Québec Lithium inc.

Lithium Carbonate Mining Project
Québec Lithium Inc

Comprehensive Study

Executive Summary

GENIVAR

5355, boulevard des Gradins - Québec (Québec) CANADA G2J 1C8
Telephone: 418 623-2254 - Fax: 418 623-2434 - www.genivar.com

JULY 2013 | N° 121-21686-00

GENIVAR

LITHIUM CARBONATE MINING PROJECT
QUÉBEC LITHIUM INC.

COMPREHENSIVE STUDY

EXECUTIVE SUMMARY

5355 Boulevard des Gradins ~ Québec, Québec CANADA G2J 1C8
Telephone: 418-623-2254 ~ Fax: 418-624-1857 ~ www.genivar.com

LITHIUM CARBONATE MINING PROJECT
QUÉBEC LITHIUM INC.

COMPREHENSIVE STUDY

EXECUTIVE SUMMARY

Submitted to

The Canadian Environmental Assessment Agency

JULY 2013
121-21686-00

STUDY TEAM

Québec Lithium Inc.

Vice-President, Sustainable Development	:	Donald Blanchet, Eng., MBA
Superintendent, Environment	:	Émilie Bélanger

GENIVAR Inc.

Project Director	:	Yanick Plourde, Biol. M. Sc.
Authors	:	Bernard Aubé-Maurice, Biol. M. Sc. Dominique Thiffault, Biol. M. Sc.
Mapping	:	Chantale Landry, Geomatics Tech. Gilles Wiseman, Geomatician
Publishing	:	Catherine Boucher

Reference to cite:

GENIVAR. 2013. *Lithium Carbonate Mining Project. Québec Lithium. Comprehensive Study* – Executive Summary. GENIVAR Report to Québec Lithium inc. 64 p. and appendices.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (CONTINUED)

LIST OF TABLES

Page

LIST OF APPENDICES

NOTE TO THE READER

This document is a translation of the french original version.

FOREWORD

Since the submittal of the Comprehensive Study, changes have been made to the project. These changes do not alter the project significantly, but are worth mentioning nonetheless.

Mine tailings accumulation area

Tailings Accumulation Area B-West had a northward extension that intercepted the watershed of the nameless stream east of the mine site. This section's surface runoff water could no longer reach part of its course, and this situation caused a disturbance of the fish habitat. The new configuration of this tailings accumulation area is presented on Map 1 in Appendix 1.

Northbound 100-tonne road

A road 35 m wide and about 1 km long had to be built northward to allow the direct passage of 100-tonne trucks to waste rock accumulation area No. 1. This road was abandoned.

Pit

Following the latest geological investigations, the mining plan was updated and the pit optimized. The location remains the same, but the shape has evolved from an ellipse to a rounder form. The surface area increased from about 0.47 km² to nearly 0.5 km².

Bypass road

The lithium road had to be diverted north of the pit and south of Lac Lortie. However, this new location had to span two streams and remained close to the pit. Québec Lithium inc. therefore proposed to the municipalities of La Corne and Barraute to carry out a project farther north in order to avoid the impact on the streams and move the infrastructure away from the pit. The diversion of the road farther north will be 5 km compared to the 2 km initially foreseen and does not include any watercourse crossing.

Natural gas

The rotary furnace, currently fueled with propane gas, was to be supplied with natural gas by the construction of a natural gas line. Gaz Métro has postponed this project to 2014.

Site restoration

The site will be restored gradually over the mine's life cycle. The work therefore will no longer be concentrated at the end of life cycle.

1. INTRODUCTION

Québec Lithium inc. (Québec Lithium) is planning to operate a mineral deposit located southeast of the regional county municipality known as MRC d'Abitibi, about 60 km north of Val-d'Or and approximately 38 km southeast of Amos (Map 2, Appendix 1). The mining property is located in the northeast part of the municipality of La Corne, southwest of Lac Lortie and Lac Roy, on the border of the municipalities of Barraute and Landrienne.

The Company intends to open a mining operation contiguous to a former underground spodumene mine, which was operated from 1955 to 1965. Québec Lithium is looking towards the establishment of an open pit mining complex, with a 15-year estimated life cycle. The project includes ore processing and refining infrastructures to extract lithium carbonate from spodumene directly on the site.

This document presents the highlights of the Comprehensive Study of the Québec Lithium inc. lithium carbonate mining project submitted in February 2013 under the Canadian Environmental Assessment Act (CEAA).

2. PROJECT CONTEXT

2.1 Presentation of the promoter

The promoter of the project is the mining company known as Québec Lithium Inc. The Company's mailing address is as follows:

Québec Lithium Inc.
500 Route du Lithium
La Corne, Québec J0Y 1R0
Telephone: 819-734-5000

Persons responsible:

Mr. Donald Blanchet, Eng. MBA
Vice-President, Sustainable Development
Email: dblanchet@québeclithium.com

Ms. Émilie Bélanger
Superintendent, Health, Safety & Environment
Email: ebelanger@québeclithium.com

2.2 The consultants' mandate

GENIVAR Inc. (GENIVAR) was mandated by Québec Lithium to complete the environmental assessment work and produce a Comprehensive Study responding to the guidelines issued in 2012 by the Canadian Environmental Assessment Agency (the Agency).

In the approach to development of the deposit, Québec Lithium called on various consultants. A project feasibility study, entrusted to Technology Management Group Inc. (TMG), was completed in December 2010 as the first step. Other firms were also involved in the project:

- Golder, for the mandate to conduct the hydrogeological studies and the site selection study for the tailings accumulation area;
- Caracle Creek International Consulting Inc., for the determination of the ore processing operations and the metallurgical tests;
- BBA Inc., for all the pit tests and planning, the plan of the processing mill and the different mine site infrastructures.

Several updates on aspects of the project were produced in 2011 and 2012, particularly by the consultants G Services Miniers inc. (GSM), AMC Mining Consultants Pty Ltd., TMG and GENIVAR.

2.3 Participants in the Environmental Assessment

Given the administrative and socioeconomic framework of the Québec Lithium project, the Company established an information and consultation program at the beginning of the project in 2009. Thus, the promoter identified the participants concerned by the last assessment and they were involved through this program.

Québec Lithium targeted and solicited stakeholders from the municipal, regional, provincial and federal administrations, citizens from neighbouring municipalities, the Aboriginal communities located in the territory concerned, community groups and business organizations, particularly in the recreational tourism field, and regional bodies with environmental concerns.

The consultation program was divided into two phases (before and after the tabling of the feasibility study), with the objectives of informing the stakeholders about the development of the Québec Lithium project and highlighting their concerns, in order to optimize the project and mitigate its environmental and social impacts.

Parallel to the second phase of the consultations, a committee was formed to negotiate with the Aboriginal communities of Lac-Simon and Pikogan and discussions were held. These discussions made it possible to reach a pre-development agreement between these two communities and Québec Lithium in May 2012, regarding issues of training, employment, the environment, and business opportunities.

A Monitoring Committee composed of twelve members was formed and has held meetings every six to eight weeks since November 2011. Ten (10) meetings have been held to date. The committee is made up of local and regional representatives and the project's institutional stakeholders.

2.4 Regulatory Framework

The Québec Lithium spodumene mine project is subject to the CEAA (SC 1992, C37), before its reform of July 2012, because Fisheries and Oceans Canada (DFO) will have to issue authorizations under subsection 35 (2) of the Fisheries Act.

The Québec Lithium mining project is subject to a comprehensive environmental study under the CEAA, because it consists of a project for:

- the construction, operation, decommissioning and abandonment of a metal mine with an ore production capacity of 3 000 t/d or more;

- the construction, operation, decommissioning and abandonment of a facility for the extraction of 200,000 m^3/a or more of ground water.

After submitting a request for a technical opinion to the Ministère du Développement durable, de l'Environnement, de la Faune et des Parcs (MDDEFP) concerning the startup of the Québec Lithium project, the MDDEFP's Direction regional de l'Abitibi-Témiscamingue et du Nord du Québec indicated that the project was not subject to the environmental impact assessment and review procedure set out in Division IV.I of the Environment Quality Act (EQA) and the obtaining of a certificate of authorization issued under Section 31.5 of that Act. However, the project must obtain many certificates of authorization in accordance with the regulations in application of the EQA and satisfy the necessary environmental analysis requirements under these processes.

3. DESCRIPTION OF THE PROJECT

3.1 Rationale for the Project

Lithium is a soft metal of major interest in the manufacturing of lithium-ion batteries as an energy production alternative. The unique properties of lithium batteries make them a choice energy source for electronic devices. These batteries are used, in particular, in cell phones and laptop computers.

With the advent of electric and hybrid vehicles, an increase in the demand for lithium is anticipated, because the majority of automobile manufacturers have decided to opt for lithium technology instead of nickel as an energy source for vehicles.

Global annual lithium consumption increased by over 6% between 2000 and 2008, rising from 13,375 to 21,280 t (or 113,270 t of lithium carbonate). Global lithium production was estimated at 25,400 t in 2008, 18,800 t in 2009 and 25,300 t in 2010. An increase of around 300,000 t in the demand for lithium carbonate is forecast in 2020.

The lithium carbonate used in battery manufacturing must offer a minimum purity of 99.5% for optimum operation. The special feature of the Québec Lithium project's deposit is that it is free of impurities, which would allow concentrations in the order of 99.9% to be achieved.

The project's rationale is related to a business opportunity based on economic growth, rising demand, and a promising projection for lithium carbonate concentrate on the market.

3.2 Mining History of the Site

The deposit targeted by Québec Lithium was mined in the 1950s by Québec Lithium Corporation, an affiliate of the Sullivan Mining Group. A first discovery of spodumene pegmatites was located in 1942. Different promoters carried out prospecting projects from 1942 to 1953. The first surveys of interest for mining were conducted in 1953 by Québec Lithium Corporation. Once the deposit was delimited, excavation of a ramp began in 1954 and construction of the infrastructures of a mining complex started in 1955. The deposit was mined underground between 1955 and 1965; approximately one million tonnes of ore was extracted.

The concentrator had a processing capacity of 1,000 t of spodumene ore per day, to produce approximately 186 t of lithium concentrate at an average assay of about 5.8% Li_2O.

From 1960 to 1965, approximately 8,442,000 L of lithium carbonate was produced. At the time, the mine tailings were contained within two dikes located north of the former mine, in a valley oriented east-west between Lac Lortie and Lac Roy. The waste rock was deposited on the perimeter of the tailings accumulation area.

In October 1965, operations were suspended due to adverse market conditions. In 2008, Black Pearl Minerals Consolidated took possession of the property and subsequently became Canada Lithium Corporation.

The rehabilitation of the former mine site, including the complete dismantling of all underground and surface installations, the spur line connecting the Canadian National tracks, and all the offices and other infrastructures, was carried out between 1990 and 2000. It was finalized to the satisfaction of the Ministère des Ressources naturelles (MRN) in 2010 and the site was retroceded to the Crown at the beginning of 2011 by IAMGOLD.

Québec Lithium currently holds 100% of the interests of the Québec Lithium mining property (surface rights). The property is composed of 19 claims and the surface area covered by the project totals 6.43 km^2. However, the Gouvernement du Québec remains the owner of the land rights. Three land leases have been issued since the beginning of 2011 and a mining lease for operation of the pit was issued in May 2012.

3.3 Description of the Project

Highlights of the Project

The Québec Lithium mining project consists of extraction of spodumene ore from an open pit with a ramp, according to conventional surface extraction methods. The depth of the pit is estimated at 150 m and the project calls for an ore processing plant with a capacity of 3,800 tonnes per day.

The mineral resources update was completed by Québec Lithium in accordance with National Instrument NI 43-101. The mining project's indicated resources would total 33.2 million metric tonnes of proven and probable resources, with an average lithium oxide (Li_2O) assay of 1.19%. The deposit's estimated reserves are presented in Table 1.

Québec Lithium started its production at the beginning of 2013 and the life cycle of the open pit mine is estimated at 15 years. A total of 17.8 Mt of mine tailings, 108.8 Mt of waste rock and 3.2 Mt of unconsolidated deposits will be generated by the project, for approximate annual production of 20,000 t of lithium carbonate (Li_2CO_3). The total extraction tonnage (overburden, waste rock and ore) for the three phases of the project will represent approximately 130 Mt.

Table 1 Estimated reserves of the Québec Lithium deposit

Category	Tonnage (M)	Li_2O (%)
Proven	6.9	1.18
Probable	24.33	1.19
Proven and probable	33.24	1.19

The infrastructures anticipated for the Québec Lithium project (Map 1 and Map 3, Appendix 1) are those common to the mining operations, such as a concentrator, a refinery with pyrometallurgical and hydrometallurgical processes, storage and accumulation areas for ore, overburden, waste rock and tailings, administration offices, a dryer for the workers and a garage for mechanical equipment maintenance.

In the operating phase, a mine tailings accumulation area, which will also be used for waste rock deposition (codisposition), two waste rock accumulation areas, five overburden storage areas and two ore storage areas are anticipated (production and low grade). The industrial complex (concentrator and refinery) is located southwest of the open pit. The process design criteria were developed for processing of 3,800 t/d of ore and production of approximately 20,000 t/a of 99.5% pure lithium carbonate. The plant will be in operation 24 hours a day, 365 days a year, for an estimated life cycle of 15 years.

The anticipated infrastructures for the open pit mine and ore processing plant by Québec Lithium include:

- an open pit with a ramp;
- an ore processing plant with a capacity of 3,800 t/d (spodumene concentration);
- a refinery with a hydrometallurgical process to obtain lithium carbonate;
- the ore and lithium carbonate transportation infrastructures;
- overburden and ore storage areas;
- waste rock and tailings accumulation areas;
- an administration building;
- a dryer for the workers;
- a mechanical equipment maintenance garage.

Related work will be performed parallel to the mining infrastructures as such. This involves the relocation of a section of the Québec-Lithium road over about 5 km, the moving of a 25 kV power line, the moving of a communications tower by Astral Media, and the construction by Hydro-Québec of a power substation in the extension of a 125 kV power line.

Costs

The Québec Lithium mining project, as described above, represents an investment of around $207 million. The project should generate over $150 million of annual revenue.

Time Frame

Construction of the Québec Lithium project began in August 2011, for startup effective December 2012. The deployment of the concentrator and refinery equipment began in the second quarter of 2012, for commissioning towards the end of the year and full production targeted for 2013. Finally, the preparatory work on the pit's south sector and the construction of Tailings Accumulation Area B-West began during the third quarter of 2012.

Labour

During the construction phase, up to 320 workers were hired. Approximately 190 person-years are required for mining operations during the operating phase.

Mineral Extraction

The ore will be extracted from the surface by open pit mining. Drilling and blasting activities are necessary to recover the ore and waste rock. The materials will be transported out of the pit by truck via access ramps to the processing plant.

In its maximum extension, the pit will have a depth of 150 m and a diameter of around 870 m. Its design was developed according to the geometry of the deposit and accounting for the presence of the underground galleries of the former mine, to prevent the walls and access ramps from intersecting with former underground galleries.

The first mining phase (years 0 to 2) is located in the southern part of the pit. The purpose of this stage is to mine one of the widest and highest grade veins near the surface, and to ensure the supply of waste rock for infrastructure construction during the subsequent years of operation. The targeted maximum spodumene production of 3,800 t/d will not be attained during this phase. At the end of this first phase, the pit dimensions will be approximately 340 m by 220 m, with a depth of 34 m.

The second mining phase (years 2 to 7) would be concentrated in the southern part of the former underground mine. It essentially would broaden the extraction zone of the first phase to greater depths and to the southeast. At the end of this phase, the pit dimensions will be approximately 400 m by 560 m, with a depth of 118 m.

The third mining phase will intercept the former underground openings (galleries, shaft head, ventilation chimneys). The extraction tonnage for this phase, all materials combined, is 77.6 Mt. The final pit will contain two distinct deepening zones. The one to the north, less deep and accessible by a one-lane ramp, will be mined to its maximum depth before excavation to the south by lateral extension. The second section of the pit, the southern section, will be deeper and its last beds would be accessible by a single ramp.

The equipment needs were determined according to the production time frame. The mining equipment fleet for the stripping and construction phase (first year) includes a wheeled loader and a fleet of mining dump trucks with a transportation capacity of ± 100 t. During large-scale operations, hydraulic excavators and auxiliary equipment will be added, such as grader, bulldozer, water truck, maintenance vehicles and fuel truck.

Supply of Explosives

The pit will be mined by drilling and blasting. The blasting frequency will be around two to five blasts per week. The explosives and detonators will be transported from Ville de Val-d'Or by Dyno Nobel. No powder house is anticipated on the site during the first years of operation.

The explosive used during extraction activities will be Titan XL1000 emulsion.

Ore Transportation and Storage

Roads will be built to allow vehicular traffic between the pit, the crusher and the truck maintenance shop. This road network will serve the different buildings.

A backhoe loader will be used to load the trucks transporting rocky material from the pit to the crushers. The ore then will be routed to the plant by conveyors.

During extraction of the first beds, the ore intercepted through the waste rock will be used in preproduction. To standardize the lithium concentration in the ore sent to the concentrator, a low-grade storage area will be developed north of the primary crusher. The low-grade ore will be stored throughout the mine's life cycle. This ore will be processed, in part, during operation, and in its entirety during years 14 and 15. The accumulated volume of low-grade ore will be around 1.9 Mm^3 and will occupy a surface area of around 200,000 m^2 for a maximum height of 30 m (elevation from 415 to 435 m, depending on the site's topography). Collector ditches will be dug at its periphery and water quality will be monitored according to the MDDEFP requirements.

Ore Processing Plant

The industrial complex is composed of an ore processing plan (concentrator) and a refinery. The concentrator will have a processing capacity of 3,800 t/d, for an approximate annual volume of 1,077,000 t. This supply rate corresponds to 90% overall availability of the concentrator, with a lithium recovery rate of around 67.6%.

The ore will be processed in two distinct stages: spodumene concentration and spodumene refining. Spodumene concentration includes crushing, grinding, gravity separation, flotation and magnetic separation. Spodumene is refined by a pyrometallurgical process including a decrepitation furnace, a sulfatation furnace, solubilization, purification of the parent solution, and lithium carbonate precipitation.

The resulting end product is 99.5% pure lithium carbonate. It is recovered by thickening and filtration, cleaned at 95°C, dried at 120°C and then packaged for transport by truck to the markets. The lithium-poor solution will be discharged into the circuit discharge thickener.

Water Management on the Mine Site

The water required for the operation of the mining complex is intended to meet the needs for drinking water, ore processing water and industrial complex operating water, and to meet firefighting requirements.

The process water supply will be assured by recirculation of process water and by a well located approximately 2 km north of Lac Lortie, which will be developed in 2014. A secondary well satisfying sanitary water needs is also present near the industrial complex.

The water coming from the pit (rainwater and runoff water on a portion of the site, from the former underground galleries and mine water) will be channelled to mine Tailings Accumulation Area B-West. The low point of this area (to the south) will be developed to collect water to meet the mining complex's needs.

Effluent from Tailings Accumulation Area B-West is anticipated around year 3 of operation, when the quantity of water accumulating in the basin developed in the tailings accumulation area will exceed the mining complex's needs. If applicable, the effluent will be released downstream from the south dike, towards the watercourse that currently drains the zone east of the tailings accumulation area. The final effluent will be intermittent, and it is anticipated that it will flow only in spring and in flood periods, before the fourth year of operation. Before being released into the environment, the effluent will be analyzed and will undergo appropriate treatment, as needed, to conform to the requirements of Directive 019 for the mining industry and the Metal Mining Effluent Regulations (MMER).

Surface water management on the mine site is based on the following assumptions:

- the tailings and waste rock are considered to be low environmental risk;
- measures are anticipated to ensure that the effluent will be free of contamination;
- a portion of the runoff water will be diverted to avoid any contact with the mining infrastructures;
- a portion of the runoff water in contact with the mining infrastructures will be directed to Tailings Accumulation Area B-West and its composition will be monitored;
- the water from the tailings accumulation area will be returned to the plant. A water treatment system is included in the process before sending the pulp to the accumulation area;
- there will be a well supplying sanitary water, and possibly fresh water;
- the former mine will be dewatered to keep the pit dry, and the pumped mine water will be directed to the tailings accumulation area;
- once the concentrator is in operation, recirculation and intake from the fresh water well will be sufficient for most of the water supply of the ore processing installations;
- a reserve water supply of at least 100,000 m^3 will be maintained after the first year of operation in Tailings Accumulation Area B-West.

Conceptual diagrams of water management, based on the development of the mine site, are presented in Figures 1 to 4 of Appendix 1.

Management of Overburden Storage Areas

The total volume of overburden to be excavated is estimated at about 2,500,000 m^3; it will be stored at five distinct locations (Map 1, Appendix 1). The overburden will be stored to favour reuse during restoration.

Management of Waste Rock Accumulation Areas

The total quantity of waste rock is estimated at 108 Mt. The option currently preferred for management of the waste rock coming from mining of the deposit is stored in an accumulation area (waste rock pile) in codisposition with the two mine tailings accumulation areas, in addition to use for part of the construction of the major infrastructures. Laboratory tests of the waste rock were performed to evaluate its potential to generate acidity and leach metals. The results are variable, depending on the type of lithology; however, on the whole, the waste rock can be qualified as non-acidogenic. With regard to leaching, the results of the TCLP test show that some

lithologies will be weakly leachable for Cu and Cr. However, the TCLP test is very conservative, given the non-acidogenic character of the rock and the conditions prevailing on the site. For the other tests (SPLP and CTEU-9), only one sample shows slight exceedances of the groundwater criterion for Cu and Cr. According to these results, the waste rock is not considered a threat to the environment, and no special containment measure is to be anticipated. Additional tests will be conducted, including kinetic tests for certain lithologies, to confirm the very low risk of environmental contamination.

When filled to capacity, the aggregate volume of the waste rock piles will be around 46,000,000 m^3.

Management of Tailings Accumulation Areas

Laboratory tests to determine the chemical composition of the mine tailings, their acidogenic potential, their metal leaching potential and their radioactive potential were conducted. In accordance with Directive 019 for the mining industry, the results of the chemical composition analysis of the mine tailings indicate that only tin exceeds the recommended criterion. According to the TCLP test, the sample is classified as non-acidogenic and the leachate tin concentration would be very low. In the absence of a groundwater protection criterion for this element, the residue is classified as low risk according to Directive 019.

Moreover, TCLP, SPLP and CTEU-9 leaching tests were also conducted. The TCLP test allows classification of the residues according to the leachate concentration. These tests indicate concentrations of aluminium, chromium and copper slightly in excess of the groundwater protection criteria. However, given that the solid residues are not acidogenic, the results of this test are not considered representative of the anticipated conditions on the site. For the SPLP test, no element of the simulated leachate exceeded the groundwater protection criteria, whereas copper and zinc slightly exceeded the groundwater protection criteria for the leachate coming from the CTEU-9 test.

For all the tests, the elements that slightly exceeded the groundwater protection criteria are present in concentrations lower than criterion A for the solid phase. The mine tailings thus are classified as non-leachable, based on the geochemical analyses.

Finally, it is important to mention that the former tailings accumulation area (previous operation) located on the mine site represents, to some extent, a real-size kinetic test over a 50-year period. No environmental problem associated with mine tailings has been observed during these years.

To summarize, the results expected on the site are considered low risk, and no special impermeabilization measure is necessary for their storage, apart from physical containment.

The concentrator rejects essentially will be composed of inert minerals, while the refinery rejects will be composed of tailings filter cakes from leaching and successive purifications. The final pH should be in the vicinity of 9.

The tailings accumulation area is designed according to the following assumptions:

- the site dimensions should contain 21.18 Mt of solid tailings;
- the deposited tailings are presumed to be consolidated at a density index of 1.190 and would occupy a volume of 17.8 Mm^3;
- the tailings will be transported from the plant to the tailings accumulation area in the form of thickened pump (42% solid);
- the tailings containment strategy consists of retaining the runoff water within the tailings accumulation area for reuse as process water;
- the water will be contained by means of a geomembrane deployed in the southern sector of Tailings Accumulation Area B-West, near the outfall.

To circumscribe the tailings within the accumulation area, containment dikes will be constructed on the perimeter, with waste rock from the pit. The southern sector of accumulation area B-West will be sealed with the geomembrane to allow water retention for recirculation. Collector ditches will be present at the foot of the dikes to collect and allow monitoring of water in contact with the retention structure.

Transportation and Storage of Chemical Substances

Québec Lithium has a proactive attitude concerning management of chemicals and hazardous materials. It endeavours to comply with the standards of the Workplace Hazardous Materials Information System (WHMIS) (Health Canada, 2012) has committed to an OHSAS 18001 certification process for an OHSAS 18001 occupational health and safety management system (PWGSC, 2012) and ISO 14 000.

Storage and containment of chemical substances were designed to contain possible events. Upon receiving chemicals at the mining complex, a specific dock is designed for unloading of the trucks and is equipped with a retention basin to contain an accidental spill during unloading. Inside the plant, containment berms have been provided to ensure that incompatible materials are stored to avoid any accidental contact or chemical reaction between them.

Administration Building and Warehouse

The administration building accommodates the management employees, office personnel and technicians (excluding the processing plant personnel), as well as the Human Resources, Health/Safety, Environment, Purchasing and Accounting Departments. In addition to the offices, this building will also house the dining rooms, washrooms, a printing room and a conference room.

Storage of Fuel and Propane Gas

Four diesel tanks of 50,000 L each will be stored in a containment zone located east of the garage and south of the ore processing plant. They will be filled by a local distributor. The propane gas used to feed the furnace will be stored in tanks located west of the processing plant. The use of propane gas is temporary; natural gas will take over when a Gaz Métro line is installed in 2014.

3.4 Alternatives to the Project and Variants

This section deals with the alternatives envisioned and the analysis of the variants that are technically and economically feasible for the implementation of the various components of the mining project, in a sustainable development perspective.

During the design of the project, technical, environmental and socioeconomic criteria were taken into consideration to optimize certain components, following information and consultation sessions.

The nature of mining of a mineral deposit limits the operating parameters and the possible alternatives or variants. These are mainly related to management of the activity's outputs, namely production of waste rock or mine tailings, the storage options, water management in operations (including release of an effluent), and wastewater.

The main components considered for the Québec Lithium project are:

- the ore extraction method;
- the location of the mining complex, which includes, in particular, the ore processing plant, the refinery, the administration buildings and the dryer for the workers;
- tailings management and the locations of the accumulation areas;
- the location of the waste rock accumulation areas;
- the plant's water supply and overall water management on the mine site.

Ore Extraction Method

The Québec Lithium spodumene deposit is a shallow surface deposit (about 150 m). The variable diameter of the mineralized veins ranges from 1 m to over 50 m. An underground mining operation would necessitate the use of many types of equipment and multiple mining methods, or would require the abandonment of a significant portion of the reserves, which would have major technical and economic impacts on the project. However, the high density of the veins, for a waste rock/ore ratio of 3:1, allows economic and technical consideration of “bulk” surface extraction of all ore. Since the deposit extends laterally over more than 1 km, an underground mine would require the excavation of many shafts or long galleries associated with management and significantly higher costs of materials. In particular, the 60° to 70° dip of the veins complicates the horizontal or vertical operation of an underground mine, because the workers performing underground extraction operations on deposits with a dip of this magnitude would have to work manually rather than with machinery.

Considering these factors, the capital and operating costs are clearly lower and the ore recovery possibilities are significantly improved with open pit mining. For these reasons, the project would not be viable in underground mode, and this option is not considered feasible.

Location of the Mining Complex

Four locations were evaluated for establishment of the mining complex to minimize the impact of the infrastructures (ore processing plant, refinery, administration buildings and dryer for the workers) on the wetlands.

A peat deposit with an approximate surface area of 18 ha, hydraulically linked to a watercourse, was discovered at the location originally preferred for the construction of the mining complex. Its location then was reconsidered based on the technical and environmental considerations (particularly the constraints of intervention in these environments and their ecological interest).

Several alternatives for the location were therefore evaluated, considering the peat deposits and the wetlands. Several alternative locations for the mining complex (Options 2, 3 and 4) were considered (Map 4, Appendix 1).

The optimum solution for location of the mining complex, minimizing the environmental impacts, was determined based on minimal encroachment on the wetlands (Table 2). Option 4 was therefore retained for the location of the mining complex.

Table 2 Surface area of wetland encroachment according to the mining complex location options

Option analyzed	Approximate surface area of wetland encroachment (ha)
Option 1	3.0
Option 2	0.6
Option 3	4.5
Option 4	0.4

Tailings Management and Analysis of Alternatives

The total quantity of dry tailings that would result from mining of the deposit at the end of activities is estimated at 21.2 Mt, for a volume of around 17.8 Mm^3. The surface area required for the tailings accumulation area is estimated at 1.83 km^2.

An assessment of the mine waste storage alternatives was produced by Golder Associates. It consisted of a qualitative and quantitative analysis of variants for disposal of mine tailings. Environmental, technical, economic and socioeconomic aspects were taken into account, as well as the consultation process, in which the concerns of the public and Aboriginal groups were expressed and integrated. This assessment was based on the approach developed in the Guidelines for the Assessment of Alternatives for Mine Waste Disposal (Environment Canada, 2011).

This characterization of alternative sites for the implementation of a tailings accumulation area made it possible to analyze the locations with the best potential, based on environmental, operational and social criteria, within a 10 km radius of the ore extraction site. The exercise was based on the development of a decision matrix with a quantitative weighting of criteria and compared variants with each other based on an average score for a given criterion. Once the weightings and the scores were compiled, the decision matrix discriminated a variant considered preferable due to its higher cumulative result.

Physical, financial and technical, biological and social aspects were weighted, particularly the sensitivity of the watershed, the distance from the watercourses, the environmental risks related to a pipeline for mine tailings according to certain scenarios, possession of the mining claims, the maximum height for pumping tailings, the need to divert watercourses, the number of containment dikes required and the lateral expansion capacity, the presence of protected areas, wetlands, old-growth forests, disturbed zones and fish habitats, the current use of the sites, visibility, potential development projects on the site, and zoning.

Eight potential sites for the location of the mine tailings accumulation area were identified and compared (Map 5, Appendix 1). At the MDDEFP's request, the abandoned Barvue and Molybdenite mine tailings sites, which are farther from the Québec Lithium deposit, were added and considered, for a total of 10 sites.

Based on this screening process, three potential sites located in the municipality of La Corne – sites B, F and H – were retained. An additional characterization was performed on the three potential sites B, F and H, as well as the Barvue and Molybdenite sites, to document the fish habitat, identify the presence of wetlands and assess the potential and their respective sensitivity.

Option B is the option that encroaches the least on the wetlands (Table 3).

Table 3 Surface areas of the wetlands at sites B, F and H

Potential site	Surface area (ha)		
	Total surface	Wetlands according to the ecoforestry maps	Wetlands according to photo-interpretation
B	139.6	7.9 (5.6%)	20.0 (14.3%)
F	162.3	137.1 (84.4%)	61.7 (38.0%)
H	176.4	120.4 (68.2%)	75.5 (42.8%)

The abandoned Barvue and Molybdenite mine sites are disadvantageous options, mainly due to the insufficient dimensions of the available space (involving expansion issues and work on inadequate former infrastructures) and the environmental conditions (particularly the presence of uncontrolled contamination problems).

On the whole, the multicriteria analysis of the alternatives for tailings management prefers site B.

Management of Waste Rock

The waste rock deposit site or sites preferably should be located near the pit to minimize the transportation costs and reduce the distances to be travelled and the air pollutant emissions. Given the geochemical assessment of the waste rock samples analyzed, the surface water and groundwater contamination issues were not a major problem in this regard. The number of potential locations was limited by the zone's hilly topography. The location of the Harricana moraine and the different occupancies of the sector were also taken into account when selecting the sites to minimize the local impacts. Finally, public consultations were integrated into the analysis, and the initial proposal of a single waste rock pile located south of the mining complex's buildings then was modified.

A codisposition approach including the tailings accumulation area was also developed to minimize the footprint of the waste rock piles on the project as a whole.

Management of Process Water and Plant Water Supply Method

The plant water supply method was the subject of several scenarios. It was optimized to reduce the quantity of water released into the environment and minimize the use of fresh water. Due to the measures envisioned (e.g. use of mine wastewater), preliminary estimates indicate that there would not be any mining effluent, except under high hydraulicity conditions, such as a spring flood, and then only in or after the fourth year of mining of the deposit.

Nonetheless, a supplemental water supply is necessary at all times for the reagents and certain stages of the process.

The additional water supply sources considered are:

- runoff water from outside the site, captured with drainage dishes and a retention basin;
- the waters of Lac Roy;
- groundwater;
- mine water from the pit and water from the mine tailings accumulation area, after treatment.

The infrastructure plan was modified several times and, in this approach, the feasibility of drawing 600,000 m^3 annually from Lac Roy was considered. On the basis of the estimated mean annual hydrograph, a volume of 291,000 to 450,000 m^3 could be drawn from Lac Roy according to the summer and winter water management methods, minimizing the impacts on the biophysical environment and the recreational activities. However, this option did not allow satisfaction of the mining complex's needs and was abandoned.

It is currently estimated that the water used for the mining complex's needs will come mainly from mine water from the pit and two wells, where a total volume of 180,000 m^3 per year would be extracted.

Water from Tailings Accumulation Area B-West will also be used. A water accumulation basin, developed in Tailings Accumulation Area B-West, is designed to collect a sufficient quantity of water to meet the mining complex's needs, particularly in the winter period when the monthly water balance could be negative.

3.5 Restoration

The restoration of the mine site when mining of the deposit ends will be articulated around dismantling the mining complex, closing the tailings accumulation area, revegetating the waste rock accumulation areas and filling the pit.

The Québec Mining Act (R.S.Q., c. M-13.1) obliges Québec Lithium to perform site rehabilitation and restoration work, and the Company must submit a rehabilitation and restoration plan for approval before beginning its mining activities. Québec Guidelines for Preparing a Mining Site Rehabilitation govern the presentation of the restoration plan and the general technical requirements for restoration.

Overview of the Decommissioning and Restoration Plan

The restoration plan was filed with the MRN in June 2012.

Closure and rehabilitation of the mine site must make it possible to secure the area and restore the site to a condition compatible with its environment, satisfactory to the departments and the community. Some information is not yet available at this stage of the project or could be modified. Québec Lithium will provide the responsible authorities with the information required as the plan is revised. The following are the principal mine site restoration measures identified at this stage:

- stabilization of the natural water level after cessation of pumping activities in the pit at an elevation of approximately 410 m, transforming the pit into a water body;
- seeding of the overburden slope along the entire perimeter of the pit;
- construction of a trench-levee preventing access to the pit;
- natural revegetation of the waste rock pile;
- grading of the overburden piles, spreading of topsoil and seeding of the surface;
- removal of the infrastructure of the tailings accumulation area (power line, barge, pipes);
- reconfiguration of the spillway of Tailings Accumulation Area B-West to accommodate a 1: 1000 flood and allow the gradual flow of runoff water according to the receiving capacity of the watercourses;
- demolition or removal of all the buildings and other surface infrastructures, including the power lines, water pipes, etc.;
- grading of the industrial zone and earthworks to restore the natural drainage network;

- revegetation of the site by spreading a layer of overburden covered with topsoil, followed by seeding;
- management of the materials generated during dismantling of the installations by applying the principles of reduction, reuse, recycling and reclamation. If applicable, disposal of the materials at authorized sites, depending on their degree of contamination;
- performance of a site characterization study to determine the presence of contaminants with concentrations exceeding the regulatory values, and taking the necessary measures, as the case may be, in accordance with the provisions of the Environment Quality Act and the Land Protection and Rehabilitation Regulation;
- scarification of the roads built by Québec Lithium during the mining activities, restoration of the natural drainage and seeding.

In view of the topography of the site, the runoff water will be partially directed naturally to the mine tailings accumulation area to flow into the sedimentation-polishing basin, and then released into the environment. The basin will remain operational until no more water remains and the effluent conforms to the requirements of Directive 019 for the mining industry. Subsequently, the basin will be backfilled and covered with overburden to favour revegetation and the return of a natural forest landscape.

The restoration work would be performed gradually at the end of the mine's life cycle, starting in 2027. The restoration cost of the accumulation areas is estimated at about $13 million ± 50%. The cost of restoration for the entire Québec Lithium mine site is estimated at about $45,600,000 ± 50%, in 2012 dollars.

However, Québec Lithium is already considering the possibility of beginning restoration work during operation, for example, by revegetating the dikes of the tailings accumulation area during the ultimate upgrade phase, and revegetating the slopes of the waste rock accumulation areas once they reach their full height.

Post-restoration monitoring will be deployed to control the integrity of the works linked to the accumulation areas, in order to ensure environmental monitoring of the quality of effluent from the accumulation areas and groundwater, and to ensure the effectiveness of all the restoration measures.

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

4.1 Physical Environment

Climate

Abitibi-Témiscamingue enjoys a cold temperature continental climate characterized by a long, cold and dry winter and a short but hot summer. According to the data from the Val-d'Or weather station, located 40 km to the south, the July mean temperature reaches a high of 17.2°C and the January mean temperature falls to a low of -17.2°C. The annual mean daily temperature is 1.2°C. On the average, 635.2 mm of rain and 300.4 cm of snow fall, for total precipitation of 914 mm (in rain equivalent). The mean wind speed is 12.6 km/h, mainly coming from the northwest from February to June, and from the south from July to January.

Physiography

The regional study area is located in the Abitibi Upland physiographic unit. The slightly hilly terrain was shaped and softened by the deposition of thick clay deposits coming from the vestiges of Lake Ojibway-Barlow. Some discontinuous alignments of rocky hills pierce the clay plain, including Mont Vidéo, which rises to 470 m. The other hills vary in altitude between 420 and 450 m, while the lowlands rise to an average of about 360 m.

Geology

The study area is located on the Canadian Shield, in the geological province of Superior. The rocks of this area date from the Archean Era. The batholith is formed by multiple parallel dikes of spodumene pegmatite (lithium ore), feldspar and quartz. These dikes are nearly 3 km long and are oriented northwest/southeast. They are found to a depth of 260 m. They are significantly continuous and the spodumene mineralization is distributed in them uniformly.

Geomorphology

The glacial footprint on the current landscape was left by the last glacier present in the region, nearly 9,000 years ago. On striking trait of the last deglaciation in Abitibi-Témiscamingue is the deposition of the Harricana moraine. This moraine marks the position of a confluence line between the Hudson Glacier and the Nouveau-Québec Glacier. Several major fluvioglacial deposits (eskers, outwash plains) were deposited during the glacial retreat.

The local study area is essentially characterized by the presence of continuous till cover, generally thicker than 1 m, which occupies the location of the pit and the mining complex. The till in place has medium permeability and can be considered a discontinuous aquifer, allowing the flow of groundwater. At some places in the local study area, the following geomorphological features are also found: discontinuous till north of Lac Roy and in a limited zone in the western sector of the local study area, juxtaglacial sediments to the north, glaciolacustrine deposits mainly in the western sector of the study area, a few organic deposits, particularly southwest of Lac Legendre, and faults east and north of Lac Lortie. One of these faults is oriented east-west and extends between Lac Roy and Lac Lortie. It could favour a hydraulic link between these two water bodies.

Hydrography

A total of 226 water bodies are inventoried in the regional study area for a surface area of about 32 ha. The principal water bodies are Lac La Corne (10.1 ha), Lac Legendre (6.7 ha), Lac Chaptes (3.8 ha), Lac Roy (2.6 ha), Lac Lortie (1.1 ha) and Lac du Repos (0.3 ha). We also find 216 km of permanent watercourses and 211 km of intermittent water courses, which are part of the Nottaway River watershed (including the sub-basin of the Laflamme River) to the east, or the Harricana River watershed (including the sub-basins of the Fiedmont and Landrienne Rivers) to the west. These two rivers flow into James Bay.

Lac Roy, Lac Legendre and Lac Lortie are the principal water bodies located near the mining project (Map 6, Appendix 1). Lac Lortie, located north of the projected pit, is an isolated lake with no surface outfall. The interpretation of the Hydrological Atlas of Canada indicates that it drains to the northwest into the Landrienne River basin. The Harricana moraine is located at the divide between the waters flowing into the Landrienne River (affluent of the Harricana River) and into Ruisseau Barraute (affluent of the Laflamme River). Lac Lortie theoretically could contribute to these two watersheds.

The mining project is found at the head of the sub-basins of the Laflamme, Fiedmont and Landrienne Rivers. The infrastructures (concentrator, tailings accumulation area and waste rock accumulation area) are found in the sub-basin of the Fiedmont River, while the pit is located at the intersection of the three sub-basins.

Surface Water Quality

Two surface water and sediment characterization campaigns were conducted in fall 2009 and summer 2010. The surface water quality in four lakes (Lortie, Roy, Legendre and La Corne), and three nameless streams of the local study area was assessed according to the concentrations measured in the samples collected, which were compared to different recognized quality criteria.

The water analyses indicate that the surface water is generally soft, with little mineralization, but rich in dissolved organic carbon. The sampled lakes do not show any specific sensitivity in terms of acidity, with pH values over 6. The water turbidity measurements are low, corresponding to clear water. The principal compounds related to human activity either completely (polychlorinated biphenyls – PCBs) or partially (monocyclic and polycyclic aromatic hydrocarbons – MAHs and PAHs) were not detected in the samples. The Lac Lortie station (Station 2), near the mine site, stands out from the other stations for several parameters. The water measured there is more alkaline and harder, and shows higher electrical conductivity. Moreover, the lithium concentration is clearly higher at this station, which is explained by the greater basal lithium content in this sector.

The values measured during the 2009 and 2010 sampling campaigns were compared with the environmental quality criteria for protection of aquatic life and prevention of contamination of water and aquatic organisms. In general, few exceedances of environmental protection criteria for the analyzed substances were observed. In October 2009, exceedances were observed for fluorides (Station 2) and total phosphorus (Stations 2, 3 and 6). The substances that exceeded the criteria in July 2010 included certain metals (Al, Fe, Mn and Hg). For aluminium and iron, the criteria are exceeded frequently in mineralized zones and do not indicate that the water is poor in quality. For manganese, the concentrations do not exceed the aquatic life protection criteria, but rather a criterion intended to protect the organoleptic properties of drinking water. For mercury, concentrations slightly above the detection limit were measured at Stations 3, 5 and 7. Finally, slight exceedances of criteria are also observed for pH and total phosphorus.

Sediment Quality

The stations where sediment quality was analyzed are the same as those targeted for water quality. The substances analyzed in the sediments include metals and organic compounds, such as oils and greases and aliphatic hydrocarbons (C_{10}–C_{50}). In July 2010, PCBs were also analyzed.

The results show great variability between stations for concentrations of metals and organic matter. Station 2 stands out from the other stations because higher concentrations of aluminium, lithium, potassium, sodium and zinc are measured. Among the parameters related to human activities, petroleum hydrocarbons were detected during both campaigns. PCBs, which were analyzed for the July 2010 samples, were not detected at any station.

In the 2009 samples, criterion exceedances were observed for cadmium (Stations 1 and 2) and zinc (Station 2), while in 2010, exceedances were measured for five metals and metalloids: As, Cd, Hg, Pb and Zn. The exceedances were observed at the same stations as in 2009, but also at Station 4.

Hydrogeology

About twenty holes were drilled initially to determine the hydrogeological properties of the rock and to establish the piezometry of the site, and two surveys were conducted in the unconsolidated deposits north of Lac Lortie. Subsequently, different series of hydrological surveys and drilling campaigns were performed, particularly to gather the information necessary for the study of different variants and alternatives.

The surveys conducted on the site, depending on the sector investigated, identified different hydrogeological units (Table 4). A waste material horizon (mine tailings and waste rock) related to the past mining activity is present north of the pit. Various permeability tests were conducted in certain piezometers, which made it possible to estimate the hydraulic conductivity of the hydrogeological units.

Table 4 Description of the hydrogeological units

Sector	Horizon	Description	Thickness (m)	Hydraulic conductivity (m/sec)
Pit	Fill	Fine to coarse sand	1.0 to 2.4	N.A.
	Waste rock[1]	Variable granulometry between silty sand and sand	13.0	4×10^{-7}
	Fluvioglacial deposits	Stratification of silt, silty sand and sand, and sand and gravel	0.9 to 15.0	5×10^{-6} to 3×10^{-4}
	Till	Granulometry ranging from clay to pebbles	0.0 to 8.7	4×10^{-7} to 3×10^{-6}
	Rock	Mafic volcanic rocks	N.A.	7×10^{-10} to 2×10^{-6}
Southern sector of the tailings accumulation area	Sand	Sand, a little gravel and silt	0.3 to 13.2	N.A.
	Till	Granulometry ranging from clay to pebbles	2.2 to 20.9	7×10^{-8} to 7×10^{-6}
	Rock	Granodiorite	N.A.	1×10^{-7} to 1×10^{-6}
Mining complex	Sand	Sand, a little gravel and silt	0.5 to 6.4	4×10^{-6} to 6×10^{-5}

1 Sector north of the pit.

The available data indicates that groundwater flows in several directions in the unconsolidated deposits and in the rock, depending on the topography. Thus, in the mining complex sector, groundwater flows east and south, while in the tailings accumulation area, it flows south. In the pit sector, located on a topographic height, water flows in all directions. No hydraulic link between Lac Lortie and the aquifers present in the pit sector was proved.

According to the information gathered, no collective catchment structure exists near the study area. Moreover, no well inventoried in the MDDEFP's Hydrogeological Information System (HIS) is present within a 1 km radium around the local study

area. There are individual catchment structures located on the edge of Lac Legendre and in the Mont Vidéo sector. However, the projected mining installations are found beyond the minimum regulatory distances to be observed to ensure protection of the existing catchment structures.

Groundwater Quality

The groundwater quality in the sector of the projected pit was assessed by analyses for which the results were compared with the MDDEFP groundwater criteria and the provincial and federal drinking water criteria. Two exceedances were observed in the water coming from the well drilled in the unconsolidated deposits of a sample. The iron concentration (1.2 mg/l) exceeded the value recommended by Health Canada for drinking water, which is established at 0.3 mg/l and the nickel concentration (0.028 mg/l) slightly exceeded the MDDEFP groundwater criterion, which is 0.02 mg/l.

4.2 Biological Environment

Vegetation

The regional study area is located in the balsam fir-white birch bioclimatic domain, western subdomain. The forest landscape there is dominated by stands of balsam fir and white spruce mixed with white birch.

Several open environments are present in the regional study area (farm fields, non-forest wetlands, recent logging areas, etc.), but the local study area is dominated by forests, as indicated by the analysis of the aerial photographs and the ecoforestry maps. Over a total land area[1] of 4,193 ha, forest environments occupy 3,879 ha of the local study area, or over 90%. Coniferous stands are the most abundant, followed by mixed stands, while deciduous stands are much less widespread and are associated almost exclusively with young or regenerating stands. The many disturbances that have occurred since the late 1970s (epidemics, logging, plantings, windthrow) translate into the strong presence of this type of stand, which cover about 70% of the local study area.

According to the Centre de données sur le patrimoine naturel du Québec (CDPNQ), no plant species designated or likely to be designated as threatened or vulnerable has been reported in the project sector. Two plant inventories covering about forty special status species were conducted nonetheless in 2011 to verify the presence of such species in suitable habitats. This research did not reveal the presence of any special status species.

[1] Surface area not occupied by lakes.

It should be noted that the local study area does not contain any exceptional forest ecosystem (EFE), forest stands of phytosociological interest or biological refuge.

Wetlands

The data from the ecoforestry maps indicates the potential presence of 659 ha of wetlands in the local study area, representing approximately 15% of total surface area of this zone. Several forest wetlands are found in coniferous or mixed stands, or in recent logging areas. They are characterized by hydric or subhydric drainage. Non-forest wetlands corresponding to alder groves and denuded wetlands are also present.

A field visit conducted in winter 2011 identified a peat deposit with an approximate total surface area of 18 ha at the initial location of the mining complex, which resulted in relocation of the concentrator and the service buildings. Additional field visits in spring and summer 2011 allowed precise delimitation of the wetlands located on the project site and validation of the information from the ecoforestry map.

Aquatic Wildlife

Benthic wildlife

A benthic invertebrate inventory was conducted in fall 2009 to identify the taxa present and assess the population density of these organisms. Seven sampling stations were located in the main water bodies of the local study area. A total of 93 benthic invertebrate taxa were inventoried. Insects are the class most represented, followed by oligochaeta and bivalves.

The characteristics of the benthic invertebrate communities differ greatly, depending on the site. Indeed, the results for the Lac Lortie and La Corne stations indicate a more abundant benthic community with a greater number of families observed. The comparison between the lakes and watercourses does not show any specific trend peculiar to these two types of habitats, although the watercourse sediments generally show a more equal distribution of benthic invertebrate families.

Ichthyofauna and aquatic habitats

Given that the tailings accumulation area initially had to be located farther east, which would have encroached on the northwest and northeast tributaries of stream R1, the fish habitats of this stream were characterized in detail by homogeneous segments. Table 5 presents a synthesis of this characterization. This data allows a general illustration of the habitats found in the study area's streams. On the whole,

the quality of the fish habitats is very poor, in view of the homogeneity of the aquatic habitats, the very low streamflows, the sometimes intermittent or underground flow, and the presence of many obstacles to the free circulation of fish. Let us remember that the more comprehensive studies of alternative locations for tailings storage at site B allowed identification of location options for the tailings accumulation area that do not encroach on fish habitat (B-West and B-West, western extension).

According to the ministère du Développement durable, de l'Environnement de la Faune et des Parc (MDDEFP), 49 fish species are potentially present in the water bodies of Abitibi-Témiscamingue, including 15 species already identified in the sectors peripheral to the project. To complete this information, scientific fishing was conducted in several water bodies of the local study area within the context of the project.

Table 6 presents the number of fish caught per species and per site during these sampling campaigns, which confirmed the presence of nine fish species in the inventoried water bodies (Map 7, Appendix 1). It should be noted that in addition to the species listed in Table 6, the MDDEFP reports the presence of three other species in the lakes of the local study area. They are the Brown Bullhead (*Ameiurus nebulosus*), the Northern Pike (*Esox lucius*) and the Walleye (*Sander vitreus*), all identified in Lac Legendre. None of these species has provincial or federal special status.

Table 5 Synthesis of characterization of the fish habitat on the northwest and northeast branches of stream R1

Characteristics	West branch	East branch
Minimum and maximum width of the watercourse (m)	0.3 - 3 (15-50 in the beaver ponds)	0.1 – 2.5 (up to 50 in the beaver ponds)
Minimum and maximum depth of the watercourse (m)	0.28 – 1.5	0.05 – 2
Principal habitats	Succession of beaver ponds Channel	Succession of beaver ponds Basin with transition Channel
Habitat functions	Hatchery Feeding Resting	Breeding Hatchery Feeding Resting

Table 6 Results of the 2009 and 2010 fishing campaigns in the project's local study area

Year:			2009						2010					
Date:			October 27 to 29						July 13 to 23					
Station:			1	2	3	4	5	6	1	2	3	4	5	6
Water body[2]:			Roy	Lortie	n.s.	Legen.	n.s.[4]	n.s.[5]	Roy	Lortie	n.s.	Legen.	n.s.[4]	n.s.[5]
English name[1]	Scientific name	Engines[3]:	g	g	ef	g	ef	ef	g-b-s	g-b-s	ef	f-b-s	ef	ef
Lake Cisco	*Coregonus artedi*	COAR	-	-	-	8	-	-	-	-	-	-	-	-
Cyprinidae[6]	*Cyprinidae sp.*	CYSP	-	-	-	-	-	-	2	2	-	-	-	3
Brook Stickleback	*Culaea inconstans*	CUIN	-	-	3	-	2	1	21	-	4	-	10	14
Lake Whitefish	*Coregonus clupeaformis*	COCL	-	4	-	-	-	-	-	-	-	-	-	-
Goldeye	*Hiodon alosoides*	HIAL	-	-	-	-	-	-	-	2	-	-	-	-
Burbot	*Lota lota*	LOLO	-	-	-	-	-	-	-	2	-	-	-	-
White Sucker	*Catostomus commersoni*	CACO	28	-	-	7	-	-	38	-	-	58	-	-
Pearl Dace	*Magariscus margarita*	MAMA	-	-	-	-	-	-	23	7	-	-	-	-
Brook Trout	*Salvelinus fontinalis*	SAFO	6	-	4	-	-	2	5	-	1	-	-	3
Yellow Perch	*Perca flavescens*	PEFL	-	-	-	3	-	-	-	-	-	69	-	-

Notes:

1 None of the species caught has federal or provincial special status.
2 Roy: Lac Roy, Lortie: Lac Lortie, Legen.: Lac Legendre, n.s.: nameless stream
3 g: Experimental gill net, ef: electrofishing, f-b-s: Experimental gill net, bait trap and seine
4 Corresponds to the northeast tributary of stream R1.
5 Corresponds to the northwest tributary of stream R1.
6 Cyprinidae not identified by species.

Herpetofauna

According to the Atlas des amphibiens et reptiles du Québec (AARQ), 11 species were observed within a quadrilateral of 3,600 km^2 including the mine site, namely seven amphibian species and four reptile species. Two of them have special status. These are the Wood Turtle (*Glyptemys insculpta*) and the Common Snapping Turtle (*Chelydra serpentina*), although they were observed outside the regional study area. A field campaign nonetheless was conducted in spring 2011 in the habitats hospitable to these species. No specimen of either of these species was observed in the potential habitats investigated. The various inventories conducted within the context of the project confirmed the presence of three amphibian species, the Green Frog (*Lithobates clamitans*), the Wood Frog (*Lithobates sylvaticus*) and the American Toad (*Anaxyrus americanus*).

Avifauna

The information from the different available sources (ÉPOQ, AONMQ and SOS-POP) reveals the potential presence of 83 bird species in the local study area. Four of these have special status under the federal or provincial legislation. They are the Short-eared Owl (*Asio flammeus*), the Olive-sided Flycatcher (*Contopus borealis*), the Rusty Blackbird (*Euphagus carolinus*) and the Bobolink (*Dolichonyx oryzivorus*).

Avifauna inventories particularly targeting the special status species potentially present were conducted in spring and summer 2011. The data gathered led to the identification of 71 bird species in the study area. Although the targeted special status species were not inventoried, other special status species were recorded in the study area, specifically the Canada Warbler (*Wilsonia canadensis*) and the Common Nighthawk (*Chordeiles minor*), which are likely to be designated as threatened or vulnerable.

Mammals

The diversity of the mammals likely to frequent the local study area is relatively high. The Moose (*Alces americanus*) and the American Black Bear (*Ursus americanus*) are the two species most likely to be found there. It is unlikely that the White-tailed Deer (*Odocoileus virginianus*) is present in the local study area, because the study area is at the northern limit of this species' range.

In the case of small mammals and fur-bearing animals, the data from the Système d'information sur les animaux à fourrure (SIAF – fur-bearing animals information system) was used to provide a profile of the species potentially present. During the 2007-2008 to 2009-2010 trapping seasons, 14 fur-bearing animal species were

reported for furbearing management units (UGAF) 03 and 04, which cover most of the northern sector of Abitibi-Témiscamingue. The North American Beaver (*Castor canadensis*) is the species for which the most furs have been traded on the market, followed by the Muskrat (*Ondatra zibethicus*) and the American Marten (*Martes americana)*. Several small mammal species, particularly rodents, are not accounted for in the SIAF, but are present in the local study area. This is the case of the Eastern Chipmunk (*Tamis striatus*), the Groundhog (*Marmota monax*), the Northern Flying Squirrel (*Glaucomys sabrinus*), the Canadian Porcupine (*Erethizon dorsatum)* and the Snowshoe Hare (*Lepus americanus*). These species do not have special status.

Thirteen micromammal species and five Chiroptera species are potentially present in the local study area, five of which are likely be designated as threatened or vulnerable. These are the Rock Vole (*Microtus chrotorrhinus*) and the Southern Bog Lemming (*Synaptomys cooperi*), for the micromammals, and the Silver-haired Bat (*Lasionycteris noctivagans*), the Eastern Red Bat (*Lasiurus borealis*) and the Hoary Bat (*Lasiurus cinereus*), for the Chiroptera.

Although the subsections regarding the different faunal groups indicate the potential presence of some special status species, the information gathered from the CDPNQ indicates that no faunal species designated or likely to be designated as threatened or vulnerable was inventoried in the local study area.

4.3 Human Environment

Land Use

The project is located in the Abitibi-Témiscamingue administrative region (08), within the limits of the MRC d'Abitibi regional county municipality. The projected mining infrastructures for the Québec Lithium project are located within the territory of the municipality of La Corne, but the regional study area also encompasses the territory of the municipalities of Barraute and Landrienne.

Most of the lands contained in the regional study area are lands in the domain of the State, under the administration of the MRN. Moreover, the public territory of the regional study area consists of Category III lands, under the James Bay and Northern Québec Agreement. Thus, the Native people have hunting, fishing and trapping rights on these lands, without limit and at all times, subject to the conservation principle.

Among the nine major land uses identified in the MRC's Land Use and Development Plan (Schéma d'aménagement et de développement, or SAD), eight are present in the regional study area, namely agriculture, forest, agriforestry, industrial, urban, recreational, conservation and vacation (development and consolidation). The majority of the territory of the regional and local study areas is zoned for forestry. In the local study area, the presence of a recreational zone encompassing Lac Roy and Lac Lortie, as well as Mont Vidéo, is worth mentioning, as well as the presence of a vacation (consolidation) zone on the shores of Lac Legendre.

Planning and Development Orientations

Among the major planning orientations of the SAD, the MRC wishes to ensure availability of space to facilitate the development of various types of industries, while protecting the environment and the existing activities. In particular, it mentions the desire to minimize the impacts of mining activities on the neighbouring sectors, to protect the aquifers, including those of the Harricana moraine, to ensure adequate protection of various natural settings and features that confer special interest on them, and to favour the integrated development of forest resources.

Land Occupancy

The three municipalities that are part of the regional study area are characterized by low density land occupancy. The residential environment is concentrated in the urban sectors located at least 15 km from the project. No real property is located on the anticipated site of the project infrastructures, and two agglomerations of private vacation residences are nearby, namely the residents of Lac Legendre and of the Mont Vidéo development. Vacation residences are also present around Lac La Paix (northeast of Landrienne), on the shores of Lac Fiedmont (south of Barraute), and on the shores of Lac La Motte and Lac Malartic (near La Corne).

Public Utility Infrastructures

The municipality of La Corne is not equipped with a public sewer or aqueduct system. The drinking water supply is assured by private wells and the municipality has an alternative water intake in Lac Baillargé.

Barraute and Landrienne have public sewer services and an aqueduct network serving the urban sector of their municipalities. The drinking water supply of these municipalities comes from groundwater. In general, the residences established outside the aqueduct networks are supplied with water by individual wells. The Mont Vidéo sector is mainly supplied with water by Lac Roy.

Regarding transportation infrastructures, the regional study area includes a section of Route 111, the national highway linking Val-d'Or to Amos via La Corne (Map 8, Appendix 1). The study area is also crossed by two regional highways, Route 386, between Landrienne and Amos, and Route 397, between Barraute and Val-d'Or. There is also a Canadian National railway line in the study area, between Landrienne and Barraute, which continues eastward towards Chibougamau. It only serves to transport freight, and no development is envisioned for the time being. The recreational network includes many snowmobile trails and a few quad (ATV) trains currently in development. La Route Verte, which takes the form of paved shoulders along Route 109 south of Amos and the edge of Route 111 west of Amos, is the region's main bikeway.

The MRC d'Abitibi power grid is the responsibility of Hydro-Québec Distribution, except for the grid under the responsibility of Ville d'Amos and a private transformer substation. Under the Québec Lithium project, the relocation of a section of the Hydro-Québec 25 kV power line along the future open pit is planned, in addition to the extension of the 120 kV line to the site.

It should be noted that a telecommunications tower belonging to Astral Media is located near the site anticipated for the project infrastructure. This tower was relocated before operation of the pit began. Several other telecommunications towers are also present on the neighbouring hills.

Recreational Tourism Activities and Facilities

Tourism is relatively important in the MRC d'Abitibi. The region has several attractions, particularly related to water and nature. The presence of Centre de plein air du Mont-Vidéo, located about 2 km from the mining project, should be mentioned. This complex includes an alpine ski centre, cross-country ski and snowshoe trails, hiking and mountain biking trails, a campground with a beach on the shore of Lac Roy, and various summer camps. Hunting and fishing activities are also significant throughout the region.

Mining Activities and Mineral Rights

Mining activity represents a large share of the economy of MRC d'Abitibi, where there are several mines. The expansion of the global consumer market is opening new horizons, such as mining of the lithium deposit in the study area.

The regional study area contains six mining concessions and 4,001 mining claims, which cover the entire territory, except for three strain zones. Two of these zones are occupied by urbanized territories where exploration is permitted conditionally, and a strain zone is occupied by telecommunications facilities where exploration is

prohibited. The Québec Lithium project's claims occupy a surface area of approximately 650 ha. The municipality of La Corne has submitted an application for amendment of its zoning plan to MRC d'Abitibi to allow the development of the future mine infrastructures in a recreational tourism zone.

It should be noted that the study area contains a restored former mine in the Lac Lortie sector. Some vestiges are found on the surface, as well as a revegetated former tailings accumulation area. This former lithium mine was operated in underground galleries between 1955 and 1965 and corresponds to the mineral deposit targeted by the Québec Lithium project.

Forest and Agricultural Activities

Some of the lands in the public domain in the regional study area are subject to forest concessions and cutting rights. The study area is part of the common area of Forest Management Units (FMU) 084-51 and 086-51. The main beneficiaries of the forest rights on these FMUs are Matériaux Blanchet inc. and Scierie Landrienne inc.

The agricultural activities of the study area are concentrated around the urbanized zones of Landrienne, La Corne and Barraute. No protected agricultural zone under the Act to preserve agricultural land and agricultural activities is located on the site anticipated for the project infrastructures.

Aboriginal Populations

The Québec Lithium mine site is at the limit of the territory of the Anishnabe communities of Lac-Simon and Pikogan, which do not use the territory of the regional study area. The Company included these communities in the information and consultation process it deployed in 2009. The exchanges with these communities over the past three years led to the recent signing of a voluntary cooperation agreement for the establishment of a business relationship profitable to both parties, based on mutual respect.

Ecology of the Landscape

The main regional unit covering the regional study area is the forest landscape. This unit is composed of a group of coniferous and deciduous stands and wetlands in a hilly terrain. This forest landscape is altered in several sectors by various former and current uses, particularly mining and forest activities, electrical power infrastructure, borrow pits, roads and buildings.

The regional unit also features the presence of the Harricana marine, which passes through the centre of the study area. At its intersection with Route 386, the moraine reaches an altitude of 397 m, dominating the 60-metre height of the neighbouring plain.

Visual simulations were performed to optimize the project's design. Based on these simulations, Québec Lithium determined that an elevation of a maximum of 440 m was adequate to respect the visual quality of the landscape and minimize the visual impact for the neighbouring populations. The project's possible sight lines are located on the Mont Vidéo lookout and at the intersection of Route du Lithium and Route Québec-Lithium.

Archeological and Heritage Potential

Although no known archeological site is present within the limits of the regional study area, an archeological potential study nonetheless was conducted under the project to evaluate the probabilities of prehistoric and historic human occupancy. This study indicates that two riparian strips 25 m wide, surrounding Lac Roy and Lac Lortie, offer strong archeological potential. A few sectors offer medium potential, while the majority of the study area has low potential or shows disturbances.

5. IMPACT ASSESSMENT

5.1 Environmental Issues of the Project

The nature of the project, the modifications to its design and their integration by the Monitoring Committee, effective January 2010, with the consultations conducted by the promoter since 2009, highlighted the environmental issues that will be taken into account in the impact analysis process. The social concerns expressed are also considered in the development of the project and the impact assessment.

As in most mining projects, the main environmental issues concern the effects on the quality and quantity of surface water and groundwater that may be affected by the project and management of mine waste. The mine's work and activities are likely to have qualitative and quantitative impacts on the water table and the surface water. The location of the spodumene deposit outside the Harricana moraine was confirmed with the interpretation of the unconsolidated deposits and the hydrogeological surveys characterizing the pit conditions.

Socioeconomic issues are related to planning of land use and regional development, the economic spinoffs and job creation in the region, as well as the perception of the project's acceptability. The project is inserted in a recreational tourism sector (Lac Roy campground, Mont Vidéo) and holiday sector (Lac Legendre). The project's potential effects on recreational tourism activities and on the perception of the residents' quality of life are issues considered. The alteration of the landscape, dust, the lighting on the project site, and the noise occasioned by the project during the construction and operating period are analyzed sources of potential adverse effects, which could affect the sector's residents and users.

The promoter is seeking to minimize the adverse environmental and social effects and took these issues into account when designing the project. They were also considered during the development of the mitigation measures intended to minimize the project's adverse effects on the local environment. Finally, compensatory measures are also anticipated for certain components of the environment.

5.2 General Approach

The general approach adopted is in compliance with the federal environmental assessment requirements. The process used to identify and assess the environmental effects of the project is mainly based on the detailed descriptions of the project and the environment, consultation of the community, and the lessons learned from carrying out similar projects.

Within the context of the federal environmental assessment and as stipulated in the guidelines presented by the Agency, the scope of the project includes the project components, infrastructures and associated and ancillary works, as submitted and updated.

The period covered by the environmental assessment includes the project's startup, operation and closure, so as to allow the review of all the project's short, medium and long-term effects. The time period considered within the context of this environmental assessment is between 2011 and 2029.

For the different components of the physical, biological or human environments that could be affected by the project, the environmental effects were analyzed for each phase of the project, i.e. construction, operation and restoration. Under the Canadian Environmental Assessment Act (CEAA), the environmental effects on the human environment must be assessed only when they result directly from an adverse effect on the natural environment.

The significance of the potential environmental effects is assessed in terms of the following criteria:

- Intensity: Indication of the apprehended degree of alteration of a component of the environment, in view of its vulnerability to the apprehended changes, as well as its environment value, influenced by the specialists' expertise and the public's concerns. Intensity can be qualified as high, medium or low.
- Extent: Depends on the spatial extent of the effect or the proportion of a population affected. The extent may be regional if the effect is felt over a vast territory with a geographic and/or administrative structure. It may also be local if the effect is felt over a more limited territory or by a portion of the regional population. A site-specific extent corresponds to a well circumscribed disturbance, affecting a small surface area or perceptible by a small portion of the study area's population.
- Duration: Refers to the temporal scope of the effect. The frequency or recurrence of the effect may also contribute to defining this notion. The duration may be permanent when the effect is irreversible or observed in the very long term, or temporary for reversible short-term effects.

For the majority of the anticipated environmental effects, mitigation measures are proposed in order to reduce the scope of the anticipated effects. These measures are practices or conditions of performance of the project with the aim of preventing or minimizing anticipated or probable adverse environmental effects. It should be emphasized that the assessment of the three criteria described above accounts for

the proposed mitigation measures. The significance of the environmental effects is then determined on the basis of the grid presented in Table 7. Thus, the residual effect may be significant or insignificant within the meaning of the CEAA.

Table 7 Interpretation grid for assessment of the significance of environmental effects, based on intensity, extent and duration

Intensity	Extent	Duration	Significance of the effect
High	Regional	Permanent	Significant
		Temporary	Significant
	Local	Permanent	Significant
		Temporary	Significant
	Site-specific	Permanent	Significant
		Temporary	Insignificant
Medium	Regional	Permanent	Significant
		Temporary	Significant
	Local	Permanent	Significant
		Temporary	Insignificant
	Site-specific	Permanent	Significant
		Temporary	Insignificant
Low	Regional	Permanent	Insignificant
		Temporary	Insignificant
	Local	Permanent	Insignificant
		Temporary	Insignificant
	Site-specific	Permanent	Insignificant
		Temporary	Insignificant

5.3 Balance of Environmental Effects

Table 8 presents the picture of all the anticipated environmental effects. For each environmental component, depending on the phase of the project, the sources of effects are identified first, followed by a brief description of the apprehended effects. The elements leading to the assessment of the significance of the residual effect are then presented. The list of proposed mitigation measures is available in Table 9.

The analysis indicates that no significant effect will result from the project. This is partly attributable to the consideration, during the design phase, of the sensitive environmental components, which made it possible to reduce the environmental effects at the source and led to several optimizations of the project. We should also mention that several studies specified the effects of the project on certain components and identified the appropriate mitigation measures.

Table 8 Synthesis of potential environmental effects

Component affected	Phase of the project	Sources of effects	Environmental effects	Mitigation measures	Intensity	Extent	Duration	Significance of the residual effect
Air quality	Construction	Machinery traffic, soil stripping, grading, earthworks	Airborne particulate and gas emissions	AIR1 to AIR9	Low	Local	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, use of explosives, operation of borrow pits, excavation of the open pit, ore crushing and grinding, transportation (including loading and unloading) of ore, concentrate and waste rock, accumulation of tailings and waste rock	Pollutant and greenhouse gas emissions	AIR1, AIR2, AIR4 to AIR10	Low	Local	Permanent (long-term)	Insignificant
	Restoration	Machinery traffic, soil stripping, grading, earthworks	Airborne particulate and gas emissions	AIR1, AIR3 to AIR9	Low	Local	Temporary (short-term)	Insignificant
Soil quality	Construction	Machinery traffic, soil stripping, grading, earthworks, clearing, installing culverts	Soil loss, erosion and sediment transport, compaction	SOIL1 to SOIL7	Low	Local	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, machinery maintenance and refueling, fuel storage, transportation (including loading and unloading) of ore, concentrate and waste rock, mine tailings accumulation areas	Soil contamination by leakage of petroleum products or accidental spills, soil erosion and sediment transport	SOIL2 to SOIL7	Low	Local	Permanent (long-term)	Insignificant
	Restoration	Road transportation and machinery traffic, machinery maintenance and refueling, fuel storage	Soil contamination by leakage of petroleum products or accidental spills, soil erosion and sediment transport	SOIL2 to SOIL5, SOIL7	Low	Local	Temporary (short-term)	Insignificant
Surface water and sediments	Construction	Machinery traffic, soil stripping, grading, earthworks, clearing, installing culverts, machinery maintenance, fuel storage	Water contamination by soil and hydrocarbons	WAT1 to WAT3, WAT8 to WAT12	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, road maintenance, mine effluent, presence of the infrastructures, the pit and the accumulation areas, fuel storage, transportation (including loading and unloading) of ore, concentrate and waste rock	Contamination of the drainage system by sediment inflows and hydrocarbons, contamination by ore process water, accidental spills, alteration of surface drainage patterns	WAT1 to WAT7, WAT13 to WAT15	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	Road transportation and machinery traffic, machinery maintenance and refueling, fuel storage	Contamination of the drainage system by sediment inflows and hydrocarbons, accidental spills, soil erosion and sediment transport	WAT1 to WAT5, WAT11, WAT12, WAT16	Low	Site-specific	Temporary (short-term)	Insignificant
Groundwater	Construction	Machinery traffic, machinery maintenance and refueling, fuel storage	Contamination by hydrocarbons	GRO2 to GRO9	Low	Site-specific	Permanent (long-term)	Insignificant
	Operation	Road transportation and machinery traffic, machinery maintenance and refueling, fuel storage, transportation (including loading and unloading) of ore, concentrate and waste rock, extraction pit, removal of groundwater, domestic wastewater, infrastructures of the complex	Groundwater contamination by leakage of petroleum products or accidental spills, groundwater contamination by mine waste (waste rock, tailings, effluents, etc.), alteration of surface drainage patterns, morphological features and levels of water bodies	GRO1, GRO2, GRO4 to GRO9	Low	Site-specific	Permanent (long-term)	Insignificant
	Restoration	Road transportation and machinery traffic, machinery maintenance and refueling, fuel storage	Soil contamination by leakage of petroleum products or accidental spills, soil erosion and sediment transport	GRO1, GRO5 to GRO9	Low	Site-specific	Permanent (long-term)	Insignificant

Table 8 Synthesis of potential environmental effects (continued)

Component affected	Phase of the project	Sources of effects	Environmental effects	Mitigation measures	Intensity	Extent	Duration	Significance of the residual effect
Noise and vibrations	Construction	Machinery traffic, infrastructure construction	Increase in the noise level on the mine site and the periphery	VIB1, VIB2	Low	Local	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, use of explosives, pit excavation work, ore crushing and grinding	Increase in the noise level on the mine site and the periphery of mine infrastructures and roads	VIB1 to VIB5	Low	Local	Permanent (long-term)	Insignificant
	Restoration	Machinery traffic, infrastructure dismantling work	Increase in the noise level on the mine site and the periphery	VIB1, VIB2	Low	Local	Temporary (short-term)	Insignificant
Vegetation	Construction	Clearing for construction of transportation infrastructures and the mining complex	Reduction of vegetated surface areas and destruction of value-added species	VEG1 to VEG5	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Development of accumulation areas over the years, with the phases of operation of the deposit (expansion of the pit and the accumulation areas)	Reduction of vegetated surface areas and destruction of value-added species	VEG2 to VEG5	Low	Local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No adverse effect anticipated at this stage	VEG4	Low	Site-specific	Temporary (short-term)	Insignificant
Wetlands	Construction	Construction of transportation infrastructures and the mining complex	Encroachment on wetlands and reduction of surface areas, loss of seedlings or colonies of special status plant species	WET1 to WET3	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Encroachment on the wetlands and reduction of the surface areas, expansion of the accumulation areas, groundwater catchment	Reduction of surface areas and disturbance of wetland hydrological conditions, loss of seedlings or colonies of special status plant species	WET2, WET3	Low	Local	Permanent (long-term)	Insignificant
	Restoration	Shutdown of operations	Disturbance of wetland hydrological conditions	WET2, WET3	Low	Site-specific	Temporary (short-term)	Insignificant
Special status plant species	Construction	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Aquatic fauna	Construction	Construction of transportation infrastructures and the mining complex , installing culverts	Avoidance of the zones peripheral to the work by fish, increase in suspended particulate matter in the fish habitat	FISH1 to FISH3, FISH5, FISH6	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Construction and expansion of the accumulation areas, release of mine effluent, mine water pumping	Reduction of the area and the fish habitat quality of Lac Lortie, the fish habitat area for the stream segments affected by the accumulation zones, disturbance of stream hydrological conditions by alteration of drainage areas of sub-basins, contamination of the drainage system by ore processing contaminants, possible restriction of the passage of fish upstream to at the watercourse crossing sites	FISH4, FISH7 to FISH10	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	Shutdown of operations	Disturbance of the hydrological conditions of the water bodies	FISH8	Low	Site-specific	Temporary (short-term)	Insignificant

Table 8 Synthesis of potential environmental effects (continued)

Component affected	Phase of the project	Sources of effects	Environmental effects	Mitigation measures	Intensity	Extent	Duration	Significance of the residual effect
Herpetofauna	Construction	Construction of transportation infrastructures and the mining complex	Loss or degradation of herpetofauna breeding and feeding habitats	None	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Construction and expansion of the accumulation areas	Loss or degradation of herpetofauna breeding and feeding habitats	HER1	Low	Site-specific	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Avifauna	Construction	Clearing, construction of transportation infrastructures and the mining complex, road transportation and machinery traffic	Loss or degradation of bird breeding and feeding habitats, disturbance of breeding pairs and migrating birds present on and near the site	BIRD1, BIRD2	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, ore extraction in the pit, all operating activities, expansion of the accumulation areas	Loss or degradation of bird breeding and feeding habitats, disturbance of breeding pairs and migrating birds present on and near the site	BIRD1, BIRD2	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Mammals	Construction	Clearing, construction of transportation infrastructures and the mining complex, road transportation and machinery traffic	Loss or degradation of breeding and feeding habitats, habitat fragmentation, disturbance by noise	MAM1	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Road transportation and machinery traffic, ore extraction in the pit, all operating activities, expansion of the accumulation areas	Loss or degradation of breeding and feeding habitats, habitat fragmentation, disturbance by noise	MAM1	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Special status faunal species	Construction	Clearing, construction of transportation infrastructures and the mining complex, road transportation and machinery traffic	Loss or degradation of suitable habitats	FSP1, FSP2	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Expansion of the accumulation areas	Loss or degradation of suitable habitats	FSP1, FSP2	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Forest activities	Construction	Clearing, construction of transportation infrastructures and the mining complex, road transportation and machinery traffic	Loss or degradation of suitable zones	FOR1 to FOR3	Low	Site-specific	Temporary (short-term)	Insignificant
	Operation	Expansion of the accumulation areas	Loss or degradation of suitable zones	FOR1 to FOR3	Low	Site-specific to local	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Temporary (short-term)	Insignificant
Other socioeconomic activities	Construction	No anticipated source at this stage	No anticipated effect at this stage	SOC4	-	-	-	-
	Operation	No anticipated source at this stage	No anticipated effect at this stage	SOC1 to SOC4	-	-	-	-
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	SOC2, SOC5	-	-	-	-
Archeology and heritage	Construction	Clearing, soil stripping, grading, earthworks, infrastructure construction	Disturbance or destruction of vestiges of interest or historical vestiges	ARC1	Low	Site-specific	Permanent (long-term)	Insignificant
	Operation	Expansion of infrastructures	Disturbance or destruction of vestiges of interest or historical vestiges	ARC1	Low	Site-specific	Permanent (long-term)	Insignificant
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	Low	Site-specific	Permanent (long-term)	Insignificant
Use by Aboriginals and Aboriginal rights	Construction	No anticipated source at this stage	No anticipated effect at this stage	None	-	-	-	-
	Operation	No anticipated source at this stage	No anticipated effect at this stage	None	-	-	-	-
	Restoration	No anticipated source at this stage	No anticipated effect at this stage	None	-	-	-	-

Table 9 Mitigation measures applicable to the project

N°	Description of the mitigation measure
Air quality	
AIR1	Use of adequate equipment and compliance with air quality standards.
AIR2	Minimization of the use of explosives to about five detonations per week.
AIR3	Sprinkling dried out soil, as needed, to keep the surface moist during stripping or grading work.
AIR4	Sprinkling in dry weather of unpaved roads with water or an acceptable chemical dust suppressant and limiting truck speed to 40 km/h.
AIR5	Sprinkling transport truck loads, as needed, particularly at the level of the tires and underbody, to prevent dust from escaping during transport.
AIR6	Shutting the engines of stopped vehicles.
AIR7	Use of machinery that meets Environment Canada emissions standards.
AIR8	Preliminary and regular preliminary inspection of the machinery to ensure its good condition and good working order, particularly the exhaust and antipollution systems.
AIR9	Sprinkling dry areas, if necessary, to keep the surface moist until the development of a mineral crust that would effectively control dust dispersion.
AIR10	Tracking annual CO_2 emission inventories and, if applicable, opening an account with the MDDEFP to trade emission rights.
Soil quality	
SOIL1	Application of the practices in use conforming to the Regulation respecting standards of forest management for forests in the domain of the State, as the case may be, for traffic, construction, installing culverts and any intervention near water bodies.
SOIL2	Dissemination of information on the procedures in case of an accidental spill. Any accidental spill will be reported immediately to the person responsible for the emergency preparedness plan drafted and approved before the beginning of the work. The zone affected will be marked off and cleaned up immediately. The warning systems of Environment Canada and the Ministère du Développement durable, de l'Environnement et des Parcs du Québec will be notified without delay. The contaminated soil will be removed and disposed of at an authorized site. An internal register will account for the spills and the corrective actions taken by Québec Lithium.
SOIL3	Preliminary and regular Inspection of the machinery to ensure its good condition and good working order (absence of hydrocarbon leaks).
SOIL4	Use of double-walled fuel tanks.
SOIL5	Accessibility at all times of an emergency recovery kit for petroleum products and hazardous materials and adequate access for rapid response to absorbents for site machinery.
SOIL6	Optimization of the use of waste rock and overburden to meet the needs for granular materials.
SOIL7	Adequate design of the accumulation areas and management of materials according to their characteristics.

Table 9 Mitigation measures applicable to the project (continued)

N°	Description of the mitigation measure
Surface water and sediments	
WAT1	Location of the machinery parking, washing and maintenance areas more than 60 m from any watercourse, including the diversion channels.
WAT2	Refueling the machinery under constant supervision, at least 30 m from any watercourse, including the diversion channels.
WAT3	Routing waste oils from the machinery to a disposal site provided for this purpose.
WAT4	Application, as the case may be, of the requirements of the MMER and Directive 019 regarding the effluent concentration at the release point.
WAT5	Presentation of final effluent monitoring reports in accordance with the requirements of the MMER and Directive 019.
WAT6	Application of a flow regulation strategy to minimize the effects on the receiving environment during release of final effluent when wastewater is stored for long periods.
WAT7	Runoff catchment within the activity zones and treatment, as the case may be, to satisfy the requirements of Directive 019 concerning effluent concentrations.
WAT8	Application of recognized practices for development of bridges and culverts in forest environments (MRNF, 1997).
WAT9	Deployment of culverts during the summer low water period (July to September).
WAT10	Use of clean granular materials for deployment of cofferdams for dike construction.
WAT11	Stabilization of disturbed areas (e.g. talus slopes and unconsolidated deposit piles) as the work is completed.
WAT12	Control of transport of fine particulate matter in the aquatic environment beyond the immediate work zone.
WAT13	Treatment of domestic wastewater with a system including a septic tank, prefilters, a pumping stations, a flow separation system and biofilters in parallel operation, with the possibility of disinfection treatment of the effluent, as the case may be.
WAT14	Surrounding waste rock, low-grade ore, unconsolidated deposit and tailings accumulation areas with collector ditches so that the drainage water from these surface areas is collected and reused.
WAT15	Gradual stabilization of the unconsolidated deposit piles to control erosion and favour the restoration of a natural ecosystem. Gradual planting of grasses. Development of reverse-slope terraces at least 3 m wide every 20 m along the upper portion of the talus slopes, where the slopes are 4H: 1V, and every 30 m in the lower portion, where the slopes will be shallower (control of runoff, and formation of sediment transport swales and crevasses on the slopes of the unconsolidated deposit piles).
WAT16	Development of a plateau in the upper portion of the waste rock pile for its restoration and to control water and wind erosion of fine particulate matter. Planning on this plateau of seedlings, young shrubs and trees to serve as a seed bank, to stabilize the pile, to increase its ecological diversity and for better integration into the landscape. These plantings will be performed on the plateau with ramial chipped wood and mycorrhizae. During its final restoration, ramial chipped wood or other cellulosic mulch will be sprayed on the slopes to partially fill the rocky interstices and thus favour germination. Finally, grasses and legumes will be seeded.

Table 9 Mitigation measures applicable to the project (continued)

N°	Description of the mitigation measure
Groundwater	
GRO1	Groundwater monitoring around developments at risk.
GROI2	Runoff water catchment outside the activity zones by drainage ditches constructed around the components of the mine site to prevent this water from coming into contact with contamination sources.
GRO3	Designing installations with recognized safety factors.
GRO4	Restriction of clearing to the minimum required.
GRO5	Machinery maintenance and refueling at the locations designated for this purpose. The refueling points will be identified clearly with signs.
GRO6	Minimization of the period when the soil is left bare.
GRO7	Traffic in the areas provided for this purpose and avoidance of undisturbed zones.
GRO8	Protection of the existing soil in the sectors that could be most susceptible to infiltration.
GRO9	Protection of the Harricana moraine and its aquifer.
Noise and vibrations	
VIB1	Supervision by the site superintendent of the proper maintenance of noisy equipment and the good condition of the machinery's mufflers and catalytic converters.
VIB2	Limitation of machinery traffic to the work areas.
VIB3	Limitation of the maximum speed of the permitted soil vibrations to the point of impact and limitation of the maximum noise pressure in any residence according to the standards (MDDEP, 2012).
VIB4	Compliance with the requirements of Directive 019 for the mining industry (MDDEP, 2012), particularly the assessment of the acoustic level according to the prescriptions, compliance with the established sound levels and deployment of a self-monitoring network for blasting operations.
VIB5	Additional monitoring with the development of measuring stations by Québec-Lithium in the Lac Legendre and Mont Vidéo sectors.
Vegetation	
VEG1	Reforestation after the work of zones used temporarily for construction.
VEG2	Limitation of machinery traffic to the work areas, which will be identified.
VEG3	Burning and shredding of cutting wastes.
VEG4	Refuse of chips, as needed, for temporary stabilization, soil fertilization or restoration of the waste rock pile and the riprap dikes.
VEG5	Application of the necessary precautions against fires and obtaining prior authorizations from SOPFEU, as the case may be.
Wetlands	
HUM1	Selection of alternatives for the location of infrastructures that minimize encroachment on wetlands.
HUM2	Identification of adequate protective measures during intervention near wetlands with hydrological connectivity.
HUM3	Compliance with adequate protective conditions during intervention near wetlands with hydrological connectivity.

Table 9 Mitigation measures applicable to the project (continued)

N°	Description of the mitigation measure
Aquatic fauna	
FISH1	Deployment of culverts during the period authorized by the regulation.
FISH2	Use of clean granular materials for deployment of cofferdams and their stabilization by means of geotextile membranes or riprap.
FISH3	Stabilization of disturbed areas (e.g. talus slopes and unconsolidated deposit piles) as the work progresses.
FISH4	Mine effluent management (flow, frequency) according to the capacity of the receiving watercourse and control of potential erosion.
FISH5	Prevention of transport of fine particulate matter in the aquatic environment beyond the immediate work zone by an effective means.
FISH6	Complementary plant inventory study of the littoral zone of Lac Lortie.
FISH7	Developments on Lac Lortie to conserve the habitat as the lake level changes, in the event of a variation of the level, to ensure maintenance of an adequate substrate for aquatic plant communities, and plant composition and density.
FISH8	Monitoring the water quality of Lac Lortie.
FISH9	If required, restoration and development of fish habitats in sections of stream R1 for Brook Trout.
FISH10	If required, restoration and development of fish habitats for Brook Trout in Lac Roy.
Herpetofauna	
HER1	Optimization of the locations of the infrastructures to minimize encroachment on wetlands.
Avifauna	
BIRD1	Machinery will not circulate outside the limits of the work areas and a fence will be installed at the limit of the protection perimeter of the sensitive designated areas.
BIRD2	To avoid affecting recruitment in the current year, clearing will be performed outside the breeding season of the birds targeted by the regulation.
Mammals	
MAM1	Machinery will not circulate outside the limits of the work areas, particularly in the riparian strip.
Special status faunal species	
FSP1	Machinery will not circulate outside the limits of the work areas, particularly in the riparian strip.
FSP2	To avoid affecting recruitment in the current year, clearing will be performed outside the birds' breeding season, according to the regulations.
Forest activities	
FOR1	Machinery traffic within the delimited areas, which will be clearly identified.
FOR2	Special attention during clearing to the vegetation at the limit of the work areas to avoid damaging it. Whenever possible, trees will be prevented from falling outside the clearing limits and in the watercourses.
FOR3	Shredding of ligneous debris. Reuse of chips, as needed, for temporary stabilization, soil amendment or restoration of the waste rock pile and the riprap dikes. Obtaining prior authorization from SOPFEU and application of the required measures.

Table 9 Mitigation measures applicable to the project (continued)

N°	Description of the mitigation measure
Other socioeconomic activities	
SOC1	In open environments, plant screens will be developed north of Route Québec Lithium to connect with the existing tree cover and camouflage certain mining infrastructures. Mixed deciduous and coniferous plantings would offer natural visual barriers with a planting thickness to be determined, all linked to the existing vegetation cover.
SOC2	Development of a plateau in the upper portion of the waste rock piles to mitigate the visual impact and favour revegetation during restoration. This plateau will be covered with organic soils and planted with coniferous trees.
SOC3	On the Québec Lithium properties, the existing wooded strips will be preserved.
SOC4	Rehabilitation and restoration of the disturbed zones at the end of the construction work, so that they integrate with the natural landscape as well as possible.
SOC5	Implementation of a mine restoration plan that integrates improvement of the site's natural landscape into the foreground.
Archeology and heritage	
ARC1	Dissemination of the measures to be taken in case of discovery of vestiges of interest during stripping or excavation work: notification of the superintendent in charge of the work and taking measures to protect the site.

5.4 Environmental Effects on the Project

The environment may also be at the origin of certain risks that could influence the Québec Lithium project. An earthquake risk has been identified within the context of the project. The Québec Lithium is located in a stable continental zone of the North American Plate. Seismic activity therefore is relatively low. The project infrastructures nonetheless will conform to the design and construction standards required according to the seismic hazard map of the 2010 National Building Code of Canada.

The possibility that the project site will be affected by floods is minimal, because the site is located at the head of the watershed in hilly terrain. In the absence of permafrost, climate change is unlikely to affect the stability of the structures. Moreover, the design of the tailings accumulation areas must consider a project flood recurrence rate of 1: 1000. For risk management associated with forest fires resulting from human activities or lightning, conventional mitigation measures are deployed: brush clearing of the site, restriction of open air fires, employee information and awareness, emergency preparedness and adequate firefighting equipment.

5.5 Failures and Accidents

To mitigate the effects of accidental spills, the promoter has defined measures to ensure maintenance, repair and cleaning of the machinery, at the site of the installations developed for this purpose. For example, fuel will be supplied to the pit by truck with a double-walled tank and four assembled compartments, equipped with an emergency kit in case of spill. It will apply regular and systematic machinery inspection measures. It will ensure documented monitoring of the results of these inspections.

Storage of fuel, oil or chemical tanks or containers will be deployed on the basis of recognized safe practices. The promoter will permanently keep a petroleum products recovery kit at a known and easily accessible location. The promoter will implement an environmental emergency preparedness program and documented procedures applicable to accidents and spills. This program will detail the measures anticipated in case of accidental spills, structural failure or major incidents, such as a forest fire. The emergency procedures, the roles and responsibilities of the stakeholders responsible for implementation of the emergency response plan and the communications procedures will be set out in detail in this program.

A key element of the promoter’s emergency preparedness program is to provide for public communications procedures, particular by ensuring that the neighbouring communities and the stakeholders concerned are informed adequately in a timely manner in case of a disaster or a spill that could have impacts on the users. The promoter will present its emergency preparedness management program to the regional and municipal stakeholders.

5.6 Cumulative Environmental Effects

The cumulative environmental effects of this project can be considered to have little significance. With regard to air quality, this mining project is located in a sector where no other activity of this type has an effect on air, soil and water quality that could be combined with the effects of the Québec Lithium project. Also in this context, the relatively localized impacts in the areas directly affected by the activities limit the problem of impact accumulation. In general, the federal and provincial regulations allow restrictions on the emission of certain contaminants, particularly air emissions, soil and groundwater protection, fish habitat protection, noise emissions and vibrations, release of mine effluent, and wastewater treatment. Some contaminant emission assumptions are uncertain and will be the object of surveillance and monitoring. They will have to be corroborated later, with an intervention, if necessary, to ensure the compliance of the project's activities.

6. CAPACITY OF RENEWABLE RESOURCES

The capacity of the renewable resources likely to be significantly affected by this project is envisioned with the perspective of determining whether their sustainable use may be compromised by the construction and operation of the Québec Lithium mining project. These resources are variables to be integrated with the other socioeconomic conditions putting this category of environmental components into perspective.

In the regional study area, renewable resources are administered by the bodies responsible for land use management. Québec public land use is the object of a planning exercise, the public land use plan, or PATP (Plan d'affectation du territoire public), which reflects the government orientations in matters of protection and use of land and resources in the domain of the State (MRNF, 2012).

This exercise identifies the main factors that can guide identification of the issues related to Abitibian land use and applicable to the Québec Lithium project, as follows:

- The importance of ensuring maintenance of esker groundwater quality, fragile and essential resource of exceptional quality, for its development for economic purposes.
- The necessity of protecting the watersheds of surface drinking water sources.
- The concern for protecting certain landscapes associated with recreational tourism uses.
- The regional population's growing needs for recreational use of public land.
- The accessibility of sites offering the best sylvicultural potential, particularly for intensification of wood production.
- The high mineral potential of certain parts of the region.

By their nature, mineral resources are not renewable resources – their stock cannot reconstitute itself and determine management practices. In this context, the main concern is to ensure integrated resource management within the context of local and regional land management, while ensuring compliance with the objectives and practices of sustainable and ecological development. Sustainable and ecological mining development is articulated around three main concerns:

- the performance of an adequate mining project design exercise, integrating the environment and social issues of the sector where its direct and indirect impacts are felt;

- application of the regulatory requirements and recognized practices, based on the technologies available during performance of the mining development activities;
- closure of the mining project and adequate restoration of the environment, ensuring that no contaminant has been emitted into the environment beyond the concentrations set by regulation or determined as acceptable.

7. CONSULTATION

7.1 Public Consultation

A public communication and consultation program was developed by Québec Lithium early in the project's exploration phase in 2009. The consultation process took the form of two distinct phases. The first phase of consultation activities had the objectives of informing the community representatives and the population about the project and gathering their concerns and expectations. This first phase was conducted between January and May 2010. Eighteen meetings were held with stakeholders from different groups, representing the government, the municipalities, the Abitibiwinni First Nation Council at Pikogan, recreational tourism groups and the public.

The second phase of the consultation program was conducted to inform the stakeholders about the progress of the project and to gather the community's concerns and expectations. This second phase was conducted between October 2010 and March 2011. About thirty meetings were held with 27 groups of stakeholders, particularly representatives of governments, municipalities, the Band Councils of the Abitibiwinni First Nation and the Anishnabe First Nation of Lac-Simon, recreational tourism groups, local and regional development bodies, environmental groups and the public.

Comments, Expectations and Concerns of the Stakeholders

The main comments, expectations and concerns formulated during the meetings concern the following aspects:

- local economic spinoffs and job creation;
- infrastructure and transportation;
- the social environment;
- safety of people and property;
- the landscape;
- recreational tourism facilities;
- the environment.

These concerns were taken into account during planning of the project. The essential points raised are presented in detail in the Comprehensive Study of the project.

7.2 Consultation of Aboriginal Peoples

Two Algonquin/Anishnabe Aboriginal communities are located near the Québec Lithium mining project. These are the Pikogan and Lac-Simon communities. The first is situated 3 km north of Amos, while the second is found 30 km southeast of Val-d'Or. There is currently no agreement dealing with land rights between the Algonquin/Anishnabe Aboriginal communities and the governments. The Québec Lithium mine sites is at the limit of the territories of the Anishnabe communities of Lac-Simon and Pikogan, which do not use the land in the regional study area.

It is not envisioned at this stage that the Québec Lithium mining project will cause negative impacts on ancestral rights, resulting from the established or potential treaties of these communities. The Company included these communities in the information and consultation process it deployed in 2009, and the exchanges with these communities over the past three years led to the recent signing of a voluntary cooperation agreement (May 2012).

The agreement finally made between the promoter and the Algonquin people recognizes the expression of claims of ancestral rights by the Abitibiwinni and Lac-Simon communities, and the will to promote cooperation with these communities. The parties agreed that:

- the agreement reflects the discussions already held and corresponds to the parameters of the project and the Aboriginal communities concerned: Abitibiwinni and Lac-Simon;
- the agreement between Québec Lithium and Abitibiwinni/Lac-Simon is to the mutual benefit of the parties;
- the parties put cooperation at the centre of the negotiations and the terms of the agreement;
- the parties cooperate in order to make the elements of the agreement a success;
- the parties make reasonable, realistic, appropriate and reciprocal commitments, in view of the circumstances.

This agreement is intended to be structuring and sustainable for the communities; it is valid during the construction, operation and restoration of the project. The cooperation agreement eventually will specify different considerations regarding education and training, employment possibilities, working conditions, business opportunities and financial compensation for the two Algonquin communities.

Before the finalization of the cooperation agreement, spinoffs resulting from the exchanges are already notable for the communities. Coopérative de solidarité de Pikogan has performed clearing work on the site of the future mine and the various infrastructures since 2011. Up to 10 workers worked on the mine site during the peak construction period. Also, five First Nations members are employed full-time by Québec Lithium. Meetings were held with certain regional suppliers to induce them to hire First Nations people to obtain contracts on the site. Finally, discussions with the school boards are in progress for training of cohorts of First Nations people to increase their employability under the mining project.

7.3 Monitoring Committee

The consultation process materialized, in particular, in different changes to the project, and in the formation since 2011 of a Standing Monitoring Committee composed of citizens of the MRC, regional representatives and representatives of the Aboriginal communities, in order to ensure monitoring of the project during the construction, operating and closure phases. This committee's first meeting was held on November 15, 2011; it meets approximately every two months.

This committee's mission, in particular, is to act as liaison between the population and Québec Lithium, so as to ensure maximization of local spinoffs, prevent problems that are likely to occur and, as the case may be, favour their resolution. It also has the mission to discuss any question or problem regarding the project and the operation that has a real or potentially significant impact on the community and its living environment. In this sense, it is a tool to facilitate identification of the potential social issues associated with the project. It also favours the expression of the questions, worries and concerns of the community, the interest groups and other stakeholders as they are raised.

8. ECONOMIC AND SOCIAL BENEFITS

The Québec Lithium project presents significant social and economic spinoffs for its region.

Regarding the social spinoffs, the promoter undertook consultations early in the mining project's exploration phase, with the objectives of informing the stakeholders about the development of the project and highlighting the social and economic concerns, in order to optimize the project and mitigate its impacts on the environment and society. Thus, as the process advanced, the local populations were informed and expressed their concerns about the project and its impacts. Changes to the project and local spinoffs were also deployed. One major factor contributing to the enhancement of the project's social spinoffs is the deployment, since November 2011, of the Standing Monitoring Committee, composed of citizens of the MRC, regional representatives, and representatives of the Aboriginal communities of Lac-Simon and Pikogan.

The promoter's engagement in a serious consultation process, initiated in 2009 with the public, influenced certain factors, such as the location of the infrastructures and the visual design of the accumulation zones, in order to account for the ecology of the landscape and the regional land use planning issues. In a sustainable development perspective, the exchanges and concerns about the project's environmental and social effects allowed better integration of the activities with the expectations of the local populations. Some of these expectations are related to economic development and the impacts at the end of mining operations. They make it possible to identify different points of view and have a better perspective on the issues for the populations and land management.

The consultation process in itself gradually allowed the development of exchanges and relationships with the communities. In the case of the Aboriginal communities, direct benefits materialized in positive business relationships and economic spinoffs for these communities. In the case of populations living near the project, the process led to better consideration of factors related to their quality of life and better integration of the project's progress as its life cycle evolves.

Economic Spinoffs

Within the context of the Québec Lithium project, economic spinoffs were assessed in relation to the mine's construction and operating phases. A preliminary estimate of the transitional spinoffs attributable to the mine's construction phase was based on total projected capital expenditures of $188.9 million, while the annual economic spinoffs were calculated on the basis of the projected annual operating costs of $55.5 million.

The resulting transitional and recurring economic spinoffs are presented in Table 10.

Table 10 Economic spinoffs of the Québec Lithium project

	Economic spinoffs of the construction phase	**Annual economic spinoffs of the operating phase**
Labour (full-time equivalents)	1,663	228
Value added to the base prices (k$)	127,582	44,418
Québec government revenue (k$)	7,329	2,124
Federal government revenue (k$)	4,186	1,466
Employer contributions (k$)		
Québec (QPP, HSF, CSST, QPIP)	14,565	2,156
Federal (EI)	2,028	290

Source: ISQ (2009) and GENIVAR (2010)

The transitional economic spinoffs attributable to all the projected investments ($188.9 million) are estimated at nearly $127.6 million. In terms of labour, job creation or maintenance would be equivalent to 1,663 persons hired full-time (full-time equivalents) during the period of the work. Moreover, the expenditures incurred during the construction phase would translate into tax revenues of around $18.6 million and $6.2 million for the governments of Québec and Canada respectively (government revenues and employer contributions).

The recurring regional economic spinoffs attributable to the projected annual operating expenditures ($59.5 million) are around $44.4 million annually. In terms of labour, job creation or maintenance would be equivalent to 228 persons hired full-time annually. Moreover, the annual expenditures incurred during the operating phase would translate into annual tax revenues of around $4.3 million and $1.8 million for the governments of Québec and Canada respectively (government revenues and employer contributions).

9. SURVEILLANCE AND MONITORING PROGRAMS

An environmental surveillance program will be deployed during construction, as well as monitoring of certain sensitive components, which will be performed once the mine is in operation. In general, environmental surveillance applies to verification of compliance of parameters or actions, while monitoring pertains to the validation of assumptions presenting a level of uncertainty that one wishes to reduce or scenarios that one wishes to confirm to determine what actions to take.

9.1 Surveillance

The environmental surveillance exercised during the development of the project will ensure that environmental commitments and obligations are honoured. It will also seek to ensure the integration of the proposed mitigation measures and Québec Lithium's commitments. The surveillance program will oversee compliance with the environmental laws, regulations and other considerations dictated in the various government permits, both for the plans and specifications and for the subcontracts.

One of the surveillance program's activities will be to ensure that all the applications for authorization and permits necessary for the development of the project have been submitted and that the certificates of authorization and the permits have been received.

At the beginning of the work, in conjunction with the principal contractor of the work, the site superintendent and the environmental compliance officer will organize the dissemination of the measures in place on the site. This means informing the personnel assigned to the site and raising their awareness regarding the environmental and safety provisions that must be observed throughout the period of the work, and the general operation of the surveillance activities. The promoter must ensure that all the stakeholders on the site (contractors, site superintendent, site supervisors, foremen and others) are sensitized to the environmental concerns and protection measures. It identifies the role and power of each stakeholder, so as to provide for unexpected situations or nonconformities, and to deploy the appropriate preventive and corrective actions; it also disseminates the measures that the stakeholders must apply to protect the environment, according to their respective activities.

During the work, the mitigation measures must be applied rigorously, particularly during activities performed near watercourses. In general, the environmental compliance officer must conduct regular visits to the work areas and take note of the rigorous fulfillment of commitments, obligations, measures and other prescriptions by the stakeholders. He must also assess the quality and effectiveness of the measures

applied and note any nonconformity. He then must report his observations to the site superintendent so that appropriate corrective actions are agreed on and adopted as soon as possible, in the event such measures would be necessary.

9.2 Monitoring

The main objective of the environmental monitoring program is to produce an adequate characterization of the future of certain sensitive environmental components, ensure that the project does not have a significant environmental impact, and ensure that corrective actions are applied, as the case may be. In accordance with the federal and provincial requirements, environmental monitoring during the operating and restoration phase of the project, includes the following aspects:

In the Operating Phase

- Monitoring of the free circulation of fish in the culverts.
- Monitoring of noise emissions and vibrations.
- Air quality monitoring.
- Groundwater quality monitoring.
- Monitoring the quality of the mine effluent and the receiving watercourse.
- Biological monitoring of the receiving environment (fish, benthos and sediments).
- Hydrological and biological monitoring of Lac Lortie.
- Monitoring of compensatory developments for fish.

In the Restoration Phase

- Monitoring of soil and groundwater quality.

The main lines of this monitoring are presented in the Comprehensive Study of the project. A detailed program, which will cover all the requirements of the decree and the certificates of authorization, then will be submitted to the government authorities for approval and comments.

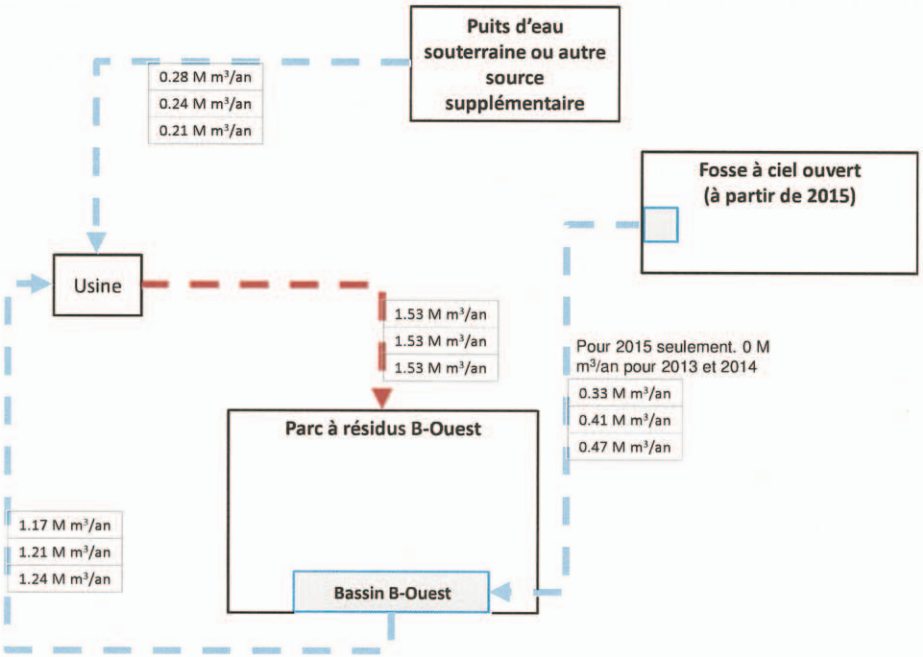
Appendix 1

Directory of maps and figures

Figure 1 Schéma conceptuel - Années 2013 à 2015

Années 2013 à 2015

Développement du site minier	Infrastructure de gestion de l'eau
Début de l'opération de l'usine. Début de déposition des résidus dans le parc B-Ouest. À partir de 2015, développement d'une topographie concave dans la fosse à ciel ouvert.	Mise en marche des pompes de recirculation de l'eau du bassin B-Ouest vers l'usine Identification et opération des puits d'eau souterraine et, si nécessaire, d'autres sources supplémentaires d'eau de procédé Installation des stations de pompage dans la fosse à ciel ouvert. Pompage vers le bassin B-Ouest



Légende

- Fossé / Déversoir Écoulement gravitaire
- Conduite de pompage
- Déposition de résidus
- Bassin collecteur avec station de pompage
- Unité d'évacuation / traitement

Résultats de modélisation

1.17 M m³/an	scénario sec
1.21 M m³/an	scénario moyen
1.24 M m³/an	scénario humide

Note: les volumes sont calculés en faisant la somme des valeurs journalières sur la période indiquée et la divisant avec le nombre d'années civiles dans la période. Le résultat ne peut pas être interprété comme un taux annuel si la période inclut une partie d'une année civile. C'est le cas pour l'année 2026, étant donné que l'opération arrête en juin 2026.

Notes:

1. **Le schéma est conceptuel et n'a pas d'échelle spatiale.**
2. **Certains détails du plan de minage (par ex. l'année à partir de laquelle une fosse est formée) n'ont pas été disponibles et ont été supposés.**

Date:	2012-11-13	Échelle:	aucune
Dessiné par:	Vlad Rojanschi	Projeté par:	Vlad Rojanschi
Vérifié par:	Joao Paulo Lutti	Approuvé par:	Michel Lemieux
No. de dessin:	1112210019-5000-FLDA	No. de dessin:	11-1221-0019

QUÉBEC LITHIUM

Québec Lithium
Plan préliminaire de gestion des eaux

Golder Associés
1001 boul. de Maisonneuve O., 7e étage
Montréal (Québec) H3A 3C8
Tel. (514) 383-0990 Fax: (514) 850-2401

Schéma Conceptuel
Années 2013 à 2015

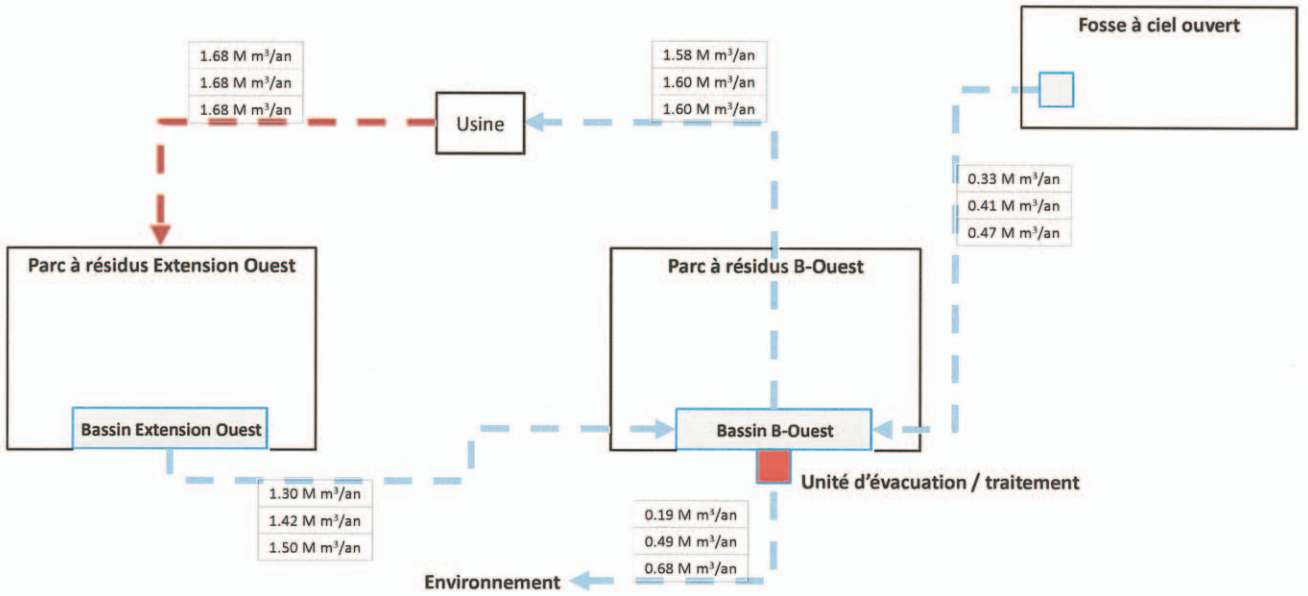
Figure 1

Fichier GENIVAR : 121_21686_RS_f1_a_4_Eau_130618.FH11

Figure 2 Schéma conceptuel - Années 2016 à 2023

Années 2016 à 2023

Développement du site minier	Infrastructure de gestion de l'eau
Déposition des résidus dans le parc Extension Ouest.	Installation des stations de pompage dans le bassin du parc Extension Ouest. Pompage vers le bassin B-Ouest



Légende

- Fossé / Déversoir Écoulement gravitaire
- Conduite de pompage
- Déposition de résidus
- Bassin collecteur avec station de pompage
- Unité d'évacuation / traitement

Résultats de modélisation

1.17 M m³/an	scénario sec
1.21 M m³/an	scénario moyen
1.24 M m³/an	scénario humide

Note: les volumes sont calculés en faisant la somme des valeurs journalières sur la période indiquée et la divisant avec le nombre d'années civiles dans la période. Le résultat ne peut pas être interprété comme un taux annuel si la période inclut une partie d'une année civile. C'est le cas pour l'année 2026, étant donné que l'opération arrête en juin 2026.

Notes:

1. **Le schéma est conceptuel et n'a pas d'échelle spatiale.**
2. **Certains détails du plan de minage (par ex. l'année à partir de laquelle une fosse est formée) n'ont pas été disponibles et ont été supposés.**

Date	2012-11-13	Échelle	aucune
Dessiné par	Vlad Rojanschi	Projeté par	Vlad Rojanschi
Vérifié par	Joao Paulo Lutti	Approuvé par	Michel Lemieux
No. de dessin	1112210019-5000-FLDA	No. de dessin	11-1221-0019

QUÉBEC LITHIUM

Québec Lithium
Plan préliminaire
de gestion des eaux

Golder Associés
1001 boul. de Maisonneuve O., 7e étage
Montréal (Québec) H3A 3C8
Tel. (514) 383-0990 Fax: (514) 850-2401

Schéma Conceptuel
Années 2016 à 2023

Figure 2

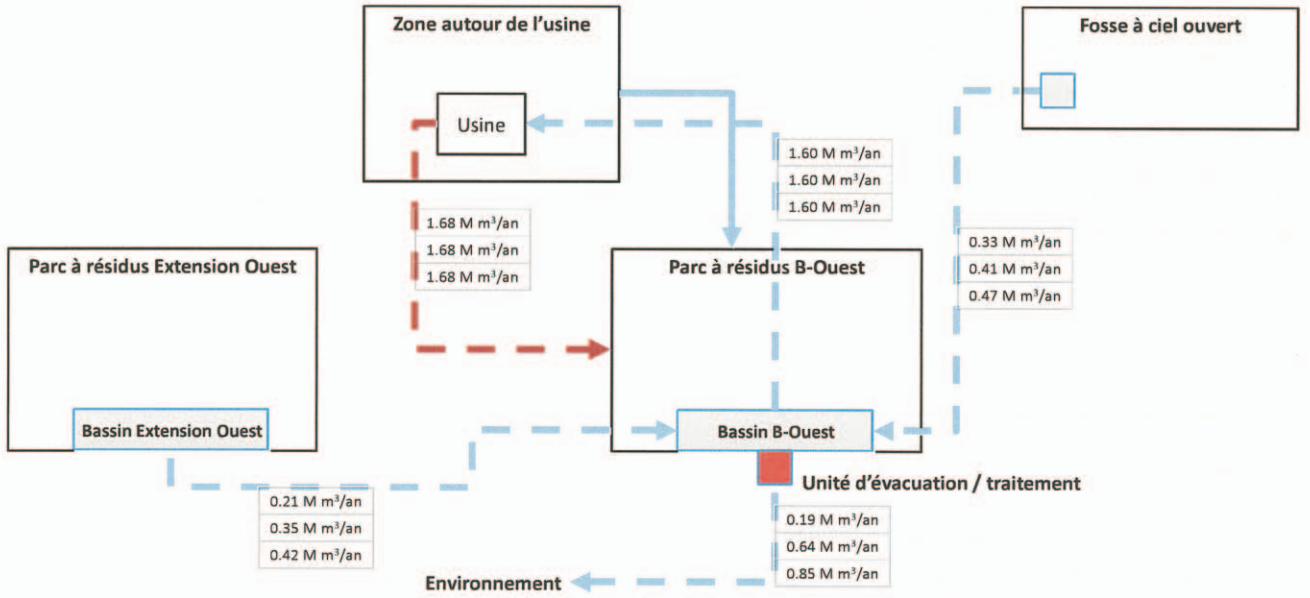
Fichier GENIVAR : 121_21686_RS_f1_a_4_Eau_130618.FH11

121-21686-00

Figure 3 Schéma conceptuel - Année 2024

Année 2024

Développement du site minier	Infrastructure de gestion de l'eau
Déposition des résidus dans le parc B-Ouest. Processus de fermeture du parc Extension Ouest.	Le pompage de l'eau du bassin Extension Ouest vers le bassin B-Ouest continue pendant le processus de fermeture. Après le dernier rehaussement des digues du parc B-Ouest, le bassin versant du bassin B-Ouest est augmenté. Il inclut maintenant aussi la zone autour de l'usine.



Légende

- Fossé / Déversoir Écoulement gravitaire
- Conduite de pompage
- Déposition de résidus
- Bassin collecteur avec station de pompage
- Unité d'évacuation / traitement

Résultats de modélisation

1.17 M m³/an	scénario sec
1.21 M m³/an	scénario moyen
1.24 M m³/an	scénario humide

Note: les volumes sont calculés en faisant la somme des valeurs journalières sur la période indiquée et la divisant avec le nombre d'années civiles dans la période. Le résultat ne peut pas être interprété comme un taux annuel si la période inclut une partie d'une année civile. C'est le cas pour l'année 2026, étant donné que l'opération arrête en juin 2026.

Notes:

1. **Le schéma est conceptuel et n'a pas d'échelle spatiale.**
2. **Certains détails du plan de minage (par ex. l'année à partir de laquelle une fosse est formée) n'ont pas été disponibles et ont été supposés.**

Date:	2012-11-13	Échelle:	aucune
Dessiné par:	Vlad Rojanschi	Projeté par:	Vlad Rojanschi
Vérifié par:	Joao Paulo Lutti	Approuvé par:	Michel Lemieux
No. de dessin:	1112210019-5000-FLDA	No. de devis:	11-1221-0019

QUÉBEC LITHIUM

Québec Lithium
Plan préliminaire de gestion des eaux

Golder Associés
1001 boul. de Maisonneuve O., 7e étage
Montréal (Québec) H3A 3C8
Tel.: (514) 383-0990 Fax: (514) 850-2401

Schéma Conceptuel
Année 2024

Figure 3

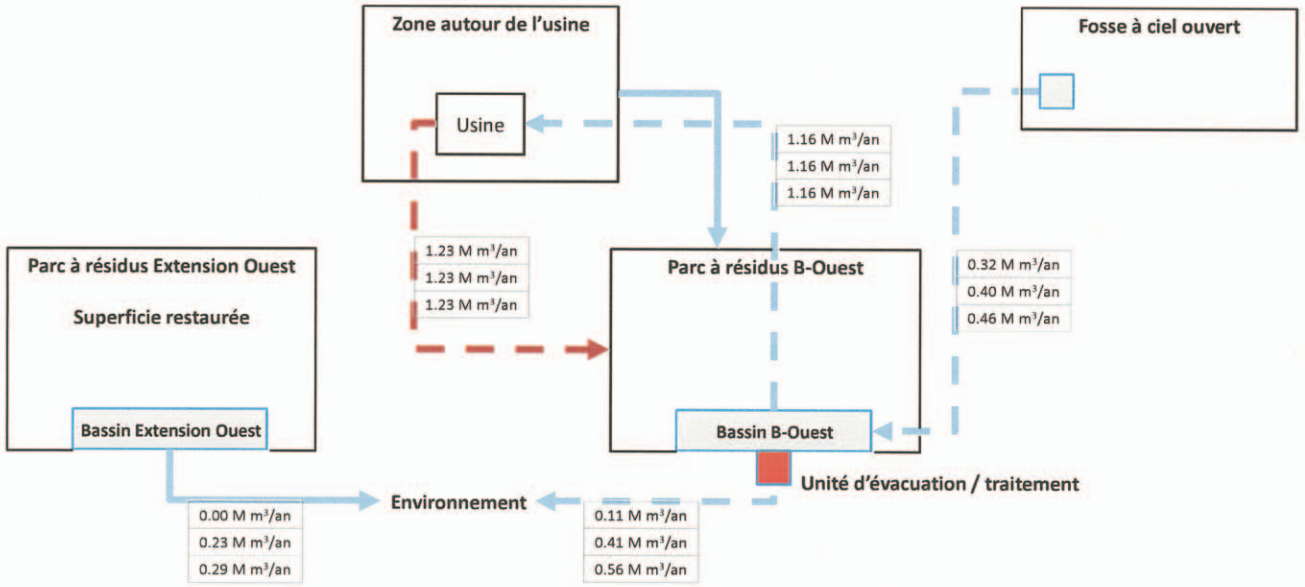
Fichier GENIVAR : 121_21686_RS_f1_a_4_Eau_130618.FH11

121-21686-00

Figure 4 Schéma conceptuel - Année 2025 à 2026

Années 2025 à 2026

Développement du site minier	Infrastructure de gestion de l'eau
Déposition des résidus dans le parc B-Ouest jusqu'en juin 2026.	Le ruissellement du parc Extension Ouest s'écoule librement vers l'environnement.



Légende

- Fossé / Déversoir Écoulement gravitaire
- Conduite de pompage
- Déposition de résidus
- Bassin collecteur avec station de pompage
- Unité d'évacuation / traitement

Résultats de modélisation

1.17 M m³/an	scénario sec
1.21 M m³/an	scénario moyen
1.24 M m³/an	scénario humide

Note: les volumes sont calculés en faisant la somme des valeurs journalières sur la période indiquée et la divisant avec le nombre d'années civiles dans la période. Le résultat ne peut pas être interprété comme un taux annuel si la période inclut une partie d'une année civile. C'est le cas pour l'année 2026, étant donné que l'opération arrête en juin 2026.

Notes:

1. **Le schéma est conceptuel et n'a pas d'échelle spatiale.**
2. **Certains détails du plan de minage (par ex. l'année à partir de laquelle une fosse est formée) n'ont pas été disponibles et ont été supposés.**

Date:	2012-11-13	Échelle:	aucune
Dessiné par:	Vlad Rojanschi	Projeté par:	Vlad Rojanschi
Vérifié par:	Joao Paulo Lutti	Approuvé par:	Michel Lemieux
No. de dessin:	1112210019-5000-FLDA	No. de dessin:	11-1221-0019

QUÉBEC LITHIUM

Québec Lithium
Plan préliminaire de gestion des eaux

Golder Associés
1001 boul. de Maisonneuve O., 7e étage
Montréal (Québec) H3A 3C8
Tél.: (514) 383-0990 Fax: (514) 850-2401

Schéma Conceptuel
Année 2025 à 2026

Figure 4

Fichier GENIVAR : 121_21686_RS_f1_a_4_Eau_130618.FH11

121-21686-00

77°51'0"
77°48'0"
77°45'0"
48°25'30"
48°24'0"
48°22'30"

Municipalité de Landrienne
Municipalité de La Corne

Route du Lithium

Route de contournement projetée

Chemin d'accès

Lac Lortie

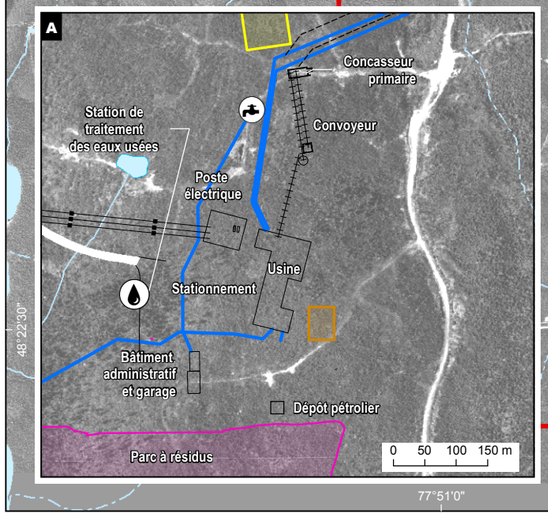
Mont Vidéo

Lac Roy

Lac Legendre

Municipalité de Barraute
Municipalité de La Corne

A



Infrastructures projetées

- Infrastructure minière
- Route
- Fosse
- Halde de mort terrain
- Halde à stériles
- Halde à minérai
- Parc à résidus
- Conduite proposée
- Prise d'eau en eau fraîche
- Station de traitement des eaux usées
- Canal du déversoir
- Route de contournement

Infrastructures existantes

- Chemin d'accès
- Ligne électrique (120 kV)
- Tour de télécommunication relocalisée

Limites

- Zone d'étude locale
- Municipalité

- Cours d'eau permanent
- Cours d'eau intermittent

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Principales infrastructures du projet

0 300 600 900 m
MTM, fuseau 9, NAD83

Sources :

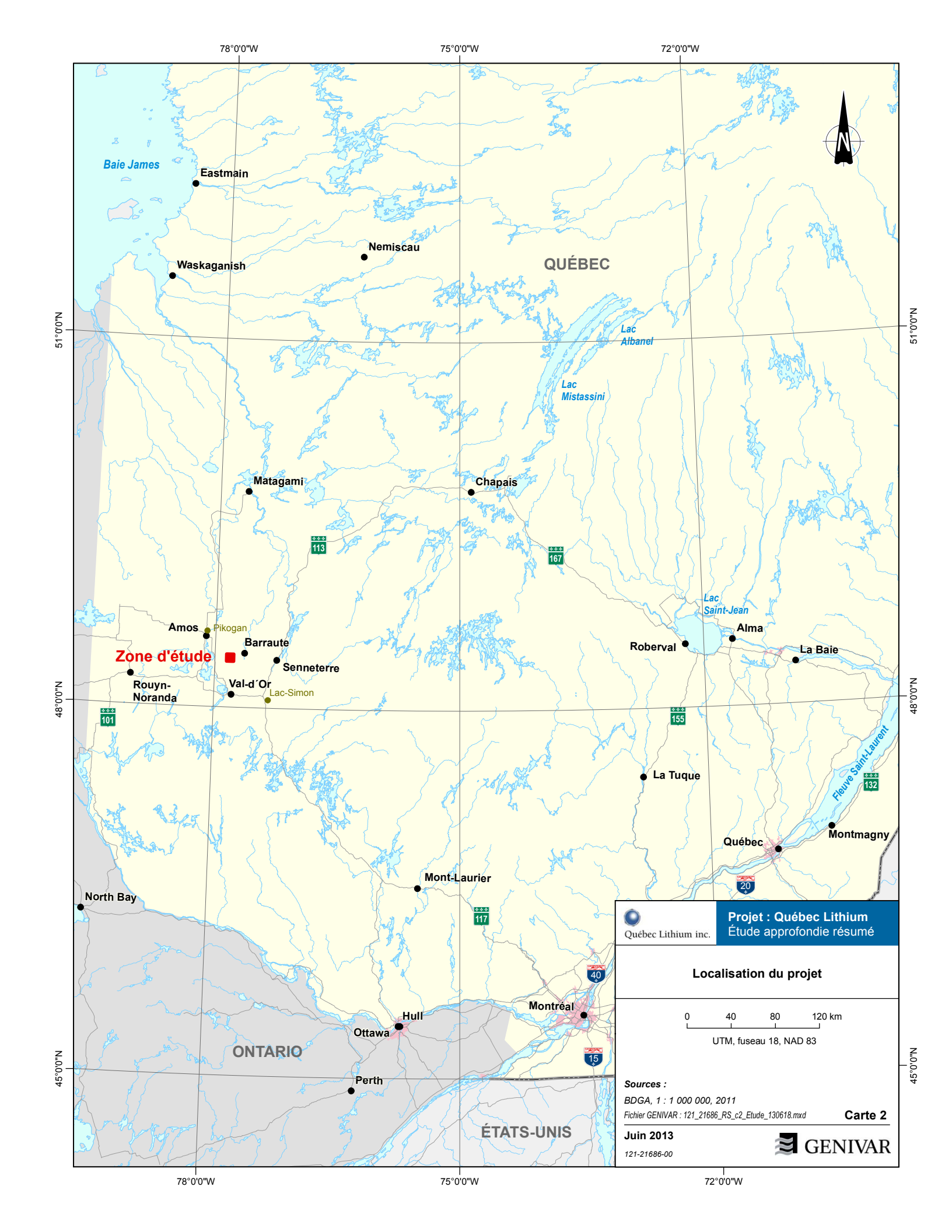
Orthophoto : MNRF Québec, 1998
BDTQ, 1 : 20 000
SDA, 1 : 20 000, 2010
Infrastructures, selon les plans concepts préliminaires en date de juin 2013

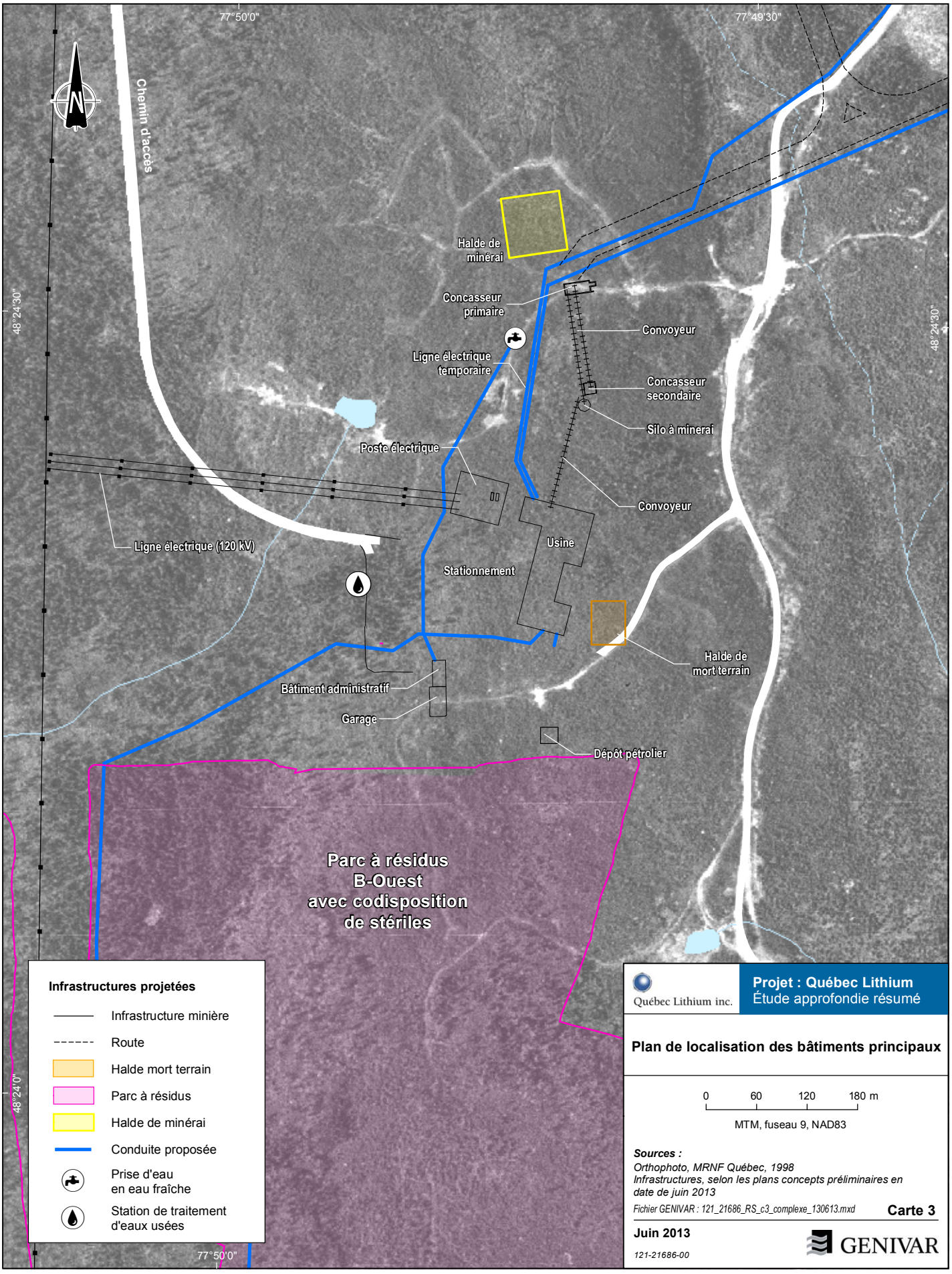
Fichier GENIVAR : 121_21686_RS_c1_Infra_principale_130618.mxd

Carte 1

Juin 2013
121-21686-00

GENIVAR


78°0'0"W
75°0'0"W
72°0'0"W
51°0'0"N
48°0'0"N
45°0'0"N
N
Baie James
Eastmain
Nemiscau
Waskaganish
QUÉBEC
Lac Albanel
Lac Mistassini
Matagami
Chapais
113
167
Lac Saint-Jean
Alma
Roberval
La Baie
Amos
Pikogan
Barraute
Zone d'étude
Senneterre
Rouyn-Noranda
Val-d´Or
Lac-Simon
101
155
La Tuque
Fleuve Saint-Laurent
132
Montmagny
Québec
20
Mont-Laurier
North Bay
117
40
Montréal
Hull
Ottawa
ONTARIO
15
Perth
ÉTATS-UNIS
Québec Lithium inc.
Projet : Québec Lithium
Étude approfondie résumé
Localisation du projet
0 40 80 120 km
UTM, fuseau 18, NAD 83
Sources :
BDGA, 1 : 1 000 000, 2011
Fichier GENIVAR : 121_21686_RS_c2_Etude_130618.mxd
Carte 2
Juin 2013
121-21686-00
GENIVAR



Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Plan de localisation des bâtiments principaux

0 60 120 180 m

MTM, fuseau 9, NAD83

Sources :
Orthophoto, MRNF Québec, 1998
Infrastructures, selon les plans concepts préliminaires en date de juin 2013

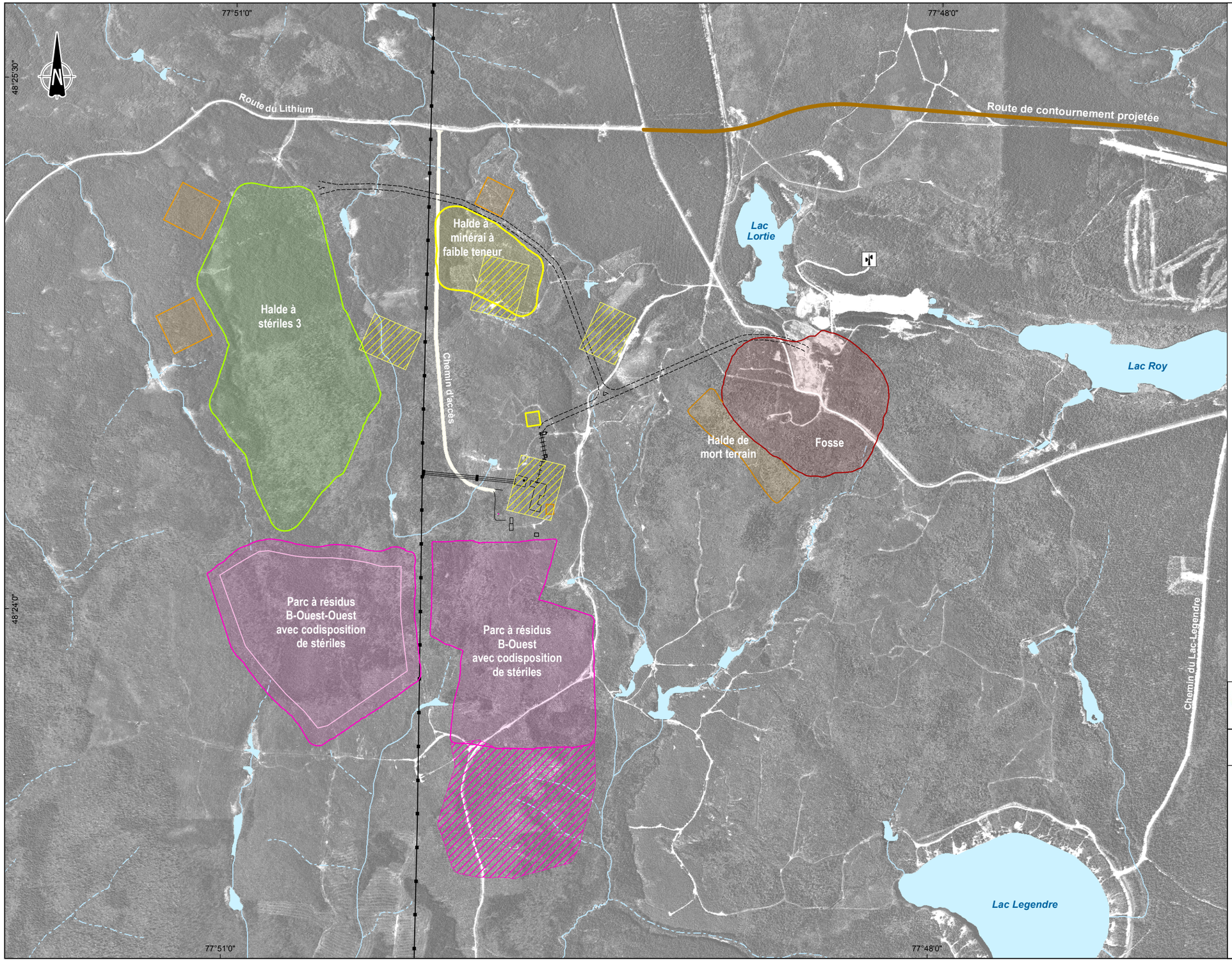
Fichier GENIVAR : 121_21686_RS_c3_complexe_130613.mxd

Carte 3

Juin 2013

121-21686-00

GENIVAR



Infrastructures projetées

- Infrastructure minière
- Route de contournement
- Route
- Fosse
- Halde de mort terrain
- Halde à stériles
- Halde à minérai
- Parc à résidus
- Variante pour la localisation du concentrateur
- Variante non retenue pour le parc à résidus

Infrastructures existantes

- Chemin d'accès
- Ligne électrique (120 kV)
- Tour de télécommunication relocalisée
- Cours d'eau permanent
- Cours d'eau intermittent

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Variantes d'emplacement d'infrastructures

0 200 400 600 m

MTM, fuseau 9, NAD83

Sources :

Orthophoto : MNRF Québec, 1998
BDTQ, 1 : 20 000
SDA, 1 : 20 000, 2010
Infrastructures, selon les plans concepts préliminaires en date de juin 2013

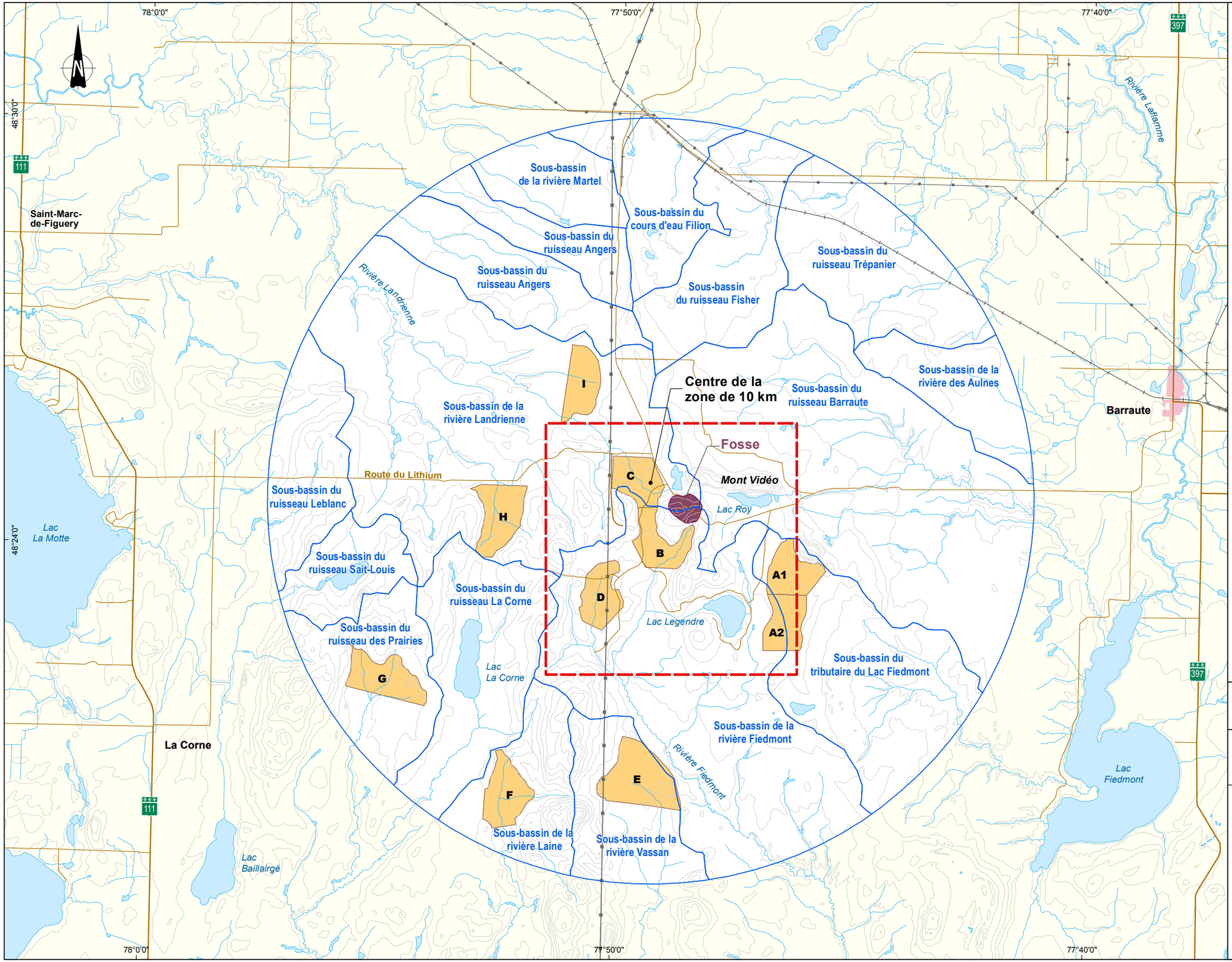
Fichier GENIVAR : 121_21686_RS_c4_Variantes_130618.mxd

Carte 4

Juin 2013

121-21686-00

GENIVAR



Solution de rechange

C Parc à résidus

Limite

Zone d'étude locale

Sous-bassin versant

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Solutions de rechange de parc à résidus

0 1 2 3 km

MTM, fuseau 9, NAD83

Sources :

BNDT, 1 : 50 000
SDA, 1 : 20 000, 2010

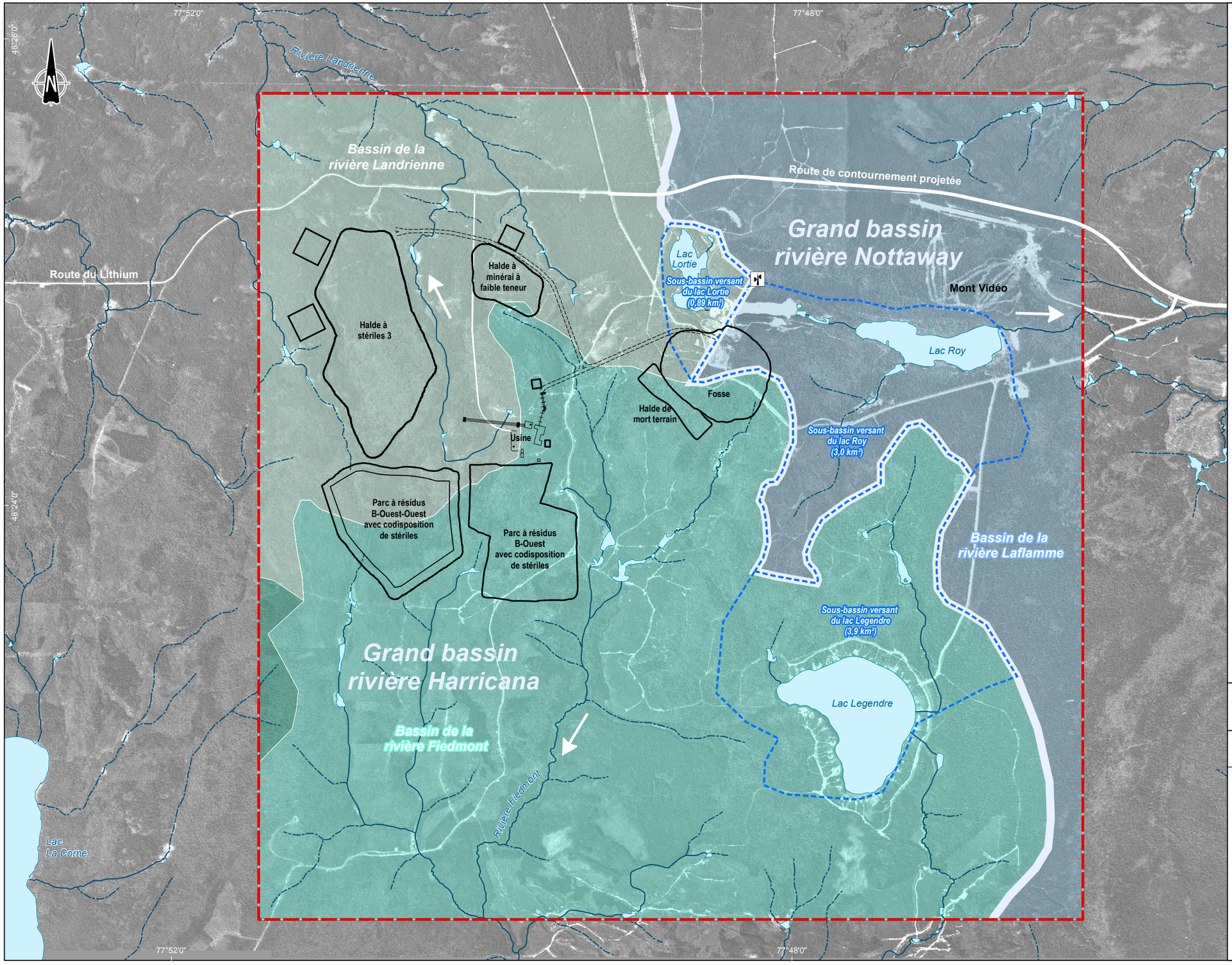
Fichier GENIVAR : 121_21686_RS_c5_Solution_130618.mxd

Carte 5

Juin 2013

121-21686-00

GENIVAR



Hydrologie

- Limite entre les bassins de la rivière Harricana et la rivière Nottoway
- Bassin versant de la rivière Fiedmont
- Bassin versant de la rivière Landrienne
- Bassin versant du lac La Corne
- Bassin versant de la rivière Laflamme
- Sous-bassin versant
- Sens de l'écoulement
- Cours d'eau permanent
- Cours d'eau intermittent

Infrastructure projetée

- Infrastructure minière

Infrastructures existantes

- Chemin d'accès
- Tour de télécommunication relocalisée

Limite

- Zone d'étude locale

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Limite des bassins versants

0 300 600 900 m

MTM, fuseau 9, NAD83

Sources :
Orthophoto : MNRF Québec, 1998
BDTQ, 1 : 20 000
Infrastructures, selon les plans concepts préliminaires en date de juin 2013

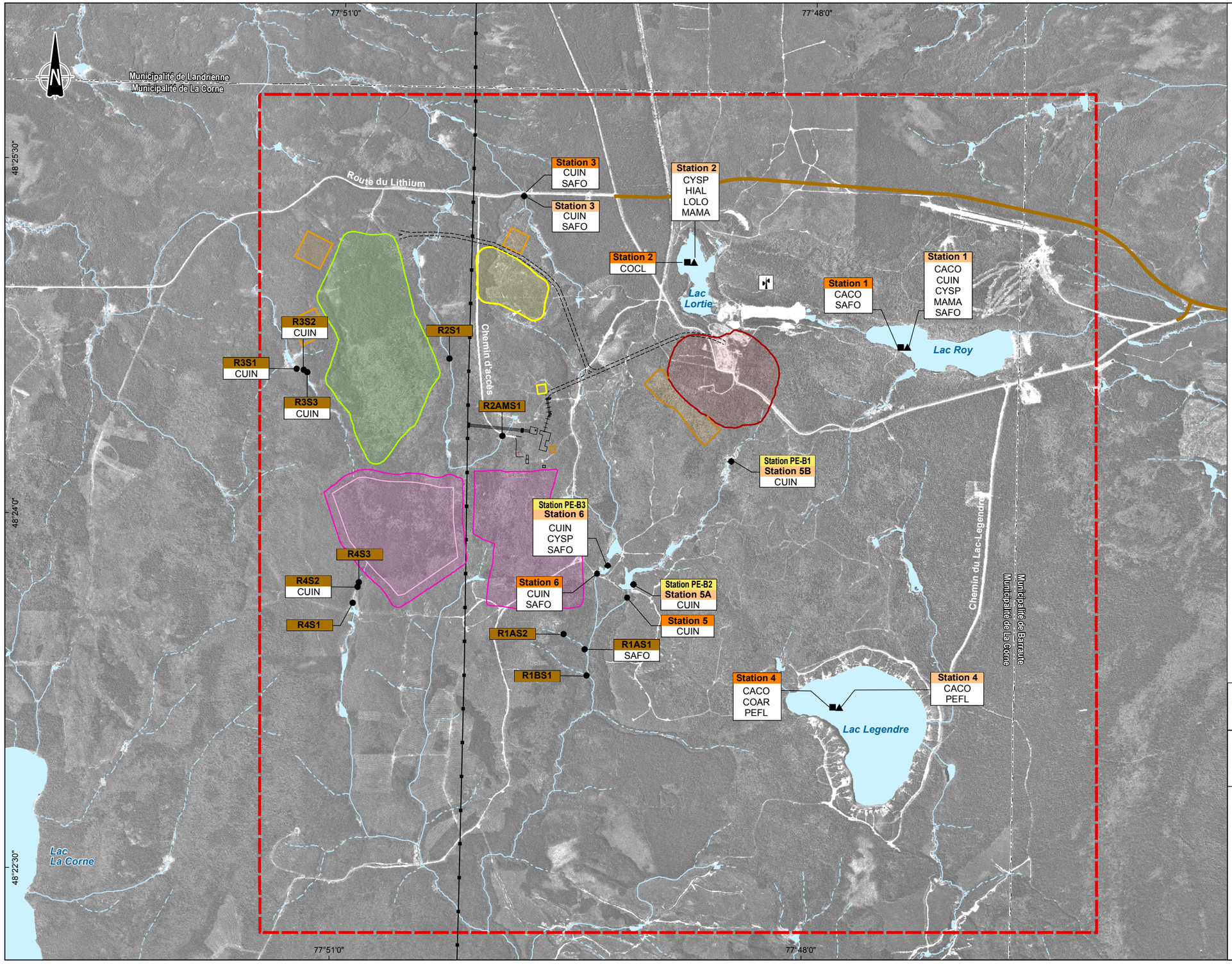
Fichier GENIVAR : 121_21686_RS_c6_BV_130618.mxd

Carte 6

Juin 2013

121-21686-00

GENIVAR



Station 5
CUIN
Année
Numéro de station
Espèce

Engin de pêche

- ● Pêche à l'électricité
- ▲ Filet maillant expérimental - Bourolle - Seine
- ■ Filet maillant expérimental

Espèces

CACO	Meunier noir	HIAL	Laquaiche aux yeux d'or
COAR	Cisco de lac	LOLO	Lotte
COCL	Grand corégone	MAMA	Mulet perlé
CUIN	Épinoche à cinq épines	PEFL	Perchaude
CYSP	Cyprinidae sp.	SAFO	Omble de fontaine

Années d'échantillonnage

- 2009 (caractérisation environnementale de base, GENIVAR 2009)
- 2010 (caractérisation environnementale de base, GENIVAR 2010a)
- 2010 (caractérisation des sites potentiels pour le parc à résidus, GENIVAR 2010b)
- 2012 (caractérisation des sites potentiels pour le parc à résidus, GENIVAR)

Infrastructures projetées

- Infrastructure minière
- Route
- Fosse
- Halde de mort terrain
- Halde à stériles
- Halde à minérai
- Parc à résidus

Infrastructures existantes

- Chemin d'accès
- Ligne électrique (120 kV)
- Tour de télécommunication relocalisée

Autres

- Zone d'étude locale
- Municipalité

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Inventaires piscicoles

0 300 600 900 m
MTM, fuseau 9, NAD83

Sources :

Orthophoto : MRNF Québec, 1998
BDTQ, 1 : 20 000
SDA, 1 : 20 000, 2010
Infrastructures, selon les plans concepts préliminaires en date de juin 2013
Milieu humide, SIEF, Inventaire forestier, MRNF QUébec

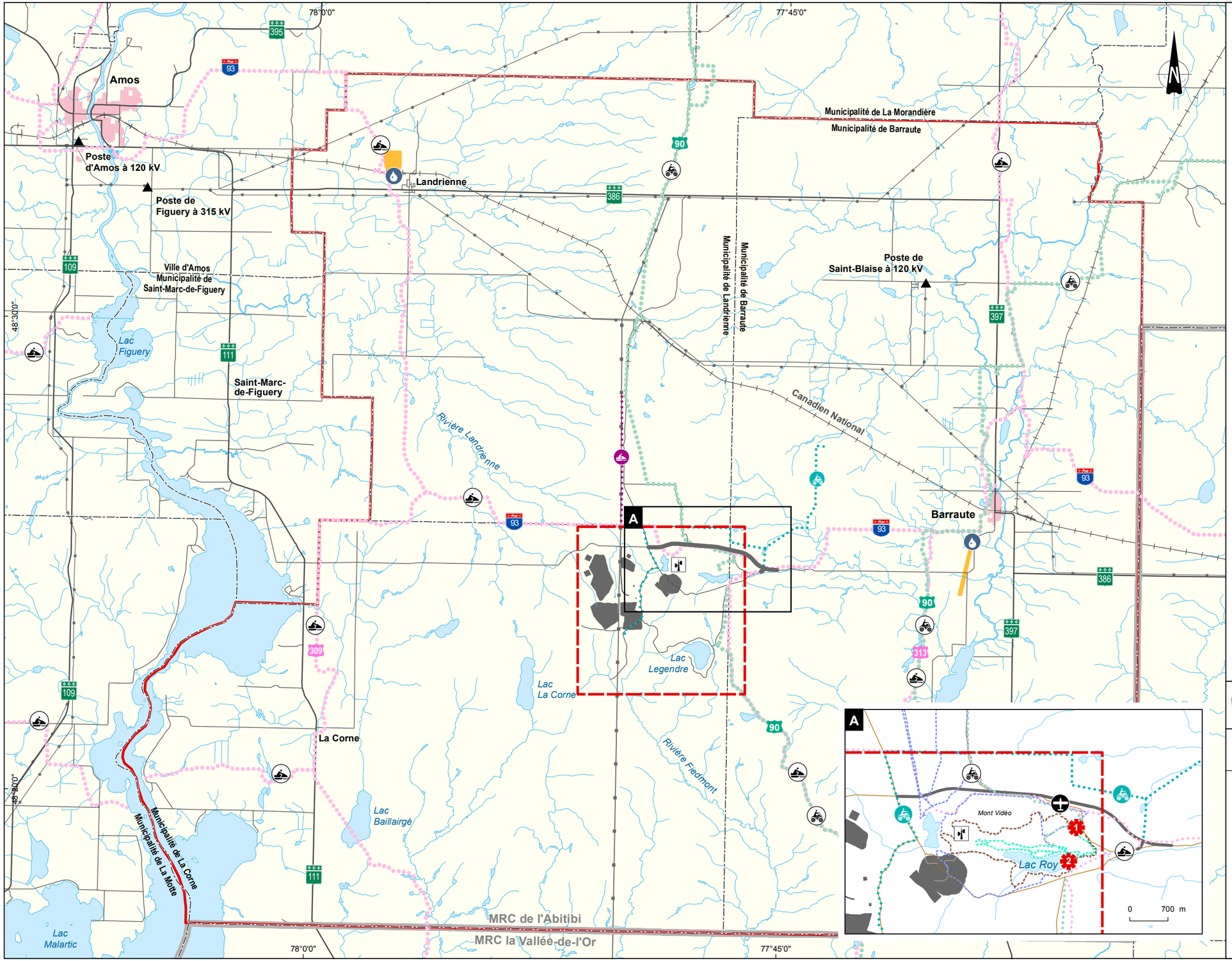
Fichier GENIVAR : 121_21686_RS_c7_Inv_pisicole_130618.mxd

Carte 7

Juin 2013

121-21686-00

GENIVAR



Sites récréotouristiques

- 1 Centre récréatif du Mont-Vidéo
- 2 Plage naturelle - Camping rustique

Transport d'énergie électrique

- Ligne électrique
- Poste de transformation

Sentiers

- Motoneige
- Motoneige (projeté)
- Véhicule tout-terrain
- Véhicule tout-terrain (projeté)
- Sentier de motoneige transcanadien
- Numéro de sentier
- Pédestre
- Ski de fond
- Vélo de montagne

Infrastructures existantes

- Piste d'atterissage
- Source d'eau municipale
- Tour de télécommunication relocalisée
- Aire d'alimentation des puits municipaux

Réseau routier

- Route principale
- Route secondaire

Infrastructure projetée

- Infrastructure minières
- Route de contournement

Limites

- Zone d'étude régionale
- Zone d'étude locale
- Municipalité
- Municipalité régionale de comté (MRC)

Québec Lithium inc.

Projet : Québec Lithium
Étude approfondie résumé

Infrastructures d'utilité publique

0 1,5 3 4,5 km
MTM, fuseau 9, NAD83

Sources :

BNDT, 1 : 50 000
SDA, 1 : 20 000, 2010
Motoneige, FCMQ, 2008
Quad, FQCQ, 2011
Sentier de vélo, pédestre et ski de fond, Mont-Vidéo
Infrastructure, selon les plans concepts préliminaires en date de juin 2013

Fichier GENIVAR : 121_21686_RS_c8_Infra_publique_130618.mxd

Carte 8

Juin 2013

121-21686-00

GENIVAR