JAMES BAY LITHIUM MINE

SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT STUDY

OCTOBER 2018

JAMES BAY LITHIUM MINE

SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSMENT STUDY

GALAXY LITHIUM (CANADA) INC.

PROJECT NO.: 171-02562-00
DATE: OCTOBER 2018

Presented to:

Environmental and Social Impact Review Committee (COMEX)
(File no.: 3214-14-055)

WSP CANADA INC.
3450, GENE-H.-KRUGER BOULEVARD, OFFICE 300
TROIS-RIVIÈRES (QUÉBEC) G9A 4M3

T: +1 819 375-8550
F: +1 819 375-1217
WSP.COM

SIGNATURES

PREPARED BY

Andréanne Boisvert, M.A.
Project Director
WSP Canada inc.

October 5th, 2018
Date

APPROVED BY

Gail Amyot, ing. M. Sc. (OIQ #31050)
Health, Safety, Environment Director
Galaxy Lithium (Canada) inc.

October 5th, 2018
Date

This report was prepared by WSP Canada Inc. for the account of Galaxy Lithium (Canada) Inc., in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP Canada Inc.'s best judgement in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years. Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given with regards to any modifications made to this document.

The project title is: "James Bay Lithium Mine". Its location on maps is identified with its title. Of noteworthy mention, there is currently no mine in existence.

TABLE OF CONTENTS

1 PROJECT SUMMARY 1

1.1 Project Location 1

1.2 General Project Description 1

1.3 Physical Setting 2

1.4 Environmental Setting 5

1.5 Social Setting 7

1.6 Project Impacts 8

1.7 Risk Management 9

TABLE

TABLE 1: FISH SPECIES IN LAKES AND WATERCOURSES 7

MAPS

MAP 1: PROJECT SITE GENERAL ARRANGEMENT 3

MAP 2: LAKES AND WATERCOURSES AROUND THE PROPOSED MINE LOCATION 5

1 PROJECT SUMMARY

1.1 PROJECT LOCATION

The James Bay Lithium Mine project is in the Nord-du-Québec administrative region in the Eeyou Istchee James Bay territory. It is located approximately 10 km south of the Eastmain river and 100 km east from James Bay. The project is on Category III lands of the James Bay Northern Quebec Agreement). The lands of the James Bay Lithium Mine project are easily accessed by the James Bay Road. This road crosses the James Bay property at kilometre 381, close to the truck stop managed by the Société de Développement de la Baie-James (SDBJ). The regional project location is shown on Map 1.

1.2 GENERAL PROJECT DESCRIPTION

The following infrastructure is planned for the James Bay Lithium Mine project. These are conventional facilities for an open pit mining operation (Map 1). They include the following:

- a pit;
- an industrial sector;
- areas to stockpile material;
- water retention basins;
- administrative and operations buildings;
- work camp;
- water treatment plant;
- maintenance facilities including warehouses, laboratories and emergency services;
- explosives magazine.

The James Bay Lithium Mine project consists of the operation of a mine. The economic material will be extracted from a pit using drills and blasting. Excavators will be used to load large mining trucks that will carry material for processing in the industrial area. The overburden and waste rock will be transported to their designated stockpiles.

The onsite treatment will be a spodumene concentration process. The concentrator will allow for the separation of the material to obtain spodumene concentrate (product). The selected process involves the crushing of the rocks followed by a physical separation.

Areas to stockpile and store material will be built at the James Bay Lithium Mine project site. Products that require stockpiles are: economic material, waste rock & dry tailings, spodumene concentrate, overburden and topsoil. A combined stockpile will be built to store the waste rock and tailings.

Water is also used throughout the plant to wash and rinse material. It will be recovered and recycled using dewatering systems. Recirculation of the water will be facilitated by the fact that no chemicals are present in the tailings. Water will be taken from the main water retention basin as needed.

The collection and sorting of reusable, recyclable and waste materials (whether harmless or hazardous) will be carried out on-site. Waste will then be managed by specialized and authorized contractors and transported off-site to a certified disposal site or toward appropriate services.

Additional infrastructure related to the development and proper management of the site will be required, namely:

- an administrative and operations building;
- an autonomous work camp;
- an explosives storage facility;

— a tank farm for the fuelling of the mining equipment, for heating purposes and for backup generators.

Furthermore, Galaxy is planning to connect the mining site to Hydro-Québec's power distribution system.

Following the end of mining operations, rehabilitation measures will be required to bring the receiving environment back as close as possible to its original state. These measures will include the management of the stockpiles and water from the basins and the demolition of the facilities. A progressive rehabilitation approach will be deployed.

Galaxy plans to start construction works at the mine in 2020 for its commissioning in 2022. According to the latest forecast, the mine will be in operation between 15 and 20 years.

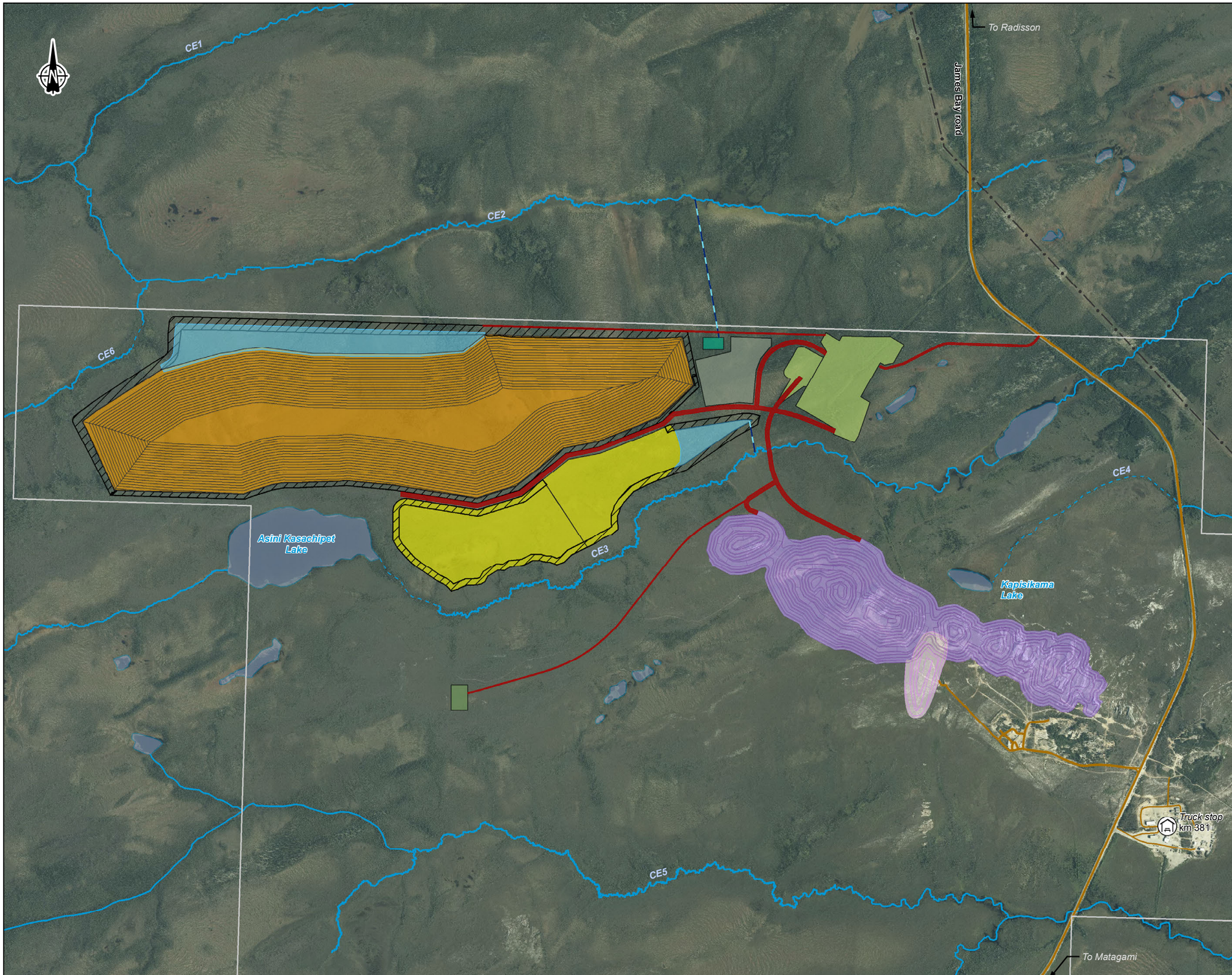
1.3 PHYSICAL SETTING

The climate of the proposed project location is of subarctic continental type. It is characterized by a very cold and long winter and a short and cool summer with limited rainfall, which lasts all year long. The coldest month is January with an average temperature of -23.2°C, and July is the warmest month with an average temperature of 14.2°C. The annual precipitation in the area is 697.2 mm, of which 453.8 mm is rain and 261.3 mm is snow. The average annual wind speed is 14.5 km/h. The direction of prevailing wind is primarily from a western sector throughout the entire year, except for October, November and December when the prevailing direction is from a southern sector.

The surface soils in the proposed mine location are mainly till (sandy) and clay deposits. Based on the information collected as part of the investigations for this project, the rock underneath corresponds with a class II fractured aquifer, meaning the aquifer is a potential source of drinking water. The till at the surface in the proposed mine location is mainly comprised of silty and gravelly sand with traces of clay. It is moderately permeable and has a low aquifer potential.

The proposed project is located inside the Eastmain River watershed. Three lakes are located immediately near the mine: Lake Asini Kasachipet, Lake Kapisikama and Lake Asiyan Akwakwatipusich (Map 2). Lake Asini Kasachipet's outflow, stream CE3, flows east to the unnamed lake that then flows into Lake Asiyan Akwakwatipusich. Lake Kapisikama is isolated throughout most of the year. Its outflow is intermittent stream CE4, that is only visible during the snow melt. It also flows east toward Lake Asiyan Akwakwatipusich. Watercourses CE1 and CE2, both located north of the project site, flow west toward the Miskimatao River and later join the Eastmain River. Watercourse CE5, south of the project site, flows east and also joins the Eastmain River.

Around the proposed mine location, the waterbodies are natural and are not affected by any forms of pollution that originate directly from human activity. Measurements taken on site showed that pH and dissolved oxygen values were low and that the surface water is very acidic. The nature of the soil and the vegetation are the main causes of this condition. Although a few trace metals were higher than the recommended criteria in the surface water samples, they were within a natural range for Canadian surface water. Of the groundwater and sediment samples analyzed, certain exceeded the water quality / sediment criteria for different metals, but as for surface water they are still within the range of the possible natural conditions.



James Bay Lithium Mine Project

Property limit

Project Infrastructure

- Proposed road
- Mine effluent
- Water treatment plant
- Administrative and industrial sector
- Pit
- Waste rock stockpile
- Overburden stockpiles
- Explosives magazine
- Dry storage
- Quarry
- Dike and berm
- Water retention basin

Infrastructure

- Main road
- Access road
- Transmission line
- Truck stop

Hydrography

- CE3 Stream number
- Permanent stream
- Intermittent or diffused flow stream
- Waterbody

GALAXY

James Bay Lithium Mine

Summary of the Environmental Impact Assessment

Project Site General Arrangement

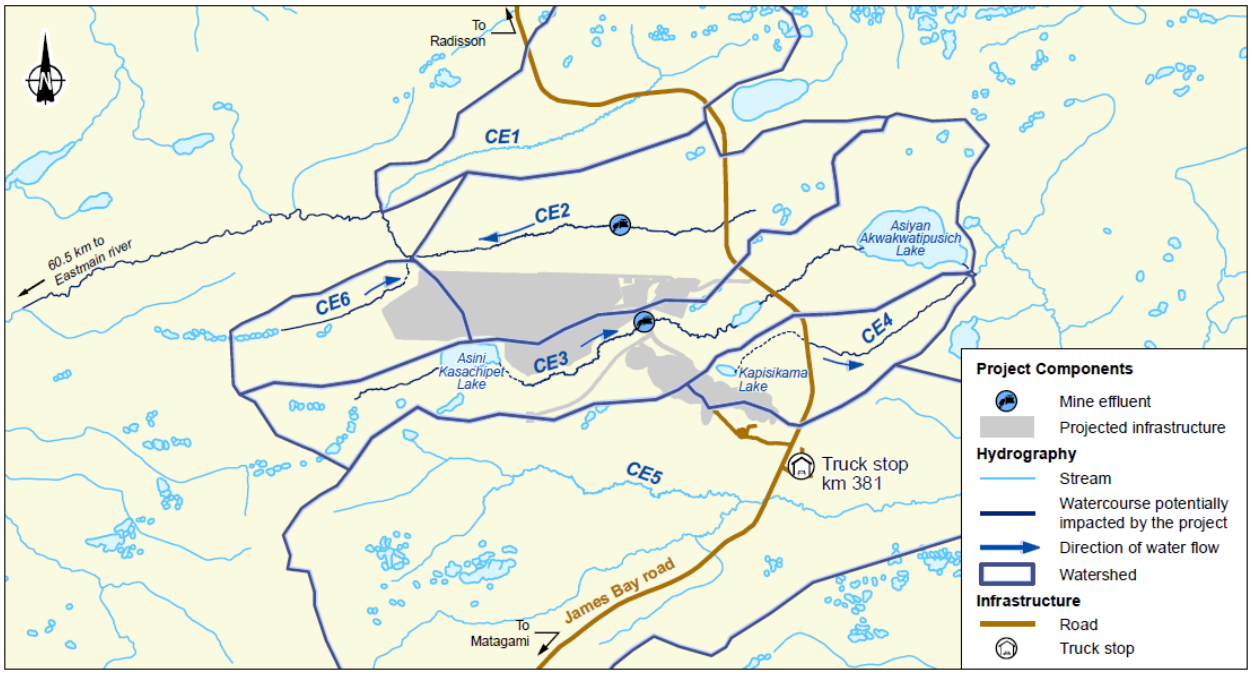
Sources :
Orthoimage : Galaxy, august 2017
Project data : Galaxy, 2018
Pit, quarry and explosives magasine : Mining Plus, 2018
Administrative and industrial sector and ROM pad : Primero, 2018

No Ref : 171-02562-00_wspT161_resP_c1_GA_181005_ANG.mxd

0 185 370 m
UTM 18, NAD83

Map 1

wsp



Map 2: Lakes and Watercourses around the Proposed Mine Location

1.4 ENVIRONMENTAL SETTING

On a regionally scope, the proposed project site is situated at the northeastern boundary of the Abitibi and James Bay Lowlands natural province, a zone characterized by large even plateaus dotted with hills and featuring vast fens and bogs often beginning at the shores of James Bay and extending 100 km inland.

Forest fires have a major impact on plant group structure and composition. Three recent forest fires (2005, 2009 and 2013) in the project area have significantly impacted the site to the point where the short- and long-term development of existing stands could be disrupted. In fact, the repeated disturbances could significantly limit their regeneration. Evidence of the recent fires is still visible, notably through the sparse nature of the newly growing black spruce and jack pine.

Land environments account for a small portion of the proposed project site. Scrubland is the most abundant plant group in the area. Their shrub layer is mainly comprised of the jack pine and black spruce regenerated after the forest fires, as well as trembling aspen, white willow, velvetleaf huckleberry and sheep laurel. The black spruce-lichen forest and the jack pine forest are the two main land groups observed in land wooded areas. In both cases, the velvetleaf huckleberry, sheep laurel and regenerating black spruce are generally the dominant species in the shrub layer; the spruce forest, in turn, are often home to Labrador tea.

Organic wetlands (peatlands) prevail in the proposed mine area, covering most of the total surface of the project site. Peatlands are bogs and fens. The bogs in the proposed project area are the largest and most frequently encountered groups. The bogs are essentially supplied by rainwater (rain and snow). The bog surface is often raised relative to the surrounding landscape and isolated from mineralized soil waters. The surface waters of bogs are strongly acid and the upper peat layers are generally nutrient poor; this has an impact on the composition and diversity of the area's vegetation. The plant community is dominated by cushion forming mosses, shrubs and black spruce trees. Fens are characterized by a very slow internal drainage. While they are also supplied by rainwater (rain and snow), they also receive flowing water enriched by minerals collected from the soil of neighbouring habitats. The vegetation in fens usually reflects the water quality and quantity available, resulting in three basic types: fens without trees or shrubs, shrub fens, and treed fens.

Wetlands and lands around the proposed mine location have a very limited potential for comprising threatened or vulnerable plant species, mainly due to the environment's weak biodiversity and numerous disturbances such as severe forest fires, which significantly modified the plant communities in the study area over the last few years. Only one plant species with a special status was identified at the proposed mine location, in a shrub peatland-like habitat. The species observed was the sterile sedge, a species likely to be designated as threatened or vulnerable.

Seven fish species were found in the lakes and watercourses around the proposed project' site in two fishing efforts realised in 2012 and 2017. The fish species caught in each water bodies are shown in Table 1.

Three species of large mammals are likely to frequent the project area of the natural environment: caribou, moose and black bears. In the proposed project area, the availability of food used by black bear is likely determined by the occurrence of wetlands and disturbed habitats. The latter are key to produce berries on which the bear relies to build up its fat reserves. Disturbed habitats are primarily represented by habitats undergoing regeneration following two fires. Moreover, Cree users reported that bears visit the remote landfill in search of food, making this a good hunting area for this species. In short, the overall study area represents a potential suitable habitat for black bear.

The moose density in Quebec's boreal forest is linked to an unproductive habitat. The moose density in hunting zone 22, which the project site is a part of, is among the lowest in Quebec. In hunting zone 22, an average of 156 moose per year were hunted from 2013 to 2017. Among these, about 15 moose were seen near the proposed project site during an aerial survey.

Caribou benefits from dual protection, at both the federal and provincial levels. Areas providing the highest probability of occurrences are generally residual forest islands formed after forest fires. The habitat available within a 10-km range of the centre of the projected mine is very fragmented. Therefore, due to its high disturbance rate, the study area offers poor habitat conditions for woodland caribou. Also, an aerial survey of 40 km by 40 km around the proposed mine site did not allow for the identification of any caribou.

A bird aerial survey allowed for the identification of 47 specimens of eight species of waterfowl and aquatic birds around the project' site. In addition, an osprey flying over the Eastmain River was observed. The most abundant species was the Canada goose with 19 individuals counted. Additionally, 33 individuals representing six species were noted during ground survey activities. The most abundant species observed on the ground were Wilson's snipe, the common loon and the solitary sandpiper.

Thirty-eight (38) terrestrial bird species were seen in 2017 around the proposed project' site. The area with the largest number of breeding bird species was the wetland habitat, followed by the open and softwood stand habitats. The densest area with breeding pairs was found in open habitats, followed by softwood stands and wetlands, all species combined. The dark-eye junco and the white-throated sparrow were the dominant species in all three areas.

The common nighthawk, a designated species both on the provincial and federal lists, was observed near the project' site. Two more species are also listed: the rusty blackbird and the bald eagle. The rusty black-bird frequents swamps, beaver ponds and peatlands, all of which are still well represented habitats in the proposed mine location and the surrounding areas. As for the bald eagle, suitable habitats for feeding and nesting are available in the study area, although the species was not detected during the 2012 and 2017 surveys.

A dramatic increase in bat mortality has been observed since 2006–2007, du to a disease named the white-nose syndrome (WNS). The presence of WNS has been confirmed in northern Quebec. In 2014, due to the spread of this disease, the little brown myotis and the northern myotis were classified as "endangered" in Canada. Acoustic monitoring conducted during the breeding and migration periods in 2017 confirmed the presence of Myotis bats as well as Big brown bat and Hoary bat. Bats choose swamps, bogs, beaver ponds, lakes and watercourses as hydration and foraging habitats. While most of these keys elements can be found around the project' site, mature forests have almost completely disappeared due to forest fires in the last decade. Also, no natural cavity was found in the sector and therefore there is no likelihood of bat winter resting ground in or around the project' site.

Table 1: Fish species in lakes and watercourses

	CE2	Asini Kasachipet Lake	CE3	Asiyan Akwakwatipusich Lake	Kapisikama Lake	CE4	CE5
White Sucker[1]			X	X			X
Lake Chub[2]	X		X	X			X
Northern Pike[3]				X			X
Yellow Perch[3]					X		
Trout Perch[2]							X
Brook Trout[3]	X		X			X	X
Brook Stickleback[2]		X	X			X	X

1 Image Source: Joseph R. Tomelleri.
2 Image Source: New York State Department of Environmental Conservation.
3 Image Source: Sentier Chasse-pêche Magazine.

1.5 SOCIAL SETTING

The community found in the project study area is Eastmain. The planned mining infrastructure is located on the RE2 trapline. The study area, located in the trapline's eastern section, covers nearly half of its area. It is bordered to the north by the Eastmain River. The Eastmain river segment and a sector with larger lakes in the south are the most frequented. Activities are also carried out along the James Bay road since it is easily accessible. The principal activities carried out on the traplines are hunting, fishing and trapping of fur-bearing animals. They take place year-round, according to specific practices and timetables.

Two permanent encampments are found in the study area, along the James Bay Road. One of these, built in 2016 and located 7 kilometres northwest of the project site, includes a single camp. The second encampment, less than 10 kilometres south of the project site, includes four camps and a tipi. These camps are the users' main camps and may be frequented year-round. Some temporary encampment sites are also present along the Eastmain River. Tents can be set up there, when needed, mainly during moose hunting or for fishing.

The project study area does not have any protected areas. A biodiversity reserve is planned north of the Eastmain community, on a piece of land that cuts across the Wemindji community's land, 60 kilometres north of the proposed mining site.

In addition, 27 areas with prehistoric archaeological potential have been targeted within the proposed project area. These sites are those that are most likely to contain remains attesting to a human presence from prehistoric time up to the twentieth century. Moreover, ancient human presence is evidenced by both the toponymy and the existence of at least one archaeological site east of the mound where the pit will be built (about 400 m). This site is near the km381 truck stop.

1.6 PROJECT IMPACTS

All storage areas at the mine site were set out to limit environmental impacts. Surface drainage channels will be built to divert water from the stockpiles. The same strategy will be used to control surface water around the infrastructure, namely buildings and roads. Surface water runoff will be directed to the main water retention basin. Appropriate wastewater management will be applied. Before being released into the receiving environment, the water will be treated to meet the applicable discharge standards.

Watersheds around the proposed project site will be modified due to the presence of the mine. Because it will receive the mine effluent, CE2 watershed will increase. Watersheds CE3, CE4, CE5 and CE6 will be shrunk. Water flow will increase in CE2 while water levels will remain similar. The changes to the northern sector's hydrology will become negligible at the junction between creeks CE1-CE2-CE6. Creek CE4's water levels will decrease by up to 9 cm from the junction with the James Bay road to its connexion to Asyian Awkawkatipusich Lake. Kapisikama Lake, a small lake with high level of acidity, will drain into the mine pit.

On the other hand, the run-off water from the overburden stockpiles is considered clean, and will be drained by a network of ditches and released into the watercourse CE3. The impacts of the water levels and flows between Asini Kasachipet Lake and the effluent will be minimal.

Apart from the loss of Kapisikama Lake, the project impacts on fish are expected to be low. Follow up studies on fish community required by the federal and provincial regulations will validate this evaluation. Effluent water quality will be continuously monitored to assure compliance with federal and provincial standards.

The apprehended impacts on vegetation are mainly related to the destruction and modification of natural habitats. These impacts are caused by deforestation and excavation necessary for the preparation of the land and the construction of temporary or permanent infrastructure. Work required to develop future mining infrastructure will result in the transformation of approximately 95 hectares of terrestrial and 302 hectares of wetlands. In comparison, in Eastmain traditional lands, the recent forest fires have destroyed 691,294 hectares, while 3,077 hectares were lost for powerline constructions.

Four species of bats are susceptible to be present (three confirmed) in the study area. Bats are listed as endangered species. However, the bat population in the study area was small and therefore the impact on the bat population is considered low. This trend is similar with regards to birds and the impacts on this component are also considered low.

Mine activities will result in various nuisances that could potentially affect the quality of the atmospheric environment, light and sound, groundwater and surface water, as well as vibrations experienced by users of the territory in the mine sector, or by the km 381 truck stop workers and its visitors, even if the regulatory requirements are met. Since the site is in an isolated environment, the current air quality in the proposed mine area is considered very good. Air quality will be affected by mining operations that alter the properties of the air through increased dust suspension. However, the results of the atmospheric dispersion modeling show that the standards will be respected

at sensitive receptors. For noise, the computer modeling study shows that sound levels will also be below applicable regulation limits. Noise levels will increase but will remain acceptable.

Because of its remoteness, sources of vibration in the proposed mine area are almost non-existent. Vibrations will occur with blasting in the pit. Vibration thresholds will be respected at the km 381 road stop and in other sensitive areas around the pit.

The only current night artificial light transmitter is the km 381 roadside station. Changes are expected due to the addition of artificial light to Galaxy's permanent facilities, as well as to the operating activities.

The drinking water supply of the km 381 roadside stop will remain unchanged. The drawdown of the water table associated with the pit will be minimal at the facility wells.

The Cree land use has been subjected to past impacts, such as loss of land due to flooding, loss of terrestrial fauna and flora caused by forest fires, habitat fragmentation with roads and powerlines, and the presence of the truck stop. The area impacted by the project is small compared to these events. Furthermore, part of the proposed project is on land that have been destroyed in the 2005, 2009 and 2013 forest fires and will require decades to completely regenerate. However, the tranquility of the site in the periphery of the mine site could also be affected by the activities of the mine. Users who are used to traditional activities in the planned infrastructure sector may also perceive that their security is compromised by the new vocation of the site. Communication measures will be put in place and monitoring reports made available. For safety reasons, an exclusion zone for traditional activities will be established in collaboration with the tallyman. In addition, hunting and fishing activities for workers will be prohibited to limit the pressure on the resource around the project area.

About 300 workers will be required for construction and 150 workers will be needed to operate the mine. Training will be provided. On a regional scale, activities and business at the truck stop, hotels and at the airport will increase. Circulation on the James Bay road will also increase with the addition of trucks moving from the mine site to Matagami. As such, business development is also expected at the Matagami transhipment centre.

1.7 RISK MANAGEMENT

During the construction, operation, rehabilitation phases, there are risks that potentially hazardous events could impact environmental components. Unexpected events occurring independently of the activities or conditions normally associated with a project’s performance are considered accidents or malfunctions.

The first line of defence against accidents and malfunctions is the introduction of best practices in the areas of health and safety and environmental protection. Being located a fair distance from any permanent dwellings, the James Bay Lithium Mine project poses very little risk to the populations in the area in the event of an accident (the only exception being the truck stop). An accident could nonetheless impact the persons and property at the site, as well as the environment. The site’s location, far from resources that could be deployed, makes it important to identify risks and ensure that resources are put in place to be able to respond diligently and confidently in the event of a major accident.

Measures to minimize risks were incorporated into the design, planning and implementation phases and will therefore be in place throughout the life of the project. The purpose of implementing such measures is to reduce the likelihood of unforeseen accidents and malfunctions occurring. The implementation of preventive measures will also reduce the impact of potential accidents. This approach is part of a stewardship initiative aiming to reduce risks at the source while mitigating their impacts on the environment.

Galaxy is committed to ensuring that the risk management process ensure that the plausible consequences of any accident scenarios that have been identified are sufficiently reduced to keep risk levels as low as reasonably achievable.