
Energy and Material Balance	Estimated
P&IDs	None
Block Flow Diagrams (BFDs)	Preliminary
Process Flow Diagrams (PFDs)	
Definition	
Plot Plans	None
Process	BFD
GA Drawing by Area/Facility	Sketch/ None
Equipment List	Assumed – major equipment only
Motor List	Preliminary sizing
GA – Mechanical	None
Mechanical/Piping Drawings	Single line
Civil/Structural Drawings	None
Electrical Single Line Drawings	None
Electrical Drawings	None
Design Criteria	Outlined
Specifications/Data Sheets	
Capital Cost Estimate	
Infrastructure Costs: Power, Water, Roads	Investigated
Vendor Selection	None
Mechanical Equipment	Factored pricing based on recent and historical budget quotes
Electrical Equipment	Benchmark project factored
Electrical Bulks	Benchmark project factored
Civil Work	Benchmark project factored
Structural Work	Benchmark project factored
Piping and Instrumentation	Benchmark project factored
Installation Labour	Factored
Indirect Costs WBS 5000	% of total
Project Delivery (includes EPCM) - WBS 6000	Factored off direct cost or TIC
Owner's Costs - WBS 7000	Factored off direct cost or TIC
Contingency - WBS 8000	Factored off direct cost or TIC
Inflation/Escalation	None

21.2.3 Mine Capital Costs

The following key assumptions were made during development of the capital cost estimate:

- The capital estimate is based on a self-perform construction strategy.
- Open pit mining activities will be self-performed. The Owner's team will immediately start with mine development activities at Year -1.
- Surface construction (including earthworks) activities will be self-performed, except for specific scopes of work that require contractors to be hired

The open pit mine capital cost estimate is mainly developed from first principles, determining quantities, and applying unit pricing. Unit pricing information is derived from in-house databases as well as vendor quotations for major items.

The mining operation has been estimated on the basis of an initial phase of development where the starter pit is prepared for production. This includes clearing the mine area and transporting topsoil to the topsoil stockpile, transporting the initial overburden material to a stockpile, and the waste rock to create stockpile areas. The mine development cost includes all necessary mine and service equipment, supply of explosives and blasting,

A mine road will be required during the pre-production phase to deliver overburden and waste material to the disposal area and to stockpile mill feed adjacent to the crusher site. The road will be constructed along the south side of the future co-disposal area and will extend to the starter pit top bench. Approximately 1.5 kilometers of mine roads will be required during this initial phase.

21.2.3.1 Mining Equipment

The procurement of open pit mining equipment assumes the equipment will be purchased with no leasing arrangements (see Table 21-3 on the following page). Capital leasing will lower the initial capital costs by deferring the equipment purchase costs over time, although the interest will increase the total cost for the unit.

21.2.3.2 Initial Mine Development

The details for the open pit mine development activities are shown in Table 21-4. This includes capitalized pre-stripping undertaken in Year -1, and well as the construction of haul roads, topsoil recovery, stockpile preparation, and water control. Some earthworks are deferred into production Year 1 and are therefore not part of the initial capital cost.

The mine pre-stripping activity will be undertaken in Year -1 by the mine fleet. The costs for this activity are estimated in the operating cost model; however, those costs are allocated to pre-production capital. Some of the materials pre-stripped from the open pit will be used in various construction activities across the site, so the cost to deliver this material to the final destination is included in the mining cost. Any specific costs needed for special processing or placement, however, are not included in the mining cost.

Table 21-3: Overview of Mining Equipment Costs

Description	Cost (C$M)
Drilling / Production and Grade Control	$2.50
Drill, Tracked, 115 to 140 mm	
Drill, Tracked, 144 mm	
Loading	$1.30
Hydraulic Excavator, 4.5 m^3 bucket	
Hauling	$3.30
Hauler, 64-t payload	
Road Maintenance	$2.80
Motor Grader, 4.3 m blade	
Water/Gravel Truck	
Primary Pit Support	$2.53
Track Dozer, 233 kW	
Wheel Loader, 4.5 m^3 bucket	
Hydraulic Excavator, 3 m^3 bucket	
Fuel/Lube Truck	
Secondary Pit Support	$1.49
Transit - Shuttle Van	
Pickup Trucks	
Light Plants	
Water Pumps, 150 m^3/h	
Dump Truck	
Emergency Response Vehicle	
Flatbed Picker Truck	
Maintenance	$1.54
Maintenance Trucks	
Mobile 30-t Crane	
55-ton Float Trailer	
Forklift and Tire Handler	
Mobile Steam Cleaner	
Total	$15.45

Table 21-4: Open Pit Development

Activity	Cost (C$k)
Clearing and Grubbing	480
Haul Road Construction (1.5 km)	1,200
Direct Mining including General Mine Expense (GME)	9,870
Total	11,550

21.2.3.3 Supplies and Inventory

Inventory for start-up and other services are estimated to be C$2.4 million. The items included are listed below:

- fuel/lube and tire initial inventory
- communication system (inclusion for plant and general site radios)
- survey GPS system and survey supplies (includes GEMS)
- software license
- maintenance tools and initial supplies
- mine rescue and safety supplies
- explosives magazines
- spare parts inventory

21.2.4 Process Capital Costs

Direct costs include all contractors' direct and indirect labour, permanent equipment, materials, freight, and mobile equipment associated with the physical construction of the areas. The process plant daily throughput is 4,110 t/d.

21.2.4.1 Direct Costs

The definition of process equipment requirements was based on conceptual process flowsheets and process design criteria (refer to Chapter 17). Each major process area has been built up with costs by separately addressing the following disciplines:

- Concrete
- Structural steel
- Architectural and unit building
- Mechanical platework and tanks
- Mechanical equipment
- Piping
- Electrical equipment
- Conduit and cable tray

- Wire and cable
- Instrumentation

Mechanical equipment supply costs were based on recent and historical budget quotes from similar projects, adjusted to reflect the La Loutre project sizing. The materials and equipment total direct costs for other disciplines were developed based on a combination of preliminary material take-offs and by applying benchmarked factors (percentages) to the total direct cost (supply and install) of the mechanical equipment. The factors are based on Ausenco's historical data for similar type work and are specific to both discipline and area.

The overall process plant area costs by discipline are presented in Table 21-5.

Table 21-5: Process Plant Total Initial Capital Cost by Discipline

Discipline	Initial Capital (C$M)	% of Mechanical Equipment Total Direct Cost
Concrete	8.37	27%
Structural Steel	3.78	12%
Architectural and Unit Building	11.11	36%
Mechanical Platework and Tanks	6.20	20%
Mechanical Equipment	30.51	100%
Piping	4.47	15%
Electrical Equipment	8.53	28%
Conduit and Cable Tray	1.53	5%
Wire and Cable	1.53	5%
Instrumentation	3.10	10%

Building (inclusive of HVAC and lighting) supply costs were based on preliminary MTOs and on recent and historical budget quotes from similar projects and scaled to reflect the La Loutre project sizing. Building costs are presented in Table 21-6.

Table 21-6: Process Plant Building Costs

Area Description	Building Description	Building Type	Initial Capital (C$M)
Crushing	Crushing	Pre-Engineered	0.42
Stockpiling & Reclaim	Stockpile and Reclaim	Fabric	1.26
Grinding	Grinding	Pre-Engineered	4.01
Coarse Cleaner Flotation	Flotation	Pre-Engineered	2.33
Concentrate Drying and Packaging	Concentrate Drying	Pre-Engineered	2.33
Tailings Area	Tailings	Pre-Engineered	0.77

21.2.5 Other Costs

Other costs are summarized in Table 21-7 and described in the following sections.

Table 21-7: Process Plant Other Costs Summary

Description	Initial (C$M)
Project Indirects	16.17
Project Delivery	25.24
Provisions (Contingency)	14.42
Owners' Costs	36.06
Total Other Capital Costs	91.90

21.2.5.1 Project Indirects

Indirect costs are those that are required during the project delivery period to enable and support the construction activities. Indirect costs include the following:

- temporary construction facilities and services
- commissioning reps and assistance
- spares (commissioning, initial and insurance)
- first fills and initial charges
- freight and logistics

21.2.5.2 Project Delivery

Project delivery costs include the following:

- Engineering, procurement and construction management services (EPCM)
- environment services and permitting
- commissioning services

The project delivery costs have been based on Ausenco's similar past project costs and have been included at a rate of 17.5% of the total direct cost.

21.2.5.3 Contingency

Contingency is included to address anticipated fluctuations between the estimated and actual costs of materials and equipment. The level of contingency is determined from total installed costs based on each area's level of uncertainty. The amount of risk was assessed with consideration of the preliminary level of design work, and the manner in which pricing was derived. A contingency of 25% was nominated in line with the risk of the project.

The contingency does not allow for the following:

- abnormal weather conditions
- changes to market conditions affecting the cost of labour or material
- changes of scope within the general production and operating parameters
- effects of industrial disputes
- financial modelling
- technical engineering refinement
- estimate inaccuracy

21.2.6 Infrastructure Capital Costs

Bulk earthworks for the plant site, mine ancillary buildings, waste rock facility (WRF) and co-disposal storage facility (CDSF) and water management infrastructure were developed based on semi-detailed cut and fill volumes based on site layout and site topographical information. Unit rates were benchmarked based on recent projects within the region.

On-site infrastructure costs were developed based on an in-house database of costs and include the following:

- process plant buildings including workshop and laboratory
- ancillary buildings including warehousing, administration and gatehouse
- potable water treatment and sewage treatment systems
- waste disposal facilities
- an allowance for high-voltage powerline tie-in and substation

Off-site infrastructure includes:

- 25 km long high-voltage overhead power line
- main access road earthworks

In total, infrastructure capital costs are estimated at C$35.70 million.

21.2.7 Owner (Corporate) Capital Costs

Owner's costs have been estimated as 10% of the total direct costs based on Ausenco's historical project costs of similar nature. These costs include the following:

- project staffing and expenses
- pre-production labour
- home office project management
- home office financial, legal, and insurance

21.2.8 Sustaining Capital

Mine equipment capital expenditures incurred after Year -1 are considered sustaining capital costs and are detailed in Table 21-8. The majority of the sustaining capital cost consists of additional mining equipment in the first five years and replacement in subsequent years. These sustaining costs amount to C$24.1 million.

Table 21-8: Mine Sustaining Capital

Type of Equipment	Year						
	1	2	3	4	5	6 - 10	11 - 15
Primary Equipment	6.35	1.10	2.20	-	-	2.60	1.40
Secondary Equipment	1.00	-	-	-	-	4.10	4.50
Ancillary Equipment	-	-	-	-	-	0.80	-
Total (C$M)	7.35	1.10	2.20	0.00	0.00	7.50	5.90

Sustaining costs for the waste disposal facility (WDF) have also been estimated. A total of C$13.7 million, as outlined in Table 21-9, is required as sustaining capital throughout the life-of-mine for the management of the WDF.

Table 21-9: Waste Disposal Facility Sustaining Capital

	Year															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cost ($CM)	2.3	1.6	1.6	1.6	1.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

21.2.9 Closure Costs

Closure costs for the La Loutre Project are estimated at C$5.64 million. This cost was benchmarked against recent similar projects in the province.

21.3 Operating Costs

21.3.1 Overview

The operating cost estimate is presented in Q2 2021 Canadian dollars (CAD or C$). The estimate includes mining, processing, and general and administration (G&A) costs.

The operating cost estimates for the life of mine are provided in Table 21-10. Mining costs are not included in this summary and are outlined in Section 21.3.3.

Table 21-10: Average Annual Operating Cost Summary

Description	C$M/a	C$/t Processed
Labour	5.23	3.48
Power	2.37	1.58
Reagents	1.72	1.15
Comminution Consumables	2.68	1.79
Maintenance	1.17	0.78
Lab Services	1.05	0.70
Mobile Equipment	0.76	0.51
Co-disposal Mobile Equipment	2.79	1.85
General & Administrative	3.56	2.37
Total	21.33	14.22

21.3.2 Basis of Estimate

Common to all operating cost estimates are the following assumptions:

- Cost estimates are based on Q2 2021 pricing without allowances for inflation.
- Costs are expressed in Canadian dollars (CAD or C$)
- For material sourced in US dollars, an exchange rate of 1.33 Canadian dollar per US dollar was assumed.
- The majority of the labour requirement is assumed to come from neighbouring municipalities.
- Processing unit operations were benchmarked against similar or comparable processing plants.
- Equipment and materials will be purchased as new.

- Grinding media consumption rates have been estimated based on the material characteristics.
- Reagent consumption rates have been estimated based on the metallurgical testwork.
- The mobile equipment cost provides for fuel and maintenance.

21.3.3 Mine Operating Costs

The mine operating costs are estimated from first principles for all mine activities. Equipment hours required to meet the production needs of the life of mine plan are based on productivity factors or equipment simulations. Each piece of equipment has an hourly operating cost that includes operating and maintenance labour, fuel and lube, maintenance parts, tires (if required) and ground-engaging tools (if required). Table 21-11 presents the breakdown of mining costs by activity.

Table 21-11: Mining Costs by Activity

Mining Category	Unit Cost ($/t processed)	Total Cost ($M)	Y01	Y02	Y03	Y04	Y05	Y06	Y07	Y08	Y09	Y10	Y11	Y12	Y13	Y14	Y15
Drilling	2.11	46.15	3.33	3.95	4.26	3.73	3.57	3.36	3.12	3.33	3.23	3.30	3.31	2.34	2.05	1.70	1.56
Blasting	2.96	64.77	5.11	5.72	5.90	5.35	5.05	4.39	4.56	4.69	4.40	4.68	4.69	2.90	2.90	2.45	2.02
Loading	1.53	33.38	2.38	2.92	2.68	2.94	2.49	2.56	2.23	2.55	2.07	2.79	2.14	1.62	1.33	1.68	1.01
Hauling	4.79	104.85	5.67	7.86	9.46	9.38	10.25	7.50	7.16	8.54	7.70	7.77	6.40	4.37	4.67	4.63	3.50
Pit support	1.60	35.20	2.41	2.78	2.80	3.12	2.36	2.41	2.52	2.28	2.77	2.40	2.39	1.63	1.85	1.60	1.72
Site Work*	0.29	6.31	0.72	0.64	0.59	0.34	0.40	0.85	0.36	0.37	0.68	0.43	0.19	-	-	-	-
Mine Operations GME	1.26	27.51	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.99	1.39	1.39	1.39	1.39
Mine Maintenance GME	0.47	10.25	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Technical Services GME	1.40	30.98	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04	2.04
Total Cost	16.40	359.40	24.34	28.59	30.41	29.57	28.84	25.78	24.65	26.47	25.56	26.09	23.84	16.98	16.91	16.17	13.91

Note: Site work includes clearing and grubbing, additional haul road construction, and on-going reclamation.

The average mining cost for material tonnes mined during operations is estimated at C$3.31/t including re-handling costs. The mining costs are lower than average during the first eight years and increase with increased haulage distances and pit deepening in the later years. This operating cost estimate includes major equipment repairs that are not treated as sustaining capital.

21.3.3.1.1 Labour Cost

Staffing was estimated by benchmarking against similar projects with comparable unit processes. A burden of 31% was applied to all rates. The total salaried labour averages 34 employees, as shown in the organizational roster outlining the mine operations salaried labour requirements in Table 21-12 (note: loaded salaries include burden). This roster does not include general and administrative positions (see Section 21.3.5). Salaries and wages are based on other Canadian operations and expected local industrial rates.

Table 21-12: Salaried Mine Operations Staffing

Position	Employees	Loaded Salaries(C$/a)
Mine Superintendent	1	196,500
Clerks	1	65,500
Mine General Foreman	1	144,100
Mine Supervisors	4	111,350
Trainers	2	91,700
TMF / Pit Labourer / Field Sampler	8	94,975
Mine Operations	17	1,794,700
Mine Maintenance Superintendent	1	183,400
Maintenance Administrator	1	65,500
Maintenance Planner	1	94,975
Maintenance Supervisor	2	111,350
Mine Maintenance	5	566,575
Chief Engineer	1	176,850
Chief Geologist	1	176,850
Geotechnical Engineer	1	131,000
Short-Range Engineer	1	111,350
Long-Range Planner	1	111,350
Drill / Blast Engineer	1	111,350
Surveyor / Technician	2	94,975
Ore Grade Technicians	4	94,975
Technical Services	12	1,388,600

Operations hourly labour requirements by year are shown in Table 21-13.

Table 21-13: Hourly Operations Labour

Description	Year														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Mine Operations	48	52	60	60	60	52	52	56	48	52	52	34	34	34	26
Maintenance	11	13	14	14	14	12	12	12	11	12	11	8	8	7	6
Total	59	65	74	74	74	64	64	68	59	64	63	42	42	41	32

21.3.4 Process Operating Costs

The average yearly process operating cost (excluding general and administrative costs) is C$ million. The process plant operating cost estimates are summarized in Table 21-14. These are derived from benchmarking against existing graphite processing plants located in Canada or similar-sized processing plants in Québec as well as in-house data.

Table 21-14: Process Plant Operating Cost Summary

Description	C$M/a	C$/t Processed
Labour	5.23	3.48
Power	2.37	1.58
Reagents	1.72	1.15
Comminution Consumables	2.68	1.79
Maintenance	1.17	0.78
Lab Services	1.05	0.70
Mobile Equipment	0.76	0.51
Co-disposal Mobile Equipment	2.79	1.85
Total	17.78	11.85

21.3.4.1 Labour

Staffing was estimated by benchmarking against similar projects with comparable unit processes. A burden of 31% was applied to all rates. The total operational labour averages 44 employees, as shown in the organizational roster outlining the process plant's labour requirements in Table 21-15 on the following page (note: loaded salaries include burden). This roster does not include general and administrative positions (see Section 21.3.5). Salaries and wages are based on other Canadian operations and expected local industrial rates.

21.3.4.2 Power

The power cost of the process plant was calculated from the installed power in the mechanical equipment list. A C$0.051/kWh power cost was used based on Québec power prices, along with an assumption that 75% of the installed power would be utilized. This amounts to an average yearly power cost of C$2.37 million, or C$1.58 per tonne of material processed.

Table 21-15: Process Plant Operations Employee Roster Summary

Description	Employees	Loaded Salary (C$/a)	Total Cost C$M/a
Mill Superintendent	1	196,500	0.19
Maintenance Superintendent	1	157,200	0.16
Chief Metallurgist	1	176,850	0.18
Mill Management Total	3	530,550	0.53
General Foreman	1	144,100	0.14
Crusher Operator	4	114,756	0.46
Grinding Operator	4	114,756	0.46
Flotation/Reagents Operator	4	114,756	0.46
Concentrate Drying/Bagging/Tailings Operator	4	114,756	0.46
Mill Operations Total	17	1,980,196	1.98
Manager – Health & Safety	1	157,200	0.16
Manager – Environmental	1	172,240	0.17
Technician – Health & Safety	1	98,250	0.10
Supervisor – Property Security	1	98,250	0.10
Nurse	1	98,250	0.10
Safety Guard	4	72,207	0.29
HSE&C Safety Operations Total	9	913,019	0.91
Laboratory Manager	1	154,868	0.15
Laboratory Technician	4	107,734	0.43
Laboratory Services Total	5	585,806	0.59
Maintenance Planner	1	95,368	0.09
Millwright	4	95,368	0.38
Electrician	2	95,368	0.19
Process Control/Instrument Technician	1	108,992	0.11
Welder	2	95,368	0.19
Mill Maintenance Total	10	967,304	0.97
Contract Allowance		250,000	0.25
Total Operations Labour	44	5,226,875	5.23

21.3.4.3 Reagents and Consumables

Frother and diesel fuel oil (DFO) consumption in the flotation circuits were provided by the testwork outlined in Chapter 13, whereas the consumption of flocculant and propane were benchmarked against similar projects. Costs for each reagent were identified from other projects in Québec. outlines the consumption and cost of the reagents used in the process plant.

Table 21-16 outlines the consumption and cost of the reagents used in the process plant.

Table 21-16: Reagent Cost Summary

Description	Reagent/Item Cost ($/t)	Consumption (t/a)	Cost (C$/a)
DFO	954.50	85.1	81,182
MIBC Frother	3,777	88.9	335,841
Flocculant	4,780	4.3	20,620
Tailings Filter Cloths	-	-	140,000
Propane	441.35	2,052	905,820
Product Bulk Bags	2.00	120,000	240,000
Total Reagent Cost	-	-	1,723,462

21.3.4.4 Comminution Consumables

The comminution consumables consist of requirements/replacements that are related to the crushing and grinding circuit. The following items have been included under comminution consumables:

- SAG mill grinding media
- polishing mill grinding media
- primary crusher, SAG mill, and polishing mill liners
- screen panels

Annual grinding media costs were estimated at C$0.98 million, and liner and screen panel costs amount to C$1.04 million per annum. The costs have been developed from Ausenco's in-house database and experience, industry practice, and benchmarking against similar projects. The consumption rates were calculated internally.

21.3.4.5 Maintenance

The process plant annual maintenance cost was derived from the total installed mechanical equipment cost determined from the mechanical equipment list using a factor of 4%. The total annual maintenance cost was estimated as C$1.17 million.

21.3.4.6 Laboratory Services

The operating cost estimate for the laboratory and assay activities were estimated by Ausenco on the anticipated number of assays per day and per year. These assay costs arise from monitoring grade and recovery for unit operations to permit optimization of the process plant, environmental analysis, and metallurgical accounting. The laboratory services are estimated to cost C$1.05 million per annum.

21.3.4.7 Mobile Equipment

Vehicle costs are based on a scheduled number of light vehicles and mobile equipment, including fuel, maintenance, spares, and tires, as well as annual registration and insurance fees. Mobile equipment requirements result in an annual cost of C$0.76 million. An allowance for light vehicles and mobile equipment used in the co-disposal facility was assumed as C$2.79 million.

21.3.5 General and Administrative Operating Costs

General and administrative (G&A) costs are expenses not directly related to the production of graphite and include expenses not included in mining, processing, external refining, and transportation costs. These costs were developed using Ausenco's in-house data on existing Canadian operations. The G&A costs were divided into the following areas:

- G&A maintenance, including vehicle and road maintenance
- personnel
- human resources, including training, recruiting, and community relations
- infrastructure power, including power requirements for HVAC and administrative buildings
- site administration, maintenance, and security, including office supplies and garbage disposal
- assets operation for non-operational-related vehicles
- health and safety, including personal protective equipment, hospital service cost, and first aid
- environmental, including water sampling
- IT and telecommunications, including hardware and support services
- contract services, including insurance, sanitation and cleaning, licence fees, and legal fees

All G&A costs are detailed in Table 21-16, with the organizational employee roster detailed in Table 21-17. G&A staffing was estimated by benchmarking against similar projects with comparable unit processes. A burden of 31% was applied to all rates to account for training, sick leave, pension contributions and other benefits provided to salaried employees.

Table 21-17: Summary of G&A Operating Costs

Department/Area	Cost/Allowance (C$/a)
G&A Maintenance	506,325
Vehicle Maintenance	206,325
Mine Property Road Maintenance (Materials)	150,000
Access Road Maintenance	150,000
Personnel (detailed in Table 21-17)	940,275
Human Resources	180,000
Training/Recruiting	150,000
Community Relations	30,000
Infrastructure Power – HVAC and Administrative Buildings	126,299
Side Administration, Maintenance and Safety	69,000
Office Supplies	45,000
Waste Management/Garbage	24,000
Assets Operation – Vehicles	98,049
Health & Safety	151,200
Personal Protective Equipment	15,600
Hospital Service Cost	120,000
First Aid on Site	15,600
Environmental/Water Sampling	50,000
IT & Telecommunications	100,000

IT Hardware	20,000
IT Support Services	80,000
Contract Services	1,334,000
Insurance	1,000,000
Sanitation & Cleaning	104,000
License Fees	130,000
Legal Fees	100,000
Total	3,555,147

Table 21-18: Process Plant General & Administrative Employee Roster Summary

Description	Employees	Loaded Salary (C$/a)	Total Cost (C$M/a)
Mine General Manager	1	245,232	0.25
Manager – Procurement/Contracts	1	153,751	0.15
Manager – Human Resources	1	122,616	0.12
Administrative Assistant	1	81,744	0.08
Warehouse Operator	1	91,700	0.09
Warehouse Attendant	3	81,744	0.25
G&A Labour Total	8	940,275	0.94

Note: The total annual G&A costs amount to C$3.56 million or C$2.37/t.

22 ECONOMIC ANALYSIS

22.1 Cautionary Statements

The results of the economic analyses discussed in this chapter represent forward-looking information as defined under Canadian securities law. The results are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here. Forward-looking information includes the following:

- mineral resource estimates
- assumed commodity price and exchange rates
- proposed mine production plan
- projected mining and process recovery rates
- assumptions about mining dilution and the ability to mine in areas previously exploited using underground mining methods as envisaged
- sustaining costs and proposed operating costs
- interpretations and assumptions regarding joint venture and agreement terms
- assumptions as to closure costs and closure requirements
- assumptions about environmental, permitting, and social risks

Additional risks to the forward-looking information include:

- changes to costs of production from what is assumed
- changes in the estimated timing and quantity of production
- unrecognized environmental risks
- unanticipated reclamation expenses
- unexpected variations in quantity of mineralized material, grade or recovery rates
- geotechnical or hydrogeological considerations during mining being different from what was assumed
- failure of mining methods to operate as anticipated
- failure of plant, equipment or processes to operate as anticipated

- changes to assumptions as to the availability of electrical power, and the power rates used in the operating cost estimates and financial analysis
- ability to maintain the social license to operate
- accidents, labour disputes and other risks of the mining industry
- changes to interest rates
- changes to tax rates
- changes in government regulation of mining operations
- potential delays in the issuance of permits and any conditions imposed with the permits that are granted

22.2 Methodologies Used

The project has been evaluated using a discounted cash flow (DCF) analysis based on an 8% discount rate. Cash inflows consist of annual revenue projections. Cash outflows consist of capital expenditures, including pre-production costs, operating costs, taxes, and royalties. These are subtracted from the inflows to arrive at the annual cash flow projections. Cash flows are taken to occur at the mid-point of each period. It must be noted that tax calculations involve complex variables that can only be accurately determined during operations and, as such, the actual post-tax results may differ from those estimated. A sensitivity analysis was performed to assess the impact of variations in concentrate prices, discount rate, foreign exchange rates, operating costs and initial capital costs.

The capital and operating cost estimates developed specifically for this project are presented in Chapter 21 of this report in 2021 Canadian dollars. The economic analysis has been run on a constant dollar basis with no inflation.

22.3 Financial Model Parameters

A base case graphite concentrate price of US$916/t Cg is based on consensus analyst estimates and recently published economic studies. The forecasts are meant to reflect the average concentrate price expectation over the life of the project. No price inflation or escalation factors were taken into account.

The economic analysis was performed using the following assumptions:

- Construction starting June 30, 2024
- Production starting on January 1, 2026
- Mine life of 14.7 years
- Exchange rate of 1.33 (USD:CAD)
- Cost estimates in constant Q3 2021 Canadian dollars with no inflation or escalation

- 100% ownership with 1.0% NSR
- Capital costs funded with 100% equity (no financing costs assumed)
- All cash flows discounted to June 30, 2024 using mid-period discounting convention
- Graphite concentrate is assumed to be sold in the same year it is produced
- No contractual arrangements for concentrate sales are in place

22.3.1 Taxes

The project has been evaluated on a post-tax basis to provide an approximate value of the potential economics. The tax model was compiled by Lomiko with assistance from third-party taxation professionals. The calculations are based on the tax regime as of the date of the preliminary economic assessment. At the effective date of the cashflow, the project was assumed to be subject to the tax regime outlined below:

- The Canadian corporate income tax system consists of 15% federal income tax and 11.5% provincial income tax.
- The mining tax rate in Québec is calculated using progressive tax rates, with each rate applied to a portion of the operator’s annual profit. Table 22-1 lists the tax rate that applies to each portion of the operator’s annual profit margin segment.

Table 22-1: Mining Tax Rates in Québec

Description	Profit Margin	Tax Rate
First Segment	0% to 35%	16%
Second Segment	More than 35%, up to 50%	22%
Third Segment	More than 50%	28%

At the base case graphite concentrate price assumption, total tax payments are estimated to be C$240.4 million over the life of mine.

22.3.2 Royalty

A 1.0% royalty has been assumed for the project, resulting in approximately C$17.0 million in royalty payments over life of mine.

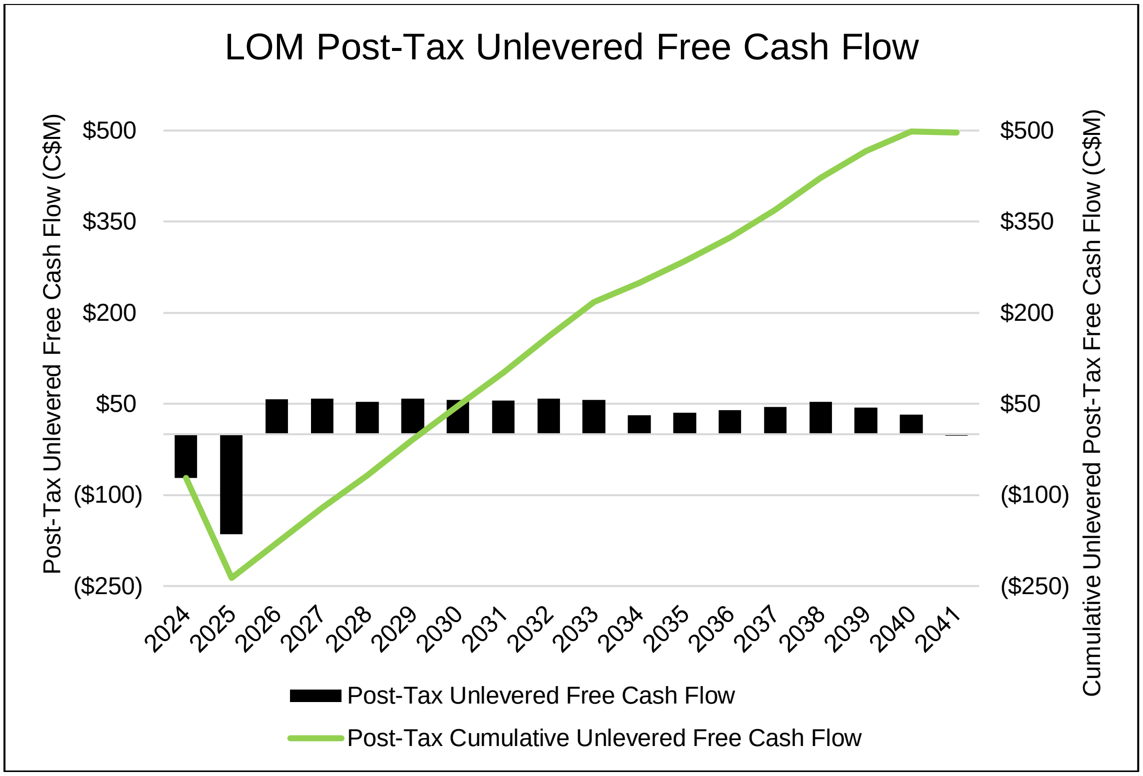
22.3.3 Transportation & Insurance Charges

Mine revenue is derived from the sale of graphite concentrate into the to the domestic and US marketplace. No contractual arrangements for upgrading or refining exist at this time. However, the parameters used in the economic analysis are consistent with current industry rates. A transportation and insurance charge of C$37.42/t of graphite concentrate was assumed with 100% graphite concentrate payability resulting in a C$53.7 million cost over the life of mine.

22.4 Economic Analysis

The economic analysis was performed assuming an 8% discount rate. The pre-tax NPV discounted at 8% is C$314 million; the internal rate of return IRR is 28.3%; and payback period is 3.3 years. On a post-tax basis, the NPV discounted at 8% is C$186 million; the IRR is 21.5%; and the payback period is 4.2 years. A summary of project economics is shown graphically in Figure 22-1 and listed in Table 22-2.

Figure 22-1: Project Economics



Source: Ausenco, 2021

Table 22-2: Summary of Project LOM Cash Flow Assumptions & Results

General		LOM Total / Avg.
Graphite Concentrate Price (US$/t)		$916
Mine Life (years)		14.74
Total Waste Tonnes Mined (kt)		88,396
Total Mill Feed Tonnes (kt)		21,874
Production		
Mill Head Grade (%)		6.67%
Mill Recovery Rate (%)		94%
Total Mill Tonnes Recovered (Mt)		21.9
Total Average Annual Production (Mt)		97.4
Operating Costs		
Mining Cost (C$/t Milled)		$16.2
Processing Cost (C$/t Milled)		$11.9
G&A Cost (C$/t Milled)		$2.4
Total Operating Costs (C$/t Milled)		$30.4
Cash Costs (US$/t Concentrate)		$385.5
AISC (US$/t Concentrate)		$406.1
Capital Costs		
Initial Capital (C$M)		$236
Sustaining Capital (C$M)		$38
Closure Costs (C$M)		$6
Salvage Costs (C$M)		($4)
Financials	**Pre-Tax**	**Post-Tax**
NPV (8%) (C$M)	$314	$186
IRR (%)	28.3%	21.5%
Payback (years)	3.3	4.2

Notes: * Cash costs consist of mining costs, processing costs, mine-level G&A, refining charges, and royalties. ** AISC includes cash costs plus sustaining capital, closure costs, and salvage value.

The analysis was done quarterly and annual cashflow basis, but the cashflow output is shown on an annualized basis in Table 22-3.

22.5 Sensitivity Analysis

A sensitivity analysis was conducted on the base case pre-tax and post-tax NPV and IRR of the project, using the following variables: gold price, discount rate, foreign exchange, operating costs, and initial capital costs.

Table 22-4 summarizes the post-tax sensitivity analysis results; pre-tax sensitivity results are shown in Table 22-5, and Table 22-6 show post-tax sensitivity results. As shown in Figure 22-2 and Figure 22-3, the sensitivity analysis revealed that the project is most sensitive to changes in graphite concentrate price, and foreign exchange and less sensitive to operating costs, discount rate, and initial capital costs.

Table 22-3: Project Cash Flow on an Annualized Basis

Cash flows discounted to June 30, 2024	Units	Sum/Avg	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Graphite Concentrate Price - Flat	US$/t	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916	$916
Foreign Exchange	US$:C$	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33	$1.33
Revenue	**C$mm**	**$1,749**	**--**	**--**	**$123**	**$132**	**$129**	**$137**	**$133**	**$128**	**$133**	**$136**	**$94**	**$97**	**$106**	**$106**	**$117**	**$101**	**$75**	**--**	**--**
Operating Cost	C$mm	($666)	--	--	($42)	($50)	($51)	($51)	($50)	($47)	($46)	($47)	($47)	($47)	($45)	($38)	($38)	($37)	($29)	--	--
Transportation and Insurance Charges	C$mm	($54)	--	--	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($4)	($3)	($3)	($3)	($3)	($4)	($3)	($2)	--	--
Royalties	C$mm	($17)	--	--	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	($1)	--	--
EBITDA	**C$mm**	**$1,013**	**--**	**--**	**$76**	**$77**	**$73**	**$81**	**$78**	**$76**	**$82**	**$83**	**$44**	**$46**	**$57**	**$64**	**$74**	**$59**	**$42**	**--**	**--**
Initial Capex	C$mm	($236)	($72)	($164)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sustaining Capex	C$mm	($38)	--	--	($10)	($3)	($4)	($2)	($2)	($1)	($0)	($3)	($4)	($0)	($4)	($2)	($1)	($0)	($0)	($0)	--
Royalty Buyback	C$mm	($1)	--	($1)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Closure Capex	C$mm	($6)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	($6)	--
Salvage Value	C$mm	$4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	$4	--
Change in Net Working Capital	C$mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pre-Tax Unlevered Free Cash Flow	**C$mm**	**$737**	**($72)**	**($164)**	**$66**	**$75**	**$69**	**$79**	**$76**	**$75**	**$82**	**$80**	**$40**	**$46**	**$53**	**$61**	**$73**	**$59**	**$42**	**($2)**	**--**
Pre-Tax Cumulative Unlevered Free Cash Flow	C$mm	$737	($72)	($237)	($171)	($96)	($27)	$52	$128	$203	$285	$365	$405	$451	$504	$565	$638	$697	$739	$737	$737
Taxes	C$mm	($240)	--	--	($9)	($16)	($16)	($20)	($20)	($20)	($23)	($24)	($8)	($10)	($14)	($16)	($20)	($15)	($9)	--	--
Post-Tax Unlevered Free Cash Flow	**C$mm**	**$496**	**($72)**	**($164)**	**$57**	**$58**	**$53**	**$59**	**$56**	**$55**	**$59**	**$57**	**$31**	**$36**	**$39**	**$45**	**$53**	**$44**	**$32**	**($2)**	**--**
Post-Tax Cumulative Unlevered Free Cash Flow	C$mm		($72)	($237)	($180)	($121)	($68)	($9)	$47	$102	$161	$218	$249	$285	$324	$369	$422	$466	$498	$496	$496
Production Summary																					
Total Resource Mined	kt	21,874	--	193	1,294	1,500	1,493	1,798	1,793	1,623	1,500	1,500	1,500	1,500	1,500	1,500	1,494	1,012	674	--	--
Total Waste	kt	88,396	--	2,807	7,273	8,058	8,058	7,002	6,407	6,277	6,100	6,100	6,100	6,100	6,100	3,220	3,226	2,969	2,599	--	--
Total Material Mined	kt	110,270	--	3,000	8,568	9,558	9,551	8,800	8,200	7,900	7,600	7,600	7,600	7,600	7,600	4,720	4,720	3,981	3,273	--	--
Percent of Resource Depleted	%	100.0%	--	0.9%	5.9%	6.9%	6.8%	8.2%	8.2%	7.4%	6.9%	6.9%	6.9%	6.9%	6.9%	6.9%	6.8%	4.6%	3.1%	--	--
Project Life	yrs	14.7																			
Mill Feed	kt	21,874	--	--	1,294	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,494	1,497	1,089	--	--

Cash flows discounted to June 30, 2024	Units	Sum/Avg	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Graphite Head Grade	%	6.7%	--	--	7.9%	7.4%	7.2%	7.6%	7.4%	7.1%	7.4%	7.6%	5.3%	5.4%	5.9%	5.9%	6.5%	5.6%	5.7%	--	--
Mill Recovery	%	93.5%	--	--	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	93.5%	--	--
Concentrate Grade	%	95.0%	--	--	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	95.0%	--	--
Recovered Graphite Concentrate	kt	1,436	--	--	101	109	106	112	109	105	109	112	78	80	87	87	96	83	61	--	--
Graphite Concentrate % Payable	%	100.0%	--	--	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	--	--
Payable Graphite Concentrate	**kt**	**1,436**	**--**	**--**	**101**	**109**	**106**	**112**	**109**	**105**	**109**	**112**	**78**	**80**	**87**	**87**	**96**	**83**	**61**	**--**	**--**
Revenue	**C$mm**	**$1,749**	**--**	**--**	**$123**	**$132**	**$129**	**$137**	**$133**	**$128**	**$133**	**$136**	**$94**	**$97**	**$106**	**$106**	**$117**	**$101**	**$75**	**--**	**--**
Mine Operating Costs	C$mm	$354	--	--	$24	$28	$30	$29	$28	$25	$24	$26	$25	$26	$24	$17	$17	$16	$14	--	--
Mill Operating Costs	C$mm	$259	--	--	$15	$18	$18	$18	$18	$18	$18	$18	$18	$18	$18	$18	$18	$18	$13	--	--
G&A Costs	C$mm	$52	--	--	$3	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$4	$3	--	--
Operating Costs per tonne Processed	(C$/t Milled)	$30.4	--	--	$32.8	$33.1	$34.3	$33.7	$33.2	$31.2	$30.5	$31.7	$31.1	$31.4	$29.9	$25.5	$25.5	$25.0	$27.0	--	--
Transportation & Insurance Charges	**C$mm**	**$54**	**--**	**--**	**$4**	**$4**	**$4**	**$4**	**$4**	**$4**	**$4**	**$4**	**$3**	**$3**	**$3**	**$3**	**$4**	**$3**	**$2**	**--**	**--**
NSR Royalty																					
Total Revenue	C$mm	$1,749	--	--	$123	$132	$129	$137	$133	$128	$133	$136	$94	$97	$106	$106	$117	$101	$75	--	--
Less: Transport Costs & Insurance	C$mm	$54	--	--	$4	$4	$4	$4	$4	$4	$4	$4	$3	$3	$3	$3	$4	$3	$2	--	--
Total Net Revenue	C$mm	$1,695	--	--	$119	$128	$125	$133	$129	$124	$129	$132	$92	$94	$103	$103	$113	$98	$72	--	--
NSR Royalty	%	1.0%	--	--	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	--	--
Royalties	**C$mm**	**$17**	**--**	**--**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**$1**	**--**	**--**
Cash Cost *	US$/t conc.	$386	--	--	$353	$380	$401	$375	$380	$371	$351	$356	$489	$481	$423	$367	$336	$377	$398	--	--
All-in Sustaining Cost (AISC) **	US$/t conc.	$406	--	--	$425	$399	$428	$386	$392	$381	$355	$377	$530	$485	$460	$387	$341	$381	$403	--	--
Total Initial Capital	**C$mm**	**$236**	**$72**	**$164**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Mining		$29	--	$29																	
On-site Infrastructure	C$mm	$29	$29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Process Plant	C$mm	$79	--	$79	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Off-site Infrastructure	C$mm	$7	$7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Project Indirects	C$mm	$16	$6	$10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Project Delivery	C$mm	$25	$10	$15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Cash flows discounted to June 30, 2024	Units	Sum/Avg	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Owner's Cost	C$mm	$14	$6	$9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Contingency	C$mm	$36	$14	$22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Sustaining Capital	**C$mm**	**$38**	**--**	**--**	**$10**	**$3**	**$4**	**$2**	**$2**	**$1**	**$0**	**$3**	**$4**	**$0**	**$4**	**$2**	**$1**	**$0**	**$0**	**$0**	**--**
Mining	C$mm	$24	--	--	$7	$1	$2	--	$0	$1	--	$3	$4	--	$4	$2	$0	--	--	--	--
Waste Management Facility	C$mm	$14	--	--	$2	$2	$2	$2	$2	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	--
Closure Cost	**C$mm**	**$6**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**$6**	**--**
Salvage Value	**C$mm**	**($4)**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**($4)**	**--**
Total Capital Expenditure Including Salvage Value	**C$mm**	**$276**	**--**	**$236**	**$10**	**$3**	**$4**	**$2**	**$2**	**$1**	**$0**	**$3**	**$4**	**$0**	**$4**	**$2**	**$1**	**$0**	**$0**	**$2**	**--**

Notes: * Cash costs consist of mining costs, processing costs, mine-level G&A and refining charges, and royalties. ** AISC includes cash costs plus sustaining capital, closure costs, and salvage value

Table 22-4: Post-Tax Sensitivity Summary

Graphite Concentrate Price US$/t	Post-Tax NPV (8%) Base Case	Initial Capital Cost		Total Operating Cost		FX	
		(-20%)	(+20%)	(-20%)	(+20%)	(-20%)	(+20%)
$750	$76	$115	$37	$123	$28	($32)	$176
$850	$143	$180	$104	$188	$96	$28	$251
$916	$186	$222	$148	$230	$140	$65	$301
$1,150	$332	$364	$297	$371	$289	$188	$461
$1,300	$419	$445	$388	$449	$382	$264	$547
Graphite Concentrate Price US$/t	**IRR Base Case**	**Initial Capital Cost**		**Total Operating Cost**		**FX**	
		(-20%)	(+20%)	(-20%)	(+20%)	(-20%)	(+20%)
$750	13.8%	18.6%	10.4%	17.1%	10.2%	5.4%	20.8%
$850	18.6%	24.1%	14.6%	21.6%	15.3%	10.2%	25.8%
$916	21.5%	27.5%	17.2%	24.4%	18.4%	13.0%	29.0%
$1,150	31.0%	38.8%	25.6%	33.5%	28.3%	21.6%	39.5%
$1,300	36.7%	45.4%	30.5%	38.8%	34.2%	26.6%	45.2%

Table 22-5: Pre-Tax Sensitivity Analysis

Pre-Tax NPV Sensitivity to Discount Rate (Graphite Concentrate Price (US$/t))

Discount Rate	$750	$850	$916	$1,150	$1,300
3.0%	$288	$436	$533	$880	$1,103
5.0%	$220	$347	$431	$730	$921
8.0%	$142	$246	$314	$556	$711
10.0%	$102	$193	$253	$466	$602
12.0%	$70	$150	$203	$391	$512

Pre-Tax IRR Sensitivity to Discount Rate (Graphite Concentrate Price (US$/t))

Discount Rate	$750	$850	$916	$1,150	$1,300
3.0%	17.8%	24.3%	28.3%	42.3%	51.1%
5.0%	17.8%	24.3%	28.3%	42.3%	51.1%
8.0%	17.8%	24.3%	28.3%	42.3%	51.1%
10.0%	17.8%	24.3%	28.3%	42.3%	51.1%
12.0%	17.8%	24.3%	28.3%	42.3%	51.1%

Pre-Tax NPV Sensitivity to FX (Graphite Concentrate Price (US$/t))

FX	$750	$850	$916	$1,150	$1,300
$1.10	$8	$93	$150	$350	$478
$1.20	$66	$160	$221	$440	$580
$1.33	$142	$246	$314	$556	$711
$1.40	$183	$292	$363	$618	$782
$1.50	$241	$358	$435	$708	$883

Pre-Tax IRR Sensitivity to FX (Graphite Concentrate Price (US$/t))

FX	$750	$850	$916	$1,150	$1,300
$1.10	8.4%	14.6%	18.3%	30.5%	37.9%
$1.20	12.7%	18.9%	22.8%	35.7%	43.7%
$1.33	17.8%	24.3%	28.3%	42.3%	51.1%
$1.40	20.4%	27.0%	31.3%	45.9%	55.1%
$1.50	24.0%	30.9%	35.4%	50.9%	60.8%

Pre-Tax NPV Sensitivity to Operating (Graphite Concentrate Price (US$/t))

Operating Costs	$750	$850	$916	$1,150	$1,300
(20.0%)	$214	$318	$386	$628	$783
(10.0%)	$178	$282	$350	$592	$747
--	$142	$246	$314	$556	$711
10.0%	$106	$209	$277	$520	$675
20.0%	$70	$173	$241	$483	$639

Pre-Tax IRR Sensitivity to Operating (Graphite Concentrate Price (US$/t))

Operating Costs	$750	$850	$916	$1,150	$1,300
(20.0%)	22.3%	28.5%	32.5%	46.3%	55.1%
(10.0%)	20.1%	26.4%	30.4%	44.3%	53.1%
--	17.8%	24.3%	28.3%	42.3%	51.1%
10.0%	15.4%	22.1%	26.2%	40.3%	49.1%
20.0%	13.0%	19.8%	24.1%	38.3%	47.1%

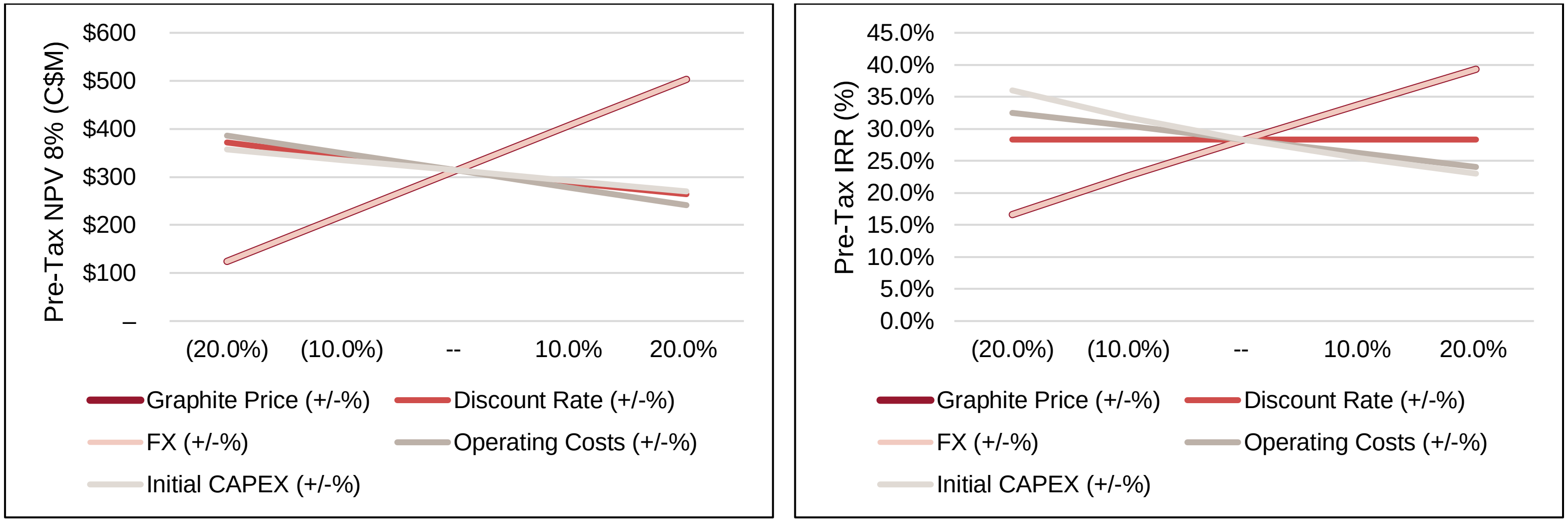
Pre-Tax NPV Sensitivity to Initial Capex (Graphite Concentrate Price (US$/t))

Initial Capex	$750	$850	$916	$1,150	$1,300
(20.0%)	$186	$289	$357	$599	$755
(10.0%)	$164	$267	$335	$578	$733
--	$142	$246	$314	$556	$711
10.0%	$120	$224	$292	$534	$689
20.0%	$98	$202	$270	$512	$667

Pre-Tax IRR Sensitivity to Initial Capex (Graphite Concentrate Price (US$/t))

Initial Capex	$750	$850	$916	$1,150	$1,300
(20.0%)	23.4%	31.1%	36.0%	53.1%	64.1%
(10.0%)	20.3%	27.3%	31.8%	47.1%	56.9%
--	17.8%	24.3%	28.3%	42.3%	51.1%
10.0%	15.6%	21.7%	25.5%	38.3%	46.4%
20.0%	13.8%	19.5%	23.0%	35.0%	42.4%

Figure 22-2: Pre-Tax NPV & IRR Sensitivity Results



Source: Ausenco, 2021

Table 22-6: Post-Tax Sensitivity Analysis

Post-Tax NPV Sensitivity to Discount Rate

Discount Rate	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
3.0%	$192	$286	$347	$556	$679
5.0%	$138	$220	$272	$452	$558
8.0%	$76	$143	$186	$332	$419
10.0%	$45	$104	$141	$270	$347
12.0%	$19	$72	$105	$219	$288

Post-Tax IRR Sensitivity to Discount Rate

Discount Rate	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
3.0%	13.8%	18.6%	21.5%	31.0%	36.7%
5.0%	13.8%	18.6%	21.5%	31.0%	36.7%
8.0%	13.8%	18.6%	21.5%	31.0%	36.7%
10.0%	13.8%	18.6%	21.5%	31.0%	36.7%
12.0%	13.8%	18.6%	21.5%	31.0%	36.7%

Post-Tax NPV Sensitivity to FX

FX	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
$1.10	($16)	$44	$81	$208	$286
$1.20	$26	$87	$127	$263	$346
$1.33	$76	$143	$186	$332	$419
$1.40	$102	$172	$216	$368	$455
$1.50	$140	$213	$260	$417	$504

Post-Tax IRR Sensitivity to FX

FX	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
$1.10	6.7%	11.4%	14.2%	23.0%	28.1%
$1.20	10.0%	14.6%	17.5%	26.5%	31.9%
$1.33	13.8%	18.6%	21.5%	31.0%	36.7%
$1.40	15.7%	20.6%	23.5%	33.3%	39.1%
$1.50	18.4%	23.3%	26.3%	36.5%	42.3%

Post-Tax NPV Sensitivity to Operating Costs

Operating Costs	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
(20.0%)	$123	$188	$230	$371	$449
(10.0%)	$99	$166	$208	$352	$435
--	$76	$143	$186	$332	$419
10.0%	$52	$120	$163	$311	$401
20.0%	$28	$96	$140	$289	$382

Post-Tax IRR Sensitivity to Operating Costs

Operating Costs	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
(20.0%)	17.1%	21.6%	24.4%	33.5%	38.8%
(10.0%)	15.5%	20.1%	22.9%	32.3%	37.8%
--	13.8%	18.6%	21.5%	31.0%	36.7%
10.0%	12.1%	16.9%	20.0%	29.7%	35.5%
20.0%	10.2%	15.3%	18.4%	28.3%	34.2%

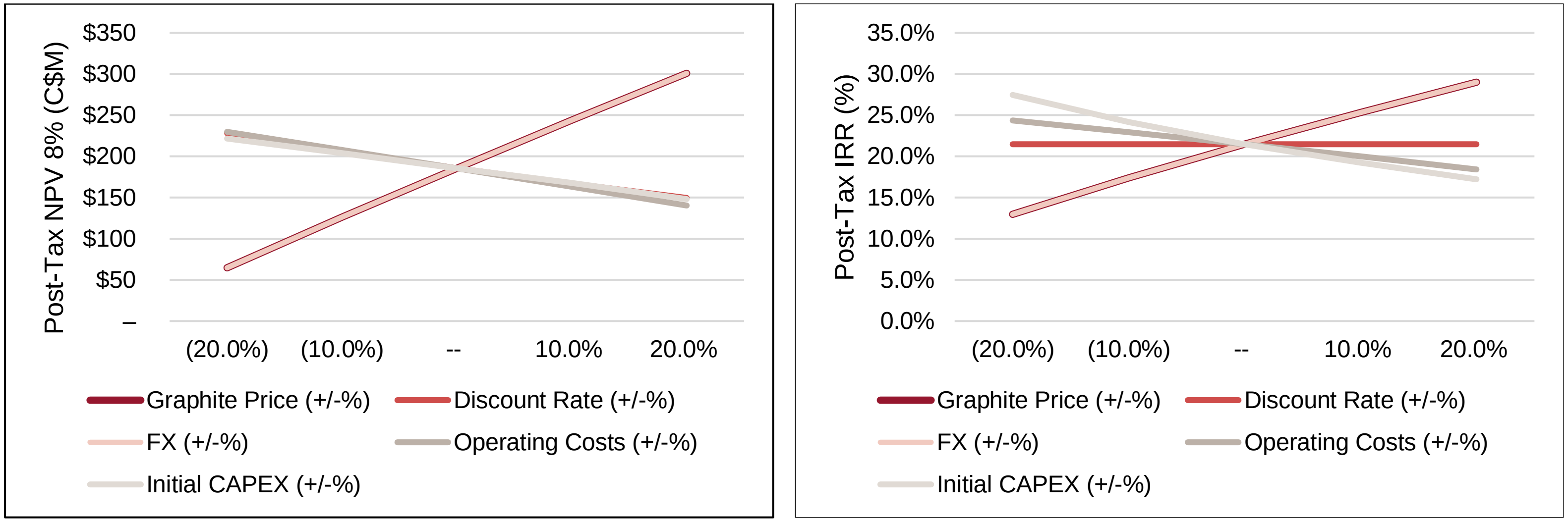
Post-Tax NPV Sensitivity to Initial Capex

Initial Capex	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
(20.0%)	$115	$180	$222	$364	$445
(10.0%)	$95	$162	$204	$349	$432
--	$76	$143	$186	$332	$419
10.0%	$57	$124	$167	$315	$404
20.0%	$37	$104	$148	$297	$388

Post-Tax IRR Sensitivity to Initial Capex

Initial Capex	Graphite Concentrate Price (US$/t)				
	$750	$850	$916	$1,150	$1,300
(20.0%)	18.6%	24.1%	27.5%	38.8%	45.4%
(10.0%)	16.0%	21.1%	24.2%	34.5%	40.6%
--	13.8%	18.6%	21.5%	31.0%	36.7%
10.0%	12.0%	16.4%	19.2%	28.1%	33.3%
20.0%	10.4%	14.6%	17.2%	25.6%	30.5%

Figure 22-3: Post-Tax NPV & IRR Sensitivity Results



Source: Ausenco, 2021

23 ADJACENT PROPERTIES

There are no adjacent properties.

24 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information to report for the La Loutre project at this time.

25 INTERPRETATION AND CONCLUSIONS

25.1 Introduction

This report was prepared and compiled by Ausenco under the supervision of the QPs at the request of Lomiko. This report has been prepared in accordance with the provisions of N.I. 43-101 Standards of Disclosure for Mineral Projects. The QPs note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this report.

25.2 Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

Mining title status for the La Loutre property was supplied by Lomiko.

The La Loutre property consists of one block of 48 claims staked by electronic map designation, covering an aggregate area of 2,867.29 ha (Figure 4-2). All the mining claims are registered 100% in the name of Canada Strategic Metals Inc., although Canada Strategic currently holds 60% of the La Loutre property and Lomiko holds 40% (refer to Section 4.5). All mining titles are in good standing according to the GESTIM database.

25.3 Geology and Mineralization

Geology and mineralization at La Loutre have been mapped through a variety of methods. The interpreted geology has been used to create the domains of graphite mineralization at the Battery and EV Zones. A total of 22 high-grade and five low-grade domains at Battery and 15 domains above 1.0% graphite at EV have been used to develop the mineral resource estimate.

25.4 Exploration, Drilling and Analytical Data Collection in Support of Mineral Resource Estimation

Exploration methods, sampling, sample storage and security and analyses of data are considered appropriate for the resource estimate at the La Loutre project.

25.5 Metallurgical Testwork

Flowsheet development culminated in a flowsheet and conditions that are suitable to achieve high-grade graphite flotation concentrates of over 97% C(t). Despite the large range of head grades of the four variability composites, the metallurgical performance was very consistent and comparable concentrate grades were achieved for all four samples. The LCT that simulated closed-circuit performance produced a high total carbon recovery of 93.5% C(t).

The equipment and reagents employed in the process are conventional and established technologies, thus reducing the project risk.

25.6 Mineral Resource Estimates

The mineral resource estimate has been done according to CIM standards and guidelines (CIM 2014, 2019) and in compliance with N.I. 43-101. The data used for the resource estimate and methods employed are considered reasonable for this level of study for the La Loutre project.

25.7 Mineral Reserve Estimates

Not applicable.

25.8 Mine Plan

The open pit mine plan is developed based on high wall angles that are generally acceptable when no geotechnical information is available. Mining rates and equipment size are based on the mill feed required to produce 100 kt of product annually. Equipment selection is based on the use of diesel fuel with no pit electrification.

The mine plan was developed to minimize the overall footprint and maximize the backfill of mined-out pits. The co-disposal site was sized to accommodate the design pits and mill tailings. Reclamation during the production period has been included in the mining costs.

Production rates and cycle times have been developed from first principles and are in line with similarly sized projects. No camp is included in the costs and all personal are assumed to be from the vicinity.

25.9 Recovery Methods

The process plant is designed to process material at a rate of 4,110 t/d to produce dried graphite flakes in three commercial product sizes and concentrate grade up to 97% Cg.

The process plant flowsheet designs were based on testwork results and industry-standard practices. The flowsheet was developed for optimum recovery, product size, and graphite grade while minimizing capital expenditure and life of mine operating costs. The process methods are conventional to the industry and are widely used with no significant elements of technological innovation.

25.10 Infrastructure

Infrastructure to support the La Loutre project will consist of site civil work, process buildings and non-process buildings, water management, waste disposal facility (WDF) and electrical power distribution. The WDF is divided into a Waste Rock Facility (WRF) and a Co-disposal storage facility (CDSF). The Co disposal facility consists of co-mingled waste rock and filtered tailings. Mine facilities and the process and administration area will include services with potable water, fire protection, compressed air, power, diesel, communication, and sanitary systems. The processing plant and WDF will be located within the La Loutre property.

The WDF has been designed to store 40.1Mm3 of waste storage, consisting of 15.1 Mm^3 of filtered tailings and 25.0 Mm^3 of waste rock. The facility is divided into two sections: the northern section is the waste rock facility (WRF) and the southern section is the co-disposal storage facility (CDSF) for tailings and waste rock. The CDSF has been designed in accordance with relevant federal and provincial construction guidelines for tailings storage facilities in Canada. Similarly, the design of the WRF is based on general guidelines for waste rock facilities. The embankments will be constructed with overall 1.25:1 (H:V) interior slopes and 2:1 (H:V) exterior slopes based on stability analyses.

The placement of waste rock for the CDSF's embankments will be transported from the pits using haul trucks, spread and compacted with dozers and compactors. The filtered tailings will be transported to the CDSF in haul trucks and placed in compacted thin lifts with dozers and compactors behind the waste rock embankments.

Water management measures for the project will include a series of diversion channels to divert clean flow of existing water courses, as well as collection and diversion ditches to collect surface and contact runoff water. Current testing has indicated that the waste rock is non-acid-generating. Runoff water will be conveyed to three collection ponds where the majority of the total suspended solids will settle out, and treated as needed, prior to releasing the water to the environment.

25.11 Environmental, Permitting and Social Considerations

The La Loutre property covers 25.1 km2 of land located in the Petite Nation territory of the Outaouais region. The site is located in the Collines du lac Nominingue (3b) ecoregion. The area has a mixed deciduous forest stand composition. This deciduous forest habitat is dominated by stands of Sugar maple (Acer saccharum), followed by over 10 other broadleaf tree species. Within the project area, there is potential for 22 species of wildlife that are either on the susceptible, threatened, or vulnerable list. Two are amphibians, four are reptiles, eight are mammals and eight are bird species. The project area is situated in white-tailed deer wintering habitat.

The project site is in the Petite Nation watershed region. There are five major lakes to which both intermittent and perennial tributaries from the project site flow. These are Lac Bélanger, Lac Doré, Petit Lac Vert, Lac Tallulah and Lac Garault.

Three fish species were found within Lac Bélanger, which were the Pearl dace (Semotilus margarita), Redbelly dace (Phonixus eos) and Fathead minnow (Pimephales promelas). Electrofishing was done in an unnamed perennial stream flowing south from Lac Garault to Lac Doré, and two fish species were identified. One was the Fallfish (S*emotilus corporalis*) and the Common creek chub (*Semotilus atromaculatus*).

Baseline studies in the project site have begun in August 2021 and will collect wetland, fish, hydrology, hydrogeology and water quality data until the end of 2022.

The La Loutre project is located in the Administrative Region of Outaouais, the Regional County Municipality of Papineau and the Municipality of Lac-des-Plages. The zoning of the project site is split between 14-R (recreotourism) and 6-F (forestry). There is a fishing and hunting outfitter located to the north of the project site and the project site is used for logging, hunting and fishing. The project site is not on any agricultural lands overseen by the CPTAQ.

The project site is located within the Kitigan Zibi Anishinabeg (KZA) First Nations territory. The KZA First Nations are part of the Algonquin Nation and the KZA territory is situated within the Outaouais and Laurentides regions.

Stakeholder consultation and information dissemination was started in Summer 2021. Lomiko will hold public participation activities in the Fall of 2021.

Since the ore production capacity will not be above 5,000 t/d, a Federal Environmental Assessment process is not required for the project. On the provincial side, the project is subject to the environmental impact assessment and review procedure provided for in Subdivision 4 of Division II of Chapter IV of title I of the *Environmental Quality Act* (c. Q-2).

In addition to this, a variety of permits will have to be obtained from both federal and provincial entities, such as a *Fisheries Act* permit for impacts to fish habitat from the Department of Fisheries and Oceans and an authorization and compensation plan for impacts on wetlands from the Ministry of the Environment and Fight against Climate Change in Québec.

25.12 Markets and Contracts

Lomiko is developing its La Loutre natural graphite project near Lac-Des-Plages, Québec to supply high-grade graphite concentrates to domestic markets. The project has a mine life of almost 15 years.

Due to its location, high-grade mill feed (LOM grading 6.67% Cg), and concentrate grades, LOM of 95% Cg, La Loutre will have a competitive advantage in the marketplace.

25.13 Capital and Operating Cost Estimates

AACE Class 5 costs have been developed for this preliminary economic assessment with an accuracy of ±50% based on recent and historical vendor quotations, preliminary material take off's (MTOs), benchmarking against recent Canadian mining projects, and consultants' experience. Further engineering is required, but the project development is sufficient at this level of study.

25.14 Economic Analysis

An engineering economic model was developed to estimate the project's annual pre-tax and post-tax cash flows and sensitivities based on an 8% discount rate. The analysis used the following key inputs:

- mine life of 14.7 years
- base case graphite concentrate price of US$916/t Cg
- exchange rate of 1.33 (USD:CAD)
- cost estimates in constant Q3 2021 Canadian dollars with no inflation or escalation
- results based on 100% ownership with a 1.0% NSR; La Loutre property is subject to a 1.5% NSR of which the company is buying back at 0.5% NSR for $0.5M.
- capital costs funded with 100% equity (no financing costs assumed)

The pre-tax NPV discounted at 8% is C$314 million; the internal rate of return IRR is 28.3%; and payback period is 3.3 years. On a post-tax basis, the NPV discounted at 8% is C$186 million; the IRR is 21.5%; and the payback period is 4.2 years.

A sensitivity analysis was conducted on the base case pre-tax and post-tax NPV and IRR of the project, using the following variables: gold price, discount rate, foreign exchange, operating costs, and initial capital costs. The sensitivity analysis revealed that the project is most sensitive to changes in graphite concentrate price and foreign exchange, and less sensitive to operating costs, discount rate, and initial capital costs.

25.15 Risks and Opportunities

25.15.1 Risks

25.15.1.1 Geology and Resource Modelling

Risks to the resource estimate include potential changes to the geological model affecting the continuity of mineralization and potential increased dilution during mining.

25.15.1.2 Mining

Geotechnical drilling and evaluations may flatten regions of highwalls.

25.15.1.3 Environmental, Social and Permitting

From a social perspective, public perception of the project is a risk that can be turned into an opportunity with efficient consultation and public participation. Wetland impacts will need authorization and permitting, but early alternative selection and reduction of impacts will turn this risk into an opportunity.

The environmental assessment process is an element of risk.

25.15.1.4 Metallurgy

The process flowsheet and conditions were developed using a composite with a limited number of samples. Hence, the metallurgical response of a composite that represents the entire life of mine may deviate from the results obtained for the master composite. However, the consistent metallurgical results for the highly different variability samples reduces this risk.

25.15.1.5 Recovery Methods

The selected full-scale equipment may not be capable to reproduce the results that were obtained on a laboratory scale. To reduce the risk, vendor testing of critical unit processes is recommended during the next phases of project development.

25.15.1.6 Project Infrastructure

A preliminary geochemical characterization was scoped for La Loutre in April 2021 to assess whether there is risk of acid formation for the waste materials, and to a lesser extent, metal leaching behaviour. Although a geochemical program was developed during the PEA, results were not obtained prior to filing date. However, initial geochemical testing of the tailings was conducted as part of the metallurgical test work results. It was determined at this time that the tailings is non-acid generating. Therefore, we have assumed at this point the tailings are non-acid-generating until there is geochemical testing on the tailings and during closure a cap (i.e., encapsulation).

25.15.2 Opportunities

25.15.2.1 Exploration

Exploration activities are likely to identify additional mineralization that could provide additional resources within the known mineralized units, as well as in additional mineralization to the south indicated by geophysical surveys and surface sampling. Extension of the modelled domains and exploration drilling to follow up on these anomalies could enhance overall project economics.

25.15.2.2 Resource Modelling

Infill drilling at each of the deposits could upgrade the classification from inferred resources to provide additional measured and indicated resources.

25.15.2.3 Mining

Geotechnical evaluations may steepen the overall highwall in areas reducing the strip ratio and producing larger economic pits. Trade off study may extend the mine life by expanding the mill feed after year 15 and processing stockpiled feed below the study cut off grade of 2.5% Cg.

25.15.2.4 Environmental, Social and Permitting

From a social perspective, public perception of the project is a risk that can be turned into an opportunity with efficient consultation and public participation. Wetland impacts will need authorization and permitting, but early alternative selection and reduction of impacts will turn this risk into an opportunity.

25.15.2.5 Metallurgy

The flowsheet has been designed to maximize process flexibility to facilitate mill feed with significant variation. This flexibility also facilitates the ability to achieve different grade targets by adjusting the specific energy input in the polishing and stirred media mills. As a consequence, the plant can respond to changing market conditions by raising or lowering the concentrate grades of the +80 mesh and –80 mesh concentrate streams.

25.15.2.6 Recovery Methods

The process flowsheet is based on preliminary information and is conceptual in nature. As additional metallurgical testing is completed, the results will contribute to optimizing flotation and grinding equipment selections. By optimizing grind size fed to the first stage of flotation, product flake size recovery is maximized. Through the optimization of the hydrocyclone circulating load, the product particle size distribution may be improved, increasing product value.

25.15.2.7 Project Infrastructure

Ausenco has identified that expansion of the geochemical characterization program would benefit the project. The following activities may reduce costs and reduce risks associated with geochemical evolution and potentially acid metaliferous drainage or neutral mine drainage. The following activities are recommended:

- Rock type discretisation and mapping,
- Geochemical program expansion to sample and analyze each rock type
- Broaden the ABA and characterisation program for tailings
- Increase the number of kinetic cells to include elevated risk materials (the current cell includes a composite of 8 samples broadly indicative of the waste sampled)
- Produce greater confidence in mineralogy via XRD testing on both tailings and waste rock. These opportunities will serve to derisk the project in terms of geochemical performance, including creating an opportunity for differential waste type management, or including engineered approaches to elevated risk material types.

26 RECOMMENDATIONS

26.1 Introduction

Considering the positive outcome to this report, it is recommended to continue developing the project through additional studies, as outlined below. Table 26-1 summarizes the proposed budget to advance the project through the next study stage.

Table 26-1: Proposed Budget Summary

Description	Cost (C$)
Resource Drilling	3,500,000
Mining & Mining Geotechnical	750,000
Metallurgy	600,000
Infrastructure Geotechnical	950,000
Power	50,000
Waste Disposal Facility	400,000
Environmental	2,000,000
Pre-feasibility Study Budget	1,000,000
Total Recommended Study Budget	**9,250,000**

26.2 Resource Drilling

The present PEA considers production from the Battery and EV deposits. Infill drilling is recommended in order to upgrade the inferred resource to the "measured plus indicated" category. The current geological interpretation and graphite interpolations and pit size are limited by the extent of drilling. Drilling both these deposits to the northwest and southeast could extend the mineralized envelopes. Further exploration of mineralized zones not currently modelled is also recommended in areas currently known as the "Reignier B" and "Reignier C" zones. Further surface exploration between these two zones may also extend the mineralization several kilometers to the south.

Table 26-2 summarizes the proposed drill expenditures for infill drilling and exploration for the next two phases of drilling.

Table 26-2: Exploration and Drilling Budget – Phase 1 & 2

Phase	Description	Metreage (m)	Budget (C$M)
1	Surface exploration of known mineralization		$0.2
	Infill drilling to upgrade from inferred to indicated	12,000	$1.8
2	Surface exploration south of resource		$0.2
	Exploration drilling	9,000	$1.3

26.3 Mining & Mining Geotechnical

The following work is recommended in the next project phase to advance the mining design:

- geotechnical drilling, evaluation, and recommendations
- trade-off study comparing 40 t trucks to 60 t trucks
- trade-off study for electrification of pits and sizing of equipment
- trade-off study on stockpiling and processing low-grade graphite (below 2.5%) that could materially extend life of mine

The cost of geotechnical drilling and evaluation is estimated at $500,000. The cost of the trade-off studies is estimated at $250,000.

26.4 Metallurgical Testwork

The following recommendations are made for the next phase of metallurgical development:

- comprehensive comminution testing on domain samples
- process flowsheet optimization with a master composite that is representative of the mine plan
- variability flotation tests using domain and mine plan composites
- develop a grinding energy versus concentrate grade relationship for the best grinding media; this will allow a more accurate prediction of the required attrition mill grinding energy as a function of the final concentrate grade
- bulk flotation to produce concentrate for marketing initiatives and value-added investigations
- value-added process investigation and development
- additional static and dynamic environmental tests on tailings with and without a desulphurization stage

The cost for the comminution and flotation components of the recommendation is estimated at $200,000. The cost of the value-added process development will depend on the targeted markets and could range between $100,000 and $400,000.

26.5 Infrastructure Geotechnical

The following activities are recommended to support the design of the site infrastructure into the next phase of the project:

- Geotechnical site investigations should be carried out at the most optimal surface infrastructure site location to characterize the foundation requirements associated with the proposed surface infrastructure facilities. This program includes a field campaign and laboratory program. The field program should include surface mapping, a drilling program and a test pit program. Samples taken from the field program will be tested in a laboratory to develop design geotechnical parameters. In addition, samples of waste rock (core) and tailings will also be tested in a laboratory to develop geotechnical design parameters. The cost of the geotechnical field and laboratory program is approximately $350,000.

- Geotechnical mine investigations should be carried out to develop the hydrogeology and geotechnical parameters for the open pits. This program includes a drilling champaign and laboratory program to develop pit slope and pit dewatering design parameters. The cost of the geotechnical field and laboratory program is approximately $600,000.

26.6 Power

The final routing of the incoming high-voltage Hydro Québec power lines should be studied further in terms of both design and community acceptance. Two scenarios of power transmission line routing should be considered: (1) implementing the CHE 235 line coming from the west (to be constructed and upgraded); and (2) implementing the CHE (Neville) 236 line coming from east. The cost of this is approximately $50,000.

26.7 Water Management

The results of the study indicated that early in the mining operation there may not be sufficient makeup water available from pits, stockpile, and collection pond, as they are not yet fully constructed. Consequently, makeup water will need to be supplied from a freshwater source (i.e., several lake and ponds in the vicinity of the mine facilities). Using groundwater from wells is not recommended unless sufficient investigations are completed. During the pre-feasibility study, detailed water balance analysis will be required to review the availability of makeup water throughout the life of mine.

During peak operations, however, there will be a significant amount of surplus water which should be managed. Depending on the quality of collected water, the surplus water should be chemically or physically treated before it is discharged into the environment.

26.8 Waste Disposal Facility

A more detailed evaluation of WDF development needs to be carried out in the next project phase. This should include optimization of waste rock and tailings placement (stacking plan), foundation design, surface and seepage water management, and physical and geochemical stability.

26.9 Environmental, Social and Permitting

It is recommended that environmental baseline studies be undertaken to characterize the wetlands, water resources, and fish habitat to advance the project toward the environmental assessment process. Stakeholder consultation will also be carried out in the Fall 2021.

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