VOLUME 1

GALAXY LITHIUM (CANADA) INC.
PROJECT NO.: 201-12362-00

RESTORATION PLAN

JAMES BAY LITHIUM MINE PROJECT

MARCH 2022

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PROJECT N^{O}: 201-12362-00
DATE: MARCH 2022

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Reference to be included:

WSP. 2021. *RESTORATION PLAN. JAMES BAY LITHIUM MINE PROJECT*. REPORT PRODUCED FOR GALAXY LITHIUM (CANADA) INC. 77 PAGES AND APPENDICES.

FOREWORD

Changes made since the last version of the restoration plan (November 2021 version) are highlighted in gray in the document.

RÉSUMÉ DU PLAN DE RESTAURATION

Galaxy Lithium (Canada) inc. est une filiale de Allkem Limited, une importante société minière sur le marché du lithium. Actuellement, Allkem Limited exploite une mine de spodumène en Australie et deux projets sont en développement : un au Québec (projet mine de lithium Baie-James) et l'autre en Argentine.

Le projet mine de lithium Baie-James prévoit l'exploitation d'une fosse de façon conventionnelle, d'où environ 2 Mt par année de pegmatite à spodumène seront extraites, pour ensuite être dirigées vers l'usine de traitement du minerai. En plus de la fosse, le site accueillera, notamment, des aires d'accumulation (mort-terrain, stériles/résidus, minerai, concentré), des bassins de rétention, une usine de traitement du minerai, des bâtiments industriels et administratifs, un campement pour les travailleurs, des ateliers et entrepôts ainsi qu'un dépôt d'explosifs. La période d'exploitation prévue est de 18,5 ans.

Le projet de mine de lithium Baie-James est situé dans la province géologique du Supérieur et fait partie de la ceinture de roches vertes archéennes du groupe d'Eastmain. Les roches de cette ceinture volcanique sont majoritairement constituées d'amphibolites et de roches métasédimentaires et métavolcaniques. Sous les roches du groupe d'Eastmain, on retrouve la formation d'Auclair, composée de paragneiss recoupé par des intrusions de pegmatite à spodumène. Le gisement du projet de mine de lithium Baie-James est constitué d'essaims de dykes et de lentilles de pegmatite, qui atteignent chacun jusqu'à 150 m de largeur par 100 m de longueur. L'ensemble des essaims est compris dans un corridor discontinu s'étendant sur environ 4 km de longueur par 300 m de largeur.

Des caractérisations géochimiques et des essais cinétiques réalisés sur le minerai, les stériles et les résidus ont été effectués par WSP entre 2018 et 2020. Les résultats de ces études mentionnent que le minerai, les stériles et les résidus qui seront extraits de la mine de lithium Baie-James sont considérés lixiviables à court terme, mais non lixiviables à long terme. Ces matériaux sont également tous non potentiellement générateurs d'acide (NPGA). Considérant cela, les assises des haldes à stériles et résidus ainsi que celles de la halde à minerai devront posséder une perméabilité inférieure au débit limite de 3,3 l/m²/j défini dans la Directive 019 pour les mesures d'étanchéité de niveau A. Toutefois, comme ces matériaux sont non lixiviables à long terme, il ne sera pas requis d'imperméabiliser le recouvrement des haldes à stériles et résidus en période postrestauration.

Durant l'exploitation de la mine, en plus de la fosse à ciel ouvert, les principales installations suivantes seront aménagées sur le site :

- quatre haldes à stériles et résidus;
- une halde à dépôts meubles et matière organique;
- une halde à minerai concassé (dans un dôme) pour récupération;
- une halde à produit final de concentré de spodumène (dans un dôme) pour chargement;
- deux bassins de gestion des eaux de contact (principal, situé au nord et drainant le secteur est);
- une usine de traitement du minerai (séparation en milieu dense ou concentrateur);

— un circuit de concassage en trois phases (situé à côté de la halde à minerai), des convoyeurs et un secteur de triage;
— un entrepôt à explosifs;
— une usine de traitement de l'effluent (UTE);
— un réservoir pour l'épaississement des résidus miniers;
— des réservoirs d'eau de procédé;
— divers bâtiments administratifs, laboratoires, ateliers et entrepôts;
— un poste extérieur à haute tension;
— un campement des travailleurs.

Un système de collecte des eaux de drainage en surface sera aménagé et les eaux collectées seront acheminées vers le bassin de gestion des eaux Nord. Les eaux de contact et les eaux de dénoyage de la fosse seront aussi acheminées vers ce bassin.

Les dépôts meubles et les sols végétaux qui seront excavés seront tous acheminés sur la halde à dépôts meubles, sauf les sols de surface qui devront être décapés pour l'aménagement de la bande coupe-feu; ces derniers seront empilés le long de la bande coupe-feu.

Le minerai sera acheminé à une usine de traitement aménagée sur le site, où il sera soumis à plusieurs circuits de concassage et de séparation en milieu dense. Le produit final consistera en un concentré d'oxyde de lithium à 6 %, qui sera acheminé par camions à l'extérieur du site. Des dépôts à explosifs et à détonateurs seront aménagés à l'ouest de la propriété. Une usine de ciment temporaire sera également construite dans le secteur industriel pour usage pendant la période de construction. Elle sera démantelée dès les premières années d'opération.

Les mesures de protection, de réaménagement et de restauration qui seront appliquées au site du projet de mine de lithium Baie-James incluront la restauration des infrastructures suivantes : les infrastructures routières, les bâtiments de services et administratifs, les aires d'accumulation, la fosse, les aires de travail et d'entreposage ainsi que les bassins d'accumulation des eaux. À la fin des opérations d'extraction minière, le pompage des eaux de la fosse cessera et celle-ci s'ennoiera progressivement par la remontée des eaux de la nappe phréatique. Une berme de sécurité sera aménagée au pourtour de la fosse et des panneaux indicateurs du danger seront installés. Les haldes à stériles et à résidus ainsi que la halde à matière organique et dépôts meubles seront nivelées et végétalisées. Les bassins d'accumulation d'eau seront soit remblayés ou convertis en milieux humides.

Tous les bâtiments et toutes les infrastructures qui ne seront pas utiles pour la réalisation du suivi postfermeture seront transportés hors site ou démantelés par un entrepreneur certifié. Les secteurs affectés par les activités d'opération seront, à la suite du démantèlement, profilés de façon à rétablir un écoulement naturel des eaux, puis végétalisés.

En période postrestauration, un suivi de l'intégrité des ouvrages sera effectué annuellement pendant un minimum de cinq ans. De plus, un suivi environnemental visant à vérifier la qualité des eaux souterraines et de surface sera réalisé six fois par an, pour une durée minimale de 5 ans. Un suivi agronomique afin de vérifier la reprise de la végétation sera également réalisé pendant une durée minimale de cinq ans.

Les travaux prévus pour le réaménagement et la restauration du site sont estimés à 49 608 897 $[1]. Ces coûts incluent les frais d'ingénierie (30 %), les coûts de suivi ainsi qu'une contingence de 15 %.

1 En dollars 2021.

RESTORATION PLAN SUMMARY

Galaxy Lithium (Canada) inc. is a subsidiary of Allkem Limited, a lithium mining company. Currently, Allkem Limited operates a spodumene mine in Australia and two projects are under development: one in Quebec (James Bay lithium mine project) and the other in Argentina.

The James Bay lithium mine project involves the operation of a conventional pit, from which approximately 2 Mt per year of spodumene pegmatite will be extracted, and then sent to the ore processing plant. In addition to the pit, the site will host accumulation areas (overburden, waste rock/tailings, ore, concentrate), water management ponds, an ore processing plant, industrial and administrative buildings, a camp for workers, workshops and warehouses as well as an explosives magazine. The expected operating period is 18.5 years.

The James Bay lithium mine project is located in the Superior geological province and is part of the Archean greenstone belt of the Eastmain group. The rocks of this volcanic belt are mainly made up of amphibolites and metasedimentary and metavolcanic rocks. Under the rocks of the Eastmain group, we find the Auclair formation, composed of paragneiss intersected by intrusions of spodumene pegmatite. The deposit of the James Bay lithium mine project consists of swarms of dykes and pegmatite lenses, each of which is up to 150 m wide by 100 m long. All the swarms are included in a discontinuous corridor extending about 4 km in length by 300 m in width.

Geochemical characterizations and kinetic tests carried out on the ore, waste rock and tailings were carried out by WSP between 2018 and 2020. The results of these studies indicate that the ore, waste rock and tailings that will be extracted from the James Bay lithium mine project are considered leachable in the short term, but not leachable in the long term. These materials are also all non-potentially acid-generating (NPAG). Considering this, the foundations of the waste rock and tailings dumps as well as those of the ore dump must have a permeability lower than the limiting flow rate of 3.3 L/m²/d defined in Directive 019 for level A waterproofing measures. However, since these materials are not leachable in the long term, it will not be necessary to waterproof the covering of the waste rock and tailings piles during the post-remediation period.

During the operation of the mine, in addition to the open pit, the following main facilities will be installed on the site:

- four waste rock and tailings storage facilities;
- an overburden and peat storage facility;
- a crushed ore stockpile (in a dome) for recovery;
- a stockpile for final product of spodumene concentrate (in a dome) for loading;
- two water management ponds (main, located to the north and draining the east sector);
- an ore processing plant (dense medium separation - DMS);
- a three-phase crushing circuit (located next to the ore stockpile), conveyors and a sorting area;
- an explosives magazine;
- a water treatment plant (WTP);
- a reservoir for the thickening of mine tailings;
- process water tanks;
- various administrative buildings, laboratories, workshops and warehouses;
- a high voltage station;
- a workers' camp.

A surface drainage water collection system will be installed, and the collected water will be channeled to the North water management pond. Contact water and dewatering water from the pit will also be routed to this pond.

The excavated unconsolidated deposits and vegetal soils will be sent to the overburden and peat storage facility, except for the surface soils which will be stripped for the development of the fire strip; these will be stacked along the fire strip.

The ore will be transported to a processing plant, where it will be subjected to several crushing and dense media separation circuits. The end product will be a 6% lithium oxide concentrate, which will be trucked off site. Explosives and detonator magazines will be set up to the west of the property. A temporary cement plant will also be built in the industrial sector for use during the construction period. It will be dismantled in the first years of operation.

The protection, development and restoration measures that will be implemented as part of the James Bay lithium mine project site will include the restoration of the following infrastructures: road infrastructures, service and administrative buildings, accumulation areas, the pit, work and storage areas as well as water management ponds. At the end of mining operations, the pumping of water from the pit will cease and it will gradually be filled with the rising water from the water table. A safety berm will be built around the pit and danger signs will be installed. The waste rock and tailings storage facilities as well as the overburden and peat storage area will be leveled and revegetated. The water management ponds will either be backfilled or converted to wetlands.

All buildings and infrastructures that will not be useful for carrying out post-closure monitoring will be transported off-site or dismantled by a certified contractor. The areas affected by the operating activities will, following the dismantling, be profiled to restore a natural flow of water, then revegetated.

During the post-restoration period, the integrity of the structures will be monitored annually for a minimum of five years. In addition, environmental monitoring aimed at verifying the quality of groundwater and surface water will be carried out six times a year, for a minimum period of 5 years. Agronomic monitoring in order to verify the recovery of vegetation will also be carried out for a minimum period of five years.

The works planned for the restoration of the site are estimated at $49,608,897[2]. These costs include engineering costs (30%), follow-up costs as well as a 15% contingency.

2 In 2021 dollars.

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LIST OF ABBREVIATIONS

IAAC (AEIC):	Impact Assessment Agency of Canada
JBNQA:	James Bay and Northern Quebec Agreement
CIDREQ:	Quebec Enterprise Register Computer Centre
COMEX:	Environmental and Social Impact Review Committee
HVAC:	Heating, ventilation and air conditioning
EIA:	Environmental impact assessment
EPA:	Environmental Protection Agency
D019:	Directive 019 pertaining to the mining industry
DEF:	diesel exhaust fluid
CNG:	Cree Nation Government
PERG:	Peatland Ecology Research Group
EQA:	Environment Quality Act
MELCC:	Ministère de l'Environnement et de la Lutte contre les changements climatiques
MDDEP:	Ministère du Développement durable, de l'Environnement et des Parcs
RHM:	Residual hazardous materials
m^3/d:	Cubic metres per day
MABA:	Modified Acid Base Accounting
MERN:	Ministère de l'Énergie et des Ressources naturelles
SS:	Suspended solids
Mm^3:	Million cubic metres
Mt:	Million tonnes
Mt/y:	Million tonnes per year
NPAG:	Not potentially acid-generating
JBLMP:	James Bay Lithium Mine Project
PAG:	Potentially acid-generating/Acid generating potential
HMR:	Hazardous Materials Regulation
RMSPNGB	Regulation respecting mineral substances other than petroleum, natural gas and brine
SDBJ:	Société de Développement de la Baie-James
DMS:	Dense media separation
WHMIS:	Workplace hazardous materials information system
WTP:	Water treatment plant

1 INTRODUCTION

1.1 CONTEXT

Galaxy Lithium (Canada) Inc. (GLCI) is a subsidiary of Allkem Limited, a leading lithium mining company. Allkem Limited currently operates a spodumene mine in Australia and two projects are under development: one in Quebec (James Bay lithium mine project) and one in Argentina.

The James Bay Lithium Mine Project (JBLMP) involves the conventional pit mining of about 2 Mt of spodumene pegmatite per year to be sent to an ore processing plant. In addition to the pit, the site will house, in particular, accumulation areas (overburden, waste rock/tailings, ore, concentrate), retention basins, administrative buildings, a workers' camp, workshops and warehouses, and an explosives magazine. The expected period of operation is 18.5 years.

The JBLMP is subject to the provincial environmental impact assessment and review procedure, as set out in section 153 of Chapter II of the Environment Quality Act (EQA). Schedule A of the EQA lists the projects that are subject to the mandatory assessment and review process, including "all mining developments, including the additions to, alterations or modifications of existing mining developments." In conjunction with the EQA, Schedule 1 of Section 22 of the James Bay and Northern Quebec Agreement (JBNQA) sets out a list of projects subject to the assessment process, including mining projects. The project is also subject to a federal environmental assessment, as required under section 13 of the Canadian Environmental Assessment Act (CEAA, 2012) (S.C. 2012, c. 19, s. 52; [Repealed, 2019, c. 28, s. 9]), since ore extraction will exceed 3,000 t/day (section 16(a)) and mill capacity will exceed 4,000 t/day (section 16(b) of the Regulations Designating Physical Activities [SOR/2012-147]). The project is being assessed at the federal level by the Impact Assessment Agency of Canada (IAAC) in conjunction with the Cree Nation Government (CNG) under the legislative requirements of the CEAA (2012) and in accordance with the spirit and objectives of the JBNQA.

As part of the analysis of the Environmental Impact Assessment (EIA) by government committees, the Environment and Social Impact Review Committee (COMEX) required GLCI to submit a complete restoration plan in accordance with the Guidelines for preparing mine closure plans in Québec (Guidelines).

WSP Canada Inc. (WSP) was mandated by GLCI to prepare the plan for the restoration of JBLMP in accordance with the Guidelines. This version will be submitted to MERN in order to validate its concordance with the Guide. Thereafter, the MERN will begin its analysis for approval prior to issuing the mining lease in accordance with section 232.1 of the Mining Act.

1.2 OBJECTIVES

This restoration plan was developed according to the requirements and recommendations of the Guidelines, with the information available as of September 2021. Since the infrastructure design studies for the project are still in progress, the description of the infrastructure presented in this document is also subject to before the approbation of the restoration plan.

The restoration program described in this document covers the activities to be conducted during the operational phase. The restoration plan will focus primarily on the following elements:

- protection, rehabilitation and restoration measures;
- post-restoration control and monitoring program;
- measures in the event of temporary suspension of activities;
- emergency measures plan;
- assessment of the cost of restoration work;
- assessment of the financial guarantee;
- restoration work schedule.

In order to facilitate readability of the document, the maps cited have all been grouped together and presented at the end of this restoration plan.

2 BACKGROUND INFORMATION

2.1 IDENTIFICATION OF PROPONENT

2.1.1 *PROPONENT*

Name of proponent:	**Galaxy Lithium (Canada) Inc.**
Address:	2000 Peel Street, Suite 720 Montreal, QC H3A 2W5
Telephone:	581-777-1534
Website:	https://www.allkem.co/projects/james-bay
Project manager:	Ms. Gail Amyot, Eng. M.Sc. CEA Environment, Health and Safety Director Email: gail.amyot@allkem.co

2.1.2 *MANDATED CONSULTANT*

Restoration Plan:	**WSP Canada Inc.**
Address:	1135 Lebourgneuf Blvd. Québec, QC G2K 0M5
Telephone:	418-623-2254
Fax:	418-624-1857
Website:	www.wspgroup.com
Contact people:	Ms. Christine Martineau Email: christine.martineau@wsp.com

2.1.3 *CIDREQ NUMBER*

The code number of the Quebec Enterprise Registry Computer Centre (CIDREQ) assigned by the enterprise registrar for Galaxy Lithium (Canada) Inc. is 1167071928.

2.1.4 *RESOLUTION OF THE BOARD OF DIRECTORS*

The resolution of the Board of Directors authorizing Mr. Denis Couture, General Manager, to act on behalf of the organization is provided in Appendix A.

2.2 LOCATION OF THE MINE SITE

The JBLMP is located in the Nord-du-Québec administrative region, on the territory of the James Bay Eeyou Istchee Regional Government. The mine site under study is located about 10 km south of the Eastmain River and about 100 km east of James Bay, at the same latitude as the Cree village of Eastmain.

The GLCI mining property (claims) is located on Category III lands under the James Bay and Northern Quebec Agreement (JBNQA). The land under mining claims is easily accessible by the Billy-Diamond Highway, which crosses the property near the truck stop at KM 381.

The site's geographic coordinates in UTM (NAD83, zone 18N) are:

- X: 358,891
- Y: 5,789,180

The general location of the mine site is shown on Map 1.

2.3 LAND MINING PROPERTY

The JBLMP property includes 54 claims that cover about 2,164 ha. The wholly owned subsidiaries of Allkem Limited including the project developer, GLCI, are the holders of current claims on the mine property of the project. GLCI will prepare, at the appropriate time, an application to acquire a mining lease to operate a mine and ore processing plant at the project site.

The active project mining claims are shown on Map 2.

2.4 HISTORY OF THE SITE

Prospector Jean Cyr carried out the first work that revealed the presence of spodumene pegmatite in the area in 1964. He staked the area in 1966. The Société de développement de la Baie-James (SDBJ) acquired the exploration rights in 1974 and carried out various exploration work before transferring the rights to Jean Cyr in 1986. The work carried out by the SDBJ in 1974 consisted of geological mapping of the area, as well as rock sampling and drilling. A total of 277 samples were collected and analyzed, with an average content of 1.7% Li_2O. The work revealed the presence of 45,000 m^2 of outcrops containing spodumene pegmatite in the form of dikes or lenses, which were concentrated in an approximately 4 km long east-west axis. Additional work was carried out by SDBJ in 1977 and consisted of a three-hole exploratory drilling campaign that totalled 383 m of drilling. Little work was carried out until the early 2000s.

In 2008, Géophysique TMC Inc. conducted an induced polarization and magnetometry geophysical survey at the request of Lithium One, the holder of the exploration rights on these properties. The magnetometer survey was conducted over a linear distance of 26.3 km with measurement points every 12.5 m, while the induced polarization survey was conducted continuously over a linear distance of 24.3 km. The survey lines were spaced 50 m apart and points were surveyed every 25 m using a high-precision GPS.

In 2008, 18 exploratory boreholes were also completed by Lithium One, each spaced 100 m apart on a rectangular grid covering an area of 180 ha. In 2009, a drilling campaign including 84 new exploratory boreholes, spaced 50 to 60 m apart, was carried out. This campaign identified new spodumene pegmatite dikes. In 2009 and 2010, rock samples were also collected in channel samples from surface outcrops of several pegmatite dikes. Fifty-three grooves were made using diamond saws.

In 2017, GLCI conducted a drilling campaign to better delineate the extension of the pegmatite dikes. Fan drilling was carried out to delineate the depth extension of known pegmatite west of the Billy-Diamond Highway, and drilling was also carried out east of the highway in unexplored areas. During this campaign, 157 boreholes (totalling 33,339 m) were drilled, which uncovered new mineralized zones.

Also in 2017, spodumene pegmatite (ore) samples from 41 drill core samples totalling 400 kg were metallurgically tested to validate the proposed ore processing method and spodumene recovery rate. At the end of this test, the lithium recovery rate was 66% at a concentration of 6% Li_2O (G Mining Services, 2021).

2.5 RESOURCES AND MINERAL RESERVES

According to SRK's 2010 Mineral Resource assessment (SRK Consulting, 2010), based on National Instrument 43-101 (NI 43-101) standards, indicated mineral resources to date have been calculated at 40,330,000 t of indicated lithium ore (Li_2O) at a concentration of 1.40%. These resources were calculated considering a cut-off grade of 0.62%, a metallurgical recovery rate of 70% and an extraction and processing cost of US$55 per tonne.

SRK also conducted a mineral reserve estimate for the deposit in 2010. Thus, a total of 33,860,000 t of probable mineral reserves of lithium ore at a grade of 1.34% would be extractable from the JBLMP deposit. This calculation considers a mill recovery rate of 66% and a cut-off grade of 0.62% Li_2O.

2.6 GEOLOGY AND MINERALOGY

2.6.1 REGIONAL AND LOCAL GEOLOGY

According to information from a prefeasibility study conducted for the project (G Mining Services, 2021) and the project mineral resource assessment report (SRK Consulting, 2010), the JBLMP is located in the Superior geological province and is part of the Archean greenstone belt of the Eastmain Group. The rocks of this volcanic belt are mostly amphibolites and metasedimentary and metavolcanic rocks. Beneath the Eastmain Group rocks is the Auclair formation, composed of paragneiss intersected by spodumene pegmatite intrusions. The non-intrusive rocks on the property show an east-northeast foliation and a subvertical dip, whereas the intrusions are rather massive.

The deposit at the JBLMP consists of swarms of pegmatite dikes and lenses, each up to 150 m wide by 100 m long. All swarms are contained within a discontinuous corridor extending approximately 4 km long by 300 m wide. The surrounding rocks are composed of gneiss and banded gneiss, along with more felsic rocks such as dacite and quartzite, as well as metagabbro and granite, are also present on the property.

The pegmatite making up the JBLMP deposit contains spodumene, which is found in crystals ranging in size from 5 cm to over 1 m in size. A total of 18 significant spodumene containing pegmatite dikes or lenses have been identified on the property. These orebodies are up to 60 m wide and 100 m long. Other mineralized dikes or lenses may be identified on site as exploration and definition work progresses.

2.6.2 MINERALOGY

Spodumene, constituting lithium ore, is found in pegmatite along with other minerals such as quartz, microcline, albite, muscovite, lepidolite, tourmaline and beryl. Spodumene is composed of lithium (8.03% Li_2O), aluminum (27.40% Al_2O_3), silica (64.58% SiO_2) and oxygen (51.59% O). Spodumene is a prismatic habitus mineral with a striated appearance and is often stretched perpendicular to the orientation of the pegmatite dikes on the property. It is whitish to greenish in colour and the crystals are millimetric to metric in size.

Spodumene can be altered to sericite, causing it to take on a brownish colour due to the presence of iron in the sericite. Thus, iron oxides are sometimes present, also within the pegmatite.

2.6.3 GEOCHEMICAL CHARACTERIZATION

WSP conducted a geochemical characterization of the ore, waste rock and tailings in 2018. Following this geochemical characterization, kinetic tests were conducted on waste rock and tailings, the results of which were published in 2019 (WSP, 2019). Finally, kinetic tests were also conducted on the ore and a waste rock unit (diabase) and the results were published in 2020 (WSP, 2020). These studies are presented in Appendix B.

GEOCHEMISTRY EXPERT STUDY (2018)

In 2018, WSP carried out a geochemical characterization of the mine waste rock, ore, tailings and unconsolidated deposits that will be extracted, produced or reclaimed when the JBLMP goes into production. The purpose of this characterization was to assess the leaching and acid generation potential of these materials on a limited number of samples, in order to initially evaluate the intervention measures required to minimize the environmental impact of mining the ore and waste rock.

In this study, samples of waste rock, tailings and ore were subjected to static analyses for available metal content, leaching tests (TCLP, SPLP, and CTEU-9) and tests to determine the potential for acid generation of these materials (MABA) and their radioactivity. The results for each type of material are presented below.

WASTE ROCK

A total of 81 waste rock samples were analyzed. All samples were analyzed for metal content and potential for acid generation, and samples with metal concentrations above the generic “A” criteria in the *Guide d’intervention – Protection des sols et réhabilitation des terrains contaminés* (*Guide d’intervention*) were subjected to leaching tests.

Samples were selected to represent the proportions of each of the lithologies (gneiss, banded gneiss, sterile pegmatite and basalt) that will be extracted from the waste rock and to have a sufficient number of samples from each of the lithologies for interpretation.

Analysis results indicate that 100% of the waste rock is considered leachable with respect to D019. Table 1 provides details of the results on waste rock for each of the units.

Less aggressive leaching tests than the TCLP test, SPLP and CTEU-9, were also performed on the waste rock. The results of these tests indicated leaching of some metals, mainly arsenic, silver, barium, copper, manganese, nickel, lead and zinc.

A higher leaching rate was obtained in CTEU-9 due to the very fine particle size (100 mesh) of the materials in this test, which can result in an increase in the specific surface area of the materials and a higher solubility of some metals. Moreover, the D019 criterion for arsenic was exceeded in this test for both I1G (4%) and V3B (80%). Although the D019 does not recommend this test for the characterization of mine waste rock, these exceedances should still be taken into consideration since the field conditions are more amenable to water than acid leaching. However, this particle size is not comparable to that of the waste rock that will be piled at the site.

The results of the static acid generating potential test (MABA) indicated that the total sulfur concentration was less than 0.3% for 100% of the I1G and V3B waste rock samples analyzed; these samples are classified as NPGA for D019. However, 30% of the samples from unit M1 and 50% of the samples from unit M2 are classified PAG with respect to D019. Comparing the results with the criteria established by the URSTM and MEND, 70% of them are within the uncertainty zone, while 20% are considered PAG and 10% NPAG for unit M1. For samples from unit M2, 40% are within the uncertainty zone, 55% are considered PAG and 5% NPAG.

ORE

A total of 28 ore samples were analyzed in this study. All samples were analyzed for metal content and potential for acid generation, and samples with metal concentrations above the generic “A” criteria in the *Guide d’intervention* were subjected to leaching tests.

The results of these analyses, when compared to the criteria in Table 1 of Appendix II of D019, indicate that 96% of the ore samples submitted for analysis would be considered leachable, based on the results of the static tests.

Furthermore, 83% of the samples would be leachable as manganese, 50% as zinc and 46% as copper. Finally, between 13% and 42% of the ore samples analyzed would be leachable as arsenic and/or barium and/or cadmium and/or nickel and/or lead. Less aggressive leaching tests than the TCLP test, including the SPLP and CTEU-9 tests, were also conducted on the ore samples. The results of these tests indicated leaching of some metals, including arsenic, silver, barium, copper, manganese, nickel, lead and zinc during the SPLP test. Furthermore, in the WTC-9 test, results above the *Guide d’intervention* GWS criteria were observed in all samples for copper, manganese, lead and zinc, with some exceedances for silver, arsenic and barium. The ore is therefore considered leachable based on the various leaching tests conducted during the study.

With respect to the results of the MABA static potential acid generation test, the results indicate that 79% of the ore samples are considered NPAG and 21% of them are considered PAG under D019. However, when comparing the MABA test results to the requirements specified in the MEND *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials*, 64% of the ore samples would be considered NPAG and 36% of them would be within the uncertainty zone, while none of them would be considered PAG. Thus, under the applicable regulations, most of the ore from the James Bay lithium mine would be considered NPAG. However, according to MEND criteria, 36% of the ore samples would be located in the uncertainty zone with respect to its potential for acid generation, based on the static tests performed.

Table 1 Summary of test results from waste rock samples

Unit	Metals >A	TCLP>GWS	SPLP>GWS	CTEU-9 >D019	CTEU-9>GWS	PAG (D019)
Sterile pegmatite (I1G)	96 %	Mn: 19/20 samples (95%)	Hg: 5/20 samples (25%)		Cu, Pb, Zn (100%)	0 %
		Cu, Zn: 11/20 samples (55%)	Zn: 2/20 samples (10%)		Mn: 18/20 samples (90%)	
		Cd, Pb: 1/20 samples (5%)	Ag, Ba: 1/20 samples (5%)		As: 5/20 samples (25%)	
					Cd: 2/20 samples (10%)	
Gneiss (M1)	100 %	Ba: 23/30 samples (77%)	Cu: 4/24 samples (17%)	As: 1/24 samples (4%)	Cu (100%)	30 %
		Zn: 19/30 samples (63%)	Zn: 3/24 samples (13%)		Ba, Pb, Zn: 21/24 samples (88%)	
		Ni, Pb: 14/30 samples (47%)	Ag: 2/24 samples (8%)		Ag: 19/24 samples (79%)	
		Cd: 10/30 samples (30%)	Ni: 1/24 samples (4%)		Cd, Ni: 18/24 samples (75%)	
		Mn: 3/30 samples (10%)			As: 17/24 samples (71%)	
		As, Cu: 1/30 samples (3%)				
Banded gneiss (M2)	100 %	Ba: 15/20 samples (77%)			Ag, Ba, Cd, Cu, Pb, Zn (100%)	50 %
		Pb: 13/20 samples (65%)			As: 7/8 samples (88%)	
		Zn: 11/20 samples (55%)			Ni: 6/8 samples (75%)	
		Ni: 6/20 samples (30%)			Mn: 1/8 samples (13%)	
		Cd: 3/20 samples (15%)				
		Mn: 1/20 samples (5%)				
Basalt (V3B)	100 %	As, Ba, Ni (100%)	As (100%)	As: 4/5 samples (80%)	As (100%)	0 %
		Mn: 3/10 samples (30%)			Ba, Cu, Ni: 4/5 samples (80%)	
					Fluoride: 1/5 samples (20%)	

Table 2 presents a summary of the ore results.

Table 2 Summary of static test results from ore samples

METALS >A	TCLP>GWS	TCLP>D019	SPLP>GWS	CTEU-9>GWS	PAG (D019)
96 %	As: 4/27 samples (15%)	As: 1/27 samples (4%)	Ag, As, Hg, Ni: 1/18 samples (5%)	Ag, As: 1/4 samples (25%)	21%
	Ba: 10/27 samples (37%)		Cu, Zn: 2/18 samples (11%)	Mn: 3/4 samples (75%)	
	Cd: 11/27 samples (41%)			Cu, Pb, Zn: 4/4 samples (100%)	
	Cu: 11/27 samples (41%)				
	Mn: 20/27 samples (74%)				
	Ni: 5/27 samples (19%)				
	Pb: 7/27 samples (26%)				
	Zn: 12/27 samples (44%)				

MINE TAILINGS

A total of 12 tailings samples were analyzed. All samples were analyzed for metal content and potential for acid generation, and samples with metal concentrations above the generic "A" criteria in the *Guide d'intervention* were subjected to leaching tests.

The results of these analyses, when compared to the criteria in Table 1 of Appendix II of D019, indicate that 100% of the tailings are considered leachable in cadmium, copper, manganese and zinc, and 8% in mercury with respect to D019.

Less aggressive leaching tests than the TCLP test, including the SPLP and CTEU-9 tests, were also conducted on the ore samples. The SPLP test did not exceed the D019 or GWS criteria of the Guide d'intervention. In the CTEU-9 test, all samples exceeded the *Guide d'intervention* GWS criteria for silver, copper and mercury. As observed for ore and waste rock, the fine particle size required for this test appears to result in higher element mobility. The results are similar when compared to the requirements specified in the MEND *Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials*.

All of the 12 samples from I1G tested in the MABA static test had S_{total} concentrations of less than 0.3% and are, therefore, classified as NPAG concerning D019. Furthermore, analysis of the difference between the gross neutralization capacity (NC) and the maximum potential acidity (MPA), as well as the NC/MPA ratio, confirmed that all samples analyzed are classified as NPAG, according to applicable criteria (D019, MEND).

Thus, under the applicable regulations, the tailings to be produced at the JBLMP site would be considered NPAG, but leachable in cadmium, copper, manganese, mercury and zinc.

Table 3 presents a summary of the results on the tailings.

Table 3 Summary of static test results from tailings samples

Metals >A	TCLP>GWS	SPLP>GWS	CTEU-9>GWS	PAG (D019)
100 %	Cd: 4/12 samples (33 %)	-	Ag, Cu, Hg (100%)	0 %
	Cu, Mn: 12/12 samples (100 %)		-	
	Hg: 1/12 samples (8 %)			

COLUMN KINETIC TEST RESULTS (2019)

Column kinetic tests were performed on mine waste rock and tailings samples in 2019. A flush was performed weekly until week 4 and then every two weeks for a total period of 50 weeks. Two of the columns contained a waste rock sample, one kept saturated at all times and the other kept unsaturated between one flush and the next, while the third column contained a tailings sample and was kept unsaturated between one flush and the next.

The results of these tests are summarized below.

ACID GENERATING POTENTIAL

The results observed in the kinetic tests on the three columns resulted in the following observations regarding the acid generation potential:

- The pH of the leachate for all three columns remained between 7 and 8 for the first 20 weeks of the test and then stabilized between 6.25 and 7.01 until the end of the test.
- SO_4 concentrations remained between 5 and 10 mg/L for the majority of the test for both waste rock columns, while concentrations for the tailings column remained below 1 mg/L.
- The acidity measured in the leachate from all three columns remained near the detection limit throughout the test. Only one increase was measured at week 8 for the unsaturated waste rock (12 mg/L) and saturated waste rock (110 mg/L).
- Electrical conductivity was maximum at the beginning of the test and then reached a plateau around week 14 for the three columns, at about 15 µS/cm for the tailings column, 28 µS/cm for the unsaturated waste rock column and 35 µS/cm for the saturated waste rock column.
- The oxidation reduction potential varied throughout the test for all three columns but remained between 500 mV and 75 mV.

Therefore, based on the results obtained from these column kinetic tests, it appears that the acid generation potential of both the saturated and unsaturated waste rock and tailings is insignificant since the pH of all three columns was maintained between 6.25 and 8 throughout the test and the acidity in the leach water remained below the DL throughout most of the test, with similar results in all three columns.

The measured conductivity is also lower for tailings than for waste rock.

Concentrations of SO_4 in solution also remained stable throughout the test. It also appears that the SO_4 concentrations in the tailings leachate are lower than in the waste rock leachate. Tailings and waste rock are therefore considered non-acid generating.

LEACHING POTENTIAL

COLUMN 1 – UNSATURATED TAILINGS

- Silver concentrations were above the GWS criterion for the first six weeks of testing. They remained below the DL from week 8 onwards (note that the DL [0.00005 mg/L] was greater than GWS [0.00003 mg/L] criterion). A value equal to the DL, and therefore greater than the GWS criterion, was also obtained at week 46. Since this value is a point value and just above the DL, it is not considered to have a significant impact on water quality. It could also be a false positive from the laboratory.
- The D019 monthly average final effluent discharge concentration was exceeded in the initial analysis.
- The copper GWS criterion was exceeded at weeks 0 to 18, 22 and 28. After week 28, concentrations remained below the GWS criterion.
- Iron exceeded the D019 final effluent discharge maximum acceptable concentration in weeks 0 and 2 and exceeded the monthly average acceptable final effluent discharge concentration in weeks 1, 3, 4 and 6. Concentrations then gradually decreased, reaching a threshold near the DL around week 14.
- Manganese exceeded the GWS criterion only between weeks 0 to 4. Concentrations reached a threshold near the DL as of week 14.
- Mercury exceeded the GWS criterion primarily between weeks 0 and 14. As of week 16, concentrations remained below the DL (note that the DL [0.00001 mg/L] was greater than GWS criterion [0.0000013 mg/L]).
- Lead exceeded the GWS criterion in the first 6 weeks of testing. Concentrations stabilized near the DL as of week 10.
- Zinc exceeded the GWS criterion during the first 14 weeks of testing. Concentrations stabilized near the DL as of week 16.
- The arsenic, barium and nickel tests did not exceed the GWS criterion.
- The copper, nickel, lead and zinc tests did not exceed the D019 (average and maximum) final effluent discharge acceptable concentrations.

COLUMN 2 – SATURATED WASTE ROCK MIX

- Only the initial and week 1 analyses results were higher than the DL. Concentrations subsequently remained below the DL (note that the DL [0.00005 mg/L] was greater than the GWS criterion [0.00003 mg/L]).
- Arsenic exceeded the D019 final effluent discharge maximum acceptable concentration at week 3 and the monthly average acceptable concentration at weeks 2, 4, and 6. The GWS criterion was also exceeded in weeks 3 and 4. Concentrations subsequently dropped to a threshold around week 24.
- Barium exceeded the GWS criterion in the initial analysis. However, concentrations stabilize near the DL as of week 2.
- Copper exceeded the GWS criterion in both the initial and week 1 analyses. However, concentrations stabilize below the GWS criterion as of week 2.

- Iron exceeded the D019 final effluent discharge maximum acceptable concentration in the initial analysis and the monthly average concentration in week 1; however, concentrations stabilized near the DL starting in week 2.
- Mercury exceeded the GWS criterion primarily between weeks 0 and 14. As of week 16, concentrations remained below the DL (note that the DL [0.00001 mg/L] was greater than GWS criterion [0.0000013 mg/L]).
- Zinc exceeded the GWS criterion only in the initial analysis. Concentrations then remained near or below the DL.
- The manganese, nickel and lead tests did not exceed the GWS criterion.
- The copper, nickel, lead and zinc tests did not exceed the D019 (average and maximum) final effluent discharge acceptable concentrations.

COLUMN 3 – UNSATURATED WASTE ROCK MIX

- Silver concentrations were above the GWS criterion for the first 12 weeks of testing. They remained below the DL from week 14 onwards (note that the DL [0.00005 mg/L] was greater than GWS [0.00003 mg/L] criterion).
- Arsenic exceeded the D019 monthly average acceptable final effluent discharge concentration in weeks 4 and 6; concentrations remained below the D019 requirements thereafter.
- Barium exceeded the GWS criterion at weeks 0, 2, 4, 5 and 10. However, concentrations stabilize near the DL as of week 14.
- Copper exceeded the GWS criterion between weeks 0 to 12. However, concentrations stabilize below the GWS criterion as of week 14.
- Iron exceeded the D019 final effluent discharge maximum acceptable concentration between weeks 0 and 12. Concentrations dropped to reach a threshold near the DL at week 14.
- Manganese exceeded the GWS criterion only at weeks 2 and 4. Concentrations reached a threshold near the DL as of week 14.
- Concentrations remained below the DL throughout the test, with the exception of the initial analysis (note that the DL [0.00001 mg/L] was greater than the GWS criterion [0.0000013 mg/L]).
- Lead exceeded the GWS criterion at weeks 2, 4 and 6. Concentrations stabilized near the DL as of week 10.
- Zinc exceeded the GWS criterion during the first 12 weeks of testing. Concentrations stabilized near the DL as of week 14.
- The arsenic and nickel tests did not exceed the GWS criterion.
- The copper, nickel, lead and zinc tests did not exceed the D019 (average and maximum) final effluent discharge acceptable concentrations.

Based on these results, although some metals were released in concentrations exceeding the GWS criterion and/or the D019 final effluent discharge requirements, in most cases the release was limited to the first weeks of testing.

Therefore, in the case of the tailings column, the GWS criterion and/or D019 final effluent discharge requirements were not exceeded after week 14, except copper, for which the exceedances ceased after week 28. For the unsaturated waste rock mix column, the GWS criterion and/or D019 final effluent discharge requirements were not exceeded after week 12. For the saturated waste rock mix column, excluding mercury, the GWS criterion and/or D019 final effluent discharge requirement exceedances were limited to the first weeks of testing, up to week 4.

Therefore, at the end of the test, unsaturated and saturated waste rock and tailings appear to exhibit similar behaviour over the test time scale. These results assume that the waste rock and tailings are potentially leachable in the short term, but that metal release is significantly limited and meets the applicable criteria and requirements (D019 and GWS) after an average of 12 weeks. These materials can therefore be considered leachable according to D019 at the end of this period.

Table 4 presents a summary of the results.

COLUMN KINETIC TEST RESULTS – ORE AND DIABASE (2020)

Column kinetic tests were conducted on an ore sample and a diabase sample, as the latter was being considered for use as backfill material on the site. A flush was performed every two weeks for a total period of 25 weeks. The two columns were kept unsaturated between flushes.

The results of these tests are summarized below.

ACID GENERATING POTENTIAL

Two test columns were monitored during the kinetic tests, an ore column and a diabase column, both of which were kept unsaturated during the test. The results observed during the kinetic test resulted in the following observations:

- The pH of the leachate from both columns remained near-neutral throughout the test, although slightly alkaline for the diabase column.
- SO_4 concentrations remained between 1 and 14 mg/L during the test for both columns.
- The acidity measured in the leachate from both columns remained below the detection limit throughout the test.
- Electrical conductivity was maximum at the start of the test for both columns and then stabilized around 20 µS/cm for the ore column and 30 µS/cm for the diabase column; these values are consistent with the reduction in dissolved metal concentrations in the leachate throughout the tests.
- The oxidation reduction potential varied throughout the test for both columns but remained between 500 mV and 70 mV.

Therefore, based on the results obtained from these column kinetic tests, it appears that the acid generation potential of both the ore and diabase is insignificant since the pH of both columns was maintained near neutral throughout the test and the acidity in the leach water remained below the DL throughout most of the test as well. Concentrations of SO_4 in solution also remained stable throughout the test.

Furthermore, oxidation/neutralization curves were conducted to evaluate the long-term acid generation potential of the two columns. This assessment was made by placing the cumulative magnesium, manganese and calcium (neutralizing minerals) loads on the y-axis, based on the cumulative sulphate loads on the x-axis.

Table 4 Summary of GWS criteria and D019 final effluent requirement exceedances during column testing

Column	Parameter	D019[1, 2] exceedance	GWS exceedance	Stabilization	D019 exceedance at end of test	RES exceedance at end of test
Column 1- Unsaturated tailings	Silver	-	Weeks 0 to 6, week 46 (0.00005 mg/L)	Week 8	-	No (DL > GWS)
	Arsenic	Week 0 (avg.)	-	-	No	-
	Copper	-	Weeks 0 to 18, 22 and 28	Week 32	-	No
	Iron	Weeks 0 and 2 (max.) Weeks 1, 3, 4 and 6 (avg.)	-	Week 14	No	-
	Manganese	-	Weeks 0 to 4	Week 10	-	No
	Mercury	-	Weeks 0 to 14	Week 16	-	No (DL > GWS)
	Lead	-	Weeks 0 to 6	Week 10	-	No
	Zinc	-	Weeks 0 to 14	Week 16	-	No
Column 2 – Saturated waste rock mix	Silver	-	Week 1	Week 2	-	No (DL > GWS)
	Arsenic	Week 3 (max.) Weeks 2, 4 and 6 (avg.)	Weeks 3 and 4	Week 24	No	No
	Barium	-	Week 0	Week 2	-	No
	Copper	-	Weeks 0 and 1	Week 2	-	No
	Iron	Week 0 (max.) Week 1 (avg.)	-	Week 2	No	-
	Mercury	-	Weeks 0 to 14	Week 16	-	No (DL > GWS)
	Zinc	-	Week 0	Week 2	-	No
Column 3 – Unsaturated waste rock mix	Silver	-	Weeks 0 to 12	Week 14	-	No (DL > GWS)
	Arsenic	Weeks 4 and 6 (avg.)	-	-	No	-
	Barium	-	Weeks 0, 2, 4, 5 and 10	Week 14	-	No
	Copper	-	Weeks 0 to 12	Week 14	-	No
	Iron	Weeks 0 to 12 (max.)	-	Week 14	No	-
	Manganese	-	Weeks 2 and 4	Week 14	-	No
	Mercury	-	Week 0	Week 1	-	No (DL > GWS)
	Lead	-	Weeks 2, 4 and 6	Week 10	-	No
	Zinc	-	Weeks 0 to 12	Week 14	-	No

Furthermore, the initial total composition of neutralizing minerals as a function of the initial sulphate composition was placed on the graph. If the initial composition is above the oxidation/neutralization curve, it is assumed that the material will deplete its sulphur content before depleting its neutralizing mineral content. This is what is observed for the ore and diabase during testing. Ore and diabase are therefore considered non-acid generating.

LEACHING POTENTIAL

COLUMN 1 – ORE

Silver concentrations remained below the DL from week 13 onwards (note that the DL [0.00005 mg/L] was greater than the GWS [0.00003 mg/L] criterion). Values above the DL were measured weeks 0, 6, 9 and 12.

- Mercury concentrations exceeded the DL at weeks 0, 2, 9 and 25 of the test (note that the DL [0.00001 mg/L] was greater than the GWS criterion [0.0000013 mg/L]). Concentrations remained below the DL for all the other test weeks.
- The D019 final effluent discharge maximum acceptable concentration was exceeded at week 0 for the SS.
- Copper, lead and zinc concentrations remained below the RES criteria as of week 1 or 2 of testing.
- No exceedance of the GWS criteria was obtained during the test for all other metals analyzed.
- No exceedances of (average and maximum) D019 final effluent discharge acceptable concentrations were obtained during the test.

COLUMN 2 – DIABASE

- The results of weeks 0, 1, 6, 9 and 11 were greater than the DL. Concentrations subsequently remained below the DL (note that the DL [0.00005 mg/L] was greater than the GWS criterion [0.00003 mg/L]).
- Copper concentrations exceeded the GWS criteria at weeks 0, 1, 3, 6, 7 and 16 but remained below the criteria as of week 17.
- Mercury concentrations exceeded the DL at weeks 0, 2, 3, 22 and 23 of the test (note that the DL [0.00001 mg/L] was greater than the GWS criterion [0.0000013 mg/L]). Concentrations remained below the DL for all the other test weeks.
- Iron concentrations exceeded the D019 final effluent discharge maximum acceptable concentration at weeks 0 and 1 but remained below the latter as of week 2.
- The D019 final effluent maximum acceptable discharge concentration was exceeded between weeks 0 and 8 for the SS.
- Barium, cadmium, lead and zinc concentrations remained below the GWS RES criteria as of week 4 of testing or earlier.
- No exceedance of the GWS criteria was obtained during the test for all other metals analyzed.
- No other exceedances of (average and maximum) D019 final effluent discharge acceptable concentrations were obtained during the test.

Based on these results, although some metals were released in concentrations exceeding the GWS criterion and/or the D019 final effluent discharge requirements, in most cases the release was limited to the first few of testing, which is normal for this type of test. Therefore, for the ore column, no exceedance was observed after week 12 of the test, except for mercury (week 25). For the diabase column, exceedances of the applicable criteria stop after week 11, except for mercury (weeks 22 and 23) and a one-time result at week 16 for copper.

Therefore, mercury concentrations above the GWS criteria (at the DL) were obtained at one point even at the end of the test for both columns. Since there does not appear to be a clear downward trend in mercury behaviour, the ore and diabase would be considered mercury leachable even after 25 weeks. These results assume that the ore and diabase are also potentially leachable, in the short term only, for some metals ([ore: silver, copper, lead, zinc], [diabase: silver, barium, cadmium, copper, iron, lead, zinc]). However, the release of metals is limited.

Table 5 presents a summary of the results.

Table 5 Summary of GWS criteria and D019 final effluent requirement exceedances during column testing

Column	Parameter	D019[1, 2] exceedance	GWS exceedance
Column 1 - Ore	Silver	-	Weeks 0, 6, 8, 9, 12
	Copper	-	Weeks 0 and 1
	Mercury	-	Weeks 0, 2, 3, 9, 25
	Lead	-	Week 0
	Zinc	-	Week 0
Column 2 – Diabase	Silver	-	Weeks 0, 1, 6, 7, 8, 9, 11
	Barium	-	Week 0
	Cadmium	-	Week 0
	Copper	-	Weeks 0, 1, 3, 6, 7, 16
	Iron	Weeks 0 and 1	-
	Mercury	-	Weeks 0, 2, 3, 22, 23
	Lead	-	Weeks 0, 1, 3
	Zinc	-	Weeks 0, 1, 3
	Suspended solids	Weeks 0 to 8	-

UPDATED SURFACE WATER QUALITY MODELLING (2021)

Hydrogeochemical modelling was used to assess water quality at the main final effluent from the site, i.e., at the outlet of the north water management pond, as well as water quality in the pit during the post-remediation period, once the pit has filled.

Initial modelling was performed in 2018 and considered only partial primary results from the waste rock and tailings kinetic tests, which were still in progress at the time the modelling was performed. The modelling was updated in 2019 considering the complete results of these kinetic tests over 50 weeks. A second update was made in 2021 after the development plan optimization and the project design (WSP, 2021). This modelling was based on data from the water balance updated by Golder (2021a). A third surface water quality modelling update was conducted by Golder (2021b) to evaluate the impact of depositing diabase in the waste rock and tailings stockpiles instead of using for road construction. However, the results from the modelling with diabase are very similar to the results previously obtained from the modelling without diabase, due to the low proportion of diabase in the overall waste rock assemblage.

Therefore, concerning the water quality in the main retention pond (north) that will hold all contact water, the results show that the pH of the sedimentation pond effluent should remain between 7.4-7.7 and the metal concentrations in the effluent remain below monthly average concentrations recommended by D019, with the exception of arsenic concentrations in dry conditions. According to projections, arsenic concentrations will comply with D019 typically in May and June, but will exceed the criterion (0.2 mg/L) when precipitation decreases over the summer and around Year 8. However, since the Metal and Diamond Mining Effluent Regulations (MDMER) standards in effect since June 2021 are more restrictive than those of the D019, arsenic concentrations will exceed the MDMER criterion (0.1 mg/l) at all times. The water treatment plant (WTP) will therefore have to be built at the beginning of the project to treat arsenic and suspended solids (SS).

Meanwhile, the pit water quality modelling results show that the pit water quality will meet the D019 guidelines when the pit is filled, but not those of the MDMER. In fact, when the pit has been filled, the pH will remain between 8 and 8.1 and the dissolved arsenic will remain below the criterion of 0.2 mg/L of the D019, but above the 0.1 mg/L of the MDMER. However, during filling, the arsenic levels will also exceed the D019 criterion until Year 59, post-closure, but the concentrations will decrease as the pit fills up. A short-term solution will be investigated to ensure that arsenic concentrations meet the MDMER criterion before the pit water is released to the natural environment.

2.7 VARIOUS AUTHORIZATIONS

At this stage of the project, no authorizations have been requested. However, GLCI will apply for all authorizations needed to complete the different stages of the project at the appropriate time.

3 SITE DESCRIPTION

The information contained in the following sections has been drawn primarily from the project prefeasibility study (G Mining Services, 2021), and the EIA revised version (WSP, 2021b) for the JBLMP, as well as information provided by GLCI.

3.1 MINING METHOD

At present, it is estimated that the mine will be in operation for 18.5 years. Ore will be extracted from an open pit (Map 1), which will measure approximately 2 km long on a northwest-southeast axis and approximately 500 m wide. Thus, the open pit will have a footprint of approximately 51.09 ha. Figure 1 presents the detailed footprint of the pit.

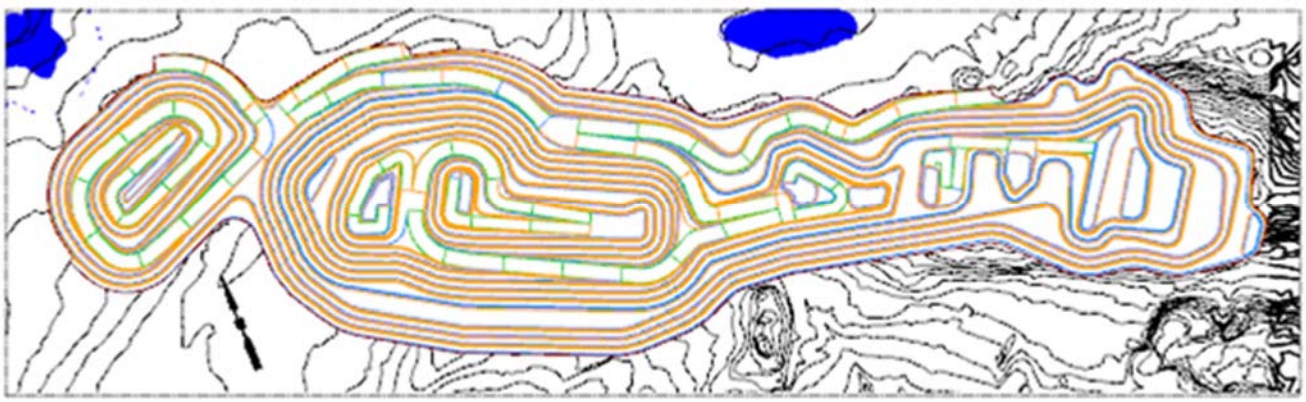

Figure 1 Top View of Planned Pit Design

The extraction of ore from the pit involves the use of bulk explosives for production blasting. ANFO and emulsion explosives will be used in equal parts. During the wet months (May-October) bulk emulsion explosives will be used, while ANFO explosives will be used during the dry months (November-April).

Ore and waste rock will be transported on several haul roads shown in Map 4.1 of the impact assessment (WSP, 2021b). The haul roads are 25 m wide and will have an acceptable foundation for heavy machinery, in order to support the 100-tonne dump trucks proposed. The trucks will exit the pit on one of three ramps. The ore will be transported to the crusher located at 960 m or 1200 m, depending on the ramp used. The ore will be introduced into the crusher and sorted, then sent to the crushed ore pile (in a dome) located in the processing plant sector. The waste rock will be transported to one of the waste rock stockpiles. The waste rock will be unloaded in compliance with a predetermined storage plan and a dozer will level the received material.

The quantity and volume estimates for waste rock, ore and overburden that will be extracted during the years of mine operation is presented in Table 6 (G Mining Services, 2021).

Table 6 Annual quantities of material extracted and produced from the James Bay lithium mine project

Material	X 1000 m³ (1)				X 1000 tonnes (2)		
	Ore	Waste rock	Overburden	Ore	Tailings	Waste rock	Overburden
A-1	68	664	240	184	1,700	1,838	479
A1	743	1,814	484	2,007	1,700	5,025	968
A2	741	2,183	0	2,000	1,700	6,046	0
A3	749	1,858	415	2,022	1,700	5,148	830
A4	762	1,908	329	2,057	1,700	5,286	657
A5	741	2,161	7	2,000	1,700	5,986	14
A6	913	1,908	126	2,464	1,700	5,284	252
A7	741	1,932	324	2,000	1,700	5,353	647
A8	741	2,816	525	2,000	1,700	7,800	1,049
A9	741	3,049	96	2,000	1,700	8,445	191
A10	730	3,259	1	1,971	1,700	9,027	2
A11	741	3,196	74	2,000	1,700	8,852	148
A12	589	3,397	0	1,591	1,700	9,409	0
A13	657	3,330	0	1,775	1,700	9,225	0
A14	715	3,274	0	1,930	1,700	9,070	0
A15	741	2,438	123	2,000	1,700	6,754	246
A16	741	2,514	160	2,000	1,700	6,964	319
A17	741	2,166	0	2,000	1,700	6,000	0
A18	741	2,560	0	2,000	1,700	7,092	0
Last year	334	470	0	902	766	1,301	0

Note: Details on mining production are available for the project lifetime (18.5 years).
Sources: (1) WSP, 2021b (2) G Mining Services, 2021

3.2 ORE PROCESSING METHOD

3.2.1 PROCESS DESCRIPTION

Ore processing is categorized as a dense media separation (DMS) process. The concentrator can process two million tonnes per year of spodumene ore, with a nominal throughput of spodumene concentrate ranging from 317,107 to 378,036 tonnes depending on the year (41 t/h). Process design criteria are explored in Table 7. The design criteria are based on industry standards, professional experience, and calculations and data supplied by GLCI.

The average moisture contained in the feed ore is estimated at 5%, while the average moisture of the tailings is estimated at 11.4%. The following sections provide more details on the main steps of ore processing.

Figure 2 shows the process diagram for the ore processing plant (WSP, 2021b, Figure 4-5).

Table 7 Process Design Criteria for Processing

PARAMETER	UNIT	DESIGN CRITERIA
Operation Schedule		
Nominal throughput	t/year	2,000,000
Days of Operation per Year	j	365
Shifts per day	No.	2
Hours per shift	h	12
Crushing Schedule		
Overall use of crushing circuit	%	68.5
Hours of use of crushing circuit	h	6,000
Average crushing rate required (dry)	dry t/h	333
Average crushing rate required (wet)	wet t/h	344
Design scale-up factor	%	20
Design crushing rate	wet t/h	412
DMS circuit operating schedule		
Use of DMS circuit	%	85
Effective daily processing hours	h	20.4
Average DMS required	dry t/h	269
Ore characteristics		
Feed ore content[a]	% Li_2O	1.30-1.46
Product characteristics		
Recovery	%	66.5
Concentrate level	% Li_2O	6
Lithium nominal throughput	t/a of Li_2O	18,850
Lithium concentrate production at 6.0% Li_2O	t/a	310,500
Feed ore characteristics		
Ore density[b]	t/m³	2.73
Crushed ore bulk density	t/m³	1.7
Feed ore size		
F_{100}[c]	mm	700
F_{80}[c]	mm	360

a Feed ore content: The first design is based on the average content of mineral resources prior to the completion of the mine design, which led to an average content estimate of 1.43% Li_2O. The difference was deemed acceptable by the process engineer.

b Density: the proposed design used a previous study as a data source. The difference with the new density (2.7) was deemed acceptable by the process engineer.

c If 100% of materials have a size smaller than a given dimension, this is referred to as F100, the same principle applies to F80 (80% of materials have a size smaller than a given dimension).

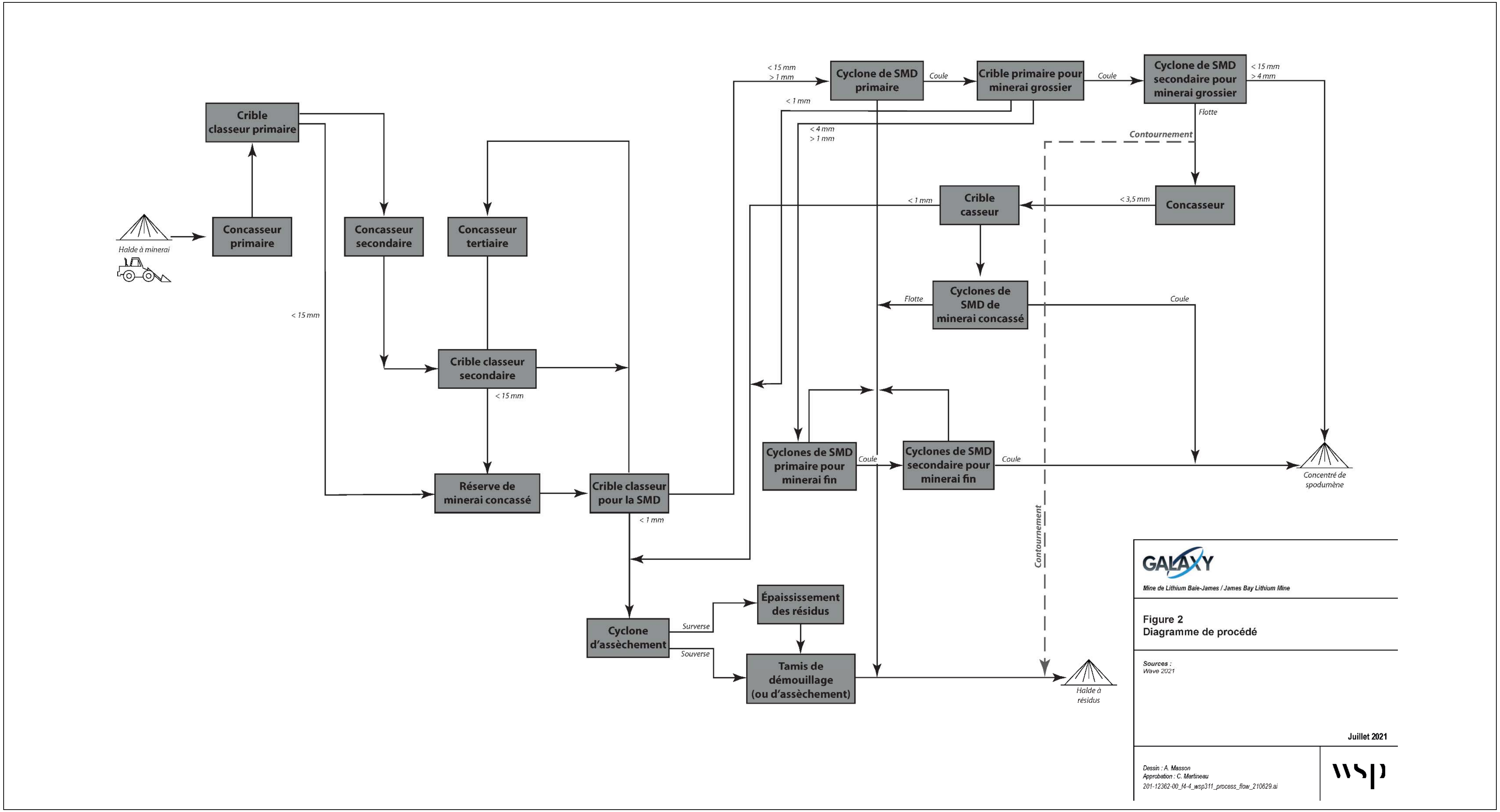

Figure 2 Process Diagram

STEPS TO PREPARE FOR DENSE MEDIA SEPARATION

The steps to prepare for DMS were designed to classify the ore using different size fractions. The ore first goes into a primary crusher and is then conveyed to a primary sizing screen. The primary sizing screen is a vibrating, tilted, double-deck screen with a 30-mm upper mesh and a 15-mm lower mesh. Ore smaller than 15 mm is sent directly to the crushed ore reserve. The coarse ore on this screen is fed to a secondary crusher and then conveyed to a screen identical to the primary screen, with a 20-mm upper mesh and a 15-mm lower mesh. The undersized ore is then sent to the crushed ore reserve. The oversized ore from the secondary screen is sent through a tertiary crusher and sent back to the secondary sizing screen. The ore is then recycled in the crushing circuit until it has a particle size under 15 mm. The crushed ore is then transferred by a feed conveyor to the DMS area.

DENSE MEDIA SEPARATION

The DMS receives all streams (> 1 mm, < 15 mm) from the screen. After the initial preparation steps, the crushed ore is mixed with ferrosilicon (FeSi) and pumped to the DMS cyclones. The FeSi pulp acts as a densifying medium to enhance the gravity separation of the spodumene from lower density minerals. Spodumene generally has a higher density than the gangue minerals and, consequently, spodumene flows while gangue material floats.

The DMS cyclone underflow is dewatered and pumped to the magnetic drum to recover FeSi and remove water. The removed water is reused in the DMS. The resulting product is the spodumene concentrate that will be prepared for transport.

The DMS cyclone overflow is guided to a wet magnetic separator where the ferromagnetic material is separated using a ferromagnetic extraction matrix. After separation, the product is dewatered and the FeSi is recovered. This product is the tailings. The tailings are sent to the transfer conveyor for processing and thickening.

LOADING

The tailings are placed on the tailings transfer conveyor from the DMS streams, screens and tailings thickening tank. The material is sent on the tailings conveyor to the tailings loading hopper. The mining haul trucks circulate to transport tailings to waste rock stockpiles.

The dewatered spodumene concentrate is moved on the conveyor up to the dome where it is loaded onto trucks to be sent to Matagami, where it will be placed on trains. The concentrate will then be transported to another plant where it will undergo a second processing. At the appropriate time, GLCI will carry out a market economic opportunity assessment for processing in Quebec in compliance with Article 101 of the Mining Act. In this assessment, the activities under consideration stop with the delivery of concentrate to Matagami.

3.2.2 SEPARATION METHOD

Ferrosilicon is an inert agent in the DMS process. It is added to the process at a rate of 0.2 t/hour. FeSi is available in bulk in one-tonne bags. It will be transported to the site and stored in the DMS product warehouse. In addition to FeSi, sodium nitrite and lime are used to prevent corrosion. Sodium nitrite and lime will be sent in 20 kg bags and like FeSi, stored in the DMS product warehouse. Regarding the quantities required, approximately 0.5 kg of sodium nitrite and 2 kg of lime are required per tonne of FeSi.

3.2.3 TAILINGS FILTRATION

The tailings will be filtered before being transported to the waste rock stockpiles. The tailings are one of two sizes: 15/+4 mm (44.5% of volume) and -4/ < 1 mm (55.5%).

Both size classes will be dewatered using a screen to obtain a moisture percentage below 10% w/w. Each tailings stream is unloaded onto its dedicated conveyor where an autosampler takes a sample which is analyzed to determine the moisture content.

3.2.4 TAILINGS PROCESSING

Coarse tailings from various areas of the plant are fed directly onto the tails stockpile via a transfer conveyor. The sources of coarse tails are listed below:

— primary coarse DMS floats;
— primary de-grit screen oversize;
— secondary DMS fine/re-crush floats;
— secondary coarse de-grit screen oversize;
— secondary fine/re-crush de-grit screen oversize.

Fines tailings streams that require further dewatering or separation are dewatered in two tails dewatering cyclones. Cyclone underflow reports to a tails filter feed tank and the cyclone overflow to the tails thickener feed box, where it is mixed with diluted flocculant and fed into a 13-m diameter thickener.

The sources of fine tails are listed below:

— DMS scavenger magnetic separator effluent;
— DMS dewatering cyclone overflow;
— material returned from spillage sumps.

The tails thickener overflow is collected and re-used as process water.

The underflow solids concentration is approximately 60% w/w and this material is combined with the tails dewatering cyclone underflow stream in the tails filter feed tank. The combined slurry is pumped to a tails filter and mixed with more diluted flocculant in-line before the filtration process. The tails filter is a belt filter that produces a solids cake with less than 12% moisture. The filtrate is recycled back into the thickener. The filter cake is sent to tailings.

Once all the tailings have been appropriately processed, they are conveyed onto the tails stockpile and from there can be removed by front-end loader and transported to the filtered tails stack.

3.2.5 REAGENTS

FLOCCULANT

Flocculant is used as an agglomerating medium in the tails processing area to help separate the water from the solids.

Flocculant is delivered to the site in powdered form in 25 kg bags. The bags are hoisted above the flocculant powder hopper and split. From the hopper the material is discharged into the flocculant heated cone. The powder is then transported into the flocculant mixing tank where it is mixed with potable water and homogenized by a flocculant mixing tank agitator. The resultant solution concentration is about 0.25% w/v. The solution is then stored in the flocculant storage tank.

From the storage tank, the flocculant is sent to either one of the flocculant in-line mixers and then to the tails thickener or tails belt filter by dosing pumps.

LIME

Hydrated lime will be delivered to site in 20 kg bags, and during extended plant outages this is added as required to maintain a pH of greater than 8.5 in the FeSi sumps to prevent corrosion of the FeSi. Nominally 2 kg of hydrated lime per tonne of FeSi is added, and this is dependent on the initial pH of the FeSi slurry in the sump.

OTHER CONSUMABLES

Raw water is used in various areas around the plant and provides a source of gland water and fire water to be used in the event of an emergency.

Raw water from a local supply is delivered into the raw/fire water tank which is equipped with a heater to be used as required to ensure the water does not freeze during colder months. Water is discharged from the tank into one of two streams depending on its downstream use. In the first stream, it feeds into process water tank 2 or alternatively it is sent to the raw water distribution line.

Water from the tailings thickener overflow is collected in one of two process water tanks and sent through to the process water supply main.

Water is also able to be recycled back into process water tank 2 as required.

Process water is filtered by one of two gland water filters and collected in the gland water tank.

From the gland water tank, the gland water is discharged and distributed into the gland water ring main.

3.3 MINE SITE LAYOUT

The following section highlights the main components of the project. The mine mainly comprises the surface mining area (pit), the waste rock and tailings stockpiles (hereinafter referred to as “waste rock stockpile”), the unconsolidated deposits and organic matter stockpile as well as the industrial and administrative sector (map 1). A storage area that will serve as the site of the temporary concrete plant as well as an explosives magazine complete the general picture. Everything is connected by access roads and a network of ditches.

Details of the various project components can be found in the sections following this section. Table 8 summarizes the areas of each infrastructure mentioned in this section, for a total of 289.49 ha.

Table 8 Infrastructure Surface Area

INFRASTRUCTURE	SURFACE AREA (HA)
Open pit	**51.09**
Waste rock and **tailings** stockpiles (including berms) **- West Stockpile (29.0 ha)** **- North Stockpile (54.4 ha)** **- Southwest Stockpile (31.0 ha)** **- East Stockpile (58.1 ha)**	**172.05**
Unconsolidated deposits and organic matter stockpile (including berms)	**25.36**
Industrial and administrative sector	**15.13**
Concrete plant (construction phase)/Storage yard (operation phase)	**3.74**
Water treatment plant and pumping stations	**0.65**
Explosives magazine	**0.78**
Roads and ditches	**20.70**
Total	**289.49**

3.3.1 ACCUMULATION AREAS

ORE ACCUMULATION AREAS

An ore storage area will be installed near the ore processing plant. The blasted ore will first be stored in the ore stockpile. This stockpile has a minimum capacity of 20,000 tonnes (in bulk). The stockpile is designed to allow access to trucks and their circulation as well as the temporary storage of blasted ore.

The ore is classified as leachable for various parameters (As, Mn, Cu, Zn, etc.) according to the definition of D019, and measures to protect the water table and surface water are planned for the on-site ore storage. However, the ore storage will be sporadic and only for a short time before it is sent to the processing plant. The ore pile as well as the industrial water basin (the one located between the camp and the concentrator) will be waterproofed by an HDPE geomembrane. The water draining from the pile will be directed to the industrial water basin and the water from this basin will be recirculated directly to the concentrator.

CHOICE OF CONSTRUCTION MATERIALS

In order to carry out the activities, namely the loading of the main crusher by a front forklift, the crest of the stockpile will be at an elevation of approximately 215 m; which is approximately 8 m above the existing ground. Given the expected volume of the stockpile, a sector of approximately 120 m by 140 m is necessary. In accordance with safety regulations, a perimeter berm with a height greater than the radius of the largest machine wheel is required at the crest. The proposed berm will be 1.5 m high. A stone (0 to 600 mm) of suitable material will be used to build the stockpile at the required elevation.

Subgrade preparation will include excavating and levelling the site to create a usable, easy-to-maintain ground surface that is not prone to flooding or erosion. In order to prevent erosion of the exterior slopes, a 200 mm thick layer of plant cover will be installed. For the road surface, a 150 mm thick layer of crushed rock (80 mm maximum) will be placed on a 650 mm thick base layer composed of rocks (0 to 450 mm).

The design criteria for the various stockpiles are presented in Table 9.

Table 9 Main Stockpile Design Criteria

PARAMETER	UNIT	CRITERION VALUE
Potential for acidic drainage of materials		
Waste rock	Yes/No	No
Tailings	Yes/No	No
Unconsolidated deposits (inorganic)	Yes/No	No
Organic matter	Yes/No	N/A
Water content of materials		
Waste rock	% w/w	3
Tailings	% w/w	12
Unconsolidated deposits (inorganic)	% w/w	15
Organic matter	% w/w	75
Overall slope		
Waste rock and tailings	H:1V	2.5 H:1V
Unconsolidated deposits and organic matter	H:1V	5 H:1V
Specific dry density (bulk)		
Waste rock	t/m^3	2.2
Tailings	t/m^3	1.70
Unconsolidated deposits (inorganic)	t/m^3	2.0
Organic matter	t/m^3	1.22
Feed ore (pegmatite)	t/m^3	1.74-1.76
Storage capacities		
Waste rock tonnage	Mt	129.9
Filtered tailings tonnage	Mt	31.4
Waste rock volume (bulk)	Mm^3	59
Filtered tailings volume (bulk)	Mm^3	18.5
Unconsolidated deposits and organic matter (bulk)	Mm^3	3.4
Seismic risk		
PGA: Peak ground acceleration in “firm soils” with a probability of occurrence of 0.02 in 50 years	G	0.038
K: Horizontal seismic coefficient retained for stability tests in pseudo-static conditions	G	0.019

Source: G Mining Services, 2021

DRAINAGE

The site levelling will comply with the following:

— design a surface water management system for the platform;

— provide an adequate surface slope for the platform to minimize stormwater runoff on it.

The design of the ore accumulation area will include a waterproof layer. The ore stockpile will be levelled with a 2% downslope toward a gravity pit and a pumping station designed (if required in detail engineering) to allow water that came into contact with the stockpile to be discharged to the industrial and administrative sector sedimentation pond. A peripheral ditch will be built at the low points of the natural terrain. When required, a berm will be built to convey the runoff water to the gravity ditches. The berm height will comply with the requirements for water retention structures in D019 as well as in the *Safety Code for the Construction Industry* (Government of Quebec, 2018).

UNCONSOLIDATED DEPOSITS AND ORGANIC MATTER STOCKPILE

According to available data, unconsolidated deposits are composed of a granular deposit mixed with a small portion of cohesive soil. Due to the heterogeneous properties of unconsolidated deposits, a protective layer on the surface of the stockpile slope was recommended. This layer will be made of a selected, more homogeneous granular material, which will have better friction behaviour to ensure the stability of the slope. This protective layer will be compacted to provide the necessary shear strength.

The proposed unconsolidated deposits and organic matter stockpile will consist of an embankment with a maximum height (depending on the ground elevation) of approximately 16 m (Figure 3). The maximum elevation of the stockpile is 220 m. This will increase over the years and its general geometry will be as follows:

- width of the peripheral strip: 15 m;
- maximum deviation of the berm: 5 m;
- maximum height of the berm: 20 m;
- local slope of the berm – 2.25 H: 1V.

A stone perimeter dike (0-1000 mm) will be built around the stockpile. In addition, access roads, spaced approximately 100 m apart, will be built. The trucks will use the roads to drive safely on the stockpile while unloading the organic matter. A dozer can then be used to spread and compact the material. A gentle slope of 6H: 1V is recommended around the stockpile. The volumes that will be stored at the stockpile are summarized in Table 10.

Table 10 Cumulative volumes of the unconsolidated deposits and organic matter stockpile

REFERENCE YEARS	UNCONSOLIDATED DEPOSITS (MM^3)
Year -1	0.24
Year 1	0.72
Year 3	1.14
Year 5	1.47
Year 10	2.54
Rest of LOM	2.90

Source: G Mining Services, 2021.

WASTE ROCK AND TAILINGS ACCUMULATION AREA

Waste rock and tailings will be placed in four stockpiles called “waste rock stockpiles” in this study (Map 1). Also, part of the waste rock will be placed in the northwest part of the pit when it is mined out.

The combined waste rock and filtered tailings will be stored at four different stockpiles named “west”, “northeast”, “southwest” and “east”. All of the waste rock stockpiles were designed to receive a total of 31.4 Mt (approximately 18.5 Mm^3) of solid filtered tailings and 129.9 Mt (approximately 59.0 Mm^3) of tailings. The east waste rock stockpile will extend into the southeast end of the pit (after all available reserves have been extracted) in order to deposit tailings.

The waste rock stockpiles were designed taking into consideration the site properties, the design criteria of D019 (MELCC, 2012), as well as the Guidelines. The design assumes, based on a hydrogeological modelling study (WSP, 2021), that the foundation soils have a permeability that is low enough to meet the maximum infiltration rate allowed in D019.

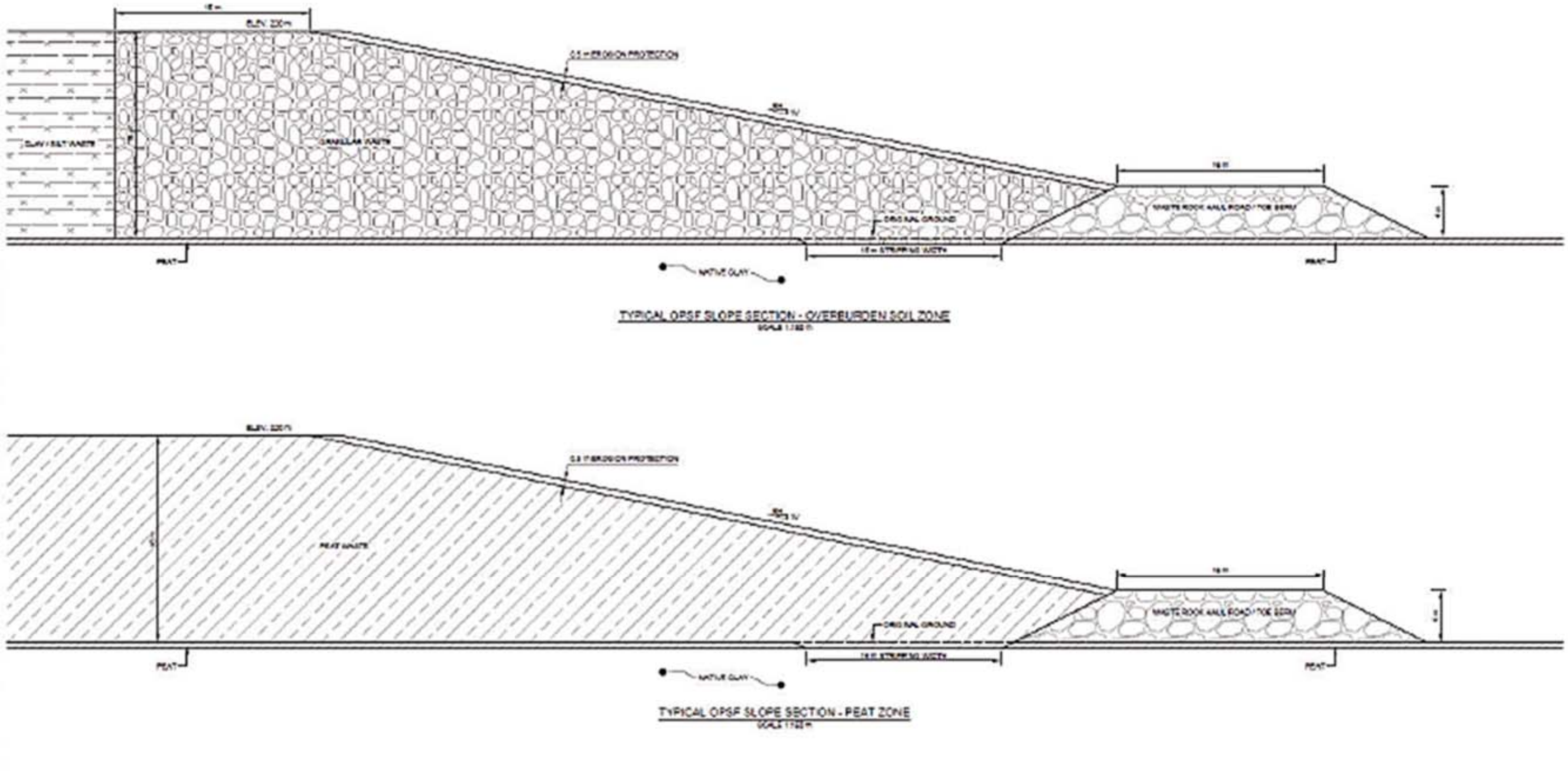

Figure 3 Cross-sections of the unconsolidated deposits and organic matter stockpile

Source: Golder Associates Ltd in G Mining Services, 2021

The soils at the intended locations are described as granular non-cohesive sand and silt deposits. The infiltration rates estimated under the waste rock stockpiles are less than 3.3 L/m^2/day (WSP, 2021c).

The location of the waste rock stockpiles was determined in order to minimize hauling distances from the pit. All the stockpiles will be at a minimum distance of 60 m from the high water mark of watercourses and lakes, with the exception of the east waste rock stockpile which crosses a segment of an intermittent watercourse draining the Kapisikama lake. It was already planned that this lake would be drained during the pit operations. The properties of the four waste rock stockpiles are presented in the table below.

Table 11 Summary of waste rock stockpile properties

Waste rock stockpile	Final soil footprint (ha)	Final crest elevation (m)	Final height (m)	Slope
West	29.0	260	53	2.5
Northeast	54.4	290	83	2.5
Southwest (JB1)	31.0	270	62	2.5
East	58.1	280	68	2.5

According to the mining plan, the diameter of the blocks will be 900 mm at maximum, with an average F50 of 200 mm.

Table 12 summarizes the minimum values of the safety factors for the slope stability of waste rock stockpiles recommended in the applicable guidelines of the Canadian Dam Association (CDA) and in D019. For the mine closure, the surface of the waste rock stockpiles will need to be restored. The Guidelines recommends minimum values of safety factors in accordance with those in the table below, while Figure 4 illustrates the typical cross section.

Table 12 Minimum values of safety factors recommended for the stability of waste rock stockpiles

Conditions	Safety factor
Short term	1.3
Long term	1.5
Pseudo-static	1.1
Following an earthquake (if applicable)	1.3

DISPOSAL PLAN

Waste rock and tailings will be placed on a solid foundation. There is no clay under the stockpiles, except for the southwest stockpile where there is a layer of about 1.5 m. Topsoil and peat will be removed to the periphery. These materials will either be stored in the organic matter stockpile or temporarily stored nearby to be used as materials in the gradual restoration of the stockpile.

The co-disposal method consists of constructing a mixed stockpile by mixing the two types of material at the same site. This method was not chosen based on the geochemical characteristics of the materials that will be stored, although the geochemical characteristics of the materials were nevertheless considered. The stacking will take place under unsaturated conditions. Thus, tailings cells will be built inside the stockpiles and encapsulated by waste rock, while creating a transition layer between the two to prevent particle migration according to the current design. The detailed design of the interior layout for the placement of waste rock and tailings will be completed at a later date (detail engineering).

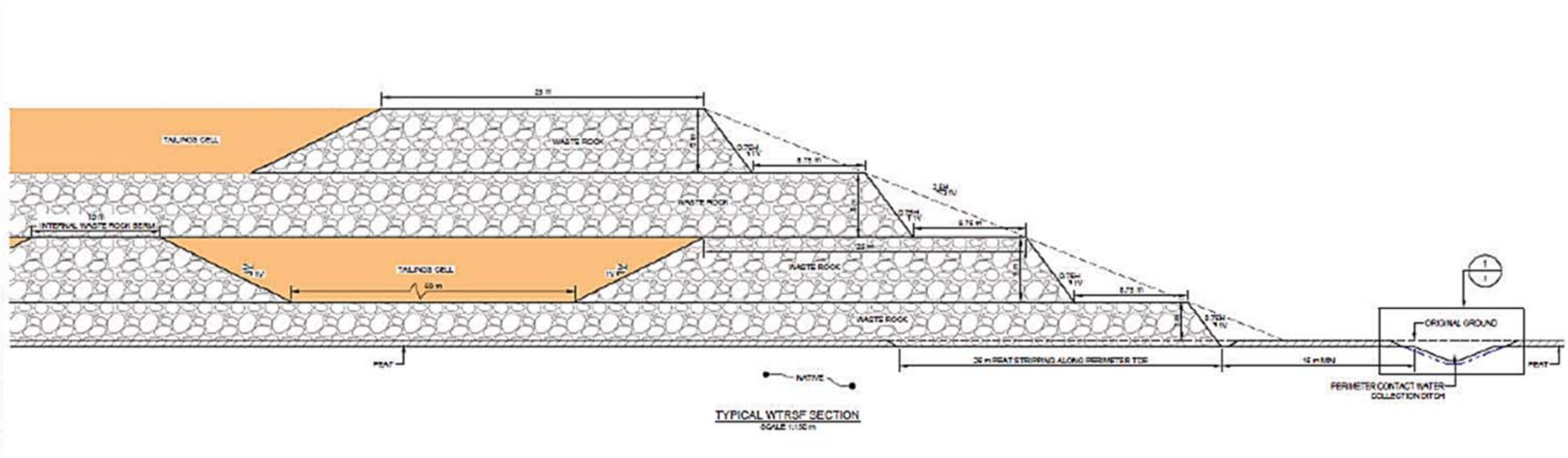

Figure 4 Waste rock stockpiles – Cross-section

Source: Golder Associates Ltd in G Mining Services, 2021

Co-disposal offers the following advantages:

- improved physical slope stability of the stockpile in the waste rock embankment zones;
- accelerated consolidation and improved shear strength of tailings;
- reduced risk of embankment failure and loss of tailings containment;
- reduced dust generation and erosion of tailings;
- improved opportunities for progressive closure.

The slope will include benches of 8.75 m for an average resulting slope of 2.3H:1V and berms of at least 5 m. There will be a gentle slope at the top to prevent ponding and water erosion. The stockpiles will reach an elevation of 260-290 m, i.e., between 53-83 m in height above the surrounding natural environment.

Table 13 shows the stockpiles receiving the material for each year of operation.

Table 13 Disposal plan in waste rock stockpiles

Reference year	Waste rock stockpile receiving materials
Year 1	East
Year 2	East
Year 3	East
Year 4	East
Year 5	West
Year 6	West
Year 7	West
Year 8	West
Year 9	West
Year 10	West
Year 11	Southwest (JB1)
Year 12	Southwest (JB1)
Year 13	Southwest (JB1)
Rest of LOM	Northeast (including pit JB3)
Total	-

Source: G Mining Services, 2021

CONCENTRATE DOME

The concentrate will be stored in a dome-shaped warehouse as it leaves the plant. A concrete slab will form the foundation of the dome. This will ensure that the concentrate will not be exposed to precipitation and will not come into contact with the ground. Trucks will be loaded from this location.

3.3.2 INDUSTRIAL AND ADMINISTRATIVE AREA GENERAL ARRANGEMENT

The industrial and administrative area includes the following:

- A three-phase crushing circuit (located beside the ROM pad), conveyors and a screening station;
- A crushed material stockpile (in a dome) and reclaim;
- A DMS building (also referred to as the concentrator);
- A storage building for DMS products and chemicals for the WTP;

- A tailings thickening reservoir;
- Two raw water tanks;
- A tailings loading and stacking station;
- A propane storage area;
- The final product stockpile (spodumene concentrate), in a dome and for loading;
- Various workshops and warehouses;
- A series of administration buildings and laboratory;
- A weighbridge (scale) and gate;
- A high-voltage switchyard;
- A diesel storage area;
- A site-wide fence;
- The workers' camp;
- The residual materials building.

Most of the building foundations will be reinforced concrete. The concentrator building will consist of a steel structure covered by metal plating on the concrete slab and footings. The heavy equipment will be supported by a reinforced heavy-duty foundation.

The workshop and storage buildings will also be included in the DMS building. A two-storey building will be located near the DMS and will include the administrative area, the clinic and the laboratory.

All buildings will be insulated, heated and ventilated. They will include an access door for staff. In addition, the workshop and storage buildings will have a rolling steel door wide enough for a large forklift to pass through.

Some of the plant buildings, with the exception of cold storage facilities, are designed to have a heating-ventilation-air-conditioning (HVAC) system. The HVAC system will be more energy-intensive in the winter, as temperatures can drop to -45°C. Heat from the HVAC units will come from propane heaters.

The mine services area is composed of:

- mine workshop, administration, and vehicle wash-down area (one building);
- mechanical warehouse;
- light vehicle parking;
- diesel filling station and storage space.

The fuel storage area located in the mine services area will consist of:

- two double-walled 150 kL diesel tanks;
- a double-walled 11 kL diesel exhaust fluid (DEF) tank;
- a tank filling area;
- a heavy vehicle service station.

Figure 5 illustrates the general layout of the industrial and administrative sector.

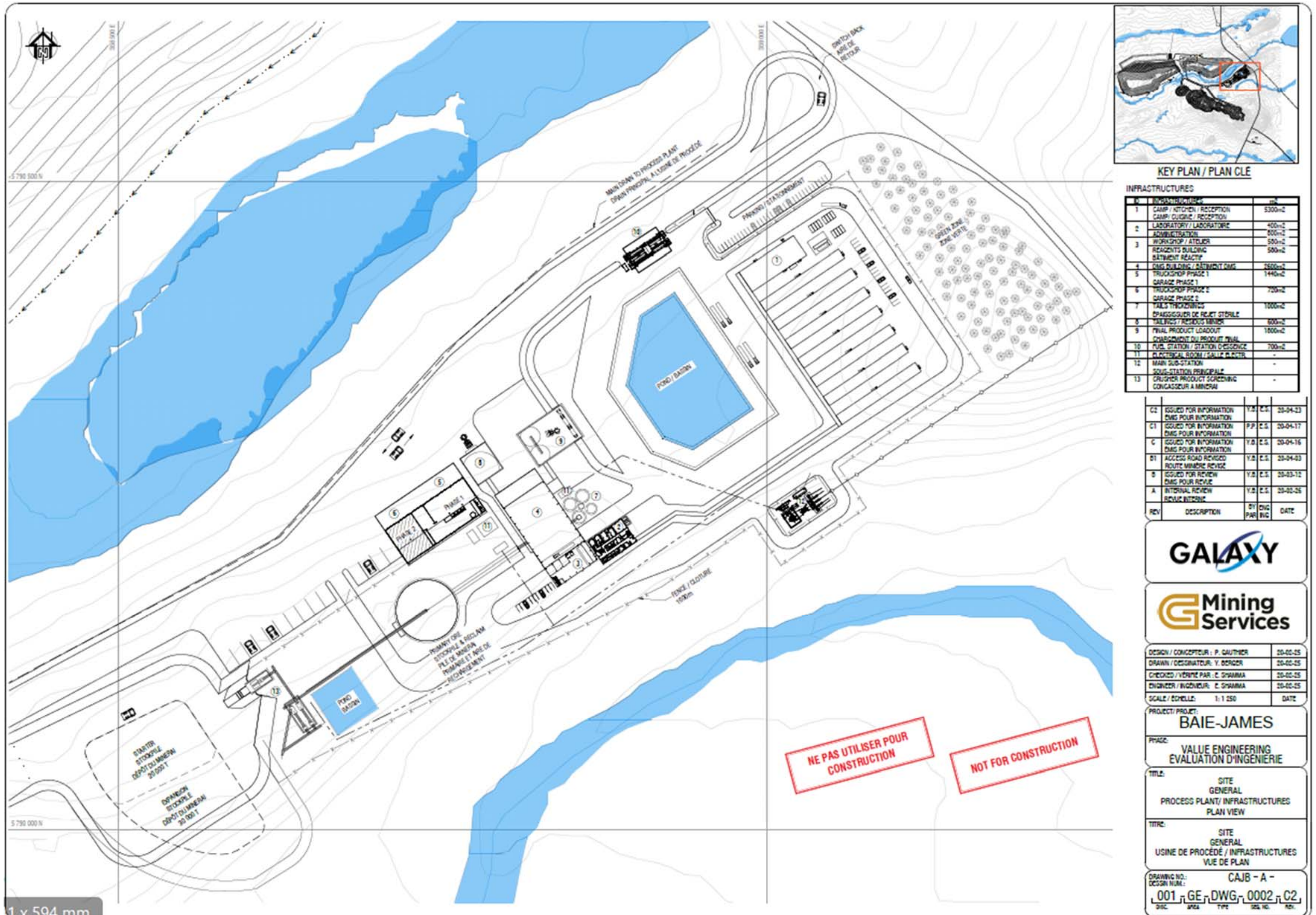

Figure 5 View of industrial and administrative sector

Source: G Mining Services, 2021.

3.3.3 ELECTRICAL, TRANSPORTATION AND SUPPORT INFRASTRUCTURE

ACCOMMODATION

Modular-type buildings will be installed on wood pilings or box-crib and connected to each other with hallways. The design can house up to 280 workers during construction and 180 workers during operation. Accommodations include the following:

- Dormitories consisting of wings connected with hallways (two of which are temporary for the construction phase only);
- Kitchen and cafeteria;
- Common room (with sofas, etc.);
- A gym;
- Laundry room;
- Emergency generators;
- Potable water treatment system and a sanitary water treatment system;
- Cold storage in sea containers.

ELECTRICAL INFRASTRUCTURE

Average electricity demand is estimated at 3.33 MW for the industrial area and 2.95 MW for the workers' camp, for an average demand of 6.3 MW and a peak demand of 7.7 MW during winter. Hydro-Québec is responsible for commissioning the 69 kV transmission line from the 69 kV power line (L 614) located 10 km south the project site. This will be the main power supply for the project. This option does, however, have some limitations; even with major upgrades to Hydro-Québec Némiscau's substation, the total available capacity will be limited to just over 7.6 MW. This is the reason why an alternative (i.e. propane) is required for heating the buildings. In addition, intermittent use of generators to meet the peak demand will be required. The current design will use emergency diesel generators to meet this demand.

TRANSPORTATION INFRASTRUCTURE

Air travel will be the primary means of transportation for workers who live outside the region. GLCI will likely organize charter flights from Montreal and the Abitibi region to the Eastmain airport and provide bus service between the airport and the site.

The Eastmain airport is owned by Transport Canada and is located 130 km from the project site. It is anticipated that the airport will be expanded to allow for the transportation of more passengers to accommodate the needs of the project. However, since GLCI does not own this airport, it is not considered part of the mining project.

SITE ACCESS ROAD

The proposed 12 m wide site access road will be 50 m long and composed (from base to surface) of:

- foundation of run material from overburden up to 1.5 m thick, clay-free and compacted;
- a layer of fine sand 300 mm thick to receive the geomembrane;
- the 1.5 mm (60 mils) thick LLDPE geomembrane;
- a layer of fine sand 300 mm thick to protect the membrane;

— a 1000 mm thick infrastructure layer of 0-300 mm caliber run-of-waste rock;
— a surface layer 450 mm thick in crushed waste rock 25-100 mm caliber.

For security reasons, the Billy Diamond Highway will be widened with the addition of turning lanes into and out of the site at the intersection between the Billy Diamond Highway and the site access road.

SERVICE ACCESS ROADS

The site will feature a single service road leading to the north water management pond and the explosives magazine.

The proposed road will be composed (from base to surface) of:

— foundation of run material from overburden up to 1.5 m thick, clay-free and compacted;
— a layer of fine sand 300 mm thick to receive the geomembrane;
— the 1.5 mm (60 mils) thick LLDPE geomembrane;
— a layer of fine sand 300 mm thick to protect the membrane;
— a 1000 mm thick infrastructure layer of 0-300 mm caliber run-of-waste rock;
— a surface layer 450 mm thick in crushed waste rock 25-100 mm caliber.

TRANSPORT OF CONCENTRATE

Equipment and supplies will be trucked to the Matagami transhipment centre. Equipment and supplies will be transported through Matagami (via the Billy-Diamond highway). Minor improvements will be made to km 382 of the Billy-Diamond highway to improve safety for users. Turning lanes will be added into and out of the site at the intersection of the Billy-Diamond highway and the site access road.

SUPPORT INFRASTRUCTURE

The mine will be connected to the km 381 truck stop infrastructure for electronic communications (internet). A fiber optic cable will be buried along the Billy-Diamond road and along the site access road to a depth of approximately 1.2 m. The installation of the cable will require a 300 mm wide clearance and the crossing of two streams and a road. It is not planned to excavate the road to carry out this work, but rather to use the directional drilling method in order not to harm the surrounding environment and existing infrastructure.

A two-way radio system will also be provided on a communications tower within the construction camp above the mine and plant site. This facility will be built during the initial phase of construction, to provide radio communications during construction and mine pre-stripping operations. The base unit will be solar powered, with sufficient battery backup to give up to five days of operation. Hand-held satellite telephones will also be available for use as required and for emergencies.

EXPLOSIVES MAGAZINE

The location of the explosives magazine was selected to comply with minimal stand-off distances (Map 1). The quantities of explosives to be stored are found in the following table.

Table 14 Estimated stored quantity of detonators and explosives

EXPLOSIVE TYPE	UNIT	QUANTITY	STOCK (DAYS)
Detonators	Number	27,000	28
Ammonium nitrate	kg	158,961	21
Emulsion	kg	76,537	21

Source: WSP, 2018

As presented in Section 4.5.2, ANFO and emulsion explosives will be utilized on a 50/50 volume ratio. During the wet months (May to October), bulk emulsion explosives will be used, while during the drier months (November to April) ANFO will be used.

The magazine area dimension is estimated at 170 m x 80 m, which includes:

— a mixing building;
— an explosives magazine;
— detonator warehouse;
— stand-off distance between different classes of explosive;
— soil barrier;
— access road;
— perimeter fence;
— buffer clearing of 35 m (for forest fire safety).

3.4 ON-SITE WATER MANAGEMENT

Water management infrastructure, water balance, and specifics of the main project phases (construction, operations, and rehabilitation) are described in the following sections. Map 3 illustrates the water management infrastructure and watershed boundaries. The project will include a single clean water discharge site at the CE2 watercourse.

3.4.1 WATER BALANCE

The site is located in the Eastmain River watershed, which drains an area of approximately 46,000 km^2. Map 3 shows the hydrology of the site and the delineation of the watersheds.

Appendix C contains a figure showing the water balance for the site conducted by Golder in 2021. This figure is taken from the EIA (Figure 4-12) and is presented for illustrative purposes. All expected flows at each unit and the water management model are presented.

A portrait of the hydrogeology of the site is presented in Map 4.

The watershed boundaries and final effluent locations are shown on Map 3.

The water balance study considers the 18.5 years of project operation to estimate effluent volumes to the CE2 watercourse and to define a water management strategy for the north water retention basin, ensuring water supply to the ore processing plant.

The annual runoff volume generated by the site exceeds the process water demand, even under dry weather conditions. There is, therefore, a surplus of water that must be managed at the north water retention basin and discharged as effluent to the CE2 watercourse.

The proposed operating strategy for the north retention basin keeps the water level below the emergency overflow level, even in wet weather years. This strategy will be reassessed or confirmed in a later phase of the project, taking into consideration the water pumping and treatment system design.

3.4.2 INFRASTRUCTURE

All runoff from precipitation that falls on areas affected by mining, including dewatering water (pumped from the pit), is considered “contact water”. Contact water will be collected and stored before treatment (if required) and discharged to the environment.

The objective of the ditch network is to divert natural runoff around areas affected by mining to limit mixing of natural runoff with contact water. The network is designed to limit the mixing of natural runoff with contact water (i.e. reducing the volume of contact water requiring management). The collection system will limit the risk of contact water discharge to the environment, collect all runoff and seepage water from tailings, waste rock and overburden accumulation areas and use a single effluent to the environment.

Contact water from these areas will be collected in collection ditches and directed to the water retention basins or the open pit. Water collected in the east water retention basin and the open pit will be pumped to the north water retention basin, which is the main water management pond for the site.

The north and east retention basins will have a maximum water storage capacity of 1,360,000 m^3 and 180,000 m^3 respectively. Sludge will accumulate in the water management ponds throughout the project.

WATER TREATMENT PLANT

The WTP is designed to treat water from the water retention basin (if measurements show noncompliance). Based on the water quality modelling results (WSP, 2021), year 8 of operation may show arsenic concentrations over the D019 criterion. However, as mentioned earlier, the WTP will be constructed early in the project. The basic engineering for this component has not yet been completed. It will be constructed to treat arsenic, iron and suspended solids at a rate of approximately 100 m^3/hr.

Concerning the disposal of the treated sludge, when disposal is required, it will be analyzed and will either be directed to the tailings and waste rock facility or considered as contaminated soils or residual hazardous materials.

MINING EFFLUENT

The CE2 watercourse effluent will include:

- construction of an overflow or channel to allow for flow measurement (e.g. Parshall flume);
- pH, temperature and water outflow monitoring instruments;
- energy dissipation measures to reduce water velocity and minimize sediment disturbance.

These elements will be installed upstream of the watercourse discharge point and will be designed at a later date (during the detailed engineering study).

3.4.3 DRINKING WATER SUPPLY SOURCE

We estimate the drinking water requirement at 63 m³ per day for the maximum number of 280 workers. The water will be stored in a 400 to 500 m³ insulated and heated water tank.

The operation phase will require two to three wells to meet the potable water needs of 41 m³ per day for 150 workers. The potable water supply will include a treatment plant and pipe insulation or heating to the camp and treatment site. The wells will be located near the workers' camp.

3.4.4 DOMESTIC WASTEWATER

The worker' camp will be serviced by a domestic wastewater treatment system with an expected capacity supplying 280 people during the construction phase and 180 people during the operation phase. The treated water requirements are estimated at 56 m³ per day and 30 m³ per day, respectively for the construction and operation phases.

A rotating biological reactor (Ecoprocess MBBR technology from Premier tech) has been chosen for wastewater treatment. Considering the nature of the native soils and the proximity to wetlands, it is unlikely that a leaching field will be possible. Therefore, the discharge of treated wastewater to a receiving watercourse must be considered.

A service building (3 m x 4 m) will be required to house the disinfection units (UV lamp) at the outlet of the Ecoflo units and the dosing chambers for phosphorus removal. The treated wastewater will be discharged to the CE4 watercourse.

The domestic wastewater treatment system selected has the ability to treat sanitary water using a biological reactor and will serve for both construction and operations. The treated water will be discharged to CE4 due to the nature of the native soil and the proximity of wetlands. The unit selected can treat the flow during construction (i.e. 56,000 l/d, based on a peak construction labour force of 280 individuals). The flow during the operation phase is lower, at 30,000 l/d, based on an average labour force of 180 individuals. The flow falls below the maximum capacity of the treatment unit.

A sampling station will be installed at the effluent.

3.5 STORAGE AND DISPOSAL LOCATIONS

3.5.1 CHEMICAL, PETROLEUM AND EXPLOSIVE PRODUCTS

A diesel storage and distribution station will be constructed on the site. This will consist of two 150-kl double-walled diesel tanks, an 11-kl double-walled diesel exhaust fluid tank, a tank filling area and a heavy vehicle service station. A propane storage and distribution site will also be present. A tank will be installed next to the camp. The tank will have a capacity of 113,562 L. The expected annual consumption is 1,250,972 L. The propane tanks will be installed on concrete slabs. The diesel and propane storage and distribution stations will be located in the industrial sector of the mine site.

Explosives and detonator depots will be constructed to the west of the site. ANFO and emulsion bulk explosives will be used during the mining of the deposit. The components will be stored separately. An external contractor will handle on-site management of explosives and will also be responsible for disposing of the explosives. Section 3.3.3 (Explosives Magazine subsection) of this document defines the quantity of stored explosives components.

Agents used in the ore processing process will also be stored on site. Ferrosilicon will be stored in one-tonne bags, while hydrated lime will be stored in 20 kg bags.

These products, as well as the flocculant used in the process will be stored based on the incompatibilities of the products. These products will be stored on the plant site under applicable requirements.

In the event of a chemical or petroleum spill, the situation will be managed under the emergency measures plan and the applicable regulations.

3.5.2 NON-HAZARDOUS RESIDUAL MATERIALS

Non-hazardous residual materials (RM) will consist mainly of domestic waste. This domestic waste will be collected in duly identified bins and transported off-site in compliance with applicable regulations to a site willing to receive it. A warehouse for RM will be built. The building will be split into various sectors where different types of RM will be stored separately. The RM will then be trucked to an outside facility as managed by a third-party contractor.

At the moment, recyclable materials, as well as non-hazardous RM, is expected to be managed at Chibougamau. A composter will be installed on the mine site and non-recyclable residual materials that cannot be managed on site will be sent to an authorized landfill.

3.5.3 RESIDUAL HAZARDOUS MATERIALS

Hazardous RM, such as used oil or other materials as defined in the Regulation respecting hazardous materials, will be temporarily stored in separate, leak-proof containers identified at the location intended to receive the hazardous RM in the residual matter warehouse. These will be removed from the site regularly by an authorized carrier, then transported to a place authorized to receive them in accordance with the applicable regulations. One of the contractors serving the area (Véolia, Sanivac, Amnor and Groupe Gilbert) will handle the hazardous RM.

No hazardous RM will be present on the site once mining activities have stopped. Table 15 presents the estimated annual quantities for the construction and operation phases.

Table 15 Estimated annual quantity of hazardous residual materials

Category	Description	Tonnage (t)	
		Construction	Operation
Hazardous domestic waste	Antifreeze, solvent, aerosols, cylinders, paint, fluorescent tubes, lanterns, etc.	8	16
Used oil, grease, oily water	From various machine shops	0.8	4
Residual hazardous materials	Containers of additives used to prepare concrete and other products used in construction	0.6	0
	Empty containers of chemical products used to treat ore and for the WTP, if necessary	0	3
Total		**9.4**	**23**

Source: WSP, 2018f

3.5.4 CONTAMINATED SOILS

In the event that soil becomes contaminated with petroleum hydrocarbons, the petroleum hydrocarbons and contaminated response equipment will be stored in separate, identified, leak-proof containers and transported to a site authorized to receive them.

4 REHABILITATION AND RESTORATION MEASURES

Restoration work will be carried out in accordance with the requirements of the Guidelines, the D019, the *Guide d'intervention* and the Land Protection and Rehabilitation Regulation (c. Q-2, r. 37).

The protection, rehabilitation and restoration measures outlined below are intended to return the mine site to a satisfactory condition, i.e.:

- eliminate unacceptable health risks and ensure the safety of people;
- limit the production and spread of substances that could harm the receiving environment and, in the long term, plan to eliminate all forms of maintenance and monitoring;
- restore the site to a visually acceptable condition for the community;
- restore the infrastructure site to a condition compatible with future use.

The development of rehabilitation and restoration measures also considered the fact that a large portion of the infrastructure footprint is located in wetlands, the loss of which must be compensated. As such, the establishment of conditions conducive to wetland development was considered to the extent possible. Eventually, the wetland compensation plan may include applicable measures.

All areas affected by operations will be restored. The areas considered in the restoration cost estimate are shown on Map 5.

4.1 CLIMATE CHANGE IMPACTS

The climate change impact is taken into account in the on-site infrastructure design. The occurrence of these changes should therefore not have any unexpected impacts. For example, an 18% increase in future rainfall intensity is considered when designing new water collection and retention infrastructures, in accordance with the recommendations of Mailhot et al. (2014) and MTMDET (2017). Furthermore, all water retention structures are equipped with an emergency overflow capable of evacuating the maximum probable flood and thus guaranteeing their long-term integrity.

Moreover, the conclusions and recommendations of various reference sources on climate change, such as Ouranos, a consortium on regional climatology and adaptation to climate change that compiles the results of numerous scientific studies on the issue, are taken into consideration when designing structures.

Similarly, the climate change impact will also be taken into account when restoring the site to ensure the long-term integrity of the infrastructures and the vegetation that will be left in place (WSP, 2021d).

4.2 SITE SAFETY

4.2.1 SECURING ACCESS

The site access will already have been secured by a locked fence, the location of which is identified on Map 5. Water will no longer be pumped from the pit at the end of mining operations and the pit will be gradually flooded. The pit will be surrounded by a 2 m high berm, with a ditch built at its foot. Hazard signs will be installed every 30 m in compliance with Section 104 of the Regulation respecting mineral substances other than petroleum, natural gas and brine (RMSPNGB).

4.2.2 ACCUMULATION AREA STABILITY

The waste rock and tailings stockpile design has recently been revised (Golder, 2021a). Section 3.3.1 presents the minimum safety factor values and Appendix D provides a summary (from Golder, 2021a).

During the restoration phase, the waste rock and tailings stockpiles will be reshaped to ensure long-term physical stability and integration into the landscape. The slopes of the earthworks will be softened to 2.5H:1V and then covered with overburden and topsoil to promote revegetation.

4.3 BUILDING AND INFRASTRUCTURE DISMANTLING

When mining activities have come to a close, all buildings and infrastructure not required for post-closure monitoring will be transported off-site or dismantled by a certified contractor.

When buildings and infrastructure are dismantled, restoration work will include the following activities:

- the concrete slabs will be washed, perforated or crushed, to ensure proper drainage of water, and covered with reserved materials to promote the growth of self-sustaining vegetation;
- the buildings will be dismantled;
- salvageable materials and equipment will be set aside and donated or sold on the salvage and used markets;
- non-hazardous materials and equipment that do not find a buyer must be managed in compliance with the applicable regulations, namely the *Regulation respecting the landfilling and incineration of residual materials* (CQLR, c. Q-2, r.19) and with the document *La gestion des matériaux de démantèlement - Guide de bonnes pratiques* (Courtois et al., 2003).
- the footprint of dismantled infrastructures will first be scarified to facilitate drainage and vegetation recovery, then covered with unconsolidated deposits before being revegetated. Where there is potential for wetland creation, the soil will be landscaped to create poor drainage conditions and covered with unconsolidated deposits prior to revegetation;

- the geomembrane will be removed from the footprint of the ore accumulation area, then the footprint will be scarified to facilitate drainage and vegetation recovery, then covered with unconsolidated deposits before being revegetated. Where there is potential for wetland creation, the soil will be landscaped to create poor drainage conditions and covered with unconsolidated deposits prior to revegetation;
- no hazardous materials will be left on site;
- all chemical products, residual and hazardous materials will be managed safely in accordance with applicable standards and regulations. All solid, liquid, pulp and sludge materials inside the buildings will be characterized, if necessary, and the location of their disposal will be approved by the on-site environmental management representative;
- water pipes and pumps will be dismantled. Pipes that are in good condition will either be sold or kept for future reuse. Those whose useful life has ended will be disposed of under the provisions of the Regulation respecting the landfilling and incineration of residual materials (RLIRM);
- surface water mains in the drinking water supply system will be removed while underground water mains will be cut below the ground surface, cleaned and left in place after the openings have been plugged. Electrical pumps and controls will be removed and, depending on their condition, either sold, kept for future reuse or discarded;
- domestic sewage collection facilities will be dismantled (cut below the ground surface and cleaned) and those in good condition will either be sold or kept for future reuse. Those whose useful life has ended will be disposed of under the provisions of the RLIRM;
- road infrastructure will be dismantled, and the geomembrane sent to an authorized landfill.
- the overburden used for the road foundation will be characterized before it is reused for site restoration. If a portion were found contaminated with waste rock leachate, it would be transported to the waste rock stockpiles and if a portion were found to be contaminated with oil, it would be transported to an authorized facility.

4.4 CONTAMINATED SOILS

Following a definitive cessation of activities, GLCI will be required to undertake a characterization study of the property, as this type of activity falls into one of the categories listed in Schedule III of the *Land Protection and Rehabilitation Regulation* (CQLR, Q-2, r.37). Areas likely to have been contaminated mainly by petroleum, hydrocarbons, and metals will be prioritized. In all areas where petroleum product storage tanks and transfer sites were present during the construction and mining operations, the ROM pad and all petroleum product transfer sites will be sampled and analyzed to confirm the degree of contamination.

Contaminated soils will be removed and managed in accordance with applicable regulations.

4.5 EQUIPMENT AND HEAVY MACHINERY MANAGEMENT

At the end of mining operations, mobile equipment not required for rehabilitation and restoration work will be removed from the site to be resold, dismantled into parts and sold to an authorized recycling facility or disposed of under applicable regulations.

Mechanical, electrical and hydraulic equipment, whether mobile or fixed, will be dismantled.

4.6 ACCUMULATION AREAS

4.6.1 COMPARATIVE ANALYSIS OF RESTORATION SCENARIOS

The mining infrastructure that will be left on-site at the end of the rehabilitation and restoration work is the pit and the waste rock and tailings stockpiles. Therefore, since waste rock and tailings are non-acid generating and leachable over a short term, they are considered low risk for the post-operation and post-restoration periods. For this reason, no specific mitigation or management measures are required for the restoration of the waste rock and tailings stockpiles (i.e., no impervious cover, water catchment) to reach an environmentally satisfactory state. Rather, satisfactory conditions for this infrastructure will be achieved through adequate revegetation of the pile. Therefore, the assessment of possible restoration techniques will consist instead of a choice of revegetation method.

Furthermore, two techniques were considered for pit restoration, either flooding alone (option 1) or the return of waste rock and tailings to the pit and flooding (option 2). The advantages of returning the waste rock and tailings to the pit consist mainly in reducing the surface area impacted by the activities, stabilizing the pit walls by filling the pit and, finally, reducing leaching for tailings with acid-generating characteristics.

Finally, the option including the return of tailings to the pit at the end of operation and flooding at the end of operation is considered the most appropriate restoration method (section 4.6.6).

4.6.2 REVEGETATION

Site vegetation will follow the Guidelines to achieve a satisfactory state. However, the development of the rehabilitation and restoration measures will consider the fact that a large part of the infrastructure footprint is located in wetlands, the loss of which will have to be compensated. As such, wetlands may be created at multiple locations where the establishment of conditions conducive to wetland development has been considered to the extent possible.

Revegetation will occur at the time of restoration. If the mine life is extended and an additional tailings and waste rock site is developed (in this case, this may include pit in which operations have concluded), then the backfilled tailings and waste rock sites would be revegetated before the end of operation. The project will deploy progressive restoration.

For the time being, traditional revegetation techniques are being considered for (dry) land areas, however, the revegetation method may be refined as the project progresses. Alternative methods to establish a typical boreal plant community, rather than seeding grasslands, are being developed. The method with the best chance of success will be selected at the time of revegetation.

A variety of wetland types may be developed to promote a return to original conditions, including riparian shrub swamps, shallow water bodies, and black spruce-moss stands. Restoration of wetland ecological functions such as biodiversity and carbon sequestration will be promoted.

Restoration could involve peatland restoration methods developed by the Groupe de recherche en écologie des tourbières (GRET) associated with Université Laval to create peatlands, such as those that cover much of the site. These wetland developments could represent an added value in terms of site restoration and could, therefore, be integrated into the compensation plan to be developed simultaneously.

In both cases, the choice of species and species mixtures will be based primarily on the potential for plant establishment under the expected conditions. Suggestions from the tallyman and the community, who will be consulted on the restoration plan, will also be considered.

4.6.3 WASTE ROCK AND TAILINGS STOCKPILES

The kinetic test results show that the waste rock has no acid generating potential and is non-leachable after a maximum of 14 weeks of storage (except 28 weeks for copper), and therefore leachable over a short term. Therefore, the proposed stockpile restoration method is maintained and considered adequate given the behaviour of the tailings and waste rock.

In order to consider the short-term leachability of mine waste rock, the management method must be developed at the end of the mine's life, i.e. at the North-East pile (ref. Table 13). The management of waste rock generated in the last years of operation, at the end of the life of the mine will have to be the subject of special attention. The strategy will consist of one of the following options, considering that the materials are leachable over a period of 14 weeks, namely:

1. Plan the location of the last 6 months of waste rock storage, of the order of 460,000 m^3, in the off-pit section of the northeast pile, near a ditch that is linked to the site's water management system, to allow runoff water collection and pre-revegetation management. Water monitoring would be carried out over a period of 6 months + a validation period of 1-2 months in order to validate that the waste rock is no longer leachable and that restoration work on this pile can be undertaken. The anticipated water treatment period may be extended if the leachate of the pile is found to be in concentrations above the applicable criteria.
2. Encapsulate waste rock from the last 6 months, in the spirit of section 2.9.2 of D019 valuing the reduction of the footprint in tailings management under an environmental protection strategy and a reduction in the impacts of the accumulation area in the long term. The concept would be to store the mine waste rock (minimum week -28 to -14 for example) so that it is leached over a minimum period of 14 weeks and its waters managed. Subsequently, store the waste rock of the last 6 months of operation of the pit, juxtaposed and cover it with at least one meter (1m) of waste rock stored nearby whose leaching period has expired. This option would allow short-term leaching to be controlled and would require additional testing to demonstrate this.

These two options have no financial impact on the amount of the financial guarantee and only require sound management in the last months of operations.

The waste rock and tailings stockpiles will be reshaped to have a 2.5H:1V slope geometry to ensure their physical stability and integration into the landscape. Overburden and topsoil layers available in the unconsolidated and organic material stockpiles and suitable for revegetation will be deposited on the surface of the material and then revegetated using sprayed seeding. However, the waste rock and tailings stockpile revegetation method will be reassessed as the engineering of the site progresses, taking into account the choice of plant species, allowing for a sustainable recovery.

4.6.4 ORGANIC MATTER AND UNCONSOLIDATED DEPOSIT STOCKPILE

Materials stored on the organic matter and unconsolidated deposit stockpile will be reused to restore accumulation areas and other sectors of the site where required. Thus, when the site is closed, no material will be left on the overburden stockpile. The stockpile footprint will be scarified or landscaped to receive a wetland and then revegetated using an appropriate method. However, the waste rock and tailings stockpile revegetation method will be reassessed as the engineering of the site progresses.

If not all the organic material or unconsolidated deposits are completely used for stockpile restoration, the slopes will be softened to 2.5H:1V and revegetated. The site will be landscaped to allow water to flow into the existing ditch system or to promote wetland creation. Backfill access roads constructed for topsoil spreading will be revegetated. If slopes of granular material are exposed, they will be softened to allow for revegetation.

4.6.5 ORE ACCUMULATION AREAS

At the end of activities, no ore will be left on site. The geomembrane, if present, will be removed from the stockpile footprint, which will be scarified or landscaped to accommodate a wetland and then revegetated using an appropriate method. However, the ore stockpile revegetation method will be reassessed as the engineering of the site progresses.

4.6.6 PIT

During the closure phase, the Mining Act stipulates strict rules for securing pits after mining operations have ceased. Indeed, section 4.5.2 of the Guidelines also deals with the rehabilitation of open-pit mines. These guidelines will be complied with.

As provided for in the mining plan, tailings and waste rock will be deposited in the southeast portion of the pit once the mineral resources of interest have been removed. The remainder of the pit will fill naturally with precipitation and groundwater to an equilibrium level with the water table. Current hydrogeological studies show that the water level in the pit is expected to peak after 180 years (WSP, 2021b).

An overflow and ditches will be constructed to prevent overflow around the pit that could damage the environment. The flow will be channelled to the CE3 watercourse. The pit will be surrounded by a 2 m high berm, with a ditch built at its foot. Hazard signs will be installed every 30 m in compliance with Section 104 of the RMSPNGB.

4.7 WATER MANAGEMENT INFRASTRUCTURE

During the rehabilitation activities, the following modifications of the water management infrastructure will gradually be performed:

- Construction of a pit overflow;
- Breach of the dike of the main water retention basin;
- Breach of the dike of the east water accumulation pond;
- Removal of culverts and surface water flows brought back to pre-project conditions;
- Dismantlement of the WTP (after the completion of the post-closure environmental monitoring program).

At the end of activities, all ditches that will not be useful in the post-restoration period will be backfilled and re-profiled and then revegetated. Depending on the topography of the land, some ditches may be widened to create ponds and wetlands. All areas where restoration work will take place will either be profiled to allow for natural water flow and good drainage to avoid water accumulation or to promote wetland creation.

The raw water basins will be characterized first. If the results comply with the applicable regulations, a breach will be made or the water pumped and then released to the environment. Otherwise, the water will be pumped into the main retention basin to be decanted and treated, if necessary.

The sludge accumulated at the bottom of the basins will first be characterized and then managed according to the applicable regulations. Thus, the sludge from the basins will be excavated and transported to the waste rock and tailings stockpiles. For cost estimation purposes, all sludge is assumed to contain only metals. If sludge is contaminated with petroleum hydrocarbons, the sludge would be transported to a licensed treatment facility. For this estimate of restoration costs, approximately 0.25 m of sludge has been assumed to have accumulated at the bottom of each of the ponds.

The raw water basin will then be backfilled, graded to create a depression and revegetated with wetland species if possible.

The north water management pond will also be converted to a wetland after the bottom sludge has been excavated and placed on top of the waste rock and tailings stockpiles. The dikes around the basin will be revegetated and the material will be pushed back into the basin to soften the inner slopes of the basin to meet a slope of 4H: 1V. Several wetland areas will be developed from the centre to the edge of the basin; deep water, shallow water, marsh, swamp and terrestrial. Plants adapted to each area, as well as seeding, will be introduced. A topsoil cover approximately 0.10 m thick will also be added to the marsh and swamp areas. The marsh will have a release point to the environment at the location of the basin's emergency overflow weir.

To make the breaches, the emergency overflows will also be lowered so that the maximum water level that can be reached in the pond is below the natural ground surface. This overflow would be designed with a 1:10,000-year event recurrence. Figure 6 presents the design for these breachers.

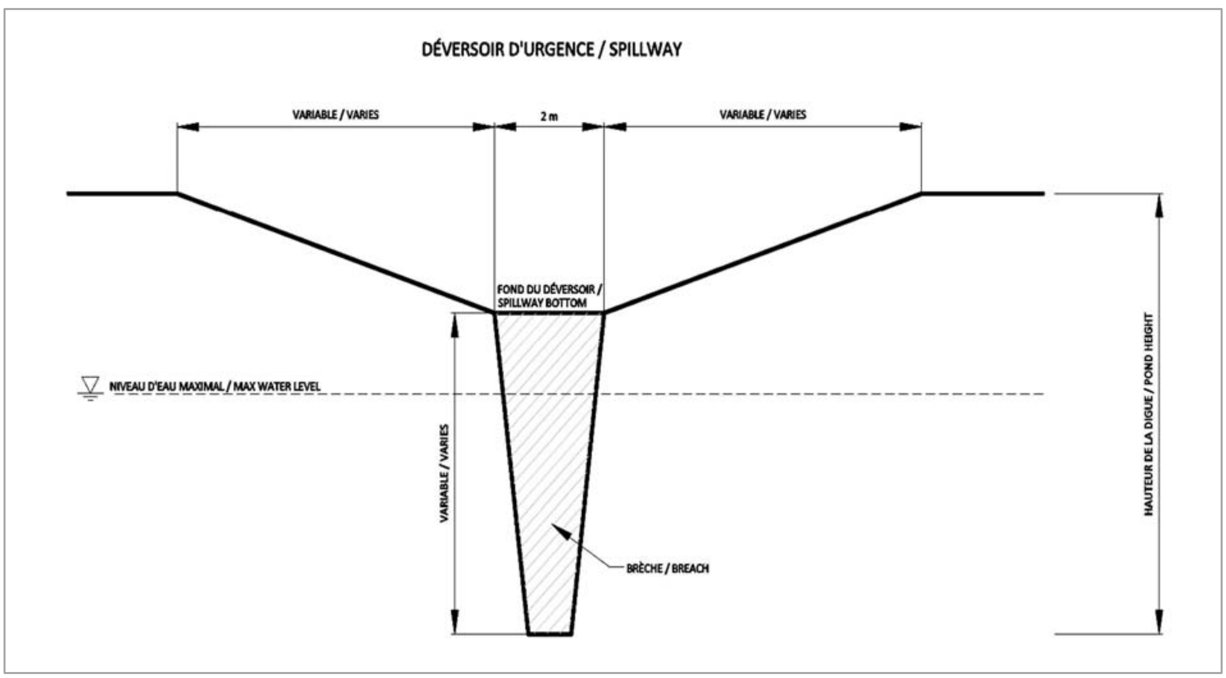

Figure 6 General design for water retention basin dike breaches

The project will likely result in gradual dewatering of Lake Kapisikama due to the lowering of the groundwater table and the reduction of surface water inflow. With the tallyman's approval, the lake may be transformed into a wetland with an open water body if possible.

4.8 TRANSPORTATION INFRASTRUCTURE

Once mining operations are terminated, the road infrastructure will be dismantled, the geomembrane sent to an authorized landfill, waste rock will be sent in the waste rock stockpiles as well as the overburden used for the road. The area will be scarified, then covered with soil suitable for revegetation and vegetated, except for the areas of access to post-restoration monitoring work. Site access will be secured with a fence already in place during the operation.

4.9 PETROLEUM AND CHEMICAL PRODUCTS AND HAZARDOUS AND NON-HAZARDOUS RESIDUAL MATERIALS

As the management of explosives on the site will be carried out by an external contractor, the contractor will also be responsible for disposing of the explosives remaining on-site at the end of operations. Furthermore, the contractor will be responsible for dismantling the explosives and detonator storage depots. The hydrocarbon tank, propane tanks and their surface piping will be removed under the provisions of the Construction Code (c. B-1.1, r.0.01.01) and the Safety Code (c. B-1.1, r.0.01.01.1). Tanks will be sold, retained for future reuse, disposed of or returned to their owner, ensuring compliance with the provisions of the Construction Code (c. B-1.1, r.0.01.01). If the tanks are not reusable, they will be disposed of under the provisions of the Regulation respecting the landfilling and incineration of residual materials (RLIRM) or the Regulation respecting hazardous materials (RHM).

All equipment and heavy machinery will be sold, or drained of any fluids, broken down into parts and sent to an authorized recycling facility.

The majority of the buildings will be dismantled only at the end of the operation phase. Although a large number of materials can be recovered, the dismantling of buildings and infrastructure will require the disposal of a volume of all types of debris.

Generally speaking, materials resulting from the demolition of a building or infrastructure are not hazardous materials as defined in the RHM (c.Q-2, r.32;), unless they are contaminated on the surface by hazardous materials as defined in section 4 of this regulation. Therefore, if the materials resulting from the demolition of a building or infrastructure are not hazardous materials or "classed" as hazardous materials as defined in the RHM, they will be managed as RM under the RLIRM (c.Q-2, r.6.02).

It is important to specify that adequate cleaning of dismantling materials "classed as hazardous materials" must be carried out to decontaminate them if necessary. Cleaning water will be collected and treated (sedimentation and water-oil separation, if necessary) before discharge to the environment. Materials deemed decontaminated according to the prescribed standards or criteria may be reused, recycled or recovered under certain conditions. The materials still contaminated will have to be considered as materials classed as hazardous materials and will be disposed of in a centre authorized by the MELCC.

Finally, off-site handling and transportation of RM and hazardous RM will be carried out in accordance with the applicable laws and regulations.

4.10 LAND REHABILITATION

At the end of mining activities, a land characterization study will be carried out as prescribed by section 31.51 of the EQA. GLCI will take the necessary measures under the provisions of the EQA and the Land Protection and Rehabilitation Regulations if this characterization reveals the presence of contaminants beyond the criteria established by the regulations.

One main activity covered by Section IV of the EQA will have been carried out on the site at the time of closure, namely the extraction or processing of other metal ores (NAICS code 21229).

Secondary activities covered by Section IV of the EQA will also have been carried out on the site, namely electricity distribution (transformer station only) (NAICS code 221122), operation of fuel distribution stations (user station) and other motor vehicle repair and maintenance services (NAICS code 811199).

Therefore, the environmental characterization of the site must be carried out in compliance with Section IV of the EQA.

Generic “C” criteria will be considered as the site criteria since the site is dedicated to activities. The results of the specialized natural background soil level study (WSP, 2018b and WSP, 2021e) will also be used in the restoration of the site.

5 POST-RESTORATION CONTROL AND MONITORING PROGRAM

The post-operation and post-restoration monitoring program is presented below. Details of the program will be submitted with the final restoration plan. The post-restoration monitoring program will be implemented following the restoration work, while the post-operation environmental follow-up will be carried out between site closure and full restoration of the site. It is proposed that this program be carried out over a minimum of 5 years, as recommended in D019 for leachable mine waste accumulation areas. A request to stop the monitoring program will be submitted to MERN at the end of this period. The contact information for the person in charge of the monitoring programs is:

Person in charge:	Ms. Gail Amyot Environment, Health and Safety Director Email: gail.amyot@allkem.com
Telephone:	514-558-1855

In accordance with the Guidelines, an annual report on post-closure restoration work will be submitted to the MERN and the MELCC. This report will present the work that has been carried out and the state of progress of the restoration work, the costs incurred, the results of research and development work, vegetation tests and monitoring of the work quality, as well as all the results of the post-restoration monitoring and follow-up program.

5.1 STRUCTURAL INTEGRITY CONTROL

The only structures that will remain on the site after restoration are the flooded open pit, the revegetated waste rock and tailings stockpiles and the water management pond that has been converted to a wetland.

The integrity of these structures will be monitored to ensure the physical and chemical stability of the structures, and the monitoring will consist of an annual inspection for the first five years and then periodically for ten years at a frequency recommended by the engineer. The objective of the inspection will be to ensure the presence of adequate drainage on the site and the integrity of the pit safety barrier and the emergency overflow of the basin. Furthermore, additional inspections may be conducted following extreme hydrological events. The program will also include a waste rock and tailings stockpile inspection to identify any situation that could compromise the stability and integrity of the structure such as cracks or signs of erosion, movement or settlement.

Inspections will be carried out by a geotechnical engineer. The objective of the inspections will be to ensure that the integrity of the infrastructure and protective measures are maintained, failing which corrective measures will be applied.

After five years of satisfactory results, the inspection program or frequency of inspections may be reviewed. No matter the case, the post-restoration personnel in charge will be on-site to ensure the proper functioning of the facilities. Any maintenance needs identified as a result of the inspections will be carried out as soon as possible.

5.2 AGRONOMIC MONITORING

The agronomic monitoring will be carried out over 5 years during the post-restoration period and will take the form of annual inspections.

The monitoring is intended to ensure that site restoration activities have achieved adequate vegetation density to protect against erosion and to adequately revegetate areas disturbed by mining activity. Monitoring will consist of characterizing the vegetation cover and species composition in the restored areas and identifying signs of erosion. If necessary, measures will be applied to ensure that objectives are met.

An inspection report will be sent to the MERN annually over the first five-year period. Following the five years, if corrective measures are required to bring the site to a satisfactory state, the duration of the monitoring could be extended if necessary.

5.3 WATER QUALITY MANAGEMENT

Surface and ground water quality monitoring will be required post-restoration. The program will also aim to ensure the effectiveness of restoration measures.

Post-operation water quality monitoring will be carried out for three years, from the time operations end until the completion of the restoration work, and comply with requirements of the D019, or equivalent at that time. Thereafter, post-restoration environmental monitoring will be carried out for five years, as recommended by D019. The post-operation environmental monitoring will be carried out on a bi-monthly basis for 6 months, then monthly for 2.5 years, as recommended in D019. Finally, post-restoration monitoring will be carried out six times a year for 5 years.

It is currently planned that at least six observation wells will be sampled to verify the quality of the groundwater in the vicinity of the facilities at risk, such as accumulation areas and petroleum tanks. However, the exact location of the observation wells will be defined based on the infrastructure location. The observation wells will be positioned in compliance with D019 and will be located upstream and downstream of the at-risk facilities. Samples will also be taken from the final site effluent to validate its quality. Note that during the post-restoration period, the final effluent from the site will be located at the outlet of the north water management pond overflow, which will then have been converted to a wetland.

The parameters monitored will be those presented in D019. The results of the environmental monitoring will be sent to the MERN and the MELCC each year in the form of an annual report. Even if the monitoring committee is disbanded, the results will remain public and accessible to everyone. GLCI may send, upon request, a copy to interested band councils.

6 EMERGENCY MEASURES PLAN

The emergency measures plan that will be in effect during the operations phase will be adapted for closure and restoration work and then for post-restoration activities. This plan will identify potential incidents, preventive measures, thresholds and alert procedures, response procedures for each potential incident and the responsibilities at each stage. The plan will also present the human and institutional resources, lists of available equipment and materials, modes of communication during and after an event and post-mortem procedures to keep a record of events and corrective measures to update the emergency measures plan as the project evolves.

During the closure work, site access will continue to be controlled and only persons with appropriate health and safety training will be allowed to work on the sites.

The person responsible for the emergency measures plan will be the person in charge of environmental monitoring and health and safety. Their contact information is as follows:

Person in charge:	Ms. Gail Amyot Environment, Health and Safety Director Email: gail.amyot@allkem.com
Telephone:	581-777-1534

During the closure and restoration period, the main incident risks previously identified are:

— risk of mobile equipment collisions or rollovers;

— risk of equipment fire;

— risk of instability during the dismantling of certain facilities;

— risk of petroleum product spills or leaks;

— risk of forest fire.

Should one of the events listed above occur, the emergency measure plan interventions would be implemented.

In the post-restoration period, the risk of accidents will be reduced. Indeed, since there will no longer be any regular activity on the site, all accidents caused by human intervention will have a very low probability of occurrence. The main incidents currently identified are:

— vandalism;

— risk of accumulation area instability;

— risk of a pit wall collapse.

Should these events occur, a local alert would be issued. Communication may take place through the environmental monitoring officer but will ultimately be directed to the GLCI crisis management coordinator, who will appoint a response officer on site.

7 MEASURES IN THE EVENT OF TEMPORARY SUSPENSION OF ACTIVITIES

Under sections 224 and 226 of the Mining Act, in the event of a temporary suspension of activities for a period of six months or more, the MERN and the MELCC will be notified of the date of suspension and the expected resumption of activities and GLCI undertakes to send certified copies of the mining work plans and installations within four months following the suspension of activities.

In accordance with the Guidelines, during a temporary suspension of operations lasting six months or more, GLCI will implement security measures. These measures are intended to restrict access to the mine site and the various facilities, as well as to maintain effluent quality control and ensure the physical and chemical stability of the various accumulation and storage areas. The following measures will be applied during a temporary cessation of mining activities:

- site access will be prohibited. A barrier at the entrance to the site will restrict access to the various on-site facilities and help ensure site security;
- a protective berm will be installed around the pit in compliance with regulations to ensure the safety of land users;
- water management will be maintained at the same frequency and operating parameters throughout the period of inactivity;
- an environmental monitoring program will be carried out, including sampling and analysis in compliance with the requirements of section 2.10 of the D019;
- as described in section 3.5, storage measures for all types of chemicals and petroleum products and residual hazardous materials will be maintained;
- measures (visual inspections and water analyses) will be taken to ensure the physical and chemical stability of the various accumulation areas.

In the event of temporary suspension of activities, an environmental follow-up will be carried out in accordance with section 2.10 of the D019.

8 ECONOMIC AND TIME CONSIDERATIONS

8.1 COST ASSESSMENT OF RESTORATION

According to the RMSPNGB, the operator of the BJLMP property must provide a financial guarantee in an amount corresponding to the anticipated cost of carrying out all of the work provided for in its mine site redevelopment and restoration plan. This section therefore presents the estimated costs of reclamation for the BJLMP following the end of operations.

The estimated direct closure and reclamation costs are detailed in Table E.1 in Appendix E. The following Table 16 summarizes these costs, which total $32,615,162 (2021 Canadian dollars).

Table 16 Summary of direct closure and reclamation costs

Description	COST
1. Securing of the mining site	$3,222,947
2. Dismantling of buildings and support infrastructures	$8,787,815
3. Restoration of the footprint of buildings, storage areas and roadways	$6,793,346
4. Restoration of the footprint of the ore stockpile	$129,354
5. Tailings and waste rock stockpiles and overburden stockpile remediation	$3,163,426
6. Restoration of the waste rock and tailings pond	$8,330,912
7. Restoration of the raw water basin	$2,085,862
8. Soil characterization program	$101,500
Total	**$32,615,162**

To these amounts must be added the indirect costs, i.e., post-mining and post-remediation monitoring and engineering costs (30% of the total value of the closure and remediation work and post-mining and post-remediation monitoring), as well as a 15% contingency on the subtotal (the work, monitoring and engineering costs). These costs are detailed in Table E.2 of Appendix E and summarized in the following Table 17. The amount of the financial guarantee required would therefore be $49,608,897.

Table 17 Summary of total closure and reclamation costs

Description	Cost
Direct closure and restoration costs	$32,615,162
Indirect closure and restoration costs	$10,523,010
Contingency	$6,470,726
Total	**$49,608,897**

Post-operational monitoring and post-remediation care and maintenance costs are related to infrastructure integrity monitoring, agronomic and environmental monitoring (reseeding monitoring, groundwater and final effluent sampling and analysis, preparation of annual reports). These activities will continue for the duration of the post-mining follow-up (3 years) and the post-remediation follow-up (5 years).

These costs are approximate and representative of the level of engineering and design progress at the time of publication of this restoration plan.

8.2 RESTORATION WORK SCHEDULE

The summary schedule for delivering the restoration work is shown in Table 18. It was developed based on existing information and current mine planning. This schedule should be considered preliminary. The following items will be addressed, and mapped as necessary, in subsequent updates of this restoration plan:

- When and how the various water collection and treatment infrastructure will be dismantled (pumps, pipes, basins, water treatment plant...);
- When and how the various drainage and water collection system components (ditches, basins...) will be backfilled;
- Where, when and how additional ditches and/or basins will be added if necessary if water flows need to be modified during the restoration work.

Table 18 Summary restoration work schedule

Activities	Post-operation period			Post-restoration period				
	Years							
	1	2	3	1	2	3	4	5
Environmental studies (characterization, rehabilitation plan, demolition and dismantling plan, permits, etc.)	x	x						
Removal or demolition of surface facilities	x	x						
Cleaning and emptying of service equipment	x							
Securing the site	x							
Removal of electrical lines and associated equipment			x					
Excavation, disposal and/or treatment of contaminated solids and excavated residual materials		x						
Excavation and disposal of sludge from basins		x						
Dismantling and filling of basins		x						
Final restoration of the tailings and waste rock stockpiles	x							
Restoration of the overburden pile footprint			x					
Restoration of the ore stockpile footprint	x							
Profiling of final site		x						
Addition of vegetation cover and seeding throughout the site			x					
Post-operation environmental monitoring	x	x	x					
Monitoring of the integrity of the structures, environmental and post-restoration agronomic monitoring				x	x	x	x	x

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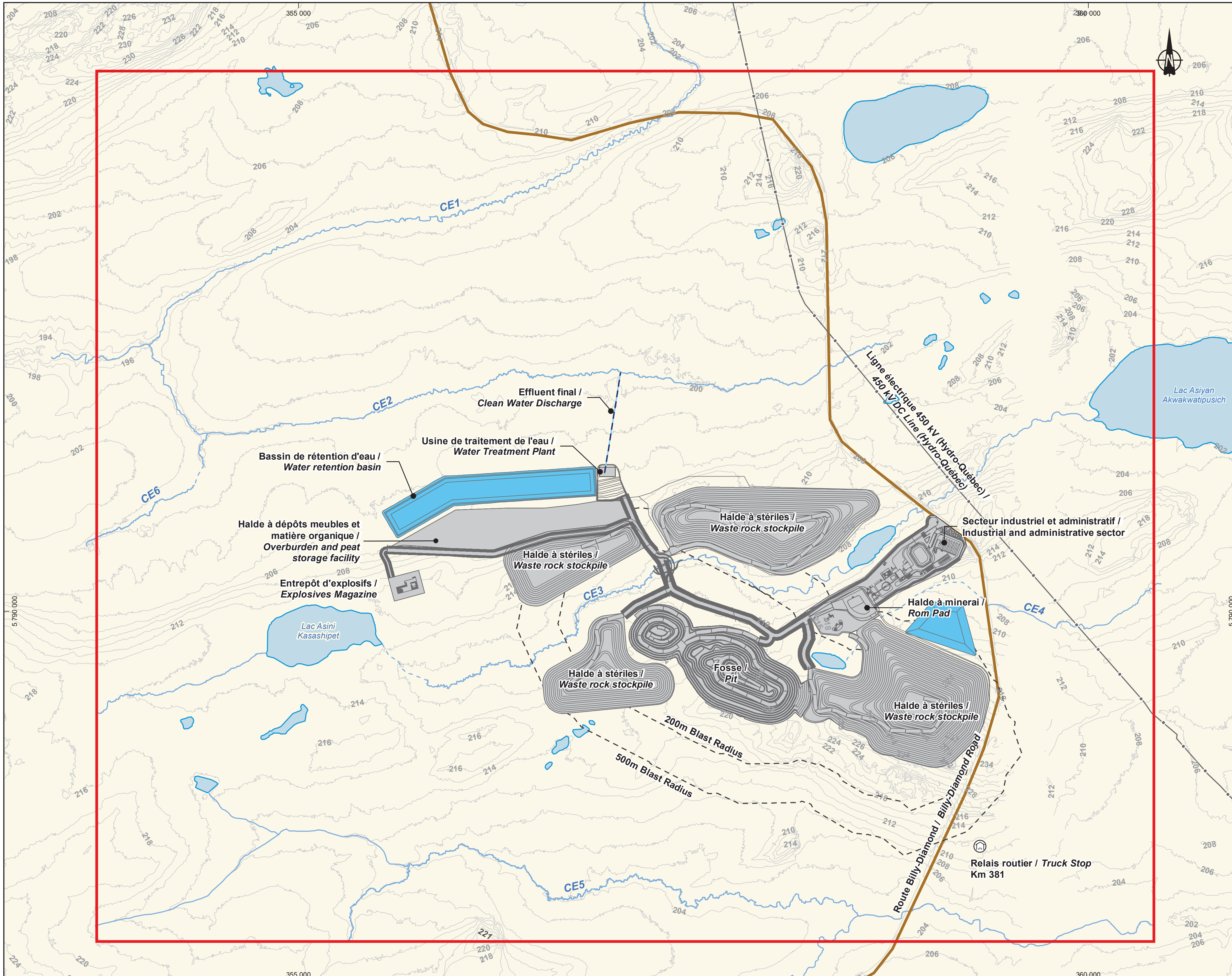
MAPS



Projet mine de lithium Baie-James / *James Bay Lithium Mine Project*

Limites du site / *Site Limits*

Composante du projet / *Project Component*

Infrastructures/ *Infrastructures*

Hydrographie / *Hydrography*

CE3 Numéro de cours d'eau / *Stream number*

Cours d'eau / *Stream*

Infrastructures / *Infrastructure*

Relais routier / *Truck stop*

Route principale/ *Principal road*

Ligne de transport d'énergie / *Transmission line*

GALAXY

Mine de lithium Baie-James / James Bay Lithium Mine

Plan de restauration / Restoration Plan

Carte / *Map* 1
Aménagement du site minier /
Mine Site General Arrangement

Sources :

Données du projet / Project data : Galaxy 2021

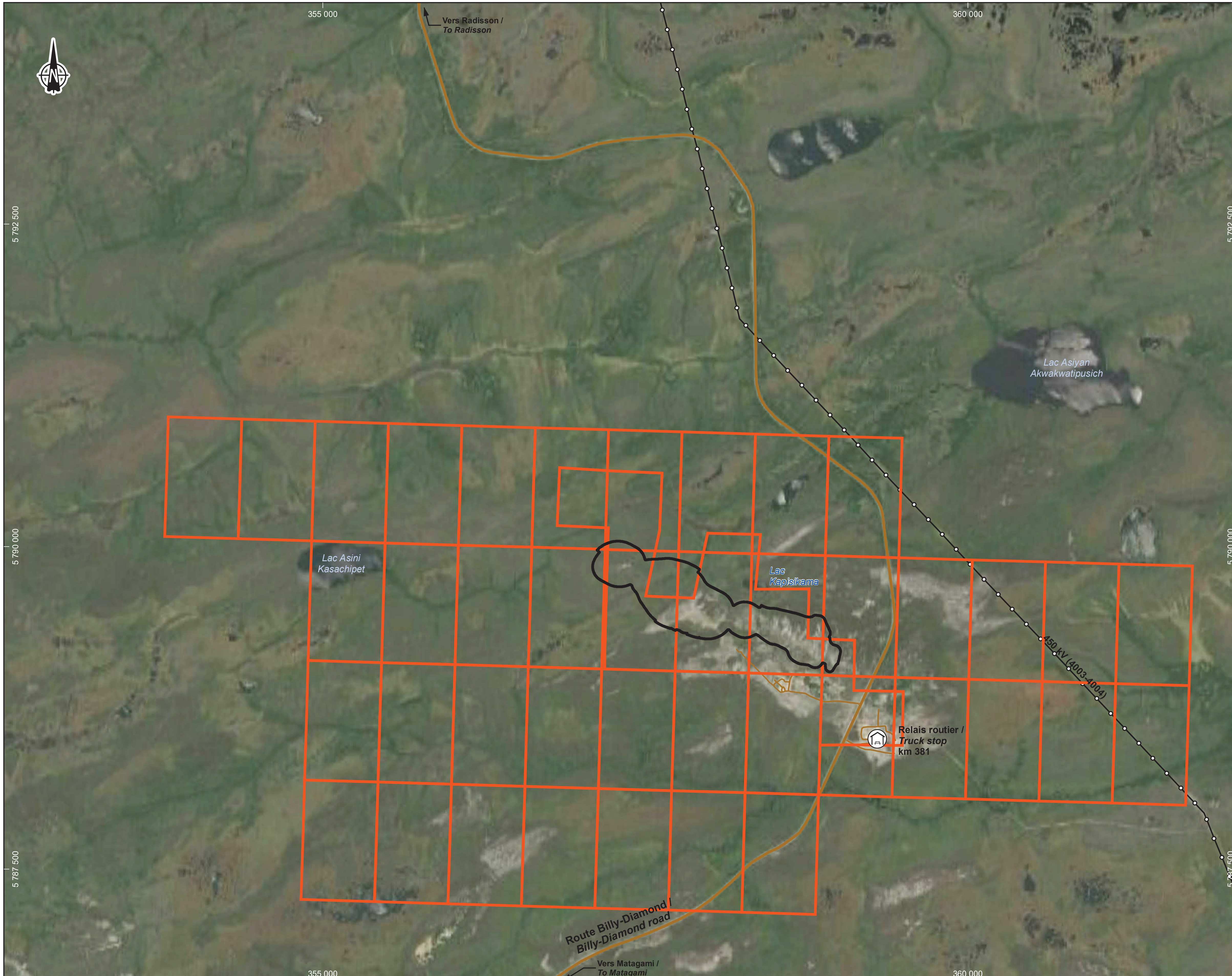
0 200 400 m

UTM, fuseau 18, NAD83

Octobre / *October* 2021

Dessin : A. Masson
Approbation : C. Martineau
201-12362-00_c1_wspT320_loc_211022.mxd

wsp



Contour de la fosse / *Open pit*

Propriété des claims / *Claim Owner*

Galaxy

Infrastructures / Infrastructure

Relais routier / *Truck stop*

Route principale / *Main road*

Route d'accès / *Access road*

Ligne de transport d'énergie / *Transmission line*

GALAXY

Mine de lithium Baie-James /James Bay Lithium Mine
Plan de restauration / Restauration Plan

Carte / *Map* 2
Claims miniers / *Mining Claims*

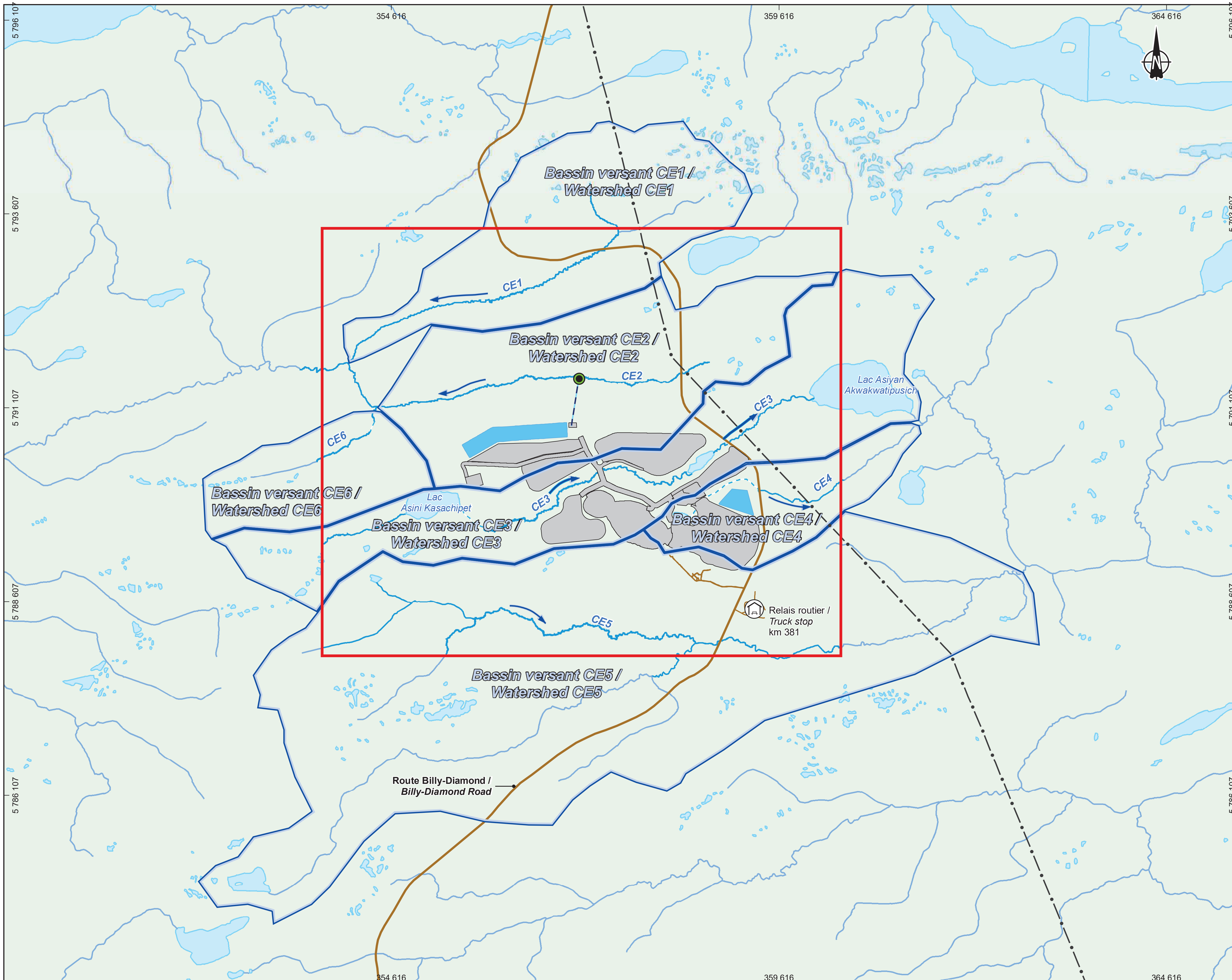
Sources :
Othoimage : Microsoft Bing (ESRI, 2017)
Gestim : MRNF Québec, 210315
Données du projet / Project data : Galaxy 2020

0 350 700 m
UTM, fuseau 18, NAD83

Octobre / *October* 2021

Dessin : A. Masson
Approbation : C. Martineau
201-12362-00_c2_wspT322_claims_211022.mxd

wsp



Zone d'étude locale / *Local study area*

Infrastructures / Infrastructure

Infrastructures/ *Infrastructures*

Route principale / *Main road*

Route d'accès / *Access road*

Ligne de transport d'énergie / *Transmission line*

Relais routier / *Truck stop*

Hydrographie / *Hydrography*

Effluent final / *Final Effluent*

CE3 Numéro de cours d'eau / *Stream number*

Cours d'eau / *Stream*

Sens d'écoulement de l'eau / *Direction of water flow*

Plan d'eau / *Waterbody*

Bassin versant / *Watershed*

GALAXY

Mine de lithium Baie-James /James Bay Lithium Mine
Plan de restauration / Restoration Plan

Carte / *Map* 3
Hydrologie du projet / *Project Hydrology*

Sources :

Données du projet / Project data : Galaxy 2021

0 500 1 000 m
UTM, fuseau 18, NAD83

Octobre / *October* 2021

Dessin : A. Masson
Approbation : C. Martineau
201-12362-00_c3_wspT322_BV_211022.mxd

wsp

Zone d'étude locale / *Local study area*

Infrastructures minières / *Mining infrastructure*

Empreinte de la mine (zone tampon de 50 mètres) / *Mine footprint (buffer 50 meters)*

Puits d'observation / *Observation well*

BH-45
-0,026
208,943 m

Nom du puits d'observation / *Name of observation well*

Profondeur du niveau d'eau p/r sol / *Water level depth from ground*

Élévation piézométrique (m) / *Piezometric elevation (m)*

Courbe piézométrique / *Piezometric contour*

Sens d'écoulement de l'eau / *Direction of water flow*

Infrastructures / *Infrastructure*

Route principale / *Main road*

Route d'accès / *Access road*

Ligne de transport d'énergie / *Transmission line*

Hydrographie / *Hydrography*

CE3 Numéro de cours d'eau/ *Stream number*

Cours d'eau permanent / *Permanent stream*

Cours d'eau à écoulement diffus ou intermittent / *Intermittent or diffused flow stream*

Plan d'eau / *Waterbody*

GALAXY

Mine de lithium Baie-James /James Bay Lithium Mine

Plan de restauration / Restoration Plan

Carte / *Map* 4

Hydrogéologie et puits piézométriques sur le site du projet /

Hydrogeology and wells on the project site

Sources :
Orthoimage : Galaxy, août / august 2017
Piézométrie, WSP 2018
Données du projet / Project data : Galaxy 2020

0 240 480 m
UTM, fuseau 18, NAD83

Octobre / *October* 2021

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Approbation : C. Martineau
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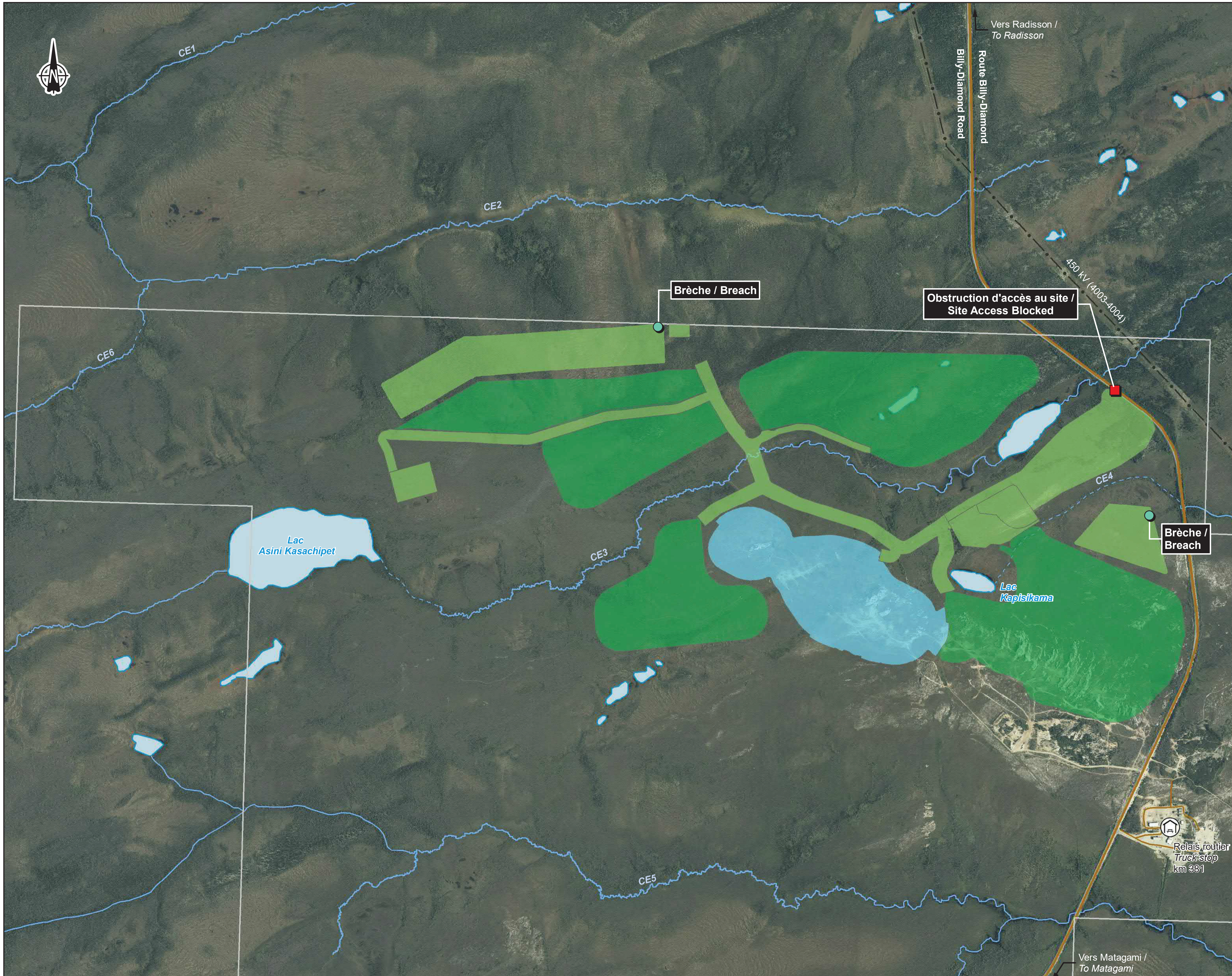

Limite de propriété / *Property limit*

Composantes du projet / *Project Component*

Haldes à stériles revégétalisée / *Revegetated waste rock stockpile*

Infrastructures revégétalisées / *Revegetated infrastructure*

Fosse remplie d'eau / *Pit filled with water*

Infrastructures / *Infrastructure*

Route principale / *Main road*

Route d'accès / *Access road*

Ligne de transport d'énergie / *Transmission line*

Relais routier / *Truck stop*

Hydrographie / *Hydrography*

CE3 Numéro de cours d'eau / *Stream number*

Cours d'eau permanent / *Permanent stream*

Cours d'eau à écoulement diffus ou intermittent / *Intermittent ou diffused flow stream*

Plan d'eau / *Waterbody*

GALAXY

Mine de lithium Baie-James / James Bay Lithium Mine
Plan de restauration / Restoration Plan

Carte / *Map* 5
Aménagement du site minier après la restauration/
Mine Site After Restoration

Sources :
Othoimage : Microsoft Bing (ESRI, 2017)
Données du projet / Project data : Galaxy 2021

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UTM, fuseau 18, NAD83

Octobre / *October* 2021

Dessin : A. Masson
Approbation : C. Martineau
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wsp