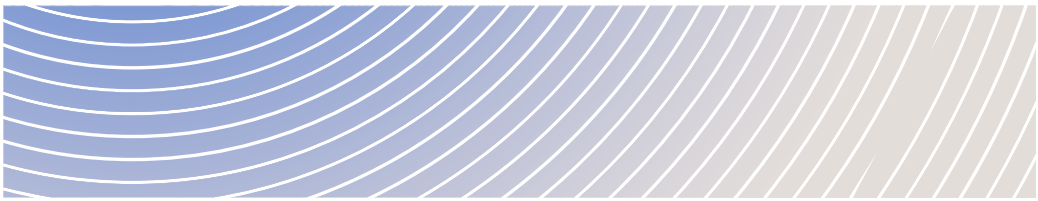
James Bay Lithium Mine Project



DRAFT ENVIRONMENTAL ASSESSMENT REPORT

September 2022

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Grand Council of the Crees (Eeyou Istchee)
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Cree Nation Government
Gouvernement de la Nation Crie

Agence d'évaluation d'impact du Canada
Impact Assessment Agency of Canada

Canada

Catalogue number: EnXXX-XXX/XXXXF

ISBN: XXX-X-XXX-XXXXX-X

The document is also published in French under the title:

Projet de mine de lithium Baie James — Rapport provisoire d’évaluation environnementale

Executive Summary

Galaxy Lithium (Canada) Inc. (the Proponent) proposes the construction, operation, and decommissioning of an open-pit lithium mine in the administrative region of Nord-du-Québec, in the Eeyou Istchee James Bay territory, more specifically on the traditional lands of the Cree Nation of Eastmain. The mine site would be located approximately ten kilometres south of the Eastmain River and 100 kilometres east of James Bay and the Cree Nation village of Eastmain. The James Bay Lithium Mine Project (the Project) would include, in particular, an open pit; accumulation areas for ore, waste rock, tailings, and overburden; a spodumene mill; and minewater management installations including a water treatment plant. Access to the site would be accessible via the Billy-Diamond Highway from Matagami. An air shuttle (*fly-in*/*fly-out*) system would be preferred for non-resident workers who would be housed in a camp located in the industrial sector of the projected mine. The mine would have a production capacity of 5,480 tonnes per day. The Proponent plans to operate the deposit for 23 years, for average annual production of 321 kilotonnes of spodumene concentrate, from which lithium would be extracted.

Under the *Canadian Environmental Assessment Act, 2012* [CEAA 2012], the Project is subject to an environmental assessment by the Impact Assessment Agency of Canada (the Agency), because it includes activities described in paragraph 16(a) of the Schedule to the *Regulations Designating Physical Activities*.

> ***"The construction, operation, decommissioning and abandonment of a new (a) metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3,000 t/day or more."***

This Project is also the object of an environmental impact assessment and review under Chapter 22 of the *James Bay and Northern Quebec Agreement* (JBNQA).

To complete the environmental assessment process, the Agency and the Cree Nation Government, in 2019, signed the *Agreement Under the Canadian Environmental Assessment Act, 2012 Concerning the Environmental Assessments of the Rose Lithium-Tantalum and James Bay Lithium Mining Projects* (the Agreement), and delegated to a Joint Assessment Committee (the Committee), composed of representative appointed by the Agency and the Cree Nation Government, the carrying out of the activities required under CEAA 2012.

The Committee prepared this Draft Environmental Assessment Report, accounting for the concerns and comments of the Cree Nation of Eastmain, the Crees of the First Nation of Waskaganish, the Cree First Nation of Waswanipi, and the public. The Committee also accounted for the technical opinions of Environment and Climate Change Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada, Transport Canada, Public Services and Procurement Canada, the Cree Board of Health and Social Services of James Bay, and the Quebec Ministère des Forêts, de la Faune et des Parcs. Primary concerns expressed were regarding the quality of the water, air, and soil and the possible contamination of traditional food. Concerns were also raised regarding hunting, fishing, trapping, and gathering activities and the wildlife and plant species that could be associated with them. Concerns about road traffic, the massive

arrival of non-Indigenous workers, business opportunities for companies, and access to jobs and training were also submitted.

This draft report presents the assessment of the Project's potential environmental effects and the Committee's conclusions, namely whether the Project is likely to lead to significant adverse environmental effects, with the implementation of the mitigation and follow-up measures. The Committee reviewed the effects the Project is likely to have on:

- the valued components under Federal jurisdiction, as described in subsection 5(1) of CEAA 2012, including:
    - fish and fish habitat;
    - migratory birds;
    - the current use of lands and resources for traditional purposes by the Indigenous peoples; and
    - health of the Indigenous peoples;
- wetlands, a valued component directly linked to a federal decision that would permit the carrying out of the Project, in accordance with subsection 5(2) of CEAA 2012; and
- the species listed in Schedule 1 of the *Species at Risk Act* (SARA) and their critical habitat.

The Committee also accounted for the points indicated in subsection 19(1) of CEAA 2012.

This draft report presents the Project's impacts on the rights of the Cree Nations through a conceptual framework based on Cree values. These values are at the core of the Cree identity and the rights established under the JBNQA and recognized by section 35 of the *Constitution Act, 1982*. In particular, the Project could have impacts on Cree values such as health, welfare, economic prosperity and hunting, trapping and fishing.

The environmental assessment conducted by the Agency brought out the following potential main environmental effects:

- Effects on fish and fish habitat resulting from the harmful alteration, disruption or destruction of habitat, particularly due to the gradual drying up of Lac Kapisikama, hydrological changes to the watercourses and changes in water quality.
- Effects on the wetlands due to their destruction or disturbance, caused by the development of mine infrastructure and the drawdown of the water table.
- Effects on birds and bird habitat, in particular, Common Nighthawk and Rusty Blackbird, two bird species at risk whose presence was confirmed during inventories. These effects would be caused, in particular, by habitat loss and degradation resulting from the development of mine infrastructure or by the Project's activities that could engender risks of collision and disturbance by noise, artificial light and the human presence. The Committee specifies that six other bird species at risk protected by SARA and one threatened bird species according to the Committee on the Situation of Endangered Wildlife in Canada (COSEWIC) could potentially be present in the sector.

- Effects on certain species at risk, including Woodland Caribou, Little Brown Myotis and Northern Myotis, due to habitat loss, the increased risk of predation and the disturbance caused by noise, vibrations and artificial light.
- Effects on the current use of lands and resources for traditional purposes by the Cree Nations, in particular on the practice of hunting, fishing, trapping and gathering. The quality of the experience in the territory could be affected by the disturbance of the sense of peace and the perception of hazards related to road safety and contamination of traditional food.
- Effects on the health of the Cree Nations arising from the contaminant emissions into the air and water. These emissions could affect the traditional resources hunted, fished or gathered for consumption by the Cree Nations.
- Cross-boundary environmental effects in relation to greenhouse gas (GHG) emissions, although they would be moderate in comparison to the emissions on the provincial and national scale.
- Effects on the natural and cultural heritage due to the development of mine infrastructure;
- Effects on the socio-economic conditions of the Cree Nations due to a potential impact of the Project on traditional income-generating activities.

The Proponent is obligated to implement many mitigation measures, which it committed to during the assessment, to reduce or avoid the Project's adverse effects. Offset measures are also proposed to counterbalance certain residual adverse effects. The Committee therefore established the key mitigation measures necessary to avoid any significant adverse environmental effects, accounting for the measures proposed by the Proponent, the opinion of the government experts, and observations received from the Cree Nations and the public. These mitigation measures non-exhaustively include:

- an offset plan to counterbalance the residual effects on fish and fish habitat, particularly the losses related to harmful alteration, disturbance and destruction of fish habitat;
- an offset plan for wetland losses;
- a minewater management program, so that it is captured, treated, and discharged into the effluent, with the goal of minimizing the effects on water quality. This program includes, in particular, the installation of a geomembrane under the ore pile and the haulage roads, so as to prevent groundwater contamination;
- a dust management plan, supported by an air quality follow-up program;
- a traffic control plan, including transportation activities by heavy truck;
- a reduction of concentrate transportation and waste rock handling during the annual moose and goose hunting periods to reduce the disturbance;
- a clause in the employees' contracts of employment to prohibit hunting, trapping, and fishing activities within the mining lease;
- an exclusion zone for traditional activities for safety reasons;
- the hiring of a liaison officer for the Cree Nation of Eastmain, whose role, in particular, would be to inform the Cree Nations about jobs and contracts offered by the Proponent, ensure the harmonious integration of the Cree workers, and raise the non-Cree workers' awareness of Cree culture;

- a complaint reception and handling system that could allow for the implementation of additional mitigation measures, as needed; and
- a communications plan to inform the Cree Nations, the Cree Nation Government, the Cree Board of Health and Social Services of James Bay, the rest area staff, the users of the territory, and the mine employees about the schedule of mining activities, the incidents, the handling of complaints, and the results of the various follow-up programs.

In addition, the Committee established the follow-up requirements to verify the expected effects on the valued components and the effectiveness of the proposed mitigation measures. These follow-ups would enable the Proponent to take corrective actions, if necessary.

In this draft report, the Committee concludes that the Project is unlikely to lead to significant adverse environmental effects, given the implementation of the key mitigation measures. The Committee also concludes that the Project, combined with the past, present and reasonably foreseeable projects, is unlikely to lead to significant adverse cumulative environmental effects on fish and fish habitat, wetlands, migratory birds and birds at risk, Woodland Caribou and chiroptera at risk. The Committee recognizes that the Project could lead to cumulative residual effects on the current use of lands and resources for traditional purposes. However, these effects would not be significant considering the application of the recommended mitigation measures.

The Committee will collect the comments of the Cree Nations, the government experts and the public on this draft report and the potential conditions. These comments will be taken into consideration to finalize the Environmental Assessment Report and the potential conditions, which then will be submitted to the Minister. If the Minister determines that the Project is unlikely to lead to significant adverse effects, he will set the conditions for carrying out the Project in his Decision Statement issued under CEAA 2012. The Proponent thus will be bound to comply with the conditions set out by the Minister, but without releasing itself from the obligation to implement all the commitments it established in its Environmental Impact Statement and subsequent documentation provided as responses and comply with the other legislative requirements of the federal, provincial or local governments. If the Minister determines that the Project is likely to cause significant adverse environmental effects, he will refer the matter to the Governor in Council for a determination of whether those effects are justified in the circumstances.

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List of abbreviations and acronyms

Abbreviation/Acronym	Definition
CEAA 2012	*Canadian Environmental Assessment Act, 2012*
SARA	*Species at Risk Act*
the Agency	Impact Assessment Agency of Canada
the Agreement	Agreement under the *Canadian Environmental Assessment Act, 2012* Concerning the Environmental Assessment of the Rose Lithium-Tantalum and James Bay Lithium Mining Projects
the Committee	Joint Assessment Committee (Cree Nation Government and Impact Assessment Agency of Canada)
the Impact Statement	Environmental Impact Statement
the JBNQA	*James Bay and Northern Quebec Agreement*
the Minister	Minister of Environment and Climate Change
the Proponent	Galaxy Lithium (Canada) Inc.

1. Introduction

1.1 Joint Environmental Assessment with the Cree Nation Government

1.1.1 Context of the James Bay and Northern Quebec Agreement

The *James Bay and Northern Quebec Agreement* (JBNQA) is a modern treaty agreed upon in 1975 by the Cree Nation and the Governments of Quebec and Canada.[1] Section 22 (*Environment and Future Development Below the 55th Parallel*), of the JBNQA establishes an environmental and social protection regime that provides for an environmental and social impact assessment and review process to which certain developments are subject to in the territory covered by the agreement. Mining projects are automatically subject to the assessment and review process under Section 22. Principles[2] guide the assessment and review of projects to ensure the protection of the Crees, their hunting, fishing, and trapping rights, as well as the wildlife and environmental resources on which they depend. Their participation in the environmental and social protection regime is also ensured. Three assessment and review committees on which the Cree Nation has increased participation have been created:

- The Evaluating Committee (COMEV) is a tripartite committee (Cree Nation Government, Government of Quebec, and Government of Canada) mandated to review the preliminary information provided by the Proponent of a Project located in the territory governed by the JBNQA and situated south of the 55th parallel. On the basis of this information, COMEV recommends to the regional, provincial, or federal Administrator of the JBNQA (depending on the Project's location on Category I, II, or III lands, and depending on the nature of the project) whether or not to subject the Project to the environmental and social impact assessment and review procedure, if the Project is not automatically subject to or exempted from the procedure. If the Project is subject to the procedure, the scope of the Environmental Impact Statement to be prepared (the directive) is determined at that time.
- The Environmental and Social Impact Review Committee (COMEX) is a joint committee comprised of representatives appointed by the Cree Nation Government and the Government of Quebec whose mandate is to review the environmental assessment of certain development projects that fall under provincial jurisdiction (e.g., mines), and to recommend to the regional or provincial Administrator whether or not to authorize the development projects and, as applicable, under what conditions.
- The Federal Review Panel (COFEX-South) is the federal body mandated to review the environmental and social impacts of certain development projects under federal jurisdiction (such as ports, airports, or national defence) proposed in the territory concerned. COFEX South is a bipartite committee (Cree Nation Government and Government of Canada) which produces at the end of its review a recommendation to the federal or regional Administrator on whether or not to authorize the development Project and, as applicable, under what conditions.

[1] The JBNQA is also signed by the *Northern Quebec Inuit Association*, the Société d'énergie de la Baie James, and the Société de développement de la Baie James et Hydro-Québec.

[2] The principles are set out in Section 22.2.4 of the JBNQA.

The James Bay Lithium Mine Project (the Project) is subject to a provincial environmental assessment under the JBNQA. In addition, this designated Project is subject to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). The Project is therefore subject to two environmental assessment processes: that of the provincial assessment and review process under Section 22 of the JBNQA and that of CEAA 2012.

On August 28, 2019, the *Impact Assessment Act* (IAA) took effect and CEAA 2012 was repealed. However, in accordance with the transitional provisions of the IAA, the environmental assessment of this Project continues under CEAA 2012 as if this Act had not been repealed.

1.1.2 Joint Environmental Assessment Agreement with the Cree Nation Government

In the winter of 2019, the Cree Nation Government notified the Canadian Environmental Assessment Agency (now the Impact Assessment Agency of Canada, hereinafter referred to as the Agency) of their concerns in relation to the ongoing federal environmental assessment, signalling their desire to ensure that it complies with the requirements set out in the Quebec (Attorney General) v. Moses[3] decision and that it respects the spirit and objectives of the JBNQA.

To this end, on June 27, 2019, the Agency and the Cree Nation Government signed the Agreement under the *Canadian Environmental Assessment Act*, 2012, concerning the environmental assessment of the Rose Lithium-Tantalum and James Bay Lithium Mining Projects (the Agreement).[4] The Agreement stipulates that the Agency delegates to a Joint Assessment Committee (the Committee), composed of representatives appointed by the Cree Nation Government and the Agency, any activity required to complete the environmental assessment of the Project under CEAA 2012.

1.1.3 Joint Assessment Committee

Role of the Committee

As stipulated in the Agreement, the Committee must carry out the environmental assessment and complete it according to the legislative requirements of CEAA 2012. The environmental assessment must be consistent with the spirit and objectives of the JBNQA, particularly with Section 22 (*Environment and Future Development South of the 55th Parallel*) and Section 24 (*Hunting, Fishing and Trapping*). It must also provide for special and concerted participation by the Crees. Certain procedural aspects of the Crown consultations were also delegated to the Committee.

The Agreement also indicates that the Committee must prepare, by consensus whenever possible, the Environmental Assessment Report, its recommendations, and its conclusions. The environmental assessment of the Project must account for CEAA 2012 and Section 22 of the JBNQA, including the social effects. The Committee's conclusions are submitted to Canada's Minister of Environment and Climate Change (the Minister), who will take them into account to decide whether the Project is likely to result in significant adverse environmental effects under section 5 of CEAA 2012. In his decision, the Minister will

[3] In Quebec (Attorney General) v. Moses, 2010 SCC 17, [2010] 1 S.C.R. 557, it is stipulated that "Common sense as well as legal requirements suggest that the CEAA assessment will be structured to accommodate the special context of a Project proposal in the territory covered by the [James Bay and Northern Quebec] Agreement, including the participation of the Cree. "

[4] The Agreement is available at the following link: https://www.ceaa-acee.gc.ca/050/evaluations/document/135131?&culture=en-CA

have to consider the points of view of the Cree Nation Government and the Cree Nations[5] potentially concerned by the Project, and any appropriate mitigation measures.

Participation in the Committee

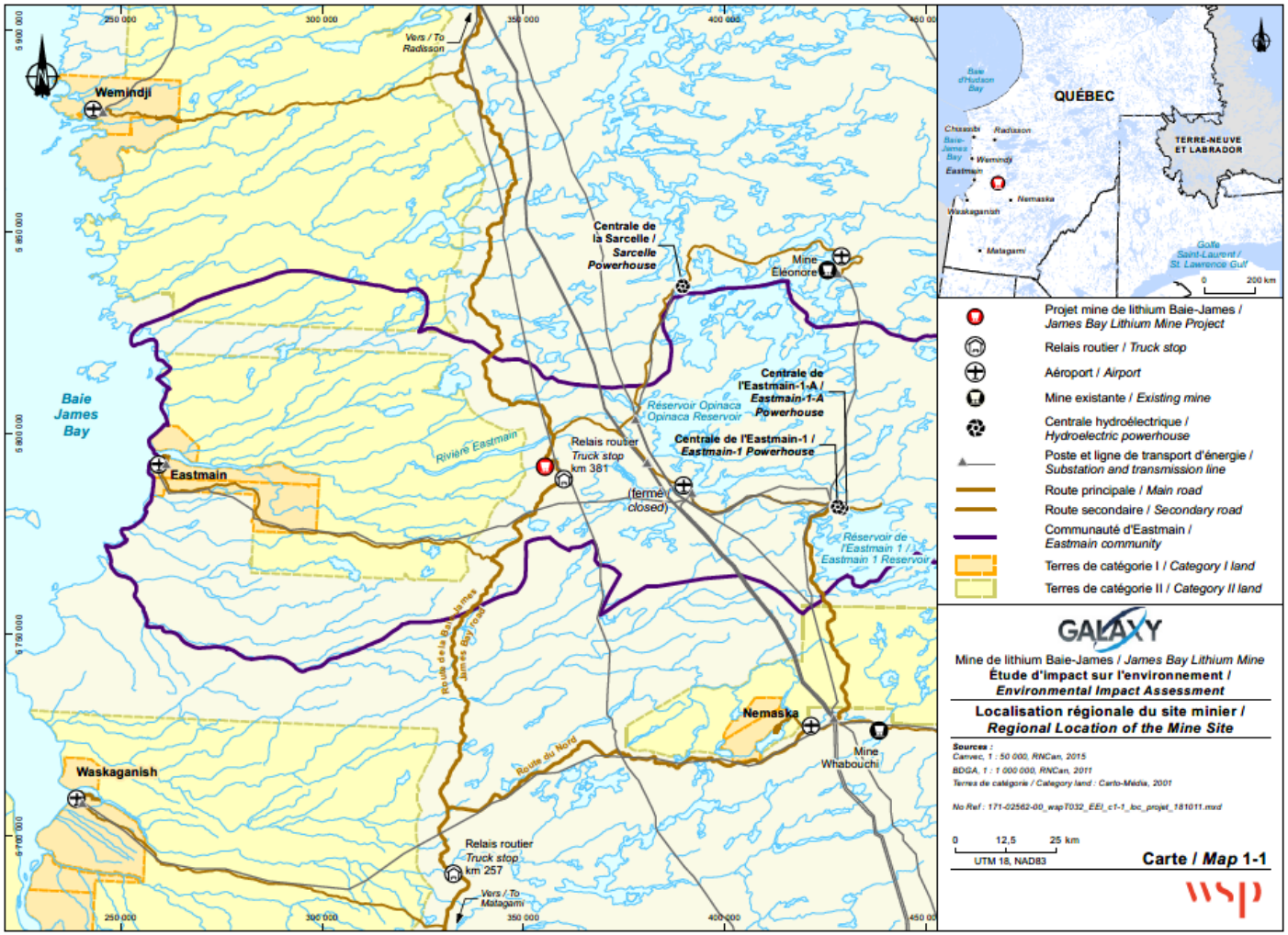
The Committee is composed of two representatives appointed by the Cree Nation Government and two representatives appointed by the Agency. The Committee is co-chaired by one representative appointed by the Cree Nation Government and one representative appointed by the Agency. The Agency provides the Committee with the logistical support and secretarial services necessary for the performance of the functions conferred by the Agreement.

1.2 Brief Presentation of the Project

The Proponent is proposing the construction, operation, and decommissioning of an open-pit lithium mine in the administrative region of Nord-du-Québec, on the Eeyou Istchee James Bay territory. The mine site would be located approximately ten kilometres south of the Eastmain River and 100 kilometres east of James Bay and the Eastmain Cree Nation village. The Project would be located within the Eastmain Cree Nation's RE02 trapline (Category III lands as defined by the JBNQA), near the truck stop at kilometre 381 of the Billy-Diamond Highway (Figure 1:). The Project would have a lifecycle of 23 years and would produce an average of 5,480 tonnes of ore per day. The Project would include an open pit from which spodumene would be extracted, an ore concentrator with a capacity of 2,000,000 tonnes per year, as well as ore, waste rock, tailing, and overburden accumulation areas.

[5] The term "Cree Nations" is used in this and the following chapters when referring to all of the Cree Nations consulted during the environmental assessment: the Cree Nations of Eastmain, Wasakaganish, and Waswanipi. The official English names of these three Cree communities are Cree Nation of Eastmain, Crees of the Waskaganish First Nation, and Cree First Nation of Waswanipi.

Figure 1: Project Location



Source: WSP Canada Inc. (2021)

1.3 Purpose of the Environmental Assessment Report

This Draft Environmental Assessment Report provides a summary of the information and analyses the Committee took into account to determine, in accordance with CEAA 2012 and the Agreement, whether the Project is likely to result in significant adverse environmental effects, in view of the proposed mitigation measures. The Minister will review the final report, which considers input from the Cree, the public, and government experts, before taking his decision under CEAA 2012.

1.4 Scope of the Environmental Assessment

1.4.1 Requirements of the Environmental Assessment

The Project is subject to CEAA 2012 because it includes physical activities described in Section 16(a) of the schedule of the *Regulations Designating Physical Activities* under CEAA 2012: "The construction, operation, decommissioning and abandonment of a new metal mine, other than a rare earth element mine or gold mine, with an ore production capacity of 3,000 t/day or more."

Based on the Project description submitted by the Proponent in October 2017, the Agency conducted a preliminary review of the Project to decide if an environmental assessment was required under CEAA 2012. On November 2, 2017, the Agency invited public and Cree comment on the Project and its potential effects on the environment. On December 14, 2017, the Agency determined that an environmental assessment was required and began conducting it. On February 21, 2018, the Agency sent the Proponent the guidelines for the preparation of the Environmental Impact Statement, which was received on October 30, 2018. On March 7, 2019, the Agency determined that the Environmental Impact Statement was in compliance with the guidelines. On June 27, 2019, the Agency delegated to the Committee the activities required to complete the environmental assessment process.

The Project is also subject to a provincial environmental review under Section 22 of the JBQNA and the Quebec *Environment Quality Act.*

1.4.2 Factors Considered in the Assessment

The Agency has published Guidelines for the Proponent to prepare the environmental Impact Statement. The Guidelines describe the environmental effects and the factors to consider in the environmental assessment and are available on the Canadian Impact Assessment Registry[6]. As required by CEAA 2012, the environmental assessment pertained to the review of the significance of the potential adverse environmental effects provided for in Section 5. Under subsection 79(2) of the *Species at Risk Act* (SARA), the Committee must determine the adverse effects of the Project on the listed species at risk (Schedule 1 of the SARA) and their critical habitats. The Committee must also ensure that measures are taken to avoid, mitigate, and control the adverse effects on species at risk and that appropriate surveillance and monitoring programs are implemented if the Project goes ahead. The measures shall be compatible with any applicable recovery strategy and action plan. In accordance with subsection 19(1) of CEAA 2012, the federal environmental assessment also considered the following factors:

[6] The *Environmental Impact Statement Guidelines* are available at the following link:https://www.ceaa-acee.gc.ca/050/evaluations/document/132451?.&culture=en-CA.

- Environmental effects of the Project, including the effects of accidents or malfunctions that may occur in connection with the Project, and any cumulative environmental effects that are likely to result from the Project in combination with other past or future physical activities;
- The significance of these environmental effects;
- Comments from the public;
- Mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- The requirements of the follow-up program in respect of the Project;
- The purpose of the Project;
- Alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternatives;
- Any change to the Project that may be caused by the environment.

In addition, under subsection 19(3) of CEAA 2012, community and Cree traditional knowledge was taken into account in the environmental assessment of the Project.

As indicated in the Agreement, the environmental assessment also considered the guiding principles of Section 22 of the JBNQA, as stipulated in Section 22.2.4:

- The protection of Indigenous hunting, fishing, and trapping rights within the Territory of the JBNQA and other rights on Category I lands in relation to development activities affecting that Territory;
- The environmental and social protection regime with respect to minimizing the impacts on Indigenous peoples of developmental activities within the Territory;
- The protection of Indigenous people, societies, communities, economies, with respect to developmental activity affecting the Territory;
- The protection of wildlife resources, the physical and biological environment, and ecological systems in the Territory with respect to developmental activity affecting the Territory;
- Indigenous rights and guarantees on Category II lands established under Section 24 of the Agreement;
- Cree participation in the application of the environmental protection regime, including the environmental assessment and review process;
- The rights and interests of non-Indigenous people, whatever they may be;
- The right to develop by persons acting lawfully in the Territory;
- The minimizing of adverse environmental and social impacts of development on Indigenous people and on Indigenous communities by reasonable means with special reference to those measures proposed or recommended by the impact assessment and review procedure.

The environmental assessment also considered the objectives, the alternatives, and the environmental and social impacts of the Project.

1.4.3 Selection of the Valued Components

The valued components (VCs) assessed by the Committee are presented in Table 1. The Committee has targeted its assessment of effects on VCs under federal jurisdiction pursuant to section 5 of CEAA 2012 and on species at risk pursuant to subsection 79(2) of SARA. The Committee also considered the guiding principles, including the socio-economic factors, of Section 22 of the JBNQA

Table 1: Valued Components Selected by the Joint Assessment Committee

Valued Component	Justification
Effects Assessed under Subsection 5(1) of the *Canadian Environmental Assessment Act (2012)*	
Fish and Fish Habitat	Changes in water quantity and quality could result in effects on fish health and the harmful alteration, disruption, and destruction of fish habitat.
Migratory Birds	Disturbance and loss of terrestrial, wetland, and aquatic habitats and increased sensory disturbances could have adverse effects on migratory birds.
Transboundary Environmental Effects	The Project would lead to greenhouse gas (GHG) emissions, which would increase global atmospheric concentrations of GHGs and could contribute to climate change.
Indigenous Peoples—Health Conditions	Changes in the quantity and quality (perceived and actual) of food hunted and gathered as traditional food, drinking water, and the atmospheric, terrestrial, aquatic, sound, and sensory environments could have effects on the health of Indigenous peoples.
Indigenous Peoples—Socio-economic Conditions	Changes in the environment, including the terrestrial environment, could affect the socio-economic conditions of Indigenous peoples.
Indigenous peoples—Current Use of Lands and Resources for Traditional Purposes	Changes in the atmospheric, terrestrial, aquatic, and sensory environments could have effects on the current use of lands and resources for traditional purposes by Indigenous peoples, including access to land and the availability, quantity, and quality of traditional foods and drinking water.
Indigenous Peoples—Physical or Cultural Heritage and Structures, Sites, and Items of Historical, Archaeological, Paleontological or Architectural Importance	Changes in the environment could have effects on natural or cultural heritage and on structures and sites of historical, archaeological, paleontological, or architectural importance.
Effects Assessed Under Subsection 5(2) of the *Canadian Environmental Assessment Act (2012)*	
Wetlands	The Project would cause the drying up of some rivers and streams, which would require federal authorizations. This aspect of the Project could lead to wetland loss and impact wetland functions.
Effects Assessed Under Subsection 29)2) of the *Species at Risk Act*	
Species at Risk	Disturbance and loss of terrestrial, wetland, and aquatic environments, as well as increased sensory disturbances, could have impacts on the following species listed in Schedule 1 of SARA: Rusty Blackbird, Short-eared Owl, Bank Swallow, Northern Phalarope, Yellow Rail, Canada Warbler, Common Nighthawk, Olive-sided Flycatcher, Little Brown Bat, Northern Bat, Wolverine, and Woodland Caribou (Woodland Caribou, Boreal population). The Project could also result in effects on Hudsonian Godwit and Caribou (eastern migratory population) species not currently listed on Schedule 1 of SARA, but which have been assessed as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
Components Considered Under the Agreement	
Socio-economic Conditions (other than those provided for in section 5 of CEAA 2012)	The Project could have effects on the safety of road users, the availability of jobs and training, and the status of women.

1.4.4 Spatial and Temporal Boundaries

Spatial Boundaries

The spatial boundaries define the geographic areas in which the Project's potential effects could occur. They can vary according to each VC of the natural and human environments. The Proponent thus defined several study areas for the purposes of assessing the Project's effects on the biophysical and human environments. The Committee used the spatial boundaries defined by the Proponent for its assessment of the effects.

The spatial boundaries of the local study area (LSA) are shown in Figure 2: . The LSA essentially includes the footprint of the proposed infrastructure. It covers an area of 36.9 square kilometres and is located on either side of the Billy-Diamond Highway at the kilometre 381 truck stop. The LSA is characterized by the presence of large plateaus dotted with hills. Wetlands dominate the landscape of the LSA, making up nearly 79% of its area. Terrestrial environments, which account for about 18% of the surface area of the LSA, have been particularly impacted by forest fires over the past 15 years. The numerous rivers and streams in the LSA are located within the Eastmain River watershed.

The Proponent adjusted the boundaries of the study area for certain VCs selected in the Environmental Impact Statement to adequately describe the existing conditions of the receiving environment prior to the Project, and to assess the Project's potential effects on each valued component (Figure 3: 3). For example, the Proponent defined the spatial boundaries of the study area for the human environment based on land use around the Project's footprint. The Proponent also selected specific study areas for caribou and waterfowl. The specific study areas are shown in Figure 3 and justified in the sections that deal with these components.

Temporal Boundaries

The temporal boundaries are established to account for all the activities of the Project likely to cause adverse environmental effects. In the context of this environmental assessment, the Proponent defined the temporal

boundaries according to the schedule and the duration of the Project's activities that may have adverse environmental effects. The Committee used the temporal boundaries defined by the Proponent, a 39-year period that encompasses the Project from the beginning of the construction phase to the end of the monitoring phase.

Construction: The construction phase, projected to last 18 months, including deforestation and clearing of the vegetation required to prepare the sites and construct the mining infrastructure.

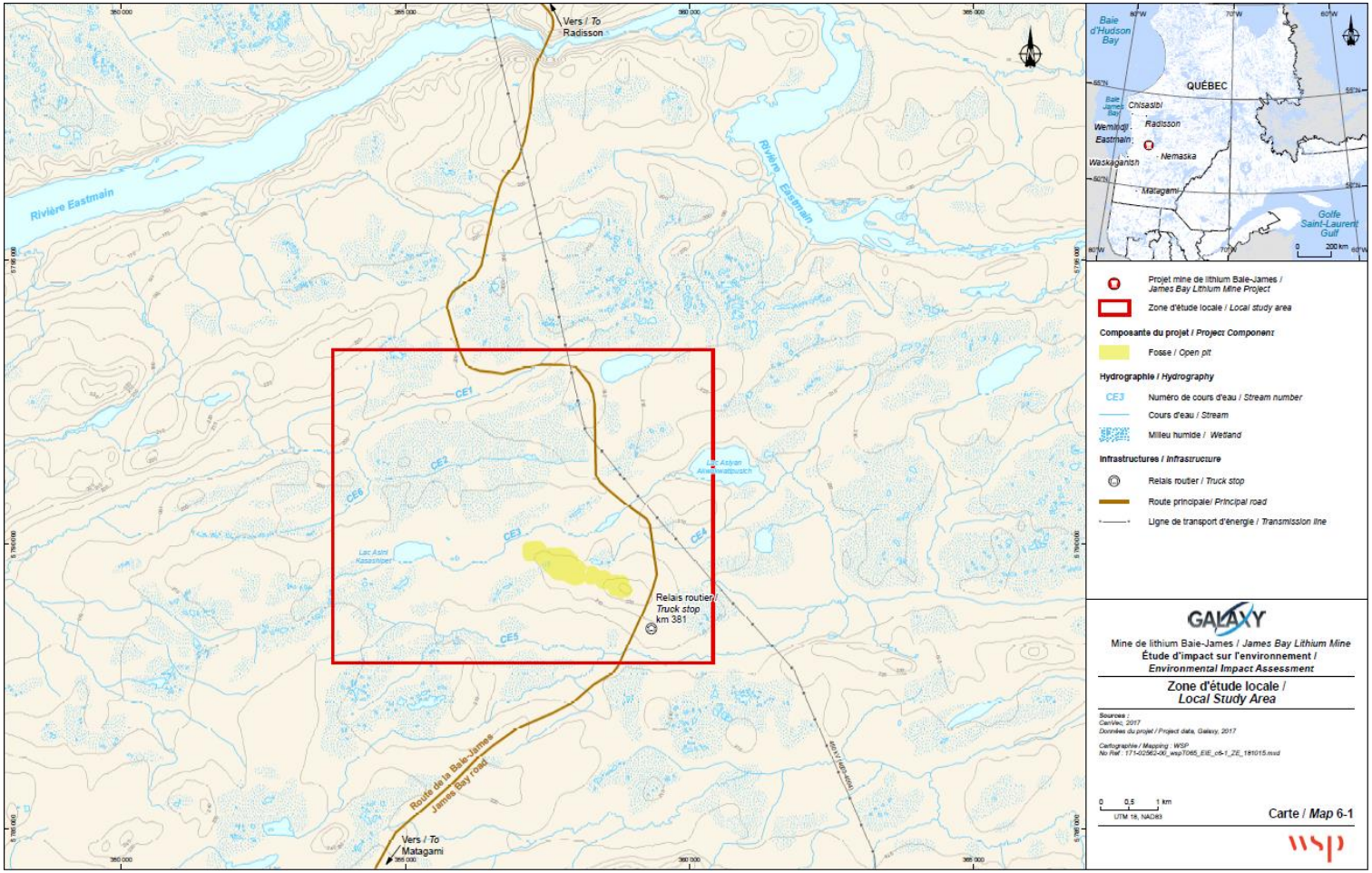
Operational: The operational phase, projected to last 18.5 years, corresponds to commercial production and includes mining of the pit, waste rock management, water management, and ore transport.

Decommissioning: Decommissioning of the mine site, projected to last three years, is the phase following the total cessation of commercial production during which the mining infrastructure will be dismantled and the mine site reclaimed.

Monitoring: The site monitoring phase, beginning after decommissioning and extending over a minimum period of five years, will include the monitoring of the physical stability of the infrastructure, various environmental factors (e.g., water and air quality, water levels around the pit, composition of vegetation, and animal populations), and

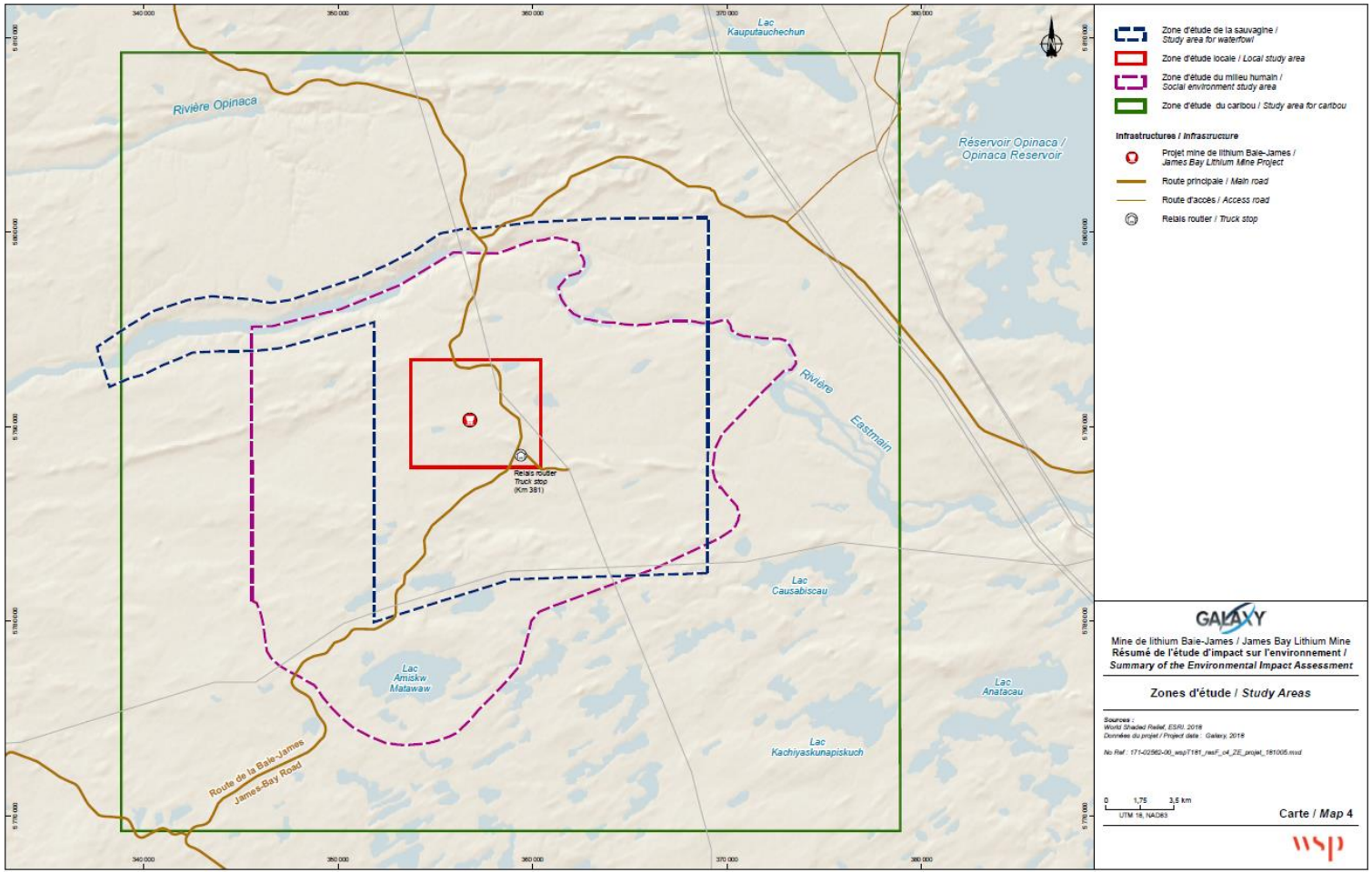
aspects of the human environment (socio-economic conditions, current use of land and resources for traditional purposes, quality of life, and well-being).

Figure 2: Local Study Area of the Project



Source: WSP Canada Inc. (2021)

Figure 3: Other Study Areas of the Project



Source: WSP Canada inc. (2021)

1.4.5 Methodology and Approach

The Committee, in collaboration with government experts (federal, provincial, and Cree) [see Section 4.3], defined and assessed the Project's adverse environmental effects based on the Environmental Impact Statement submitted by the Proponent, additional information provided by the Proponent during the environmental assessment, as well as comments, concerns, and knowledge received from the Cree and the public.

The Committee reviewed the effects of potential environmental changes on the VCs selected in Table 1 and determined the residual adverse effects after accounting for the implementation of mitigation measures and monitoring programs proposed by the Proponent. The Committee then determined the significance of residual effects for each VC.

To characterize the significance of the residual effects, the Committee used the same criteria as the Proponent, namely intensity, extent, and duration. The Committee also considered reversibility and frequency according to the Agency's Operational Policy Statement, Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under CEAA 2012 (Canadian Environmental Assessment Agency, 2015a). These criteria are defined as follows:

- The **intensity** indicates the degree of change the VC under study would undergo. The assessment of the intensity accounts for the ecological or social context of the component. The intensity can integrate the notion of the time when the effect would occur, which may refer to a phase of the component's lifecycle (migration, breeding, feeding, etc.) or a period during which a cultural, spiritual, or recreational activity would be practised by a Cree Nation or population (e.g., the hunting season);
- The **extent** corresponds to a geographic area over which the adverse effects would occur;
- The **duration** corresponds to the period during which the adverse effects would be felt;
- The **frequency** corresponds to the rate at which the adverse effects would occur during a given period; and
- The **reversibility** corresponds to the probability that a VC would recover from the adverse effects caused by the Project.

The Committee assigned three effect levels to each criterion. The example, the "duration" criterion was scored according to a short, medium or long-term effect. The Committee also considered existing federal, provincial, and Cree Nation Government regulatory standards, criteria, and guidelines in determining the significance of residual effects.

Appendix A defines the Committee's assessment criteria for each of the VCs assessed under subsections 5(1) and 5(2) of CEAA 2012. The Committee then used a grid that combines the levels attributed to each of the criteria (intensity, extent, duration, frequency, and reversibility) to determine the significance of each residual effect on each VC (see Appendix A).

The Committee's analyses and conclusions about the significance of the environmental effects on the VCs selected and assessed under subsections 5(1) and 5(2) of CEAA 2012 are presented in Chapters 5 and 6. Appendix B summarizes the Committee's assessment of residual effects on the VCs after consideration of mitigation measures and monitoring programs. The Committee described the residual effects on the socio-economic VCs considered under the Agreement and the Proponent's associated measures in Chapter 6.5,

but the Committee did not conclude on their significance because the Minister cannot set conditions regarding these effects. The Committee also assessed the impact of the Project on Cree values in Chapter 8.

2. Project Overview

2.1 Project Location

The purpose of the Project is to operate an open-pit mine to extract lithium ore. It would be located in the Nord-du-Québec administrative region, in the Eeyou Istchee James Bay territory, more specifically on the traditional lands of the Cree Nation of Eastmain. The geographical coordinates (NAD83) of the mine site would be latitude 52.234928 and longitude -77.066414. Under the *James Bay and Northern Quebec Agreement* (JBNQA), the Project would be located on Category III lands, where the Cree have exclusive trapping rights. Certain wildlife species, particularly aquatic species, are also reserved for their exclusive use (sections 24.3.19 and 24.7.1 of the JBNQA). As shown in Figure 1, the mine site would be located approximately ten kilometres south of the Eastmain River and 100 kilometres east of the Cree Nation village of Eastmain. Access to the site would be via the Billy-Diamond Highway from Matagami. This road crosses the mining property at kilometre 381, near the kilometre 381 truck stop managed by the Société de développement de la Baie-James (SDBJ).

The mining project would be located in the Eastmain River watershed (Figure 4). The water system in the local study area (LSA) represents a very small percentage of the Eastmain River watershed (0.1% in total). Streams CE1, CE2, and CE6 flow west toward the Miskimatao River and then join the Eastmain River. Streams CE3, CE4, and CE5 flow eastward to also join the Eastmain River. Stream CE3 connects Lac Asini Kasachipet and Lac Asiyan Akwakwatipusich, among others. Lac Kapisikama, located near the proposed pit, is connected to intermittent stream CE4

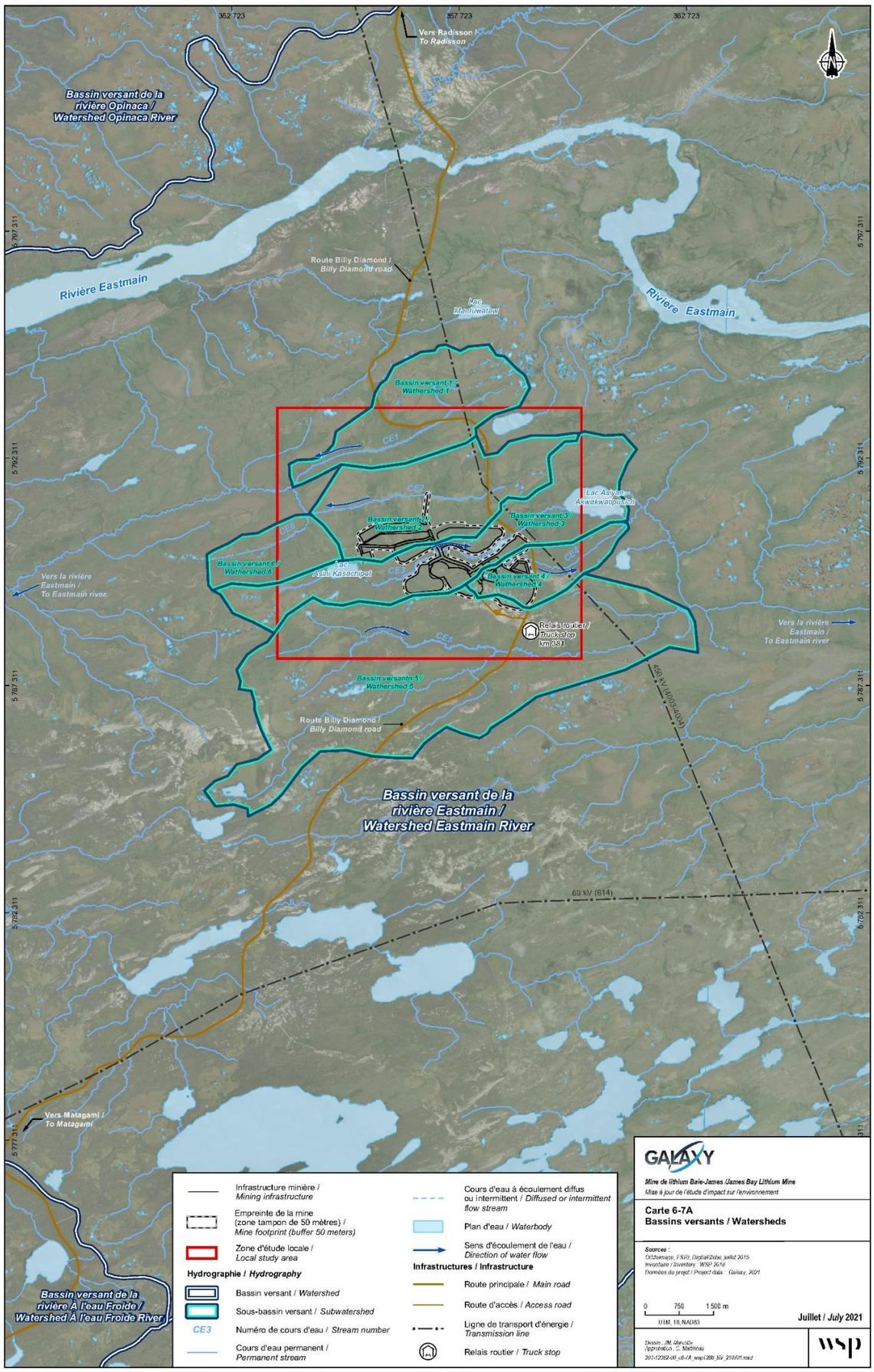
2.2 Project Components

The Project components covered by this environmental assessment are illustrated in Figure 5 and are briefly described below.

2.2.1 Pit and Industrial Complex

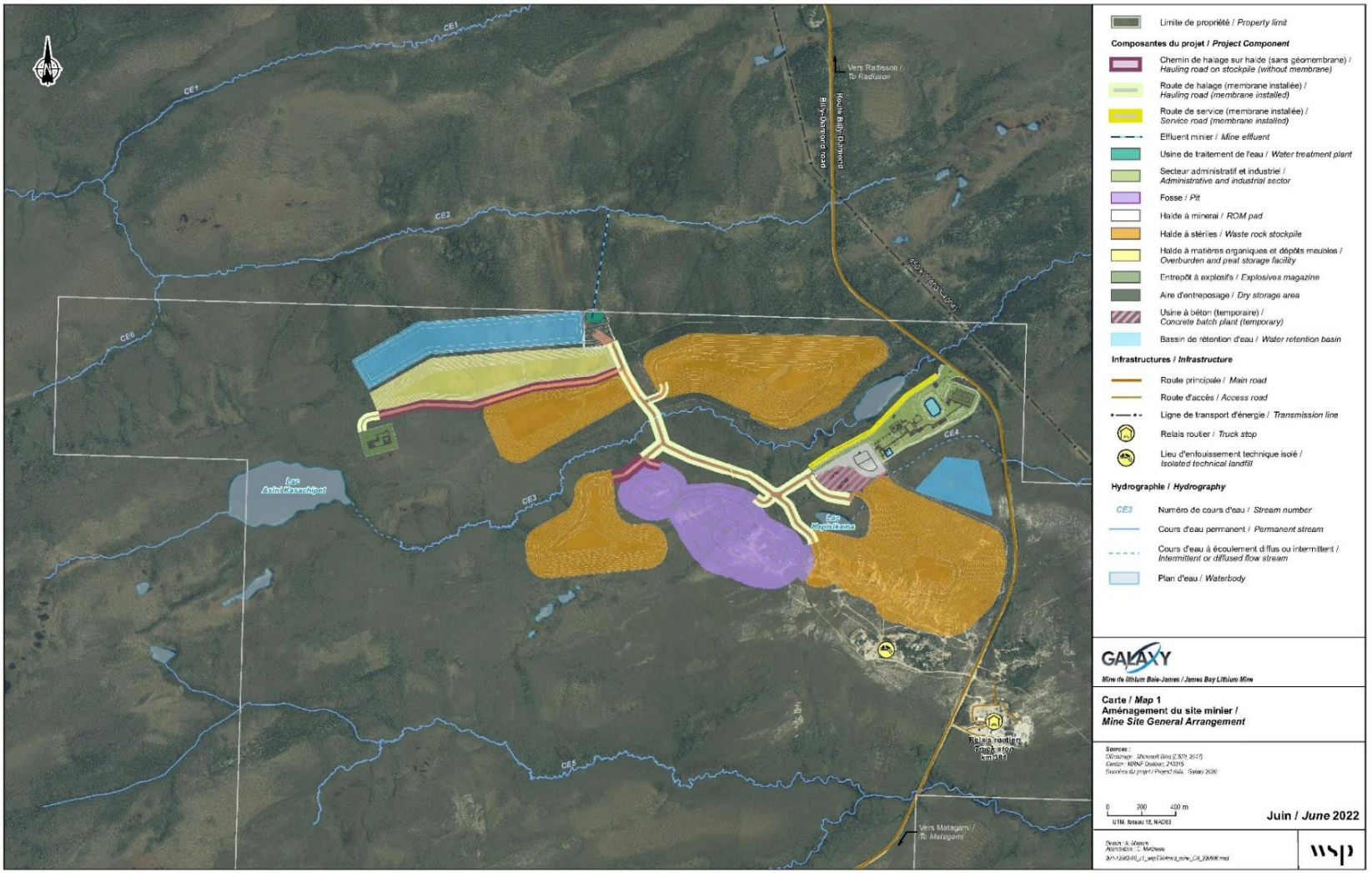
The Project would include an open pit with a total area of 51.09 hectares and a depth ranging from 140 to 250 metres depending on the section of the pit. Approximately 173 million tonnes of ore, waste rock, and overburden would be extracted from the mine over the life of the Project. The Project would include an industrial complex that contains a storage dome for blasted ore, a crushing circuit, conveyors, a lithium spodumene concentration plant, and an industrial water pond (Figure 6). The concentrator would use a dense media separation (DMS) process and would have an estimated production capacity of two million tonnes per year. The Proponent anticipates a nominal production of spodumene concentrate ranging from 317,107 to 378,036 tonnes per year.

Figure 4: Location of Local Study Area and Watersheds



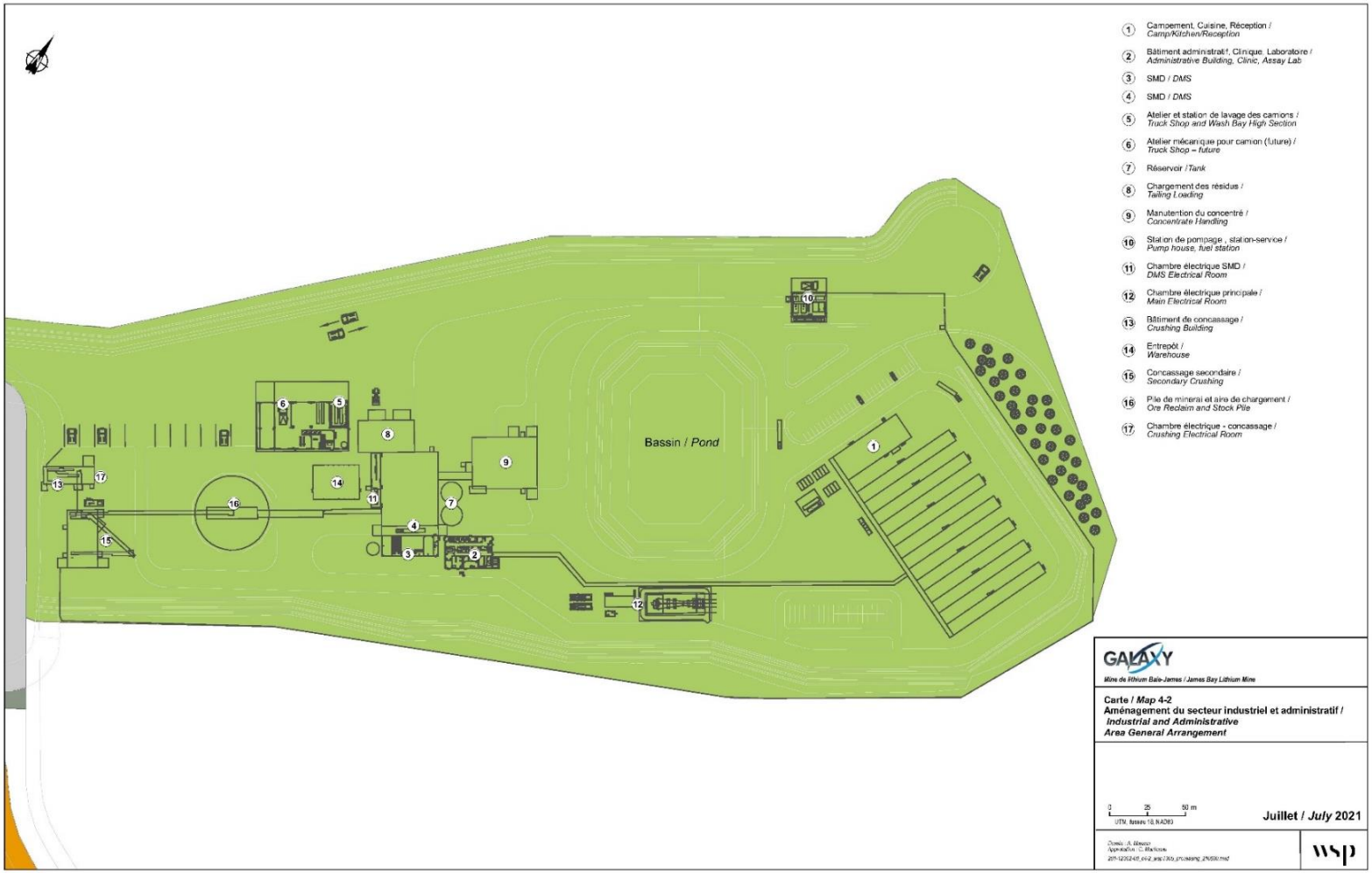
Source: WSP Canada inc. (2021)

Figure 5: Main Components of the Project



Source: WSP Canada Inc. (2022)

Figure 6: Development of the Industrial and Administrative Complex



Source: WSP Canada Inc. (2021)

2.2.2 Accumulation Areas

The Proponent plans to set up four accumulation areas for tailings and waste rock. The west and northeast stockpiles would be located north of stream CE3, while the east and southwest stockpiles would be located south of this stream, on either side of the pit. The east stockpile would extend to the southeast end of the pit once the extraction of mineral resources at this location is complete. An unconsolidated deposit and organic material (overburden) accumulation area would be set up to the northwest of the mine site, while the ore stockpile would be located in the western portion of the industrial complex.

All accumulation areas would be a minimum of 60 metres from the high-water mark of streams and lakes, with the exception of the east waste rock stockpile, which would encroach on a segment of intermittent stream CE4 that drains Lac Kapisikama. A geomembrane would be installed under the ore stockpile. The Proponent has not provided geomembranes for the other accumulation areas since they have percolation rates that meet the standards in effect. Figure 5 illustrates the accumulation areas described above. Table 2 shows the main characteristics of the accumulation areas.

Table 2: Main Characteristics of the Accumulation Areas

Accumulation Area	Capacity	Height (in metres)	Area of the Footprint (in hectares)
Ore stockpile	≥20,000 tonnes	7	3.4
Waste rock and dry tailings stockpile	161.3 megatonnes (77.5 cubic megametres)	53 to 83	172.5
Overburden stockpile	5.8 megatonnes (2.90 cubic megametres)	16	25.36

2.2.3 Water Management

This section describes the planned surface water management at the mine site. In the construction phase, the Proponent would first install the north water management pond, the water treatment plant, the explosives storehouse and haul roads, including the installation of a culvert at the crossing of the CE3 stream. It would also prepare the surfaces for the various accumulation areas and the industrial section. No stream diversion or draining activities are planned during the construction phase. Mine water would be collected in ditches and directed to the north water management pond by runoff or pumping. Solids suspended in the water would settle in this pond. If necessary, excess water would be directed to the plant for treatment and then discharged to stream CE2. A temporary concrete plant, necessary for the construction of the infrastructures, would be fed by water pumped directly from Lac Kapisikama. During the construction phase, domestic wastewater from the workers' camp would be treated using a rotating biological contactor. This wastewater effluent would be discharged to stream CE4.

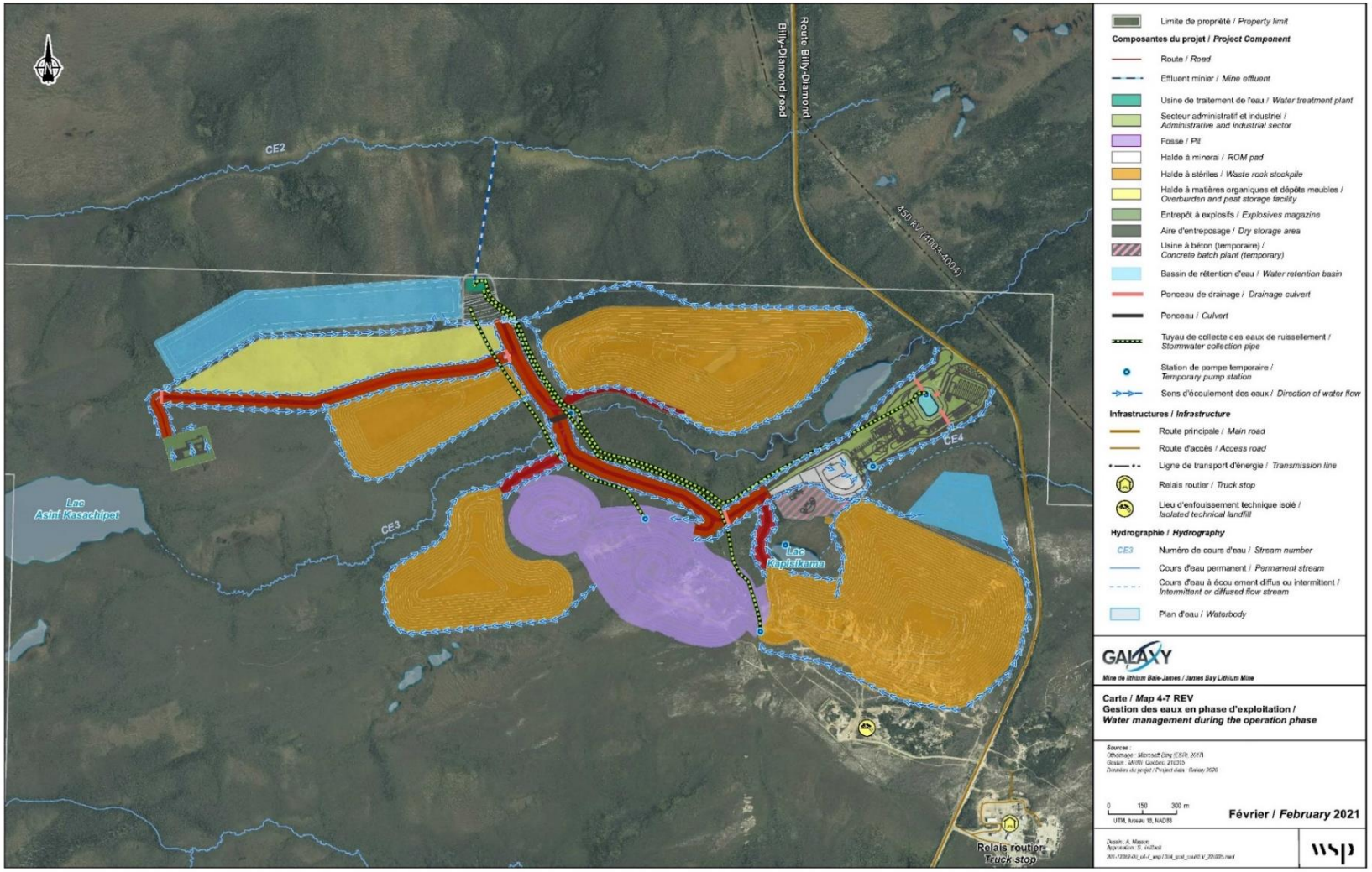
In the mining stage (Figure 7), the pit would be dewatered to extract the ore. In other words, the water accumulating in the pit would be pumped to the north water management pond. This dewatering would lead to the lowering of the water table, which would cause the gradual drying up of Lac Kapisikama as of the fourth year of operations.

Runoff and seepage from the east waste rock accumulation area and the industrial section would be directed to the east water management pond and then pumped to the north water management pond. However, water from the other waste rock accumulation areas and the overburden stockpile would be collected in ditches and directed straight to the north water management pond.

The mine effluent would be treated to meet applicable criteria prior to discharge to stream CE2. If the monitoring criteria are exceeded, the water treatment plant will be put into recirculation mode until the readings are adequate. During this period, water leaving the plant would be returned to the north water management pond rather than to the effluent.

The Proponent intends to prioritize the recirculation of contact water. Water requirements for the concentrator, fire protection, and dust control would be met by water stored in the north water management pond and the industrial water pond. No water withdrawals from streams are planned.

Figure 7: Surface Water Management at the Mine Site During the Operation Phase



Source: WSP Canada inc. (2022)

2.2.4 Roads

The access road to the site would be 50 metres long and would connect to the Billy-Diamond Highway at kilometre 382. For safety reasons, Billy-Diamond Highway would be widened by adding turning lanes to enter and exit the access road. A gatehouse would be installed to control access to the industrial section. Twenty-five-metre-wide haul roads would be constructed on the site, over a length of 6.5 kilometres, for the transportation of ore and tailings. One of these routes would cross stream CE3 (Figure 5). A service road would provide access to the north water management pond and the explosives storehouse.

The roads would consist of a foundation fill of loose deposits (sand, silt, and gravel) from the stripping of the pit, the industrial area, and the water management ponds. This foundation would be covered with various materials such as a linear low density polyethylene (LLDPE) geomembrane as well as subgrade and wearing courses made of waste rock. This geomembrane, which is intended to prevent groundwater contamination, would also cover the road's side ditches. The waste rock would be taken from the pit. The rationale for this unique haul road design is detailed in Section 3.2, Project Alternatives.

2.2.5 Energy Supply

The mine site would be connected to Hydro-Québec's electrical distribution network, located south of the mine site, by a 69-kilovolt power line. This new power line is about 10 kilometres long and would be the main source of electricity supply. However, the buildings would be heated by propane appliances. In addition, intermittent use of diesel generators would be required to meet peak demands.

2.2.6 Workers' Camp

The workers' camp would be located in the administrative section of the mine site (Figure 6). It would accommodate up to 280 workers during the construction phase and 180 workers during the operation phase. The camp would include dormitories, a kitchen, a cafeteria, a common room, a training room, and a drinking water treatment system. The camp would also be served by a domestic wastewater treatment system. The Proponent would like to arrange with the SDBJ for the first set of workers to be housed at the kilometre 381 truck stop prior to the installation of the first wings of the camp.

2.2.7 Other Facilities

The Proponent plans to set up several other facilities, including administration buildings, a fuel storage area, and an explosives storage site (Figure 5). The Proponent would use buildings to be assembled that would arrive in containers. Since energy supply would be a limiting factor, the Proponent would prioritize energy-efficient solutions in the design and material selection of these buildings.

The fuel storage area would be located in the service area of the industrial section. This area would include diesel tanks, a tank filling area, and a fuelling station for heavy vehicles. The explosives storage site, located west of the overburden stockpile, would include an explosives storehouse, a blasting cap storage facility, and a building for mixing. This site would be fenced off with a buffer zone around it to protect the buildings from forest fires. The Project site would be connected to the fibre-optic network. The cable would be buried along the site access road and the Billy-Diamond Highway.

2.3 Project Activities

The activities required to carry out the Project are listed in Table 3 below according to the phases of its lifecycle. The expected duration of the Project is 23 years.

Table 3: Physical Activities of the Project and Description of Activities by Performance Phase

Activities	Description
Site Preparation and Construction (1.5 year)	
Site Preparation	• Deforestation, overburden stripping, excavation, and earthwork for building construction; • Preparation of the waste rock extraction site in the pit footprint and blasting of the waste rock; • Installation of temporary facilities required for construction work; • Creation of temporary access roads; • Construction of the workers' camp; • Installation of a guard station at the site entrance.
Construction Work	• Construction of the access, service, and haul roads; • Development of turning lanes for the site entrance and exit at the intersection of the Billy-Diamond Highway and the site access road; • Construction of buildings, support infrastructure, and the fibre-optic line; • Construction and commissioning of the 69-kilovolt power line by Hydro-Québec;[1] • Development of tailings, overburden, and ore accumulation areas; • Development of a water management system (drainage ditches, north and east water management ponds, water treatment plant).
Operations (18.5 years)	
Open-pit Mining	• Pumping of water to dewater the pit; • Rock drilling, blasting and extraction; • Handling and storage of ore, tailings, and overburden; • Use and management of explosives by a third-party contractor.
Ore Processing	• Crushing of the ore and storage in the ore stockpile, under a dome; • Treatment of spodumene ore by a dense media separation process.
Water Management	• Recovery and treatment of mine water and discharge at the final effluent point into stream CE2; • Wastewater effluent treatment and discharge to stream CE4.
Decommissioning (3 years)	
Dismantling of the Facilities and Support Infrastructure	• Dismantling of buildings, support infrastructure, as well as water lines and pumps; • Creation of a spillway for the pit and for breaches in the north water management pond dike; • Scarification and vegetation of nonessential road infrastructure.
Site Reclamation	• Natural flooding of the pit; • Rehabilitation of the contaminated lands if applicable;

Activities	Description
	• Rehabilitation and revegetation of the mine site; • Management of waste and hazardous materials.

[1] The construction and commissioning of the power line by Hydro-Québec is not part of the Project assessment.

3. Project Justification and Alternatives Considered

3.1 Purpose of the Project

The purpose of the Project is to operate an open-pit mine to extract lithium ore. Lithium has very diverse applications. In particular, it can be used in manufacturing of glass, ceramics, lubricants, polymers and pharmaceuticals, as well as in air treatment and production of lithium-ion batteries. In the past, glass and ceramics manufacturing occupied the biggest share of the lithium market. Manufacturing of lithium-ion batteries henceforth represents the main market for lithium. According to the Proponent, carrying out the Project would allow the extracted lithium to be used to meet the growing demand for this ore. It forecasts economic impacts for Quebec, particularly for the Nord-du-Québec administrative region and the Cree Nations.

Some members of the Cree First Nation of Waswanipi questioned the necessity of a new lithium mine in the James Bay territory at a time when other lithium mines are under construction. To respond to this concern, the Proponent indicated that the International Energy Agency forecasts significant growth of production of electric vehicles over the next few years. It adds that it has learned lessons from the problems encountered by other proponents and intends to improve the management and execution of its Project. In addition, given the high lithium content of the deposit, 1.4% lithium superoxide, the Proponent is convinced it can carry out a profitable Project.

3.2 Alternatives to Carry Out the Project

Under CEAA 2012, the environmental assessment of a Project must account for alternatives that are technically and economically feasible and their environmental effects. In 2018, the Proponent provided the Committee with an Environmental Impact Statement on the James Bay Lithium Mine Project. Subsequently, the Proponent optimized the planning of the mine site and certain components of the Project, particularly with the goal of reducing its footprint and the transportation distances on the site. In 2021, it therefore submitted a revised Environmental Impact Statement reflecting these changes. In this document, the Proponent outlined different alternatives for the main components of the Project and justified each preferred option. This chapter describes this approach for the main components of the Project.

The Proponent indicates it opted for open-pit mining from the outset, because spodumene pegmatites are located on the surface. It adds that this lithium extraction method is preferred for technical and economic reasons.

3.2.1 Waste Rock and Tailings Deposition Method

The Proponent considered the following waste rock and tailings deposition methods:

- Hydraulic deposition of tailings in the form of sludge, including separation of fine and coarse tailings;
- Separate deposition of waste rock and tailings;
- Co-deposition of waste rock and tailings.

Hydraulic deposition of tailings is a method by which the tailings are submerged in water to reduce the oxygen intake and thus avoid acid mine drainage. The Proponent excluded this option due to a lack of space and the absence of favourable topographic features on the site. It also indicates that this deposition method necessitates management of a large volume of water and may generate significant adverse environmental effects in the event of a dike breach, such as landslides and contamination of the neighbouring environment.

After treatment of the ore by dense media separation (DMS), the tailings obtained would be filtered and dehydrated on a sieve to obtain a moisture rate below 10%, which would allow their loading, transportation and piling. The Proponent therefore explored two options, co-storage of waste rock and tailings in two separate repositories in the same pile, or mixed co-deposition. It estimates that these two deposition methods present few differences in the areas and volumes required. Finally, the Proponent chose piling by co-deposition on four separate piles. This method involves mixing the waste rock and tailings. In other words, tailings cells are surrounded by waste rock. These cells are also separated by a waste rock layer to avoid migration of particles. The Proponent specifies that it preferred this option, given the following advantages:

- improvement of the physical stability of the pile slopes in waste rock fill zones;
- cccelerated consolidation and better shear resistance of the tailings;
- reduction of the risk of breach of the fill and the tailings containment slope;
- reduction of dust production and tailings erosion; and
- possibilities of gradual closure.

Natural Resources Canada (NRCan) is of the opinion that, according to the results of the critical tests performed, waste rock and tailings management by co-deposition is satisfactory.

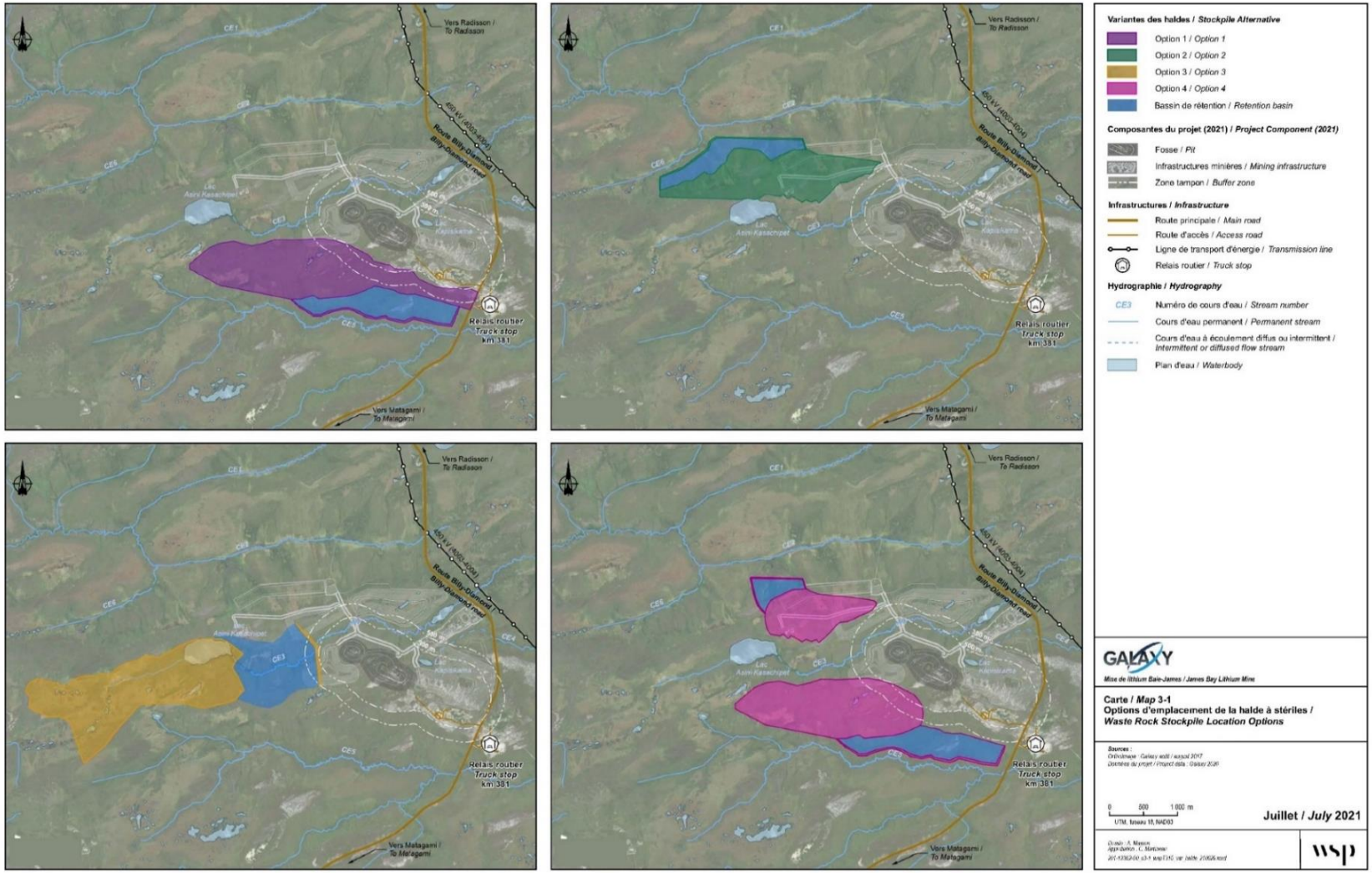
3.2.2 Location of the Waste Rock and Tailings Pile

In 2018, the Proponent produced a multicriteria analysis to determine the optimum location of the waste rock and tailings piles, considering the environmental, technical, economic, and socio-economic aspects. The four options initially considered by the Proponent are illustrated in Figure 8. The first option provided for a single pile south of Route Billy-Diamond Highway and the kilometre 381 rest area. However, this option was excluded by the Proponent, because it could have affected Watercourse CE5, valued by the tallyman of Trapline RE02 and his family for traditional activities. The second option involved a pile located northwest of the pit, but the capacity of this pile would have been restricted by the limits of the mine property and the presence of two bodies of water. In the third option, a pile extending on the north side of the pit would have necessitated dewatering of Watercourse CE3 and Lac Asini Kasachipet. The fourth option involved two separate piles, a tailings pile northwest of the pit and a tailing pile southwest of the pit. The Proponent did not retain options 3 and 4, because they were not economically advantageous. Moreover, the third option would have resulted in the destruction of fish habitat. For these reasons, the Proponent had initially selected the second option, namely the waste rock and tailings pile in co-deposition, located northwest of the pit.

In 2021, the Proponent optimized the layout of the mine site to reduce the footprint of the Project and the transportation distances of the excavated materials, so that a completely different option was preferred for the location of the waste rock and tailing piles (Figure 9). The Proponent considered the hydrogeological characteristics of the mine site to decide on the location of the piles, particularly the hydraulic conductivity of the stratigraphic units and the groundwater flow direction. The Proponent henceforth prefers four waste rock and tailings piles, all positioned near the pit, to the west, northeast, east and southwest. This new layout would reduce the footprint of

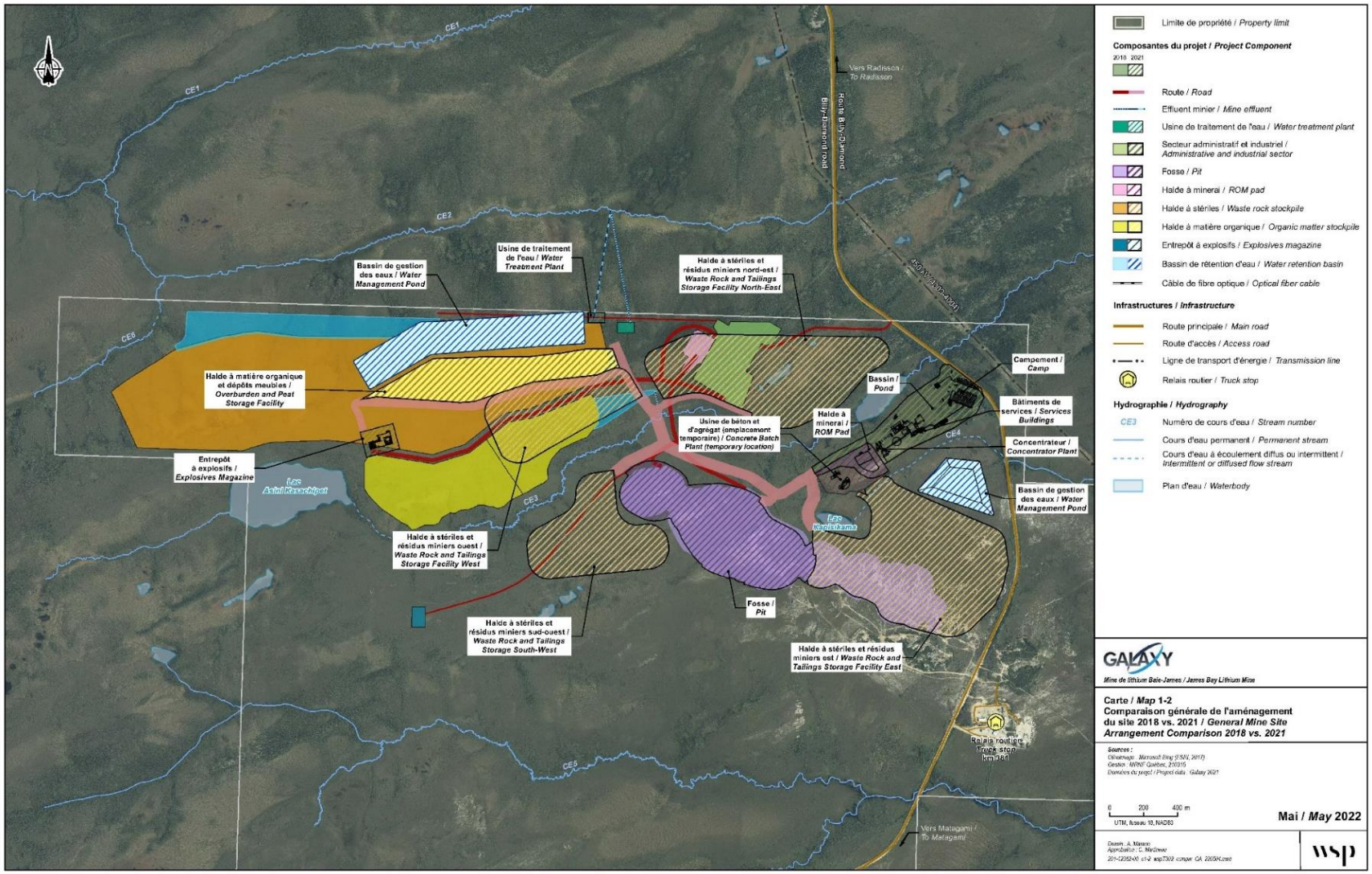
the piles on the ground by 50% in comparison to the option chosen in 2018 (Figure 9). Moreover, the Proponent intends to extend the east pile so as to fill the eastern portion of the pit, once operation of this sector is completed, thus allowing reduction of the areas of the other waste rock and tailings piles. The east pile would be designed to create a noise screen effect between the mine site and the rest area after a few years of operation.

Figure 8: Waste Rock and Tailings Pile Location Options (2018)



Source: WSP Canada inc. (2021)

Figure 9: Comparison of the Mine Site Layout (2018 and 2021)



Source: WSP Canada Inc. (2021)

3.2.3 Location of the Overburden Pile

Given the considerable volumes of overburden to be stored, the Proponent initially had provided for two separate piles, respectively containing unconsolidated deposits and organic matter. Two options were explored for the location of these piles, north or west of the pit (Figure 10). The Proponent first determined that the location west of the pit was the most appropriate for these piles. Although the north option was partially located in a terrestrial environment and reduced the wetland slopes, the presence of Lac Kapisikama and Watercourse CE4 limited the storage capacity. The option would also have been entirely contained within the limits of a single watershed, which would have confined the effects to one watercourse segment.

However, after optimizing the mine site layout, the Proponent determined that a single pile would be necessary for piling of unconsolidated deposits and organic matter. This pile would be located between the west waste rock and tailings pile and the north water management pond (Figure 10), thus allowing reduction of the waste rock transportation distances. The Proponent also accounted for the topography of the site in order to reduce the excavation and backfill needs during construction.

3.2.4 Minewater Management

Water Treatment Plant

Minewater management has evolved since the deposit of the first version of the Impact Statement in 2018. Considering the results obtained by water quality modelling, the Proponent had first considered the construction of a water treatment plant only in the ninth year of operation. The plant then would have been constructed when monitoring of mine effluent would have detected metal concentrations approaching environmental criteria not to be exceeded. According to the Proponent, this approach complied with the water quality criteria of mine effluent established in the *Metal and Diamond Mining Effluent Regulations* (MDMER). However, certain MDMER criteria were updated in June 2021, particularly the maximum monthly mean concentration permitted for arsenic, reduced from 0.2 to 0.1 milligrams per litre. Consequently, the Proponent resolved to build a water treatment plant during the construction phase in order to comply with the MDMER requirements. All the minewater of the site thus would be collected by the pit and the ditches to be directed to a water management pond, then treated and discharged into Watercourse CE2.

Haulage Roads Design

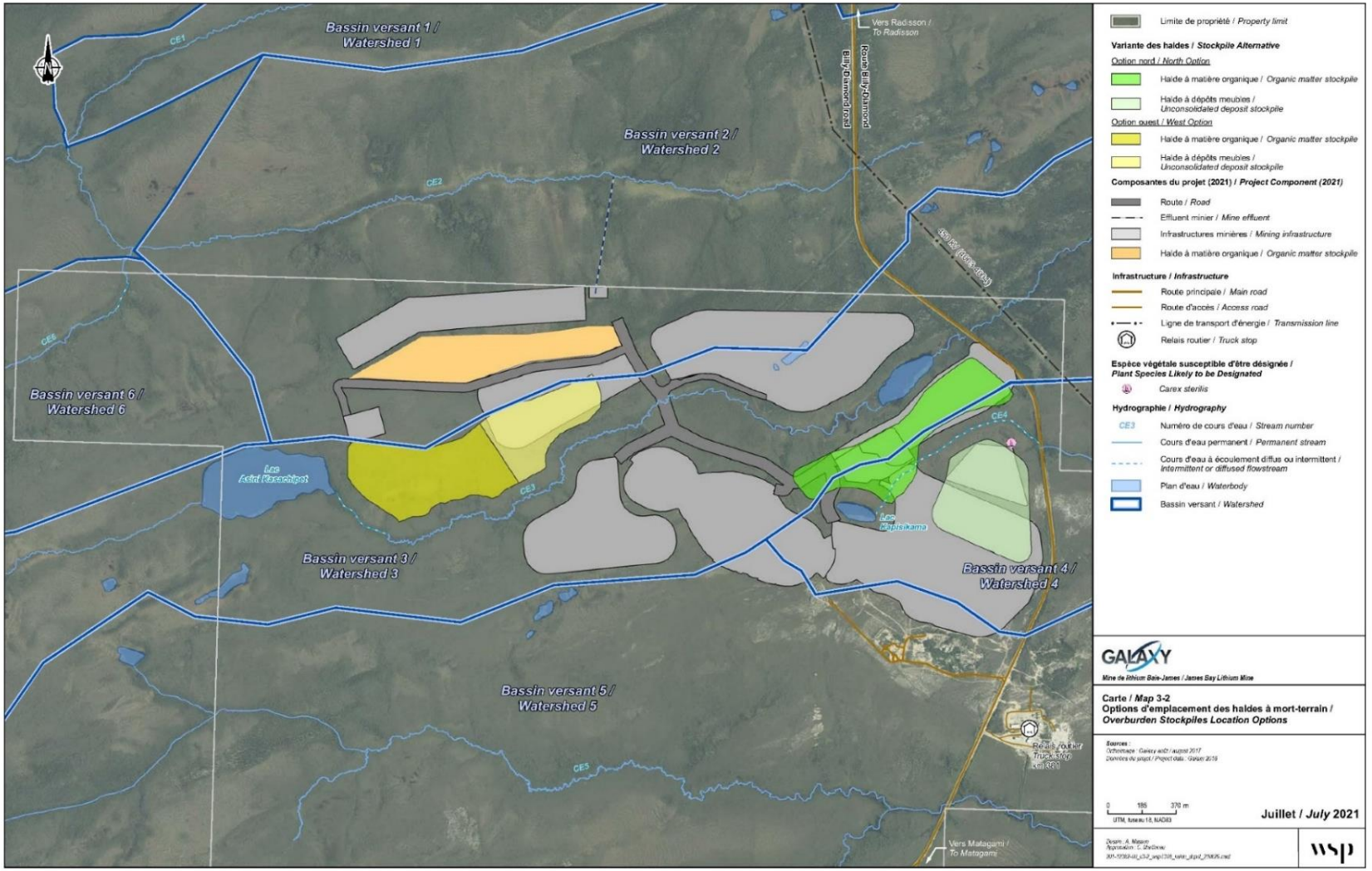
In a similar vein, the Proponent initially planned to build the haulage roads from the site, using waste rock extracted from the pit. This method was preferred to the exclusive use of materials from quarries and borrow pits, because the feasibility of the latter option was reduced by the limited quantity of materials available in the vicinity and the substantial transportation costs. Because the waste rock from the mine site contains leachable metals, it was proposed to leach the waste rock on a platform before use to avoid any groundwater contamination. Considering the uncertainties raised by Environment and Climate Change Canada (ECCC), NRCan, and the Cree Nation Government regarding the efficiency of this technique, the Proponent instead modified the design of the haulage roads based on the technical advice of an engineering firm specializing in geosynthetic materials. They thus would be composed especially of a foundation fill of unconsolidated materials covered with a linear low-density polyethylene (LLDPE) geomembrane and waste rock. The

geomembrane thus would act as a sealing measure for groundwater; the water collected by the roadside ditches would be directed to the water treatment plant.

3.2.5 Location of the Mine Effluent Discharge Point

The Proponent chose the location of the mine effluent discharge point, based, in particular, on the use of the watercourses by the Crees, the homogeneity of the watercourses, the inventory results, the technical aspects, the related costs, the criteria of Directive 019 on the mining industry and the MDMER, and the environmental discharge objectives. The Proponent considered two options, i.e., two discharge points in Watercourses CE2 and CE3 or only one discharge point in Watercourse CE2. The option with two discharge points allowed retention of the current drainage conditions of the watercourses and compliance with the delimitations of the watersheds of these watercourses. The Proponent had envisioned a second discharge point in Watercourse CE3, considering that it would have already been affected by the Project amenities (access road, watercourse crossing). This option also included an advantage during monitoring, because a monitoring point had been located at the crossing of the road passing over the watercourse. The Proponent finally provided for a single mine effluent discharge point in Watercourse CE2, north of the water treatment plant added to the Project.

Figure 10: Location Options for Overburden Piles



Source: WSP Canada Inc. (2021)

3.2.6 Mine Site Energy Sources

Among the potential energy sources in view of construction and operation of the Project, the Proponent chose hydroelectricity to supply power to most of the site's stationary equipment, due to the proximity of the Hydro-Québec transmission grid and its advantageous cost. The nearby hydroelectric grid includes:

- three 735-kilovolt lines and one 450-kilovolt line from the La Grande-2 and La Grande-2A substations, running to southern Quebec;
- one 315-kilovolt line between the Sarcelle and Eastmain-1 substations; and
- one 69-kilovolt line from the Muskeg substation, located near the former Opinaca Airport, running westward to supply the community of Eastmain. This line passes seven kilometres south of the mine site.

The Proponent thus preferred a connection to the 69-kilovolt line from the Muskeg substation which would necessitate construction of a 69-kilovolt power line over 10 kilometres by Hydro-Québec. The hydroelectric grid thus would supply a maximum of 7.6 megawatts to the projected mine, which nonetheless would require 8.1 megawatts to supply the stationary infrastructures.

The Proponent assessed the possibility of using different energy sources to make up this difference: wind energy, natural gas, liquefied natural gas or propane. It points out that renewable energy minimizes greenhouse gas (GHG) emissions and reduces operating expenses, but on the other hand, this is direct energy, meaning that it must be used as soon as it is produced unless the energy produced is accumulated in a battery, which is expensive. Moreover, the Proponent estimates that the installation costs of solar or wind infrastructures are too high, given the mine’s useful life. It adds that the Project area receives low solar irradiation, which limits the efficiency of a solar energy system. The investment cost of such a system would be 2.5 dollars per watt, not counting the costs related to energy storage. By way of comparison, this cost would be about one dollar per watt for a generator system.

Natural gas was excluded due to the absence of a distribution network in the sector. The Proponent finally chose propane as auxiliary energy to heat the workers’ camp during the construction and operating phases. This decision was made in view of the ease of supply of propane compared to liquefied natural gas. The Proponent mentions that at first glance, liquefied natural gas would emit fewer GHGs than propane. However, it estimates that, considering the complete liquefied natural gas cycle, including its transportation to the mine site and the losses during transportation and storage, the anticipated reductions of GHG emissions would be negligible. ECCC nonetheless points out that the propane option represents the biggest source of stationary combustion GHG emissions.

3.2.7 Mobile Equipment Energy Sources

In a GHG reduction perspective, the Proponent assessed the different energy sources that can be envisioned for the equipment necessary for operation of the mine, including electrification of the mobile vehicle fleet. However, the Proponent noted two aspects limiting electrification of mobile equipment, i.e., the limited supply

of electric models and an insufficient source of hydroelectricity for their power supply, as explained in the previous subsection. The Proponent established the list of electrical equipment available on the market that would suit the Project's needs. It undertook to purchase the following electric vehicles: two buses for transport of employees from or to Eastmain, a forklift and nine vans. It indicates that some of the equipment available in an electric version, particularly the telescopic forklifts and the platform trucks, is not large enough to meet the Project's needs. Other equipment simply is unavailable on the market in an electric version.

Moreover, the Proponent contacted Énergir, supplier of natural gas and liquefied natural gas in Quebec, to explore the possibility of converting the haulage trucks to supply them with liquefied natural gas, and thus reduce GHG emissions. It is felt that a proportion of 65% diesel necessarily had to be maintained in the haulage trucks to obtain adequate performance. It was also noted that a diesel tank truck can contain a greater volume of fuel than a load of liquefied natural gas, which considerably reduces the number of trips made for supply. This scenario nonetheless required transportation and storage of two types of fuel. The Proponent finds that conversion of a diesel truck to liquefied natural gas or electricity represents a substantial cost. In addition, the equipment manufacturers withdraw their warranty when this type of modification is made. The costs associated with conversion and loss of warranty reduce the advantages of this option. Given the constraints previously presented, the Proponent finally opted to supply most of the mobile equipment with diesel. Nonetheless, it intends to monitor the technological developments and advances in this field closely during the mine's lifecycle. It says it is open to the eventual acquisition of any new electrical equipment with the goal of reducing its dependence on fossil fuels.

3.2.8 Transportation of Employees

The Proponent considered two transit sites for employees coming from southern Quebec by air, namely Eastmain and Opinaca Airports. These airports are located approximately 130 kilometres west and 55 kilometres east of the mine site. Opinaca Airport has been closed since 2013 and its facilities have been dismantled, but the runway remains usable. On the one hand, choosing Opinaca Airport would involve many approaches, namely applications regarding occupancy, construction and land use rights, an environmental assessment and construction of new infrastructures. On the other hand, choosing Eastmain Airport would also necessitate additional infrastructures, such as a fuel tank, a hangar and ground handling and defrosting equipment to be able to accommodate travellers year round. This work would allow improvement of the fluidity of departures and landings, without necessitating environmental assessment. Finally, the Proponent chose Eastmain Airport, despite the additional time and costs occasioned by transportation over a longer distance. This decision was made based on forecasts regarding investment expenses, considering the delays and costs associated with recommissioning of Opinaca Airport.

3.2.9 Road Routes

The different infrastructures of the mine site necessarily will have to be connected by a network of haulage roads. In 2018, the Proponent had planned to build eight kilometres of two-lane roads on the mine site. After optimizing the planning of the mine site, the Proponent eliminated the access road, because the site henceforth would be accessed directly via Route Billy-Diamond Highway. It made sure to prefer the shorter route between the infrastructures and to maintain a minimum distance of 60 metres between roads and

watercourses. It also included some curves in the design of the route, in order to respect the topography and limit acceleration. The total length of the haulage roads thus would be 6.5 kilometres, a 1.2-kilometre portion of which would be built directly on the piles. The width of these roads would increase from 10 metres (2018) to 25 metres (2021) to support the passage of bigger trucks, i.e.100-tonne dumpers.

3.2.10 Domestic Wastewater Treatment Technology

The workers' camp and the cafeteria must be equipped with a domestic wastewater treatment system to serve the personnel during the construction and operating phases. This system must be able to treat a flow of 36,000 litres of wastewater per day, for a maximum of 180 workers during the operating phase. Because the flow to be treated would exceed 10,000 litres per day, the treatment system requires low-pressure distribution. The Proponent thus assessed four wastewater treatment technologies based on environmental, technical and economic criteria:

- A septic field with a filter bed modified for very permeable soil;
- A septic field using Enviro-Septic technology for permeable to very permeable soil;
- Modular units combined with mobile units with a polishing field;
- A rotating biological contactor modular unit.

The Proponent first considered the deployment of a septic or polishing field, by which the treated water infiltrates into the soil. It mentions that the environmental requirements for water infiltrated into natural soil are less restrictive than for a discharge into a watercourse, even with tertiary treatment. However, it excludes the option of the septic or polishing field, because the geotechnical studies conducted near the workers' camp showed that the water table is less than one metre from the soil surface, which would prevent adequate filtration through the sand horizon. The Proponent instead opted for a rotating biological contactor with tertiary treatment, the best alternative considering, in particular, the surface water and groundwater quality, the operability and the related costs, particularly the initial purchase cost. The sanitary effluent initially had been discharged into Watercourse CE3, near the overburden piles. After optimizing the planning of the mine site in 2021, the Proponent henceforth intends to discharge the sanitary effluent into Watercourse CE4, near the new location planned for the workers' camp.

3.2.11 Drinking Water Supply

Given the remoteness of the mine site, only two options were considered for the drinking water supply, either by a tank truck or by drilling wells. The Proponent specifies that it opted for wells for economic and environmental reasons. According to the Proponent, the hydrogeological features of the sector are favourable to exploitation of the rock aquifer to meet the needs for water, since the permeability of the rock is variable due to its nature and its degree of fracturing. It mentions that it is able to target sectors favourable to exploitation of drinking water to develop open wells in the rock between 30 and 100 metres deep. A submersible pump installed in the well would allow collection of the quantity of water required for the workers' camp. The number of wells to develop would be determined according to the capacity of the aquifer for

drilling. For the time being, the Proponent proposes drilling two wells near the administrative and industrial sector.

3.3 Analysis and Conclusion of the Joint Assessment Committee

The Committee understands the concerns of the Cree First Nation of Waswanipi regarding the necessity of a new lithium mine in the James Bay territory at a time when other lithium mines are under construction. The Committee recognizes that the recent financial difficulties of another lithium mining project located in the territory may be a source of concern. However, it notes that the Quebec Government considers lithium to be a mineral of the future, which could contribute to GHG reduction and the fight against climate change, because it is used in manufacturing of batteries of electric vehicles. The Committee shares the Proponent's opinion that the global demand for lithium should increase over the next few years. The Committee recalls that every mining project involves distinct technical and financial aspects. It points out that an economic feasibility study by the Proponent (Allkem Limited, 2021) could respond in part to the economic concerns. In short, the Committee is of the opinion that the Proponent has provided enough information to understand the Project's rationales.

The Committee considers that, in general, the Proponent has accounted for the technical and economic considerations, as well as the environmental effects and the concerns raised by the Cree Nations, the Cree Nation Government and the federal authorities in the choice of the preferred alternatives to carry out the Project.

The Committee is of the opinion that the exclusive use of non-leachable and non-acid-generating materials from quarries would have constituted a satisfactory solution for construction of the haulage roads. On the other hand, it agrees that, given the constraints associated with the limited availability of aggregates in the Cree territory, choosing such an option would have resulted in a significant increase in road transportation, GHG emissions and disturbances related to road traffic and noise. However, the Committee finds that the design of the haulage roads, including laying of a geomembrane, is not proven. Certainly, several recognized applications of geomembranes exist, particularly for landfill sites and containment structures. Nonetheless, there are no concrete examples proving with certainty that, despite the repeated passage of heavy trucks and the environmental effects, the proposed design of unpaved roads with geomembrane will effectively prevent groundwater contamination in the sector. Consequently, this situation led the Committee to obtain a second opinion from a company specializing in mining engineering and geomembranes to minimize the uncertainties and adequately identify the risks incurred by this alternative. The second opinion obtained considers that the preferred option has the potential to prevent groundwater contamination with some remediation. The mitigation and monitoring measures related to construction of the haulage roads are presented in Section 5.1, Fish and Fish Habitat.

In another vein, the Committee recognizes that hydroelectricity is an advantageous energy source in view of the construction and operation of the Project. However, as indicated by ECCC, propane is not the best auxiliary energy source in the perspective of a GHG reduction. The Committee notes that the Renard Mine

and the Rose Lithium-Tantalum Mining Project chose liquefied natural gas, while being subject to the same constraints. The Committee nonetheless agrees that the Project's contribution to GHG emissions would be reasonable overall (see Section 5.4, Transboundary Environmental Effects – Greenhouse Gas Emissions).

In conclusion, the Committee considers that the Proponent sufficiently assessed the feasible alternatives for the Project for the purposes of the environmental assessment under CEAA 2012.

4. Consultation Activities and Opinions Received

The Committee has prepared this Draft Environmental Assessment Report taking into account comments from the Cree Nations, the public, and government experts (federal, provincial, and Cree). The local and traditional knowledge regarding the Project site was also taken into account to determine its potential environmental effects. The Committee consulted with the Cree Nations and the public at key stages of the process. The consultation activities, announced on the Canadian Impact Assessment Registry, pertained to the following documents:

- Project description (November 2 to 22, 2017);
- Draft guidelines for the preparation of the Proponent's Environmental Impact Statement (December 14, 2017, to January 23, 2018);
- Summary of the Proponent's Environmental Impact Statement (March 7 to April 6, 2019).

In this fourth and final consultation period, the Committee is seeking to obtain comments on this Draft Report and on the potential conditions that will support the Minister's Decision Statement. This report contains the Committee's conclusions and recommendations. After considering comments from the Cree Nations, the public, and government experts, the Committee will produce the final Environmental Assessment Report, which will be submitted to the federal Minister of Environment and Climate Change for him to render a decision under the *Canadian Environmental Assessment Act, 2012* [CEAA 2012].

4.1 Crown Consultation with the Crees

4.1.1 Crown Consultation Conducted by the Agency (Pre-Agreement)

The federal government has the obligation to consult with Indigenous peoples and, where appropriate, provide for accommodation measures when it considers making decisions that risk having impacts on established or potential Indigenous or Treaty rights set out in the James Bay and Northern Quebec Agreement (JBNQA), protected by Section 35 of the *Constitution Act, 1982*. Indigenous and Treaty rights are discussed in Chapter 8. Consultation with Indigenous peoples is conducted comprehensively as a key factor in good governance, policy development, and informed decision-making. For the purposes of this environmental assessment, the Agency is acting as the Crown consultation coordinator to facilitate a whole-of-government approach.

The Indigenous peoples invited to participate in the consultations are those whose established or potential Indigenous or Treaty rights may be adversely affected by the Project, i.e., the Cree Nation of Eastmain, the Crees of the Waskaganish First Nation, and the Cree First Nation of Waswanipi. The Project, located on the Eastmain Cree Nation's RE02 trapline, could have environmental effects and repercussions on the health

and socio-economic conditions of these three Cree Nations, on their current use of land and resources for traditional purposes, on their natural and cultural heritage, and on sites of archaeological significance.

The Agency proposed consultation plans detailing the proposed activities to the Cree Nations of Eastmain, the Crees of the Waskaganish First Nation, and the Cree Nation of Waswanipi during the various stages of the environmental assessment and held consultation activities based on the needs expressed. The Agency used a variety of methods (Canadian Impact Assessment Registry, telephone calls, emails, and letters) to consult with these three Cree Nations and to communicate any developments in the assessment process. In addition, the Agency kept the Nemaska Cree Nation and the Abitibiwinni First Nation informed throughout the environmental assessment process. From the Project notice to the receipt of the impact study, the Agency also maintained regular contact with representatives of the Cree Nation Government, particularly through their presence on the federal environmental assessment expert committee.

The Agency supports the participation of Indigenous peoples through the Participant Funding Program, which is designed to encourage participation in consultations on the Environmental Impact Statement, the Draft Environmental Assessment Report, and potential conditions. The Agency's Participant Funding Program allocated $91,537 to the Cree Nation of Eastmain, the Cree of Waskaganish First Nation, and the Cree Nation of Waswanipi, as well as $16,424 to the Cree Nation Government.

4.1.2 Crown Consultation Conducted by the Joint Assessment Committee (Post-Agreement)

On June 27, 2019, the Cree Nation Government and the Agency signed the Agreement under the *Canadian Environmental Assessment Act, 2012*, for the environmental assessments of the Rose Lithium-Tantalum and James Bay Lithium Mining Projects (the Agreement), agreeing to the establishment of the Committee. From that point on, the environmental assessment and its associated consultations, described below, were conducted by this Committee composed of the Cree Nation Government and the Agency.

In the fall of 2019, the Committee held consultations on the environmental impact assessment at the Crees of the Waskaganish First Nation (October 28–30, 2019) and the Cree Nation of Eastmain (December 2–4, 2019). During these consultations, public sessions were held in the presence of the Committee and the Proponent. The Committee also met with the Band Councils and several community members, including the tallymen affected by the Project.

On November 19, 2020, and January 29, 2021, the Committee also held virtual consultations with a number of Waswanipi tallymen. These meetings focused on the impacts of increased traffic on the Billy-Diamond Highway, which could affect the use of the traplines along this road. The reports of these consultations were shared with the communities.

The concerns expressed by the Cree Nations during the consultations included the effects of the Project on:

- water, air, and soil quality and possible contamination of traditional food;
- hunting, fishing, trapping, and gathering activities as well as the associated wildlife and plant species; and

- socio-economic effects (road traffic, massive influx of non-Indigenous workers, business opportunities for companies, and access to jobs and training).

Details of these concerns and comments are presented throughout this report.

4.1.3 Consultation and Engagement Activities Organized by the Proponent

The Proponent mentioned that the first round of consultations was held in 2011 and 2012. The Proponent had primarily consulted with the Cree Nation of Eastmain, on whose lands the proposed Project is located. In particular, it organized meetings with the Band Council of the Cree Nation of Eastmain, socio-economic stakeholders, and Cree users of the land. The Proponent organized focus groups that included youth, women, and elders from this community. Some tallymen were also met to hear their concerns about traditional land use. Public information sessions on the Project were also held.

In 2017, the Project's revival led to a second round of consultations with the same parties. The Agency invited the Proponent to add the Crees of the Waskaganish First Nation and the Cree First Nation of Waswanipi to the consultation process so that their concerns regarding the increase in road traffic and its impact on the use of the land and resources could be considered. With this in mind, the developer organized a meeting in December 2018 with the Waskaganish Band Council. The Proponent held one-on-one meetings in February 2019 with the Waswanipi Band Chief and tallymen whose land is located along the Billy-Diamond Highway.

In the fall of 2020, the Proponent presented an optimized mine site development plan to the Eastmain tallymen and their families. It also organized a virtual consultation session in which some twenty Cree community members and stakeholders participated. Further meetings were held in the fall of 2021 and summer of 2022 to provide an update on the Project and gather feedback, particularly with the Eastmain Cree Nation, tallymen and their families, the Cree Women of Eeyou Istchee Association, and the Cree Trappers' Association.

The negotiation of an impact benefit agreement between the Proponent, Cree stakeholders, and the community of Eastmain is currently underway

4.2 Public Consultation

4.2.1 Public Consultation Conducted by the Agency and by the Joint Assessment Committee

The Agency offered the public the opportunity to participate in the environmental assessment process by submitting comments and concerns on the Project description, the Draft Guidelines for the Preparation of an Environmental Impact Statement, and the Environmental Impact Statement Summary. Individuals and groups who expressed an interest in the Project were informed of these consultation opportunities and were

able to express their views directly to the Agency or through the Canadian Impact Assessment Registry. Following the signing of the Agreement, the Committee continued public consultation activities by responding to individuals who submitted comments on the Project.

During the comment period on the Draft Guidelines, the Agency heard from the town of Matagami. These comments dealt mainly with the importance of keeping the local workforce in the region to avoid commuting and using local infrastructure to transport the ore. During the comment period on the Environmental Impact Statement, the Agency received a submission from the town of Matagami, which raised concerns about transportation and local economic benefits. After reviewing the Impact Statement and related documents, the environmental non-profit organization Eau Secours also provided comments regarding water quality. The Committee now invites public comment on the content, conclusions, and recommendations contained in this Draft Environmental Assessment Report and on the potential conditions that would support the Minister's Decision Statement. This will be the last public comment period. After reviewing the comments received from the public, the Agency will complete the report and submit it to the Minister of Environment and Climate Change.

The Agency supports public participation in the environmental assessment through the Participant Funding Program, but no public bodies have applied for funding for the James Bay Lithium Mine Project. To announce the comment periods and the Participant Funding Program, the Agency issued notices through the Canadian Impact Assessment Registry, local newspapers, and radio stations. Documents relevant to the consultations were posted on the Canadian Impact Assessment Registry and were filed with the Band Council offices of the Cree Nations consulted.

4.2.2 Public Participation Activities Organized by the Proponent

In 2012, the Proponent conducted interviews in Matagami with stakeholders from the municipal administration, economic development, land management and planning, and natural resources management sectors of James Bay. In 2017 and 2018, the Proponent organized public information meetings and presentations on the Project with the town of Matagami, the Eeyou Istchee James Bay Regional Government, the James Bay Development Corporation, and various Jamesian socio-economic stakeholders.

4.3 Participation of the Federal Government and Other Experts

In accordance with section 20 of CEAA 2012, federal authorities with specialist or expert information or knowledge with respect to the designated Project provided advice on the Draft Guidelines for the Preparation of an Environmental Impact Statement, the Proponent's Environmental Impact Statement, and the Proponent's responses to the Committee's information requests. Federal authorities also provided comments and observations for the preparation of this Draft Report and potential conditions that will support the Minister's decision.

The following federal authorities and experts gave their opinion at one or more stages of the environmental assessment process and provided expertise and knowledge relevant to the Project, depending on their area of jurisdiction:

- Fisheries and Oceans Canada: fish and fish habitat, including aquatic species at risk, and regulatory and legal provisions under the *Fisheries Act* and the SARA;
- Environment and Climate Change Canada: weather and climate, air quality and greenhouse gases, surface water quantity and quality, soil and sediment quality, accidents and malfunctions, migratory birds, species at risk (other than fish and marine mammals), wetlands, and regulatory and statutory provisions under the *Canadian Environmental Protection Act*, the 1994 *Migratory Birds Convention* Act, SARA, and subsection 36(3) of the *Fisheries Act*;
- Natural Resources Canada: hydrogeology, groundwater quality, geological characteristics, seismic movements, and regulatory and legal responsibilities under the *Explosives Act* and the *Explosives Regulations*;
- Transport Canada: navigation protection and regulatory and legal responsibilities under the *Canadian Navigable Waters Act*;
- Health Canada: the Project's potential health risks to Indigenous peoples due to changes in air quality, the noise environment, and water quality, particularly those that may have an effect on traditional food or the perception that it is contaminated;
- Public Services and Procurement Canada and the engineering firm Englobe : design of haul roads;
- Cree Board of Health and Social Services of James Bay (CBHSSJB): in partnership with the Ministère de la Santé et des Services sociaux du Québec, the CBHSSJB manages and organizes health and social services in the nine Cree communities of the Terres-Cries-de-la-Baie-James;
- The Cree Nation Government Environment and Remedial Works Department: wildlife management and conservation, land use planning, and mining;
- Aanischaaukamikw Cree Cultural Institute: cultural heritage.

5. Expected Effects on Environment Valued Components

5.1 Fish and Fish Habitat

The Committee considers that the Project residual effects on fish and fish habitat resulting from the harmful alteration, destruction or disturbance of this habitat will not likely be significant given the application of the mitigation and follow-up measures in Section 5.1.2, including the implementation of an offsetting plan. To determine the importance of the effects on fish and fish habitat, the Committee assessed, in particular, whether the effects would harm the essential functions of the fish habitat, the survival of fish and the maintenance of their populations.

The following subsections provide the information which the Committee considered in its analysis, including the opinions and comments of the government experts and the Cree Nations consulted.

5.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

The Proponent selected the local study area (LSA) to assess the Project's effects on fish and fish habitat. The LSA is a zone with an area of 36.9 square kilometres, which includes all of the projected infrastructure (Figure 2 of Chapter 1). It is located in the Eastmain River watershed. This watershed, with an area of approximately 46,000 square kilometres, drains the waters of many lakes and rivers, including Lac Asiyan Akwakwatipusich, Lac Asini Kasachipet and Lac Kapisikama. In the LSA, Streams CE1, CE2, and CE6 flow westward toward the Miskimatao River and then join the Eastmain River. Streams CE3, CE4, and CE5 flow eastward to also join the Eastmain River (Figure 7). Another "nameless" lake is found north of the local study area (Figure 2).

The Proponent inventoried a total of seven fish species in the watercourse of the LSA: White Sucker, Lake Chub, Northern Pike, Yellow Perch, Brook Trout, Brook Stickleback, and Trout-perch. However, no fish species was observed in Stream CE4. Given that Stream CE5 is valued by the users of the territory for fishing, the Proponent designed the layout of the site to move the mining infrastructures away. Moreover, one user of the territory indicated that occasional fishing is done in Stream CE2, at the approaches to Route Billy-Diamond Highway.

In the Proponent's opinion, the Project could harmfully alter, destroy or disturb fish habitat or cause fish mortality. These adverse effects would mainly be caused by the modification of the streamflows and water levels resulting from the drawdown of the groundwater (water table) related to dewatering of the pit and alteration of water quality by mine effluent and accidental spills. Fisheries and Oceans Canada (DFO) confirms that the Project would lead to the destruction and harmful alteration of the habitat of several fish species, including Brook Trout, Northern Pike and White Sucker. It adds that the Project would cause the death of fish by means other than fishing, particularly by the drying up of Lac Kapisikama. DFO specifies that the Proponent, to carry out the Project, necessarily must obtain an authorization under the *Fisheries Act* during the regulatory phase, after the environmental assessment.

The Project's effects on fishing activities are assessed in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by the Cree Nations), while the health effects related to consumption of fish by the Crees are assessed in Section 6.2 (Cree Health).

Harmful Alteration, Destruction or Disruption of Fish Habitat

The Proponent estimates that the Project would be likely to harmfully alter, destroy or disturb fish habitat, including 1.22 hectares in the lacustrine environment. This assessment of the effects is based on models, which themselves are based on the state of the watercourses surveyed in 2017 and 2018. According to the Proponent, these models always include a certain degree of scientific uncertainty.

Construction Phase

During the construction phase, land preparation and infrastructure construction could generate adverse effects on fish habitat. The Proponent indicates that excavation of the soil would alter the surface water infiltration regime on the mine site. It also mentions that the deployment of dikes, ditches and collection ponds would be likely to alter the natural flow in the environment. Encroachment by infrastructure would also reduce by 5% the areas of the subwatersheds of the watercourses during the construction phase. The temporary concrete plant would be supplied by water pumped directly from Lac Kapisikama (300 litres of water per cubic metre of concrete produced), which could lower the water level of this lake starting in the construction phase. Moreover, the Proponent is planning the construction of a watercourse crossing of CE3, including a haul bridge and culvert, which could lead to localized destruction of fish habitat.

By way of mitigation measures, the Proponent undertakes, in particular, to perform all work in the fish habitat during low-risk periods for the species present. These periods extend from July 1 to August 31 for Brook Trout, and from July 15 to April 15 for Northern Pike. The development work would not be carried out during snowmelt, in order to limit the impact on the watercourses.

Operating Phase

Several activities carried out during the operating phase could generate adverse effects directly and indirectly on fish and fish habitat, such as development of mining infrastructure, water management, pit dewatering and blasting. The Proponent first mentions that the development of the surfaces for the mining infrastructure would be likely to alter the natural flow of the surface water and would have an impact on the subwatersheds of the LSA. The area of the subwatersheds of Streams CE3, CE4 and CE5 would be reduced by 6%, while that of Streams CE1 and CE6 and of Lac Asini Kasachipet would not be altered, given their remoteness from the pit. On the contrary, the area of the subwatershed of Stream CE2 would increase to 16%, because it would receive the mine effluent.

During operation, the water management preferred by the Proponent would involve surrounding the infrastructure (e.g., piles and roads) with ditches to collect all the contact water. The contact water would be channelled to the north water management pond, like the pit dewatering water. This water then would be directed to the treatment plant and finally released into Stream CE2 (Figure 7 of Chapter 2). Sanitary effluent would also be released, after treatment, into Stream CE4. The pit would be dewatered by pumping to allow extraction of the ore, which would cause a progressive drawdown of the groundwater. This drawdown effect would be at its maximum near the pit and would be attenuated the further the distance from the pit.

According to the Proponent, this water management strategy would have a substantial impact on the flows, flow velocities and water levels in the bodies of water and watercourses of the LSA, as described in Table 4. Pit dewatering would alter the groundwater flow regime, gradually drying out Lac Kapisikama starting from the fourth year of operation and affecting the flows of Streams CE2, CE3, CE4 and, to a lesser degree, Stream CE5. However, these changes would not lead to any impact on fish and fish habitat in Streams CE1, CE5 and CE6 and in Lac Asini Kasachipet.

The drying out of Lac Kapisikama, which accommodates an isolated Yellow Perch population, would engender a fish habitat loss of 1.22 hectares. The Proponent considers that this lake does not offer optimum conditions for this species, since the individuals captured were all small, a sign of poverty of the environment. Some members of the Crees of the Waskaganish First Nation nonetheless said they are concerned about what would happen to fish in the lakes affected by the Project. To respond to these concerns, the Proponent proposes, among other measures, to relocate the fish from Lac Kapisikama to another favourable habitat. DFO underscores that before the relocation, the Proponent will have to ensure that it will not cause any adverse effects on the fish species already present in the receiving environment.

For Stream CE2, no significant effect is expected upstream of the mine effluent release point. However, a water-level rise of 3 to 13 centimetres is anticipated downstream during low water periods, due to the presence of effluent. Despite the increase in the flows of Stream CE2, the current velocities would remain low, which should not cause erosion or major morphological change. For Stream CE3, DFO considers that the projected reduction of the water level potentially could harmfully alter fish habitat over a distance of 6,800 metres. The Proponent indicates that the reduction of the flows of Stream CE4 in the low water periods would be so great (- 97%) that there would no longer be any flow, but simply pockets of water for which the level would be maintained by the presence of hydraulic controls. According to DFO, this situation could lead to a fish habitat loss in the low water period over a distance of 1,500 metres downstream of Route Billy-Diamond Highway, and a potential harmful alteration of the fish habitat over the next 1,100 metres.

The Proponent estimates that, in general, the observed effects on bodies of water and watercourses would be moderate, considering that the terrain is flat and swampy. However, in DFO's opinion, the models produced by the Proponent could underestimate the anticipated changes for certain watercourses. Indeed, the models presume that the hydraulic controls observed during the inventories (e.g., natural logjams and beaver dams) are permanent. The Proponent acknowledges that the state of the watercourse could change if the hydraulic controls were altered, shifted or disappeared. Consequently, DFO and ECCC recommend validating the accuracy of these models through a steamflow and water level monitoring program in the LSA. ECCC specifies that this follow-up should begin in the construction phase and continue after restoration. It adds that this follow-up should be performed on the scale of the subwatersheds of Streams CE2, CE3 and CE4 to verify the accuracy of the environmental assessments and judge the effectiveness of the mitigation measures. ECCC also recommends establishing intervention thresholds in case of effects and adaptive measures in case of non-compliance with these thresholds. According to DFO, the Proponent must ensure that these adaptive measures do not engender deleterious effects on fish and fish habitat.

Table 4: Anticipated Effects of the Project on the Watercourses and Bodies of Water of the Local Study Area

Body of water or watercourse	Fish species inventoried[7]	Source of effects	Description of effects	Effects on fish
Lac Kapisikama	Yellow Perch	- Groundwater drawdown by dewatering. - Reduction of the size of the subwatershed.	- Gradual drying out of the lakes starting in the fourth year of operation.	- Habitat loss of 1.22 hectares. - Fish mortality
CE1	Brook Trout, Brook Stickleback	No effect		
Lac Asini Kasachipet	Brook Stickleback	No effect		
CE2	Brook Trout, Lake Chub, Brook Stickleback	- Presence of mine effluent. - Groundwater drawdown by dewatering. - Reduction of natural flow over part of the subwatershed.	- Increase of the area of the subwatershed by 16%; Summer: - Increase of streamflows and average and low water levels. Winter: - Reduction of average and low water streamflows. - Imperceptible effects on levels. Flood period - Increase of streamflows, levels and flow velocities.	- No change of habitat functions.

[7] Lake Sturgeon, White Sucker, Burbot and Lake Whitefish are species reserved for exclusive Indigenous use under the *Act respecting hunting and fishing rights in the James Bay and New Québec territories* (Schedule E).

Body of water or watercourse	Fish species inventoried[8]	Source of effects	Description of effects	Effects on fish
CE3	Brook Trout, White Sucker, Lake Chub, Brook Stickleback	- Construction of a water crossing (tow bridge and culvert); - Reduction of natural flow over part of the subwatershed.	- Decrease of the area of the subwatershed by 18%; - Reduction of average, low water and flood streamflows. - Reduction of water levels fading toward downstream. - Fish habitat encroachment.	- Harmful alteration of habitat over a distance of 6,800 metres. - Localized habitat destruction caused by construction of the water crossing.
CE4[9]	Brook Trout, Brook Stickleback	- Groundwater drawdown by dewatering. - Reduction of the size of the subwatershed.	- Decrease of the area of the subwatershed by 33%; - Reduction of streamflows, particularly low-water streamflow. - Reduction of levels in the low water period over a distance of 350 metres downstream of Route Billy-Diamond Highway, fading gradually after 1,500 metres.	- Habitat loss in the low water period over a distance of 1,500 metres downstream of Route Billy-Diamond Highway. - Harmful alteration of the habitat over the next 1,100 metres.

[8] Lake Sturgeon, White Sucker, Burbot and Lake Whitefish are species reserved for exclusive Indigenous use under the *Act respecting hunting and fishing rights in the James Bay and New Québec territories* (Schedule E).

[9] Only the downstream portion of the culvert of Route Billy-Diamond Highway is considered to be a fish habitat in Stream CE4.

Body of water or watercourse	Fish species inventoried[10]	Source of effects	Description of effects	Effects on fish
CE5	Brook Trout, Trout-perch White Sucker, Lake Chub, Brook Stickleback, Northern Pike	**- Groundwater drawdown by dewatering.** - Reduction of the size of the subwatershed.	**- Decrease of the area of the subwatershed by 1%;** - Low reduction of streamflows producing imperceptible changes of levels.	- No change of habitat functions.
CE6	No inventory produced	- No effect.	**- No change of low water, monthly average and flood streamflows.** - No change of the area of the subwatershed.	**- No change of habitat functions.**

Source: Adapted from WSP (2021)

[10] Lake Sturgeon, White Sucker, Burbot and Lake Whitefish are species reserved for exclusive Indigenous use under the *Act respecting hunting and fishing rights in the James Bay and New Québec territories* (Schedule E).

Moreover, DFO points out that Lake Sturgeon (Southern Hudson Bay and James Bay populations) are likely to use habitats located downstream of the LSA. Lake Sturgeon is a species at risk designated under SARA. It is part of the species reserved for exclusive Indigenous use under the *Act respecting hunting and fishing rights in the James Bay and New Québec territories* and is of special importance for the Crees. The Lake Sturgeon population was affected adversely by the diversion of the Eastmain River in 1980. To favour recovery of the species, a community spawning area Project is planned at the crossing of the James Bay Road and the Eastmain River, ten kilometres north of the site. Cree users of the territory expressed concerns regarding the sustainability of this spawning area in the event the mining project is carried out. The Proponent seeks to be reassuring in this regard. It affirms that no adverse effect is anticipated on the spawning area, while specifying that the hydrographic network of the LSA only represents 0.1% of the Eastmain River watershed. It adds that all the mine water would be captured and treated before its release, and that the water quality would be verified by close follow-up.

Some Cree users of the territory nonetheless fear that the vibrations emitted by the Project can harm Lake Sturgeon in the context of the community spawning area Project. It was mentioned that Lake Sturgeon is very sensitive to disturbances of the environment and could feel vibrations imperceptible to humans. The Proponent refers to the document *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky, 1998), which recommends a maximum overpressure of 100 kilopascals. In the swim bladder of fish to avoid adverse effects, such as internal hemorrhages, and even mortality. In the context of the Project, such overpressure would be observed within a 133-metre radius of a detonation of explosives. Because the nearest watercourse is 230 metres away, the Proponent concludes that the detonations on the site should not affect the neighbouring fish, or the spawning area Project 10 kilometres north of the mine site. It estimates that an area of Stream CE5, located 920 metres from the pit, could have spawning potential in the sector. A vibration level of 3.9 millimetres per second was calculated there, which is well below the spawning area protection criterion, established at 13 millimetres per second during the egg incubation period (Wright and Hopky, 1998).

The Proponent proposes several mitigation measures, the main one being an offsetting plan for fish and fish habitat, the details of which still have to be specified. This plan, also required by DFO, would allow counterbalancing of the losses that inevitably would occur with the accomplishment of the Project. The offsetting proposals must be compliant with the *Policy for Applying Measures to Offset Adverse Effects on Fish and Fish Habitat Under the Fisheries Act* DFO, 2019). The Proponent also intends to deploy a network of wells on the periphery of the mining infrastructures to monitor the effects of pit dewatering, particularly by measuring the groundwater level.

Decommissioning Phase

The decommissioning phase includes a three-year restoration phase, seeking to rehabilitate the site to a satisfactory condition. Although the mining activities would be reduced during the restoration, the dismantling of the mining facilities and the machinery traffic near the bodies of water and watercourses nonetheless could alter the flow of the surface water on a pinpoint basis. However, the mine site surfaces eventually would be profiled and revegetated. Moreover, the water management ponds and Lac Kapisikama would be transformed into wetlands if the conditions allow it. These actions would contribute to the return to natural drainage and a natural surface water flow regime. The Proponent nonetheless specifies that the presence of piles would permanently change the area and the topography of certain subwatersheds. These changes could render the sector more sensitive to precipitation, which is the reason for its proposal to create wetlands in the gentle slope areas. Definitively, it is the Proponent’s opinion that the restoration would bring the site

closer to the original hydrological conditions, but acknowledges that certain bodies of water and watercourses would not regain their initial conditions, such as Lac Kapisikama and Streams CE3 and CE4.

The mine closure would also be marked by the stoppage of pit dewatering, which would trigger the resurgence of the groundwater level to its original position. The pit would be filled progressively with groundwater and precipitation until an equilibrium level is reached with the groundwater. The Proponent estimates that between 120 and 180 years would be necessary for the pit to be filled with water. During restoration, a spillway and ditches would be created to avoid any overflow around the pit. The Proponent indicates that the water contained in the pit then would pour into Stream CE3 through this spillway.

The Proponent recalls that the actions taken in the restoration phase seek the return to a satisfactory state. All in all, it considers that only a few hydrological changes would persist over time, particularly in Lac Kapisikama and Streams CE3 and CE4. The Proponent therefore concludes that the residual effect on fish and fish habitat during and after the decommissioning phase would not be significant. In this regard, DFO finds that the Proponent has not assessed the residual effects on fish for these phases. It specifies that, if additional residual effects on fish and fish habitat were anticipated (effects that would not have been taken into account in this environmental assessment, and not authorized in the upcoming regulatory phase), it would be the Proponent's responsibility to comply with all the laws and regulations in effect, before carrying out any work.

Alteration of Surface Water and Groundwater Quality

The Cree Nations attach great importance to water quality in their territory and thus are concerned about the Project's effects on bodies of water and watercourses, including a possible contamination of fish. Indeed, degradation of water quality can adversely affect fish and fish habitat.

This subsection begins with a description of the baseline state of water and materials in the LSA. In the first place, the Proponent produced a profile of the sector's surface water and groundwater quality. It reports the presence of potential anthropogenic sources of surface water contamination in the LSA, namely a former landfill site on isolated land and the kilometre 381 rest area, which is equipped with a gasoline station. Considering the location and the pinpoint character of these potential contamination sources, its opinion is that the concentrations it measured in the surface water for the various parameters correspond to natural original levels. According to the sampling campaigns conducted in Streams CE1 to CE5, the surface water is clear, with low alkalinity, and contains little suspended particulate matter (SPM). The concentrations of nutrients and dissolved metals are generally low. Nonetheless, certain natural concentrations exceeded the water quality criteria of the Canadian Council of Ministers of the Environment and the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC). The Proponent describes the groundwater as a potential water supply source, moderately vulnerable to contamination, which is defined in the Guide to application of the *Water Withdrawal and Protection Regulation* (MELCC, 2021a). The majority of the watercourses and lakes in the LSA would be supplied by groundwater. The Proponent also sampled and analyzed the groundwater to determine the metal content naturally present on the Project site. According to these results, the natural content of certain metals in the groundwater (silver, barium, copper, manganese, zinc) could exceed the Surface Water Resurgence Criteria of the MELCC *Guide d'intervention – Protection*

des sols et réhabilitation des terrains contaminés (Beaulieu, 2021) (Intervention Guide – Soil Protection and Contaminated Sites Rehabilitation), or the alert thresholds[11] established by the MELCC.

Secondly, the Proponent produced a geochemical characterization of the waste rock, tailings, ore and unconsolidated deposits. It thus assessed the leaching and acid-generating potential of these mining materials by static and kinetic tests, so as to determine if they would present an environmental contamination risk. The leaching potential establishes the ease of the metals and other compounds present in the mining materials in dissolving in water. The acid-generating potential indicates if the sulphur compounds present in the mining materials risk forming acid upon contact with air. The Proponent then interpreted the characterization results based on Quebec *Directive 019 pertaining the mining industry* (MDDEP, 2012). It defines **waste rock** and **tailings** as potentially leachable in metals such as arsenic, iron, silver, barium, copper, mercury, manganese, nickel, lead and zinc, but notes a significant reduction of release of these metals after an average of 12 weeks. It considers that, among the different waste rock lithologies, **gneiss** and **banded gneiss** are potentially acid-generating. The analyses performed on **ore** and **diabase** show they would be potentially leachable in the short term for certain metals and leachable in mercury even after 25 weeks. It also maintains that a portion of the **spodumene** samples showed an acid-generating potential, while the clay portion of the **unconsolidated deposits** would be leachable. NRCan is generally satisfied with the characterization done by the Proponent, but recognizes certain deficiencies pertaining to the methodology (e.g., lack of reproducibility and representativeness, interpretation error). ECCC also considers that the interpretation done by the Proponent of the geochemical behaviour of the materials studied involves uncertainties. The Proponent chose to stockpile the waste rock and tailings in co-disposal because, in its opinion, the kinetic tests showed that the behaviour of the waste rock and the tailings, considered separately, could be comparable to a mixture of waste rock and tailings. However, ECCC indicates that the Proponent's argument is not based on a sufficient demonstration, particularly because no kinetic test was conducted on the "waste rock-tailing" mixture. Because of the potential risks of contamination of the aquatic environment, ECCC recommends that the Proponent conduct additional kinetic tests with a representative mixture of waste rock and tailings to simulate co-disposal of these materials before construction. In light of these results, the Proponent should review the design criteria of the waste rock and tailings piles to satisfy the requirements of Directive 019. ECCC also recommends follow-up for the geochemical behaviour of the waste rock and tailings under conditions representative of reality. This follow-up would allow changes to be made to the Project, if necessary, and validation or modification of the restoration concept.

Construction Phase

As explained in Section 3 (Justification of the Project and Alternatives Considered), the Proponent decided to build the mine site's haulage roads by using the waste rock extracted from the pit. It specifies that this method was preferred to the exclusive use of materials from quarries and borrow pits, given the limited quantity of materials available in the vicinity and the substantial transportation costs. Because it was established that the site's waste rock is leachable in various metals, the chosen method aroused concerns on the part of the Cree Nation Government and the federal authorities regarding the groundwater contamination risks. In response to these concerns, the Proponent developed several measures to mitigate the risks. It first undertook not to use diabase and banded gneiss, respectively leachable and acid-generating, for road construction. These waste rock materials would be set aside without being crushed,

[11] The MELCC has established groundwater alert thresholds corresponding to a concentration effective from which there is reason to apprehend a loss of the resource, a risk of effects on health, uses and the environment.

then transported from the pit to the waste rock and tailings piles. The Proponent then proposed a unique mine site haulage road design, supported by the recommendations of an engineering firm specializing in geosynthetic materials. This type of road would extend over a distance of four kilometres within the mine site (Figure 5), outside the co-disposal piles, and would be constituted as follows:

- subbase fill composed of pit run material without clay;
- a layer of fine granular materials to receive the geomembrane;
- a linear low-density polyethylene (LLDPE) geomembrane covering the road and its ditches. This geomembrane, 1.5 millimetres thick and textured on both sides, would act as an impermeable lining for groundwater;
- a sand drainage layer to protect the geomembrane;
- a pit run infrastructure layer of 0-300 millimetre gauge waste rock; and
- a driving surface of 25-100 millimetre gauge crushed waste rock.

ECCC notes that the type of geomembrane that would be used in haulage road construction typically seems to be used to line storage infrastructures with impermeable material. The Proponent was unable to rely on one of the similar cases where a geomembrane would have been used as an impermeable lining for roads that would be used several times a day for trucks with a capacity of a hundred metric tonnes. However, the Proponent puts forward numerous additional mitigation measures to ensure the efficiency and durability of haulage roads containing a geomembrane. They would be built in several stages, according to a precise development schedule. For example, a 120-day waiting period should be respected to allow the roadway to settle and thus avoid any rupture of the haulage roads built on organic soils. The Proponent would implement a quality control and assurance program developed by a third-party expert for the fill materials and the geomembrane. The installation of the geomembrane would be closely supervised by a specialist present on the site. A follow-up program would be implemented in each phase of the Project, particularly involving preventive maintenance of the driving surface, periodic verification of the profiles and elevations of the works, geoelectric leak detection, geomembrane repair, follow-up of the chemical parameters of the groundwater by observation wells, and the collection and treatment of contaminated water, if applicable. The Proponent also specified that two haulage road sections would not have an impermeable lining as described above, because they would be located on waste rock and tailings piles or in the pit. The first section would be the road to the explosives plant and the second would be the road leading to the southwest waste rock and tailings pile and to the northwest section of the pit (Figure 5 of Chapter 2).

The Committee requested the services of a second expert to confirm that the haulage road design could limit the effects on groundwater. The second expert identified deficiencies in the proposed design and issued additional recommendations that the Proponent should apply rigorously to ensure greater groundwater protection. In particular, the second expert mentions that the choice of the geomembrane and the installation methods are of critical importance to the performance of the haulage road concept. The second expert also mentions that the durability of the membrane would be adequate for the Project lifecycle, as long as the measures favouring its durability were implemented. Consequently, based on the second opinion and additional recommendations presented throughout its report (Englobe, 2022), which complement those presented by the Proponent (Alphard Group, 2022), ECCC considers that groundwater contamination would be minimized. Given that the quality assurance and control programs presented by the engineering firm is provided only indicatively and that installation is a critical stage in conservation of the geomembrane's

integrity, ECCC recommends that this program be analyzed by a competent third party after the detailed engineering to ensure that it is appropriate for this Project. It also recommends that the Proponent provide for groundwater protection measures on the haulage roads in the event the Project had to last longer than expected.

In the construction phase, the Proponent provides for the deployment of a concrete plant and a temporary crushing unit that would be used until the industrial complex and the mine infrastructures are built. The runoff water that would come into contact with the concrete plant would be directed to a pond that would be built effective from the first month of the construction phase, or to temporary ponds. Moreover, a pond with an impermeable lining would be developed to collect and treat the wash water from the concrete plants. ECCC recalls that the Proponent will have to ensure that the requirements of the *Fisheries Act* are respected and meet the requirements of the MDMER.

Ditches located along the haulage roads and other mining infrastructures would therefore channel the runoff water to the north water management pond, which contains an impermeable clay layer. The runoff water then would be directed to a water treatment plant, with a capacity of 125 cubic metres of water per hour, adjacent to the north water management pond. The Proponent indicates that this plant would reduce the concentrations of arsenic, iron and suspended particulate matter so that the mine effluent complies with the surface water quality criteria established in Directive 019 (MDDEP, 2012) and the *Metal and Diamond Mining Effluent Regulations* (MDMER). In the opinion of NRCan, the collection and treatment of runoff water are essential to eliminate the risks related to arsenic, from the beginning of the Project. The Proponent also provides for a surface water quality follow-up program during construction to comply with the *Fisheries Act* and the MDMER.

Furthermore, the Proponent indicates that road transportation, machinery traffic and stockpiling and handling of residual or hazardous materials are activities that would occur in every phase of the Project, and could lead to an increase of SPM in the bodies of water and watercourses. It also evokes the risks that an accidental spill will affect surface water and groundwater quality. The effects that could result from accidents and failures and the mitigation measures proposed by the Proponent are detailed in Section 7.1.

Operating Phase

The Proponent surveyed the potential sources of adverse effects on water quality in the operating phase while accounting for the geochemical properties of the materials on the site. Without the implementation of special mitigation measures, water could percolate through mine infrastructure, such as haulage roads and piles, thus risking groundwater contamination. However, the Proponent specifies that the waste rock and tailings piles, like the overburden pile, do not require any impermeable lining, because they showed percolation flows (0.15 litres per square metre per day) lower than the criterion of Directive 019 (3.3 litres per square metre per day). The ore pile and its peripheral ditch would be lined with an impermeable geomembrane, however. The water infiltrating into this pile would be collected and then directed to a separate industrial water pond, also with an impermeable lining. This water then would be reused in the ore processing plant.

Despite these measures, the model produced by the Proponent shows that after 50 years, the water percolating through the northeast waste rock and tailings pile and not captured by the ditches could resurge to the surface in Stream CE2. The metal concentrations in this resurgence water nonetheless would comply with the criteria in effect. Moreover, the Proponent alleges that the water percolating through the other piles

would not resurge in the surface deposits, and would have no impact on the quality of Streams CE1, CE3, CE4 and CE5. The water quality in Stream CE3, located near the mining infrastructure, would not be altered, given the groundwater flow direction. Stream CE4 would almost no longer be supplied with groundwater, which greatly reduces the possibility of eventual contamination.

To minimize the adverse effects on the Project and surface water quality, the Proponent proposes to collect the precipitation water touching the mining infrastructure (e.g., haulage roads, overburden pile, waste rock and tailings pile) by means of a network of ditches. This water then would be directed to the main water collection pond located northwest of the site. The Proponent plans to develop a concrete layer under this pond to comply with the percolation flow required by Directive 019. The Proponent also plans to pump the pit dewatering water. This mine water would be treated before its release into Stream CE2. Given that the metal concentrations (particularly arsenic) in the runoff water could be higher, considering the haulage road design, the Proponent shall ensure that the water treatment plant allows it to comply with the water quality criteria established in the MDMER and Directive 019, as well as the environmental release objectives. In the event of exceedance of any follow-up criterion in the treated water, the water treatment plant would be switched to recirculation mode until there is no more exceedance. During this period, the water leaving the treatment plant would be returned to the north water management pond instead of to the effluent by a set of automated valves.

Some Crees of the Waskaganish First Nation mentioned their concern about the efficiency of this water treatment plant. The Proponent indicates that it would monitor the mine water quality before its release into the effluent. It also plans a follow-up of the surface water quality in Streams CE1 to CE5 and near the mining effluent release point in Stream CE2. Follow-up studies would be carried out to assess the potential effects of effluent on fish, fish habitats and harvesting of fishing resources. The study area covered by these studies would include the watercourses exposed to mining effluent (CE2) and a baseline watercourse located outside the mine influence zone. The same stations as those used to establish the baseline would be used. In addition, the Proponent would follow up groundwater quality with a network of monitoring wells around facilities that could affect water quality (roads, piles, pit, industrial sector, explosives warehouse). The sampling frequency in this network of wells would be twice a year, during the summer low water period and the spring floods.

Given the use of waste rock in haulage road construction and the absence of documentation of cases of use of geomembranes in this type of construction, ECCC considers that appropriate measures should be implemented to avoid groundwater contamination. It also recognizes that uncertainty would persist even if such measures were taken. Consequently, ECCC considers that follow-up of groundwater quality along the haulage roads is essential to verify the effectiveness of the geomembrane and provide for corrective actions throughout the Project in case of contamination. NRCan recommends that the frequency of this monitoring be based on water infiltration rates into the groundwater. In the context of groundwater follow-up, the Proponent plans three monitoring wells to follow up the groundwater along road sections not located on the piles. The sampling in these wells would be done each season, or four times a year if the conditions allow, in order to obtain a more precise follow-up and assess the annual and seasonal trends. In case of contamination, measures would be taken to remedy an eventual harmful alteration of water quality depending on the extent and intensity of the contamination. These measures could be one or a combination of the following: drainage trench, pumping well and investigation by the dipole method, followed by repair work. The results of the surface and groundwater follow-ups would be shared with the Cree Nations via information sessions, which could respond to the above-mentioned concerns.

Decommissioning Phase

The Proponent indicates that the mine site would be revegetated during restoration, which generally involves dismantling the infrastructures and then scarifying the soil, covering it with unconsolidated deposits and seeding it with various plant species. Wetlands could also be created at suitable locations. To avoid any contamination of the neighbouring environment the Proponent would make sure, before any work, to remove the geomembranes and send them to an authorized landfill site. The upper courses of the haulage roads would be transported to the waste rock and tailings piles. According to NRCan, the Proponent should consider backfilling waste rock and other materials used in the construction of haul roads in the pit rather than depositing them on top of the waste rock piles. All contaminated materials (e.g., soil, sludge) would be removed and managed in accordance with the regulations in effect. The unconsolidated materials coming from the overburden pile would be reused for site restoration, like those from the roadbeds, if the characterization shows they are not contaminated.

The Proponent mentions that the effects observed during decommissioning would be similar, all in all, to those described for the operating phase. It points out that the water management infrastructure, particularly the water treatment plant, would remain in operation, as long as the mine effluent would not be compliant with the requirements of Directive 019 and the MDMER. It estimates this period at three years after the mine closure. Most of the ditches then would be backfilled and the water treatment plant dismantled. The Proponent considers the waste rock, including the waste rock that would be accumulated in the southeast part of the pit, as non-acid-generating and leachable only in the short term. In its opinion, no additional mitigation measure concerning waste rock (e.g., impermeable cover) would be necessary to reach a satisfactory state from the environmental point of view.

Pumping of the pit would therefore cease and it would be filled gradually with precipitation water and groundwater. According to the Proponent, this could degrade the water quality of the pit, given that this water would be in contact with the exposed rock walls. It adds that based on the modelling done, the arsenic contents would exceed the criterion of Directive 019 during the first 62 years of filling of the pit, after which the criterion (0.2 milligrams per litre) would be respected. The filled pit eventually would spill into Stream CE3, between 120 and 180 years after the mine closure. However, Eau Secours[12], an organization that promotes the protection and responsible management of water, shared its concerns regarding potential arsenic contamination of the pit water. Indeed, Eau Secours reports that, according to the Proponent's model, the arsenic concentrations in the pit water, ranging between 0.20 and 0.23 milligrams per litre during the first 62 years of filling, would not fall below 0.17 milligrams per litre after 180 years. The organization points out that these concentrations would be twice as high as the standard prescribed by the MDMER (0.1 milligrams per litre), 40 times higher than the recommendation of the Canadian Council of Ministers of the Environment for protection of freshwater aquatic life (0.005 milligrams per litre) and up to 230 times higher than the levels naturally present in the neighbouring watercourses. Eau Secours therefore recommends that the pit water be treated to reduce its arsenic content to an appropriate level, which would allow long-term protection of aquatic life in the neighbouring watercourses. The Proponent plans to propose additional models with the analysis results obtained during the first years of the Project. These models would have the objective of refining the closure plan. The restoration plan then could be updated according to these results. However, given the exceedances of standards initially provided by the model, ECCC recommends that at least one

[12] Document available at reference number 46: :https://www.ceaa-acee.gc.ca/050/evaluations/proj/80141/contributions/id/58398?&culture=en-CA

follow-up of the quality of the water that will accumulate in the pit be done during the post-restoration period. It also recommends that the Proponent ensure it complies at all times with the requirements of the MDMER and the *Fisheries Act*.

The Proponent intends to do a follow-up of surface and groundwater quality during the decommissioning phase, in compliance with the requirements of Directive 019. If applicable, corrective actions could be deployed by the Proponent in the event of unsatisfactory results. Follow-up of the water quality of the water management pond would also be maintained in the decommissioning phase to validate the assumption that the waste rock and tailings piles would not engender leaching once the deposit of waste rock and tailings has ceased. Because the water treatment plant would be in operation as long as this would be necessary, the Proponent would do a follow-up of the mine effluent in compliance with MDMER and according to the same terms as during operation. Once the water treatment plant is dismantled, water samples would be collected in Stream CE2 and at the locations where the dikes would have been breached, until the situation is judged to be stable and the initial conditions will have been restored.

In short, the Proponent considers that the proposed mitigation and follow-up measures would prevent potential contamination of surface water, groundwater and sediments. These measures thereby would allow minimization of the adverse effects on fish and fish habitat caused by changes in surface water and groundwater quality.

5.1.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

The Committee assessed the residual effects of the Project on fish and fish habitat based on the environmental effects assessment criteria in Appendix A. The Committee concludes that the Project is not likely to cause significant adverse environmental effects on fish and fish habitat if the Proponent applies the mitigation and follow-up measures below. The adverse effects projected, particularly the destruction and harmful alteration of fish habitat, would be counterbalanced by the Proponent's offsetting plan. The analysis of the residual effects is based on the findings below.

The residual effects of the Project are considered to have high intensity due to the destruction and harmful alteration of fish habitat expected in Lac Kapisikama and Streams CE3 and CE4. The Committee considers that the range of the effects is local, because it is limited to certain bodies of water and watercourses of the LSA. The effects would be felt continuously and in the long term. The Committee notes that certain effects could be reversible in the very long term, while the hydrological changes would be attenuated after the restoration of the mine and the progressive flooding of the pit. However, the above-mentioned effects on Lac Kapisikama and Streams CE3 and CE4 would be irreversible.

The Committee and DFO point out that offsetting activities could counterbalance modification of the functions and fish habitat loss. As such, the Committee believes that the intensity of the effects would be reduced to moderate levels. The Committee also considered the efficiency, durability and sustainability of the haulage roads with geomembrane in the context of a mine site in the northern environment. The Committee notes that this technology is not proved for haulage roads, being used instead on landfill sites and tailings storage facilities. In this sense, the technical opinion prepared by an engineering firm specializing in geosynthetic materials is meant to be reassuring, indicating that the proposed road concept is solid enough to withstand the repeated passage of 100-tonne trucks and the climate conditions of James Bay for the Project's lifecycle.

The geomembrane would be impermeable, resistant to waste rock leaching, deicing salts and dust suppressants. Perforation resistance would depend on the quality of the geomembrane's installation.

Moreover, the Committee obtained another opinion from a second engineering firm to verify the Proponent's assertions. This second opinion was able to confirm that the component presented was satisfactory if certain corrective actions were taken, i.e., that it would effectively prevent groundwater contamination by the waste rock composing the haulage road, throughout the Project's lifecycle. In the Committee's opinion, these corrective actions, presented below, will have to be integrated by the Proponent. To summarize, given the proposed mitigation and follow-up measures, including the offsetting plan and the haulage road design, the Committee considers that the Project would result in insignificant residual environmental effects on fish and fish habitat.

Determination of Key Mitigation Measures

The Committee established the following key mitigation measures to mitigate the Project's adverse environmental effects on fish and fish habitat. To do this, the Committee relied on the Proponent's proposals, the opinions of government experts and engineering firms, and the comments received from the Cree Nations consulted.

Offsetting Plan

- Prepare and implement an offsetting plan to counterbalance the Project's residual effects on fish and fish habitat. This plan will have to be produced in collaboration with the Cree stakeholders and be approved by DFO. It will have to account for the requirements of the *Fisheries Act*, the Quebec *Act respecting the conservation and development of wildlife* and the Lignes directrices pour la conservation des habitats fauniques (Wildlife habitat conservation guidelines) (MFFP, 2015).

Water Management

- Implement a mine water management program to comply with the standards of the MDMER, the *Fisheries Act* and Quebec *Directive 019 pertaining to the mining industry* (MDDEP, 2012). This program includes, in particular:
    - the creation of temporary and permanent sedimentation ponds effective from the construction phase to minimize SPM releases:
    - the development of a pond with an impermeable lining to collect the wash water from the concrete plants;
    - sealing of the north water management pod to comply with the percolation flow established in Directive 019;
    - digging ditches surrounding the mining infrastructure, so as to collect the drainage and runoff water from the site and channel it to the north water management pond; and
    - the implementation of a functional water treatment plant as soon as there is a final effluent to treat. Provide for the necessary adjustments of exceedances of monitored parameters. This plant will treat:
        - during the construction phase, the water from the concrete plant, the waste rock extraction area and the explosives plant;

- during the operating phase, the mine water accumulating in the north water management pond, including the pit dewatering water and the runoff water from the waste rock and tailings pile, the overburden pile, the industrial sector, and the haulage roads. The final mine effluent will be released into Stream CE2; and
- during the restoration and post-restoration stages, all mine water, especially that which accumulates in the pit.

- The capture of runoff water from outside the activity areas by ditches dug around the mine site's components, followed by release into the environment, to prevent this water from coming into contact with contamination sources.

- Line the ore pile and its peripheral ditch and the industrial water basin with an impermeable membrane to recover this sector's runoff water and then use this water to supply the mill. As needed, treat the water from the ore concentration process and coming from the ore pile before its release into the environment.
- Construct haul roads with non-leachable materials. If non-leachable materials are not available, construct haul roads according to the recommendations outlined in the Alphard Group technical memorandum[13], Englobe's counter-expertise report and the August 4, 20227[14] multi-stakeholder report (Actions 1 to 18). Among other things, the Proponent shall comply with the following:
  - prior to construction, identify on plans all roads constructed with waste rock, including haul roads, access roads, temporary roads, and traffic roads. Include on plans roads constructed with geomembrane;
  - include geomembrane in the design of all haul roads using waste rock except for haul roads constructed on piles or in the pit;
  - validate, through piezometric monitoring, that groundwater flow is towards the pit prior to undertaking haul road work;
  - implement measures to ensure that all maintenance operations in impervious ditches along towpaths are carried out without risk to the geotextile and allow for effective freeze-thaw and melt flow control;
  - construct the drainage sand layer with a steep drainage slope (4%) and drainage sand. If necessary, plan and implement control measures for the leaching of the drainage sand layer;
  - provide a quality control plan for haul road construction, including checkpoints during geomembrane installation and validation of material properties;
  - follow best practices in geomembrane placement by following the recommendations of Rowe (2020 and 2013);

[13] Alphard Group's technical opinion (available in French only), Appendix A of the document "Additional information concerning haul roads - James Bay Lithium Mine Project" available on the Canadian Impact Assessment Registry (reference number: 51) at the following link: https://www.ceaa-acee.gc.ca/050/evaluations/document/144369

[14] Multi-party meeting report (available in French only) with the Joint Assessment Committee (Canadian Impact Assessment Agency and Cree Nation Government) available on the Canadian Impact Assessment Registry (reference number: 58) including Englobe's counter-expertise report at the following link: https://www.iaac-aeic.gc.ca/050/evaluations/document/144874?culture=fr-CA

  - begin placement of sand, geomembrane, and mine waste rock once the first layer of soils is consolidated and postpone work if surveys show that consolidation has not yet been achieved even after 120 days;
  - ensuring that roads can adequately drain water and that ditches are designed to prevent overflow throughout the year;
  - construct haul roads with unfrozen materials and perform geomembrane installation and welding when temperatures are above 0 degrees Celsius;
  - ff haul road construction must be halted, ensure geomembrane integrity and ditch drainage to prevent groundwater contamination; and
  - clean and maintain ditches year-round to prevent damage. To validate the effectiveness of ditch maintenance and meltwater management, assess the condition of the ditches during snowmelt each spring, identify the maintenance measures applied, establish a snowmelt water balance and identify any deficiencies;
- Provide for corrective action in the event that groundwater contamination related to haul roads is detected. The Proponent shall determine the threshold level of contamination that would initiate the implementation of these measures. The source and area of the contamination shall be determined and the Proponent shall demonstrate that the remedial measures are applicable specifically to the contaminated area.
- Operate the water treatment plant to produce the natural streamflow variations of Stream CE2 while accounting for the storage capacity of the north water management pond.
- Deploy a network of wells on the periphery of the mining infrastructure to measure the groundwater level.
- Maintain a riparian buffer strip 10 to 15 metres wide, depending on the slope of the embankment, around wetlands, bodies of water and watercourses.
- Develop the temporary facilities more than 60 metres from a watercourse.
- Install culverts or crossing structures designed to maintain the free flow of water and the free passage of fish when required.

Management of Materials

- Conduct additional kinetic tests with a representative mixture of tailings and waste rock, when these materials become available, to simulate co-disposal of tailings and waste rock.
- Review the design criteria of all the waste rock and tailings piles, according to their potentially leachable and acid-generating character, in order to satisfy all the requirements of Directive 019.
- Prepare and implement a waste rock management plan.
- Prohibit the use of banded gneiss and diabase as construction materials.
- Manage excavation materials according to their degree of contamination and in accordance with the requirements of the Soil Protection and Contaminated Sites Rehabilitation Policy (MDDELCC, 2017),

- Dispose of the excess or unusable excavated materials with the usual precautions and in accordance with the Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (MDDELCC, 2015) and Directive 019, so as to ensure sufficient spacing between these excavated materials and the water environments.
- When the contaminated excavation materials are stored temporarily, take all the necessary actions to preserve the integrity of the neighbouring soil and water and the workers' safety, particularly by depositing excavated materials in piles on a leakproof or impermeable surface, covering the piles or limiting access to these piles.
- Dispose of the contaminated excavated materials according to the contaminated soil management grid of Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés (Intervention Guide – Soil Protection and Contaminated Sites Rehabilitation). If disposal of contaminated excavated materials in a pile is a possible option, the Proponent must apply for authorization to the MELCC and act only after obtaining the authorization.
- During the restoration phase, verify the soil quality on each side of the haulage road sections that do not have an impermeable lining so as to manage them appropriately.

Project Timetable

- Perform work in the water outside the sensitive period for the fish species present, by minimizing the duration of the work in an aquatic environment.
- Carry out the development work likely to affect the hydraulicity of the watercourses outside the snowmelt period, which is from April 15 to June 15.

Control of Erosion and Sediment Transport

- Limit deforestation, soil stripping and cutting close to the ground in the Project area (Figure 5 of Chapter 2).
- During work carried out in watercourse crossing areas, do deforestation immediately before construction to minimize erosion.
- Stabilize or protect the exposed surfaces continuously as soon as possible to reduce transport of SPM and limit leaching of materials to the watercourses.
- Limit transport of fine particles in water environments beyond the immediate work area by an effective means, such as a sediment trap, a sediment barrier or a containment curtain.
- Install a sediment barrier to protect Stream CE3 from drainage water that would be directed there by the ditches of roads built during the first months of construction.
- Develop a temporary bridge for machinery if crossing a watercourse is required. Deploy bridging or an ice bridge during development of a trail crossing a watercourse or a fish habitat.
- Reclaim the banks of the watercourses disturbed by the work as soon as possible to minimize erosion and sedimentation. If it is impossible to stabilize the disturbed surfaces permanently before winter, deploy temporary protective measures.

Blasting

- During blasting, respect the criteria for distances and maximum loads specified in Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012) and the thresholds of the *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky, 1998).
- Manage the explosives plant so that there is no release into the environment:
    - recover the sanitary releases of the explosives plant in a sealed pit and dispose of them externally;
    - dispose of used oils and other non-recyclable release externally through an authorized company; and
    - wash the trucks containing explosives inside the explosives plant and send the wash water to the oil separator for filtering and recycling.

Site Reclamation

- Restore the job site areas and the piles by grading the surfaces, covering them with natural soils, scarifying them or seeding them to favour the regrowth of vegetation. Stabilize the disturbed locations. The embankment slopes, the unconsolidated deposit piles and others, as the work is completed.
- In the decommissioning phase, favour the creation of wetlands in the gentle slope areas adjacent to the revegetated piles of the watersheds of Streams CE2 and CE3 with the goal of limiting peak streamflows and reducing the SPM contribution to these watercourses. The Proponent must ensure that these wetlands are located so that they receive all of the runoff water from the piles without threatening the stability of their slopes.
- In the decommissioning phase, maintain continuous treatment at the water treatment plant, as long as the concentrations of measured parameters exceed the applicable standards.

In DFO's opinion, the mitigation measures in relation to fish and fish habitat proposed by the Proponent appear necessary and relevant to mitigate the Project's effects on this valued component. However, certain additional measures and standards seeking to avoid and mitigate the deleterious effects on fish and fish habitat could be required later by DFO, during the regulatory phase in the context of examination of the Project under the *Fisheries Act*, which occurs after the federal environmental assessment. ECCC also mentions that it is always difficult to do an objective assessment of the appropriateness and effectiveness of the measures provided to preserve surface and groundwater quality. In fact, their effectiveness will be demonstrated only at the time of their application on the job site. Consequently, ECCC considers that the rigorous deployment of all the mitigation measures enumerated or discussed above, together with the monitoring and follow-up program presented below, would make it possible to confirm the importance of the effects and take corrective actions, if necessary.

Need for Follow-up and Follow-up Requirements

The Committee recommends the application of a follow-up program to verify the effectiveness of the mitigation measures and the forecasts pertaining to fish and fish habitat. This program must include a water quality monitoring component based on the standard and requirements in effect, particularly those established in the MDMER and Quebec *Directive 019 pertaining to the mining industry* (MDDEP, 2012) and should be shared with the Agency and the relevant authorities before construction for its assessment. The

Proponent must also ensure that the requirements of the MDMER and the *Fisheries Act* are respected at all times during all phases of the Project. Moreover, given the exceedances noted of the natural concentration for certain metals in surface water and groundwater, ECCC recommends that the baseline stations and the relevant observation wells that were used to describe the basic conditions should be selected for the follow-ups proposed in this section. Adjustments to the mitigation measures could be made where appropriate to minimize adverse environmental effects. This program applies to each phase of the Project, unless otherwise indicated, and must include:

- A follow-up to assess the effectiveness of all the elements of the fish habitat offsetting plan, ensure the achievement of the offsetting objectives set and deploy corrective actions adapted to the results of the follow-up. This program will have to be improved in the event that the follow-up demonstrates that the Project leads to greater residual effects than anticipated.
- A follow-up of water quality at the final mine release point to comply with the Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012), particularly by conducting sublethal toxicity tests and measuring the SPM concentrations and indicator metals, including lithium. The results, in particular, must be compared with the environmental release objectives defined by the MELCC and tend toward them. The environmental release objectives account for human health and seek to protect fish farming resources for future generations. The MELCC also has surface water quality criteria for lithium to ensure protection of aquatic life (and chronic effects).
- Follow-up of surface water quality with sampling stations in the natural environment, non-exhaustively considering the following elements:
    - The water samples must be collected around the effluent inlet point at the final release point (Stream CE2), in the baseline areas and in the areas selected in the context of biological follow-up, with at least one sampling point in each of Streams CE1 to CE5, and in Lac Asiyan Akwakwatipusich and the “nameless” located in the north of the LSA. The follow-up in these two lakes should allow demonstration of the level of risk of deposition of airborne particulate matter during the construction and operating phases.
    - The Proponent must ensure that the runoff water reaching Stream CE3 is not charged with particles coming from erosion of the accumulation areas.
- Follow-up of the quality of the water that will accumulate in the pit during the post-restoration phase.
- Follow-up of groundwater quality, as specified in Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012). A network of monitoring wells must be deployed around facilities that risk affecting groundwater quality. This network must include a sufficient number of monitoring wells, spatially well located, upstream and downstream of each facility at risk, including the haulage road sections located outside the piles and an additional observation well, southwest of PO29-2021. During the operating phase, follow-up must also be carried out for the haulage road sections without an impermeable lining. Follow-up must be done at a seasonal frequency and measures must be provided in case of eventual groundwater contamination, such as a drainage trench, a pumping well or an investigation by the dipole method and repair work.
- Follow-up of the streamflows and water levels at critical control points of Streams CE2, CE3 and CE4 to validate the accuracy of the models that made it possible to estimate the changes to the hydrological regime engendered by the Project, verify the accuracy of the environmental assessment and judge the effectiveness of the mitigation measures. The follow-up must be carried out effectively

from the construction phase and continue until at least three years after the end of the restoration activities. This program must be prepared and presented to the authorities responsible for examination and comments so that it is finalized before the beginning of the work. The follow-up program must specify at least:

  - The location of the measuring sites, the frequency of measurements and the duration of follow-up.
  - The methodology, the content and the frequency of the reports.
  - The intervention thresholds, including the type of streamflows used for these thresholds, and the adaptive measures, which do not result in adverse effects on fish or fish habitat, in case of non-compliance with these thresholds.

- Follow-up of the physicochemical quality of the sediments during the operating phase, in compliance with the indications of the *Guide de caractérisation physico-chimique de l'état initial du milieu aquatique avant l'implantation d'un Project industriel* (Guide to physicochemical characterization of the initial state of the aquatic environment before implementation of an industrial project). The Proponent must do this follow-up at the same stations as for the follow-up of surface water quality.
- Monitoring of the geochemical behaviour of the tailings and waste rock under conditions representative of reality in order to make changes, as the case may be. These follow-ups should also allow validation or modification of the restoration concept during the operating phase.

5.2 Wetlands

The Project could result in the loss and disturbance of wetlands and thus cause residual effects on them. However, the Committee believes that these effects are not likely to be significant given the implementation of the mitigation measures recommended in Section 5.2.2, which include a compensation plan and a follow-up program.

The following subsections present the information considered by the Committee in its analysis to conclude on the significance of the Project's effects on wetlands, including the opinions and comments of the expert departments, and First Nations consulted.

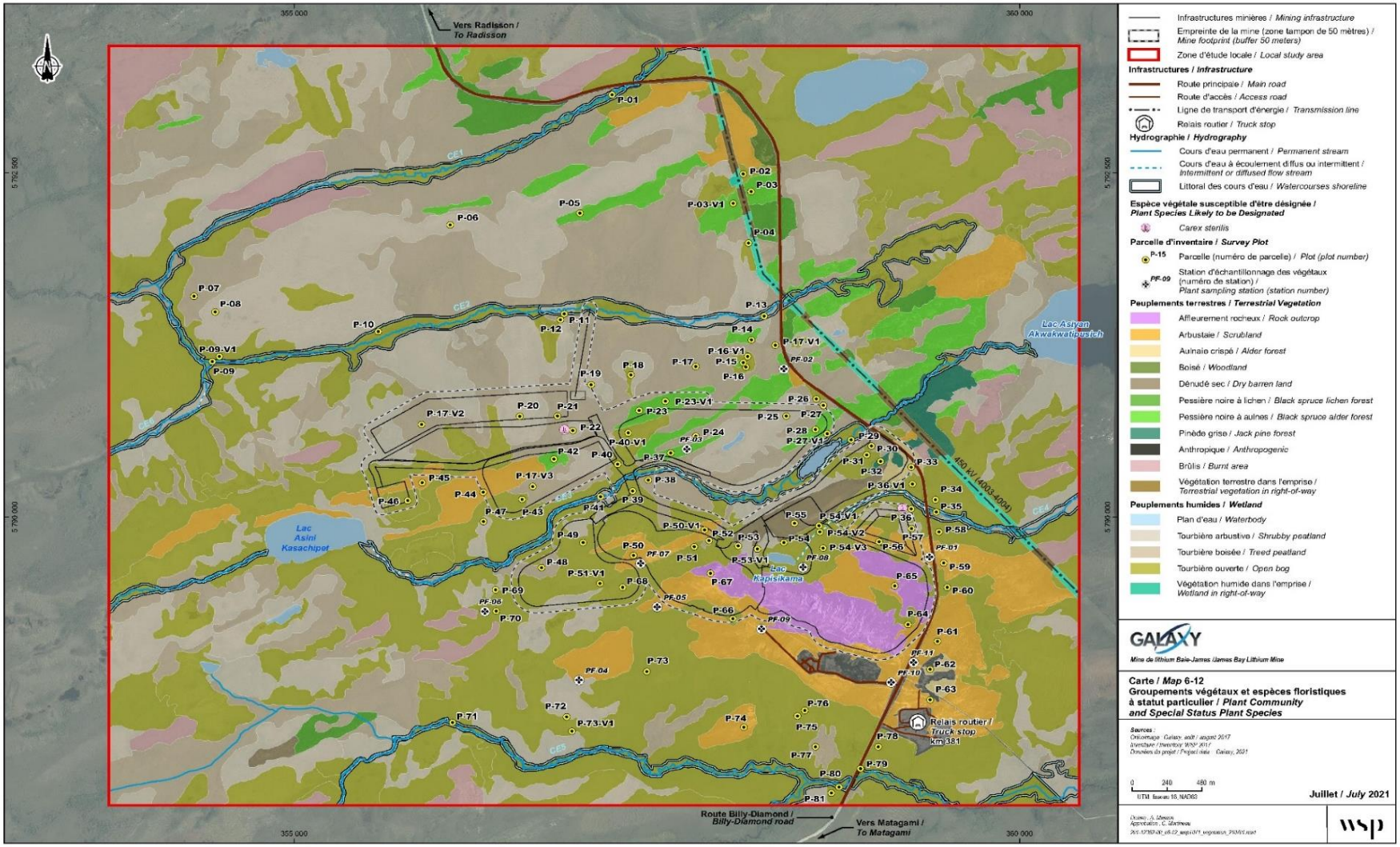
5.2.1 Analysis of Potential Effects and Proposed Mitigation measures

A wetland is land that is saturated with water long enough to support wetland or aquatic processes characterized by poorly drained soils, hydrophilic vegetation, and various forms of biological activity adapted to a wetland environment (ECCC, 2016). The wetlands in the vicinity of the Project are located on public lands where provincial jurisdiction prevails. Quebec's *Loi concernant la conservation des milieux humides et hydriques* (Act respecting the Conservation of wetlands and bodies of water) applies. It provides for the application of the "avoid-minimize-compensate" sequence and favours at all times an approach that ensures the maintenance of functional ecosystems, rather than the restoration of fragmented and degraded environments. ECCC is satisfied with the application of the "avoid-minimize-compensate" sequence, which

led the Proponent to choose the location of the Project components in a way that limits the permanent loss of wetlands and their functions.

The Proponent identified four categories of wetlands in the local study area (LSA), namely shrub bogs, forested bogs, open bogs and wet vegetation (Figure 11). These wetlands, considered common in the James Bay region, occupy 78.6% of the LSA and total an area of nearly 2,891 hectares. Table 5 presents the surface area of each type of wetland in the LSA. The Proponent identified 23 species of migratory birds in the various wetlands of the LSA. No special-status plant species were detected during the vegetation inventories. The sterile sedge (Carex sterilis) had been observed in 2017, but it has since been removed from the list of plant species likely to be designated as threatened or vulnerable in Quebec. ECCC notes that wetlands are present in large quantities in the LSA. ECCC is of the opinion that the baseline condition for wetlands has been satisfactorily described. Although the Proponent's description of their biological functions is brief, it nevertheless confirms their habitat role for avian wildlife, particularly for the Common Nighthawk and the Rusty Blackbird, two species listed in Schedule 1 of the *Species at Risk Act*.

Figure 11: Plant Groups, Including Wetlands



Source: WSP Canada (2021)

Loss and Disturbance of Wetlands

Site preparation for the installation of the construction site and the mine infrastructure would result in the loss of 304.71 hectares of wetlands, or 10.5% of the wetlands in the LSA (Table 5). These losses would result in the destruction and alteration of natural habitats for fauna and flora. Although the wetlands identified are common and abundant in the region, the Proponent considers these losses to be significant. These include, but are not limited to, the potential location of the waste rock piles, overburden pit, pit, storage yard, industrial and administrative sector, explosives warehouse, water treatment plant, ponds and access points. The Proponent is also planning a 50-metre buffer around the site, including a 35-metre protective strip, stripped to protect the infrastructure from forest fires.

Table 5: Area of Wetlands in the Local Study Area

Type of wetland	Area (hectare)	Proportion of the local study area (%)	Area affected by the Project (hectare)	Proportion of total area (%)
Open bog	1,326.52	36.1	140.69	10.6
Wooded bog	800.54	21.8	91.69	11.4
Shrub bog	747.95	20.3	72.33	9.7
Wetland right-of-way	15.94	0.4	-	-
Total	2,890.95	78.6	304.71	10.5

Bogs develop on poorly drained or low permeability substrates, such as clay deposits. The water saturation conditions that prevail in these areas promote the accumulation of organic matter produced by plants, which forms peat. The perched water table of a bog refers to the water mass above this low permeability substrate layer. This perched water table is located above the regional groundwater table and has little or no groundwater recharge.

According to the Proponent, creating drainage ditches could directly affect the bogs near the mine site. It indicates that the placement of these ditches at the edge of the infrastructure could create partial dewatering by lowering the level of the perched water table of the bogs. This could isolate parts of the bogs or lead to their progressive afforestation. However, the Proponent considers that this effect would be negligible at more than 25 metres from the ditches. The Proponent plans to install a clay berm along the stripped areas to avoid draining the peat bogs around the infrastructure.

In addition, the Proponent maintains that the dewatering of the pit would result in a lowering of the water table, which could also have an impact on the perched water table of the bogs. This could lead to increased tree growth and even afforestation of open bogs. The Proponent stated that it was unable to predict the nature and extent of this indirect effect given the current state of knowledge on the subject, while reminding of the tenuous hydraulic link between the regional groundwater table and the perched water table of the peatlands. It added that the presence of a variable thickness of clay, particularly south and north of the planned mining infrastructure sits, should limit the impact of the groundwater lowering on peatlands. To overcome this uncertainty, the Proponent proposes to monitor the peatland perched water table using

surface wells. This monitoring would also include a measurement of artesian pressure at different depths and an assessment of the composition of the terrestrial and wetland plant communities. In the event that the lowering of the groundwater table would result in negative effects on peatlands, the Proponent considers that these effects would not be permanent.

The Proponent intends to develop a compensation plan to offset unavoidable loss of wetlands. This plan should be consistent with the requirements of the MELCC and would be developed in close collaboration with MELCC, the Cree Nation Government and the Cree Nation of Eastmain, some of whose members have expressed concern about the Project's effects on wetlands. The Proponent plans to create or restore different types of wetlands, which would promote biological and habitat diversity. It added that it could reassess the areas that need to be compensated based on the results of the monitoring program mentioned above. However, given the northern and isolated context of the Project, there are currently few projects under development that it could offer to participate in to enable their carrying out. The compensation plan could include participation in the restoration of abandoned mine sites in the Nord-du-Québec region. The Proponent also indicated that a financial contribution for university research could be relevant to develop fundamental and applied knowledge on the boreal wetlands in the Nord-du-Québec region. ECCC emphasized the Proponent's commitment to compensate for the loss of wetlands to meet regulatory requirements. The Committee further notes that the development of the compensation plan in collaboration with the Cree Nation of Eastmain and the sharing of environmental monitoring results could address, at least in part, concerns raised by some members of the Cree Nation of Eastmain.

Loss of Wetland Functions

Wetlands have several ecological functions. They contribute primarily to biological diversity by providing habitat for many species of flora and fauna, including migratory birds. Wetlands retain sediments and nutrients and can have a positive impact on water quality. Wetlands store more carbon than they release and can mitigate the impact of climate change. Some wetlands, such as bogs, play a role in regulating water flows and levels given their capacity to retain water, thereby preventing an excessively rapid flow to a receiving watercourse. In summary, the diversity of wetlands and their functions contributes to healthy ecosystems.

The ecological functions of the 304.71 hectares of wetlands that would be destroyed by the Project would necessarily be lost. Wetlands indirectly disturbed by the Project could also experience some loss of function, depending on the type of wetland, its location, and the nature and intensity of the disturbance. The compensation plan, which would be developed in close collaboration with MELCC, the Cree Nation Government and the Cree Nation of Eastmain, would help maintain ecosystem functions specific to northern wetlands or support the development of fundamental or applied knowledge on boreal wetlands.

Wetlands are a habitat of choice for several species, particularly migratory birds, which breed, feed and rest there. The Proponent estimates that the Project would affect an average of 1,207 breeding pairs for all wetlands, i.e., 663, 321, and 223 breeding pairs respectively in open, shrubby, and wooded bogs. Proposed measures to mitigate the adverse effects of the Project on migratory birds and birds at risk are presented in Section 5.3. ECCC believes that the implementation of wetland compensation measures should compensate for the loss of wetland functions, including the loss of habitat for migratory birds and species at risk, as long as these functions are considered in the development of the offset program and its success is demonstrated through monitoring.

Risk of Accidental Hydrocarbon Spills

Several pieces of equipment present on the site would require the use of hydrocarbons for their operation. This could result in accidental spills affecting wetlands, primarily during equipment refuelling or in the event of machinery breakdown. According to the Proponent, the environmental risks related to spills are low for this Project. In fact, the Proponent maintains that an accidental spill would likely be limited to the work site and that appropriate work practices would be put in place to prevent spills. Should such an event occur, the contaminated soils would be managed in accordance with existing regulations. Spill risks and associated mitigation measures are discussed in more detail in Section 7.1 (Accidents and Malfunctions).

Introduction and Propagation of Invasive Alien Species

Invasive alien plant species are plants introduced outside their natural range and may pose a threat to the environment and biodiversity. They have a competitive advantage over native species due to their high dispersal capacity and rapid growth.

During the Proponent's inventories, no invasive alien plant species were noted in the LSA. The Proponent states that special attention must nevertheless be paid to invasive alien plant species to avoid any propagation, even if they are less widespread in Northern Quebec. The Proponent specifies that transportation and traffic in the work zone could contribute to the accidental introduction or spread of invasive alien plant species in the territory. However, the rather harsh climatic conditions prevailing in the LSA would limit the growth potential of some invasive species present mainly in the southern part of the province. The Proponent plans to minimize the risks of introduction and spread by cleaning excavating machinery or boats before their use on the site. Annual monitoring would also be carried out to verify if there is any introduction and spread of these species. Any new occurrence of invasive alien plant species would be eradicated quickly, if possible. This monitoring would be carried out up to two years following the completion of the work and one year following the restoration of the site.

ECCC is of the opinion that the Proponent has correctly identified the potential sources of effects and environmental effects of the Project on wetlands and their functions. ECCC believes that the Proponent has adequately documented the residual environmental effects of the Project on wetlands. ECCC considers that the proposed mitigation measures, including compensation for permanent wetland losses, would minimize the residual environmental effects of the Project on wetlands. ECCC adds that uncertainties inherent in any compensation Project remain, particularly with respect to indirect effects caused by drainage ditches and pit dewatering. ECCC is also satisfied with the Proponent's monitoring and follow-up commitments for wetlands, which would ensure the implementation of planned mitigation measures and identify any unanticipated sources of potential effects that may occur. ECCC adds that monitoring of wetlands bordering those that would be encroached would make is possible to observe the actual indirect effects of the Project on wetlands and ensure the effectiveness of planned mitigation measures.

5.2.2 Analysis and Conclusions of the Joint Assessement Committee on Residual Effects

The Committee assessed the residual effects on wetlands based on the environmental effects assessment criteria in Appendix A. The Committee is of the opinion that the Project is not likely to cause significant net adverse environmental effects on wetlands if the following key mitigation measures (including the compensation plan) and monitoring program are implemented. This compensation plan must be approved

by the Government of Quebec and implemented by the Proponent to meet the provincial regulatory requirements of the *Loi sur la qualité de l'environnement* (*Environmental Quality Act*).

The loss and disturbance of wetlands and their functions would be local in extent, as they would be within the footprint of the mine site and its periphery. The extent of effects would be validated through the wetland monitoring program. Effects would occur at the outset of the Project, as wetlands would be destroyed to develop the Project site. These effects would be felt over the long term and with a continuous frequency. Since 304.71 hectares of wetlands would inevitably be destroyed, the effects are considered irreversible. Since the proposed mine would be located in one of the most disturbed areas in the Eeyou Istchee Baie-James territory, the intensity of the effects is considered to be high on a basic level. The Committee believes that, once enhanced and approved by the Government of Quebec, the wetland compensation plan could limit the effects caused by the loss of wetlands and their functions. The intensity of the effect would thus be reduced to an average level since the negative effects would be partially compensated in this plan. The Committee notes, however, that the compensation methods are yet largely to be defined. The Committee notes that mining companies in Cree territory have so far focused on supporting research and restoration of ecological services rather than creating new wetlands. In summary, the Committee concluded that the residual effect was moderate and not significant.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the proposed Project does not cause significant adverse environmental effects on wetlands. The Committee took into account the mitigation and compensation measures proposed by the Proponent and the advice of government experts. The key mitigation measures are the following:

- Avoidance of work in wetlands, whenever possible. If work were to take place in the wetlands, the required mitigation measures would be put in place and the loss of functions would be compensated.
- Development and implementation of a compensation plan for wetland or water loss related to the Project, in collaboration with the Cree Nation of Eastmain, the Cree Nation Government and the relevant authorities. As part of this plan, the Proponent is encouraged to identify research or compensation projects with a view to contributing to or collaborating on them. The detailed compensation plan must:
    - be based on the Operational Framework for Use of Conservation Allowances (Environment Canada, 2012) and be implemented before wetland loss occurs;
    - demonstrate clearly how it will meet the objective of reducing wetland function losses, specifying the functions that will be compensated and the post-compensation loss balance;
    - identify and justify the performance indicators that will assess the success of the compensation measure and establish additional measures that could be implemented if the performance indicators are not met;
    - demonstrate that the compensation will be sustainable over time; and
    - be submitted to the Cree Nation Government and the appropriate authorities as soon as possible for review and comment, and before the start of construction.

- Apply measures to limit erosion and leaching of materials.
- Maintain drainage conditions in wetlands adjacent to the work areas, including the construction of a clay berm along stripped areas to prevent drainage of peatlands around infrastructure.
- Prevent the introduction of invasive alien plant species into the Project study area by cleaning construction equipment prior to arrival at the mine site to ensure that it is free of mud, animals, or plant fragments.
- Delineate areas containing invasive alien species to ensure land management without risk of spread.
- Clean up any vehicles and machinery that have driven through an area containing invasive alien species.

In addition, compliance with the key measures identified in the other chapters of this report would minimize effects on other environmental components affected by the Project that could impact wetlands. Adjustments to the mitigation measures could be made where appropriate to minimize adverse environmental effects.

Need for Follow-up and Follow-up Requirements

The Committee recommends the implementation of a wetland monitoring program at and near the mine site to:

- Document the actual direct and indirect effects of the Project on wetlands, such as the impact of hydrological changes caused by pit dewatering and drainage ditches on plant communities and maintenance of ecological functions;
- Verify the accuracy of the environmental assessment predictions;
- Assess the effectiveness of mitigation measures and compensation projects;
- Propose adaptive management measures, if existing measures are not adequate to avoid, reduce and control effects on wetlands.

This monitoring program must be submitted as soon as possible to the Agency, the Cree Nation Government and the relevant authorities for comment, in order to review the objectives, methodology, performance indicators and duration required to adequately assess the effectiveness of the mitigation measures that have been implemented for the wetlands.

In addition, the Proponent must follow up on the project-related wetland loss compensation plan, allowing corrective action to be taken as appropriate. This monitoring should be carried out for at least five years following the implementation of the plan to ensure that wetlands have recovered their functions and that these are maintained over time.

During all phases of the Project, the Proponent must verify annually whether invasive alien species have established themselves in the Project area and surrounding wetlands. This monitoring must be done at least once more after the mine has been restored.

5.3 Migratory Birds and Birds at Risk

The Project could result in residual effects on migratory birds and birds at risk due to habitat loss and degradation, and disturbance to birds. However, the Committee is of the opinion that these effects are not likely to be significant with the implementation of the mitigation and monitoring measures recommended in Section 5.3.2. In determining the significance of effects on these birds and their habitat, the Committee considers, among other things, whether the effects of the Project could adversely affect the conduct of one or more phases of their lifecycle, the maintenance of their populations, or the maintenance, management, or recovery of birds at risk, as well as the potential for adverse effects and non-compliance with the Migratory Birds Convention Act, 1994 and its Regulations.

The Committee assessed the effects of the Project on traditional resource use, including goose hunting, in Section 6.1 (Traditional Land and Resource Use). The following subsections present the information considered by the Committee in its analysis, including the opinions and comments of government experts and the Cree Nations consulted.

5.3.1 Analysis of Potential Effects and Proposed Mitigation measures

The Committee assessed the effects of the Project on migratory birds, their eggs and their nests, and on the bird species listed in Schedule 1 of SARA. Migratory birds are those listed in the Schedule of the *Migratory Birds Convention Act, 1994*.

The Proponent first selected the local study area (LSA), which covers an area of 36.9 square kilometres on the periphery of the future mine site, to assess the effects of the Project on migratory birds and birds at risk. The local study area (LSA) is frequented by avian fauna in the spring and fall migration periods and during nesting and rearing of young.

The Proponent produced a profile of the avian fauna by conducting an aerial inventory of waterfowl and aquatic birds in 2017. This inventory was conducted in an enlarged area (Figure 3) during the spring waterfowl migration. The Proponent also inventoried the land birds in the LSA during the same year, using listening stations distributed according to three habitat categories: wetlands, open environments and softwood stands. Finally, it completed its description of the baseline state, using existing data sources. For waterfowl and aquatic birds, 47 individuals divided into eight species were inventoried and no notable concentration area was identified. The Proponent also noted the presence of 32 terrestrial nesting bird species, for a total of 472 individuals. In general, it denoted a relatively low density of the bird species inventoried.

The Proponent specifies that eight species at risk protected under SARA and one species designated as threatened according to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) are likely to frequent the LSA, given their range or the presence of a potential habitat (Table 6). The Proponent also noted the presence of two of these species during inventories, the Common Nighthawk and the Rusty Blackbird. On the other hand, the Proponent considers that the presence of the Canada Warbler, the Red-necked Phalarope, the Yellow Rail and the Hudsonian Godwit in the LSA remains unlikely, given their range.

Table 6: Special-Status Bird Species Potentially Present in the Local Study Area

Species	Potential presence	Status	
		SARA	COSEWIC
Common Nighthawk	– Presence confirmed – At least one nesting pair	Threatened[15]	Special concern
Rusty Blackbird	– Presence confirmed – Estimate of 35 nesting pairs	Special concern	Special concern
Short-eared Owl	– Potential habitat – Low probability of presence due to the availability of prey	Special concern[17]	Threatened
Bank Swallow	– Potential habitat – High probability of presence	Threatened	Threatened
Olive-sided Flycatcher	– Potential habitat – Low probability of presence due to habitats less conductive to breeding	Threatened[17]	Special concern
Canada Warbler	– Potential habitat – The LSA is located at the northern limit of the nesting area	Threatened[17]	Special concern
Red-necked Phalarope	– Potential habitat	Special concern	Special concern
Yellow Rail	– Potential habitat	Special concern	Special concern
Hudsonian Godwit	– Potential habitat	Not listed[17]	Threatened

ECCC is satisfied with the description of the baseline state. The abundance of birds and their use of the study area during the spring, summer and fall periods were described appropriately. The Proponent proved that the potential habitats were covered sufficiently by the inventories to allow production of a representative picture of the study area. However, ECCC considers that the limitations on the quantity and quality of existing data increase the level of uncertainty regarding the validity and representativeness of the inventory results. According to the Proponent, the context of the bird inventories conducted for this Project is particular. Recent and repeated forest fires have considerably transformed the local environment, making it difficult to compare with undisturbed environments or its pre-fire state. Furthermore, the Proponent indicates that the data available for the study area is sparse and does not cover the winter season. The sector is not covered by the Eastern Waterfowl Monitoring Program, and the SOS-POP database does not contain any data for the study area. According to the Proponent, this state of affairs also limits the use of existing data to document the baseline, since the analysis of historical data cannot be used to describe the avian community that will be affected by the construction of the Project.

[15] Under review for change of status

ECCC indicates that many bird species are likely to nest in the LSA. The presence of two species at risk, the Common Nighthawk and the Rusty Blackbird, was confirmed in the nesting period. Moreover, the presence of potential nesting habitats for the Bank Swallow and the Olive-sided Flycatcher was documented in the area corresponding to the Project's footprint. ECCC confirms that no essential habitat of avian fauna at risk is present in the LSA.

Habitat Loss and Degradation

According to the Proponent, the deployment of mining infrastructure requires land preparation (soil stripping, deforestation, excavation work and earthwork), which would cause a notable habitat loss for the migratory birds and birds at risk of the LSA. This land preparation could also result in negative effects by accidentally disturbing, injuring or killing individuals or disturbing or destroying their nests or eggs, particularly during deforestation work. ECCC is of the opinion that the best approach to avoid infringing this Act is to understand clearly the risk of potential impact on migratory birds, their nests and their eggs and to take reasonable precautions and appropriate avoidance measures.

The Proponent also anticipates that the landscaping of the surfaces, the deployment of infrastructure and minewater management could have a moderate impact on certain water levels and streamflows on the scale of the watersheds. These changes to the hydrological regime could also alter the habitat of the aquatic bird species observed in the LSA.

The Proponent considers that habitat loss and degradation could have effects on breeding, feeding, migration and wintering of individuals, particularly for birds frequenting wetlands. Indeed, the Proponent notes that this type of environment accommodates great biological diversity. ECCC is of the opinion that the nesting and feeding habitat losses would have residual effects on birds, particularly on nesting pairs that would have to relocate to similar habitats nearby. When similar habitats are rarer, such relocation may result in increases in density of birds in the same habitat and lead to habitats scarcity of resources and an increase in predation. The destruction and deteriorations of habitats contribute directly or indirectly to the decline of certain more vulnerable species. Thus, certain bird pairs would succeed in settling elsewhere, while others could not, given their greater vulnerability to disturbances of their breeding habitat, intraspecies competition or predation.

The Project's total footprint, and thereby the habitat loss projected for birds, is about 450 hectares, including 305 hectares of wetlands and 145 hectares of terrestrial environments. Table 7 details the habitat losses projected for the various bird categories analyzed. However, certain areas would be revegetated during the restoration phase, making them available for avian fauna, although in a potentially different state than originally. In addition, the Proponent notes that the stripped environments and certain portions of waste rock piles could be attractive for the Common Nighthawk, just as the flooded pit could be for waterfowl. The same applies to the steep slopes of the borrow pits, appreciated by the Bank Swallow.

Table 7: Potential Habitat Loss According to Bird Type, Excluding Birds at Risk

Bird type	Preferred habitat in the local study area:	Function	Permanent loss of potential habitat (hectares)
Land birds – woodlands	Woods, black spruce-lichen stand, black spruce-alder stand, jack pine stand, wooded bog	Breeding, migration and wintering	112.63
Land birds – open environments or wetlands	Rock outcrop, shrubs, dry bare, anthropogenic, burns, terrestrial vegetation in the right of way, shrub and open bogs, wetland vegetation in the right of way	Breeding, migration and wintering	336.60
Waterfowl and shorebirds	Bodies of water, watercourses and shores	Breeding and migration	0.65

Table 8: Potential Habitat Losses for Birds at Risk

Bird species at risk	Preferred habitat in the local study area:	Function	Permanent loss of potential habitat (hectares)
Common Nighthawk	Open habitats, such as recently harvested forests, burns, deforested areas, open forests, bogs, lakeshores and rock outcrops	Breeding and migration	**336.60**
Short-eared Owl	Open habitats, such as bogs or vegetation of rights of way	Breeding and migration	**447.32**
Bank Swallow	Steep shore embankments of watercourses	Breeding and migration	**0**
Olive-sided Flycatcher	Natural forest openings, forest strips near natural openings (such as wetlands) or open or semi-open forest stands, opening of human origin (such as clear cutting), bogs.	Breeding and migration	**304.87**
Canada Warbler	Various forest types, particularly moist mixed forests in which the shrub stage is well developed, wooded bogs	Breeding and migration	**112.63**
Red-necked Phalarope	Wetlands, riparian vegetation on the edge of watercourses and bodies of water	Breeding and migration	**304.87**
Rusty Blackbird	Wetlands, edges of watercourses and bodies of water	Breeding and migration	**304.87**
Yellow Rail	Open wetlands	Breeding and migration	**213.02**
Hudsonian Godwit	Open and shrub bogs	Migration	**213.02**

The Proponent evaluated the number of nesting pairs that would be affected by the loss of wetlands, given the importance of this habitat for migratory birds. According to the scenario envisioned, the Proponent estimates that the Project would result in a wetland habitat loss for 1,207 nesting pairs in the LSA. These figures include an average of 35 nesting pairs of Rusty Blackbird, the only species at risk inventoried in wetlands. The Proponent considers that the expected effects on avian fauna would be reduced, given the low diversity and density observed in the LSA during inventories.

The Proponent plans to apply several measures to mitigate the negative effects of the Project on migratory birds and birds at risk. Whenever possible, it intends to avoid deforestation during the nesting period,

between May 1 and August 15. However, considering the technical constraints associated with the deforestation work in the territory, the habitats affected and the nesting periods of the species present, the Proponent is considering reducing this period from June 1 to July 31. ECCC indicates that it is essential to avoid conducting activities harmful to migratory birds during the nesting season. If deforestation work absolutely must be done during the nesting period, ECCC prefers non-intrusive monitoring methods, such as the use of listening stations, to determine if migratory birds are established in the work area. In all cases, ECCC recommends not conducting active searches for nests. Since the Proponent has not undertaken to perform deforestation work outside the nesting period, ECCC considers that the Project risks causing negative effects on breeding of migratory birds. However, ECCC is of the opinion that for land and aquatic birds, including the species at risk, the mitigation measures planned by the Proponent would allow minimization of the environmental effects resulting from the habitat losses.

The Proponent also proposes measures concerning the use of borrow pits, such as maintenance of a slope of no more than 70 degrees on the embankments exploited, in order to avoid effects on Bank Swallow nesting. ECCC finds that these measures are consistent with the recommendations formulated in the document Bank Swallow (*Riparia riparia*) in sandpits and quarries (ECCC, 2021a).

The Proponent intends to develop the offset plan to counter the loss of wetlands, which is addressed in Section 5.2. It also agrees to implement monitoring and follow-up programs for migratory birds and birds at risk in order to minimize the negative impacts of habitat loss. ECCC is of the opinion that monitoring should not be limited to the issues relating to use of water management ponds and borrow pits. Concerning the follow-up program for migratory birds and birds at risk, ECCC indicates that adaptive management measures would be required based on the summary information presented by the Proponent.

Disturbances Related to Noise, Light, Dust and Collision Risks

The mining infrastructure and activities may cause noise, light and dust, risking disturbance of bird behaviour. The mortality risks would also be increased, due to the potential collisions related to the presence of infrastructure and traffic on the site, particularly during the land preparation, construction and operation phases.

Noise

Vehicles driving on the Billy-Diamond Highway currently are the leading source of noise in the Project sector. The noise modelling study conducted by the Proponent forecasts that the ambient noise level during mining operations would rise to 73 dBA on the mine sites (workers' camp) and to 44 dBA at the kilometre 381 rest area.

The Proponent undertakes to comply with the provincial criteria relating to noise levels set out in Note d'instructions 98-01 (MELCC, 2006), namely 55 dBA in the daytime and 45 dBA at night at the closest sensitive receptor, the rest area. However, these criteria do not apply to the workers' camp, which is an integral part of the mining project. Note d'instructions 98-01 specifies that the criteria used are intended to protect human beings, but should also ensure sufficient protection for other animal species. In short, the Proponent indicates that an increase in the noise level would be perceptible at the rest area during the construction and operation activities, while remaining below the permitted limits.

However, ECCC considers that noise levels 10 decibels (dB) higher than the ambient level in the natural environment and noise levels higher than 50 decibels constitute a substantial source of disturbance for

birds (ECCC, 2019). The noise due to the Project thus could cause avoidance of the sector, and particularly the displacement of waterfowl to a quiet area elsewhere. Some members of the Cree Nations also raised concerns about noise associated with blasting and the passage of heavy trucks during the goose hunting seasons. Mitigation measures for this purpose are presented in Section 6.1 (Use of Lands and Resources for Traditional Purposes by Cree Nations). Noise could also disturb certain bird species during the breeding period, particularly songbirds who must adapt to changes in the noise environment.

Given the results of the noise modelling study and the acoustic power of the equipment planned for the construction and operation phases (e.g., hydraulic excavators, off-road trucks and crushers), the Committee is of the opinion that the noise level in the Project footprint could induce birds to avoid the sector of the future mine site, affect breeding success and alter interspecies communication. The Proponent proposes, in particular, to install efficiently performing mufflers on the equipment and avoid nighttime road transportation as much as possible to minimize disturbance by noise. It also undertakes to reducing the handling of waste rock and transportation of concentrate during the annual two-week moose and goose hunting seasons. In addition, there would be a reduction from three to one blast per week (two weeks total) for the spring goose hunting season. ECCC says it is satisfied with the mitigation measures proposed to manage noise.

Light

The presence of nocturnal light sources on the mine site, the equivalent of an average of 0.2 for the LSA, would alter the sky brightness conditions. Migratory birds and birds at risk frequenting the area would likely be disturbed by this artificial lighting. In particular, nocturnal migratory birds could be diverted from their route by the artificial lighting. Certain bird species could benefit from artificial lighting to increase their feeding success. On the other hand, some nocturnal birds instead might avoid the sector due to the increased predation risk resulting from artificial lighting. The Proponent proposes mitigation measures relating to the range, duration and type of artificial lighting, particularly by limiting the period and duration of nighttime use of lighting by installing fixed lights, oriented to avoid light spillage around the spaces to be lit. These measures would particularly seek to reduce the collision and mortality risks. ECCC says it is satisfied with the mitigation measures proposed to manage light.

Dust

The dust emitted during construction of infrastructure and the extraction, storage and transportation of ore, waste rock and tailings, could affect air quality and consequently avian fauna. The Proponent concludes that there would be occasional exceedances, mainly east of the pit, of the standard for total particles from the *Clean Air Regulation* (CAR). However, according to the atmospheric dispersion modelling study produced by the Proponent, the expected dust concentrations at the sensitive receptors would comply with the human health standards established by the CAR. To reduce the negative effects associated with dust, the Proponent proposes, in particular, a dust emissions management plan, including a road sprinkling management program and an air quality monitoring program.

Contamination Risks

Birds could use the water accumulation ponds present on the site for feeding or grooming purposes (e.g., preening). This water could be a source of contamination for birds, because it would contain heavy meals that could accumulate in their tissues and suspended particulate matter. According to the Proponent, the

east and north water management ponds could receive contaminated water, but would have little attraction for avian fauna in comparison with neighbouring lakes and ponds. It indicates that these ponds would not offer any source of food for birds. The Committee wishes to nuance this assertion, while a study by Desjardins et al. (2021) suggests that the mine ponds have the potential to be used by waterfowl during the breeding season. The Proponent proposes the deployment of a monthly monitoring program for the ponds upon their creation to document the eventual presence of birds. ECCC is satisfied with the Proponent's undertaking to conduct a follow-up to manage use of the water management ponds and implement measures to avoid their use.

An accidental spill of oil or other products could contaminate the neighbouring environment, thus affecting migratory birds and birds at risk. This could result in health problems for birds in direct or indirect contact with the product (lesions, body burns or loss of impermeability of plumage). A prudent scenario presumes that individuals are present during the accidental spill or between the time of the spill and the cleanup. The Proponent indicates that there is little likelihood of such a situation, wildlife should not approach the mine site, given the intensive human activity in the sector. The mitigation measures in relation to spills are discussed in Section 7.1 (Accidents and Malfunctions).

5.3.2 Joint Assessement Committee's Analysis and Conclusions Regarding Residual Effects

The Committee's analysis is based on the assessment of the effects produced by the Proponent on migratory birds and birds at risk, on the observations received from the Cree Nations and on ECCC's opinion.

After accounting for the implementation of the key mitigation measures and the follow-up measures described in this section, the Committee is of the opinion that the Project is unlikely to result in significant adverse effects on migratory birds and birds at risk. The Committee believes that the Proponent has adequately documented its Project's effects on migratory birds and birds at risk. The level of residual effects would be moderate. The Committee's assessment of the residual effects is based on the environmental effects assessment criteria in Appendix A and the following findings:

Because the operation phase of the mine extends over 18.5 years, the adverse effects would be observed continuously in the long term. Although the habitat loss would be limited to the footprint of the mine site, the disturbances suffered by the birds would extend beyond the immediate site of the Project, which corresponds to a local range. A partial return to the baseline state could be envisioned starting in the restoration phase, while all the adverse effects would diminish gradually. The Committee is of the opinion that these effects could be reversible in the very long term, meaning that the VC could be restored completely over several decades after revegetation.

The Committee estimates that the intensity of the adverse effects of the Project on migratory birds and birds at risk would be medium, given the habitat loss of about 450 hectares, projected in an area where the presence of two species at risk was confirmed: the Common Nighthawk and the Rusty Blackbird. The Committee also recalls the potential presence of one other species at risk privileged under SARA, and one species designated as threatened by the COSEWIC. The habitat loss could impair the progress of one or more important phases of the lifecycle of migratory birds and birds at risk, thus reducing their abundance. However, because replacement habitats exist, available beyond the LSA, and coherent mitigation measures are planned by the Proponent, the Committee is of the opinion that habitat loss would not impair

population maintenance. The Committee points out that deforestation in the construction phase would be carried out, whenever possible, outside the nesting period, which would reduce the risks of inadvertently disturbing, injuring or killing individuals or disturbing or destroying their nests or eggs. The Committee considers that the disturbances associated with noise, light and dust, as well as the collision and contamination risks, are of lesser intensity than habitat loss and that birds are able to avoid the sector. The Committee is satisfied with the measures presented by the Proponent to avoid and minimize the adverse effects on migratory birds and birds at risk.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures necessary to ensure that the Project does not have significant adverse environmental effects on migratory birds and birds at risk. The Committee took into account the mitigation measures proposed by the Proponent, the opinions of government experts and the observations received from the Cree Nations consulted. The Committee also ensured that measures consistent with any recovery strategy would be taken to avoid, mitigate, or monitor adverse effects on birds at risk if the Project proceeds. The key mitigation measures are as follows:

- Carry out the Project, including vegetation clearing and blasting, in a manner that protects migratory birds and birds at risk and avoids injuring, killing, or disturbing them, or destroying, disturbing, or taking their nests or eggs. It is important that measures be deployed to avoid the adverse effects on birds, their nests and their eggs during all the Project phases, and more specifically for the period from the end of April to mid-August. Implement the measures that comply with the *Migratory Birds Convention Act, 1994*, the *Migratory Birds Regulations*, and SARA; In this regard, account for the ECCC Guidelines to reduce risk to migratory birds. In doing so:
  - Whenever possible, conduct any activity likely to impair nesting of migratory birds and species at risk, including deforestation, outside the nesting periods, usually extending from the end of April to mid-August;
  - Determine the dates of the nesting period on the basis of the best information available for any year during which activities associated with each stage of the Project could impair nesting of migratory birds and birds at risk. It should be noted that, when the dates of the nesting period apply to a large territory, it is possible that the local nesting period differs from the dates selected due to microclimate conditions specific to certain places or interannual climate variations (e.g., early spring, cold and rainy summer);
  - If deforestation work must be done during the nesting period, do not do active searches for nests, except if they are easy to identify. To determine if migratory birds make their nests in an area at a specific time, use non-intrusive monitoring methods, such as listening stations, to avoid disturbing the birds during nesting;
  - If nests are found in the work area, implement protective measures around the nest until nesting has ended. Develop these measures in advance in consultation with ECCC, the Cree Nation Government, the Cree Nation of Eastmain and the tallyman of trapline RE02. Present these measures to the Agency and the Cree Nation Government before implementing them.
  - Do not frighten the birds, even before the beginning of the nesting period, which would result in the risk of harmful effects on migratory birds and birds at risk.

- Delineate, prior to the commencement of clearing, the areas to be cleared, including along roads, and do not undertake clearing outside these areas unless necessary for health and safety reasons.
- Apply noise and light reduction measures to minimize disturbances for migratory birds and birds at risk. The effectiveness of these measures must be presented annually to the Cree Nation Government, the Cree Nation of Eastmain and the tallyman of trapline RE02 and they must be adjusted as needed.
- Implement measures to avoid the use of water management ponds for migratory birds and birds at risk.
- Implement measures to avoid the use of borrow pits by the Bank Swallow. These measures must be consistent with the recommendations formulated in the document Bank swallow (*Riparia riparia*) in sandpits and quarries (ECCC, 2021a).
- Gradually rehabilitate the components of the Project to revegetate the cleared areas and thus create a suitable habitat for migratory birds.
- Gradually restore the environment at the end of the work, as the disturbed areas are no longer used. Prefer the creation of favourable habitats for species at risk present or potentially present in the Project area, at the time of restoration.
- Include a component on protection of avian fauna in the training of employees. In particular, this must sensitize employees to the presence of migratory bird nests and the measures to be implemented in the event a nest is discovered. The training must also sensitize employees to report any use of water management ponds by avian fauna to the environment manager.

Need for Follow-up and Follow-up Requirements

To verify the predicted effects on migratory birds and birds at risk protected under SARA and the effectiveness of the proposed mitigation measures, the Committee recommends that the follow-up program include the following requirements:

- Develop and present to the Agency, the Cree Nation Government and ECCC a detailed general follow-up program for migratory birds and birds at risk before the beginning of the construction work, considering the knowledge of the users of the territory. This follow-up program must apply to all the phases of the Project. Before the performance of the work, inventories could be necessary to establish appropriate and up-to-date baseline values, because the last inventory was conducted in 2017. This program, in particular, must:
  - Identify the birds present on the periphery of the deforested area and in the restored habitats, indicating the density, the abundance and the location of these birds. All the bird species seen and heard during inventories must be listed, and special attention must be given to the following special-status bird species: Common Nighthawk, Rusty Blackbird, Short-eared Owl, Bank Swallow, Olive-sided Flycatcher, Canada Warbler, Red-necked Phalarope, Yellow Rail and Hudsonian Godwit.
  - Establish performance indicators to assess the effectiveness of the mitigation measures and determine if additional mitigation measures are required. All the types of residual effects foreseen must also be assessed and documented, including those related to collisions and mortality;
  - Include adaptive management measures, if applicable, to mitigate any unforeseen negative environmental effect;
  - Present the following items in the follow-up reports: methodology, Cree participation in the follow-up work, results, analysis of the results, and additional mitigation measures, if applicable. A

schedule of follow-up reports must be established according to the different activities and phases of the Project.

- Before the beginning of the construction work, deploy a monitoring program for activities that risk having an effect on migratory birds and birds at risk during all the phases of the Project. For each activity, determine the measures to be deployed to ensure reduction of nuisances or disturbance, particularly during the nesting period. The monitoring program shall include, non-exhaustively, the issues relating to use of water management ponds by avian fauna and use of borrow pits for Bank Swallow nesting. The program must also deal with monitoring of the work to be performed in order to ensure that it does not cause any destruction of nests or eggs of migratory birds. Account, in particular, for bird species at risk, particularly the Common Nighthawk and the Rusty Blackbird, whose presence has been confirmed. Periodically update the monitoring program to account for changes in the regulations, particularly the revision of the status of wild species by the COSEWIC or SARA.
- Follow up the recovery of vegetation on the restored surfaces. The objective of this follow-up is to ensure that the site restoration activities have allowed the establishment of an appropriate vegetation density to protect against erosion and to ensure appropriate revegetation of the areas disturbed by mining activity. The follow-up will seek to characterize the recovery of the vegetation and the species composition in the restored areas, identify the signs of erosion and to verify the use of restored surfaces by avian fauna. The follow-ups must be conducted for five years.

5.4 Transboundary Environmental Effects – Greenhouse Gas Emissions

The Project could result in residual transboundary effects in relation to greenhouse gas (GHG) emissions. The Committee is of the opinion that those effects are unlikely to be significant, because the Project's quantity of GHGs would make little contribution to provincial and national emissions. Indeed, the highest annual emissions, about 48 kilotonnes of carbon dioxide equivalent (CO_2 eq), would be observed in the 14th year of mining operations. The quantity corresponds to 0.06% of the total GHG emissions inventoried in Quebec in 2017 (MELCC, 2021b) and 0.007% of the total GHG emissions inventoried in Canada in 2018 (ECCC, 2021b). The total emissions for the duration of the Project, 23 years, would be approximately 846 kilotonnes of CO_2 eq.

The following subsections provide the information which the Committee considered in the analysis of the significance of the transboundary environmental effects, including the opinions and comments of the government experts and the Cree Nations consulted.

5.4.1 Analysis of Potential Effects and Proposed Mitigation Measures

GHGs are naturally present in the Earth's atmosphere. These gases retain a portion of the infrared radiation emitted by the Earth's surface, which causes overheating of the lower layers of the atmosphere. Climate change, caused by the increase in the GHG concentration in the atmosphere, has an impact on ecosystems and human health. This increase in the GHG concentration is due to human activity, particularly the use of

fossil fuels. The main GHGs are carbon dioxide, methane, nitrous oxide, sulphur hexafluorine, ozone, hydrofluorocarbons, and perfluorinated hydrocarbons. GHG estimates are usually expressed in terms of carbon dioxide equivalent (CO_2 eq) per year.

GHGs are dispersed globally and this dispersion is considered to be a transboundary environmental effect for the purposes of CEAA 2012. Since 2017, projects that emit more than ten kilotonnes of CO_2 eq per year are bound to report their emissions to ECCC. On the main menu, under the *Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere*, every person operating an establishment that, during a calendar year, emits GHGs into the atmosphere in a quantity equal to or greater than ten kilotonnes of CO_2 eq must report those emissions to the Quebec Government each year. In 2018, total GHG emissions in Quebec amounted to 80,600 kilotonnes of CO_2 eq (MELCC, 2021b). In 2019, total GHG emission in Quebec amounted to 729,300 kilotonnes of CO_2 eq (ECCC, 2021b).

The Proponent established the main sources of GHG emissions for each phase of the Project. During operation, the main emissions sources, in descending order, would be:

- fossil fuel (diesel) combustion by vehicles and mining equipment;
- stationary combustion (e.g. use of propane generators);
- ore and freight transportation;
- air and bus transportation of employees;
- sse of explosives for extraction activities; and
- hydroelectric consumption.

The Proponent estimates that 845.8 kilotonnes of CO_2 eq would be produced during the mining project lifecycle of 23 years. About one quarter of these emissions are said to be indirect, meaning that they are a consequence of the Project's activities, but come from sources controlled by other entities (e.g. electricity production by a third party, transportation of employees) [MELCC, 2019]. The Project would emit 18.6 kilotonnes of CO_2 eq per year of construction, or a total of 27.9 kilotonnes of CO_2 eq for the 18 months projected for this phase. The emissions would be 41.8 kilotonnes of CO_2 eq in the first year of operation and would increase to 48 kilotonnes of CO_2 eq in the 14th year of operation. The emissions would decrease to 22 kilotonnes of CO_2 eq for the restoration year. Table 9 presents the quantities of GHG emissions for each phase of the Project.

Table 9: Summary of the Project's Greenhouse Gas Emissions Forecasts

Phase	Duration (years)	Estimate of greenhouse gas emissions	
		Annual (tonnes of CO_2 eq /year)	For the duration of the phase (tonnes of CO_2)
Construction	1.5	18,512	27,768[1]
Operation	18.5	43,028	796,027
Decommissioning	3	7,335	22,005
Total	23	68,875	845,800

[1] This number does not include the loss of a carbon sink caused by the deforestation necessary to carry out the Project, which corresponds to the additional emission of 37,862 tonnes of CO_2 eq in the construction phase.

The Proponent proposes different measures to reduce GHG emissions. First of all, the planning of the mine site was optimized in summer 2021 to reduce the transportation distances and, consequently, the fuel consumption of the trucks on the site. It also undertook to acquire some electric vehicles: a forklift, two buses and nine pickups. It specifies that the other mine equipment is unavailable in an electric version or does not suit the Project's needs. However, the Proponent points out that, at the time of the renewal of the vehicle fleet, it will closely monitor the development of the electric models for eventual integration. The equipment and vehicles would be serviced regularly to maintain their energy efficiency and the drivers would avoid idling their engines needlessly. Moreover, the Proponent would monitor GHG emissions by mobile sources, compiling fuel consumption of the vehicles and machinery throughout the Project's lifecycle. It would also monitor diesel consumption by the generators and electricity consumption via electric meters.

ECCC is of the opinion that the GHG emissions were estimated according to a well established and recognized methodology. ECCC considers that the mitigation measures mentioned previously would allow reduction of emissions, GHGs would be emitted during every phase of the Project and would contribute to the Canadian and global GHG emissions. ECCC recalls the GHG reduction approach that must be put forward for the Project, i.e.:

- Whenever possible, use green energy, such as hydroelectricity;
- Prefer the use of electrical equipment for operation of the mine;
- Deploy a watch program for replacement, when possible, of equipment consuming fossil fuel with equipment consuming loss polluting energy (emitters);
- Extend electricity to the other infrastructures when it becomes available in sufficient quantity

5.4.2 Joint Assessment Committee Analysis and Conclusions Regarding Residual Effects

According to the Committee, significant adverse transboundary environmental effects occur when the Project's emissions represent a high contribution compared to provincial or national GHG emissions. Given the Project's low contribution to provincial and national GHG emissions and the implementation of the mitigation measures described previously, the Committee is of the opinion that the Project is unlikely to cause significant adverse environmental effects regarding GHG emissions. The Committee notes that the Proponent would use hydroelectricity, which emits few GHGs, to supply power to most of the stationary equipment. The Committee also acknowledges the steps taken by the Proponent to procure some electric vehicles.

The most GHGs would be generated during the operating phase, for an annual maximum of 48 kilotonnes of CO_2 eq. These emissions are equivalent to 0.06% of the total GHG emissions inventoried in Quebec in 2017 and 0.007% of the total GHG emissions inventoried in Canada in 2018. In comparison, in 2018, the top ten Canadian emitters emitted 4,785 and 11,783 kilotonnes of CO_2 eq per year. In Quebec, the top ten emitters emitted 763 and 1,187 kilotonnes of CO_2 eq per year (ECCC, 2021b).

Accounting for this information, the Committee considers that the GHG emissions volume for the Project would be low compared to the provincial and national emissions levels. It notes that this nonetheless involves a non-negligible increase in the context of the fight against climate change.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures necessary to ensure that the accomplishment of the Project does not lead to significant adverse environmental effects associated with GHG emissions. The Committee took into account the mitigation measures proposed by the Proponent, the opinions of government experts and the observations received from the Cree Nations consulted. The key mitigation measures are as follows:

- With the goal of reducing greenhouse gas (GHG), nitrogen dioxide and particulate matter emissions resulting from combustion, use zero-emission equipment and vehicles. If they are unavailable, use equipment and vehicles running on diesel in accordance with the Group 4 emissions standards, or equipment and vehicles running on fuel with low carbon content, such as natural gas, propane, renewable fuel or hydrogen;
- Prioritize purchasing of energy-efficient equipment and vehicles based on the best technology available on the market in terms of energy consumption, if this is technically and economically feasible;
- Produce an official watch program involving monitoring of any technological advance in the energy field to reduce dependence on fossil fuel and implement the projects envisioned in the event of the supply of sufficient electric power for all of the Project's infrastructure;
- Provide ecodriving training to the truck drivers transporting materials;
- Do not idle engines, except in case of exceptions related to weather conditions;
- Use the equipment and follow the construction and development standards, procedures and operating modes intended to achieve energy efficiency;
- Establish the speed limits on the roads located within the limits of the Project's property, accounting for the recommendations of *Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities*. Require and ensure that every person observes the established speed limits, during every phase of the Project;
- Whenever possible, avoid burning of felling and brush cutting residues on the work site. Prefer shredding and spreading of these residues on the work or any other use that would allow their valorization, use or recycling;
- Monitor consumption of fuel and electricity.

In short, the Committee is of the opinion that the Proponent must implement all the mitigation measures available to it that would allow reduction of the Project's contribution to GHG emissions.

Need for Follow-up and Follow-up Requirements

Given the Project's low contribution to GHG emissions on the provincial and national scale, the Committee considers that follow-up is unnecessary to verify the transboundary effects of the mitigation measures. However, the Committee notes that the projected emissions would exceed the reporting threshold of 25 kilotonnes of CO_2 eq per year. Consequently, the Proponent must monitor its GHG emissions and communicate them every year to ECCC and the Quebec Government.

5.5 Species at Risk

5.4.1 Analysis of Potential Effects and Proposed Mitigation measures

Species at risk include species that receive legal protection under Schedule 1 of Canada's SARA. For the Project, at least four mammalian wildlife species at risk have been observed or are likely to frequent the territory: Woodland Caribou, Little Brown Myotis, Northern Myotis, and Wolverine. The Project's potential effects on these species are discussed in this section, while the impacts on bird species at risk are discussed in Section 5.3. The Committee believes that, with the implementation of the mitigation and monitoring measures recommended below, the Project is unlikely to result in adverse residual effects.

ECCC believes that the Proponent has identified the Project's potential environmental effects on species at risk but has not described them in detail to better guide the selection of effective mitigation measures and the development of monitoring and follow-up programs. ECCC indicates that all relevant mitigation measures proposed by the Proponent below to minimize the Project's effects on the individuals and habitat of these species should be implemented in a timely manner, regardless of the significance of the effects.

Caribou

The Woodland Caribou (boreal population) is a species recognized as threatened under SARA and as vulnerable under Quebec's *Act respecting threatened or vulnerable species*. The migratory caribou (or caribou – eastern migratory population) is a species designated as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). As of the date of this report, the migratory caribou is not a species at risk under SARA. Nevertheless, the Committee has conducted a summary assessment of the effects on migratory caribou since the species is valued by the Cree Nations.

The Cree Nations participate in caribou conservation efforts by limiting their harvesting of the species. A number of members of the Cree Nations expressed concerns about the Project's effects on caribou, including habitat loss and fragmentation and collision risks due to increased road traffic. The members who expressed concerns want Cree traditional knowledge to be considered in the analysis and assessment of the effects on caribou. Information about caribou from traditional knowledge shared during the consultations is incorporated below.

Woodland Caribou

The Woodland Caribou is a sedentary species that requires large areas of continuous, undisturbed habitat, such as mature coniferous forests and peatlands. These large areas allow them to disperse when conditions are unfavourable and avoid areas of high predation risk (ECCC, 2020). The goal of the Modified Recovery Strategy for Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada is to ensure the self-sustainability of local populations of the Woodland Caribou within each of its ranges in Canada (ECCC, 2020). This is achieved by promoting habitat connectivity so that Woodland Caribou can move throughout their range to satisfy their life history processes (calving, rutting and wintering). Habitat alteration (loss, degradation, or fragmentation) due to human activity and wildfires is the primary factor affecting local populations of Woodland Caribou. It can affect the viability of a local population of Woodland

Caribou by reducing habitat quality or area, and it can even result in the disappearance of a local population. ECCC has determined that nearly 70% of the variation in a Woodland Caribou population can be attributed to habitat alteration (ECCC, 2020).

The future mine site would overlap the QC6 range[16] of the Woodland Caribou. As noted in the Recovery Strategy, the rate of disturbance to Woodland Caribou habitat within a given range must remain below 35% for the population to have a 60% minimum probability of self-sustainability. The QC6 range currently has a habitat disturbance rate of 32% and is considered slightly to moderately disturbed (ECCC, 2020). The local population in this range therefore has a probability of self-sustainability and is considered stable (Environment Canada, 2012). However, Quebec's Ministère des Forêts, de la Faune et des Parcs (MFFP) indicates that the density of the species is not homogeneous in the QC6 range, which requires a differentiated management approach under provincial jurisdiction.

The Proponent has established a large wildlife study area to assess the Project's effects on Woodland Caribou. That study area, covering 7,850 km^2, is included within a 50 km radius of the future mine site (see Figure 2). According to the Proponent, the Nottaway herd, which occupies the territory north of Matagami, is likely to frequent the study area. The large wildlife study area lies to the north of the territory inhabited by the Nottaway herd. The MFFP estimated the population of the Nottaway herd at 308 individuals in 2016, and ECCC notes it would be in decline (ECCC, 2017). The Proponent also points out that in the view of the working group on Woodland Caribou recovery, the Nottaway herd and the Assinica and Témiscamie herds further east are not self-sustaining.

Habitat Alteration

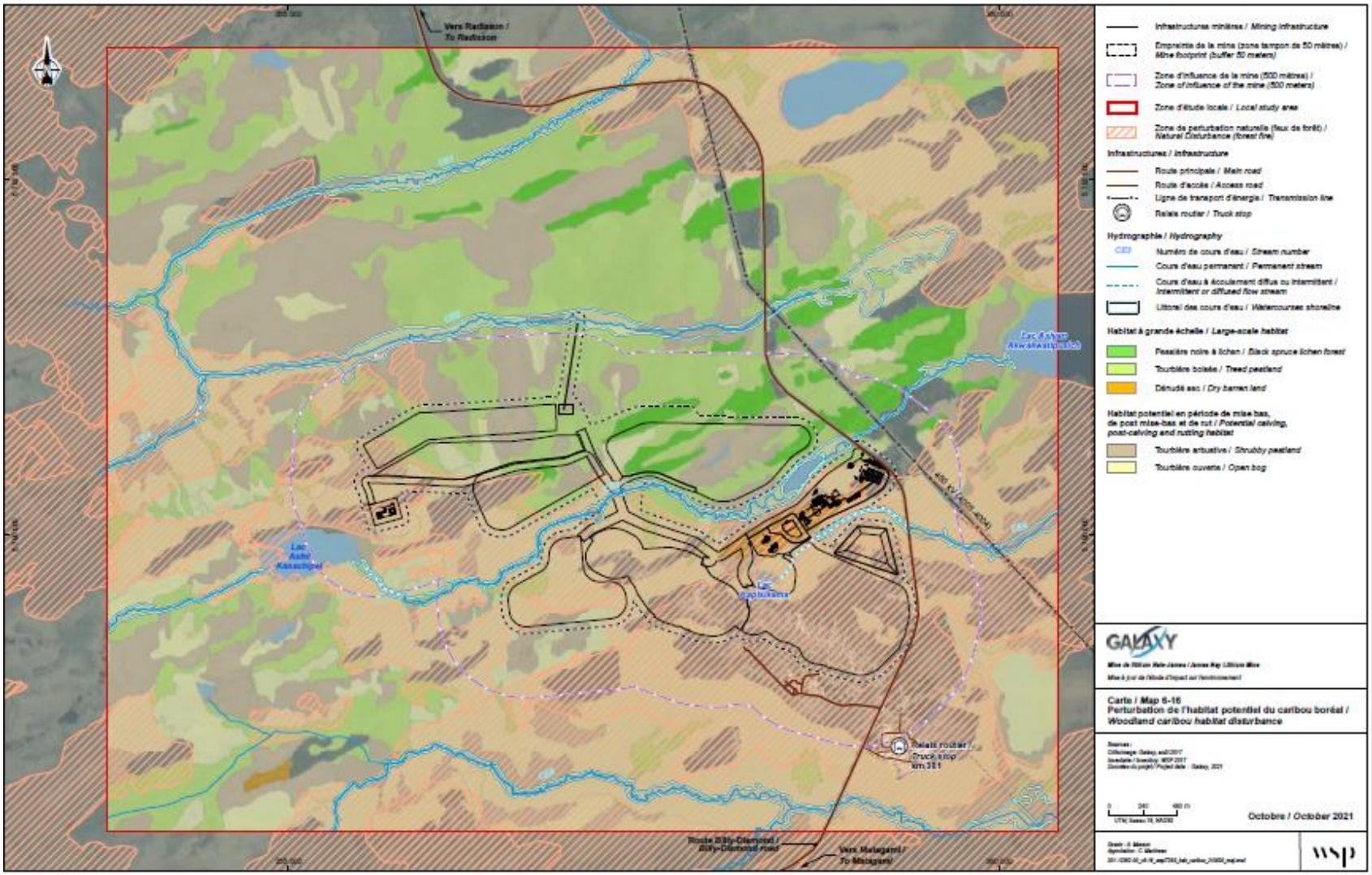
In SARA, critical habitat is defined as the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species. The Proponent estimates that the Project would cause a loss of 671.5 hectares of critical habitat for Woodland Caribou. This calculation includes habitat undisturbed by fire within the mine footprint and within a 500 metre buffer zone around the mining facilities, as recommended by ECCC. The loss of large-scale habitat would be 254.1 hectares. The loss of calving, post-calving and rutting habitat, which consists of shrub peatland and open peatland, would be 417.5 hectares. This total loss of 671.5 hectares would make up less than 0.1% of the large wildlife study area and, according to the Proponent, would occur in an area that is unsuited to satisfying the life history processes of Woodland Caribou. The Committee and ECCC believe that the Project would alter the Woodland Caribou habitat but would not significantly increase the habitat disturbance rate across the QC-6 range.

Figure 12 shows the different types of habitat present on the site and the potential loss of critical habitat for Woodland Caribou. The Proponent notes that the black spruce-lichen woodlands and wooded peatlands in the vicinity of the future mine site are highly fragmented and small in area, as a result of anthropogenic or natural disturbances. These characteristics do not meet the criteria defined by ECCC for large-scale Woodland Caribou habitat. On the other hand, shrub peatland and open peatland, which make up 64% of the large wildlife study area, may be used by Woodland Caribou during calving, post-calving and rutting.

[16] The range is the geographic area that is occupied by a group of individuals exposed to similar factors affecting their demography and is used to satisfy their life history processes. The QC6 range, as established in the Modified Recovery Strategy (ECCC, 2020), encompasses the territory of James Bay and the North Shore, an area of about 622,000 km^2.

The Proponent maintains, however, that this type of environment is very common in the area and that the females would choose habitats further away from the mine.

Figure 12: Disturbance of Potential Woodland Caribou Habitat



Source: WSP Canada (2021)

The Proponent argues that there is a particular context to this moderate loss of critical habitat, as the large wildlife study area has been heavily disturbed by forest fires over the past 40 years. These forest fires, some of them occurring in rapid succession, have disturbed 90% of the area within 5 km of the proposed mine and 66% of the area within 50 km. According to the MFFP, the very short fire cycle in the territory does not favour colonization by Woodland Caribou. The active populations are currently located further south and tend not to move around much. The MFFP believes that over a 50- to 80-year window, Woodland Caribou are unlikely to colonize the Project area. Moreover, with climate change, the fire cycle is likely to be more frequent and could impede forest recovery. The Proponent points out that in the long term, the site's footprint would be vegetated and might gradually become a potential habitat for Woodland Caribou.

The Proponent asserts that as far as is currently known, caribou have not frequented the large wildlife study area in the last decade. According to the Proponent, caribou may already be avoiding the area because of existing human activity at the Kilometre 381 truck stop and the presence of Billy Diamond Highway. In the winter of 2008-2009, MFFP telemetry data showed the presence of a single Woodland Caribou in the study area. However, those data must be interpreted with caution, since a very small proportion of individuals have telemetry collars. The MFFP incidentally observed signs of caribou in the fall of 2013 and also observed two individuals in July 2014 and three individuals in June 2015. In addition, no individuals were noted in an aerial survey conducted over a portion of the study area in March 2018. However, the Proponent does not rule out the possibility that individuals may have frequented the study area in the past during movements, mainly in the summer and fall. The traditional knowledge of Cree users of the Eastmain territory tends to support the above information. According to those users, the area around the proposed mine was never frequented by large numbers of caribou, even before the repeated disturbances caused by forest fires. A few Woodland Caribou have been observed over the past 15 years, specifically south of trapline RE02, west of Billy Diamond Highway. There are apparently still a few Woodland Caribou in the area of Kilometre 340 on Billy Diamond Highway, which is at the northern limit of their range.

According to the Proponent, the Project would not have significant adverse effects on the connectivity between Woodland Caribou habitats, since the mine site would be very close to Billy Diamond Highway, the Kilometre 381 truck stop and a power line. Existing infrastructure has already fragmented the caribou habitat considerably, and the addition of mining facilities is not expected to significantly increase habitat fragmentation, which will probably be concentrated in an area extending over about 5 km. The Proponent's view is that in comparison with the study area, the proposed mine site would be small and could be easily bypassed by caribou.

Increased Predation Risk

According to the Proponent, the areas cleared for development of the mining facilities would not offer good habitat conditions for moose and would therefore not attract the Woodland Caribou's main predators, namely black bears and wolves. Specifically, the mining facilities would not include linear elements that would allow wolves to move at high speed and hunt more effectively, thereby increasing the predation pressure on Woodland Caribou. The Proponent also indicates that the current intensity of human activity at the Kilometre 381 truck stop probably has a deterrent effect on wildlife.

However, some members of the Cree Nation of Eastmain expressed concern about waste management and its impact on the presence of predators around the worker camp. According to the MFFP, Woodland Caribou are particularly vulnerable to predators, which can be attracted by poor waste management in a given area.

To minimize the risks of attracting wolves and black bears, the MFFP believes that the Proponent should store its waste in containers equipped with bear-proof lids in fenced areas. The Proponent plans to install animal-proof containers. The containers would be placed in the industrial area, where there would be continuous traffic. The Proponent believes that it would be surprising for black bears to venture onto land that is regularly used by employees and movable vehicles.

Increased Noise and Road Traffic

The Project would cause a number of disturbances for the species, particularly because of the increase in road traffic and noise. The impact of road traffic and noise on animal behaviour is an important issue for the Cree. Concerns about this were raised during consultations with the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation, and the Cree First Nation of Waswanipi. During the operation phase, weekly traffic on Billy Diamond Highway would consist of the following: 168 truck trips to transport ore (84 round trips), 42 truck trips for supply (21 round trips), and 28 bus trips (14 round trips) to transport workers between the Eastmain airport and the mine site. The Proponent indicates that this substantial increase in road traffic could increase the risk of collision with caribou.

The noise level currently measured at the Project site does not exceed 48 decibels. Construction activity, which would take place between 7 a.m. and 6 p.m., would increase the maximum noise level to 72 A-weighted decibels (dBA) at the worker camp. The noise level would increase to 73 dBA during the operation phase. However, the maximum perceived noise level would decrease as one moves away from the proposed mine. For example, sound levels of less than 45 dBA are expected at the Kilometre 381 truck stop. The Proponent indicates that blasting would also cause vibrations, but that would at least be done during the day. Furthermore, the Proponent notes that there are no scientific studies documenting the effect of light on Woodland Caribou. The Proponent expects few adverse effects from light because of the low level of light that would be projected upward and the absence of intrusive light at the perimeter of the Project site.

The Proponent believes that the caribou would respond to these disturbances by avoiding the mine area. Furthermore, since there are few caribou in the large wildlife study area, the Proponent believes that the significance of the effects associated with disturbances due to noise and road traffic would be minor. ECCC is of the opinion that effects on individuals are possible even though the Project area is relatively uncommon for the species and woodland caribou are likely to avoid the Project area during the construction and operation phases. As a precautionary measure and in order to reduce the uncertainties regarding the risks to individuals in the event of the presence of caribou in the Project's area of influence during the construction and operation phases, ECCC considers that monitoring and follow-up measures should be put in place to prevent the effects of the Project on individuals.

Proposed Mitigation Measures

The Proponent proposes a number of mitigation measures to minimize the Project's adverse effects on Woodland Caribou and to ensure consistency with the Recovery Strategy, such as the establishment of a joint working group with the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation to discuss potential monitoring of the species. The measures also include a road traffic management plan and a mandatory reporting protocol in the event that caribou are observed in the study area or on the ore transportation route. The Committee recommends that the plan be developed in conjunction with the Cree Nations.

The Proponent also proposes to add signage in areas of higher collision risk to warn drivers and thus reduce the collision risk. The Committee notes that Billy Diamond Highway is managed and maintained by the James Bay Development Corporation (JBDC), an agent of the Government of Quebec. The Proponent must therefore discuss this measure with the JBDC. In addition, the Proponent plans to manage waste so as to avoid attracting predators to the mine site, to transport ore by truck convoy in the event that caribou are observed in the Project's zone of influence, to assist in monitoring local Woodland Caribou populations, and to give preference to softwood species for reforestation during the decommissioning phase. According to ECCC, although the study area is generally not well-suited to Woodland Caribou, certain environmental effects, such as habitat alteration, would persist despite the implementation of mitigation measures. ECCC also raised risks and uncertainties about the effects on individuals.

Migratory Caribou

The mine site would overlap the southern part of the historical range of the Leaf River herd. According to the Proponent, migratory caribou may frequent the large wildlife study area during the winter, when the population is growing and individuals are moving south in search of food. However, the population of this herd plunged from over 600,000 individuals in the early 2000s to 181,000 individuals in 2016. According to the MFFP, the range of migratory caribou has receded substantially northward because of the population decline, and a return to peak populations in the Project area is unlikely within the next three decades because of adverse environmental pressures. According to MFFP telemetry tracking data, individuals from the Leaf River population frequented the large wildlife study area from December 2013 to March 2014 and from December 2015 to February 2016. However, these observations were made within a radius of 20 km or more from the centre of the proposed mine. Comments from two Cree hunters corroborate these findings. They state that the large wildlife study area has generally not been frequented by caribou for several years, with the exception of the Opinica Reservoir area, northeast of the study area, from November to March. The Committee believes that the Project is unlikely to have adverse effects on migratory caribou, in view of their more northerly range and their low probability of returning to the area in the coming decades. The Committee and ECCC believe that the effects and the mitigation measures outlined above for Woodland Caribou are applicable to migratory caribou.

Chiropterans

The Proponent selected the local study area (LSA), which covers an area of 36.9 km^2, to assess the Project's effects on the Northern Myotis and the Little Brown Myotis. Between July and September 2017, the Proponent conducted an acoustic inventory of chiropterans (bats) using six stations located within 1.5 km of the facilities. During the inventory, 68 passes and 3 calls of bats of the genus *Myotis* were recorded. Among bats of the genus *Myotis*, the Little Brown Myotis and the Northern Myotis are designated as endangered under SARA. As a result, the Proponent paid special attention to these species in its effects analysis. The designation of these two species is due in part to the population decline caused by white-nose syndrome. According to the Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-coloured Bat (*Perimyotis subflavus*) in Canada (ECCC, 2018), white-nose syndrome and habitat loss are hindering the recovery of these species.

The Little Brown Myotis and the Northern Myotis nest in tree structures, including cavities and cracks under bark, in buildings, and in rock structures. Older forest stands are prime habitat, as they contain standing

dead trees (snags), in which both species like to nest. In the Recovery Strategy, critical habitat for bats is identified in part as hibernacula. Hibernacula are caves, abandoned mines, wells, cellars, or tunnels with low light and sound levels that bats like to return to year after year for hibernation and overwintering. The Proponent conducted a literature search to assess the potential for hibernacula in the LSA. According to the various sources the Proponent consulted, such as external databases (e.g., the Quebec Geomining Information System), internal databases, photos, and videos taken during wildlife inventories, there are no natural cavities or mine openings in the study area. Consequently, the Proponent considers the potential for hibernacula in the LSA to be nil. By way of comparison, a Little Brown Myotis maternity colony numbering approximately 300 individuals was identified about 100 km southeast of the LSA, in connection with the Whabouchi Mining Project.

Habitat Alteration

The Proponent estimates that clearing and related work would result in the loss of 110.9 hectares of tree habitat for the Little Brown Myotis and the Northern Myotis. The Proponent states that as the forest stands in the area have been affected by major fires in recent decades, they are not high-quality habitat for chiropterans. The Proponent adds that clearing activities could also result in mortality for chiropterans present on the site, particularly if a maternity site is present, but it considers this risk to be minimal in view of the modest results of the 2017 inventory, which it believes are attributable to the general poverty of forest stands available in the area.

The Proponent anticipates that the Project would also result in the loss of approximately 305 ha of wetlands, which are considered key habitats for the feeding needs of chiropterans. However, the Proponent maintains that those wetlands are primarily peatlands, which are not preferred feeding sites for chiropterans. In addition, the Proponent notes that many alternative habitats of equal or better quality are available regionally, for daytime roosting locations, maternity colonies or foraging sites. Thus, the above-mentioned losses would likely result in a shift of chiropteran populations to alternative sites. The losses could also alter habitat structure (e.g., through fragmentation) and affect land use by chiropterans.

ECCC notes, however, that the Proponent did not assess the potential for recovery of roosting habitat, such as maternity colonies or male roosting sites, in forested parts of the study area. Wooded areas with snags, though rare in the study area because of recent wildfires, could support this type of summering habitat, which is of great importance to the life history of chiropterans. In the Recovery Strategy (ECCC, 2018), the destruction or degradation of roosting habitat is identified as a threat to the recovery of these species.

Noise, Vibrations, and Light

Mining activities produce noise, vibrations and artificial light that can disturb chiropterans. Chiropterans locate prey and obstacles by echolocation, i.e., by producing very high-pitched sounds and then listening to their echoes. According to the Proponent, the noise from mining activities could therefore disturb their sleep, their movements and their ability to locate prey. The Proponent notes that the noise generated by road traffic falls in a frequency band ranging up to 50 kilohertz, but most of it is between 1 hertz and 20 kilohertz. The general noise from road traffic could thus cause greater disturbance for species that use relatively low frequencies for echolocation, particularly the hoary bat and the big brown bat. Vibrations could reduce the reproductive success of affected chiropterans and cause them to avoid the area of the proposed mine. The Proponent indicates that if there are roosting sites located near the facilities, they may no longer be suitable

for the local chiropteran population and that disturbances would cause them to move to habitats on the periphery.

Chiropterans are likely to be disturbed by light pollution because of their essentially nocturnal lifestyle. The Proponent explains that artificial light on the mine site could modify the movements of chiropterans, requiring greater energy expenditure and increasing the risks of predation. In addition, bats of the genus *Myotis* sometimes use artificial light sources to feed, as they attract insects. However, the Proponent believes that these effects would not be significant.

Proposed Mitigation Measures

The Proponent proposes various mitigation measures to minimize the Project's adverse effects on chiropterans. The Proponent would systematically inspect buildings and facilities to be dismantled to determine whether they are being used as maternity or roosting sites by chiropterans. If so, protective measures would be taken to ensure the bats' survival. The Proponent plans to perform clearing operations outside the chiropterans' breeding period if the schedule permits. The Proponent also states that because of logistical considerations, it cannot commit to carrying out all the clearing work during the construction phase. In ECCC's view, performing clearing outside the species' breeding season is a key mitigation measure to avoid injuring, killing or disturbing chiropterans. For this reason, ECCC believes that the Project is likely to result in adverse effects on chiropterans. ECCC believes that a firm commitment to implementing this measure would address remaining uncertainties regarding the potential presence of maternity sites or male roosting sites in the work zone.

The Proponent believes that, in view of the very low frequency of use of the site by chiropterans of the genus *Myotis*, the poor quality of the available habitats and the planned mitigation measures, the Project's potential effects on northern and Little Brown Myotis populations are not significant. The Committee's view is that the mining project would result in a loss of habitat for the Little Brown Myotis and the Northern Myotis due to deforestation and disturbance, but it notes that the Proponent is proposing appropriate measures to minimize these adverse effects.

Wolverine

The Wolverine is designated as a species of special concern under SARA. The species' persistence in Quebec remains uncertain At best, the Wolverine population consists of an extremely small number of individuals. The last verified sighting of a Wolverine in Quebec dates back to 1978, although unconfirmed sightings have been reported since then. In 2006, two possible trail networks were identified a few dozen kilometres from La Sarre and Matagami. In 2006, low-altitude aerial surveys in Quebec produced no sightings. Numbers appear to be so low that adult males and females would be unlikely to meet during the mating season (Environment Canada, 2016). In this context, although the Project is located in the species' range and the Project area includes potential habitats and food sources, ECCC believes that Wolverines are unlikely to be present in the area. The Committee nevertheless recommends that a reporting mechanism be put in place for Wolverine sightings.

For these reasons, the Proponent does not expect the Project to have any adverse effects on the Wolverine and consequently has not proposed any specific mitigation measures. The Proponent bases this decision on the low probability of Wolverine presence, the extent of the territory it occupies, the small size of the

Project's zone of influence, and the intensity of current human occupation in the Project area. The Committee and ECCC concur with the Proponent's analysis.

5.4.1 Analysis of Potential Effects and Proposed Mitigation Measures

In general, ECCC's view is that all relevant mitigation measures proposed by the Proponent to minimize the Project's effects on the individuals and habitat of these species should be implemented in a timely manner, regardless of the significance of the effects. Following its analysis, the Committee believes that, with the implementation of key mitigation measures, the Project is unlikely to result in adverse residual effects on the Woodland Caribou, the Little Brown Myotis, the Northern Myotis and the Wolverine. The Committee recommends that the Proponent bear in mind the recovery documents for species at risk that may be affected by the Project, in accordance with SARA, to reduce or prevent their decline. The Committee also recommends that any observations of species at risk be shared with the appropriate authorities at an appropriate frequency. For the Committee's analysis of the Project's effects on the current use of species at risk such as caribou for traditional purposes, please see Section 6.1 of this report.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the proposed Project does not result in adverse residual effects on species at risk. It considered the mitigation measures proposed by the Proponent, the advice of government experts, and the comments received from the Cree Nations consulted. The key mitigation measures are outlined below.

General

- Take light and noise reduction measures. The effectiveness of these measures must be reported annually to the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02. The measures are to be adjusted as needed.

Woodland Caribou

- Set up a joint working group with the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation to discuss the monitoring to be performed for caribou. The frequency of the meetings will be determined with the participants.
- Limit deforestation, soil stripping and close-cut clearing to the Project area (Figure 5 of Chapter 2).
- Implement a communication system for employees and subcontractors, including truck drivers, to promptly report the presence or signs of caribou in the Project's zone of influence (500 m around the mine footprint) and on the ore transportation route. All observations must be reported to the operations manager and the environmental manager.
- Work with the Cree Nations to develop and implement, prior to the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government and the Agency and must include the following:

  - A protocol for radio communications between the drivers and the mine site;
  - Monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures;
  - The distribution of heavy truck traffic through the day and the week.
- In cooperation with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02, implement an action plan in the event caribou are observed near the mine or on the ore transportation route. The action plan, whose effectiveness depends on the rapid detection of individuals, is intended to reduce the risk of disturbance to caribou. It must include procedures to be followed if caribou or signs of the presence of caribou are detected within a 4 km radius of the mine site, and mitigation measures to be implemented based on the most likely scenarios, including the risk of collision on the ore transportation route. Before the action plan is implemented, the Proponent must consult the Cree Nation Government, the affected Cree Nations, the Agency and the appropriate authorities, including ECCC, to ensure that it is executed optimally, with the aim of protecting individuals of the species.
- Transport the ore in a convoy of at least two trucks if caribou are present in the Project's zone of influence.
- Develop and present a training module to educate employees and subcontractors regarding the precarious situation of the species and how to identify any sign of caribou presence. The module should also explain the existing communication system and action plan in the event caribou are observed, and the importance of reporting any caribou sightings in the mine's zone of influence or on the ore transportation route.
- Educate workers not to feed animals or leave food lying around to avoid attracting wildlife near work areas.
- Limit wildlife access to food waste by installing a composter and bear-proof lids on garbage cans.
- Revegetate the mine site and the roads running through it during the decommissioning phase. Rehabilitation of the site should be gradual, as disturbed areas are no longer used, with a focus on creating habitats suitable for species at risk, including Woodland Caribou.

Northern Myotis and Little Brown Myotis

- Perform clearing operations outside chiropterans' breeding season, whenever possible, to avoid injuring, killing or disturbing these species.
- If clearing has to be done during chiropterans' breeding season for technical or economic reasons, have an expert conduct a survey beforehand in order to verify the presence of maternity or resting places for males in natural sites. If necessary, a protection zone must be set up and no deforestation must be carried out within this zone during the breeding period of chiropterans. The expert must work with land users to identify areas frequented by chiropterans.
- Before any building dismantling operations, have an expert conduct a survey to determine whether there are any maternity or roosting sites in the Project area. The expert must work with land users to identify areas frequented by chiropterans.

- If signs of chiropteran presence are observed or maternity or roosting sites are identified, implement protective measures to ensure the animals' survival, such as installing a new shelter in a location protected from disturbance and monitoring its use and integrity annually.

Wolverine

- Establish a protocol for prompt reporting of signs of Wolverine presence. Have the protocol validated by the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02.

Need for Follow-up and Follow-up Requirements

To verify the accuracy of the predicted effects on species at risk and the effectiveness of the proposed mitigation measures, the Committee recommends a follow-up program containing the following requirements:

- Implement a general monitoring program for species at risk, including measures to educate land users. The program must be submitted to the Agency, the Cree Nation Government and the appropriate authorities, such as ECCC, before construction begins. In particular, the program must identify the activities that may have an effect on species at risk and, for each species, indicate what measures need to be implemented to reduce the nuisance or disturbance. The program must be updated periodically to reflect changes in regulations, including revisions to the status of wild species by the COSEWIC or in SARA. These changes may require the implementation of additional measures to mitigate the Project's effects on species affected by changes in their status.
- Implement a monitoring program for Woodland Caribou in conjunction with the joint working group. The program must be presented to the Agency and the appropriate authorities before the Project begins. The program must:
    - include monitoring of predators' use of the site to ensure that waste is being properly managed and is not increasing predator densities significantly in the vicinity of the mine;
    - provide for gradual rehabilitation of areas disturbed by the Project, except for the pit. For this purpose, consult with the appropriate authorities and the tallyman of trapline RE02 to determine which species should be used for revegetation, a necessary aspect of gradual rehabilitation of areas disturbed by the Project. These plant species must support the creation of habitats suitable for species at risk such as the Woodland Caribou;
    - be of sufficient duration to ensure the success of reforestation and assess the value of implementing additional measures, such as control of hardwood species in recovered habitats to ensure that they are suitable for caribou as quickly as possible;
    - provide for the collection of Indigenous knowledge regarding caribou habitat fragmentation and the development of appropriate measures to mitigate the Project's potential effects on caribou harvesting for current and future land users; and
    - participate in monitoring the evolution of local Woodland Caribou populations.
- Starting at the construction stage, implement a monitoring program for chiropterans to estimate actual habitat losses. The program must include five-year inventories from the first year of operation to the fifth year following closure.

6. Anticipated Effects on Indigenous Components under CEAA 2012 and the Agreement

6.1 Current use of Lands and Resources for Traditional Purposes by Cree nations

The Project could result in residual effects on the current use of land and resources for traditional purposes, specifically on hunting, fishing and trapping by the Cree Nations, by limiting access to the land and the use of resources for traditional purposes. However, the Committee believes that with positive relationships and the implementation of the mitigation and follow-up measures recommended in Section 6.1.2, these effects are unlikely to be significant.

The information that the Committee considered in its analysis is set out in the following subsections. Also included are the advice of federal, provincial and Cree government experts and the views of the Cree Nations consulted.

6.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

For the purposes of federal environmental assessment, current use of land and resources for traditional purposes refers to any practice or activity that is part of the distinctive culture of an Indigenous Nation and has been commonly carried out by that group over a period of time extending from the past to the present (CEAA, 2015a). In the territory where the Project is located, the current use of land and resources for traditional purposes refers mainly to big game and small game hunting, trapping of fur-bearing animals, fishing, gathering of plants and berries, and the cultural practices associated with these uses. Under the James Bay and Northern Quebec Agreement (JBNQA), the Project would be located on Category III lands, where the Cree have exclusive trapping rights. In addition, certain wildlife species are reserved for the exclusive use of the Cree (Appendix E).

The Committee's analysis takes into account potential uses in all phases of the Project's lifecycle, from construction to decommissioning, and is carried out for each specific practice or activity. It also covers uses that have ceased because of external factors, if they are likely to resume once conditions are restored. The analysis includes whether the Project may result in changes to resources subject to traditional use and to the conditions of Indigenous peoples' land use and practices.

The Committee assessed the residual environmental effects of the Project on the current use of land and resources for traditional purposes by the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi. The main effects are as follows:

- Decreased availability of resources;
- Changes in access to the land and the hunting camps;
- Decreased overall quality of the experience of land users, including perceptions of contamination.

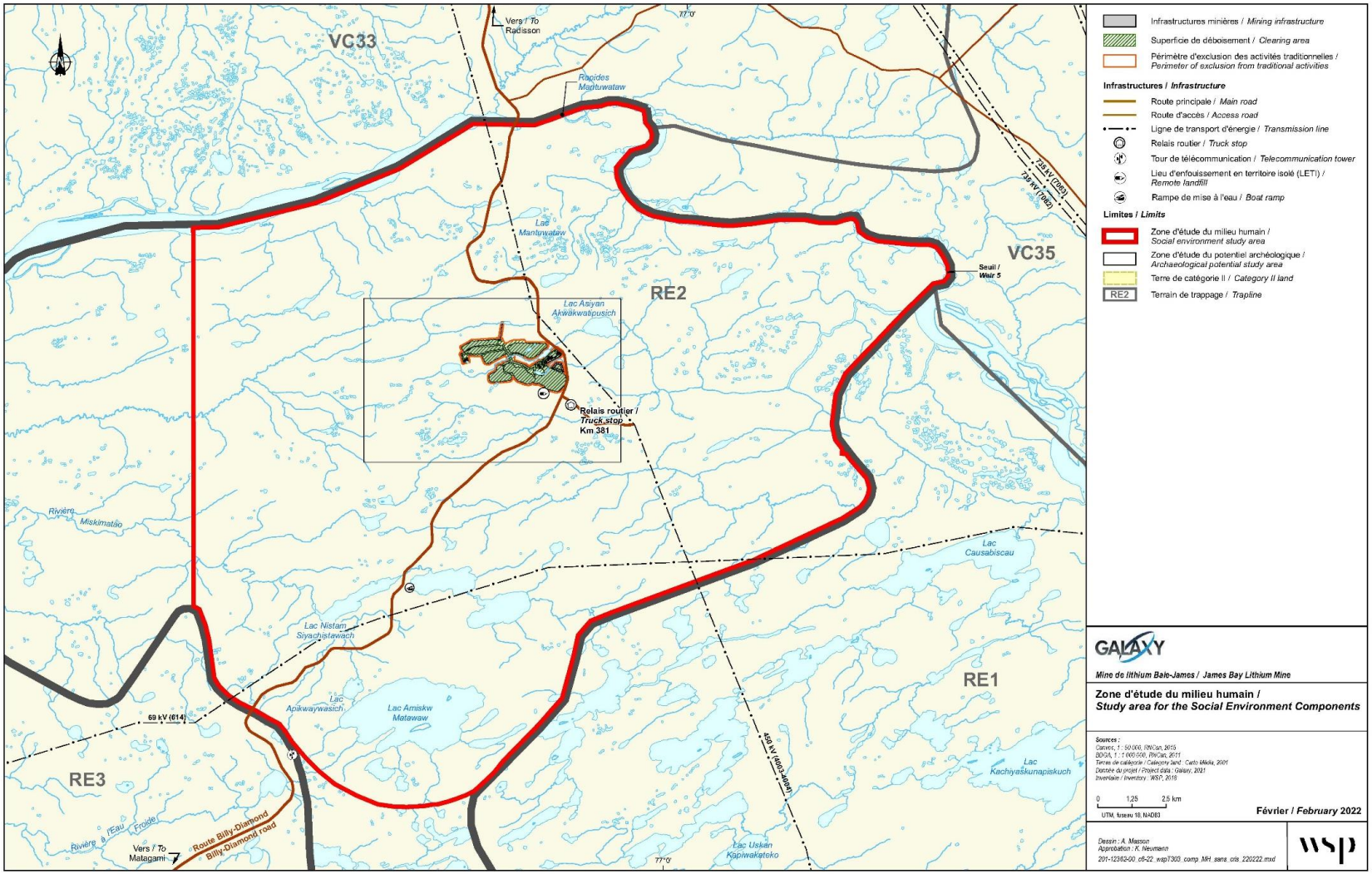
The Cree Nation of Eastmain includes traplines RE01, RE02, RE03, VC33 and VC35. For the analysis of effects on use, the Proponent selected the eastern portion of trapline RE02 as the human environment study area (Figure 13). The future mine site would occupy 5.8% of the area of this trapline. The study area is bordered by traplines VC33 (to the northwest), VC35 (to the northeast), RE01 (to the southeast) and RE03 (to the southwest).

There are two permanent campsites along Billy Diamond Highway in the study area. The first campsite is located northwest of the site and consists of one camp. The second campsite is located south of the Project and consists of four camps and a teepee. Temporary campsites are also located along the Eastmain River. Tents can be set up there as needed. Drinking water supply points, snowmobile trails and goose ponds, built by the tallymen, are located near the Project. Billy Diamond Highway passes through the study area. A truck stop, managed by the James Bay Development Corporation (JBDC), is located at Kilometre 381.

Trucks carrying the ore concentrate would take Billy Diamond Highway, which is fully paved, to Matagami. This route would cross a number of other traplines of the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi located along Billy Diamond Highway (R01A, R05, R07, R08, R09, R13, R14, N05, N18, N20, N23, W01, W03, W07, W13). These traplines are not included in the human environment study area, but the Committee believes that effects on use could also occur there because of the increased road traffic generated by the Project.

No heritage sites were found in the study area, but areas with archaeological potential were identified (see Section 6.3, Physical and cultural heritage). A number of areas are also culturally valued for traditional activities. The various bodies of water and watercourses in the territory are of great cultural importance to the Cree Nations.

Figure 13: Human Environment Study Area



Source: WSP Canada Inc. (2022)

Decreased Availability of Resources

The Committee believes that the Project could alter the conditions for practising the traditional activities listed below by reducing the availability of resources for the Cree Nations near the mine site and the roads used by the Proponent. That zone of influence could be different for different species. However, the decreased availability of resources would not alter the continuation of the various harvests and would therefore not compromise the current use of land and resources for traditional purposes by the Cree Nations.

Big Game Hunting

Several big game species are hunted in the territory, but the analysis focused on moose and caribou, two species that are particularly valued by the Cree. The black bear is also hunted in the study area, but its population density is low, at 0.2 bears per 10 km^2 in 2003. Waste stored on the mine site could attract black bears. However, the Proponent has planned waste management measures, discussed below and described in Section 5.5 (Species at risk), to minimize these risks. Nevertheless, the Committee recommends that the Proponent work with the tallyman of trapline RE02 to develop a black bear management protocol so that any intervention is consistent with the land users' values and practices.

Moose hunting takes place mainly in the fall. There are many permanent and temporary moose hunting campsites located near Billy Diamond Highway and along the Eastmain River. However, the moose population in the study area is currently low and scattered. The decline in the moose population observed in hunting zone 17, which includes the southern portion of the study area, is of concern to the Cree Nations. In December 2021, the MFFP restricted moose hunting in zone 17. Only the harvesting of moose by Indigenous peoples for subsistence hunting is now permitted.

Woodland and Migratoraribou were historically hunted in the study area, along the southern boundary of trapline RE02 and along the Eastmain River. However, sport hunting of migratory caribou has been prohibited by the MFFP since 2018, and land users are limiting their harvesting of caribou to contribute to the recovery of this valued species. According to available information, harvesting of caribou by the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation has been virtually nil since 2010-2011.[17] Cree users of the Eastmain and Waskaganish territories expressed concern about the Project's effects on caribou.

According to the Proponent, the Project would not alter the availability of moose and caribou for the Cree Nations' hunt. The Proponent notes that caribou hunting is occasional and has not occurred recently in the study area. In general, caribou were not very common before the 2013 forest fires, which nevertheless had a negative impact on the availability of wildlife resources on trapline RE02. Woodland Caribou have not frequented the study area much in the last decade and are observed very sporadically. The same is true for migratory caribou, whose range has receded substantially to the north.

The Proponent indicates that the construction and operation of the mine could temporarily disrupt traditional activities in the immediate vicinity of the site, including big-game hunting. The Proponent maintains that hunting could be altered by mining activities, in part because game would avoid the periphery of the site. To mitigate this negative impact, the Proponent proposes specific measures during the annual goose and moose hunting seasons, developed after consultations with the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi. These periods, each lasting two weeks, would be based on the corresponding breaks included in the Cree Nation of Eastmain's school calendar. The handling of waste rock on the site would be reduced from 23,000 to 14,000 tonnes per day, or from 230

[17] The data used by the Proponent came from the Cree Trappers Association. These wildlife harvesting reports are made on a voluntary basis by Cree tallymen and must be regarded as possibly incomplete.

to 140 truck trips per day, thereby reducing dust and noise emissions. The reduced need for truck drivers in those periods would make it easier for Cree workers to take vacation time to engage in traditional activities. In addition, concentrate haulage on Billy Diamond Highway would be reduced from 12 to 10 round trips by double road trains during those periods. Concentrate haulage would take place from 9:00 a.m. to 7:10 p.m. rather than from 6:00 a.m. to 6:00 p.m., which would be beneficial to land users who hunt in the early morning. Truckers using Billy Diamond Highway would have to obey a speed limit of 100 km per hour. The Proponent indicates that it considered a speed limit of 80 km per hour, but land users indicated that this could create convoys of vehicles and affect the safety of road users. The Proponent mentions the installation of tachographs in the trucks to ensure that the speed limit is obeyed. The Proponent indicates that it would like to work with the JBDC in locating the camps and access roads along Billy Diamond Highway (between Matagami and Kilometre 382) so that signs marking their presence can be erected. In addition, the Proponent would make truckers aware of the presence of land users near Billy Diamond Highway through training, awareness campaigns and warnings. It would also inform land users of the work schedule for each phase of the Project. Mitigation measures for blasting during goose hunting season are specified in the subsection on goose hunting.

The Proponent believes that the increase in heavy truck traffic and the risk of collision could negligibly reduce the abundance of large wildlife for harvesting by the Cree Nations. Members of the Cree First Nation of Waswanipi pointed out that the risk of fatal collisions could be higher for large game because they move more slowly. The Proponent plans to implement a road traffic management plan and a mandatory reporting protocol in the event that caribou are sighted in the study area or on the ore transport route. The Proponent is also committed to creating a joint caribou working group to serve as a forum for discussion on caribou monitoring. Section 5.5 (Species at risk) contains an analysis of the Project's effects on caribou.

Based on the expertise of the Cree Nation Government and the MFFP, the Committee believes that the disturbances associated with mining activities and the increased road traffic due to the Project could result in big game avoiding the vicinity of the mine site and Billy Diamond Highway during all phases of the Project. The Project could also affect a moose hunting area located on the periphery of the future mine site. The MFFP notes that, on the basis of an inventory carried out by the Proponent in part of the study area, there are, on average, five moose in an area of 100 km^2, while the Project's footprint covers 4 km^2. In view of the low density of moose in the area, the MFFP's judgment is that the loss of moose habitat is not significant and should not influence the species' abundance. On the other hand, the Committee believes that recent restrictions on moose hunting could contribute to the recovery of the moose population in the study area. More individuals could eventually be affected by the disturbances due to the Project. All things considered, the Committee believes that the Project would not significantly change the potential for moose harvesting in the study area once Cree users move their hunting sites to other parts of trapline RE02 and the Proponent curtails mining activities during the moose hunt.

The Committee is satisfied with the traffic management plan proposed by the Proponent to reduce the risk of collision with big game. Those arrangements could help limit the risk of wildlife mortality. The Committee notes, however, that the increased road traffic caused by the Project could exacerbate the already significant avoidance of the area by caribou. That avoidance would perpetuate the low availability of caribou in the study area. The Committee also notes the MFFP's opinion that the presence of predators such as black bears, attracted by the waste stored on the mine site, could be detrimental to moose. Accordingly, the Proponent plans to use animal-proof containers and install screening or fencing in the storage area. These containers would be located in the industrial area, where there would be continuous traffic. The Proponent believes that it would be surprising for black bears to venture onto land that is regularly used by employees and mobile vehicles (see Section 5.5, Species at risk).

The Committee believes that the Project's residual effects would not significantly alter hunting conditions or the habits of caribou hunters, in view of the limited use of the study area by this valued species. In the Committee's judgment, caribou hunting by the Cree Nations is likely to be more successful outside the study area during the life of the Project. The Committee notes that the MFFP's 2018 decision to end sport hunting

of migratory caribou may help reduce the incidental harvest of Woodland Caribou in the area where their ranges overlap. Based on the advice of government experts, the Committee believes that external factors such as climate change may delay the return of habitat suitable for caribou for the next several decades. The likelihood of increased availability of the resource to future generations of trapline users may be reduced as a result of the Project. The continued reduction of caribou in the study area may compromise the transfer of Cree knowledge about the caribou.

The Committee notes that some Cree land users, mainly the tallyman of trapline RE02, would have to change their habits in order to continue their traditional activities, particularly moose hunting. The adaptability of Cree land users would again be tested. There have been several development projects in the same area, including the diversion of the Eastmain and Opinaca rivers in 1980 and the construction of the Eastmain-1-A – Sarcelle – Rupert power stations between 2007 and 2010. While land users may show resilience in response to these changes by altering their harvesting areas, that adaptation could adversely affect many individuals and their families. Renewal of knowledge and habits in connection with these new locations could take time and require a period of adaptation. In some cases, it *could affect the transmission of knowledge and the sense of belonging*. During the consultations held by the Committee, a Cree leader expressed dissatisfaction with the need to constantly adapt traditional Cree activities to mining projects.

Goose Hunting

Many members of the Cree Nations engage in goose hunting, which is highly valued culturally. During the goose hunt, there are numerous gatherings and excursions in the territory. The hunt takes place over a period of a few weeks, mainly in the spring, near bodies of water and along Billy Diamond Highway. Goose hunting also occasionally takes place in the fall when the birds are in the area. The tallyman of trapline RE02 is considering building a goose-hunting pond on the Eastmain River.

The Cree Nations are concerned that blasting and heavy truck traffic associated with the Project will cause avoidance by surrounding wildlife, reducing the harvests of the goose and moose hunts. ECCC indicates that the Project's potential environmental effects on migratory birds of hunting interest would be primarily associated with activities likely to cause disturbance due to noise, vibration or light. Depending on the intensity of the disturbance, some species might flee, abandon or avoid certain areas during all seasons, including the hunting season. ECCC adds that the intensity of these effects may vary depending on factors such as proximity to water bodies, the staging location of the geese, distance from the blasting site, the location of hunting sites, the power of the explosive charge, geese abundance and annual productivity, weather conditions, and tolerance of and acclimation to noise. The tallyman of trapline VC35 is concerned that blasting would require a traffic stoppage on Billy Diamond Highway, temporarily limiting access to his trapline. The Proponent states that such traffic stoppages would occur only rarely and would last a few minutes. Members of the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi also expressed concern about the effects of increased road traffic during the goose and moose hunting seasons.

To address these concerns, the Proponent proposes the hunting season measures listed in the previous subsection, including the reduction of materials handling on the site and concentrate haulage. The Proponent will also reduce blasting operations from three per week to one (for a total of two weeks) for the spring goose hunting season. The Committee notes that while goose hunting can extend over a six-week period, it is usually concentrated during the two weeks when schools and offices are closed. Blasting would be conducted between 1 and 3 p.m. so as to avoid the morning hours preferred for hunting. The Committee believes that this reduction in blasting operations would be particularly beneficial for goose hunting, as the geese are migratory birds. In the Committee's opinion, the benefit would not be the same for moose, which live in the area year-round. Where possible, the Proponent would schedule blasting on days when the expected weather conditions are not suitable for goose hunting, such as when it is raining or when the wind is from the north.

The Committee is satisfied with the Proponent's efforts to consult with the Cree Nations to develop mitigation measures that are somewhat consistent with the needs of land users. In the Committee's opinion, the measures planned by the Proponent could reduce the intensity and frequency of disturbances suffered by wildlife and therefore by land users during the busiest annual hunting seasons.

Small Game Hunting and Trapping of Fur-bearing Animals

The Cree Nations hunt willow ptarmigan, hare and other species in various parts of the study area, particularly roadsides. However, the main species harvested on trapline RE02, which includes the mine site, is beaver.[18] Trapping is done on the shores of lakes and watercourses. The western part of trapline RE02 is considered a beaver conservation area by land users.

According to the MFFP, the loss of habitat due to construction and operation of the mine would result in the displacement of partridge, ptarmigan, muskrat, beaver and other species. These typically sedentary species would move to more favourable areas. Members of the Cree Nations expressed concern about the Project's impacts on the abundance of small wildlife, mainly partridge, ptarmigan, muskrat and beaver, whose populations are already limited because of the 2013 forest fires. In addition, according to the Proponent, a member of the Cree Nation of Eastmain mentioned the need to conduct beaver inventories before the Project starts. According to him, the inventories should be carried out annually.

The Proponent plans to inspect beaver dams at regular intervals to measure any changes in the flow and water level of watercourse CE2, into which the final effluent would be discharged. Following the beaver inventory work, the Proponent states that it would work with the tallyman of trapline RE02 to assess the need to trap beaver in watercourse CE2. More specifically, the Proponent would conduct an initial inventory of the beaver colony during mine construction to determine potential hazards to the mining facilities. Subsequently, the Proponent would inspect the beaver dams at identified monitoring points at a frequency established after the initial inventory. If hazards to the facilities are identified, the Proponent would assess the need for water level control systems and controlled trapping in the area, after consultation with several stakeholders, including the tallyman of trapline RE02 and a subject-matter expert. The Proponent intends to work with the tallyman at all stages of this process. Beaver dam inspections are part of the environmental monitoring and follow-up plan.

The increase in predators due to the presence of waste stored on the mine site may affect small game, but the MFFP considers this effect to be negligible for this Project. The MFFP believes that the mitigation measures proposed by the Proponent should prevent or minimize any adverse effects on small game. The MFFP believes that small game would remain available on the periphery of the mine site for harvesting by the Cree. The Proponent also planned to implement a follow-up program on traditional land use that would address the Project's effects on traditional hunting, fishing, trapping and other activities.

The Committee believes that the Project would reduce the abundance of small game around the mine site. Nevertheless, the Committee is of the opinion that the proposed measures would maintain populations for harvesting by the Cree, after the users move their harvesting sites. With regard to beaver trapping, the Committee notes that construction and operation activities would result in the loss of use of the land where the mining facilities would be located. However, other areas away from the Project's zone of influence are also suitable for this activity on trapline RE02. The Committee is reassured by the traditional land use follow-

[18] The trapping of beaver and mustelids is an activity exclusive to JBNQA beneficiaries on Category III lands. Fur-bearing animal catches by Cree trappers are documented yearly by the Cree Trappers Association. In 2015-2016, the main species harvested and documented for the community of Eastmain are, in descending order, with the number of specimens in parentheses: marten (55), beaver (47), moose (20), black bear (14), muskrat (12), lynx (12), fox (various species) (7), and otter (6) (CTA, 2016).

up program planned by the Proponent. Should significant changes occur in the availability of resources, the follow-up program would provide a means of evaluating the measures in place and making adjustments to the Project.

Fishing

The Cree Nations harvest a number of species of fish in the study area, including sturgeon, pike, walleye and whitefish. Under the JBNQA, the sturgeon and whitefish fisheries are for the exclusive use of the Cree Nations on Category III lands. According to the tallyman of trapline RE02, watercourse CE5 is the most valued fishing resource among those affected by the Project. It has an abundance of fish. The Proponent has optimized the layout of the mine site based on the traditional value placed on watercourse CE5; it has moved the accumulation areas away from watercourse CE5 to reduce potential impacts on it. According to the Proponent, Apikwaywasich Lake and Amiskw Matawaw Lake, located in the southern part of the study area, and the intersection of Billy Diamond Highway and the Eastmain River are also valued locations for fishing. A community Project to enhance sturgeon spawning areas is being considered near that intersection.

According to the Proponent, the dewatering of the pit would result in a significant drawdown of the water table around the pit. As a result, starting in the fourth year of operation, Lake Kapisikama would no longer be fed by groundwater and would gradually dry up. According to the Proponent, this isolated, acidic lake, with an average depth of 2 m, is not frequented much by aquatic fauna. According to the tallyman of trapline RE02, land users do not fish in this lake. They prefer to fish in larger lakes or in large rivers such as the Eastmain River. The dewatering of Lake Kapisikama would nevertheless limit the availability of fish and endanger the lake's yellow perch population. As required by the *Fisheries Act*, the Proponent intends to develop a plan to compensate for any loss of fish habitat. The Proponent indicates that this compensation plan may include relocation of Lake Kapisikama's yellow perch population, downstream release into the watercourse, or distribution of the catch to the local population. In the latter case, the Proponent is committed to involving the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02. The Proponent points out that the details of the compensation plan will be determined at a later date.

The Proponent states that the Project would also decrease the size of the watersheds and the natural flow within them, which would have some effect on the flow rates, flow velocities or levels of watercourses CE2 to CE6, causing a loss of fish habitat in watercourse CE4 during low-water periods. Although the Proponent believes that the decrease in the flow rate of watercourse CE5 would be slight, producing imperceptible changes in its water levels, it is nevertheless an expected impact in a watercourse valued by land users. In addition, according to Fisheries and Oceans Canada (DFO), the above effects could degrade fish habitat in watercourse CE3 over a distance of 6,800 m, and the construction of a culvert on this same watercourse could result in localized destruction of fish habitat. However, the Project would have no effect on watercourses CE1 and CE6 and Lake Asini Kasachipet. Brook trout, northern pike, yellow perch, white sucker, lake chub and brook stickleback are the species present in the water bodies and watercourses particularly affected by the Project (CE3, CE4, Lake Kapisikama). According to DFO, these habitats are likely used as spawning, nursery, feeding and migration areas by these species. Further details on these effects are provided in Section 5.1, Fish and fish habitat.

The Committee notes that the use of Lake Kapisikama would be permanently lost because of the location of the pit. In addition, the Committee believes that the mine activities could result in changes in watercourses CE2 to CE5, which would not systematically affect fish habitat but could have adverse effects on fishing. The Committee believes that Cree users could continue fishing in other parts of the territory. In the Committee's judgment, the Proponent has proposed satisfactory mitigation measures to reduce the effects on fish and fishing, including a commitment to submit a fish habitat compensation plan and a commitment to carry out any work in fish habitat outside the various breeding periods of the species present. However, since the details of the compensation plan are to be determined at a later date, the Committee is not in a position to fully assess the plan's impact on the current use of land and resources for the users of

trapline RE02. The Committee recommends consultation with the tallyman of trapline RE02 and the Cree Nations in the development of the plan.

Pressure on Wildlife Resources due to Workers' Hunting and Fishing Activities

The Cree Nations are concerned about the massive influx of non-Indigenous workers who could hunt and fish outside their working hours. The Proponent notes that the arrival of these workers in the area could create competition for the harvesting of wildlife resources. The Cree Nation Government's small game experts believe that mine workers could hunt partridge and ptarmigan in large numbers, thereby increasing the pressure on the resource.

The Proponent plans to address these concerns primarily through clauses in its service contracts with contractors and employees. Employees would be prohibited from hunting, fishing and trapping on the mine site and from possessing the equipment used for these activities. There would be penalties for non-compliance with these clauses. Workers would be prohibited from taking firearms and fishing equipment on charter flights. Workers travelling to the mine by road would be systematically searched. They would also have to declare that they have no fishing or hunting equipment. The Proponent also undertakes to set up a dispute resolution mechanism to address any problems related to the reconciliation of land and resource use by workers. To maintain continuous communication between the employees, the Cree Nations and the Proponent, the Proponent would hire a liaison officer who is fluent in the Cree language. During the orientation sessions for new employees and during awareness sessions, the Proponent plans to educate its personnel regarding Cree culture and the regulations that apply to hunting and fishing on JBNQA territory.

The Committee is satisfied with the measures proposed by the Proponent to prohibit mine employees from having hunting, fishing and trapping equipment. The Committee believes that these measures could have a significant deterrent effect. In the Committee's opinion, the Proponent is proposing to do what is within its control to limit the additional pressure that workers could exert on the wildlife resources valued by the Cree Nations. Health Canada indicates that the Proponent must educate workers regarding Cree cultural realities. The Committee also notes the importance of hiring a liaison officer to educate employees on Cree culture and the territory's traditional wildlife management system. The Committee is satisfied with the Proponent's commitment to implement a dispute resolution mechanism to reconcile land use. The Committee is confident that continuous communication between the Proponent and the land users, particularly through the communication committee, would allow for timely dialogue to address or prevent problems. The communication committee would be composed of representatives of the Proponent, representatives of the Cree Nation of Eastmain, members of the Cree Nation Government and a community liaison officer. It would be responsible for developing a communication plan to inform stakeholders about the mine's main activities and the complaint management and resolution system.

Plant Gathering

The gathering of plants, mushrooms and berries for food and medicinal purposes is practised in various parts of the study area near Billy Diamond Highway. According to the Proponent, the tallymen and their families are mainly involved in picking blueberries and mushrooms for traditional use. Blueberry picking takes place in areas affected by forest fires and near Billy Diamond Highway. Mine activities would result in the loss of parts of the berry-picking area and create a perception of contamination. Other areas away from the Project's zone of influence would still be suitable for berry-picking because of the abundance of resources. In the Committee's opinion, the Project would not compromise the harvesting of plants, mushrooms and berries because of the abundance of the resource in the area. On the other hand, the Committee notes that plant gathering by families has a social dimension for the land users. The loss of parts of the territory could alter gathering practices and adversely affect families' experience of the territory.

Changes in Access to the Land and Hunting Camps

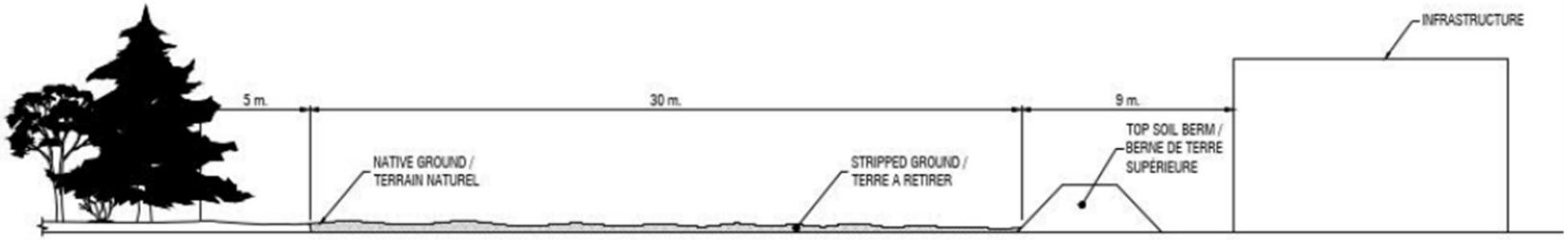
Several studies show that time spent engaging in traditional activities on the land can improve the health and well-being of Indigenous peoples. It is therefore important to consider the Project's impacts on access to traplines. Access to certain parts of trapline RE02, to certain water bodies and to Cree campsites along Billy Diamond Highway could be affected by the Project. The establishment of a security perimeter around the mining facilities would also change certain behaviours and habits. The Committee believes that the Project could alter the conditions under which a number of traditional activities are practised, but that the changes in access to the land and hunting camps would not compromise the current use of land and resources for traditional purposes by the Cree Nations. According to the Committee, traditional activities could still be carried out in other parts of the study area with altered behaviour.

Loss of Practice Locations

Two permanent campsites and one temporary campsite are located in the study area. During the various consultations, the Cree Nations did not raise any concerns regarding the relocation of the camps. The Proponent conducted an assessment of ecotoxicological risks to human health (Sanexen, 2018) in which traditional activities practised by the Cree were considered as an exposure scenario. The results show that practising traditional activities while the mine is in operation involves negligible risks to the health of land users. Consequently, the Proponent is not planning to relocate any camps. The Proponent states that users interested in camp relocation should contact the Cree Nation Government and the Cree Trappers Association. The Proponent adds that funding from the Impact and Benefit Agreement would be available if they are interested in relocation, although the agreement had not been signed at the time of publication of this draft report. The Committee discusses the relocation of camps in more depth in the subsection on the decline in the quality of the land experience.

For security reasons, the Proponent plans to establish a security perimeter within a 50 m radius of the mining facilities. The security perimeter would include a 35 m fire protection buffer around Project facilities that are not already protected by a water body or a road (Figure 14). Top soil, vegetation and overburden would be piled up to form a berm. The establishment of the security perimeter would restrict access by the tallyman of trapline RE02. According to the tallyman, the establishment of the perimeter would result in a loss of sites used for hunting geese, bear and other fur-bearing animals. In the Committee's opinion, the security perimeter could limit trapping and hunting on trapline RE02 by reducing the harvesting potential in these specific areas. However, this restriction is considered reasonable in order to ensure the safety of workers and land users. The Committee also notes that the Proponent consulted the tallyman of trapline RE02 on establishing the security perimeter.

Figure 14: Security Perimeter



Source WSP Canada Inc. (2022)

Ability to Move Around the Territory

Members of the Cree Nations consulted raised concerns about the effects of increased road traffic on their ability to move around the territory. Many family gatherings take place during the hunting season. Travel for these gatherings results in increased road traffic, especially during the goose hunting season. The presence of heavy trucks on the highway and the rare traffic stoppages during blasting could make access to traplines and Cree campsites more difficult. Also noted was the safety of children and pedestrians on Billy Diamond Highway, which is frequently used by families travelling and gathering during hunting season.

The Proponent believes that the increased road traffic would make access to the traplines more difficult, particularly during the annual goose and moose hunting seasons. The Proponent therefore proposes mitigation measures such as reducing the amount of concentrate haulage on Billy Diamond Highway during those periods. The Proponent is also committed to implementing a follow-up program on the current use of land and resources for traditional purposes. The program would include an assessment of camp use, camp peacefulness, and camp access during hunting seasons.

Billy Diamond Highway is used extensively to travel between camps during the annual goose and moose hunting seasons. The Committee believes that increased road traffic could lengthen the usual travel time and make access to some hunting areas temporarily more difficult for short periods. In addition, increased road traffic could pose a safety hazard to children and pedestrians on the roadside, increasing the sense of insecurity of land users and road users. As a result, family gatherings during these hunting seasons and the current harvesting habits of some land users could be affected. The Committee believes that reducing transportation during the annual hunting season and educating truckers would help reduce this disturbance. In the Committee's opinion, ease of access to the hunting grounds by road would return to pre-Project levels after the Project is completed. However, the return to pre-Project status would take more than 20 years, and increased road traffic would affect an entire generation of land users.

According to the Proponent, the Cree campsites in the study area remain accessible by vehicle, and the Project would not affect travel by snowmobile, quad or canoe. In addition, the Project would not result in significant changes to Cree Nations' navigation activities for traditional purposes. Navigation on watercourse CE4 could be compromised since the flow rate would be intermittent during low-water periods, but there has been little or no use of this watercourse to move around the territory in recent years. The Proponent would consult the users of trapline RE02 under the traditional land use follow-up program to obtain more details on potential and future uses of watercourses CE1 to CE5. Transport Canada states that the planned dewatering of Lake Kapisikama and the hydrological changes in watercourse CE4 caused by the Project would make them non-navigable. The tallyman of trapline RE02 told Transport Canada that Lake Kapisikama and watercourses CE1 to CE6 are currently used for navigation, have been used in the past or could be used in the future. According to the tallyman, the nature of the journey, beaver dams and the seasons may affect the navigability of the watercourses or the choice to use one watercourse rather than another for travel.

The Committee believes that the future loss of navigability noted by Transport Canada and the tallyman of trapline RE02 would reduce access to fish and beavers there. It would alter the practice conditions and the habits of the tallyman of trapline RE02. The Committee notes that the loss of navigability would alter future generations' access to certain parts of trapline RE02 already affected by the presence of the Eastmain-1 dam and to its resources. That could reduce the connectivity of the various areas of the trapline by degrading part of the land users' natural travel corridors. The Committee believes that the Proponent could propose additional mitigation measures based on land users' concerns and comments regarding the residual effects on navigability, land access and traditional food harvesting. These concerns and comments could be shared with the Proponent under the traditional land use follow-up program.

Access to the Mine Site Area by Future Generations

A number of Cree land users told the Committee of their concerns about the recovery of the mine site. The tallyman of trapline RE02 lamented the potential loss of a valued hill within the future pit area. He indicated a preference for filling the pit with waste rock in the mine recovery phase. Cree land users also request that the accumulation areas be revegetated gradually, if possible with the same type of vegetation currently present. In their view, revegetation should include conifers to promote soil stability, the return of wildlife and future use of the land.

The Proponent anticipates that the Cree Nations could reuse the Project site for traditional purposes following mine recovery. The Proponent indicates that wildlife could quickly move back into the area. However, the site would retain a residual post-industrial visual appearance[19] after the mine closes. The Proponent presented the recovery plan to the tallyman of trapline RE02. The pit would be naturally flooded over a period of more than 100 years. The hill valued by the tallyman would be permanently lost. The tallyman's preference for filling the pit has been incorporated into the Project. In addition, the Proponent plans to revegetate the site using indigenous species appropriate to the hardiness zone at the time of recovery. Revegetation will follow the guidelines in the Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec. The Proponent states that it would consult with the various Cree stakeholders regarding the recovery plan and would take their recommendations into account.

The Committee believes that the final site recovery scenario proposed by the Proponent would influence the future reuse of the mine site. Nevertheless, the Committee considers it likely that some land users would not be inclined to invest time in the reuse of those areas, since they would have changed their habits during the operation of the mine. The Committee believes that consultations with the tallymen and the various Cree stakeholders as part of the design of the mine recovery plan would contribute to the reuse of the area by future generations. Ongoing communication and collaboration with members of the Cree Nations throughout the life of the Project could assist in the future planning of land use by the Cree, the tallymen and their families.

Decline in the Quality of the Land Experience

The Committee believes that the various nuisances resulting from the Project could affect the conditions for practising certain traditional activities, including hunting, fishing and trapping. There could be a decline in the quality of the land experience in a few specific areas. The perception of contamination could also alter the harvesting practices and behaviours of a number of land users. Adverse residual effects on the land experience could also be felt by certain families whose camps are located near the mine site or roads. However, the members of the families consulted indicated that other parts of the territory are suitable for harvesting. With that in mind, the Committee believes that the decline in the quality of land experience would not compromise the current use of land and resources for traditional purposes by the Cree Nations, as detailed below.

Decreased Peacefulness and Sense of Security on the Land

Various members of the Cree Nations expressed concern about an overall decrease in the quality of the experience at Cree camps along Billy Diamond Highway. Increased nuisance, less access to campsites, less safe parking along the road and possible displacement of hunting and trapping areas due to wildlife avoidance are concerns expressed by members of the Cree First Nation of Waswanipi. Those concerns are

[19] Under the *Mining Act* (Section 4.5.2 – Open pit excavation), an open pit must be secured with fences or an appropriate physical barrier (e.g., artificial ditch). Signs indicating danger must be installed and placed in prominent locations around the pit to ensure the safety of the users of the area.

shared by members of the Waskaganish First Nation, who anticipate similar effects for roadside beaver trappers. The Project could reduce the sense of tranquility in the territory, disrupt the opportunity to re-energize in the forest and curtail the ability to peacefully access traditional use areas.

According to the Proponent, the Project could disrupt the peace and quiet conducive to traditional activities in the territory. Noise, vibrations and dust would affect the tranquility of Cree campsites located near the mine site. The Proponent also states that the increase in heavy vehicle traffic would generate the perception of increased risks of accidents. To mitigate these effects on the experience of the land, the Proponent plans measures such as the following:

- Implement a follow-up program involving the tallymen of traplines RE01, RE02, RE03, VC33, VC35 and R08 to review potential land use disputes and address their concerns regarding the Project's effects on the current use of land and resources for traditional purposes;
- Include in the traditional land and resource use follow-up program the effects of increased road traffic on the quality of the hunting camp experience and on access to the land during annual goose and moose hunting trips;
- Inform all workers and the local community of the blasting schedule;
- Schedule activities that reduce wildlife disturbance and road traffic during the annual goose and moose hunting seasons.

The Proponent believes that these measures, combined with a period of adaptation, would be sufficient to reduce the Project's effects on the quality of land users' experience.

The Committee believes that disturbances due to mine activities would noticeably reduce peace and quiet on part of the Cree Nation of Eastmain's trapline RE02 during all phases of the Project. In the Committee's opinion, the intensity of these nuisances would vary from family to family, based on the camps' location in relation to Billy Diamond Highway. Cree camps located near the road could be exposed to more nuisances than camps located further away. The various nuisances (noise, dust, mining effluent, road haulage, etc.) associated with the Project could affect the conditions for practising certain traditional activities, including hunting, fishing and trapping. The Committee believes that implementation of the traditional land use follow-up program proposed by the Proponent would make it possible to assess the effectiveness of the proposed mitigation measures. It is also satisfied with the inclusion of the tallymen of traplines RE01, RE02, RE03, VC33, VC35 and R08 or members of their families in the consultations associated with the program. The follow-up would provide an opportunity for a discussion of the effects of the nuisances caused by the Project on the tranquility of land users. The follow-up program could therefore actively monitor the adjustment of mitigation measures with the Proponent if the effects were to interfere more significantly than expected with current land use. The Committee recommends that the Proponent offer the tallymen of the Cree First Nation of Waswanipi the opportunity to be included in discussions concerning the Project's effects on their use of the land.

The Committee recognizes that while these measures are satisfactory, they only partially address the Cree Nations' broader concerns about road maintenance, an issue that is beyond the scope of the federal environmental assessment. The Committee believes that despite all these measures, the Project would result in residual effects on the quality of the experience of certain Cree land users whose camps are closest to the mine and Billy Diamond Highway. For this reason, the Committee believes that the relocation of camps could be justified in the view of land users, despite the Proponent's argument that no relocation is necessary in view of the negligible risks to Cree health. In particular, it is the Committee's judgment that a potential decrease in tranquility and well-being and the perception of contamination constitute legitimate concerns for hunting camp owners. The Committee also notes the Proponent's openness to allocating funds for camp relocation in a future impact and benefits agreement. In summary, the Committee recommends that the Proponent consult the owners throughout the Project so that they can share their experience of the

disturbances and then assess their needs regarding possible camp relocations. These steps could be carried out as part of the traditional land use follow-up program.

Perception of Land and Resource Contamination

Members of the Cree Nations raised concerns about possible contamination of the environment, game, fish and flora that make up their traditional food, specifically beaver, moose, geese and fish. The Cree Nations land users consulted say they have already noticed changes in the appearance of fish. They believe that these changes are attributable to the historical contamination of some water bodies and watercourses in the area. The Cree Nations land users consulted also have doubts about the ability of mining proponents to control the water quality of the final mining effluent. They expect that many land users would avoid using the water and the resource in an extended area around the mine for several decades for fear of contamination. Specifically, members of the Cree First Nation of Waskaganish expressed concerns about the mine's effects on the quality of drinking water at the truck stop and on the water table. They are also concerned about the effects on the quality of beaver meat and fur.

According to the Proponent, the mitigation measures proposed in Section 5.1 (Fish and Fish Habitat) would reduce the Project's effects on the water quality in water bodies and watercourses where there are fish. The Proponent proposes to monitor the drinking water supply at the truck stop and the well(s) supplying the mine's administrative and industrial area in accordance with the *Regulation respecting the quality of drinking water*. This monitoring would be done during the mine's construction and operation phases. These points will be explored in greater detail in Section 6.2 (Cree health). The Proponent notes that the quality of surface water and groundwater would also be subject to an environmental monitoring program in accordance with the requirements of mining industry Directive 019. The results of this monitoring would be reported annually to the Ministère de l'Énergie et des Ressources naturelles (MERN) and the MELCC. The Proponent states that the results would be accessible to the public and could be presented to interested band councils and tallymen.

To address concerns about traditional food, the Proponent conducted an ecotoxicological human health risk assessment (Sanexen, 2018). The Proponent plans to work with land users to develop a program to monitor the quality of plants and meat consumed as traditional food by the Cree Nations. The program would document any changes in the chemical composition of plants and game used as traditional food. The Proponent would submit a draft version of the traditional food monitoring program to the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi for comment. The Proponent notes that the physical environment monitoring and follow-up program would also help alleviate concerns about the risk of contamination of traditional food. The program would address water, air and sediment quality.

The Committee notes that the Project would be carried out in a regional context marked by a history of contamination of the area's water by other proponents. Avoidance of the Project site and its surroundings due to fear of contamination could persist after the mine closes. The perception of contamination could lead to anxiety, cause avoidance of certain areas for several generations, and reduce the current level of satisfaction with time spent on the land. This perception of contamination might be felt somewhat more intensely by users of the Cree Nation of Eastmain's trapline RE02, in view of where the final mine effluent would be discharged. Avoidance of the Project site could persist despite the measures taken by the Proponent to boost user confidence. Users could alter their harvesting habits for fear of a change in practice conditions. Changes in habits could limit harvests and occasionally affect the food security or drinking water supply of certain families. The Committee therefore recommends that the Cree be informed of the environmental monitoring results, and that the tallyman of trapline RE02 be encouraged to collaborate in the monitoring work. In the Committee's judgment, the human health mitigation and follow-up measures proposed by the Proponent, including the construction of a mine water treatment plant in the construction phase, would reduce the risk of contamination (see Section 6.2, Cree health). The Committee also

recommends that the Proponent develop its program for monitoring the quality of plants and meat consumed as traditional food by the Cree Nations in conjunction with the Cree Board of Health and Social Services of James Bay (CBHSSJB).

The Committee believes that the Proponent is proposing a number of measures to boost the confidence of land users. However, the Committee considers it unlikely that users will actively reuse the mine site following mine recovery. The recovered site would take several decades to return to natural appearance conducive to traditional activities. Many users might avoid the vicinity of the recovered mine site for fear of contamination. However, the intensity and frequency of the perception of contamination would be lower following mine recovery.

6.1.2 Analysis and Conclusions by the Assessment Committee on Residual Effects

At the end of its analysis, based on the evaluation criteria presented in Appendix A, the Committee concludes that, with the mitigation measures proposed by the Proponent and the additional measures proposed by the Committee, the Project is unlikely to cause significant adverse environmental effects on the current use of land and resources for traditional purposes by the Cree Nations (Appendix B). In the Committee's opinion, these effects would be moderate and not significant for the following reasons:

- The extent of the effects would be local. The effects would occur in the local study area, particularly in part of trapline RE02. Wildlife avoidance caused by the Project would extend beyond the mine site but not beyond the local study area. In the Committee's judgment, the effects of transportation activities on current land use would be felt at hunting camps near Billy Diamond Highway. The availability of resources and the quality of the land experience would not be compromised beyond the zone of influence of the mine and Billy Diamond Highway.
- The duration of the effects would be long because of the Project's lifespan (23 years) and the perception of contamination that would persist thereafter.
- The frequency of the effects would be continuous since they would be perceived on an ongoing basis through all phases of the Project.
- Some effects would lead to changes in practising traditional activities. The loss of Lake Kapisikama to the pit would be permanent. The decrease in fish availability would be irreversible, although the intensity of the effect would be reduced by the implementation of a compensation plan for fish and fish habitat. With the exception of fish in Lake Kapisikama, wildlife would be able to return to their current level of abundance after the mine is rehabilitated and transportation activities end. The perception of contamination would probably remain at least until the site is fully recovered. The Project's impacts on land access would be partially reversible after the mine is closed and the security perimeter is dismantled. A small portion of the area – the flooded pit secured with a physical barrier – would remain inaccessible to the Cree. The Project's effects on the reduction of peace and quiet on the land and the feeling of safety on the road would be reversible, although they would change land users' activity habits.
- The intensity of the effects would be moderate. Reduced availability of resources, changes in land access, the lower quality of the experience, and the perception of contamination would modify traditional practice conditions and a number of habits and behaviours of certain families of land users. However, this would not compromise the current use of land and resources for traditional purposes by the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi.

The Committee believes that the consultations are not complete, and that further information about the current use of land and resources for traditional purposes and potential residual effects on that use may be

provided to the Committee. Comments from the Cree Nations on this draft report and potential conditions will be taken into account and will help the Committee finalize its conclusions.

Identification of Key Mitigation Measures

The Committee considered the mitigation measures proposed by the Proponent, the advice of government experts (federal, provincial and Cree) and the comments of the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi in identifying the following key mitigation measures that would be required to ensure that the Project does not cause significant adverse environmental effects on the current use of land and resources for traditional purposes by the Cree Nations:

- Work with the Cree Nations to develop and implement, before the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government and the Agency and must include the following:
    - A protocol for radio communications between the drivers and the mine site;
    - Monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures;
    - The distribution of heavy truck traffic through the day and the week.
- Regular education for workers, including drivers, regarding the following:
    - The Cree culture and the practice of traditional activities by users of the land, particularly in the vicinity of Billy Diamond Highway;
    - The requirement to obey road safety rules;
    - Compliance with speed limits on Billy Diamond Highway to avoid creating convoys of vehicles;
    - The courtesy required for the safety of land users who park along the roadside to carry out their harvesting.
- Work with the Cree Nations concerned, the Cree Board of Health and Social Services of James Bay (CBHSSJB) and the Cree Nation Government to develop and implement a communication plan for the mine's entire lifespan. In particular, the plan must communicate the following to the Cree Nations, the employees of the Kilometre 381 truck stop, land users and mine employees:
    - The schedule for mine construction, operation and decommissioning activities;
    - The blasting schedule and timetable;
    - Incidents and complaint handling;
    - Issues and risks associated with the operation of the mine site;
    - The results of follow-ups, including those carried out during the recovery and post-recovery phases;
    - Responses to Cree Nation concerns regarding traditional foods to minimize resource avoidance;
    - The recovery plan.

- Post the follow-up reports annually in English on a special website, and present them to the tallymen if they so desire. Hold sessions to present and explain the follow-up results to the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi once or twice a year.
- Offer the tallymen of traplines RE02, VC33 and VC35 and Eastmain's environmental services the opportunity to participate in environmental monitoring and follow-up activities.
- Work with the Cree Nation of Eastmain to develop a calendar specifying the annual periods for the goose and moose hunting seasons, each lasting two weeks. During these two periods, carry out Project activities as follows:
    - Reduce daily handling of waste rock by 30%;
    - Reduce concentrate trucking on Billy Diamond Highway from 12 to 10 round trips per day;
    - Carry out the trucking between 9:00 a.m. and 7:10 p.m.;
    - After these two periods, verify with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02 that the measures are sufficient. If changes in the mitigation measures are needed, they must be communicated to the above stakeholders and to the Agency before being implemented the following year.
- Use blasting mats when blasting within 500 m of the truck stop and Billy Diamond Highway to control flyrock.
- During the annual goose hunting season established in collaboration with the Cree Nation of Eastmain, plan blasting as follows:
    - Reduce the number of blasting operations to one per week;
    - Conduct blasting operations between 1:00 and 3:00 p.m.;
    - Where possible, conduct blasting operations on days of the week when the weather is not suitable for goose hunting.
- Allow Cree workers access to traditional foods on the work site, by setting aside space in the freezer for traditional food, for example.
- Include a clause in the employment contracts of employees, including subcontractors, to prohibit hunting, trapping and fishing on the mine site and within the mining lease. Prohibit employees from possessing firearms and hunting, trapping or fishing equipment. Include penalties for non-compliance with this prohibition in employment contracts.
- Work with the tallyman of trapline RE02 to establish a traditional activity exclusion zone for safety reasons.
- Before construction begins, establish a system for receiving and handling complaints until the mine closes. The response time for complaints should be 48 hours. The Proponent will prepare a report on the nature of complaints received and how they were handled. The number and resolution of complaints received must be shared through the communication plan. The system for receiving and handling complaints could allow for the implementation of additional mitigation measures.
- Hire a liaison officer from the Cree Nation of Eastmain for all phases of the Project. The officer's role will be to inform the Cree Nations of the jobs and contracts offered by the company, ensure the harmonious integration of Cree workers into the mine's workforce, educate workers regarding Cree culture and

traditional stewardship of the land, communicate the Cree Nations' concerns to the company, including land users, and participate in dispute resolution.

- Work with the Cree Nation of Eastmain to develop and implement a fish management plan for Lake Kapisikama before it is dewatered.
- Work with the tallyman of trapline RE02 to perform a beaver inventory before the Project starts and in watercourse CE2 once a year thereafter for the life of the Project. Inspect the beaver dams at regular intervals to identify any changes in the flow and water level of watercourse CE2, and inform the Cree Nation of Eastmain of those changes.
- Develop and implement a black bear management protocol to ensure that any intervention (e.g., relocation) is consistent with the land users' values and practices. Relocation must be carried out with the support of Protection de la faune du Québec. The necessary permits must be obtained in advance.
- Offer to consult with the tallyman of trapline RE02 on the mine recovery plan before it is submitted to the Ministère de l'Énergie et des Ressources naturelles (MERN) for approval or before it is implemented. Offer to present the final mine recovery plan to the members of the Cree Nation of Eastmain and the tallymen of traplines VC33 and VC35 before and after its approval by the MERN so that they will be aware of the scenario selected and of the residual changes to the territory.
- Retain the services of an independent third-party environmental monitor to oversee the implementation of the follow-up programs outlined in this Environmental Assessment Report. The monitor would report its findings to the Proponent, the Agency and the Cree Nation Government.

Need for Follow-up and Follow-up Requirements

The Committee recommends that the Proponent develop and implement a follow-up program to verify the effectiveness of the mitigation measures and the predictions regarding the current use of land and resources for traditional purposes by the users of traplines RE02, VC33 and VC35. The follow-up would be based mainly on meetings with the tallymen of these traplines and their families to discuss the effectiveness of the measures taken. Other stakeholders could be consulted regarding follow-up on specific issues, including the tallymen of traplines RE01, RE03 and R08, the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation involved in the follow-up of traffic management and access to camps and trails. The Proponent will consult with the tallymen of the Cree First Nation of Waswanipi to discuss their involvement in this follow-up program. A baseline survey must be conducted before construction. The follow-up program would document the following:

- the use and frequentation of the study area;
- an assessment of the condition of wildlife resources;
- Cree knowledge of wildlife species;
- traditional hunting, fishing, trapping, and other activities;
- snowmobile routes and other modes of transportation;
- residual effects on navigability;
- the frequentation and tranquility of camps and access to camps during hunting seasons;
- access to activity areas and movements;
- changes that have occurred and the perceived effects;

- evaluation of mitigation measures implemented; and
- the effectiveness of the traffic management plan.

The Committee recommends that the frequency of this follow-up be discussed with the users of traplines RE02, VC33, and VC35 and minimally be carried out at the end of the construction phase; and one year after the mine recovery work. The results of the follow-up would be presented to the concerned Cree Nations, the Cree Nation Government, the CBHSSJB and others, as detailed in the communication plan. If, after a few follow-ups, no significant changes are observed for the users of traplines VC33 and VC35, the follow-up would be limited to the users of trapline RE02. In addition, if the Proponent determines that the mitigation measures are effective, it could consult with the above-mentioned parties to reassess how often follow-up would be required over the remaining life of the Project. If the measures are not deemed effective by the parties, adjustments to the mitigation measures could be made to minimize adverse effects on the current use of the land and resources for traditional purposes. If residual effects on these components persist, Health Canada recommends that the Proponent invest in community-based initiatives and programs, as determined by the Cree Nations, as compensation.

The Committee also recommends follow-up on the effectiveness of the rehabilitation of areas disturbed by the Project five years after rehabilitation. In particular, the Proponent should check soil stability and the growth and diversification of the plant species used for revegetation.

6.2 Cree Health

The Project may have residual effects on Cree health related to environmental changes. However, the Committee is of the view that these residual effects are not likely to be significant, given the application of the mitigation and follow-up measures recommended in Subsection 6.2.2. To reach this conclusion, the Committee assessed whether residual effects on air, water, soil and traditional food quality and the availability of drinking water would persist despite the contaminant management measures and mitigation measures proposed by the Proponent. The Committee also analyzed the impact of exposure to contaminants and nuisances generated by the Project on Cree health.

The following subsections present the information considered by the Committee in its analysis to conclude on the significance of the Project's effects on the health of the Cree, including the views and comments of federal government experts, the Cree Board of Health and Social Services of James Bay, the Cree Nations consulted and the public.

6.2.1 Analysis of Potential Effects and Proposed Mitigation Measures

Under CEAA 2012, this analysis focuses on environmental changes caused by the Project, which could then pose a health risk to the Cree. According to the Proponent, the Project could have health effects on the Cree through the degradation of air, water (drinking and surface) and soil quality, as well as contaminants in traditional food sources obtained through hunting, fishing, trapping and harvesting. Potential sources of effects and contamination are dust, heavy metals in water and dust, gaseous contaminants, and hazardous products accidentally released into the environment. These sources of effects are closely related to various

mining activities, such as mining, road traffic and use of machinery. Possible routes of exposure are inhalation, ingestion and direct contact. Noise nuisance could also affect the health of the Cree.

The human study area was selected by the Proponent to assess the effects of the Project on Cree health (Figure 13). This study area is the eastern portion of the RE-02 trapline and extends approximately 13 kilometres west of the mine site. It is bounded on the north and east by trapline RE-02, and on the south by an area valued by the family of the trapline tallyman, around Amiskw Matawaw Lake. Hunting, fishing, trapping, berry harvesting, and medicinal harvesting are the main activities on the RE-02 trapline. And Cree camps are located on the trapline, as described in Section 6.1 (Current Use of Land and Resources for Traditional Purposes by Cree Nations). Due to regular forest fires occurring in the study area, anthropogenic activities as well as the fauna and flora present in the study area change over time.

The Proponent considered a close study area within a five-kilometre radius of the mining infrastructure to assess toxicological risks to human health. This area includes the 381-kilometre road relay and its drinking water well, a Cree camp about five kilometres north of the Project, the CE1 to CE6 rivers, Kapisikama, Asini Kasachipet and Asiyan Akwakwatipusich lakes, and several hunting, fishing, and trapping areas.

Air Quality

The Proponent considers the current air quality in the Project area to be very good, as the closest industrial activities are more than 100 kilometres from the mine site. ECCC believes that the impact assessment and related documents adequately describe the baseline. Health Canada indicates that the Proponent has provided baseline concentrations of the key contaminants that may have human health effects in the context of the Project.

The Proponent indicated that the Project could emit contaminants into the air during site preparation, infrastructure construction, truck traffic and operations. The contaminants mentioned are particulate matter, crystalline silica, gaseous compounds and metals. Crystalline silica would mainly be emitted during blasting, in the operation phase. ECCC notes that the elements that may affect air quality are related to all construction, operation and remediation activities. All of these activities would produce solid and gaseous air pollutants (combustion products), including fugitive emissions (dust). During the Committee's consultations, members of the Cree Nations expressed concern about the effects of dust on their health and the measures that would be taken to control these emissions.

The Proponent first modelled the expected levels of air contaminants at human sensitive receptors: the truck stop, five Cree camps located within five to 10 kilometres of mining infrastructures, as well as in selected valued areas (e.g., streams, spawning grounds) and traditional areas of activity (e.g., snowmobile trails, hunting, fishing and trapping areas). Air contaminants assessed include nitrogen dioxide, carbon monoxide, sulfur dioxide, crystalline silica, volatile organic compounds, particulate matter, and 19 metals and metalloids. It then compared these results with Quebec air quality standards and criteria [20]and Canadian ambient air quality standards (CAAQS[21]).

[20] The standards (sections 196 and 197 and schedule K of the *Clean Air Act*) and air quality criteria (*Environment Quality Act*) were designed to facilitate air quality assessment.

[21] The Canadian Council of Ministers of the Environment (CCME) has established Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter, ozone, sulphur dioxide and nitrogen dioxide. The CAAQS consist of four management levels, with a series

Health Canada is of the opinion that the sponsor has adequately identified potential human sensitive receptors, with particular attention to the Cree Nations. ECCC notes that sensitive receptors in the selected domain have been taken into account. Health Canada adds that air contaminant dispersion modelling offers an assessment of the potential impacts of the Project on air quality, which could have health effects. It considers that comparing the projected concentrations with CAAQS and discussing possible exceedances of the criteria represents an appropriate approach. ECCC indicated that, overall, the Proponent's air dispersion model meets the requirements of the Atmospheric Dispersion Modelling Guide (MELCC, 2005) and addresses issues of importance to the assessment of Project effects.

In the construction phase, the modelling shows contaminant concentrations below the applicable ambient air quality limits, with the exception of nitrogen dioxide for the CAAQS schedule. Exceedances would be observed at some sensitive human receptors located within approximately three kilometres of the mine site, including three sites associated with traditional activities, the truck stop and a valued area. Nitrogen dioxide concentrations are estimated to be 190%, 138% and 114% of CAAQS for 2025, respectively. The frequency of these exceedances is estimated to be 75 days over a five-year period.

These exceedances of the hourly CAAQS for nitrogen dioxide would persist in the operations stage, but would be observed further east and southeast of the mine site, at the truck stop (243% of CAAQS for 2025) and at traditional activity sites (130% of the CAAQS for 2025). The frequency of these exceedances would then be 157 days over a five-year period. Furthermore, the Proponent anticipates exceedances during the operational stage for annual concentrations of crystalline silica at the truck stop and at a traditional activity site, corresponding to 213% and 261% of Quebec's air quality criterion, respectively. The Proponent also notes a slight exceedance of total particle concentrations, limited, however, to a radius of 300 metres from the mine site, on a single day over a five-year period of operation. The Proponent believes that activities would be less likely to emit contaminants during the remediation phase. Air quality degradation would then be limited to the Project site and its immediate surroundings.

According to ECCC, the Project could degrade air quality throughout all phases of the Project. ECCC stated that the potential environmental effects on air quality have been adequately described overall. However, ECCC believes that the modelling performed potentially underestimates the concentration of particulate matter, including crystalline silica, and its deposition. The observed exceedances could therefore be more frequent or more significant than those predicted by the Proponent.

In addition, it cannot be excluded that particulate matter could be transported over greater distances and could be deposited on surrounding water bodies and other sensitive receptors depending on prevailing winds. Due to the anticipated exceedances and the uncertainties discussed above, ECCC believes that mitigation measures should be implemented rigorously to be effective and to significantly reduce the potential adverse effects of the Project on air quality.

The Proponent then assessed the health risks to the Crees associated with the above air contaminants. To do so, it conducted a toxicological risk assessment in which the concentrations of contaminants expected at sensitive human receptors were compared to toxicological reference values. These values are indicators of

of progressively more stringent monitoring, reporting and management measures as air contaminant concentrations approach or exceed the CAAQS. These management levels ensure that the CAAQS are not perceived as levels up to which pollution can occur. Numerical values for the standard have been established for 2015, 2020 and 2025.

whether or not a given level of exposure is likely to lead to a significant health risk. According to this toxicological risk assessment, concentrations of air contaminants (fine particulate matter, carbon monoxide, sulfur dioxide, nitrogen dioxide, metals and crystalline silica) are not expected to pose a significant health risk to the population in the study area, despite the exceedances noted above.

Health Canada has no significant uncertainties or deficiencies to report with respect to the assessment of crystalline silica, arsenic or chromium. Where total modelled concentrations are close to the standards, criteria and guidelines, the Proponent has demonstrated that they remain below the toxicological baseline values (threshold effect). Carcinogenic effects (non-threshold effect) were estimated quantitatively in the toxicological risk assessment. No significant health effects associated with the inhalation of these substances are therefore anticipated. Health Canada is of the opinion that the concentrations of particulate matter and nitrogen dioxide resulting solely from the transportation of ore are low and represent a low risk to human health. Health Canada notes, however, that the World Health Organization criteria used by the Proponent to interpret the effects of short- and long-term exposure to nitrogen dioxide are less restrictive than the CAAQS criteria. Without justification for this choice, Health Canada considers that this interpretation could underestimate the risk to health, especially since it is a substance without an effect threshold.

The Proponent's main mitigation measures include optimizing the stripping based on operation's actual needs, maintaining the dust collectors and regularly watering roads, work areas and piles. It also proposes establishing a dust management plan to assess the effectiveness of mitigation measures and apply adaptive measures where appropriate. In addition, the Proponent plans to install a weather station at a representative location and an air quality measurement station at the truck stop. This would include implementing an air quality monitoring program during the construction and operation phases to track the concentrations of contaminants emitted to the atmosphere, with the goal of limiting impacts and meeting applicable air quality criteria. Based on the conclusions of the toxicological risk assessment and the proposed mitigation and monitoring measures, the Proponent concludes that the health effects on the Crees associated with air contaminants would be negligible. Given the concerns expressed by members of the Cree Nations regarding the degradation of air quality, Health Canada stresses the importance of the Proponent's overall measures aimed at dialogue and engaging the Cree Nations directly in monitoring, surveillance and risk communication activities.

Drinking Water Availability and Quality

During the operation phase, the groundwater accumulating in the pit would be pumped out so that the extraction work could be done dry. This pumping would result in a drop in the groundwater table. Such a drop could limit the supply of water to surrounding wells if they were no longer deep enough to reach the water table. Five sources of drinking water have been identified in the human study area (Figure 13). Of these, only the truck stop drinking water well is within the potential groundwater drawdown zone, which is located within 1.7 km of the pit. Members of the Cree Nations have raised concerns about the effects of the Project on the available drinking water at the truck stop, which is located approximately 700 metres from the pit boundary.

The Proponent estimates that this drawdown zone would develop progressively as the pit is developed. The anticipated drawdown would be at its maximum near the pit and would diminish with distance; it would be less than two metres at the truck stop. As such, the Proponent considers that the effects of the drawdown of

the water table on the drinking water well at the truck stop would be negligible. To ensure this, the Proponent plans to follow up to collect data on soil properties and the quantity and quality of the water in this well. This would help anticipate potential problems and take corrective action if necessary. If needed, the Proponent would supply drinking water to the truck stop or drill a new drinking water well.

During the Committee's consultations, members of the Cree Nations also expressed concerns about the potential for groundwater contamination. To avoid such contamination, the Proponent plans to install a geomembrane beneath the towpaths, the ore dump and its peripheral ditch, and under the industrial water basin between the concentrator and the workers' camp. A minimum 0.5 metre layer of impermeable clay would be placed in the footprint of the north water management pond where no natural clay is present. Waste rock and tailings would be deposited on a solid foundation, with the exception of the southwest dump, which would be placed under approximately 1.5 metres of clay. These measures are proposed in order to meet the standard set by Directive 2019 on percolation flow for the management of mine tailings. In addition, the Proponent adds that the Project would have no impact on groundwater quality in the relay area, since the water flows to the mine. In short, the Committee considers that the effects on drinking water quality and availability would be negligible and would therefore not have any impact on health.

Surface Water Quality

According to the sampling carried out, the Proponent is of the opinion that the chemical characteristics of the surface waters of the study area have naturally occurring levels. It specified that fishing is practised in this study area, mainly to the north, on the Eastmain River, and to the south, on lakes Nistam Siyachistawach and Amiskw Matawaw. However, these areas are far from the Project's close exposure zone. On this point, it notes that fishing is carried out on the EC5 watercourse, at the edge of the road. Land users mention that there would also be occasional fishing on the EC2 watercourse and near the road.

As explained in Section 5.1 (Fish and Fish Habitat), mine waters may contain metals from ore, tailings and waste rock. The management of these mine waters is required by Quebec's Mining Directive 019 and Canada's *Metal Mining and Diamond Mining Effluent Regulations* (MDMER). The Proponent undertakes to meet the criteria established by Directive 019 and the MDMER. This will be achieved by building a treatment plant near the north water management basin. The mine water would systematically be treated by this plant and then discharged into the EC2 stream (Figure 4). The Proponent adds that it would monitor water quality in the EC2 stream and surrounding streams throughout mining operations.

Mining activities emit metal-containing particles. The Proponent believes that these particles could move through the air and then deposit on surface water within a five-kilometre radius of the mining infrastructure. Since streams EC1 to EC5 are closest to the proposed mine, they would be most affected by air emissions. The Proponent estimates that water consumed during stays by land users would be taken from the truck stop. Therefore, the toxicological risks associated with the consumption of surface water from streams were not assessed. However, it cannot be excluded that users may be able to obtain supplies from the rivers of the study area. The Proponent conducted a toxicological risk assessment to determine whether direct contact with water contaminated with these particles could affect the health of the Cree. It first conservatively estimated metal concentrations in water based on available atmospheric deposition rates. The Committee concludes that the risks to human health would be negligible for the population in contact with the water in

the streams near the Project. In summary, the Proponent believes that the proposed mitigation and follow-up measures would minimize the effects of the Project on surface water quality.

The quality of surface water is of particular importance to Cree land users. Several expressed concerns about the efficiency of final mining effluent treatment and the potential for surface water contamination. Members of the Cree Nations also wish to have access to water quality monitoring results. The Proponent submits that the environmental monitoring reports would be published on its website. In addition, it would communicate its monitoring results to Band Councils and trapline tallymen. It also intends to present its monitoring results to the members of the Cree Nations, once or twice a year.

Soil Quality

A spill of hazardous materials (e.g., petroleum products) can occur during the life of a mine. Spilled contaminants could drip or seep into the soil, reaching surface or groundwater. This scenario could involve health risks to the Cree. The Proponent considers that the measures it proposes to prevent accidents and malfunctions and to minimize their effects (Section 7.1, Accidents and Malfunctions), including the development of an emergency measures plan and the decontamination of contaminated soils at the remediation stage, satisfactorily mitigate health risks.

Sound Environment Quality

Noise levels at the Project site currently range from 32 to 48 decibels A (dBA). At the truck stop, the recorded values are 48 dBA during the day and 47 dBA at night. The Billy-Diamond Highway represents the most significant source of anthropogenic noise in the human environment study area, with average daytime noise levels of 56 and 61 dBA. The maximum values, associated with passing vehicles, reach 86 dBA, but the noise level decreases to 35 dBA between vehicle passes. Health Canada is of the opinion that the baseline noise environment has been adequately described and documented, but that there is still uncertainty as to whether the baseline measurements at the truck stop are sufficiently representative to establish a reliable annual average.

Noise caused by mining activities, whether it be infrastructure construction, pit mining or transportation, would lead to an increase in noise levels. Members of the Cree Nations consulted expressed concerns about the noise from blasting and its impact on the sound environment in the Cree camps.

The Proponent notes that the increase in noise could be perceived at the truck stop as early as the construction stage. Construction work, including blasting, would generally be conducted from 6 a.m. to 6 p.m., but sometimes up to 9 p.m. depending on daylight. During the operation phase, when activities would take place day and night, the noise level would average 55 dBA over a 24-hour period at the closest sensitive receptor, the truck stop. According to the sound propagation simulation carried out by the Proponent, the Project would comply in all respects with the criteria set out in the Guidelines for Noise levels from an Industrial Construction Site (MELCC, 2015) and Instruction Note 98-01 on Noise (MELCC, 1998). It adds that the simulated noise levels at the truck stop during construction and operation respect the Health Canada (2017) criterion for change in the percentage of people greatly affected by noise (% HA). The Proponent is therefore of the opinion that the impact of the Project on the noise environment at Cree camps, located at least five kilometres from the mine site, would be virtually nil. Based on road noise modelling, the Proponent

also considers that the noise impact associated with the increase in road traffic due to the Project would not be significant.

Health Canada is of the opinion that if the noise levels measured in the field during the construction and operation of the mine are similar to the modelled levels, the noise emissions from the proposed site are not expected to cause significant adverse health effects to the users of the workers' camp, the truck stop and the territory. However, this opinion is subject to the Proponent's rigorous application of all mitigation measures aimed at limiting Project-generated noise, particularly at night. In addition, it would have been desirable that tonal, impulsive, highly impulsive or high-energy noise audible at the truck stop be described for the construction, operation and decommissioning stages. Failure to discuss all noise sources results in some uncertainty in the noise predictions presented. That said, blasting would typically be done three times a week, during daylight hours. Health Canada would also like to point out that compliance with the standards and criteria used by the Proponent to evaluate the Project's impact on the sound environment does not necessarily guarantee the absence of health effects on humans. In this low-noise environment, an increase in the noise level of about ten decibels in certain areas used by the Cree for hunting, fishing or trapping, although meeting the criteria, could affect them. The noise impacts depend greatly on individuals' expectations of quietness during the activities they practise.

The Proponent proposes various measures to minimize the noise impact of the Project, such as equipping engine equipment with high-performance silencers and communicating the blasting schedule to land users. During the operation phase, the Proponent intends to develop a tailings mound at the southern perimeter of the eastern dump, to create a screen effect between the mobile equipment circulating at the top of the dump and the truck stop. This mound would evolve according to the elevation of the dump and would reduce the noise levels of the equipment. The Proponent specified that this mound would have a real screening effect starting in the fourth year of operation. It would also maintain a noise monitoring plan by conducting noise readings at the truck stop every year. Considering the proposed mitigation and follow-up measures, the Proponent is of the opinion that the noise impact of the Project on Cree health would be of minor importance.

Traditional Food Quality

Members of the Cree Nations consulted expressed concerns about the effects of the Project on the quality of traditional food, including beaver and moose meat. Health stakeholders, including the Miyupimaatissiun community centres, are concerned that cancer in the Cree Nations may increase due to contaminants in the food chain. Traditional food obtained through hunting, fishing, trapping and gathering represents a significant part of the Cree diet using the RE-02 trapline, although this share has decreased following the 2013 forest fire. The Proponent reports that land users located in the human environment study area (Figure 13) bring home traditional food at least once a week. The nature of the products consumed varies with the season. For example, the goose is eaten more in the spring and the moose in the fall. The Cree hunt waterfowl, small game and several other species. Nistam Siyachistawach and Amiskw Matawaw Lakes and ponds created east of the truck stop are popular hunting areas. Beaver trapping is practised at CE2 and CE3 streams, near two small lakes east of the Billy-Diamond Highway and around the camp near Lake Nistam Siyachistawach. Fishing practices are discussed in the Surface Water Quality subsection. In the context of the Project, Health Canada is of the view that the information on baseline conditions provided by the Proponent to assess potential contamination of traditional foods is sufficient.

According to the Proponent, mining has the potential to emit gaseous compounds and particulate matter into the atmosphere. The main sources of emissions would include mining and hauling activities and material stockpiles. These emissions could contaminate traditional food sources, thereby posing health risks to the Cree consuming this food. It therefore carried out an assessment of the toxicological risks associated with the consumption of traditional foods in the study area (game, plants, fish). The risks were estimated using conservative assumptions, i.e., by overestimating exposure in a realistic framework. By comparing expected contaminant concentrations with toxicological reference values, it was determined that risks to human health would be negligible for the population consuming traditional food from an area within five kilometres of mining infrastructure. However, considering that the watercourses in the vicinity of the Project are not used for subsistence fishing, the Proponent did not assess the toxicological risk posed by the mining effluent discharging into the CE2 stream. The Proponent believes that monitoring the water quality of the CE2 stream throughout the Project is sufficient, since some hunted or trapped species are likely to be exposed to it. Health Canada considers that the potential health impacts on the Cree Nations in the vicinity of the Project, resulting from chemical changes to traditional foods, have been adequately considered. According to the results of the toxicological risk assessment, the risks to human health would be negligible. Health Canada reiterates that access to and availability of traditional foods are important and must be valued and protected.

The Proponent would develop a traditional food quality monitoring program to identify any changes in their chemical composition. It would be developed in collaboration with the land users to adequately target the plant and game species that would be monitored. A preliminary version of the program would be presented to the Cree Nation of Eastmain, the Waskaganish Cree Nation and the Waswanipi Cree Nation for discussion. By combining the results collected with those obtained through the air, water and sediment quality monitoring programs, the Proponent would be able to determine whether there is potential for contamination and, if so, implement additional mitigation measures. Health Canada recommends that the Proponent determine baseline contaminant levels in traditional foods consumed by the Cree (plant and animal) before the Project begins. Health Canada added that the traditional food quality monitoring program would reduce the uncertainty associated with the toxicological risk assessment and confirm its conclusions. Health Canada recommends that the communication plan for monitoring results should address the concerns of the Cree Nations regarding traditional foods to minimize avoidance of this resource. This would mean going beyond passive dissemination of information and developing a strategy based on dialogue and the direct involvement of Cree Nations in monitoring, surveillance and risk communication activities.

6.2.2 Analysis and Conclusions by the Assessment Committee on Residual Effects

The Committee assessed the residual effects of the Project on the health of the Crees based on the environmental effects assessment criteria in Appendix A. The Committee agrees with the Proponent's analysis that the Project is not likely to cause significant adverse environmental effects on Cree health if the key mitigation measures and follow-up programs below are applied. Given the application of the key mitigation measures indicated below, the Committee is of the opinion that the residual effects of the Project on Cree health would be moderate. The Committee's analysis is based on the findings below.

The Committee found that the intensity of the residual effects would be medium. The Proponent's modelling of air, water, ambient noise, and traditional food quality demonstrates that the levels of contaminants expected at sensitive receptors would be below or close to applicable standards and criteria for the protection

of physical health, with the exception of nitrogen dioxide and crystalline silica. The assessment of the toxicological risks to human health reassures the Committee with respect to these two air quality exceedances. It concluded that the Project would not pose any significant health risk to the population that would frequent the study area.

The geographic extent would be local, as the effects could extend beyond the immediate Project site, generally occurring within a five-kilometre radius of the proposed mine. These effects would be long-term and continuous over the 23-year life of the Project. Health effects, caused by the degradation of environmental components, are considered irreversible even though the source may be reversible.

Mitigation and follow-up measures are expected to minimize the Project's residual effects on the quality and availability of drinking water, as well as on the quality of surface water, soil, the noise environment and traditional food. In addition, any potential for contamination would be highlighted by the results of the various environmental and human health monitoring programs, allowing the effectiveness of the measures planned to be analyzed and significant mitigation measures to be added where appropriate.

Furthermore, the Committee is satisfied with the communication mechanisms that would be put in place to report a situation of concern or to present the results of the follow-up programs. It notes that Cree land users and workers of the truck stop would be able to access environmental monitoring reports online.

Determination of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the Project would not cause significant adverse environmental effects on Cree health. The Committee took into account the mitigation measures proposed by the Proponent, the opinions of government experts, (federal, provincial and Cree), as well as the comments received from the Cree Nations consulted. The key mitigation measures are as follows:

Air Quality

- Implement a dust management plan to assess the effectiveness of the design and mitigation measures considered in the Proponent's modelling. This plan shall include an adaptive mitigation management program, including a framework for implementing additional mitigation measures that specifies when these measures would be implemented based on the results. This plan should also include criteria for determining the most appropriate times to apply dust suppressants. The dust management plan should be maintained, and updated as necessary, throughout all phases of the Project, namely based on the results of air quality monitoring and complaints received. This plan will have to be established in consultation with the Cree Nations concerned, the Government of the Cree Nation, the RE-02 trapline tallyman, those in charge of the truck stop at kilometre 381 and the relevant authorities. This plan will have to be filed with the Board of Health and Social Services of James Bay and the relevant authorities three months before the start of the construction phase;
- Regularly spray the roads and work areas with water. If necessary, use dust suppressants on surfaces where traffic is likely to raise dust despite regular watering;
- Implement a road watering management program and monitor the effectiveness of planned mitigation measures. Keep a record of water application and dust suppression during site construction and

operation. This will ensure that the frequency and intensity of road watering roads are adapted to weather conditions and air quality monitoring;

- Use non-friable, non-clay materials and with good road abrasion resistance for road surface construction and maintenance;
- Maintain roads on a regular, thorough and documented basis to maintain a good road surface and low silt. Documentation of road maintenance should be available for inspection as required;
- Install, inspect daily and maintain dust collectors on drills and in the industrial complex during operations. The dust collected by these devices must be disposed of in a manner that prevents its dispersion;
- Implement additional measures to prevent the dispersion of dry, fine material deposited on the surface due to drilling activities, including blasting;
- Prevent wind erosion at material storage sites and during blasting. For example, avoid blasting and handling of granular materials during periods of high winds or when prevailing winds can transport dust to sensitive areas, such as the truck stop, to avoid dispersal of dust, silica and blasting gases off the mine site;
- Use splash mats when blasting within 500 metres of the truck stop and the Billy-Diamond Highway to limit rock splash;
- Plan and implement mitigation measures in the event that conditions are not optimal during blasting activities. The measures should minimize nitrogen dioxide emissions that can be directed to receptors near the site, such as the truck stop. The Proponent should establish specific criteria that would drive the implementation of these measures;
- Enclose the external conveyors in the industrial area in watertight structures;
- Ensure that exhaust and dust collection systems on vehicles and machinery are in good condition and operating optimally to minimize emissions of contaminants into the air;
- With the goal of reducing greenhouse gas (GHG), nitrogen dioxide and particulate matter emissions resulting from combustion, use zero-emission equipment and vehicles. If not available, use diesel-powered equipment and vehicles that meet Tier 4 emission standards, or equipment and vehicles that run on low-carbon fuels such as natural gas, propane, renewable fuel or hydrogen;
- Prioritize the purchase of energy-efficient equipment and vehicles based on the best available technology on the market for energy consumption if technically and economically feasible;
- Optimize the number of transport vehicle trips during the construction and operation phases (for equipment, excavated or backfilled soil, personnel, etc.) to reduce air emissions;
- Shut down all unused electrical or mechanical equipment, including trucks waiting for a load for more than five minutes, to reduce fuel consumption and the use of engine heaters and to reduce disturbances from exhaust, smoke, dust or any other contaminant likely to come from machinery;

- Limit the speed of vehicles on the mine site following the recommendations set out in the *Best Practices for the Reduction of Air Emissions from Construction and Demolition Acivities*. Require that all persons comply with this limit and post road signs to this effect in appropriate locations to reduce vibration and dust emissions;
- Perform regular inspection and maintenance of site equipment and generators;
- Inspect concentrate transport trucks and clean them when necessary, specifically: clean the underbody, tires and wheels of trucks before they enter the public highway so as not to contaminate the roadways or make them dangerous (presence of mud or other materials);
- Whenever possible, avoid burning of felling and brush cutting residues on the work site. Prioritize the shredding and spreading of these residues on the work site or any other use that would allow them to be recovered, reused or recycled;
- Limit deforestation, soil stripping and flush cutting to the Project area (Figure 5 in Chapter 2);
- Gradually equalize the dumps as soon as possible, to minimize particulate matter emissions generated by wind erosion;

Noise Environment

- Comply with the noise limits imposed by Directive 019 on the mining industry and the noise standards contained in Instruction Note 98-01 on noise in Quebec;
- At the construction stage, implement MELCC guidelines for noise levels from an industrial construction site;
- During the operations phase, the Proponent intends to develop a tailings mound at the southern perimeter of the eastern dump, to create a screen effect between the mobile equipment circulating at the top of the dump and the truck stop. This mound would evolve according to the elevation of the dump;
- Develop and implement a communication plan throughout the life of the mine, in collaboration with the Cree Nations concerned, the Cree Nation Government and the Cree Board of Health and Social Services of James Bay. This plan will include communicating the following to Cree Nations, truck stop staff, land users and mine employees:
    - Schedule of mine construction, operation and closure activities;
    - Blasting schedule and timetable;
    - Incidents and complaint handling;
    - Issues and risks associated with the operation of the mine site;
    - Monitoring results, including those performed during the remediation and post-remediation; phases;
    - Responses to Cree Nations concerns over traditional foods to minimize resource avoidance;
    - Remediation plan.

- Establish a system for receiving and handling complaints, before construction begins and until the mine closes, to confirm that the noise environment associated with the mine site and road transport is not causing any effects on land users. The response time for complaints should be 48 hours. The Proponent will prepare a report on the nature of the complaints received and how they were handled. The number and handling of complaints received will need to be shared through the communication plan. This complaint reception and handling system could allow for the implementation of additional mitigation measures;
- Develop and implement, prior to the construction stage and in collaboration with the Cree Nations, a traffic management plan to reduce traffic noise;
- Equip motorized equipment (trucks, loaders, dozers, backhoe loaders, etc.) with efficient mufflers that are in good condition;
- Prohibit the use of engine brakes within the work area. Educate truckers to limit the use of engine braking outside the mine site, in areas where Cree camps are located and in areas where traditional activities are practised more intensely;
- Regularly inspect machinery to ensure exhaust systems are in good condition to limit noise emission;
- Conduct detonations within 800 metres of the truck stop in the absence of thermal inversion and carrying winds, to comply with the criterion of Mining Directive 019, i.e., 128 decibels;
- Use an electronic detonator so that the number of holes exploding in the same eight milliseconds does not exceed four for an explosive charge of 175 kilograms per hole.

Traditional Foods

- Assess the human health risks associated with fish consumption if significant exceedances occur during water quality monitoring.

The implementation of the key measures identified in the other chapters of this report, including those related to water quality and presented in Section 5.1 (Fish and Fish Habitat), would minimize the effects on other environmental components affected by the Project that could have an impact on Cree health.

Need for Follow-up and Follow-up Requirements

The Proponent has already planned for several water monitoring programs in Section 5.1 (Fish and Fish Habitat). The Committee also recommends that the following follow-ups be conducted to verify the accuracy of the anticipated effects on Cree health and the effectiveness of the proposed mitigation measures.

Air Quality

- Air quality monitoring program, including monitoring of total particulate matter, respirable particulate matter, fine particulate matter, nitrogen dioxide, metals (including arsenic and chromium) and

crystalline silica. The monitoring program will have to be submitted to the Agency, in consultation with ECCC and other relevant authorities, before the start of the construction phase. The monitoring should:

- Start the program prior before the construction phase to assess temporal variability;
- Provide an adequate portrait of air quality in the direction of sensitive receptors, including the truck stop;
- Refer, where possible, to Canadian ambient air quality standards and any other relevant standards or criteria based on human health effects, in addition to determining compliance of mining operations with MELCC's Quebec air quality standards and criteria;
- Allow measurements to be taken at an air and meteorological measurement station on the mine site;
- Verify the Proponent's conclusions regarding the impacts on air quality during the construction and operation phases;
- If necessary, allow the modification or addition of mitigation measures based on the results obtained to ensure the protection of Cree health, in collaboration with the Cree Nation of Eastmain, the Cree Nation Government, the tallyman of trapline RE-02, land users and the Cree Board of Health and Social Services of James Bay;
- In the event that exceedances of air quality criteria are anticipated or measured, allow for the implementation of adaptive mitigation measures as outlined in the dust management plan and risk communication through the communication plan;
- For nitrogen dioxide and fine particulate matter, which are non-threshold substances, establish triggers resulting in the implementation of additional mitigation measures, with the aim of keeping levels as low as possible.

- Air quality monitoring program during the construction and operation phases to ensure compliance with standards. This program must be developed in collaboration with the Agency, ECCC and other relevant authorities and presented to them before the start of the construction phase.

Noise Environment

- Annual sound monitoring program at the truck stop, during all phases of the Project, using sound readings. This monitoring should make it possible to compare the measured sound levels with the relevant health indicators (% HA, sleep disturbance, interference with speech), taking into account all sources of noise. This monitoring plan must be submitted to the Cree Nation Government, the Agency and the relevant authorities before the start of the construction phase.

Drinking Water

- Program to monitor the quantity and quality of water in the drinking water supply well at the truck stop. Supply drinking water to the truck stop or drill a new drinking water well if the Project renders the truck stop's drinking water well unusable.

Traditional Foods

The monitoring of traditional food presented below will, among other things, validate the conclusions of the toxicological risk assessment.

- Program to monitor the quality of plants consumed by Cree Nations as traditional food in order to identify any changes in the chemical composition of the main foods used by Cree Nations. Monitoring must be done on an annual basis, i.e., one sampling campaign per year. This program will have to be developed in collaboration with the Cree Nations, the Cree Nation Government, the RE-02 trapline tallyman and the Cree Board of Health and Social Services of James Bay to target the species being monitored. This program must be implemented with the participation of the Cree Nation of Eastmain. The Proponent will determine the levels of baseline contaminants in traditional (plant) foods consumed by the Cree before the construction phase. A preliminary version of the program must be presented to the Cree Nations for discussion. The program will be provided prior to the commencement of construction and be to the satisfaction of Cree Nations and relevant authorities, including Health Canada and the Cree Board of Health and Social Services of James Bay;
- Program to monitor the quality of game tissues consumed by Cree Nations as traditional food, to identify any changes in chemical composition. This program must include a sampling campaign every five years. This program must be developed in collaboration with the Cree Nations, the Cree Nation Government, the RE-02 trapline tallyman and the Cree Board of Health and Social Services of James Bay to target the species being monitored. This program must be implemented with the participation of the Cree Nation of Eastmain. The Proponent must establish background levels in game tissues before the construction phase. The program must be provided before the start of construction and be to the satisfaction of Cree Nations and the relevant authorities, including Health Canada and the Cree Board of Health and Social Services of James Bay;
- Monitor potential sources of contamination during construction and operation to identify unanticipated sources.

6.3 Physical and Cultural Heritage

Physical and cultural heritage is one of the valued components under subparagraph 5(1)(c)(ii) of CEAA 2012 in relation to Indigenous peoples. For the purposes of this report, physical and cultural heritage also includes structures, sites and things of historical, archaeological, paleontological or architectural significance. A land or resource (e.g., an artifact, object or place) that is considered heritage is distinguished from other elements by the value attributed to it (CEAA, 2015a).

The environmental assessment examines the impact that any changes in the environment have on physical and cultural heritage. The analysis of the Project's effects on physical and cultural heritage focuses only on important archaeological features, as no other elements were identified within the Proponent's study area.

The Committee believes that with the application of the key mitigation and follow-up measures recommended below, the Project is unlikely to cause significant adverse residual environmental effects on physical and

cultural heritage. The following subsections provide the information which the Committee considered in its analysis, including the comments of the Cree Nations consulted.

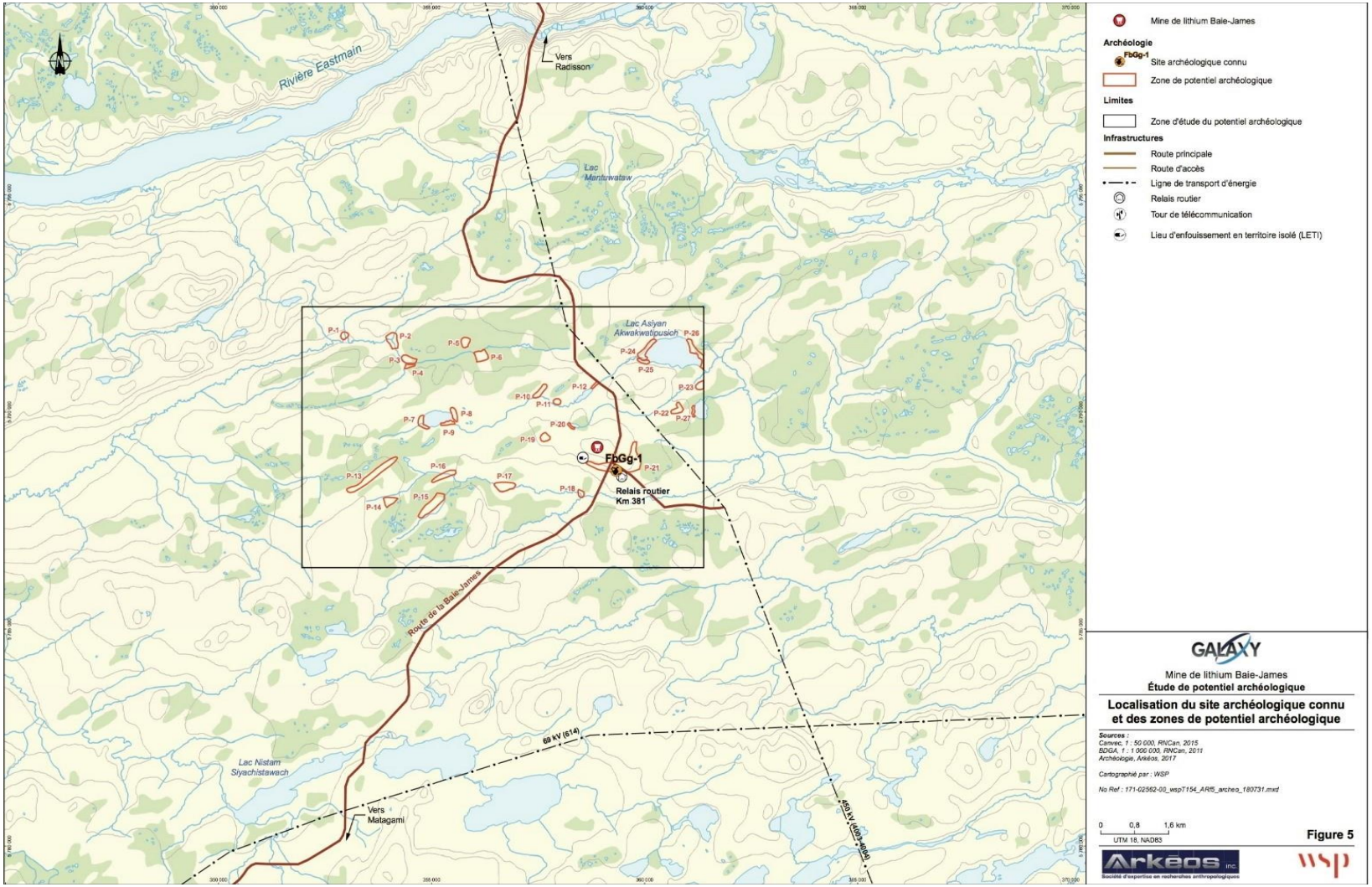
6.3.1 Analysis of Potential Effects and Proposed Mitigation Measures

The Proponent's study area used to assess the Project's effects on physical and cultural heritage is located within the territory of the Cree Nation of Eastmain, south of the Eastmain River, more specifically in a wetland located south of Conglomerate Gorge. The study area covers 56.6 square kilometres and contains two secondary watersheds, including the Miskimatao River and some rapids. The landscape is dominated by peatlands. According to the Proponent, the particular hydrographic and topographic characteristics of the study area were favourable to the ancient presence of Indigenous peoples. Previous studies showed the existence of a prehistoric archaeological site associated with the Indigenous occupation on the site of the truck stop at kilometre 381.

The study of archaeological potential carried out in 2018 by the Proponent identified the areas of interest where the probability of finding signs of human occupation was highest. The Proponent identified 27 areas of archaeological potential in the Project study area. To that end, the Proponent considered both the information provided by Cree users of trapline RE02 during its consultations and summaries of interviews with Cree people who have lived there for generations, including Elders. However, the Aanischaaukamikw Cree Cultural Institute archaeologist considers this consultation insufficient. It would have been advisable for the Proponent to consult the Nishiiyuu Council of Elders (a regional council of Elders) as well. The Proponent notes that the archaeological potential in the area being considered for the mining facilities is low.

To validate the information in the archaeological potential study, the Proponent conducted an archaeological inventory in July 2021 in five potential areas (P-10, P-11, P-19, P-20, P-21) and on the rocky promontory where the spodumene deposit is located (Figure 15). The promontory was visually inspected because of its potential as a landmark for ancient caribou hunts. The Aanischaaukamikw Cree Cultural Institute archaeologist also notes that it is historically very rare for the Cree to build dwellings on the south shore of water bodies and watercourses. Consequently, he considers it unlikely that the P-20 area has any evidence of ancient human occupation. In summary, the Proponent's archaeological team did not find any evidence of ancient human occupation and did not recommend any further archaeological intervention for this Project. It should be noted that, because of the COVID-19 health crisis, the Proponent was unable to carry out its inventory with Elders or tallymen present.

Figure 15: Location of the Known Archaeological Site and Areas of Archaeological Potentia



Source**:** WSP Canada Inc**. (**2018**)**

According to the Proponent, the Project's environmental effects on archaeological heritage could occur during the construction and operation phases. Soil stripping and site preparation could uncover archaeological remains. During operations, potential impacts would result from mining of the pit and from the management of ore, waste rock, tailings and overburden. Both of these activities could result in the incidental discovery of archaeological remains.

In the event of incidental archaeological discoveries, the Proponent undertakes to protect the site by suspending the work. It also undertakes to immediately notify the person in charge of the work, the tallyman of trapline RE02, the Cree Nation Government and the Ministère de la Culture et des Communications du Québec so that the authorizations required by Quebec's *Cultural Heritage Act* can be obtained. According to the Proponent, if objects of interest are discovered, they will be cleaned and inventoried by a qualified consultant and will then be the subject of a scientific publication and a travelling Cree Nation museum exhibit. The objects of interest may later be given to the Aanischaaukamikw Cree Cultural Institute, after agreement is reached with the Ministère de la Culture et des Communications du Québec.

Members of the Cree Nation of Eastmain recommended that the Proponent hold a ceremony with the Nation on the future site of the mine to honour and recognize Mother Nature and the various components that will be adversely affected by the Project, before construction begins. The Proponent said that it was open to this suggestion and would work with the Cree Nation of Eastmain to determine the arrangements for the ceremony.

Among the concerns raised by the Cree Nation of Eastmain, the tallyman of trapline RE02 is worried about the possible loss of a hill located in the future pit's right-of-way. This concern is also addressed in Section 6.1, Current Use of Lands and Resources for Traditional Purposes by Cree Nations. The Proponent would have to remove this hill because of its location and does not anticipate reshaping it during the recovery phase. In return, he would consult and take into account the recommendations of the various Cree stakeholders, including the tallyman of trapline RE02, regarding the restoration plan.

The Proponent indicated that no other cultural heritage sites, such as burial grounds or birthplaces, had been identified in the Project study area. A few sites were inventoried further downstream along the Eastmain River. The Cree Nations attach great importance to the integrity of the various watercourses in the territory, which they consider an integral part of their physical and cultural heritage. The importance of watercourses is also addressed in Section 6.1, Current Use of Lands and Resources for Traditional Purposes by Cree Nations.

6.3.2 Joint Assessement Committee's Analysis and Conclusions Regarding Residual Effects

The Committee assessed the residual effects on archaeological heritage using the environmental effects assessment criteria in Appendix A. The Committee is of the opinion that with the key mitigation measures identified below, the Project would not cause significant adverse residual environmental effects on archaeological heritage and that the Project's residual effects on archaeological heritage would be low.

The Committee believes that the intensity of the Project's effects would be low. The archaeological inventory carried out by the Proponent did not uncover any evidence of ancient human occupation. In the event of the

discovery of remains during the work, the mitigation measures implemented by the Proponent would follow the applicable provincial regulations, and the Proponent would be required to notify a number of Cree stakeholders who might have an interest in the discovery. Therefore, the Project's effects would not compromise the integrity of the archaeological heritage. The Project would result in long-term modification of the archaeological heritage in the event that new remains are discovered. The extent of that modification would be site specific, as it would be limited to the Project study area. The frequency would be intermittent, as discoveries could be made at different times. If no artifacts are discovered, the Project's effects on this component would be reversible. In view of the intensity, extent, duration and frequency of the effects, the Project would have nonsignificant residual effects on archaeological heritage.

The Committee notes the RE02 tallyman's concern regarding the hill that he values, which would disappear when the pit is excavated. The Committee notes that this effect cannot be mitigated, since the nature of the Project makes it impossible to preserve the hill. The Committee believes, however, that consultation with the RE02 tallyman during the preparation of the recovery plan should make it possible for his concerns and preferences regarding the future use and appearance of the land to be addressed. The Committee also recommends that the Proponent verify the state of knowledge on physical and cultural heritage with the Cree Nation Government, the Eastmain Cree Nation and the tallyman of trapline RE02 before the start of construction work and every five years during the operation phase. This measure would ensure that the Crees who were not consulted during the archaeological studies could, if necessary, provide new information during the Project. The Committee also expects that an eventual impact and benefit agreement set out the specific procedure that the Proponent must follow in relation to archaeological and cultural sites and burial grounds.

Identification of Key Mitigation Measures

The Committee identified the key mitigation measures required to ensure that the Project would not cause significant adverse environmental effects on archaeological heritage. It took into account the mitigation measures proposed by the Proponent as well as the comments received from the Cree Nations consulted.

Before the start of construction:

- Provide training to workers on the identification of any archaeological or cultural remains that may be discovered in the designated Project area. The training must be provided by a qualified person. The Proponent must document worker participation in the training.
- Develop a glossary of Cree place names that identifies, in the Cree language, geographic locations within the Project area, in consultation with the Cree Nation of Eastmain and the Cree Nation Government's Social and Cultural Development Department.

If artifacts are found:

- Immediately halt work at the location of the discovery.
- Delineate an area of at least 30 metres around the discovery as a no-work zone. The no-work requirement does not apply to actions required to protect the integrity of the discovery.
- Notify the following stakeholders in a timely manner of any archaeological discoveries or the undertaking of work of an archaeological nature:
    - the RE02 tallyman;

- the Band Council of the Cree Nation of Eastmain;
- the Cree Nation Government;
- the Aanischaaukamikw Cree Cultural Institute; and
- the Ministère de la Culture et des Communications du Québec.

- Have the site of the discovery evaluated by a qualified person as required by Quebec's *Cultural Heritage Act* to determine the extent of the work required (e.g., excavation) to safeguard the archaeological discoveries.
- Offer the RE02 tallyman and any other stakeholder identified for this purpose by the Cree Nation Government the opportunity to oversee work of an archaeological nature.
- After consultation with the Cree Nation of Eastmain, the Aanischaaukamikw Cree Cultural Institute and the competent authorities, comply with all legislative requirements regarding the discovery, recording, transfer and safeguarding of structures, sites or things of historical, archaeological, paleontological or architectural significance. Additional measures may be taken in light of these consultations, such as holding a commemorative ceremony.

Need for Follow-up and Follow-up Requirements.

The Committee recommends the implementation of a follow-up program on physical and cultural heritage. As part of this follow-up, the Proponent must verify, before the start of construction and then every five years during operation, the state of knowledge of the users, including the history of their use of the territory.

6.4 Effects on Socio-economic Conditions

The effects on the socio-economic conditions of the Cree Nations are assessed on the basis of the changes to the environment caused by the Project, including the installation of mining facilities, a change in land use, and increased road traffic. The Committee is of the opinion that with the application of the key mitigation measures recommended in Section 6.4.2, those effects are unlikely to be significant. In determining the significance of the effects on socio-economic conditions,[22] the Committee assessed whether the residual effects would result in changes to the Cree Nations' commercial or income-generating activities (e.g., hunting and trapping).

The following subsections present the information considered by the Committee in its analysis, including the comments of the Cree Nations consulted, and the Committee's conclusions regarding the significance of the Project's effects on the socio-economic conditions of the Cree.

[22] Under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), socio-economic effects of the Project that are not directly related to a change in the environment, such as contracts, training, jobs, the status of women or road safety, are not considered by the Committee, since those effects are under provincial jurisdiction. However, Section 6.5 of the report provides a brief portrait of some of those socio-economic issues, documenting the concerns heard by the Committee and the measures proposed by the Proponent, with no conclusion as to the expected level of effect, in accordance with the Agreement with the Cree Nation Government.

6.4.1 Analysis of Potential Effects and Proposed Mitigation measures

The territory of the Eastmain community contains a number of traplines. The Project is located exclusively within trapline RE02. Traditional activities such as hunting, fishing and fur trapping are carried out all year long on these traplines. The Proponent anticipates that the users of trapline RE02 would be affected by the mine's activities.

The Proponent was unable to document the amount of income derived from commercial or traditional activities of members of the Cree Nations on trapline RE02. For confidentiality reasons, the Proponent was unable to determine how many users of trapline RE02 were beneficiaries of the Cree Hunters and Trappers Income Security Program (ISP).[23] The ISP information would have given an indication of how many land-user heads of families spend at least 120 days annually practising traditional resource harvesting activities. Furthermore, the Proponent indicates that, according to the data available for the last five seasons (2015–2016 to 2019–2020), the pelts of 234 beavers, 6 otters, 13 Canada lynx, 110 martens, 3 black bears, 1 muskrat, 26 red foxes and 1 mink were sold in the Cree territory of Eastmain. Although traditional activities were identified in trapline RE02, it was impossible to determine whether the income from the land users' traditional and commercial activities would be affected by the Project's environmental effects. The available data are thus incomplete and do not allow for a detailed analysis of the Project's effects on economic activities involving resource exploitation.

The Committee did not identify any concerns related to a decrease in traditional incomes during the consultations with the Cree Nations' members. In the Committee's opinion, the consultation is not complete, and further information about traditional incomes and the Project's effects on traditional incomes may be provided to the Committee. Comments from the Cree Nations on this draft report and potential conditions will be taken into consideration and will assist the Committee in finalizing its conclusions.

Although a detailed analysis could not be completed, the Proponent believes that the Project could result in the following socio-economic effects.

- Increased pressure on wildlife harvesting due to the arrival of workers in the area;
- Modification of harvesting habits or sites due to the presence of mining facilities, the traditional activity exclusion perimeter, increased road traffic, and a perception of contamination related to the presence of the mine;
- Difficulty in accessing traplines, particularly during the annual goose and moose hunting seasons, due to increased road traffic;
- Temporary disruption of the peace and quiet conducive to traditional activities on the land.

On the basis of the conclusions concerning the Project's effects on the current use of lands and resources for traditional purposes (Section 6.1.2), the Committee is of the opinion that the Project could result in effects

[23] This program, established by the James Bay and Northern Quebec Agreement (the JBNQ Agreement) in 1976, is intended to encourage the Cree to practise their traditional hunting, fishing or trapping activities on the land by guaranteeing a daily income to participants. According to the Cree Hunters and Trappers Income Security Board, ISP benefits are based on the number of days spent on the land by adult family members.

on the ability of some trapline RE02 users to earn income from traditional activities. The Committee notes the following:

- The Project might disrupt the practice of traditional activities (hunting, fishing, berry picking, trapping and snaring) and land users' ability to earn income from them, particularly in the area where the mining facilities will be located;
- The Project might restrict access to some parts of trapline RE02 because of the 50-metre security perimeter;
- The Project might reduce the availability of wildlife resources for users. Wildlife avoidance caused by the Project might adversely affect harvesting;
- Camps and trapping areas on the site's periphery might be affected by noise during construction and operation of the mine;

The Proponent believes that the proposed mitigation measures for the current use of lands and resources for traditional purposes (see Section 6.1), combined with a period of adaptation after a while, would maintain land users' ability to earn income from traditional activities. During the consultations held by the committee, a Cree leader said he was upset to see that the Cree Nations must continually adapt to mining projects.

The Committee believes that the following mitigation measures proposed by the Proponent may help maintain users' ability to earn income from traditional activities:

- Establish and maintain a communication plan to inform the public, users and municipal authorities of the start and progress of the work;
- Implement a traffic management plan, including the addition of signs indicating the presence of hunting camps, and require compliance with speed limits;
- Establish a follow-up committee, as prescribed by the *Quebec Mining Act*, that would include representatives of the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation, the Eeyou Istchee James Bay Regional Government, and the tallymen of traplines RE01, RE02, RE03, VC33, VC35 and R08. The follow-up committee would serve as a discussion forum for any concerns regarding the Project's effects.
- Restrict the movement of machinery to the work areas;
- Encourage activities that limit wildlife disturbance and road traffic during the hunting season and make it easier for Cree workers to take time off for traditional activities (such as reducing waste rock handling and concentrate transportation during annual moose and goose hunting periods);
- Prohibit hunting and recreational fishing by mine site workers, including a clause in their contract and appropriate disciplinary measures; Prohibit workers from taking firearms and fishing equipment on charter flights; Require employees travelling to the mine site by road to stop at the gatehouse, identify themselves and declare that they are not carrying any hunting or fishing equipment;

Educate workers regarding the traditional practices of Indigenous communities and the activities of Indigenous land users

6.4.2 Joint Assessment Committee's Analysis and Conclusions Regarding residual Effects

Because of the confidential nature of the information about income from traditional activities, the Committee is unable to draw any conclusions regarding potential income decreases. However, in light of its analysis of effects on the current use of lands and resources for traditional purposes (Section 6.1), the Committee believes that income-generating traditional activities would be altered but not compromised.

In its assessment of the effects on the socio-economic conditions of the Cree Nations, the Committee takes into account the mitigation measures proposed by the Proponent, the follow-up program defined by the Committee in Section 6.1 and the positive socio-economic effects on employment and training mentioned in Section 6.5 of this report. It should be noted that Cree users can derive revenue from the territory other than through monetary gains. Traditional economics employs a different conception of value than that taken into account by the Proponent in his analysis. In summary, the Committee assesses that the adverse residual effects on the socio-economic conditions of the Cree Nations would be moderate and not significant (see Appendix A). The Committee bases its conclusion on the use of the following criteria:

- The extent of the effects would be local. The effects would be located within the human environment study area, i.e., trapline RE02. Wildlife avoidance caused by the Project would extend beyond the mine site but not beyond that area. In the Committee's judgment, the effects of transportation activities on current land use would be felt at hunting camps near Billy Diamond Highway. The availability of resources and the quality of the land experience would not be compromised beyond the zone of influence of the mine and Billy Diamond Highway.
- The duration of the effects would be long-term because of the Project's 23-year lifespan. In addition, Cree users may avoid the site long after the mine closes because of the perception of contamination.
- The frequency of the effects would be continuous since they would be perceived on an ongoing basis through all stages of the Project.
- Some effects would lead to changes in the practice of income-generating traditional activities. The loss of Lac Kapisikama to the pit would be permanent. The decrease in fish availability would be irreversible, although the intensity of the effect on fish abundance would potentially be reduced by the implementation of a compensatory plan for fish and fish habitat. The success of this compensatory measure on the practice of traditional income-generating activities remains to be determined, however, as the details of this plan are not yet known, including the intended locations and target species. With the exception of fish in Lac Kapisikama, wildlife would be able to return to their current level of abundance after the mine is rehabilitated and transportation activities end. The Project's impacts on land access would be partially reversible after the mine is closed and the security perimeter is dismantled. A small portion of the area – the flooded pit secured with a physical barrier – would remain inaccessible to the Cree. Peace and quiet in the area and the feeling of safety on the highway would be restored after the mine is closed.
- The intensity of the effects would be moderate. Reduced availability of resources, changes in access to the land, the lower quality of the experience, and the perception of contamination would modify traditional practice conditions and a number of habits and behaviours of certain families of land users. However, this would not compromise the current use of lands and resources for traditional purposes by the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation

and the Cree First Nation of Waswanipi, nor the possibility of earning income from traditional activities practised there.

Identification of Key Mitigation Measures

The Committee believes that the key mitigation measures recommended in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would prevent significant residual effects on users who earn income from traditional activities. The Committee does not recommend any additional measures concerning the Project's effects on the socio-economic conditions of the Cree Nations.

Need for Follow-up and Follow-up Requirements

The Committee believes that the follow-up program recommended in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would verify the effectiveness of mitigation measures and the predictions regarding the maintenance of current land use, which is essential to the practice of traditional activities from which income and other benefits are derived. No other specific follow-up programs are recommended for this valued component.

6.5 Other Socio-economic Effects under the Agreement

Under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the Agency has a mandate to assess the Project's socio-economic effects associated with changes in the environment on Indigenous peoples (Section 6.4). It is also required to set conditions that the Proponent must meet in this regard. However, the June 2019 Agreement under the *Canadian Environmental Assessment Act, 2012* for the Environmental Assessments of the Rose Lithium-Tantalum and James Bay Lithium Mining Projects (the Agreement) between the Agency and the Cree Nation Government specifies that the Committee must take into account the Project's social effects in order to respect the spirit and principles of the James Bay and Northern Quebec Agreement (JBNQ Agreement). In this section, the Committee describes the Project's effects in three socio-economic domains unrelated to changes in the environment which it deemed of interest for this report:

- road user safety;
- employment and training; and
- the status of women.

Since the Project was assessed under CEAA 2012, only socio-economic effects associated with changes in the environment can be considered in the Minister's decision. As the Project's effects in these three socio-economic domains are not considered in the Minister's decision or in the conditions attached to the Project, the Committee documents in this section the main information gathered on these domains during the environmental assessment process, with no conclusions as to the significance of the effects.

The main elements of the Proponent's analysis, the mitigation measures it proposes, and the views of the Cree Nations consulted are presented below, for information purposes.

6.5.1 Potential Effects and Proposed Mitigation Measures

Road User Safety

The study area selected by the Proponent to assess the Project's effects on the human environment is bisected from south to north by the Billy Diamond Highway over a distance of nearly 31 kilometres. This 620-kilometre paved highway runs between Matagami and Radisson. The SDBJ is the organization responsible for road management and signage in the area. Road user safety is the responsibility of the Sûreté du Québec. According to the Proponent, some 57,000 trips were made on the Billy Diamond Highway in 2017. The average daily traffic flow between 2014 and 2017[24] was 314 vehicles, about one third of which were heavy vehicles of various types.

The Billy Diamond Highway is used frequently by members of the Cree Nations for roadside hunting, fishing and trapping and for travel in the area. Many camps are located along the road. The main concerns raised by the Cree Nations regarding increased road traffic are associated with the following:

- the safety of children and land users near the camps during the annual goose and moose hunting seasons;
- the safety of beaver trappers who park along the roads;
- potential damage to the Billy Diamond Highway, which has been upgraded, from heavy trucks; and
- higher vehicle maintenance costs due to dust and stones thrown up by the trucks.

Heavy trucks would be used to carry supplies to the proposed mine and to transport the ore concentrate, which would increase road traffic. In the operation phase, the Proponent estimates that 238 vehicles (trucks, buses and cars) will enter and leave the mine site each week, including 168 truck trips to transport ore concentrate (84 round trips), 42 truck trips to bring in supplies (21 round trips), and 28 bus trips carrying employees between the Eastmain airport and the mine site (14 round trips). These trips would mean 12,012 additional trips per year, an increase of 21.6% from 2017. The Proponent states that the transportation would be spread out during the day, and that night trips would be infrequent. As road rehabilitation work was completed by the SDBJ in 2021, the Proponent does not anticipate accelerated deterioration of the road due to increased traffic. However, the Proponent promises to discuss this aspect with the SDBJ and to take responsibility for any repairs directly related to the Project.

According to the Proponent, the Project's main effect on road user safety would be to increase the risk of accidents. The Proponent also believes that road users could be inconvenienced by the increased traffic. The Proponent plans to develop a traffic management plan in conjunction with land users to reduce the Project's effects on road user safety. The plan would involve a number of mitigation measures, including the following:

[24] The Committee believes that this estimate is still valid, as there have been no new major industrial projects in this area since 2017.

- educating workers and subcontractors responsible for transportation on the need to obey road safety rules and, if necessary, implementing measures with the appropriate authorities to ensure the safety of road users;
- equipping heavy trucks with speed governors and radios for communication between the drivers and other road users;
- spreading heavy traffic out during the day, where possible, to avoid having periods of heavy traffic;
- holding timely discussions with SDBJ on reducing the speed limit and doing road maintenance in the winter;
- educating drivers about the increased presence of land users and their families along the Billy Diamond Highway during the annual goose and moose hunting seasons;
- putting up warning signs between the mine exit and truck stop segments;
- educating drivers about traditional Cree roadside activities, such as beaver trapping; and
- implementing a system for receiving and handling complaints by land users.

The Proponent undertakes to conduct regular monitoring of these elements during the Project's lifecycle, from the construction phase to the end of the operation phase. It also undertakes to present the conclusions of this monitoring and to make adjustments to the mitigation measures as needed.

According to the Proponent, road users would gradually adapt to the new traffic volume. This point of view, however, exasperates some members of the Cree Nations, who say they have to constantly deal with new projects on the territory. The Proponent is of the opinion that with the proposed mitigation measures, the Project would result in a low and nonsignificant residual effect on the Cree Nations' quality of life and well-being.

Employment and Training

The unemployment rate is generally higher in the Cree Nations than in most regions of Quebec. According to an employment needs assessment conducted by the Proponent, the unemployment rate in the Cree Nation of Eastmain was about 9.5% in 2016, compared with about 15% in other Cree communities.

The Proponent believes that a number of Cree Nations have experienced construction workers with skills acquired through major Hydro-Québec projects. It would therefore encourage the hiring of Cree workers to enhance this local expertise. According to the Proponent, the Project would give the Cree Nations opportunities for good, well-paid jobs. The Proponent estimates that the Project would require 280 workers during the construction phase (1.5 years) and an annual average of 167 workers during the operation of the mine (18.5 years). During the first five years of mining, 95 to 270 workers would be employed each year. The jobs available during the operation phase would be permanent and long-term. The Proponent anticipates that the Project would also create a number of indirect jobs. According to the Proponent, the direct jobs and the contracts won by Cree businesses would contribute to improving the quality of life of the workers and the Cree communities. In response to some members of the Cree Nation of Eastmain interested in using their skills in the construction, operation and monitoring of the Project, the Proponent states that local contractors will be guaranteed business opportunities.

Access to training and hiring criteria are among the Cree Nations' main concerns regarding the Project's socio-economic effects. According to some members of the Cree Nation of Eastmain, training courses are not accessible because the training centres are so far away. To address these concerns, the Proponent plans to work with Développement des Compétences Apatisiiwin (DCA) and the Cree School Board to develop specialized training and upgrading programs in the Cree communities so that Cree workers can take jobs at the mine. Discussions would be held regarding constraints related to course scheduling and locations and language barriers. The Proponent intends to provide more details on the types of jobs available and the training required in its updated feasibility study, which would be submitted before construction begins.

The Proponent is planning a number of measures to attract Cree Nation youth to employment in the mining sector before the Project begins:

- Give presentations in local schools to discuss training and the available jobs;
- Plan a tour of the mine;
- Host a job fair;
- Organize job preparation workshops;
- Consult with the community to determine expectations regarding jobs at the mine and establish a skills pool.

The Proponent also undertakes to set up a communication committee, composed of a community liaison officer and members of the Cree Nation Government and the Cree Nation of Eastmain, to provide local stakeholders and schools with information about human resources needs. This would ensure that the Cree Nations will be well informed and prepared if the Project goes ahead.

Members of the Cree Nation of Eastmain are also concerned about the long-term retention of Cree employees. In their view, the work schedules pose a challenge for employee retention, since they would not allow for participation in the annual hunting seasons or frequent visits to the community. To address this, the Proponent states that this type of leave would be permitted for Cree employees. The Proponent is also open to more regular work schedules (details in the next subsection).

In addition, other mitigation measures would be taken by the Proponent to maximize the Project's benefits for members of the Cree Nations, including the following:

- Insert clauses promoting training, the hiring of Cree workers and the Cree economy in a future impact benefit agreement with the Cree Nation of Eastmain;
- Implement a process for the onboarding of Indigenous employees, including holding information sessions, hiring a human resources worker and establishing an employee assistance program;
- Provide an employee assistance program through a workforce transition committee, of which the Community Liaison Officer would be a part, to help workers switch occupations when the mine closes;
- Employ a Cree Nation of Eastmain liaison officer during all phases of the Project to promote dialogue between the company and Indigenous workers and to advertise the jobs and contracts offered by the company.

The Proponent believes that once the mitigation measures are implemented, the Project would have a positive impact on the quality of life of the Cree people, particularly Cree workers, women and youth. The Proponent plans to submit to the MELCC a follow-up program on the Project's impacts on the human environment that will document the Project's repercussions for training, employment and the economy of the regional communities.

Status of Women

The Proponent reports that the overall labour force participation rate of Cree Nations women[25] is about 67.0%. The rate for Cree Nation of Eastmain women is 73.3%. The Proponent anticipates that the Project should facilitate access to employment for Cree women, both at the mine site and in the village of Eastmain.

A representative of the women of the Cree Nation of Eastmain consulted by the Committee pointed out the importance of encouraging young Cree women to take jobs in the mining industry. To address this concern, the Proponent undertakes to ensure that women receive career development assistance focused on specific skills. The Proponent hopes to organize on-site training and development workshops and provide specific support programs for women. To that end, the Proponent would work with the Cree Women of Eeyou Istchee Association to reach out to qualified women who are interested in working and to discuss training opportunities and job readiness with them. In addition, the Proponent plans to gather information about women's expectations and concerns regarding the Project through the quality of life and well-being follow-up program. The program would implement solutions to mitigate social or health problems wherever possible. The details of this follow-up program would be provided before the construction phase.

Some members of the Cree Nation of Eastmain are concerned that they will be judged or discriminated against by other members of the community because they work on a rotating schedule. This situation would particularly affect single mothers who choose to work for a mining company, since they might have to leave their children for one or two weeks. To address this situation, the Proponent would like to set up offices in the community of Eastmain so that it could support a better work-life balance for women and a more structured work week than on the mine site. It would also consider adopting the Flexible Work Arrangement Standard, currently used in Australia. This standard would support flexible work schedules for certain jobs. The Proponent would allow members of the Cree Nation of Eastmain to have a four-day work week followed by three days off or a typical schedule of five days of work (Monday to Friday) and two days off.

A representative of the women of the Eastmain community also raised concerns about safety at the truck stop. She recommended that the sale of alcohol be prohibited and that the area be closely monitored. The Proponent also believes that the Project could generate concern among Cree women, since there would be a larger male population in the vicinity of the Cree Nations. This could affect the women's feeling of safety, in part because of a concern about sexual harassment. To address this concern, the Proponent undertakes to provide a healthy work environment where sexual harassment would not be tolerated, through the following measures:

- prohibit all forms of harassment and discrimination on the sites where employees live and work;
- levy penalties based on the severity of the actions committed;

[25] The overall female labour force participation rate is the ratio of the number of women employed or looking for work to the total female working-age population.

- implement a harassment awareness program for all employees;
- work with the Cree Women of Eeyou Istchee Association on additional measures to promote a safe environment free of sexual harassment;
- include a Cree woman in the Human Resources team;
- prohibit the use of alcohol and drugs and visits to the mine site;
- ask employees to stay at the workers' camp during their shifts;
- discuss the truck stop safety and monitoring issues with the SDBJ;
- take measures to prevent violence on the mine site and in the communities of Eastmain and Waskaganish;
- conduct a fitness-for-duty assessment for employees; and
- set aside a section of the camp for women to ensure their privacy.

The representative of the women of the Cree Nation of Eastmain also raised concerns about pay equity. The Proponent indicates that all positions would be open to both men and women. The Proponent wants to work with the Cree Women of Eeyou Istchee Association to set up focus groups with the women of the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi to discuss the various socio-economic issues. In fact, the Proponent plans to stay in touch with Cree women for the entire duration of the Project so that it can address their concerns and adjust the mitigation measures in the event that they do not fully meet their needs. In order to promote exchanges between the Proponent and the Cree women, the Committee is of the opinion that a Cree woman should, in addition to being a member of the human resources team, sit on one or more follow-up committees created by the Proponent.

The mitigation measures would be implemented through the quality of life and well-being follow-up program, which would be based on interviews with Cree Nation of Eastmain stakeholders, focus groups and the Cree Women of Eeyou Istchee Association. The interviews would take place at least six times during the Project. This follow-up program would cover issues primarily related to sexual harassment, safety and drug/alcohol use through discussions with the Proponent's employees and the liaison officer. A system for receiving and handling complaints would be established by the Proponent before the start of construction and would be maintained until the mine closure period. Complaints related to women's sense of well-being and safety could be addressed through this mechanism.

In summary, the Proponent has assessed the Project's impacts on the status of women. In view of the positive socio-economic impacts outlined above and the proposed mitigation measures and follow-up program, the Proponent believes that the Project would cause a low and nonsignificant residual effect on the quality of life and well-being of Cree women.

7. Other Effects Considered

7.1 Accidents and Malfunctions

Accidents and malfunctions may occur in any phase of the Project, whether a release of contaminated water due to a malfunction of the water treatment system, a hazardous materials spill, a fire, or a pile that collapses due to instability of the slopes. Such accidents could result in adverse effects on the environment. The Committee therefore assessed the prevention and response measures and the Emergency Preparedness Plan proposed by the Proponent to determine the probability of an accident or a malfunction, and to establish the significance of the effects in relation to accidents and malfunctions. The Committee is of the opinion that these effects are not likely to be significant, in view of the application of the recommended mitigation measures (Section 7.1.2).

The following subsections present the information considered by the Committee in its analysis of the effects associated with accidents and malfunctions, including the opinions and comments of the expert government departments, the Cree Board of Health and Social Services of James Bay (CBHSSJB), and the Cree Nations consulted.

7.1.1 Analysis of Potential Effects and Proposed Mitigation Measures

The environmental assessment considers the environmental effects of the Project, including those caused by accidents or malfunctions, which may occur in any phase of the Project. In the context of the environmental assessment, an accident is an unexpected and sudden event involving components or activities of the Project, which leads to damage to valued components (VC). A malfunction is the inability of equipment or a system to operate as foreseen thus leading to damage to the VCs. Components of the environment could also damage the Project's infrastructures and increase the probability of an accident or a malfunction. The effects of the environment on the Project are discussed in Section 7.2.

The Proponent envisioned different scenarios in which accidents and malfunctions related to the Project could occur table 10). He assessed the risk associated with each of these scenarios according to their probability of occurrence and the severity of their consequences. For this purpose, the sensitive components of the neighbouring environment were considered, particularly the bodies of water and watercourses, the drinking water sources, the workers' camp, the kilometre 381 rest areas and the hunting, trapping and fishing areas. This analysis includes the determination of the probable adverse environmental effects on the VCs that could be affected by an accident or a malfunction, and proposes prevention and response measures for each scenario.

ECCC is of the opinion that the Proponent adequately surveyed the sensitive components of the environment that could be affected by accidents and malfunctions, that it properly presented the assessment of the risks of accidents and malfunctions, and that on a whole, it appropriately described the environmental effects that could be caused by these accidents and malfunctions. ECCC also considers that the mitigation measures

proposed by the Proponent, including the Emergency Preparedness Plan, are appropriate to reduce the risks of accidents and malfunctions and to minimize their effects on the environment.

Table 10: Accident and Malfunctions Scenarios Assessed by the Proponent

Structure or activity	Accident or malfunction scenario
Extraction pit	• Pit flooding • Rockfall and landslide
Ore processing	• Fire • Ionizing radiation exposure • Dust emissions
Petroleum product storage and use	• Petroleum product, oil or grease spill • Fire and/or explosion
Propane storage and use	• Fire • Propane vapour cloud formation
Chemical storage and use	• Spill
Explosives storage and handling	• Explosion • Theft of explosives
Use of electrical transformers	• Dielectric oil spill • Fire and/or explosion
Mine water treatment	• Non-compliant discharge into final effluent
Accumulation areas	• Collapse of a pile • Malfunction of a retention dike
Road transportation	• Hazardous materials spill • Ore concentrate spill

The Committee grouped the Proponent's scenarios most likely to have effects on the neighbouring environment in four categories described below, accounting for their potential impact on the VCs, their higher-risk level and their probability of occurrence.

Water Treatment System Deficiency

A water treatment system malfunction could lead to the accidental discharge of deleterious substances into the final effluent. A discharge without treatment or with partial treatment could thus contaminate Watercourse CE2, which flows west toward the Miskimatao River, and then joins the Eastmain River. Such a discharge could be caused by a design or operating error, a human error or a mechanical breakdown at the water treatment plant.

A discharge of contaminated water could have impacts on fish and fish habitat, particularly by the mortality of individuals and by a negative impact on the feeding, growth rate, breeding diversity and abundance of fish. Effects could also be felt by various wildlife and plant species. DFO confirms that the discharge into the effluent of water of non-compliant quality, just like the long-term alteration of the quantities of water discharged, is likely to have adverse effects on fish and fish habitat. Contaminated water could also affect the health of Crees or at least lead to their avoidance of the contaminated territory. Health Canada points

out that it is very important to prevent any accident or malfunction that could contaminate the fish and other animals consumed by the Cree Nations with mine effluent.

To prevent a malfunction of the water treatment system, the Proponent proposes, in particular, to produce periodic water quality assessments and continuously monitor the water's acidity rate and turbidity. The water treatment system would be set in recirculation mode in the event that one of the treated water quality criteria is exceeded. The treated water would be returned to the main north water management pond by a set of automated valves instead of to the effluent.

Spill of Hazardous Materials and Chemicals

A spill of hazardous materials or chemicals may occur during a mine's lifecycle. This may involve a spill of ore concentrate, petroleum products (e.g., fuel, oils and greases), or chemicals used in the treatment of ore or mine wastewater (e.g., ferrosilicon, hydrated lime and sulphamic acid). The causes of the spill are varied: accident during road transportation; equipment breakdown; leak from a valve, a pipe or a fitting; tank overflow; or any faulty use, handling, and storage.

According to the Proponent, a spill can occur on the mine site or during transportation on the regional road network. The impact of a spill would depend, in particular, on the substance spilled, the quantity spilled and the spill site. It mentions that such a spill could contaminate the soil. The animals in contact with the product could suffer many health problems, up to and including death. The foliage of the exposed vegetation could also be destroyed. Damage to a wetland or a watercourse could lead to adverse effects on wildlife (e.g., fish, birds and amphibians) and habitats. Certain species would be more susceptible to feeling the effects of a spill, given their limited ability to move quickly. DFO maintains a spill of deleterious substances could have adverse effects on fish and fish habitat, and that the Proponent must avoid or limit risk activities near bodies of water and watercourses. As mentioned previously, contamination of a watercourse could also affect the health of the Crees and their use of land and resources for traditional purposes.

In case of a spill of hazardous materials or chemicals, the Proponent provides for a response procedure in its Emergency Preparedness Plan. Moreover, the Proponent specifies that a spill would probably be located, contained and cleaned up quickly, given the preventive measures and the response measures proposed. These measures include the presence of petroleum product and chemical recovery kits at sensitive locations and frequent inspection of machinery and fuel and lubricant tanks. Moreover, the Proponent adds that the petroleum equipment and the tanks would all be designed to prevent and contain any eventual accidental spill. This equipment is regulated by the *Building Act* and would be the object of a permit from the Régie du bâtiment du Québec (RBQ).

Members of the Cree Nation of Eastmain raised concerns about the risk of chemical infiltration of spills in Watercourse CE5 and the Eastmain River. Watercourse CE5 was further described by the RE02 tallyman as being of great value. In light of these comments, the Proponent designed the Project to avoid any discharge into Watercourse CE5. Questions are also raised regarding the selection of the material to waterproof the bottom of the piles. The Proponent specifies that the preferred materials, either a geomembrane (for the ore pile and the haulage roads) or clay (for certain piles), would allow compliance with the standards regarding percolation flows. Moreover, the piles are designed to direct mine water to the ditches and ultimately to the water treatment plant, so as to avoid groundwater contamination. Follow-up of the groundwater would also be done.

Fires and Explosions

Fire and explosion risks exist for several of the projected activities on the eventual mine site. In particular, a fire could break out in the mill, in an electrical transformer, following an accidental event, or during storage, transportation or distribution of petroleum products. An explosion could occur following a fire in the explosives warehouse or an accident involving a vehicle. The Proponent indicates that a fire spreading beyond the mine site would cause mortality of neighbouring vegetation, including certain plants conducive to the presence of wildlife. A loss or alteration of plant cover thus would be observed, which could cause a wildlife habitat loss. The Proponent reports that fire could also alter the quality of nearby watercourses by the deposition of particulate matter and other contaminants. In the case of an explosion without a fire, the immediate vegetation would be destroyed by heat, while the blast and projection effect could affect the vegetation and cause injuries or death of the wildlife present within the blast radius. The Proponent considers a fire would be possible, but unlikely given the preventive measures in place, while an explosion would occur exceptionally.

Response procedures in case of fire, explosion or propane leak are specified in the Emergency Preparedness Plan. In addition, the Proponent undertakes to form a fire brigade to prevent and control fire and explosion risks. The Proponent also plans to install extinguishers in the sectors presenting a fire risk and a hydraulic system to fight fires. The measures described above to prevent and mitigate the risks of hazardous material spills are also applicable to this section.

Members of the Cree Nation of Eastmain raised concerns about the combustion risks of peat piles. The Proponent indicated that the engineers would pay special attention to this aspect in the design of the overburden pile.

Malfunction of a Retention Dike

In the context of the mining project, the runoff and exfiltration water would be pumped and redirected to a main water management pond, located north of the overburden pile. This pond would be surrounded by a dike to ensure its leak proofing. The malfunction of this retention dike could be caused by an extreme weather phenomenon, an earthquake, a construction error or aging of the structure. It should be noted that the runoff water collection pond developed east of the waste rock and tailings pile most often would be empty, or nearly empty, because the pond would serve as a transfer point, where a pump would redirect water to the main pond. A malfunction of the dike of the main water management pond would have an impact on the components of the environment located north of the mine site, which includes several watercourses, including CE2. A malfunction could cause major property damage and bring contaminants (e.g., suspended particulate matter, leaching products, residual reagents and debris) into the environment. The Proponent specifies that there is little likelihood the retention dike will fail. Indeed, the Proponent would ensure the retention works are designed according to the criteria of the Canadian Dam Association, the *Dam Safety Act* and its regulation. The Proponent also undertakes to monitor the stability of the infrastructure. If preliminary signs or symptoms are detected, corrections would be applied to avoid any malfunction. Moreover, the Proponent points out that the Emergency Preparedness Plan includes a response procedure in case of dike malfunction.

Emergency Preparedness Plan

In the Committee's opinion, the Proponent's Emergency Preparedness Plan, presented in its draft version for now, is an essential measure to intervene effectively in case of accidents or malfunctions, and thus minimize the environmental effects they could cause. In particular, this Plan specifies the roles and responsibilities of the stakeholders and the emergency response and evacuation procedures. The Emergency Preparedness Plan would be updated annually, quickly accessible and easy to consult. The Proponent plans to consult the Band Councils of Eastmain and Waskaganish about the Emergency Preparedness Plan. A communication plan in case of accident or malfunction during the construction and operating phases would be an integral part of the Emergency Preparedness Plan, and would include information the Cree Nations consider important. The Cree Nation Government, the Cree Nations concerned, the CBHSSJB and the local stakeholders would be informed systematically of any accident or malfunction related to the Project and having an effect on the environment.

According to ECCC, the draft version of the Emergency Preparedness Plan is sufficient and appropriate, because it addresses different emergency situations that reasonably could occur and includes items such as prevention, alarm and preparation devices, and corrective and recovery measures. ECCC takes note that clarifications would be provided in the final version of the Plan, before the Project begins. To this effect, ECCC and Health Canada offer several recommendations:

- On detailed maps, clearly identify the sensitive components of the mine site and its vicinity, such as the gathering places in case of evacuation, the location of the chemical tanks and warehouses, the location of the emergency response equipment, and the places where certain specific mitigation measures are to be implemented;
- Indicate what protective measures would be applied on the site, depending on different types of potential accidents and substances involved. For example, accidents involving flammable substances necessitate the evacuation of the sector affected by the leak, because the flammability or explosion risk is normally greater for the persons exposed than the intrinsic toxicity of the substance. However, other criteria may influence the decision to contain or evacuate a sector following an accident;
- Develop the accident scenarios associated with instability of pile slopes, particularly in the event of a malfunction of the dike surrounding the containment areas;
- Develop the accident scenarios that could have impacts on the rest area, such as the explosion of a propane tank with off-site consequences or contamination of the rest area's drinking water wells;
- Specify how the rest area would be notified in the event of detection of an anomaly in the water quality parameters of the wells that could affect human health;
- Determine the mechanisms to be implemented in order to supply drinking water quickly to rest area users, if applicable;

Include a communications procedure between the mine site and the rest area manager.

7.1.2 Joint Assessment Committee's Analysis and Conclusions Regarding Residual Effects

The Committee considers that the Proponent accounted for the environmental effects that could result from accidents or malfunctions, that it has documented these effects and that it has provided for an appropriate Emergency Preparedness Plan. The Proponent appropriately discerned the risks inherent in its Project would implement appropriate preventive measures, including measures at the time of infrastructure design, inspection and maintenance.

Given the application of the mitigation measures indicated below, the Committee is of the opinion that there is little likelihood that the Project will lead to significant adverse environmental effects due to accidents or malfunctions. Although significant adverse effect could occur according to certain scenarios, the probabilities of major accidents are low. The Committee takes note of the Proponent's intention to comply with the federal and provincial legislation and regulations.

The Committee also considered the opinions and the analysis of the effects produced by the CBHSSJB, ECCC, Health Canada, and DFO. These departments provided recommendations that were integrated into the relevant sections.

Determination of the Key Mitigation Measures

The Committee considered the mitigation measures proposed by the Proponent and the opinions of the expert government authorities, the CBHSSJB and the Cree Nations consulted to establish the key mitigation measures required so that the Project does not cause significant adverse environmental effects in case of accidents or malfunctions. The Proponent must:

- Apply all reasonable measures to prevent accidents and malfunctions that could lead to adverse environmental effects. Mitigate any adverse environmental effect that could occur;
- Draw up an Emergency Preparedness Plan in consultation with the Cree Nation of Eastmain, the Cree First Nation of Waskaganish, the kilometre 381 rest area managers and the competent authorities. Complete and communicate the Emergency Preparedness Plan (Plan) before the construction phase. Maintain this Plan up to date throughout the Project. This Plan must include, non-exhaustively, the following points:
  - Detail all the types of accidents and malfunctions and that all the measures to be taken for each of the scenarios envisioned, including those for the purpose of protecting the sensitive components of the environment, such as surface water, wetlands, fish, migratory birds and any other sensitive species concerned;
  - Develop and include special response procedures, including the road network and the rest area, particularly in case of spill of hydrocarbons or any other hazardous substances;
  - In collaboration with the CBHSSSJB, identify the resources for the exclusive use of the Project in case of emergency. Distinguish these resources from those that may also be used by the public, including the ambulance at the rest area, to avoid any confusion in an emergency;

- Specify the evacuation and containment criteria according to the different types of accidents and malfunctions;
- Establish a Communications Plan (alarm system diagram) in case of emergencies to quickly inform the Cree Nation Government, the Cree Nations and the responders concerned. Include the contact information of the representatives of the Cree Nations and toll-free emergency numbers, particularly the toll-free emergency numbers of the external organizations, particularly the rest area;
- Specify the parties to contact in case of accidents or malfunctions that have an effect on the environment, such as the Cree Nation Government, the Cree Nations and the stakeholders concerned, as well as the competent authorities, such as the Agency, the CBHSSJB, ECCC and the MELCC;
- Determine in concert with the Cree Nations the nature of the information they hope to be shared with them in case of accidents or malfunctions;
- Include the particularities of the site that it would be better to communicate to the external emergency responders likely to respond on the site, particularly concerning cell phone reception;
- Specify how the rest area would be notified in the event of detection of an anomaly in the water quality parameters. As applicable, establish the mechanisms that would make it possible to supply drinking water quickly to the rest area users;
- Number the copies of the Plan and accompany them with an appropriate ID of the holder to ensure transmission of the updates;
- Place the Plan in an easily accessible location and visible to all employees. Integrate into the Plan a map of the sensitive components of the human environment and the key components that could be affected by an accident or a malfunction in the context of an emergency response. Keep the map of sensitive components of the environment up to date.

- Implement the Plan in case of accidents or malfunctions, which includes the application of appropriate measures to minimize the adverse environmental effects;
- Ensure the presence and availability of the necessary equipment to respond to the emergency scenarios. Locate this equipment strategically on the mine site;
- Provide for enough emergency kits for recovery of petroleum products and hazardous materials on the mine site. These kits must be complete, permanent, located in the sensitive places and easily accessible at all times. They must include a sufficient provision of absorbent materials and related materials (shovels, gloves, leak plugs, etc.) and clearly identified leakproof receptacles, intended to receive petroleum residues and other hazardous residual materials. Secondary emergency kits may be necessary at certain locations. The contents of these kits must be checked periodically. Any machinery required for the Project must also contain a sufficient quantity of absorbents to allow a quick response. The list of spill response material and devices must be approved by the supervisor.
- Provide for training for the employees in maintenance and use of the response material;
- Ensure that the employees responsible for handling and transportation of hazardous products have received specific training in advance on the handling to be done and the related hazards, whether Transportation of Hazardous Materials, the Workplace Hazardous Materials Information System

(WHMIS) or any other training appropriate to the job. The information contained in the material safety data sheets of the hazardous products used must be known to the employees;

- Ensure, through frequent inspections, the good working order of the machinery, which must be clean and free of any contaminant product leak, and the perfect tightness of the fuel and lubricant tanks. A finding of a leak must result in an immediate repair of the tank involved;
- Proceed with refuelling and maintenance of the vehicles and machinery at the places designated for this purpose and according to the good practices in force;
- Take the usual precautions during maintenance and refuelling of vehicles and machinery on the work site to avoid any accidental spill;
- Equip with a leakproof recovery system any stationary equipment containing oils or fuel and positioned within 60 metres of a body of water or a watercourse. Equipment must be equipped with absorbents in order to respond quickly and effectively to accidental spills.

Necessity for Follow-up and Follow-up Requirements

The Committee recommends instituting a pile monitoring program to reduce the risks of collapse. No other follow-up or monitoring program is recommended. If the Project goes ahead, the Proponent nonetheless will have to ensure implementation of the above-mentioned measures.

7.2 Environmental Effects on the Project

The Committee is of the opinion that the Proponent has adequately addressed the elements of the environment that may affect the Project in the design of the infrastructure and in the ongoing operations of the Project. The Committee believes that the environment is unlikely to have effects on the Project that would result in significant adverse environmental effects.

The following subsections present the information considered by the Committee in its analysis, including the opinions and comments of the government experts and the Cree Nations consulted.

7.2.1 Analysis of Potential Effects and Proposed Mitigation Measures

The Committee's analysis takes into account the elements of the environment that could lead to adverse environmental effects on the Project, i.e., earthquakes, flooding, terrain instability, extreme weather conditions and forest fires. These events could damage the Project infrastructure and increase the likelihood of an accident or malfunction occurring (Section 7.1).

Earthquakes

NRCan notes that the Project is located in an area of relatively low seismic hazard and therefore there would be no reason to be concerned about seismic risks associated with this Project. Eastern Canada is located in a stable continental region of the North American tectonic plate and has low seismic activity. In the study area, the National Building Code sets the probability of a seismic event at 0.000404 per year. Over a 50-year time horizon, the probability of an earthquake causing greater than expected ground movement is 2%. The Proponent identified earthquakes with a magnitude greater than five, the threshold for possible damage. Such earthquakes have occurred more than 600 kilometres from the mine site, in the Saguenay (1988) and Témiscamingue (1935) regions, and were of magnitude 5.9 and 6.1 respectively. The Proponent states that the infrastructures planned for the Project comply with the National Building Code and the earthquake-resistant standards of the Quebec Construction Code.

Flooding

Flooding is caused by heavy precipitation and can compromise the safety of structures and roads at a mine site. Flooding usually occurs during spring freshet, when the flow of water may be impeded by ice jams at river narrows. The Proponent states that there are no major watercourses in the vicinity of the site that could cause major flooding. The Proponent also states that the drainage system that would be put in place could accept a significant amount of precipitation. In addition, the surrounding wetlands have a high capacity to retain rainwater, which would reduce the risk of flooding.

Terrain Instability

According to the Proponent, the risk of a landslide occurring on the mine site depends on the composition and gradient of the slopes of the piles. The Proponent states that the piles were designed to have a low gradient, i.e., a slope of 5 H:1 V for the overburden pile, 2.5 H:1 V for the waste rock and tailings piles, and 2.5 H:1 V for the pit slopes. The Proponent explained that the waste rock piles were designed taking into account the properties of the site. For example, a protective layer of compacted, homogeneous granular material would be added to the surface of the overburden pile slope due to the heterogeneous properties of the overburden. The design of the waste rock piles and pit is supported by stability analyses including geotechnical and hydrogeological studies. The waste rock and tailings piles would meet the design criteria of the Directive 019 on the Mining Industry and the Guide for the Preparation of a Rehabilitation and Restoration Plan for Mining Sites in Quebec. The preferred co-disposition method for these piles would contribute, among other things, to the physical stability of the slope in the waste rock fill zones.

The Proponent indicates that instability of the slopes of the waste rock piles could lead to the collapse of materials outside the containment zone. This instability could also be caused by extreme weather conditions or errors and omissions during construction. The Proponent indicated that due to the presence of dikes surrounding the containment areas of the stockpiles, the collapse of a stockpile would have little or no impact on infrastructure such as buildings, power lines and roads, with the exception of the roadway between the stockpiles. However, the presence of workers at the time of the collapse would increase the severity of the incident. The Proponent states that a collapse could occur, but that this is an unlikely situation.

The Proponent proposes to implement an infrastructure monitoring program during the operational phase, including pit walls, waste rock and tailings piles, the overburden pile, and water management ponds. For the

first five years following reclamation, an engineer would inspect the integrity of the structures annually and then periodically for the next 10 years. This monitoring would include inspection of the waste rock and tailings piles for cracks, erosion, movement or settlement that could compromise the stability and integrity of the structure. In light of these measures, the Proponent considers that there are no issues associated with the stability of the surface deposits and the instability of the terrain.

Extreme Weather Conditions

Extreme weather conditions can occur in the form of drought, heavy precipitation (rain, snow), high winds and hail or ice. These phenomena could lead to overloading and put the integrity of buildings and equipment at risk. Climate change is likely to increase the frequency and intensity of these extreme weather events (INSPQ, 2006).

The Proponent analyzed climate trends to determine their potential impact on the Project. This analysis predicts a warming of two degrees Celsius (2021-2050). Under moderate climate trends (2041-2070), average seasonal precipitation would increase by 19.3% in winter, 5.7% in spring, 3.5% in summer and 9.4% in autumn. In addition, the precipitation pattern would be more variable. Major weather systems would bring episodes of heavy precipitation, alternating with longer dry periods. This would increase the risk of seasonal droughts and heat waves in the longer term (2051-2080). Based on this analysis, the Proponent determined that by 2021-2050, the risks associated with flooding, forest fires and heat waves would be the most significant and would require prevention and mitigation measures.

Consequently, the Proponent plans to design the buildings and equipment in compliance with the codes and regulations in force in order to withstand extreme weather conditions. The Proponent believes that extreme weather conditions could have a negative impact on certain components of the Project, but not adversely affect mining operations. The Proponent proposes additional measures to prevent and mitigate the negative effects associated with extreme weather conditions, including an emergency response plan that includes an evacuation procedure for mine personnel, as well as the presence of generators at the camp and spare electrical equipment on site.

Forest Fires

Given the temperature increases associated with climate change, it is possible that forest fires will occur more often in the future, especially since the Project would be located in an area where forest fires are already frequent. In fact, a few events have occurred at the Project site in the past. In 2005, forest fires developed within one kilometre of the site, affecting tens of thousands of hectares. The truck stop at kilometre 381 was affected. In 2009, further forest fires were observed to the west and southwest of the site. In 2013, a forest fire of more than 500,000 hectares once again reached the truck stop at kilometre 381, passing close to the mine site. Therefore, it is plausible that a forest fire could occur during the life of the mine.

A forest fire occurring in the vicinity of the mine site could threaten the facilities and the safety of workers. The Proponent has developed several fire prevention and response measures, including an agreement with

the Société de protection des forêts contre le feu (SOPFEU), periodic consultation of fire hazards provided by SOPFEU, an emergency response plan that includes a forest fire response procedure, the implementation of a periodic inspection program, and the removal of peat from around the facilities for a distance of 35 metres. The adverse effects and measures regarding fire and explosions listed in Section 7.1 also apply to this subsection.

7.2.2 Analysis and Conclusions of the Joint Assessment Committee on Residual Effects

The Committee finds that the Proponent has taken into account environmental factors that could affect the Project in the design of the infrastructure, documented potential accidents and malfunctions related to these effects, provided an adequate contingency plan and proposed appropriate mitigation measures. The information related to accidents and malfunctions is presented in Section 7.1. The Committee notes that climate change could increase extreme weather events in the coming decades, but that this aspect has been adequately addressed by the Proponent. The Committee is of the opinion that the environment is unlikely to have effects on the Project that would result in significant adverse environmental effects.

Identification of Key Mitigation Measures

The Committee considered the Proponent's proposals and the advice of the federal experts and the Cree Nations consulted to conclude that the implementation of a contingency plan, as outlined above, is a key mitigation measure to ensure that the Project does not cause significant adverse environmental effects.

Need for Follow-up and Follow-up Requirements

The Committee considers that no follow-up program is required. If the Project goes ahead, the Proponent will still have to ensure that it implements the prevention and mitigation measures it has proposed.

7.3 Cumulative Environmental Effects

Cumulative environmental effects are the residual effects that may result from a designated project in combination with other projects or activities that have been or will be carried out. Cumulative effects are a serious concern for the Cree Nations as industrial development transforms the territory and has an impact on the Cree identity and way of life. The assessment of cumulative effects was guided by the Agency's operational policy statement on this topic (CEAA, 2015b). The Committee focused its cumulative effects analysis on the following valued components (VCs):

- fish and fish habitat;
- wetlands;
- migratory birds at risk;

- woodland caribou;
- bats at risk; and
- current use of lands and resources for traditional purposes by the Cree Nations.

Based on its analysis, the Committee has concluded that the Project, in combination with past, present, and reasonably foreseeable future projects, is not likely to cause significant cumulative effects on the VCs listed above.

7.3.1 Methodology and Scope

The Proponent and the Committee conducted the cumulative effects assessment as follows:

- Scoping of the assessment, including identification of regional concerns, selection of VCs, and establishment of spatial and temporal boundaries;
- Identification, description, and selection of past, present, or future projects, actions, or events that may have an interaction with at least one of the selected VCs;
- Determination of cumulative effects for each selected VC;
- Determination of mitigation and follow-up measures.

To determine the scope of the assessment, the Committee first identified the VCs for which the Project would result in residual environmental effects. The Committee then analyzed the potential significance of these effects and the likelihood of their occurrence, the status of each VC (health, status, condition), and the degree of concern expressed by the Cree Nations, the public, and the experts consulted. The Committee therefore excluded certain VCs based on the absence or low intensity of anticipated residual effects and the fact that these residual effects are unlikely to be cumulative with past, present, or reasonably foreseeable projects in the region.

The Committee and the Proponent each conducted a separate analysis of cumulative effects, which explains why they did not select the same VCs. Unlike the Proponent, the Committee included the VCs “fish and fish habitat” and “wetlands” since the Cree Nations raised concerns about cumulative effects on these components.

The spatial boundaries established by the Proponent for the cumulative effects analysis, shown in Figure 16, are considered appropriate by the Committee. These spatial boundaries were primarily selected based on the abundance and distribution of VCs and the expected extent of cumulative effects. The spatial boundaries of the “current use of lands and resources for traditional purposes by the Cree Nations” VC correspond to the community and traplines of the Cree Nation of Eastmain. For the “migratory birds at risk” and “bats at risk” VCs, this spatial boundary is the area within 110 kilometres of the centre of the proposed mine. The Committee also selected the same area for the “fish and fish habitat” and “wetlands” VCs. For the “woodland

caribou" VC, the spatial boundary is the area within 50 kilometres of the centre of the proposed mine, as requested by ECCC.

Most of the temporal boundaries established by the Proponent for the cumulative effects analysis, as outlined below, are considered appropriate by the Committee. This conclusion is based in part on comments from a James Bay Advisory Committee on the Environment (JBACE) cumulative effects workshop [AURA Environmental Research and Consulting Ltd, 2016]. Participants suggested that the 1970s be considered as a starting point for cumulative effects assessment, noting that historical baseline conditions should be established based on environmental monitoring, defined by local communities and supported by traditional knowledge. Furthermore, the Cree Nation Government believes that Indigenous knowledge provides essential insight into the understanding of the environment, both today and in the period preceding the major anthropogenic disturbances associated with natural resource development on the land. This knowledge would allow for improved assessments, mitigation, and follow-up. The signing of the James Bay and Northern Quebec Agreement (JBNQA) in 1975 is generally considered an acceptable starting point. Future temporal boundaries should be defined according to the end of the Project's life, or even a few years after the end of operations.

The past temporal boundary of the VC "current use of lands and resources for traditional purposes by the Cree Nations" is in 1980, i.e., the year when Hydro-Québec diverted the Eastmain and Opinaca rivers, which led to major changes to Cree lands. For the "bats at risk" VC, the past temporal boundary is in 2003, the year of the first bat inventory carried out by the Réseau québécois d'inventaires acoustiques de chauves-souris in the Nord-du-Québec region. For the "migratory birds at risk" VC, the temporal boundary begins in 1989, when inventories were conducted in the Bird Conservation Region (BCR) of the area. For the "fish and fish habitat" and "wetlands" VCs, the Committee chose 1970 as the past temporal boundary since it precedes the other projects or activities considered in the analysis. The Proponent chose 2028 as the future temporal boundary for all of the selected VCs, considering that it would be very difficult to make projections beyond that year. However, the Committee prefers 2046, the year corresponding to the closure of the mine and the reclamation of the site.

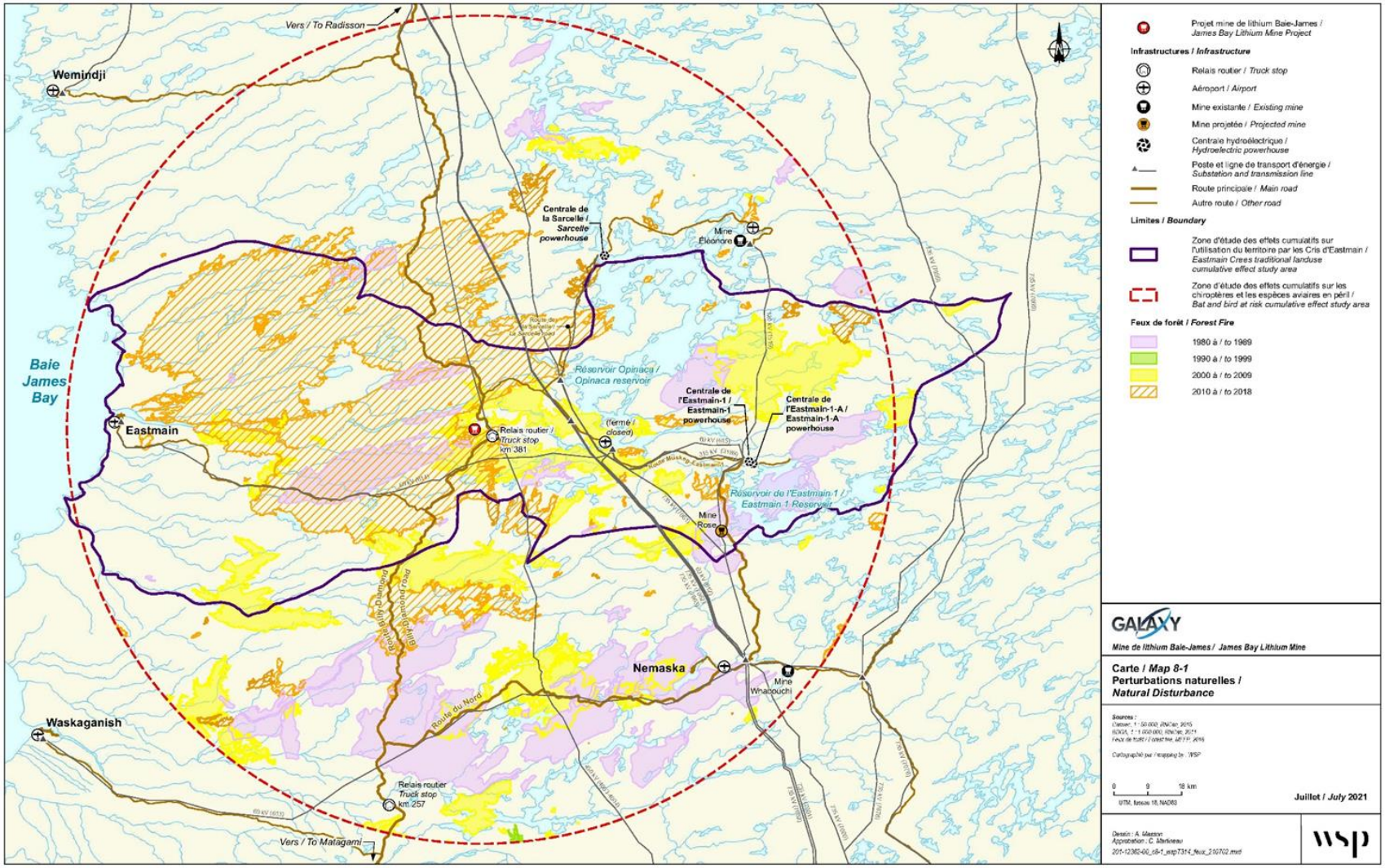
The past, present, and reasonably foreseeable future work and events selected by the Proponent and the Committee are listed below (see also Figure 16):

- Development of the community of Eastmain (since 1980);
- Diversion of the Eastmain and Opinaca rivers (1980);
- Construction and operation of the La Grande–Phase II (1987–2002), Eastmain-1 (2002–2006), and Eastmain-1-A–Sarcelle-Rupert (2007–2010) hydroelectric complexes;
- The airports of Eastmain (1986), Nemiscau (2002), Opinaca (2002, now closed) and Eleonore (2014);
- The access road to the community of Eastmain (1994) as well as the Billy-Diamond, Nemiscau – Eastmain-1 (2002), Muskeg – Eastmain-1 (2007), Muskeg – Sarcelle (2008), and Sarcelle – Eleonore mine (2010–2011) roads; and
- Reconstruction of kilometre 381 rest stop (2013);

- The Nemaska-Eastmain, Nemaska-La Grande 2, Nemaska-Waskaganish, Eastmain, Sarcelle, and Eleonore transmission lines;
- The Eleonore underground gold mine;
- The Whabouchi Mining Project, an open pit and underground spodumene mine for lithium production (in the pre-production phase);
- The Rose Lithium-Tantalum Mining Project, an open pit spodumene mine for lithium production, including the relocation of a 315-kilovolt line (under development);
- Mining exploration;
- The Grande Alliance, a memorandum of understanding for collaboration and consolidation of socio-economic ties between the Cree Nation and the Quebec government for the purpose of connecting, developing, and protecting the territory. Among other things, the Grand Alliance provides for a complete plan to extend the transportation network on the James Bay Territory;
- Protected areas and biodiversity reserves (MELCC, 2021c):
    - Réserve de biodiversité projetée de Waskaganish (proposed biodiversity reserve);
    - Réserve de territoire aux fins d'aire protégée Coldwater-Juneshew-Sibi (territorial reserve for protected area purposes);
    - Réserve de territoire aux fins d'aire protégée de la Baie-de-Boatswain (territorial reserve for protected area purposes);
    - Refuge d'oiseaux migrateurs de la Baie de Boatswain (Boatswain Bay Migratory Bird Sanctuary);
    - Réserve de territoire aux fins d'aire protégée Namewaakamiishtikw-Piskuchitishu-Siipii (territorial reserve for protected area purposes);
    - Réserve de biodiversité projetée Paakumshumwaau-Maatuskaau (proposed biodiversity reserve);
    - Réserve de territoire aux fins d'aire protégée Wichishkw-Uubauquushduuk (territorial reserve for protected area purposes);
    - Réserve de biodiversité projetée Chisesaakahikan-et-de-la-Rivière-Broadback (proposed biodiversity reserve).

In addition, the Committee believes that new mining projects could be developed in the region in the coming decades.

Figure 16: Cumulative Effects Assessment Study Areas for Biophysical and Human Components



Source: WSP Canada Inc. (2021)

7.3.2 Fish and Fish Habitat

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

The Proponent did not include the "fish and fish habitat" VC in its cumulative effects analysis. This decision was justified by the low number of individuals and species recorded during inventories conducted in 2012 and 2017. These seven species are white sucker, lake chub, northern pike, yellow perch, brook trout, brook stickleback, and trout perch. The reference state of this VC is discussed in detail in Section 5.1 (Fish and Fish Habitat).

Analysis and Conclusion of the Joint Assessment Committee

The Committee included the "fish and fish habitat" VC in its cumulative effects analysis because of concerns raised by the Cree. Fishing is an important traditional activity for the Cree and fish are an integral part of their diet, but this has been significantly altered by developments in the Cree territory over the past few decades.

The creation of the La Grande complex reservoirs, Opinaca and Eastmain 1 reservoirs and the Rupert diversion bays flooded thousands of square kilometres of land in the James Bay Territory. These hydroelectric projects have also caused hydrological modifications such as the flooding of water bodies and streams, changes in the flows of 13 rivers, and rising lake levels in the diversion channels. For example, the average flow at the mouth of the Eastmain River has been reduced by 90%.

In addition, the impoundment of these hydroelectric reservoirs has resulted in the transformation and release of mercury into the aquatic environment as a result of the decomposition of flooded organic matter (Bilodeau et al., 2020). In the 1980s, high levels of mercury were measured in fish flesh in the La Grande complex reservoirs. The Mercury Agreement, adopted in 1986, was intended to minimize the potential effects of mercury on the health of the Cree and to preserve their way of life and traditional activities. Fish contamination is therefore a major concern for the Cree. The Cree Board of Health and Social Services of James Bay (CBHSSJB) also issues recommendations for fish consumption, depending on the species and sector. Despite the provincial government's efforts to restore and strengthen the Cree fishery, 70% of James Bay Cree reportedly consume local fish less than once a week (Hydro-Québec, 2022).

The Committee considered the following projects in its analysis: the creation of the Opinaca and Eastmain 1 reservoirs, the Eastmain-Sarcelle-Rupert complex, the Whabouchi and Rose Lithium-Tantalum Mining Projects, the Eleonore mine, and the associated roads and power lines. These past and present projects have altered fish habitat and water quality in some sections of the study area.

Anticipated effects of the James Bay Lithium Mine Project include a direct loss of 1.2 hectares of fish habitat through the gradual drying up of Lac Kapisikama due to pit dewatering. The Committee points out that Lac Kapisikama is home to an isolated population of small yellow perch and is considered poor and unproductive. The Project could also result in indirect habitat losses due to changes in the hydrological regime in

streams CE3 and CE4. It could also affect water quality through the potential flow of contaminants such as hydrocarbons, heavy metals, and suspended solids into the aquatic environment. In comparison, the Rose Lithium-Tantalum Mining Project has the potential to alter, disrupt, or destroy 42.3 hectares of fish habitat.

The Committee notes the measures proposed in Section 5.1 (Fish and Fish Habitat) to mitigate adverse effects on fish and fish habitat, particularly the implementation of an offsetting plan for loss of fish habitat and the construction of a mine water treatment plant at the construction stage. The Committee considers that with these measures, the residual effects on fish and fish habitat would be of moderate intensity and limited to a few bodies of water and streams within the Eastmain River watershed. The Committee finds that these moderate residual effects are in addition to those of the above-mentioned projects, but there is no overlap between the habitat losses associated with the above-mentioned mines and mining projects. Although the James Bay Lithium Mine Project and the Rose Lithium-Tantalum Mining Project would both be located in the Eastmain River watershed, the expected hydrological changes (flows and water levels) would not affect fish habitat at the Eastmain River scale. The Committee takes into consideration the measures that would be implemented in each Project to avoid water contamination.

DFO considers that the proposed measures related to residual effects on fish and fish habitat (Section 5.1) are likely to contribute to the mitigation of cumulative effects. The Committee believes that the Project would not result in significant cumulative effects on fish and fish habitat, and that no further specific measures are required to reduce cumulative effects.

7.3.3 Wetlands

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

Wetlands are abundant in the James Bay Territory and play an important role in the maintenance of ecosystems and the species that depend on them. However, the Proponent did not assess the Project's contribution to cumulative effects on wetlands, judging that there was no potential for cumulative effects in relation to past, present, and future projects in the study area.

Analysis and Conclusion of the Joint Assessment Committee

The Committee included wetlands in its cumulative effects assessment. This decision is based in part on concerns raised by Cree Nations and experts on this issue. In fact, wetlands support a great deal of biodiversity on which the Cree depend for the practice of their traditional activities and the exercise of their rights. For example, wetlands and water environments provide quality habitat for waterfowl and migratory birds. Cumulative effects on these habitats may result in impacts on these species and, consequently, on traditional activities and access to country foods. According to the holder of the NSERC-UQAT Industrial Chair on Northern Biodiversity in a Mining Context, the proposed mine would be located in one of the most disturbed areas in the James Bay Eeyou Istchee territory, which justifies documenting the Project's contribution to cumulative effects on wetlands (N. Fenton, personal communication, December 2021).

The Committee included the following projects in its analysis of cumulative effects: the creation of the Opinaca and Eastmain 1 reservoirs, the Eastmain–Sarcelle-Rupert complex; the Billy-Diamond, Nemiscau–Eastmain-1, Muskeg–Eastmain-1, Muskeg–Sarcelle, and Sarcelle–Eleonore mine roads; the power transmission lines; mining exploration activities; the Whabouchi and Rose Lithium-Tantalum Projects; and the Eleonore mine. Wetland losses associated with mining projects would be as follows: Whabouchi (173.55 hectares), Rose Lithium-Tantalum (63.62 hectares), and Eleonore mine (7.4 hectares) (Joint Assessment Committee, 2021; Newmont Goldcorp, 2019).

The Project would result in a loss of 304.71 hectares of wetlands. In Section 5.2 (Wetlands), the Committee determined that the Project would result in moderate residual effects on wetlands based on the offsetting plan for wetland loss. The Committee has identified the wetland offsetting plan as the mitigation measure to minimize the loss of habitat function, particularly for migratory birds and species at risk. In addition, the Committee has noted that the Proponent is proposing various follow-ups to document the Project's impacts on hydrology, plant communities, and the maintenance of wetland ecological functions in the area. During reclamation, the mine site would be landscaped to encourage the creation of wetlands at various locations (e.g., overburden piles, retention ponds, and ditches).

The *Act respecting the Conservation of wetlands and bodies of water* of Quebec applies in Cree territory. Although the *Regulation respecting compensation for adverse effects on wetlands and bodies of water* in Quebec does not apply, offsetting plans for wetland losses may be required as part of the certificates of authorization issued under the procedure set out in Section 22 of the JBNQA and the authorization requirements of the MELCC. The Committee therefore encourages the Proponent to put forward the "avoid-minimize-compensate" mitigation sequence. The implementation of this sequence would allow them to avoid a net loss of ecological functions during the implementation of projects, especially because of offsetting projects and financial contributions that may be requested in case of losses.

Although the Committee notes the presence of large areas of wetlands in the territory, it believes that the additive effects of the above-mentioned projects and activities create additional pressure on wetlands. However, any additional loss or alteration of wetlands is likely to further contribute to the loss of wetland functions, whether it be the loss of carbon sinks or quality habitat for various species. The Committee emphasizes that the implementation of projects to compensate for the loss of wetlands in Cree territory is essential to counterbalance the cumulative effects on these environments and the functions associated with them. The follow-up required for offsetting projects would validate their effectiveness and measure their impact on wetlands and their functions. Overall, given the compensation measures for the loss of wetlands and the implementation of the mitigation and follow-up measures specified in Section 5.2 (Wetlands), the Committee believes that the Project is not likely to result in significant cumulative effects on wetlands and their functions.

7.3.4 Migration Birds at Risk

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

The James Bay Lithium Mine Project is located in the Taiga Shield and Hudson Plains region (BCR 7). However, the southern portion of the study area for the cumulative effects analysis is located in the boreal coniferous forest (BCR 8). The Proponent therefore assessed the cumulative effects associated with the loss and alteration of habitat for migratory birds at risk likely to use the area: Common Nighthawk, Rusty Blackbird, Short-eared Owl, Bank Swallow, Olive-sided Flycatcher, Canada Warbler, Red-necked Phalarope, and Yellow Rail. The Hudsonian Godwit, designated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), was also included in this analysis. The Committee noted that the presence of the Common Nighthawk and the Rusty Blackbird has been confirmed by surveys.

The Proponent included the following projects in its cumulative effects analysis: the creation of the Opinaca and Eastmain 1 reservoirs, the Eastmain–Sarcelle-Rupert complex, the Nemiscau and Opinaca airports, the Whabouchi and Rose Lithium-Tantalum Mining Projects, the Eleonore mine, and the associated roads and power lines. These past and current projects have resulted or will result in habitat loss for migratory birds at risk as well as increased perceived disturbance to these birds.

The Proponent believes that the Project would have little cumulative effect on migratory birds at risk in the study area, and estimates that the Project would cause habitat losses ranging from 0 to 447.32 hectares depending on the species (see Section 5.3, Migratory Birds and Birds at Risk). It notes that there is potential nesting habitat beyond the mining infrastructure. The Proponent concludes that the Project would not result in significant cumulative effects on migratory birds at risk, and that no additional measures are required to mitigate adverse effects.

Analysis and Conclusion of the Joint Assessment Committee

The Committee's analysis is based on the analysis conducted by the Proponent, as well as on the advice of the ECCC. ECCC is satisfied with the Proponent's assessment of cumulative effects on bird species at risk. It provided a separate analysis for each of the bird species at risk that are listed in Schedule 1 of SARA and likely to occur in the area. ECCC considers this to be an appropriate methodological approach, consistent with the Agency's recommendations, given that each species faces its own unique reality, threats, or issues. ECCC adds that, in the face of uncertainty as to why bird species at risk are declining, any additional loss or alteration of habitat is likely to have an effect on these species. The Project activities as well as past, present, and future projects, actions, and events identified by the Proponent may cause cumulative effects on the nesting habitat of bird species at risk (alteration and loss of habitat), as well as on the nesting activities of these species (disturbance due to the presence of infrastructure and operations). Even if habitats are plentiful in the vicinity of the Project, the accumulation of residual effects over time may reduce the availability of quality habitat for birds at risk, thereby increasing intra- and inter-species competition.

ECCC found that the Proponent did not propose specific mitigation measures to reduce cumulative effects on birds at risk and their habitats. ECCC believes that the Proponent should implement any additional measures that would reduce, mitigate, or compensate for habitat losses of bird species at risk and species with declining populations.

In conclusion, considering the limited loss of habitat and the ability of birds to move to equivalent habitats nearby, as well as the mitigation and follow-up measures detailed in Section 5.3 (Migratory Birds and Birds at Risk), the Committee believes that the Project is unlikely to result in significant cumulative effects on migratory birds at risk.

7.3.5 Woodland Caribou

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

The Proponent assessed the Project's contribution to the cumulative effects associated with the loss and disturbance of habitat for the woodland caribou, which is designated as a threatened species under SARA. It considered the possible interactions between the James Bay Lithium Mine Project and the other projects in the cumulative effects study area, namely the Opinaca and Eastmain 1 reservoirs, the Eastmain–Sarcelle-Rupert complex, the Whabouchi and Rose Lithium-Tantalum Mining Projects, and the Eleonore mine. These projects have resulted or will result in habitat losses for woodland caribou in the cumulative effects analysis area, while increasing avoidance by this species. According to the Proponent, it is unlikely that any other large-scale projects will be developed during the operation of the mine.

As explained in Section 5.5 (Species at Risk), the rate of disturbance to woodland caribou habitat within a given range must remain below 35% for the population to have a 60% minimum probability of self-sustainability. In fact, the variations of a woodland caribou population are explained mainly by the alteration of its habitat (ECCC, 2020).

Therefore, the Proponent first assessed the current level of disturbance to potential woodland caribou habitat within the cumulative effects study area, which is the area within 50 kilometres of the proposed mine centre. It determined that anthropogenic features (e.g., rest stops, roads, power lines) disturb 7% of the habitat in the study area prior to Project implementation. The main source of disturbance, however, is natural. From 2000 to 2016, large tracts of forest making up 66% of potential woodland caribou habitat in the study area were affected by fire. These areas altered by fire overlap with most areas disturbed by human activities, resulting in an estimated 68% total disturbance of potential woodland caribou habitat. The Proponent therefore believes that these disturbances have significantly reduced the availability of potential woodland caribou habitat in the study area, although undisturbed and connected ranges remain in the southern and eastern sectors of the study area. These ranges have the biophysical characteristics required for woodland caribou to carry out their life processes.

In comparison, the Proponent calculates that the Project would cause a potential habitat disturbance of 671.5 hectares, of which 298.1 hectares would be associated with a loss of function within a 500-metre zone of

influence around the mining facilities. The Proponent believes that the Project's relative contribution to cumulative effects would be small. In fact, this loss of habitat represents a very small proportion of the study area for the cumulative effects on woodland caribou, in a sector whose characteristics are not very conducive to the completion of the species' lifecycle. The Proponent believes that the Project's residual effects, which could be cumulative with the effects of past, present, or future projects in the study area, would not have significant repercussions on the maintenance of habitat areas and local populations located further south.

Analysis and Conclusion of the Joint Assessment Committee

The Committee's analysis is based on the assessment carried out by the Proponent, as well as on the opinion of government experts and the comments received from the Cree Nations consulted. In the absence of a range-specific plan, ECCC points out that it is difficult to accurately assess long-term effects in the QC-6 range and to keep the percentage of habitat disturbed below 35%. However, based on information provided by the Proponent, and according to the Report on the Progress of Recovery Strategy Implementation for the Woodland Caribou, Boreal population (ECCC, 2017), the population and distribution objectives identified in the Woodland Caribou Recovery Strategy for range QC-6 do not appear to be in jeopardy in the short to medium term. ECCC has noted that hydroelectric projects, linear structures (roads and power lines), and forest fires have been the primary contributors to cumulative effects in the study area, which falls within the QC-6 range.

According to the MFFP, woodland caribou already avoid the Project area because of the low quality of the habitat. This species is unlikely to colonize the Project area in the next 50 to 80 years due to adverse environmental pressures. Due to climate change, the fire cycle is likely to intensify in the coming years and this would not allow a recovery of the forest cover.

Disregarding non-Project environmental pressures, the Committee believes that its contribution to cumulative effects on woodland caribou would be small because the expected loss of habitat is limited to small areas. In addition, the species already avoids the Project area and increased traffic on roads will exacerbate this trend. ECCC has determined that the Project's contribution to the rate of disturbance of potential woodland caribou habitat within the QC-6 range would be low; the Project would be unlikely to compromise the objective of keeping this rate of disturbance below the 35% threshold. According to the Cree Nation Government, the range used is very large and requires tailored management approaches due to the varying densities of caribou populations. It considers that habitat losses are limited and reversible if the Proponent contributes to their restoration. The Committee therefore concludes that the Project is not likely to contribute significantly to cumulative effects on woodland caribou and finds that no additional mitigation or follow-up measures are required.

7.3.6 Bats at Risk

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

The Proponent assessed the Project's contribution to cumulative effects related to habitat loss and disturbance for four bat species, two of which are designated as endangered under SARA, the little brown bat and the northern long-eared bat. These two bat species are likely to visit the study area. White-nose syndrome, which appeared in Quebec in 2010, has severely affected several bat species, causing their populations to decline. Forest fires have also contributed to the fragmentation and destruction of their habitat.

The Proponent included the following projects in its cumulative effects analysis: the creation of the Opinaca and Eastmain 1 reservoirs, the Eastmain–Sarcelle-Rupert complex, the Nemiscau and Opinaca airports, the Whabouchi and Rose Lithium-Tantalum Mining Projects, the Eleonore mine, and the associated roads and power lines. These projects have resulted or could result in habitat loss (deforestation, flooding) for the little brown bat and the northern long-eared bat. In its analysis, the Proponent also considered disturbance, the presence of potential travel corridors, and mortality caused by white-nose syndrome in hibernating bat populations.

According to the Proponent, most of the natural environments that would be affected by the Project are characterized by the absence or near absence of a tree stratum due to forest fires. This stratum is a prime habitat for bats. The Proponent believes that despite the habitat loss associated with the Project, including 110.9 hectares of tree habitat, there is sufficient replacement habitat of similar quality in the region. The Proponent mentions in passing that there are three biodiversity reserves, including habitats of interest for bats, in Cree territory. The Committee notes, however, that the closest reserve is more than 50 kilometres from the Project. The Proponent also reiterates certain relevant measures to mitigate the negative effects, such as clearing land outside the breeding season and rehabilitating the site.

In conclusion, the Proponent believes that the Project would not compromise the integrity of local populations. The Proponent concludes that the Project's contribution to cumulative effects on the little brown bat and the northern long-eared bat would not be significant, particularly in view of the large areas of available replacement habitat for these species.

Analysis and Conclusion of the Joint Assessment Committee

The Committee supports the opinion of ECCC, which recognizes that habitat losses due to forest fires and human activities identified in the study area by the Proponent are the major contributors to the cumulative effects on bats at risk, whose populations are already severely compromised by white-nose syndrome. The Committee and ECCC believe that the Project's contribution to cumulative effects would be low, as habitat losses and alterations are limited to the Project area and there is ample replacement habitat regionally beyond the future mine site to support local populations. The Committee concludes that the Project is not likely to cause significant adverse cumulative effects on bats at risk and that no additional mitigation or follow-up measures are required.

7.3.7 Current Use of Lands and Resources for Traditional Purposes by the Cree Nations

Proponent's Assessment of Cumulative Environmental Effects and Proposed Mitigation and Monitoring Measures

The Proponent reports that previous hydroelectric development in the study area (Figure 16) has had a substantial negative impact on land and resource availability for the Cree. The diversion of the Eastmain and Opinaca rivers, as well as the flooding of the areas occupied by the Eastmain and Opinaca reservoirs and the Rupert diversion bays, have altered the terrestrial and aquatic environments, resulting in a considerable loss of hunting, fishing, and trapping sites. These projects have driven the Cree to use new areas for their traditional activities or to increase their use of traditional areas.

As discussed in Subsection 7.3.2 (Fish and Fish Habitat), the impoundment of hydroelectric reservoirs has resulted in increased mercury levels in fish flesh. The Proponent indicates that this situation has forced the Cree to modify their fish harvesting and consumption strategies, while greatly affecting their perception of contamination in the territory. The users of the territory fear that the mining project will contaminate the water, the vegetation, and the fauna, especially since the animals move around on the territory. They also worry about an increase in cancer cases caused by the presence of contaminants in the food chain. These concerns are more pronounced among Cree users of the area between the James Bay Lithium Mine Project, the Rose Lithium-Tantalum Mining Project, and the Eleonore mine (in operation), as they could potentially be adversely affected by the cumulative effects of these three mines. They also note that other projects could be developed nearby, adding to the cumulative effects on the territory.

The Proponent points out that the construction of airports, roads, and power lines has helped open up the territory and has made it more accessible. However, it recognizes that these constructions have disturbed wildlife habitats, fragmented the territory, and modified its use by the Cree. It also notes that the pressure on wildlife resources has increased in the area due to the arrival of non-Indigenous workers, who may engage in recreational fishing and hunting. However, the number of workers in the territory is now lower than when the large hydroelectric complexes were built.

The study area for cumulative effects related to the current use of lands and resources for traditional purposes, i.e., the village and traplines of the Cree Nation of Eastmain, includes another mining project, Rose Lithium-Tantalum. It is located approximately 60 kilometres southeast of the James Bay Lithium Mine Project, while the Whabouchi and Eleonore projects are located outside the study area. The Rose Lithium-Tantalum Mining Project would particularly affect the users of trapline RE01. It borders trapline RE02, on which the James Bay Lithium Mine Project would be located.

As with the Rose Lithium-Tantalum Mining Project, the Proponent anticipates that carrying out the James Bay Lithium Mine Project would disrupt, among other things, hunting, fishing, trapping, and gathering activities, in addition to modifying navigation and access to the territory. Disturbances associated with the Project, including noise and increased traffic, would result in a loss of tranquility in the vicinity of the Project,

thereby disrupting the practice of traditional activities, particularly through the avoidance of certain popular areas. The presence of non-Indigenous workers could also lead to concerns over disturbance of the natural environment and may reduce the sense of security among Cree users of the territory (e.g., risk of road accidents and break-ins in the camps).

The Proponent recognizes that the Project would have some impact on Cree users who have already had to adapt to major projects in the Eeyou Istchee region. It does, however, put the scale of the current Project into perspective compared to sources of impact in the past, such as hydroelectric projects and forest fires. The Proponent estimates the Project's contribution to cumulative effects on the VC to be of low magnitude, limited extent, and long duration, and therefore not significant.

Analysis and Conclusion of the Joint Assessment Committee

The Committee finds that the Proponent has identified relevant past, present, and future projects and their respective and cumulative effects on the current use of lands and resources for traditional purposes by the Cree Nations. The Committee believes that the Project could result in cumulative residual effects, particularly with respect to hunting and the quality of experience on the land. After considering the effects of the Project and its interactions with past, existing, and reasonably foreseeable projects or activities, the Committee believes that these effects are not likely to be significant. The Committee reached this conclusion based on the Proponent's assessment, the comments of the Cree Nations consulted, and the advice of government experts. The analysis is detailed in the subsections that follow.

Cumulative Decrease in Fish Availability for Fishing

The Committee notes that the Project would take place in a sector where the quality of fish has already been altered by mercury contamination from the hydroelectric facilities of the La Grande complex. It points out that fishing is a highly valued and widely practised activity by the Cree, especially during the summer. Several of the members consulted stressed the importance of the integrity of streams and rivers for the maintenance of the ecosystem and Cree culture.

The Project would result in the draining of the 1.2 hectare Lac Kapisikama. The Proponent claims that this lake contains few fish. The Committee nevertheless concludes that this reduction in fish availability would be irreversible, but notes that the intensity of this effect on the fishery would be reduced by the compensation provided under the *Fisheries Act*. Furthermore, according to the information gathered by Transport Canada from the RE02 tallyman, the water courses whose flows and levels would be directly affected by the Project do not seem to be particularly popular for fishing. The effect on fishing and access to a traditional food source would therefore be limited. In addition, the Committee believes that water bodies and water courses are abundant within trapline RE02. The Committee believes that Cree users of this territory have access to several other quality fishing sites. The Committee believes that the Project would result in insignificant cumulative effects on the availability of fish for the Eastmain Cree Nation's trapline RE02.

Cumulative Decline in Quality of Experience on the Land Due to Increased Nuisance and Perception of Contamination

The Committee notes that the Project's effects may be felt in a relatively limited area, namely the eastern portion of trapline RE02. This trapline has already undergone significant changes over the past few decades in terms of the quality of experience on the land, not to mention the forest fires that have caused disruption of land and resource use.

The Committee considers that the Project would contribute to a decrease in the overall current quality of experience on trapline RE02 due to sensory disturbances related to mine activities, including increased road traffic. Users of the traplines along the Billy-Diamond Highway may also experience the cumulative effects of traffic from the James Bay Lithium Mine Project and the Rose Lithium-Tantalum Mining Project. In both cases, the Billy-Diamond Highway would be used by trucks to ship the daily production of concentrate to Matagami. The Committee takes note of Health Canada's view that the Proponent may have underestimated the total concentrations of air contaminants and the impact on human health. The Proponent claims that traffic on this road would not increase significantly over time, regardless of the impact of the Rose Lithium-Tantalum Mining Project.

The nuisances generated by the Project could diminish the sense of tranquility on the land, interfere with the possibility of relaxing in the forest or at the camps, decrease the ability to access the activity sites in a peaceful and safe manner, and disrupt hunting, fishing, trapping, and gathering activities. The Committee considers these aspects essential to the satisfactory practice of traditional activities by the Cree. In this respect, the Committee is satisfied with implementing a system for receiving and processing complaints from land users, and a follow-up program on current use including the effectiveness of proposed mitigation measures, such as the traffic management plan.

The Project could also reduce the quality of experience because of the fear of contamination. This would occur against the background of the region's history of water contamination by other developers. The Committee believes that users of the Eastmain Cree Nation's RE02 property may experience a slightly higher level of perceived contamination due to the flow of water from the final mine effluent. Avoidance of the Project site and its surroundings for fear of contamination could persist after mine closure, despite the measures put in place by the Proponent to increase user confidence. However, the Committee reiterates that it does not anticipate any significant effects on the health of the Cree, given the measures proposed to limit the risks and ensure adequate monitoring, particularly of water quality (Section 6.2, Cree Health).

The level of user resilience to cumulative disturbance is also difficult to predict. Some users may continue their activities in the same areas with less satisfaction, others may move to areas they feel are quieter or safer, while others may discontinue their activities on this trapline. The Committee also points out that the Cree population is increasing significantly and that this could increase the pressure on these areas.

The Committee recognizes that the specific areas that would be avoided by Cree users are difficult to measure, but believes that these effects on current use are cumulative and likely. It should be noted, however, that the area covered by trapline RE02 remains vast and that portions of the land remain visibly

free of industrial or anthropogenic disturbances that could give rise to concerns. In conclusion, the Committee believes that these effects on the quality of experience on the Cree Nation lands would not be significant due to the mitigation and follow-up measures planned. The Committee does not recommend adding specific mitigation or follow-up measures considering what is already proposed in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) and Section 6.2 (Cree Health). The Committee stresses, however, that any new major industrial project affecting the Eastmain Cree Nation's traplines should be carefully assessed to document what would be a critical threshold for maintaining the current use of lands and resources for traditional purposes by the Cree.

8. Collaborative Evaluation of the Impacts of the Project on Cree Values

The Agency's new policy for assessing potential impacts on the rights of Indigenous peoples[26] indicates that Indigenous Nations may identify a set of values and priority issues associated with their well-being, cultural expression and preferred means of exercising their Aboriginal and treaty rights. For the purposes of this environmental assessment, the Committee agreed to focus its impact analysis on Cree Nation rights through a conceptual framework based on Cree values. These values are at the heart of the Cree identity and the rights established for the Crees under the James Bay and Northern Quebec Agreement (the JBNQ Agreement) and recognized by section 35 of the *Constitution Act, 1982*.

8.1 Established Rights in the Project Area

The Project is located on the Eeyou Istchee Territory, which means the People's Land, and corresponds to the east of James Bay and the south-east of Hudson Bay. The Eeyou traditional territory comprises eleven Nations, home to over 18,000 people and over three hundred "traplines", traditional family hunting, and trapping grounds.

The JBNQ Agreement was signed in 1975 by the Grand Council of the Crees, the Northern Quebec Inuit Association, the Government of Canada, the Government of Quebec, Hydro-Quebec, the James Bay Energy Corporation, and the James Bay Development Corporation. It was Canada's first modern land claim agreement. Section 24 of the JBNQ Agreement establishes a Hunting, Fishing, and Trapping Regime subject to the principle of conservation and outfitting regime specific to the Territory. This Regime provides certain rights to signatory Cree Nations including gathering and harvesting wildlife. The Cree people have the exclusive use of certain wildlife species, as well as the exclusive right to establish and operate commercial fisheries for certain fish species, as set out in Section 24, Annex 2 of the JBNQ Agreement. This list is included in Appendix E of the present report. Section 22 of the JBNQ Agreement sets out the environmental and social protection regime for Cree people, societies and communities with respect to developmental activity on the Territory. It also protects the hunting, fishing and trapping rights and guarantees established in Section 24. These activities are still at the bedrock of the Cree identity and essential for meeting their physical, psychological, spiritual, and economic needs, and cultural values. The protection of the environment, the Cree rights, the Cree people, their economies, and the wildlife resources upon which they depend are at the foundation of the JBNQ Agreement environmental and social protection regime.

[26] *Policy Context: Assessment of Potential Impacts on the Rights of Indigenous Peoples* is available at the following link: https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/practitioners-guide-impact-assessment-act/assessment-potential-impacts-rights-indigenous-peoples.html

The Project is located on Category III land. These lands fall under the jurisdiction of the Government of Quebec, which retains mining rights, but the James Bay Crees have exclusive trapping rights of fur-bearing animals, as well as exclusive hunting rights for certain species of animals (Appendix E). Fishing and hunting of other species are permitted for both Cree and non-Cree land users on Category III lands. The environmental effects of the Project would not be felt exclusively on the mine site, but in the larger area around the Project as well. These could include Category I lands, whose use is reserved exclusively for Cree beneficiaries of the JBNQ Agreement, and Category II lands, which are owned by the Province of Quebec but on which Crees have exclusive hunting, trapping and fishing rights (see Section 4.1 Crown Consultation with the Crees).

The New Relationship Agreement “Paix des Braves”, signed in 2002 between the Quebec Government and the Crees, was a peaceful political and economic agreement that helped address issues related to the implementation of the JBNQ Agreement. This 20-year agreement marked the beginning of a new era in Quebec-Cree relations by guaranteeing Cree participation in forestry, mining and hydroelectric development in James Bay, and a portion of the revenue derived from that development. This was followed by the Canada-Cree New Relationship Agreement signed in 2008 to improve the implementation of the JBNQ Agreement and which led to the Agreement on the Cree Nation Governance in 2017. Many other agreements have been signed since the JBNQ Agreement, which demonstrates that the relationships between the Cree and the federal and provincial governments, the Cree self-governance and the rights of the Cree people are still evolving.

8.2 Analysis Methodology

The analysis of the Cree values is guided by the principles found in the JBNQ Agreement article 22.2.4, and are the following:

a) the protection of the hunting, fishing and trapping rights of Native people in the Territory, and their other rights in Category I lands, with respect to developmental activity affecting the Territory;

b) the environmental and social protection regime with respect to minimizing the impacts on Native people by developmental activity affecting the Territory;

c) the protection of Native people, societies, communities, economies, with respect to developmental activity affecting the Territory;

d) the protection of wildlife resources, physical and biotic environment, and ecological systems in the Territory with respect to developmental activity affecting the Territory;

e) the rights and guarantees of the Native people within Category II established by and in accordance with Section 24 until such land is developed;

f) the involvement of the Cree people in the application of this regime;

g) the rights and interests of non-Native people, whatever they may be;

h) the right to develop by persons acting lawfully in the Territory; and

i) the minimizing of negative environmental and social impacts of development on Native people and on

> Native communities by reasonable means with special reference to those measures proposed or recommended by the impact assessment and review procedure. All development projects in Eeyou Istchee must be respectful of historic, social, and economic contexts and territorial organization.

The draft value list was established by the Committee. The list and the definition of each value were finalized with the cooperation and input of representatives of each of the Cree communities consulted.

This approach recognizes that impacts to values do not only happen because of biophysical effects but also because of social, economic, heritage, and health-based effects, as well as direct impacts to values from the Project. For each value, the assessment considers Project effects that could cause a change to the practice of a right (for example Project-induced changes to habitat of a hunted species), impacts to the exercising of a right (for example Project-induced changes on access to preferred hunting or fishing sites), and Project-induced effects to other traditional or cultural uses of the land such as destruction or degradation of cultural sites, or noise and visual disturbances. The perception of impacts to rights is also considered as part of this analysis, as perception may interfere with the exercise of rights. The outcome of this assessment has allowed for the assessment of the sufficiency of mitigation and compensation measures to mitigate impacts on Cree values.

Members of the Cree Nation of Eastmain and of the Cree Nation of Waskaganish shared their concerns with the Committee through in-person consultations in fall 2019. These consultations included public open houses (Proponent present) and meetings with Chiefs and Councils, the Mining Coordinator from the Cree Nation of Eastmain, the Forestry and Mining Coordinator from the Cree Nation of Waskaganish, a representative of the Cree Nation of Eastmain Women, and tallymen from traplines RE02, VC35, and VC33. Members of the Cree First Nation of Waswanipi, including the Mining Coordinator and tallymen from traplines W03, W13 and W53, were consulted virtually in fall 2020, specifically related to the effects of traffic on their land use. Chief and Council of the Cree First Nation of Waswanipi was consulted (virtually) in winter 2020. Once again, in fall 2021, the Committee informed Chiefs and Councils of the Cree Nation of Eastmain, Cree Nation of Waskaganish and the Cree First Nation of Waswanipi of the Proponent's optimization of the Project (submitted in July 2021). The perspectives reported in this chapter represent what was shared with the Committee during these consultation and information sessions. The Committee also consulted with these three Cree Nations on the draft Environmental Assessment Report in the fall of 2022. Concerns frequently raised during these consultations have been added to this chapter.

8.3 Potential Repercussions of the Project on Cree Values

In carrying out its analysis, the Committee accounted for all impacts to Cree values raised by the Proponent (Galaxy Lithium (Canada) Inc.) and by Cree Nations affected by the Project. The analysis was updated to reflect any new information as it came to light through the environmental assessment process, in order to assess the nature and scope of the impact the Project would have on Cree values. The following section outlines the Committee's impact assessment on Cree values, should the Project be allowed to proceed. In each section, the value is described, the key comments heard during the Committee's consultations, as well as its corresponding mitigation measures, are presented, and the Committee's detailed analysis is included.

It should be noted that additional mitigation measures may be found in other chapters of this report. The *key mitigation measures* presented for each value are those recommended to the Minister by the Committee. These measures would be addressed by establishing conditions that would be part of the decision statement issued by the Minister pursuant to CEAA 2012. These conditions are deemed essential to avoid significant adverse environmental effects on valued components under federal jurisdiction if the Project is approved. *Other accommodation and mitigation measures* are those that have been proposed by the Proponent or respond directly to Cree concerns but are not under federal jurisdiction and may not be considered as conditions within the meaning of the Minister's decision statement. The comprehensive list of key mitigation measures is provided in Appendix C.

8.3.1 Health (air, water, and quality of traditional food)

Description of the Cree value

This value refers to Crees' access to quality air, water and traditional food whose contaminant levels do not exceed established thresholds. The perception that Cree communities may have that the air, water or traditional food is contaminated must also be taken into consideration in the health impact assessment.

Perspectives of the Cree Nations

Cree Nation of Eastmain

The water and land are of extreme importance to the Cree Nation of Eastmain. Members of the Cree Nation of Eastmain who participated in the federal consultation stated that they are preoccupied by the effects of mining operations on health. They are concerned about the damage the mining project could cause to the surrounding environment, in particular air and water quality. Members of the community expressed concern about the effects of dust on the environment. They questioned the measures the Proponent would implement in order to control dust emissions.

Members of the Cree Nation of Eastmain expressed that the Project's footprint on aquatic habitats (wetlands, rivers, lakes, etc.) and seepage could cause degradation of water quality and quantity. Some land users are concerned about the type of membranes (if any) to be installed under the waste rock and tailings stockpiles and the potential risks to the health of humans and wildlife in case of breakage or seepage. They fear that the streams flowing away from the mine and into the Eastmain River could become contaminated, leading to substantial social and environmental impacts on the river and territory. The Eastmain River has already been impacted by hydroelectric projects and these impacts could be exacerbated by the mine. Some land users are particularly concerned about the potential contamination of the stream CE5, which is valued for traditional activities. They stated that the results of water testing around the mine site should be shared with land users. In terms of potable water locations, community members are concerned about the impact of the Project on water quality and quantity at the km 381 truck stop. The water available at the km 381 truck stop is an important source of potable water for land users in the area. When staying at their main camp, users primarily get their water supply from the km 381 truck stop. Land users also identified other sources of drinking water further from the mine that are used when travelling on the territory. During consultations, the

Proponent responded that the water source at the truck stop would be monitored. Members of the Cree Nation of Eastmain questioned how water at the mine site would be treated. They added that the Proponent must ensure that the quality of the environment is maintained for future generations. In response to the Committee's information requests as well as land users' concerns about water quality, the Proponent added a water treatment plant that would be operational at the beginning of the Project.

The Cree Nation of Eastmain has concerns about the condition of the site after the mine closure and remediation. They worry that contaminants may still be present in the environment. They expressed interest in knowing how the site and in particular, water quality, would be monitored during operations and after site closure and remediation. It is important that the land can be used by future generations.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish expressed concerns related to traditional food, water quality and the Proponent's emergency plan. They were also concerned about the possible contamination of resources consumed for food. A member of the Nation was particularly concerned about beaver meat due to its traditional value.

During the open house consultations, community members expressed that they lack confidence in the Proponent's ability to effectively control water quality of the mining effluent and questioned the effectiveness of the chosen wastewater treatment system. In the past, proponents of other development projects had indicated that there would not be any impacts on the rivers when there were. A community member was concerned over the impacts of the mine on groundwater and over the quality of drinking water at the km 381 truck stop.

Key Accommodation and Mitigation Measures

- Program to monitor the quality of game tissues consumed by Cree Nations as traditional food, to identify any changes in chemical composition. This program must include a sampling campaign every five years. This program must be developed in collaboration with the Cree Nations, the Cree Nation Government, the RE-02 trapline tallyman and the Cree Board of Health and Social Services of James Bay to target the species being monitored. This program must be implemented with the participation of the Cree Nation of Eastmain. The Proponent must establish background levels in game tissues before the construction phase. The program must be provided before the start of construction and be to the satisfaction of Cree Nations and the relevant authorities, including Health Canada and the Cree Board of Health and Social Services of James Bay.
- Perform regular inspection and maintenance of site equipment and generators.
- Regularly spray the roads and work areas with water. If necessary, use dust suppressants on surfaces where traffic is likely to raise dust despite regular watering.
- Shut down all unused electrical or mechanical equipment, including trucks waiting for a load for more than five minutes, to reduce fuel consumption and the use of engine heaters and to reduce disturbances from exhaust, smoke, dust or any other contaminant likely to come from machinery.
- Limit the speed of vehicles on the mine site following the recommendations set out in the *Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities*. Require that all persons

comply with this limit and post road signs to this effect in appropriate locations to reduce vibration and dust emissions.

- Whenever possible, avoid burning of felling and brush cutting residues on the work site. Prioritize the shredding and spreading of these residues on the work site or any other use that would allow them to be recovered, reused or recycled.
- Implement a dust management plan to assess the effectiveness of the design and mitigation measures considered in the Proponent's modelling. This plan shall include an adaptive mitigation management program, including a framework for implementing additional mitigation measures that specifies when these measures would be implemented based on the results. This plan should also include criteria for determining the most appropriate times to apply dust suppressants. The dust management plan should be maintained, and updated as necessary, throughout all phases of the Project, namely based on the results of air quality monitoring and complaints received. This plan will have to be established in consultation with the Cree Nations concerned, the Government of the Cree Nation, the RE-02 trapline tallyman, those in charge of the truck stop at kilometre 381 and the relevant authorities. This plan will have to be filed with the Board of Health and Social Services of James Bay and the relevant authorities three months before the start of the construction phase.
- Install, inspect daily and maintain dust collectors on drills and in the industrial complex during operations. Dust collected by these devices must be removed in a way that prevents its dispersion.
- With the goal of reducing greenhouse gas (GHG), nitrogen dioxide and particulate matter emissions resulting from combustion, use zero-emission equipment and vehicles. If not available, use diesel-powered equipment and vehicles that meet Tier 4 emission standards, or equipment and vehicles that run on low-carbon fuels such as natural gas, propane, renewable fuel or hydrogen.
- Develop and implement a communication plan throughout the life of the mine, in collaboration with the Cree Nations concerned, the Cree Nation Government and the Cree Board of Health and Social Services of James Bay. This plan will include communicating the following to Cree Nations, truck stop staff, land users, and mine employees:
    - schedule of mine construction, operation, and closure activities;
    - blasting schedule and timetable;
    - incidents and complaint handling;
    - issues and risks associated with the operation of the mine site;
    - monitoring results, including those performed during the remediation and post-remediation phases;
    - responses to Cree Nations concerns over traditional foods to minimize resource avoidance; and
    - remediation plan.
- Program to monitor the quantity and quality of water in the drinking water supply well at the truck stop. Supply drinking water to the truck stop or drill a new drinking water well if the Project renders the truck stop's drinking water well unusable.
- Follow-up program to verify the effectiveness of the mitigation measures and the predictions regarding the current use of land and resources for traditional purposes by the users of traplines RE02, VC33 and VC35. The follow-up would be based mainly on meetings with the tallymen of these traplines and their

families to discuss the effectiveness of the measures taken. Other stakeholders could be consulted regarding follow-up on specific issues, including the tallymen of traplines RE01, RE03 and R08, the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation involved in the follow-up of traffic management and access to camps and trails. The Proponent will consult with the tallymen of the Cree First Nation of Waswanipi to discuss their involvement in this follow-up program. A baseline survey must be conducted before construction. The follow-up program would document the following:

- the use and frequentation of the study area;
- an assessment of the condition of wildlife resources;
- Cree knowledge of wildlife species;
- traditional hunting, fishing, trapping, and other activities;
- snowmobile routes and other modes of transportation;
- residual effects on navigability;
- the frequentation and tranquility of camps and access to camps during hunting seasons;
- access to activity areas and movements;
- changes that have occurred and the perceived effects;
- evaluation of mitigation measures implemented; and
- the effectiveness of the traffic management plan.

Analysis of the Joint Assessment Committee

The Cree Nations consulted raised many health-related concerns. Deterioration of the air quality and increased dust emissions were the main worry from the mine site. Dust emissions could have an impact on the health of fauna and flora and human health. The Proponent has indicated that during the construction period, dustfall may be felt in certain areas of the study area. The nearby Cree camps would remain under the allowable standards of the *Canadian Ambient Air Quality Standards*, but during the operation phase, crystalline silica was modelled to occasionally exceed standards at the km 381 truck stop. The dust management plan and other measures outlined above will help mitigate impacts. However, land users may still experience perceived impacts from the dust near the mine site which could disturb their activities on the land.

Water quality was a central concern of the Cree Nations in terms of drinking water and keeping the Eastmain watershed clean and free from contamination. The risk of spills that could contaminate the watershed would be reduced by the application of mitigation measures (outlined above) and the implementation of an emergency plan should a spill occur. All contact water from the mine site would be collected by a ditch system and directed to a retention basin where particulate matter would settle. A water treatment plant was added to the Project, to respond to the concerns raised by the Cree Nations and the Committee alike. In addition, new *Metal and Diamond Mining Effluent Regulations* (MDMER) standards came into effect in June 2021. These regulations are more restrictive than those of Directive 019. Arsenic concentrations will therefore exceed MDMER criteria at all times, thus making the water treatment plant a necessity at the beginning of

the Project, to treat arsenic and suspended solids. The quality of surface water and groundwater would be monitored during mining operations. Cree Nation members were also concerned about the quantity of drinking water available at the 381 truck stop. There is a risk that during the construction phase, the water table could be lowered, affecting the availability of drinking water at the 381 truck stop. The Proponent notes that the risk of this occurring is low. They will monitor the quantity and quality of the drinking water and provide drinking water to the truck stop or drill a new well in the event that the drawdown renders the drinking water well of the truck stop unusable. The Committee is satisfied that the risk of this occurring is relatively low, and the monitoring and mitigation planned by the Proponent will quickly remedy the situation, if it were to occur.

The Proponent originally planned to construct haul roads on the site using waste rock excavated from the pit. This method was preferred over the exclusive use of material from quarries and borrow pits. The feasibility of the latter option was reduced by the limited amount of material available in the vicinity and the substantial transportation costs. Since the waste rock from the mine site contains leachable metals, it was proposed that the waste rock be leached on the pad prior to use to avoid groundwater contamination. Considering the uncertainties raised by ECCC, NRCan, and the Cree Nation Government as to the effectiveness of this technique, the Proponent instead modified the design of the haul roads. The haul roads would consist of a loose base covered with a linear low-density polyethylene (LLDPE) geomembrane and waste rock. The geomembrane would act as a groundwater sealing measure, with water collected by the road ditches being directed to the water treatment unit. The Committee sought a second opinion from a company specialized in mining engineering. The second opinion obtained considered that the method used by the Proponent had the potential to reduce groundwater contamination and recommended additional monitoring and mitigation measures. The Committee is satisfied with the methods employed in the design and construction of haul roads as well as the monitoring and mitigation measures proposed to further prevent groundwater contamination.

Due to the traditional value given to stream CE5 (south of mine site), the Proponent reconfigured their plan so as to have their waste rock and tailings stockpiles further away to reduce potential impacts in this area. The Proponent anticipates no effects on the fish habitat for creek CE5. The mine effluent would be discharged in one location (stream CE2), north of the mine site, and would respect Directive 019 and the MDMER. Therefore, possible contamination from the mine effluent should not be felt in creek CE5. Dust emissions, on the other hand, are more prevalent south of the mine and could have a potential impact on the vegetation and fauna in and around creek CE5. However, the Cree Health Board expert is satisfied that rigorous application of monitoring and mitigation measures will adequately address risks posed by dust emissions. The Committee is reassured that if monitoring and mitigation measures are implemented properly, there should not be a significant impact on land users, wildlife and users of the 381 truck stop caused by dust emissions from the mine. The Proponent's air pollution modelling demonstrates that the levels of contaminants predicted at sensitive receptors would be below or close to the applicable standards and criteria for the protection of physical health, with the exception of nitrogen dioxide and crystalline silica. The human health toxicology risk assessment reassures the Committee of these two air quality exceedances.

An assessment of ecotoxicological risks to human health was performed by the Proponent. Results suggest that the risks associated with the dispersion of air contaminants would be negligible.

Air and water quality would be monitored during the operation phase of the mine. Land users would be invited to sit on the environmental monitoring committee or would be informed of the monitoring report. They would hold regular meetings to present the results to the impacted Cree Nations. The Proponent is also committed to developing a monitoring program for the quality of traditional food used by the Cree community. The objective of this program would be to record any changes in the chemical composition of the main foods used by the land users. This program would include monitoring beaver meat and would be developed in collaboration with land users to adequately target species to be monitored. Despite these measures, the Proponent must maintain good communication with land users and communities throughout all phases of the Project. Given the application of key mitigation measures indicated above, the Committee is of the opinion that the level of residual effects of the Project on Cree health value would be moderate.

8.3.2 Well-Being of the Cree Nations

Description of the Cree Value

This value refers to the social cohesion and quality of life that exists within a Cree community and on the land. It also refers to the socio-economic conditions of the different subgroups of a community and the interrelationship between these subgroups. The connection with culture, identity, the land and the possibility of transmitting Cree knowledge to future generations is also part of this. It also refers to the possibility to live in a safe space free of external disturbances that could affect cultural integrity and mental health (notably noise, vibrations and negative socio-economic impacts).

Perspectives of the Cree Nations

Cree Nation of Eastmain

It is important that the people living from the land can continue to live from it despite the Project. It is also important to promote the economy while respecting the Cree way of life. One of the major concerns in terms of well-being expressed by members of the Cree Nation of Eastmain was regarding the preservation of the Cree way of life and the impacts the Project will have on how Crees will continue to practise traditional activities on the land.

The Project itself could potentially have an impact on waterways, vegetation, fauna and human activity due to noise disturbances, dust emissions and infiltration of contaminants into the environment. For example, creek CE5 is a valued waterway by the RE02 tallyman and his family for practising traditional activities. Land users consider it important that they have access to water quality test results. They are concerned that the mine will have major and irreversible effects on the territory, affecting the practice of traditional activities for future generations. The VC33 tallyman expressed that he is concerned that the Project's footprint may increase if more resources are found. He is concerned that eventually the area developed may reduce access to the territory and land use would be lost. He said that there must be a balance between nature and the development of the territory. A member of the Cree Nation of Eastmain suggested that the Proponent and the Crees could organize a ceremony to show respect to mother nature before the start of the Project.

The Project could lead to an influx of workers in the territory during the construction and operation of the mine. The Cree Nation of Eastmain is concerned that this will add pressure on wildlife resources as the territory opens up and is available for mine workers to hunt and fish. Another negative aspect that could arise due to the increase of workers is vandalism and theft at Cree camps. The VC35 tallyman described that he has previously experienced theft and vandalism at his camp after the construction of development projects near his trapline and camps.

Members of the community equally expressed concerns in terms of workers' and land users' safety. The presence of food waste could attract bears near the camp. They were also concerned about the risk of workers getting lost if they leave the mine site. They suggested that in the event of a disappearance, the Proponent should include the tallymen in the search since they have knowledge of the territory. There is concern about security around the pit after closure.

Female participants from the Cree Nation of Eastmain are concerned about employment and security at the mine site. They suggested sexual harassment workshops, delivered by Cree women, if possible, to raise awareness, as well as a strict sexual harassment policy. Additional safety measures should be put in place at the km 381 truck stop to ensure women's safety. Drugs and alcohol should be banned on the mine site and at the nearby truck stop. It was also suggested that the Proponent put in place a women's group to help combat feelings of isolation of Cree female workers in a male-dominated industry while on the mine site. The Proponent could also make sure there is always at least one woman in the human resources department and/or a counselor or psychologist at the mine site or in the community to provide support. Some participants mentioned that single mothers could potentially face discrimination from other community members if they choose to work at the mine and leave their children for a few weeks at a time. They also noted that salaries should be equal for men and women. Finally, it is important for women to have a voice and they suggested that there should be a female representative on the mine implementation and monitoring committees.

The participants from the Cree Nation of Eastmain would like to see that there is inclusion and a sense of belonging at the mine site. They are concerned that Cree employees may feel lonely at the mine which may discourage them from keeping their jobs. They also indicated that language is an important tool in feeling included and suggested that English be the main language spoken at the mine site.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish were mainly concerned about the increase in workers in the territory and the pressure it could have on the wildlife resources. Mine workers could practise harvesting activities (hunting, fishing, etc.) when they are not working. Tallymen consulted also expressed that workers often lack cultural sensitivity or disrespect Cree culture. It was suggested that as a mitigation measure, the Proponent should implement a mandatory Cree cultural awareness workshop related to hunting and fishing on the JBNQ Agreement Territory. These workshops could be based on intercultural exchanges between tallymen and employees.

Key Accommodation Measures

- Regular education for workers, including drivers, regarding the following:
    - the Cree culture and the practice of traditional activities by users of the land, particularly in the vicinity of Billy Diamond Highway;
    - the requirement to obey road safety rules;
    - compliance with speed limits on Billy Diamond Highway to avoid creating convoys of vehicles; and
    - the courtesy required for the safety of land users who park along the roadside to carry out their harvesting.
- Include a clause in the employment contracts of employees, including subcontractors, to prohibit hunting, trapping, and fishing on the mine site and within the mining lease. Prohibit employees from possessing firearms and hunting, trapping, or fishing equipment. Include penalties for non-compliance with this prohibition in employment contracts,
- Work with the Cree Nation of Eastmain to develop a calendar specifying the annual periods for the goose and moose hunting seasons, each lasting two weeks. During these two periods, carry out Project activities as follows:
    - reduce daily handling of waste rock by 30%;
    - reduce concentrate trucking on Billy Diamond Highway from 12 to 10 round trips per day;
    - carry out the trucking between 9:00 a.m. and 7:10 p.m.; and
    - after these two periods, verify with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02 that the measures are sufficient. If changes in the mitigation measures are needed, they must be communicated to the above stakeholders and to the Agency before being implemented the following year.
- During the annual goose hunting season established in collaboration with the Cree Nation of Eastmain, plan blasting as follows:
    - reduce the number of blasting operations to one per week;
    - conduct blasting operations between 1:00 and 3:00 p.m; and
    - where possible, conduct blasting operations on days of the week when the weather is not suitable for goose hunting.
- Before construction begins, establish a system for receiving and handling complaints until the mine closes. The response time for complaints should be 48 hours. The Proponent will prepare a report on the nature of complaints received and how they were handled. The number and resolution of complaints received must be shared through the communication plan. The system for receiving and handling complaints could allow for the implementation of additional mitigation measures,
- Follow-up program to verify the effectiveness of the mitigation measures and the predictions regarding the current use of land and resources for traditional purposes by the users of traplines RE02, VC33 and VC35. The follow-up would be based mainly on meetings with the tallymen of these traplines and their families to discuss the effectiveness of the measures taken. Other stakeholders could be consulted regarding follow-up on specific issues, including the tallymen of traplines RE01, RE03 and R08, the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation involved in the follow-up of traffic

management and access to camps and trails. The Proponent will consult with the tallymen of the Cree First Nation of Waswanipi to discuss their involvement in this follow-up program. A baseline survey must be conducted before construction. The follow-up program would document the following:

- the use and frequentation of the study area;
- an assessment of the condition of wildlife resources;
- Cree knowledge of wildlife species;
- traditional hunting, fishing, trapping and other activities;
- snowmobile routes and other modes of transportation;
- residual effects on navigability;
- the frequentation and tranquility of camps and access to camps during hunting seasons;
- access to activity areas and movements;
- changes that have occurred and the perceived effects;
- evaluation of mitigation measures implemented; and
- the effectiveness of the traffic management plan.

- Hire a liaison officer from the Cree Nation of Eastmain for all phases of the Project. The officer's role will be to inform the Cree Nations of the jobs and contracts offered by the company, ensure the harmonious integration of Cree workers into the mine's workforce, educate workers regarding Cree culture and traditional stewardship of the land, communicate the Cree Nations' concerns to the company, including land users, and participate in dispute resolution.
- Limit wildlife access to food waste by installing a composter and bear-proof lids on garbage cans.

Other Accommodation and Mitigation Measures

- Provide development assistance for women focused on specific skills, such as influencing and networking. Provide specialized on-site training and development sessions. Provide networking opportunities for women to exchange information and support each other.
- Offer jobs in the community of Eastmain in addition to those at the mine, so that women can be close to their families.
- At the request of and in collaboration with the Council of the Eastmain Nation, a ceremony of gratitude for Mother Nature will be held at the future mine site before construction begins.
- In collaboration with the Cree liaison officer and the Cree Board of Health and Social Services of James Bay (CBHSSJB), implementation by the Galaxy's human resources department of a social issue awareness program for workers, including sexual harassment, prostitution, alcohol and drug use, gambling, money management, violence and any other issue that may arise during mine operation.
- Offer suitable working conditions for pregnant women by complying with the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) program "For a Safe Maternity Experience".

- Ensure that telephone and/or Internet services are available at the camp to encourage workers to contact their families.
- Authorize family visits for workers staying on the mining site during special occasions.
- Have zero tolerance for violence on employee housing and work sites, and enforce disciplinary measures if someone is found guilty of violence or harassment.
- Reserve a section of the workers' camp for women to protect their privacy.
- Have at least one woman present at the camp on Galaxy's human resources team to facilitate discussions with Cree and non-Cree female workers.
- Establish a protective berm around the pit to ensure the safety of land users during closure in accordance with the guidelines in Section 4.5.2 of the Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec (2017).
- Establish and implement a Galaxy Lithium Code of Ethics and ensure that all workers are well informed of its contents.
- Prohibit alcohol and drug consumption in the worker camp at the site.
- Provide a fund in the IBA with the Cree Nation of Eastmain to finance intergenerational knowledge transfer initiatives.

Analysis of the Joint Assessment Committee

The Committee would like to highlight the importance of the Crees being able to continue living from the land without disturbance, as they have since time immemorial. The Proponent has proposed several measures to minimize disturbances to Cree traditional activities. To ensure safety, land users would be kept informed of the scheduling of construction and mining operations. Cree workers would be able to request leave during traditional hunting seasons (i.e., goose and moose hunting seasons) in an effort to promote the continued practice of traditional activities.

The influx of workers in the territory raises concerns about increasing pressure on wildlife resources, vandalism and theft in Cree camps. The Committee considers that workers should be made aware of traditional practices of Cree communities and activities on the territory. Workers at the mine site would be prohibited from practising recreational hunting and fishing. The Committee is reassured that this measure would help mitigate potential conflicts between mine workers and land users. The Proponent would have a system during the lifetime of the Project allowing land users to file complaints. A specific monitoring committee would be developed in order to evaluate and mitigate impacts on land users' traditional use of the territory. Land users of the impacted area would sit on this monitoring committee. The Committee believes that with the proposed measures and initiatives, the impacts on the traditional use of the territory would be reduced. However, residual effects could still be felt by RE02 trapline users, who will no longer be able to practise traditional activities in the area of the Project's footprint.

In terms of safety for both workers and land users, the Proponent would establish a protective berm around the pit to ensure the safety of land users during closure. The Committee believes that this will help address concerns about the safety of the pit post-closure but notes the importance of communicating with land users during the closure phase, to confirm that they are satisfied with the safety measures put in place.

To diminish wildlife encounters, food waste would be stored in containers with lids until pickup. Workers would also be made aware that it is important not to feed animals and not to leave food lying around. The Committee is satisfied that the measures put in place by the mine to control the attraction of wildlife conform to current best practices. They will help mitigate the risk of dangerous wildlife encounters and contamination of traditional food.

The Committee underlines that it is important for Cree workers to feel a sense of inclusion while working at the mine. The Proponent acknowledges that integration may be difficult. They would establish and implement a Code of Ethics and ensure that all workers are well informed of its contents. An intercultural training component in the orientation program is also planned.

Women may find it difficult working in a generally male-dominated environment and may feel lonely or judged for leaving their families behind while working at the mine site. The Proponent would implement several mitigation measures that would help in allowing women feel safe and have equal opportunities as their male counterparts. Notably, a section of the workers' camp would be reserved for women to protect their privacy and there would be at least one woman present at the camp on the human resources team to facilitate discussions with female workers. A special focus would also be put on providing development assistance for women focused on specific skills, specialized on-site training and development sessions. There would also be an opportunity for women to network, exchange information and support each other. There would be jobs available in the community for women who would like to remain close to their family. Additionally, the Proponent is not opposed to allowing different shift rotations for Cree employees, especially women, depending on the type of job. The Committee believes that the Proponent has taken into consideration the difficulties of women working at mine sites and has proposed adequate measures to help in facilitating a good working environment.

In relation to sexual harassment, drugs and alcohol, the Proponent has said that there will be a zero tolerance policy on the mine site. Drugs and alcohol would be banned on site. A social issues awareness program would be implemented, in collaboration with the Cree liaison officer and the Cree Board of Health and Social Services of James Bay (CBHSSJB). This program would include topics such as sexual harassment, prostitution, alcohol and drug use, gambling, money management, violence and any other issue that may arise during mining operations. The Committee believes that the mitigation measures put in place to address this issue are appropriate.

The program would implement solutions to mitigate social or health issues where possible. The details of this follow-up program would be specified prior to the construction phase. The Committee is satisfied that the Proponent is committed to setting up a monitoring program for the quality of life and well-being. They have engaged in conversations with the CBHSSJB to guarantee one member sits on the monitoring committee. As well, there would be women working in human resources tasked with following and ensuring employees' well-being.

With regard to women's issues, the Proponent indicated that it would not be safe to have children in daycare at the mine site, but the Proponent should work to find solutions for mothers who would like to work at the mine with the 2 weeks on 2 weeks off schedule. The Proponent has said that salaries would be equal between male and female workers.

The Committee notes that the work environment at the mine site, which is generally more male, could increase the risk of harassment for Cree women employed by the Proponent. The Proponent plans several measures related to the prevention of harassment on the mine site. The Committee believes that the Proponent has adequately documented the management and prevention of sexual harassment.

The success of these mitigation measures hinges on the follow-up and communication between the Proponent and the three Cree Nations. Many of the impacts would cease once the mine is no longer in operation. However, some lasting impacts could occur if social issues are brought about by the mine. Positive impacts to well-being could occur if the mine reduces unemployment rates and thus improves the quality of life of members of the three Cree Nations.

8.3.3 Economic Prosperity

Description of the Cree value

This value refers to a favourable economic situation, abundant wealth and development opportunities that have positive effects on the community as a whole and on the quality of life of its members in the longer term. Various elements can be considered in this value, including the creation of quality jobs (notably for Cree women), access to training, obtaining contracts for local businesses, investment in infrastructure or any other activity that promotes the empowerment or the capacity building of the community.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members of the Cree Nation of Eastmain stated that it was important that those who live off their land can continue to do so. It is equally important to promote the economy of the community while respecting the way of life of its members, as indicated in Section 22 of the JBNQ Agreement. They underlined the importance of the Proponent keeping the Cree Nation of Eastmain informed about opportunities with the mine and investing in the Nation in the long-term.

Many participants stated that they were interested in jobs and business opportunities created by the Project. Some people mentioned that there was an increased graduation rate in the community, and increased interest in employment with such projects. However, community members are concerned about access to training and being ready for upcoming jobs. One participant suggested including Apatisiiwin Skills Development in the training program. It was also suggested that adequate training should be made available so that they can acquire the necessary skills to participate in the construction, operation, and monitoring of the Project. Some community members see an opportunity for the Proponent to offer workshops aimed at encouraging young women to pursue a non-traditional career in the mining sector. Other community members were concerned about the working language at the mine and the location of training programs. They would like to overcome language barriers on the mine site.

Community members also see the possibility of reusing the waste rock for commercial activities such as road maintenance. The RE02 tallyman would like to be involved in the Project (contracts, etc.) and benefit from the available resources of the site (e.g., wood, mining waste, etc.).

The Cree Nation of Eastmain expressed that they are concerned about the impacts that the Project will have on the housing availability in the community. An increase in housing would allow the community to house its members who will be working at the mine and allow the community to grow.

Key Accommodation and Mitigation Measures

- Hire a liaison officer from the Cree Nation of Eastmain for all phases of the Project. The officer's role will be to inform the Cree Nations of the jobs and contracts offered by the company, ensure the harmonious integration of Cree workers into the mine's workforce, educate workers regarding Cree culture and traditional stewardship of the land, communicate the Cree Nations' concerns to the company, including land users, and participate in dispute resolution.

Other Accommodation and Mitigation Measures

- Establish a regional purchasing policy that would prioritize local and regional companies in the competitive bidding process where the skill and price are competitive.
- Offer training programs to local workers, when possible, to fill mine positions. Organize training in partnership with Apatisiiwin Skills Development to give Cree Nation workers access to jobs at the mine.
- Prioritize the Cree workforce, followed by the regional workforce, with equal skills, for the available positions.
- Implement mechanisms to integrate workers, particularly for members of Indigenous communities (information sessions, human resources representatives, employee assistance program, etc.).
- A communication committee and the Galaxy human resources department will communicate with local stakeholders and go to schools to present the positions available at the mine.
- Provide development assistance for women focused on specific skills, such as influencing and networking. Provide specialized on-site training and development sessions. Provide networking opportunities for women to exchange information and support each other.
- Offer jobs in the community of Eastmain in addition to those at the mine, so that women can be close to their families.

Analysis of the Joint Assessment Committee

Cree community members are interested in new job opportunities but are concerned about not having the skillset necessary when the mine begins their hiring process. The Proponent has not yet informed communities on what the training program would entail. However, the Proponent has already committed to a few mitigation measures to aid in the training of Cree workers and to promote job opportunities in the communities. A program for monitoring the impacts on the human environment, including monitoring the impact on training, employment and the economy of regional communities would be put in place at the

beginning of the Project and performed annually. The Proponent is waiting for their Project to be approved in order to implement their training plan. The Cree community liaison would be responsible for managing communications between the mine and community members in regard to employment opportunities available. The Committee is satisfied that the Proponent will ensure that there will be adequate communication about jobs and training between the communities and the mine.

The Proponent is interested in encouraging young Cree Women to apply on job postings by organizing networking opportunities allowing women to share information and support one another. Additionally, recruiters and managers would be trained to recognize stereotypes and cognitive biases related to the type of work women can do, especially in non-traditional roles. The Committee notes that although it is possible that the mine will have asymmetrical impacts on Cree women, the Proponent is making efforts to put in place measures to mitigate these impacts to the extent possible. In particular, the Committee is satisfied that measures will be put in place to accommodate and encourage women to access jobs at the mine, and reduce the potential impacts on women in the community.

8.3.4 Cree Hunting, Trapping and Fishing

Description of the Cree value

This value refers to the quality of the experience on the land and the availability and access to resources in sufficient quality and quantity for Cree personal and community use. This value also refers to the Cree land users' capacity to rely on the land for food security and to adapt to the changes the Project would cause to the environment. The land users' resilience must be assessed by taking into account the effects of past projects on the territory. This value is considered from two angles: 1) Cree family subsistence hunting, trapping and fishing, and 2) the seasonal goose and moose hunting, summer and ice fishing of the members of the Cree Nations.

Perspectives of the Cree Nations

Cree Nation of Eastmain

People of the Cree Nation of Eastmain have been hunting, fishing, trapping, and using the territory for generations. They fear that the Project might have lasting effects on the current use of the territory for traditional purposes. It is important that people living off the land can continue to do so without disruption from the mining project. The VC33 tallyman is concerned about the future access to his trapline and fears land users will not be able to practise traditional activities if the Project expands. Climate change is already having an impact on animal behaviour in the territory and is only predicted to have increased impacts in the coming years. For example, the fauna is moving northward, and hibernation periods are shorter. The tallymen fear this may worsen with the presence of the mine.

Members of the Cree Nation of Eastmain are concerned about the impacts the Project will have on valued species and species at risk such as moose, wolves, woodland caribou, bears, beavers, and geese. Since the forest fires in the recent past, animals have started to return to the area. Beavers and bears have been spotted near the Billy Diamond Highway. The members of the community indicated that beaver inventories

should be completed prior to the construction of the mine. These inventories should be carried out in collaboration with the tallymen and repeated annually during the life of the Project. The construction and operation of the Project will result in the loss and fragmentation of certain species' habitats locally. Noise due to blasting from the Project may scare away wildlife. Other species may be more attracted to the presence of humans and their behaviours may change (e.g., bears around the workers' camp). The Cree Nation of Eastmain is especially concerned about the return of fauna to the area and the trapline once the Project is complete and the site remediated. To illustrate, after a forest fire, small animals, mushrooms, and berries will come back first. If animals lose their trail, they may become lost and not come back. Some members of the Cree Nation of Eastmain consider the Proponent should evaluate which animals would return first and the Project's impact on the return of fauna and flora.

The VC33 tallyman and land users expressed their concerns with regard to cumulative impacts and climate change on wildlife as a result of the mine Project. They are already noticing changes in the climate and its effects on the distribution of various wildlife species. For example, valued species such as moose and caribou are moving further north. New species such as lynx and deer are seen in the territory. Duck sightings are becoming rare. Pigeon and eagle sightings are more common, especially in the summer. Bear hibernating patterns are changing. They used to wake up in April and now they are noticing them waking up earlier, in February or March.

Due to the increase in road traffic, the Cree Nation of Eastmain is concerned about noise disturbance for geese, especially during goose hunting season. They recommend that the Proponent hold planned shutdowns during hunting season. The VC35 tallyman is also concerned about road traffic and its effects on animal behaviour. Certain species may avoid the road. Even though the VC35 trapline is further north than the proposed mine, the tallyman expects that animal behaviour on their trapline will be subject to change. Additionally, in order to access their hunting grounds, they use the Billy Diamond Highway passing by the proposed mine site and km 381 truck stop.

The Cree Nation of Eastmain expressed concern about the Project's impact on the surrounding wetlands, rivers, and lakes, as well as the wildlife (i.e., fish, amphibians, aquatic mammals, and waterfowl) that live there. They are especially concerned about the Eastmain River, since all nearby rivers and streams flow into it. If there were contamination, this could have important social and environmental impacts on the people of the territory and their traditional activities (i.e., hunting, trapping, and fishing along the river). The RE02 tallyman is especially concerned about possible contamination or impacts to stream CE5 south of the projected mine site. This stream is of great value to the tallyman and his family for traditional purposes and resources.

Finally, the members of the community fear that the influx of workers in the territory during the construction and operation phases of the Project could potentially put pressure on the resources of the territory. They wonder how the Proponent will prevent the workers from hunting and fishing on the land.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish are concerned about the potential contamination of resources consumed as food and the impact on their traditional activities such as hunting, fishing, and trapping. They wonder how the mine will change the way the land is used and affect their rights under Section 24 of the

JBNQ Agreement. They stated that the arrival of workers from the south could lead to moose being hunted on Cree traplines without tallymen being informed. This could both put pressure on resources and cause a security risk for land users. They are concerned about how the Project would affect wildlife in the territory and on trapline R08. The fish are of particular concern. They wonder what will become of the fish in the Lake Kapisikama, which is to be drained, and all of the other lakes or streams that will be affected. The Forestry and Mining Coordinator for the Cree Nation of Waskaganish, indicated that there should be a study to compare species from impacted and non-impacted areas. Observations have been made regarding species in developed areas. As an example, beaver meat tastes differently and moose meat is leaner. The community state that it is important to also consider Cree traditional knowledge when assessing impacts on wildlife.

Members of the Cree Nation of Waskaganish were also concerned about the increase in road traffic, especially during goose and moose hunting seasons. It could also impact beaver trapping along the road. Land users regularly trap beaver along the Billy Diamond Highway to prevent dams from causing flooding. This highway will be used by the Proponent from the mine site to Matagami. It was suggested that the Proponent space out the truck departures throughout the day.

Key Accommodation and Mitigation Measures

- Perform work in the water outside the sensitive period for the fish species present, by minimizing the duration of the work in an aquatic environment.
- Work with the Cree Nations to develop and implement, before the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government, and the Agency and must include the following:
    - a protocol for radio communications between the drivers and the mine site;
    - monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures; and
    - the distribution of heavy truck traffic through the day and the week.
- Educate workers not to feed animals or leave food lying around to avoid attracting wildlife near work areas.
- Before the beginning of the construction work, deploy a monitoring program for activities that risk having an effect on migratory birds and birds at risk during all the phases of the Project. For each activity, determine the measures to be deployed to ensure reduction of nuisances or disturbance, particularly during the nesting period. The monitoring program shall include, non-exhaustively, the issues relating to use of water management ponds by avian fauna and use of borrow pits for Bank Swallow nesting. The program must also deal with monitoring of the work to be performed in order to ensure that it does not cause any destruction of nests or eggs of migratory birds. Account, in particular, for bird species at risk, particularly the Common Nighthawk and the Rusty Blackbird, whose presence has been confirmed. Periodically update the monitoring program to account for changes in the regulations, particularly the revision of the status of wild species by the COSEWIC or SARA,
- Limit wildlife access to food waste by installing a composter and bear-proof lids on garbage cans.
- Prepare and implement an offsetting plan to counterbalance the Project's residual effects on fish and fish habitat. This plan will have to be produced in collaboration with the Cree stakeholders and

be approved by DFO. It will have to account for the requirements of the *Fisheries Act*, the MDMER, the Quebec *Act respecting the conservation and development of wildlife* and the Lignes directrices pour la conservation des habitats fauniques (Wildlife habitat conservation guidelines).

- Regular education for workers, including drivers, regarding the following:
  - the Cree culture and the practice of traditional activities by users of the land, particularly in the vicinity of Billy Diamond Highway;
  - the requirement to obey road safety rules;
  - compliance with speed limits on Billy Diamond Highway to avoid creating convoys of vehicles; abd
  - the courtesy required for the safety of land users who park along the roadside to carry out their harvesting.
- Work with the tallyman of trapline RE02 to perform a beaver inventory before the Project starts and in watercourse CE2 once a year thereafter for the life of the Project. Inspect the beaver dams at regular intervals to identify any changes in the flow and water level of watercourse CE2, and inform the Cree Nation of Eastmain of those changes.
- Include a clause in the employment contracts of employees, including subcontractors, to prohibit hunting, trapping and fishing on the mine site and within the mining lease. Prohibit employees from possessing firearms and hunting, trapping or fishing equipment. Include penalties for non-compliance with this prohibition in employment contracts.
- Work with the Cree Nation of Eastmain to develop a calendar specifying the annual periods for the goose and moose hunting seasons, each lasting two weeks. During these two periods, carry out Project activities as follows:
  - reduce daily handling of waste rock by 30%;
  - reduce concentrate trucking on Billy Diamond Highway from 12 to 10 round trips per day;
  - carry out the trucking between 9:00 a.m. and 7:10 p.m;
  - ffter these two periods, verify with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02 that the measures are sufficient. If changes in the mitigation measures are needed, they must be communicated to the above stakeholders and to the Agency before being implemented the following year.
- During the annual goose hunting season established in collaboration with the Cree Nation of Eastmain, plan blasting as follows:
  - reduce the number of blasting operations to one per week;
  - conduct blasting operations between 1:00 and 3:00 p.m.;
  - where possible, conduct blasting operations on days of the week when the weather is not suitable for goose hunting.
- Work with the tallyman of trapline RE02 to establish an for traditional activity exclusion zone for safety reasons.
- Post the follow-up reports annually in English on a special website, and present them to the tallymen if they so desire. Hold sessions to present and explain the follow-up results to the Cree Nation of

Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi once or twice a year.

- Follow-up program to verify the effectiveness of the mitigation measures and the predictions regarding the current use of land and resources for traditional purposes by the users of traplines RE02, VC33 and VC35. The follow-up would be based mainly on meetings with the tallymen of these traplines and their families to discuss the effectiveness of the measures taken. Other stakeholders could be consulted regarding follow-up on specific issues, including the tallymen of traplines RE01, RE03 and R08, the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation involved in the follow-up of traffic management and access to camps and trails. The Proponent will consult with the tallymen of the Cree First Nation of Waswanipi to discuss their involvement in this follow-up program. A baseline survey must be conducted before construction. The follow-up program would document the following:
    - the use and frequentation of the study area;
    - an assessment of the condition of wildlife resources;
    - Cree knowledge of wildlife species;
    - traditional hunting, fishing, trapping, and other activities;
    - snowmobile routes and other modes of transportation;
    - residual effects on navigability;
    - the frequentation and tranquility of camps and access to camps during hunting seasons;
    - access to activity areas and movements;
    - changes that have occurred and the perceived effects;
    - evaluation of mitigation measures implemented; and
    - the effectiveness of the traffic management plan.

Analysis of the Joint Assessment Committee

The Committee notes that all Cree Nations indicated that the Project would have an impact on hunting, fishing and trapping activities. They are most concerned about how animal behaviour and populations will change with the arrival of the Project. The land where the mine will be located is often used for hunting moose, black bear, and caribou. Land users will have to find new areas to hunt due to the mine footprint and the security perimeter (exclusion zone for traditional activities) surrounding it. Woodland caribou have seldom been seen in the mine vicinity due to recent forest fires. However, the vegetation in the area is beginning to grow back and the fauna is also slowly returning. The Proponent has committed to implementing several mitigation measures to reduce the impacts on wildlife, as mentioned above. In addition, the Proponent will monitor wildlife throughout the life of the mine. They would form a monitoring committee with representatives from the Cree Nation of Eastmain, Cree First Nation of Waswanipi and Cree Nation of Waskaganish as well as land users from traplines RE01, RE02, RE03, VC33, VC35 and R08. A joint working table would be formed to specifically monitor caribou. The monitoring group would allow for the development of adequate measures to mitigate the possible effects of the Project on the harvest of woodland and migratory caribou for current and future territory users. Woodland caribou species are listed as threatened under the federal *Species at*

Risk Act. The monitoring committee would support community knowledge transfer encourage good practices and promote caribou conservation for future generations. The Committee believes that although the mine will impact the availability of wildlife and traditional harvesting practices to some extent, the Proponent would employ current best practices and would remain in communication with land users to adjust their approach along the way and reduce impact.

Beavers are a valued species to the Crees and are often trapped along the Billy Diamond Highway and waterbodies around the mine. The beaver could be included in the monitoring program at the request of land users. The Proponent is also committed to periodically inspecting beaver dams to identify any changes in CE2 water levels and flow. The Proponent would notify the tallyman and the Cree Nation of Eastmain of such changes. Following the initial inventory, subsequent inventories would be repeated at regular intervals during the active season. The Committee is satisfied that the close collaboration between land users and the Proponent would reduce impacts felt on the practice of beaver trapping.

Goose hunting season is a valued tradition in Cree communities and therefore the geese and this period must be protected from disturbance by the mine (e.g., noise). The Proponent proposed mitigation measures that would encourage traditional activities such as the reduction of blasting, material handling on the site and transportation of concentrate by truck. In response to the recommendation of holding planned shutdowns, the Proponent indicates that planned shutdowns require additional resources and employees which would increase road traffic. Therefore, the Proponent would reduce the handling of equipment on site by 30% for a two-week period during goose and moose hunting season and reduce the number of blasts for a two-week period during goose hunting season. The Proponent also proposed to facilitate breaks for traditional activities for Cree workers during this time. The Committee is in agreement with a reduction in mining activities during hunting season, and underlines the importance of this measure to reduce impacts to traditional hunting periods. The Committee is satisfied that the Proponent believes it is crucial for the Proponent to determine, in collaboration with the tallymen and community, the appropriate dates and length of the period of reduction in mining activities. The Committee is satisfied that the Proponent consulted with land users to make certain that the mitigation measure meets the objective of limiting the impact of mining activities during culturally important periods such as goose and moose hunting so that land users can continue their traditional hunting and gathering activities and access their territory with a sense of safety during their travels.

The Proponent has proposed several mitigation measures to protect the nearby waterbodies from contamination and the fish populations. More specifically, creek CE5 is a valued fishing area and land users are concerned about fish habitat. Vibrations could be a concern. Creek CE5 has potential fish spawning grounds. The criteria for vibration levels in a spawning ground during the period when eggs are incubating is 13 mm/s. The estimated vibration level calculated in the pit location closest to Creek CE5 is 3.9 mm/s, which is compliant. According to the Proponent, there is no anticipated change in habitat function. The Committee notes that the Proponent took care to design the infrastructure in such a way that there would be minimal impact on CE5. The Proponent also plans to develop a compensation Project for the loss of fish habitat (in compliance with the *Act respecting the conservation and development of wildlife*). Monitoring of fish would be done as part of the Metal and Diamond Mining Effluent Regulations under the *Fisheries Act*. They will monitor the fish population, the benthic invertebrate community, and the fish tissue.

The arrival of a large number of workers to the territory could put pressure on hunting and fishing activities. However, with the prohibition of hunting and recreational fishing by mine site workers, this impact should be limited. Although, the Proponent has proposed many mitigation measures to reduce the potential contamination of the environment and would have monitoring programs for wildlife and valued species, the perception of the contamination of the environment might still remain. Cree land users may still avoid certain species at a certain radius around the mine site. It would be important for the Proponent to have constant communication with Cree communities and land users and to include them in monitoring programs.

The Committee notes that the issues the mine will cause for Cree hunting, fishing and trapping practices could further exacerbate the impacts already being felt by the communities because of climate change. Climate change is causing changes to the range and distribution of certain species, which is having effects on traditional harvesting practices and the availability of fauna on specific traplines. However, the Committee is satisfied that the measures to be put in place by the Proponent will mitigate these cumulative impacts as much as possible.

8.3.5 Plants and Berry Picking

Description of the Cree value

This value refers to the quality of the experience on the territory and access to resources in sufficient quantity and quality by members of Cree Nations during their medicinal plants and berry picking activities.

Perspectives of the Cree Nations

Cree Nation of Eastmain

Members of the Cree Nation of Eastmain stated that they were concerned about the potential contamination of traditional foods caused by the Project, including plants and berries. For example, dust emissions could impact harvesting areas. The members of the community wondered how the Proponent would manage dust. They questioned whether the Project site would still be contaminated after remediation. It is of great importance that those who live off their land can continue to do so now and for generations to come.

Cree Nation of Waskaganish

Members of the Crees of the Waskaganish First Nation are concerned about the possible contamination of resources gathered and the change in land use. The Proponent must ensure that the land users' rights described under Section 24 of the JBNQ Agreement are protected.

Key Accommodation and Mitigation Measures

- Regularly spray the roads and work areas with water. If necessary, use dust suppressants on surfaces where traffic is likely to raise dust despite regular watering

- Shut down all unused electrical or mechanical equipment, including trucks waiting for a load for more than five minutes, to reduce fuel consumption and the use of engine heaters and to reduce disturbances from exhaust, smoke, dust or any other contaminant likely to come from machinery;
- Limit deforestation, soil stripping and flush cutting to the Project area;
- Implement a dust management plan to assess the effectiveness of the design and mitigation measures considered in the Proponent's modelling. This plan shall include an adaptive mitigation management program, including a framework for implementing additional mitigation measures that specifies when these measures would be implemented based on the results. This plan should also include criteria for determining the most appropriate times to apply dust suppressants. The dust management plan should be maintained, and updated as necessary, throughout all phases of the Project, namely based on the results of air quality monitoring and complaints received. This plan will have to be established in consultation with the Cree Nations concerned, the Government of the Cree Nation, the RE-02 trapline tallyman, those in charge of the truck stop at kilometre 381 and the relevant authorities. This plan will have to be filed with the Board of Health and Social Services of James Bay and the relevant authorities three months before the start of the construction phase;
- Follow-up on the effectiveness of the rehabilitation of areas disturbed by the Project five years after rehabilitation. In particular, the Proponent should check soil stability and the growth and diversification of the plant species used for revegetation.

Analysis of the Joint Assessment Committee

Both communities consulted had similar concerns about plants and berry picking. The concerns were mainly related to contamination (e.g., dust emissions) of valued harvesting areas and land use change. Dust emissions would lead to avoidance of certain harvesting areas. This could lead to changes in the way future generations harvest and a reduction in the land available for harvesting plants.

As mentioned in Section 8.3.1, the Proponent is also committed to developing a monitoring program for the quality of plants used by the Cree community as traditional food. The objective of this program is to record any changes in the chemical composition of the main foods used by land users. The program will be developed in collaboration with land users to adequately target species to be monitored.

The Proponent mentions that according to the affected tallymen, the main use of local flora consists of gathering blueberries and mushrooms. Although individuals of the affected species of plants of interest for land users will be lost, the Proponent notes that these species are abundant in the local area and will remain present around the Project site throughout the Project. The Committee is satisfied that the loss of individual plants will not seriously impact the ability of land users to harvest these species, given their abundance. However, the Committee questions whether land users will continue to harvest plants near the mine site, due to fear of contamination. The communication plan, monitoring programs and dust reduction measures that are planned will help mitigate this impact.

Overall, the Committee believes that with the mitigation measures the Proponent has committed to, the impacts should be reduced. However, unavoidable residual impacts will remain, as will the perception of potential contamination of areas within a certain distance from the mine site.

8.3.6 Cultural and Physical Heritage

Description of the Cree value

This value refers to the access to culturally important places, landscapes, objects, or archeological sites that are profoundly related to the relationship that a Cree community has to spirituality, traditions, customs, or history.

Perspectives of the Cree Nations

Cree Nation of Eastmain

A member of the Cree Nation of Eastmain stated that the Proponent and the Cree should hold a ceremony before construction begins to show respect for Mother Earth. They expressed that this is part of the Crees' ancestral ways, rites of passage, and connection to the spirit world.

The RE02 tallyman indicated that a small mountain is located right where the future pit will be. This mountain is culturally important to their family and is a landmark. It will disappear with the construction of the mine. Members of the community voiced that the waste rock piles would change the appearance of the landscape and wondered if it would be possible to use the waste rock to fill the pit.

Cree Nation of Waskaganish

Members from the Cree Nation of Waskaganish stated that they wanted to make certain that traditional knowledge is considered in environmental monitoring and, in particular in assessing impacts on caribou.

Key Accommodation and Mitigation Measures

- Provide training to workers on the identification of any archaeological or cultural remains that may be discovered in the designated Project area. The training must be provided by a qualified person. The Proponent must document worker participation in the training.
- Develop a glossary of Cree place names that identifies, in the Cree language, geographic locations within the Project area, in consultation with the Cree Nation of Eastmain and the Cree Nation Government's Social and Cultural Development Department.

If artifacts are found :

- immediately halt work at the location of the discovery;
- delineate an area of at least 30 metres around the discovery as a no-work zone. The no-work requirement does not apply to actions required to protect the integrity of the discovery;

- notify the following stakeholders in a timely manner of any archaeological discoveries or the undertaking of work of an archaeological nature:
    - the RE02 tallyman;
    - the Band Council of the Cree Nation of Eastmain;
    - the Cree Nation Government;
    - the Aanischaaukamikw Cree Cultural Institute; and
    - the Ministère de la Culture et des Communications du Québec.
- have the site of the discovery evaluated by a qualified person as required by Quebec's *Cultural Heritage Act* to determine the extent of the work required (e.g., excavation) to safeguard the archaeological discoveries;
- offer the RE02 tallyman and any other stakeholder identified for this purpose by the Cree Nation Government the opportunity to oversee work of an archaeological nature; and
- ffter consultation with the Cree Nation of Eastmain, the Aanischaaukamikw Cree Cultural Institute and the competent authorities, comply with all legislative requirements regarding the discovery, recording, transfer, and safeguarding of structures, sites, or things of historical, archaeological, paleontological,l or architectural significance. Additional measures may be taken in light of these consultations, such as holding a commemorative ceremony.

Other Accommodation and Mitigation Measures

- Round the top of waste rock stockpiles and integrate them into the landscape.
- At the request of and in collaboration with the Council of the Eastmain Nation, a ceremony of gratitude for Mother Nature will be held at the future mine site before construction begins.

Analysis of the Joint Assessment Committee

The Cree Nations consulted expressed concerns about whether the land, important cultural sites, and their traditional knowledge would be protected. The Proponent has proposed to work with the Cree Nation of Eastmain to conduct a ceremony of gratitude to Mother Nature before construction begins. Several mitigation measures related to archaeological sites and the visual aspect of the Project will help protect and preserve Cree culture. One of the proposed measures is the landscaping of the waste rock stockpiles (which will remain after restoration) to better integrate them into the natural landscape. An archaeological potential study (Arkéos, 2019) was also done by the Proponent to identify areas with archaeological potential. From this study, it was recommended that a team of archaeologists conduct a pre-work archaeological inventory within the potential areas likely to be affected by the Project. This archaeological inventory was done in July 2021. The sites visited were those identified in the archaeological potential study (Arkéos, 2019) that would be affected by the mine Project. They were chosen based on the presence of known ancient occupations, topography, hydrography, sedimentology and interviews with Crees who have inhabited the territory for generations. No archaeological evidence was revealed during the inventory. The Proponent has stated that during the life of the Project, in the event that an artifact is discovered, the tallyman, the Cree Nation of Eastmain and the Social and Cultural Development Department of the Cree Nation Government would be notified.

The archaeologist from the Aanischaaukamikw Cree Cultural Institute does not believe that the Proponent's consultation was sufficient when evaluating the archaeological potential of the site. They stated that the Proponent should have consulted more land users and elders, from other communities across Eeyou Istchee, to ensure that there were no culturally important sites in the mine area. The Committee agrees with the assessment of the archaeologist. However, the Committee believes that the mitigation measures put in place are nevertheless adequate to mitigate potential impacts to the cultural heritage of the site.

The Proponent would like to use overburden and waste rock for road construction. In addition, some of the waste rock would be used to refill the pit, as suggested by members of the Cree Nation of Eastmain. The rest of the pit would refill naturally over a 180-year period through rainfall and groundwater, as estimated in the Proponent's hydrogeological studies. Concerns were raised by ECCC and Cree Nation Government experts regarding the potential for leaching if waste rock is used as road construction materials. Additional measures were put in place to alleviate this concern. The Committee is satisfied that these measures will prevent potential contamination resulting from using the waste rock for site infrastructure.

Key Cree members from the community of Eastmain, as well as the RE02 tallyman would sit on the mine's monitoring committee to ensure that traditional Cree knowledge is incorporated into monitoring activities. The tallyman of RE02 will be consulted on the restoration plan and the future configuration of the site. A separate wildlife monitoring committee and a joint caribou working group would also be formed, with Cree members and land users from nearby traplines.

8.3.7 Waterbodies, Wetlands and Vegetation

Description of the Cree value

This value refers to the ecological value and services provided by the water bodies, wetlands and vegetation to maintain habitats of quality for species of interest, especially fish, beaver, geese, partridge, bears, caribou, muskrat and moose. It also refers to the acknowledgment of the diverse uses of water bodies and wetland components for cultural purposes (i.e., navigable waterways, places to store food during winter, etc.).

Perspectives of the Cree Nations

Cree Nation of Eastmain

Water is a key element of concern for the Cree Nation of Eastmain. It is a highly valued component. The streams near the Project flow into the Eastmain River. The community fears that in the event of contamination, there could be significant social and environmental impacts expected near the river and on the territory. The Project could result in potential degradation of aquatic environments such as wetlands, rivers, and lakes, which in turn would affect the fauna that live there (i.e., fish, amphibians, aquatic mammals, waterfowl, etc.).

Another valued component is the size and quality of mammalian habitat. The mine project would require deforestation and would result in loss and fragmentation of habitat for species of significant cultural value such as moose, wolf, caribou, bear, and beaver.

Community members would like to know how the Proponent plans to monitor the return of fauna and flora and the contamination of the site after the end of the mine's life.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish expressed that the community would be concerned if the final mine effluent flowed into the Waskaganish territory. Deforestation is also a concern, as are the plant species selected for reforestation during the site's rehabilitation. A community member recommends to plant species native to the area (e.g., coniferous species) or that were present before the mine was built.

Key Accommodation and Mitigation Measures

- Development and implementation of a compensation plan for wetland or water loss related to the Project, in collaboration with the Cree Nation of Eastmain, the Cree Nation Government and the relevant authorities. As part of this plan, the Proponent is encouraged to identify research or compensation projects with a view to contributing to or collaborating on them. The detailed compensation plan must:
    - be based on the Operational Framework for Use of Conservation Allowances (Environment Canada, 2012) and be implemented before wetland loss occurs;
    - demonstrate clearly how it will meet the objective of reducing wetland function losses, specifying the functions that will be compensated and the post-compensation loss balance;
    - identify and justify the performance indicators that will assess the success of the compensation measure and establish additional measures that could be implemented if the performance indicators are not met;
    - demonstrate that the compensation will be sustainable over time; and
    - be submitted to the Cree Nation Government and the appropriate authorities as soon as possible for review and comment, and before the start of construction.
- Stabilize or protect the exposed surfaces continuously as soon as possible to reduce transport of SPM and limit leaching of materials to the watercourses.
- During work carried out in watercourse crossing areas, do deforestation immediately before construction to minimize erosion.
- Deploy a network of wells on the periphery of the mining infrastructure to measure the groundwater level in the pit sector.
- Limit transport of fine particles in water environments beyond the immediate work area by an effective means, such as a sediment trap, a sediment barrier, or a containment curtain.
- Maintain a riparian buffer strip 10 to 15 metres wide, depending on the slope of the embankment, around wetlands, bodies of water, and watercourses,
- Implement a mine water management program to comply with the standards of the MDMER, the *Fisheries Act* and Quebec *Directive 019 pertaining to the mining industry* (MDDEP, 2012). This program includes, in particular:
    - the creation of temporary and permanent sedimentation ponds effective from the construction phase to minimize SPM releases:
    - the development of a pond with an impermeable lining to collect the wash water from the concrete plants;

- the addition of a clay layer of sufficient thickness at the bottom of the north water management pod to comply with the percolation flow established in Directive 019;
- digging ditches surrounding the mining infrastructure, so as to collect the drainage and runoff water from the site and channel it to the north water management pond;
- the deployment of a function water treatment plant effective from the start of the construction work, for the entire lifecycle of the mine. This plant will treat:
  - during the construction phase, the water from the concrete plant, the waste rock extraction area, and the explosives plant;and
  - during the operating phase, the mine water accumulating in the north water management pond, including the pit dewatering water and the runoff water from the waste rock and tailings pile, the overburden pile, the industrial sector, and the haulage roads. The final mine effluent will be released into Stream CE2;
- the capture of runoff water from outside the activity areas by ditches dug around the mine site's components, followed by release into the environment, to prevent this water from coming into contact with contamination sources; and
- Continuous treatment of the effluent at the water treatment plant during operation and the subsequent phases of the Project (restoration and post-restoration) as long as there will be final effluent. Provide for the necessary adjustment to optimize treatment in case of exceedances of the monitored parameters.

- Maintain drainage conditions in wetlands adjacent to the work areas, including the construction of a clay berm along stripped areas to prevent drainage of peatlands around infrastructure.
- Prepare and implement an offsetting plan to counterbalance the Project's residual effects on fish and fish habitat. This plan will have to be produced in collaboration with the Cree stakeholders and be approved by DFO. It will have to account for the requirements of the *Fisheries Act*, the MDMER, the Quebec *Act respecting the conservation and development of wildlife* and the Lignes directrices pour la conservation des habitats fauniques (Wildlife habitat conservation guidelines).
- The Committee recommends the implementation of a wetland monitoring program at and near the mine site to:
  - document the actual direct and indirect effects of the Project on wetlands, such as the impact of hydrological changes caused by pit dewatering and drainage ditches on plant communities and maintenance of ecological functions;
  - verify the accuracy of the environmental assessment predictions;
  - assess the effectiveness of mitigation measures and compensation projects;
  - propose adaptive management measures, if existing measures are not adequate to avoid, reduce and control effects on wetlands; and
  - this monitoring program must be submitted as soon as possible to the Agency, the Cree Nation Government, and the relevant authorities for comment, in order to review the objectives, methodology, performance indicators, and duration required to adequately assess the effectiveness of the mitigation measures that have been implemented for the wetlands.
- Work with the tallyman of trapline RE02 to perform a beaver inventory before the Project starts and in watercourse CE2 once a year thereafter for the life of the Project. Inspect the beaver dams at

regular intervals to identify any changes in the flow and water level of watercourse CE2, and inform the Cree Nation of Eastmain of those changes.

Analysis of the Joint Assessment Committee

Water is a valued component for the Crees. The waterbodies and wetlands are used for cultural purposes and are the habitat for many species. The Project could have lasting impacts on waterbodies and wetlands through degradation, deforestation, and contamination. According to Fisheries and Oceans Canada, the Project would cause a loss of at least 1.2 hectares of fish habitat. ECCC estimates that the Project would cause a loss of 304.71 hectares of wetlands. According to Nicole Fenton, Professor of the NSERC-UQAT Industrial Chair on Northern Biodiversity in a Mining Context, the proposed mine would be located in one of the most disturbed areas in the James Bay Eeyou Istchee Territory, which justifies documenting the Project's contribution to cumulative effects on wetlands (N. Fenton, personal communication, December 2021). The Proponent has proposed several mitigation measures to reduce the risk of contamination and to compensate habitat loss, such as a wetland and fish habitat compensation projects. The Committee is satisfied that the Proponent's mitigation measures as well as the compensation programs required by provincial and federal regulations will respond to the concerns expressed by the Cree Nations.

Creek CE5 is a valued area for traditional activities. The Proponent states that this creek would be encroached upon by Project infrastructure. However, the area should only be reduced by 1% and the typical water flow should only decrease by 1 to 3%. According to the Proponent, navigation along this creek should not be affected. They state that dewatering of the pit would have a small impact and lower water flow in the upstream portions of creeks CE3 and CE4 and to a lesser extent in creeks CE2 and CE5. According to Transport Canada, navigation on two watercourses would be impacted by the Project: creek CE-4 and Kapisikama Lake (see Land Use chapter 6.1 for more details). The Committee is satisfied that the loss of navigation will be adequately dealt with by Transport Canada during the regulatory phase of the Project. No additional mitigation measures are required to respond to the loss of navigability.

Water quality would be monitored to ensure compliance with the MDMER at the federal level, and D019 at the provincial level. The Proponent would also monitor indirect impacts to the vegetation and wetlands surrounding the infrastructure and perform an assessment of the surface area that would need to be compensated. An initial inventory would be conducted during the construction phase and monitoring will occur over 5 years during the operational phase. A wildlife monitoring program would also be implemented and would include land users and their knowledge of the territory.

After mine closure, surface water quality would be monitored for a period of 3 years after mine operation and must comply with the requirements of the Directive 019. The water treatment plant will continue to function until the surface water quality is compliant with Directive 019. Post-restoration environmental monitoring would be carried out for 5 years. Results would be made public, and a copy could be sent to the tallyman upon request. Post-restoration vegetation recovery would also be monitored over a 5 year period. The monitoring would guarantee that the site's rehabilitation activities have helped to establish adequate vegetation density to protect against erosion and that areas disturbed by mining activities are adequately revegetated and secured. The Committee is satisfied that there are sufficient monitoring measures in place

that will include collaboration with key members of the Cree communities, to make sure that restoration works are carried out in a manner that is satisfactory to Cree Nations.

8.3.8 Road Safety

Description of the Cree value

This value refers to the possibility of travelling on roads free of road traffic. Access from the road to the various hunting camps is also taken into account. It also includes the road users' feelings of safety and the risk of road accidents and potential spills that could occur in the environment.

Perspectives of the Cree Nations

Cree Nation of Eastmain

The Cree Nation of Eastmain is concerned about the impact of increased traffic. There are five potential projects proposed in the area, which raise concerns about cumulative impacts on road safety. Potential impacts of concern include road damage, accidents, changes in animal behaviour and road user safety. Land users recommend that the Proponent install speed limiters on all vehicles and increase monitoring of the Billy Diamond Highway during construction and operation of the mine. The noise could also disrupt the flight patterns and behaviour of geese during goose hunting season. Members of the Cree Nation of Eastmain propose that the Proponent have a planned shutdown during this period. Community members also raised questions about how workers would be transported to the workers' camp at the mine site.

Cree Nation of Waskaganish

Members of the Cree Nation of Waskaganish indicated that the biggest issue for their community related to the mining project is the increase in road traffic. Specifically, increased road traffic could impact animal behaviour and land user safety during goose and moose hunting seasons. Land users from the Cree Nation of Waskaganish stated that trappers regularly trap beaver along the roads to avoid flooding caused beaver dams. Increased traffic could affect roadside beaver trapping, in terms of both trapper safety and beaver presence.

Cree Nation of Waswanipi

Land users from the Cree First Nation of Waswanipi stated that signs near their camps would be helpful because some camps are hidden behind trees in certain areas. They specified that some trappers are in their camps permanently or are present most of the year. Most camps are located near the highway, for logistical reasons. Families with children often visit in the spring and fall, especially during moose and goose break, which could lead to dangerous situations given the increase in truck traffic on the Billy Diamond Highway. A participant in the Committee's consultations suggested that trucks should travel at 80 km/h or less during moose and goose breaks. Another member told the Proponent that if they reduce their speed to 80 km/h, the other trucks on the road would catch up, create a very long convoy and slow down traffic which would prevent users from passing them. Land users were also concerned about damage to their cars, as

they often have no choice but to park on the shoulder of the Billy Diamond Highway, and the trucks could potentially damage their cars. Another participant mentioned that they are most concerned about large animals, and that small animals can usually get out of the way relatively quickly. Traffic noise would also disrupt activities at the land user camps.

Key Accommodation and Mitigation Measures

- Work with the Cree Nations to develop and implement, before the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government, and the Agency and must include the following:
    - a protocol for radio communications between the drivers and the mine site;
    - monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures; and
    - the distribution of heavy truck traffic through the day and the week.
- Maintain roads on a regular, thorough and documented basis to maintain a good road surface and low silt. Documentation of road maintenance should be available for inspection as required;
- During the annual goose hunting season established in collaboration with the Cree Nation of Eastmain, plan blasting as follows:
    - reduce the number of blasting operations to one per week;
    - conduct blasting operations between 1:00 and 3:00 p.m.; and
    - where possible, conduct blasting operations on days of the week when the weather is not suitable for goose hunting.

Other Accommodation and Mitigation Measures

- Develop procedures for the proper management of truck breakdowns on the road.
- Establish a radio communication protocol between the drivers, the site and the transshipment yard.
- Conduct appropriate training of truck drivers and confirm their licences, qualifications and completion of applicable training programs. Train drivers assigned to the transport of hazardous materials on the transport of hazardous materials (TDG). Educate all drivers on the risks of using the Billy Diamond Highway, land use by Crees near the road, winter driving and night driving. The applicable number of transport hours must be respected. Conduct quarterly driver training and meetings to discuss driver safety, awareness and hot spots.
- Install running recorders in the trucks.
- Maintain a record of driver training files.

Analysis of the Joint Assessment Committee

Road safety could be an issue throughout the life of the mine that would directly impact the experience and well-being of land users, despite the mitigation measures put in place. Wildlife safety would be compromised by the increasing likelihood of collisions and wildlife could increasingly avoid the Billy Diamond Highway. The Proponent notes that caribou, like most large fauna species, are generally more active between dusk and dawn. This could indirectly affect the traditional activities of land users if wildlife moves further away from

areas where they once lived. Dust emissions from the large trucks could impact the harvesting of animals, plants and berries practised by Cree land users. The safety of land users and road users would also decrease, especially during goose and moose hunting seasons when more people are at their camps and travelling along the highway. The Committee notes that the speed limit on the Billy Diamond Highway is the responsibility of the Société de développement de la Baie James, and not the Proponent. The Committee also notes that although the Proponent mentions the use of speed limiters in their trucks, this is not listed in the mitigation measures. Therefore, the concern from the Cree First Nation of Waswanipi regarding the 80 km/h speed limit on the Billy Diamond Highway is not being adequately responded to. However, this is outside of the scope of the federal environmental assessment.

Workers from outside the region would be flown from Montreal and Abitibi region to the Eastmain airport. During the construction and operation phases, the Proponent plans to have three to four chartered flights per week, which will vary depending on the number of employees. The number of flights will also depend on where employees are from and the contract terms of individual employees (related to fly-in fly-out clauses). The Proponent mentions that they would like to hire as many local workers as possible. An electric bus service will then transport workers from the airport and to the mine where the workers' camp is located. The Committee believes that adequately implementing all the measures proposed to hire as many Cree and local workers as possible will help to reduce the impact of an increased number of chartered flights.

The Proponent will implement a traffic management plan that would include the installation of appropriate signs in specific areas. Truck drivers would undergo training on Cree use of the land. Trucks would travel during the day with minor exceptions. As part of the monitoring program for impacts on use of lands and resources for traditional purposes, the Proponent would evaluate the effectiveness of the traffic management plan and access to camps during hunting seasons. The Committee believes that although several mitigation measures will be put in place to reduce the impacts of increased road traffic, impacts will be unavoidable. In particular, there will be cumulative impacts with increased traffic from other existing and proposed mine sites on the Billy Diamond Highway. However, road transport off the Project site is only partially in the control of the Proponent. Collaboration with the Société de développement de la Baie James will be necessary to alleviate these impacts.

8.4 Conclusions of the Joint Assessment Committee

The Committee considered the concerns and input of the Cree Nations regarding the impacts of the Project on Cree rights, including the Proponent's proposed accommodation and mitigation measures. The Committee finds that the mitigation measures put in place by the Proponent and the additional ones recommended by the JAC are satisfactory to cope with the impacts on Cree rights.

9. Joint Assessment Committee Conclusions and Recommendations

In preparing this draft report, the Committee considered the Environmental Impact Statement submitted by the Proponent, its responses to requests for information, the opinions of government experts, and the comments of the Cree Nations and the public.

The environmental effects of the Project and their significance, as well as the potential for cumulative environmental effects, were determined using assessment methods and analytical tools that reflect recognized practices in the field of environmental assessment. The Committee concludes that, taking into account the application of the mitigation and follow-up measures it recommended, the Project is not likely to cause significant adverse environmental effects as defined in the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

The Committee will seek comments from the Cree Nations, government experts and the public on this draft report and potential conditions. These comments will be taken into consideration in finalizing the Environmental Assessment Report and conditions, which will then be provided to the Minister. If the Minister determines that the Project is not likely to cause significant adverse effects, the Minister will set conditions for the Project in his CEAA 2012 Decision Statement. This will require the Proponent to comply with the conditions set out by the Minister, but will not relieve the Proponent of the obligation to comply with any other federal, provincial or local legislative or statutory requirements. If the Minister determines that the Project is likely to result in significant adverse effects, the Minister will refer to the Governor in Council the question of whether these effects are justifiable in the circumstances.

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Annexes

Annex A: Assessment Criteria for Residual Environmental Effects

The Committee has developed the following assessment criteria for analysis of the significance of residual environmental effects in the context of the environmental assessment of the James Bay Lithium Mine Project (the Project). It also presents below the general definitions of the criteria, the definition of the levels for extent, duration, frequency and reversibility (Table 11), the definition of the intensity levels applicable to each of the valued components (Tables 12-18), and the grids for determination of the significance of the residual environmental effects (Tables 19-21).

General definitions of the criteria used in the assessment of the residual environmental effects on each of the valued components

Intensity: Indicates the degree of disturbance (change) to which the valued component (VC) studied would be subject. The assessment of intensity accounts for the ecological or social context of the component. The intensity can integrate the notion of the time when the effect would occur, which may refer to a phase of the component's lifecycle (migration, breeding, feeding, etc.) or a period during which a Cree Nation or population would engage in a cultural, spiritual, or recreational activity (e.g., the hunting season).

Extent: Geographic extent over which the negative effects will persist.

Duration: Time period during which the negative effects will be felt.

Frequency: Rhythm at which the negative effects will recur during a given period.

Reversibility: Probability that a VC will recover from the negative effects caused by the Project.

Significance: The significance of the negative effects is determined by the combination of the levels assigned to each of the criteria (intensity, extent, duration, frequency and reversibility) for each VC. A grid for determination of the significance of residual environmental effects on the VCs is used for this purpose and is presented below.

Table 11: Definition of the Levels of the Extent, Duration, Frequency and Reversibility, Applicable to all the Valued Components

Assessment criteria	Level	Definition
Extent	Project Area	The effects would be limited to the site of the Project.
	Local	The effects would extend beyond the site of the Project, but would be situated in the local study area. The limits of this area have been adjusted for some of the VCs selected.
	Regional	The effects would extend beyond the local study area.
Duration	Short-term or temporary	The effects would be felt over a period of less than one or two years.
	Medium-term	The effects would be felt over a period of one or two to five years.
	Long-term	The effects would be felt over a period of more than five years.
Frequency	Once	The effects would be produced once at any stage of the Project.
	Intermittent	The effects would be produced from time to time or intermittently during one or more stages of the Project.
	Continuous	The effects would be produced continuously during one or more stages of the Project.
Reversibility	Reversible	The VC would recover completely from the effects caused by the Project (return to the reference value or to another target).
	Partially reversible	The VC would recover partially from the effects caused by the Project.
	Irreversible	The VC would not recover from the effects caused by the Project.

Table 12: Wetlands

Level	Definition of levels for the intensity criterion
Low	In the case of wetlands found in "geographic areas where wetland losses or functional values require that special measures (...) be applied"[27] or wetlands designated as ecologically or socio-economically important to a region:[28] **The effects** would not limit or reduce **the ecological or socio-economic functions of wetlands.** In the case of wetlands not found in such regions: **The effects** would affect **the wetlands and changes or losses of ecological or socio-economic functions would be expected for wetlands with low ecological value**
Medium	In the case of wetlands found in "geographic areas where wetland losses or functional values require that special measures (...) be applied" or wetlands designated as ecologically or socio-economically important to a region: The effects **would affect** the wetlands, **BUT** without causing **a net loss** of ecological or socio-economic functions of wetlands. In the case of wetlands not found in such regions: The effects **would affect** the wetlands and changes or losses of ecological or socio-economic functions would be expected for wetlands with **medium ecological value.**
High	In the case of wetlands found in "geographic areas where wetland losses or functional values require that special measures (...) be applied" or wetlands designated as ecologically or socio-economically important to a region: The effects would result in a **net loss** of ecological or socio-economic functions of wetlands. In the case of wetlands not found in such regions: The effects **would affect** the wetlands and changes or losses of ecological or socio-economic functions would be expected for wetlands with **high ecological value.**

[27] Environment Canada, 1996. *Federal Policy on Wetland Conservation.* An Implementation Guide for Federal Land Managers 26 pages + appendices.
[28] Environment Canada, 1991. *Federal Policy on Wetland Conservation.* 15 pages.

Table 13: Fish and Fish Habitat

Level	Definition of levels for the intensity criterion
Low	The effects **would cause little or no hindrance** to the progress of one or more significant stages of the lifecycle of fish.
Medium	The effects **would hinder** the progress of one or more significant stages of the lifecycle of fish, **BUT without hindering maintenance** of the fish population.
High	The effects **would hinder** maintenance of the fish population.

Table 14: Migratory Birds

Level	Definition of levels for the intensity criterion
Low	The effects **would cause little or no hindrance** to the progress of one or more significant stages of the lifecycle of birds.
Medium	The effects **would hinder** the progress of one or more significant stages of the lifecycle of birds, **BUT without hindering maintenance** of the bird population.
High	The effects **would hinder** maintenance of the bird population.

Table 15: Cree Health

Level	Definition of levels for the intensity criterion
Low	The potential effects on physical health would be linked to exposure to contaminant levels clearly below the applicable standards and criteria in protection of physical health. OR The contaminant management measures and the mitigation measures would allow minimization of the residual effects on the sound environment, the quality of air, water, soil and food, or the quality of life (including the contaminants for which no thresholds exist) at contaminant levels below the applicable standards and criteria in protection of physical health. AND The potential effects on physical health would be linked to exposure to low nuisance levels (noise, vibrations, dust). The effects could be felt by a few individuals.
Medium	The contaminant management measures and the mitigation measures would allow minimization of the residual effects on the sound environment, the quality of air, water, soil and food, or the quality of life (including the contaminants for which no thresholds exist) at contaminant levels below or near the applicable standards and criteria in protection of physical health. OR The potential effects on physical health would be linked to exposure to moderate nuisance levels (noise, vibrations, dust). The effects could be felt by certain sensitive receptors.

Level	Definition of levels for the intensity criterion
High	The potential effects on physical health would be linked to exposure to contaminant levels **higher than the applicable standards and criteria** in protection of physical health. OR The potential effects on physical health would be linked to exposure to **high nuisance levels** (noise, vibrations, dust). The effects could be felt by several sensitive receptors or a significant part of the population affected. AND The **residual effects would persist** on the sound environment, the quality of air, water, soil and food, or the quality of life, despite the contaminant management measures and the mitigation measures (including the contaminants for which no thresholds exist).

Table 16: Socio-economic Conditions

Level	Definition of levels for the intensity criterion
Low	The effects would lead to few changes in engaging in any commercial or income-generating activity. The sector is not regularly frequented to engage in these activities.
Medium	The effects would lead to **changes** in engaging in any commercial or income-generating activity, **BUT** engaging in activities **would not be compromised** in sectors regularly frequented.
High	The effects would lead to **notable changes** in engaging in any commercial or income-generating activity in sectors regularly frequented, so that it would be **compromised or would no longer be possible**.

Table 17: Physical and Cultural Heritage

Level	Definition of levels for the intensity criterion
Low	The effects would make little change to the characteristics or special character of a natural or cultural heritage element or a structure, a site or a thing of historical, archaeological, paleontological or architectural importance. OR Access to or use of a natural or cultural heritage element or a structure, a site or a thing of importance would not be compromised for the users.
Medium	The effects **would lead to changes** to certain characteristics or the special character of a natural or cultural heritage element or a structure, a site or a thing of historical, archaeological, paleontological or architectural importance **BUT without compromising its integrity**. OR Access to or use of a natural or cultural heritage element or a structure, a site or a thing of importance **would be changed, BUT would not be compromised** for the users.
High	The effects would lead to the loss of characteristics or special character of a natural or cultural heritage element or a structure, a site or a thing of historical, archaeological, paleontological or architectural importance and compromising its integrity. OR The effects would prevent a natural or cultural heritage element or a structure, a site or a thing of historical, archaeological, paleontological or architectural importance by the users.

Table 18: Current Use of Lands and Ressources for Traditional Purposes by the Cree Nations

Level	Definition of levels for the intensity criterion
Low	The effects would change the conditions of traditional practices in a way that would cause few changes to the current use. OR The effects would involve few changes in behaviour, which would allow maintenance of the practice of current use, based on the preferred methods or in places valued by the users.
Medium	The effects would change the conditions of traditional practices **without compromising the current use**. OR Some behaviours would be changed, but the current use would not be compromised.
High	The effects would change the conditions of traditional practices in a way that would cause **changes that would compromise the current use**. OR The current use **would no longer be possible** according to the preferred methods **or would be compromised** in the only places conducive or available to the users or the most valued by the users.

Table 19: Grid for Determination of the Residual Environmental Effects (High Intensity)

Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance
Regional	Long-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
	Medium-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
	Short-term or temporary	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
Local	Long-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
	Medium-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	Moderate	Not significant
	Short-term or temporary	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	Moderate	Not significant
		Once	Irreversible	High	Significant
			Partially	Moderate	Not significant
			Reversible	Moderate	Not significant
Project Area	Long-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Once	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
	Medium-term	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	High	Significant
		Intermittent	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	Moderate	Significant
		Once	Irreversible	High	Significant
			Partially	Moderate	Not
			Reversible	Moderate	Not
	Short-term or temporary	Continuous	Irreversible	High	Significant
			Partially	High	Significant
			Reversible	Moderate	Not
		Intermittent	Irreversible	High	Significant
			Partially	Moderate	Not
			Reversible	Moderate	Not
		Once	Irreversible	Moderate	Not
			Partially	Moderate	Not
			Reversible	Moderate	Not

Only the residual environmental effects that have a “High” level of the effect represent a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*

Table 20: Grid for Determination of the Residual Environmental Effects (High Intensity)

Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance
Regional	Long-term	Continuous	Irreversible	High	Significant	Local	Long-term	Continuous	Irreversible	Moderate	Not significant	Project Area	Long-term	Continuous	Irreversible	Moderate	Not significant
			Partially	High	Significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
		Intermittent	Irreversible	High	Significant			Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
		Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
	Medium-term	Continuous	Irreversible	High	Significant		Medium-term	Continuous	Irreversible	Moderate	Not significant		Medium-term	Continuous	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
		Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
		Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Low	Not significant
	Short-term or temporary	Continuous	Irreversible	Moderate	Not significant		Short-term or temporary	Continuous	Irreversible	Moderate	Not significant		Short-term or temporary	Continuous	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Moderate	Not significant
		Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Moderate	Not significant
			Reversible	Moderate	Not significant				Reversible	Moderate	Not significant				Reversible	Low	Not significant
		Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant			Once	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Low	Not significant
			Reversible	Moderate	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant

Only the residual environmental effects that have a “High” level of the effect show a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*

Table 21: Grid for Determination of the Residual Environmental Effects (High Intensity)

Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance	Extent	Duration	Frequency	Reversibility/ Irreversibility	Level of the effect	Significance
Regional	Long-term	Continuous	Irreversible	Moderate	Not significant	Local	Long-term	Continuous	Irreversible	Moderate	Not significant	Project Area	Long-term	Continuous	Irreversible	Moderate	Not significant
			Partially	Moderate	Not significant				Partially	Moderate	Not significant				Partially	Low	Not significant
			Reversible	Moderate	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Low	Not significant
			Partially	Moderate	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Once	Irreversible	Moderate	Not significant			Once	Irreversible	Low	Not significant			Once	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
	Medium-term	Continuous	Irreversible	Moderate	Not significant		Medium-term	Continuous	Irreversible	Moderate	Not significant		Medium-term	Continuous	Irreversible	Low	Not significant
			Partially	Moderate	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Intermittent	Irreversible	Moderate	Not significant			Intermittent	Irreversible	Low	Not significant			Intermittent	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Once	Irreversible	Low	Not significant			Once	Irreversible	Low	Not significant			Once	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
	Short-term or temporary	Continuous	Irreversible	Moderate	Not significant		Short-term or temporary	Continuous	Irreversible	Low	Not significant		Short-term or temporary	Continuous	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Intermittent	Irreversible	Low	Not significant			Intermittent	Irreversible	Low	Not significant			Intermittent	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant
		Once	Irreversible	Low	Not significant			Once	Irreversible	Low	Not significant			Once	Irreversible	Low	Not significant
			Partially	Low	Not significant				Partially	Low	Not significant				Partially	Low	Not significant
			Reversible	Low	Not significant				Reversible	Low	Not significant				Reversible	Low	Not significant

Only the residual environmental effects that have a “High” level of the effect show a significant effect within the meaning of the *Canadian Environmental Assessment Act, 2012*.

Annex B: Assessment of Residual Adverse Environmental Effects – Summary

Table 22: Fish and Fish Habitat

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Habitat destruction and modification: • Gradual dewatering of the 1.22 hectare Kapisikama Lake due to the lowering of the groundwater table; • Modification of watershed areas and flow rates and velocities of watercourses CE2, CE3 and CE4; • Deterioration of fish habitat in watercourse CE3 over a distance of 6,800 metres; • Localized destruction of habitat in watercourse CE3 caused by the construction of a tow bridge and culvert; and • Loss of fish habitat in watercourse CE4 during low water periods for 1,500 metres downstream of the Billy-Diamond Road and habitat alteration for the next 1,100 metres. Modification of water quality: • Low risk of increased contaminant inputs to watercourse CE2 (final mine discharge point) due to proposed mine water treatment and control measures.	Intensity: Moderate – Effects would be detrimental to fish due to the expected destruction and alteration of fish habitat in Kapisikama Lake and watercourses CE3 and CE4. The Proponent plans to develop and implement a compensation plan in partnership with Fisheries and Oceans Canada and the affected Cree Nations to offset the alteration of fish functions and loss of fish habitat. Extent: Local – The effects would be limited to the local study area. Duration: Long-term Frequency: Continuous Reversibility: Irreversible effects on watercourses CE3 and CE4 and on Kapisikama Lake. Other reversible residual effects.	Not significant The residual effects of the Project would be moderate given the compensatory plan, mitigation measures and surface and groundwater quality monitoring and follow-up programs proposed by the Proponent.

Table 23: Wetlands

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
• Destruction of 304.71 hectares of wetlands to create mining infrastructure; • Isolation and progressive afforestation of some wetlands through the creation of drainage ditches and the lowering of the water table; and • Loss of ecological functions caused by the loss and disturbance of wetlands, including, but not limited to: habitat for several species of flora and fauna, climate mitigating carbon storage and regulation of water flows and levels.	Intensity: Moderate – The Project would result in the destruction of wetlands with multiple ecological functions. The Proponent has planned a compensation plant to avoid a net loss of wetland functions. Extent: Local Duration: Long-term Frequency: Continuous Reversibility: Irreversible	Not significant The Project's residual effects would be moderate given the compensation plan, the mitigation measures and the follow-up program relating to the effects of the hydrological modifications on the wetlands proposed by the Proponent.

Table 24: Migratory Birds and Birds at Risk

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
The following species, listed on Schedule 1 of the *Species at Risk Act* (SARA), are likely to frequent the study area and thus be subject to potential residual effects: Common Nighthawk, Rusty Blackbird, Short-eared Owl, Bank Swallow, Olive-sided Flycatcher, Canada Warbler, Red-necked Phalarope, and Yellow Rail. Habitat loss and degradation: • Habitat loss of 450 hectares, corresponding to the total Project footprint, i.e., 305 hectares of wetlands and 145 hectares of terrestrial areas. Some areas would be revegetated in the restoration phase.	Intensity: Moderate – Effects could affect one or more important phases of the birds' lifecycle without affecting population maintenance. Extent: Local – Disturbance would be felt beyond the Project footprint, but still within the local study area. Duration: Long-term Frequency: Continuous Reversibility: Partially reversible, possibly reversible in the very long term.	Not significant The residual effects of the Project would be moderate given the proposed mitigation measures.

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Disturbances and collisions: • Risk of disturbance from noise, light and dust from construction and operation activities; • Avoidance of the area and disturbance of certain bird species during the breeding season; and • Risks of collisions due to the presence of infrastructure and road traffic during site preparation, construction and operation. Contamination: • Risks of contamination through the use of water accumulation basins for feeding or grooming purposes.		

Table 25: Species at Risk

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Woodland Caribou: • Loss of critical habitat of 671.5 hectares, comprising 254.1 hectares of large-scale habitat and 417.5 hectares of farrowing, post-fledging and rutting habitat; • Increased risk of predation due to the presence of waste materials that attract predators; and • Risk of noise disturbance (e.g., blasting, road traffic) and increased risk of collision due to increased road traffic. Little Brown Myotis, Northern Myotis: • Loss of tree habitat (110.9 hectares) and wetlands (305 hectares) due to clearing and other related works; • Risk of mortality caused by clearing activities; and • Risk of disturbance from noise, vibration and artificial light. Noise could disturb the chiropterans' sleep, causing them to avoid the area and choose another resting place. Vibrations could lead to reduced reproductive success and lead to the abandonment of maternity wards. Light pollution could alter chiropteran movements. Wolverine: • No residual effects are expected on wolverine given the low probability of presence of this species, the extent of the territory it occupies, the small size of the Project's zone of influence and the intensity of current human occupation.	The assessment of effects for species at risk is carried out here under subsection 79(2) of SARA. Therefore, unlike the other items in the table, the committee does not conclude on the significance of residual effects under CEAA 2012.	The Project is not likely to cause adverse residual effects on Woodland Caribou, Northern Myotis, Little Brown Myotis and Wolverine given the proposed mitigation measures and follow-up programs.

Table 26: Cross Border Environnmental Effects – Greenhouse Gas (GHG) Emissions

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
• Maximum annual emissions of 18.5 kilotonnes of CO_2 equivalent during the construction; • Annual emissions of 43 kilotonnes of CO_2 equivalent during operation; • Annual emissions of 22 kilotonnes of CO_2 equivalent at closure; and • GHG sources would be from diesel combustion by mining vehicles and equipment; stationary combustion; transportation of ore and goods; transportation of employees by air and bus; use of explosives; and hydroelectricity consumption.	Low contributions of the Project's direct and indirect emissions to provincial or national emissions.	Not significant GHG emissions would not contribute significantly to provincial or national emissions.

Table 27: Indigenous Peoples – Current Use of Lands and Resources for Traditional Purposes by Cree Nations

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Resource availability: • Disruption of traditional activities directly around the site and along the Billy-Diamond Highway, including big game and goose hunting; • Avoidance of the mine area by wildlife due to blasting and heavy trucking during all phases of the Project; • Increased risk of fatal collisions for big game due to increased road traffic. Disruption of traditional activities directly adjacent to the site and along the Billy-Diamond Road, including big game and goose hunting; • Avoidance of the mine area by wildlife due to blasting and heavy trucking during all stages of the Project; • Increased risk of fatal collisions for large game due to increased road traffic; • Reduced abundance of small game around the mine site, but available elsewhere in the area; • Decreased availability of fish due to the destruction, disturbance and deterioration of certain water bodies, including Lake Kapisikama, which will be drained; • Competition for wildlife harvesting by non-indigenous workers; and • Loss of berry picking sites and perception of contamination affecting land users. Access to the territory and hunting camps: • Restricted or more difficult access to certain areas of trapline RE02, to certain bodies of water and to Cree camps along the Billy-Diamond road, particularly in connection with increased road traffic; • Loss of sites used for hunting geese, bears and other furbearers due to the establishment of a security perimeter in trapline RE02; and • Loss of navigability in watercourses CE3, CE4, CE5 and CE6. Quality of experience on the territory: • Disruption of the sense of tranquility for traditional activities due to increased nuisance (noise, vibration, dust), less easy access to camps, less safe parking along the road, and possible displacement of hunting and trapping areas due to wildlife avoidance; • Perceived increased risk of accidents due to increased heavy vehicle traffic; and • Concerns about contamination of the environment, game, fish and flora that could lead to avoidance of the sector by land users.	Intensity: Moderate – Several behaviours would be modified, but the current use by the Cree Nations would not be compromised. Extent: Local – Effects would extend beyond the Project site and would happen in the local study area. Duration: Long-term Frequency: Continuous Reversibility: Irreversible – The loss of Lake Kapisikama would be irreversible despite the implementation of a compensation plan. Wildlife, with the exception of fish in Kapisikama Lake, could eventually return to its current level of abundance once the mine is recovered and transportation activities are completed.	Not significant The residual effects of the Project would be moderate, taking into account the mitigation measures and follow-up programs put in place to verify the effectiveness of certain mitigation measures and the predictions of continued current use of lands and resources for traditional purposes.

Table 28: Cree Nation Health

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Air quality : • Potential inhalation of dust and airborne contaminants associated with activities at the mine site; and • No significant health risk to the population in the local study area according to the toxicological risk assessment, although exceedances were noted (nitrogen dioxide, total particles and crystalline silica). Availability and quality of drinking water: • Low risk of water contamination from the drinking water well at the truck stop due to the direction of groundwater flow; and • Lowering of groundwater levels as the pit is dewatered, which could limit the supply of drinking water to the truck stop. Surface water quality : • Low risk of exposure to contaminated water due to mine water treatment and proposed control measures. Sound Environment Quality : • Potential disturbance from noise from mining activities, which would be perceived at the truck stop at kilometre 381. It is expected, however, that noise levels would meet applicable standards. Traditional foodqQuality : • Negligible human health risks for the population consuming country food from an area within five kilometres of the mine site.	Intensity: Moderate – Predicted contaminant levels at sensitive receptors would be below or near applicable physical health protection standards and criteria, with the exception of nitrogen dioxide and crystalline silica. The human health toxicity risk assessment shows that the Project would not pose a significant health risk to the population that would frequent the study area. Extent: Local Duration: Long-term Frequency: Continuous Reversibility: Irreversible	Not significant The effects of the Project would be moderate given the mitigation measures and follow-up programs (e.g., air, water and country food quality) proposed by the Proponent.

Table 29: Physical and Cultural Heritage

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Archeological heritage : • During the construction phase, the ground work required to construct the mining infrastructure could result in the discovery of various archaeological remains and could damage some of the artefacts currently buried on the Project site. During the operation phase, the same risks would result from the operation of the pit, as well as the management of ore, overburden and waste rock.	Intensity: Low – The mining project would not compromise the integrity of the archaeological heritage. The archaeological inventory carried out by the Proponent did not reveal any evidence of ancient human occupation. Extent: Occasional Duration: Long-term in the event that new remains are discovered. Frequency: Intermittent if artefacts are discovered. Reversibility: Reversible if no artefacts are found.	Not significant The residual effects of the Project would be low given the proposed mitigation measures.

Table 30: Socio-economic Conditions

Potential Residual Effects	Characterization of Potential Residual Effects	Significance of Potential Residual Adverse Environmental Effects
Economic activities • Potential decrease in income from traditional activities, resulting from the Project's impacts on the current use of land and resources for traditional purposes. However, little information is currently available on this subject.	Intensity: Moderate – The Project could reduce the availability of resources, modify access to the territory, reduce the quality of the experience and alter the perception of contamination in the territory, which could modify the conditions for traditional practice. However, this would not compromise the possibility of earning an income from the traditional activities practised there. Scope: Local Duration: Long-term Frequency: Continuous Reversibility: Partially reversible	Not significant The effects of the Project would be moderate given the proposed mitigation measures and follow-up programs (e.g., air, water and country food quality).

Annex C: Key Mitigation and Monitoring Measures Identified by the Committee

The Committee identified the main mitigation and monitoring measures required to ensure that the proposed Project does not cause significant adverse environmental effects on the valued components considered in the federal environmental assessment of the Project. It took into account the mitigation measures proposed by the Proponent, the advice of government experts, as well as the comments received from the Cree Nations and the public. These mitigation and monitoring measures were used in the development of the document on potential conditions for the environmental assessment.

Table 31: Key Mitigation Measures and Monitoring Requirements for Each Valued Component

Components	Key Mitigation Measures and Monitoring Requirements

Fish and Fish Habitat	**Key Mitigation Measures**
	
	<u>Offsetting Plan</u>
	• Prepare and implement an offsetting plan to counterbalance the Project's residual effects on fish and fish habitat. This plan will have to be produced in collaboration with the Cree stakeholders and be approved by DFO. It will have to account for the requirements of the *Fisheries Act*, the Quebec *Act respecting the conservation and development of wildlife* and the Lignes directrices pour la conservation des habitats fauniques (Wildlife habitat conservation guidelines) (MFFP, 2015).
	
	<u>Water Management</u>
	• Implement a mine water management program to comply with the standards of the MDMER, the *Fisheries Act* and Quebec *Directive 019 pertaining to the mining industry* (MDDEP, 2012). This program includes, in particular:
	  ○ The creation of temporary and permanent sedimentation ponds effective from the construction phase to minimize SPM releases:
	  ○ The development of a pond with an impermeable lining to collect the wash water from the concrete plants;
	  ○ Sealing of the north water management pod to comply with the percolation flow established in Directive 019;
	  ○ Digging ditches surrounding the mining infrastructure, so as to collect the drainage and runoff water from the site and channel it to the north water management pond;

Components	Key Mitigation Measures and Monitoring Requirements
	○ The deployment of a function water treatment plant as soon as there is a final effluent to treat. Provide for the necessary adjustments of exceedances of monitored parameters. This plant will treat: • During the construction phase, the water from the concrete plant, the waste rock extraction area and the explosives plant; • During the operating phase, the mine water accumulating in the north water management pond, including the pit dewatering water and the runoff water from the waste rock and tailings pile, the overburden pile, the industrial sector and the haulage roads. The final mine effluent will be released into Stream CE2; • During the restoration and post-restoration stages, all mine water, especially that which accumulates in the pit. ○ The capture of runoff water from outside the activity areas by ditches dug around the mine site's components, followed by release into the environment, to prevent this water from coming into contact with contamination sources; • Line the ore pile and its peripheral ditch and the industrial water basin with an impermeable membrane to recover this sector's runoff water and then use this water to supply the mill. As needed, treat the water from the ore concentration process and coming from the ore pile before its release into the environment. • Construct haul roads with non-leachable materials. If non-leachable materials are not available, construct haul roads according to the recommendations outlined in the Alphard Group technical memorandum[29], Englobe's counter-expertise report and the August 4, 20227[30] multi-stakeholder report (Actions 1 to 18). Among other things, the Proponent shall comply with the following: ○ Prior to construction, identify on plans all roads constructed with waste rock, including haul roads, access roads, temporary roads and traffic roads. Include on plans roads constructed with geomembrane; ○ Include geomembrane in the design of all haul roads using waste rock except for haul roads constructed on piles or in the pit; ○ Validate, through piezometric monitoring, that groundwater flow is towards the pit prior to undertaking haul road work;

[29] Alphard Group's technical opinion, Appendix A of the document "Additional information concerning haul roads - James Bay Lithium Mine Project" available on the Canadian Impact Assessment Registry (reference number: 51) at the following link: https://www.ceaa-acee.gc.ca/050/evaluations/document/144369

[30] Minutes of the multi-party meeting with the Joint Assessment Committee (Canadian Impact Assessment Agency and Cree Nation Government) available on the Canadian Impact Assessment Registry (reference number: 58) including Englobe's counter-expertise report at the following link: https://www.iaac-aeic.gc.ca/050/evaluations/document/144874?culture=fr-CA

Components	Key Mitigation Measures and Monitoring Requirements
	◦ Implement measures to ensure that all maintenance operations in impervious ditches along towpaths are carried out without risk to the geotextile and allow for effective freeze-thaw and melt flow control; ◦ Construct the drainage sand layer with a steep drainage slope (4%) and drainage sand. If necessary, plan and implement control measures for the leaching of the drainage sand layer; ◦ Provide a quality control plan for haul road construction, including checkpoints during geomembrane installation and validation of material properties; ◦ Follow best practices in geomembrane placement by following the recommendations of Rowe (2020 and 2013); ◦ Begin placement of sand, geomembrane and mine waste rock once the first layer of soils is consolidated and postpone work if surveys show that consolidation has not yet been achieved even after 120 days; ◦ Ensuring that roads can adequately drain water and that ditches are designed to prevent overflow throughout the year; ◦ Construct haul roads with unfrozen materials and perform geomembrane installation and welding when temperatures are above 0 degrees Celsius; ◦ If haul road construction must be halted, ensure geomembrane integrity and ditch drainage to prevent groundwater contamination; ◦ Clean and maintain ditches year-round to prevent damage. To validate the effectiveness of ditch maintenance and meltwater management, assess the condition of the ditches during snowmelt each spring, identify the maintenance measures applied, establish a snowmelt water balance and identify any deficiencies; • Provide for corrective action in the event that groundwater contamination related to haul roads is detected. The Proponent shall determine the threshold level of contamination that would initiate the implementation of these measures. The source and area of the contamination shall be determined and the Proponent shall demonstrate that the remedial measures are applicable specifically to the contaminated area; • Operate the water treatment plant to produce the natural streamflow variations of Stream CE2 while accounting for the storage capacity of the north water management pond. • Deploy a network of wells on the periphery of the mining infrastructure to measure the groundwater level. • Maintain a riparian buffer strip 10 to 15 metres wide, depending on the slope of the embankment, around wetlands, bodies of water and watercourses. • Develop the temporary facilities more than 60 metres from a watercourse.

Components	Key Mitigation Measures and Monitoring Requirements
	• Install culverts or crossing structures designed to maintain the free flow of water and the free passage of fish when required. <u>Management of Materials</u> • Conduct additional kinetic tests with a representative mixture of tailings and waste rock to simulate co-disposal of tailings and waste rock before the construction phase. • Review the design criteria of all the waste rock and tailings piles, according to their potentially leachable and acid-generating character, in order to satisfy all the requirements of Directive 019. • Prepare and implement a waste rock management plan. • Prohibit the use of banded gneiss and diabase as construction materials. • Manage excavation materials according to their degree of contamination and in accordance with the requirements of the Soil Protection and Contaminated Sites Rehabilitation Policy (MDDELCC, 2017), • Dispose of the excess or unusable excavated materials with the usual precautions and in accordance with the Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (MDDELCC, 2015) and Directive 019, so as to ensure sufficient spacing between these excavated materials and the water environments. • When the contaminated excavation materials are stored temporarily, take all the necessary actions to preserve the integrity of the neighbouring soil and water and the workers' safety, particularly by depositing excavated materials in piles on a leakproof or impermeable surface, covering the piles or limiting access to these piles. • Dispose of the contaminated excavated materials according to the contaminated soil management grid of Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés (Intervention Guide – Soil Protection and Contaminated Sites Rehabilitation). If disposal of contaminated excavated materials in a pile is a possible option, the Proponent must apply for authorization to the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC) and act only after obtaining the authorization. • During the restoration phase, verify the soil quality on each side of the haulage road sections that do not have an impermeable lining so as to manage them appropriately. <u>Project Timetable</u>

Components	Key Mitigation Measures and Monitoring Requirements

	• Perform work in the water outside the sensitive period for the fish species present, by minimizing the duration of the work in an aquatic environment.
	• Carry out the development work likely to affect the hydraulicity of the watercourses outside the snowmelt period, which is from April 15 to June 15.
	
	<u>Control of Erosion and Sediment Transport</u>
	• Limit deforestation, soil stripping and cutting close to the ground in the Project area (Figure 5 of Chapter 2).
	• During work carried out in watercourse crossing areas, do deforestation immediately before construction to minimize erosion.
	• Stabilize or protect the exposed surfaces continuously as soon as possible to reduce transport of SPM and limit leaching of materials to the watercourses.
	• Limit transport of fine particles in water environments beyond the immediate work area by an effective means, such as a sediment trap, a sediment barrier or a containment curtain.
	• Install a sediment barrier to protect Stream CE3 from drainage water that would be directed there by the ditches of roads built during the first months of construction.
	• Develop a temporary bridge for machinery if crossing a watercourse is required. Deploy bridging or an ice bridge during development of a trail crossing a watercourse or a fish habitat.
	• Reclaim the banks of the watercourses disturbed by the work as soon as possible to minimize erosion and sedimentation. If it is impossible to stabilize the disturbed surfaces permanently before winter, deploy temporary protective measures.
	
	<u>Blasting</u>
	• During blasting, respect the criteria for distances and maximum loads specified in Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012) and the thresholds of the *Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters* (Wright and Hopky, 1998).
	• Manage the explosives plant so that there is no release into the environment:
	  ○ Recover the sanitary releases of the explosives plant in a sealed pit and dispose of them externally.
	  ○ Dispose of used oils and other non-recyclable release externally through an authorized company.

Components	Key Mitigation Measures and Monitoring Requirements
	○ Wash the trucks containing explosives inside the explosives plant and send the wash water to the oil separator for filtering and recycling. <u>Site Reclamation</u> • Restore the job site areas and the piles by grading the surfaces, covering them with natural soils, scarifying them or seeding them to favour the regrowth of vegetation. Stabilize the disturbed locations. The embankment slopes, the unconsolidated deposit piles and others, as the work is completed. • In the decommissioning phase, favour the creation of wetlands in the gentle slope areas adjacent to the revegetated piles of the watersheds of Streams CE2 and CE3 with the goal of limiting peak streamflows and reducing the SPM contribution to these watercourses. The Proponent must ensure that these wetlands are located so that they receive all of the runoff water from the piles without threatening the stability of their slopes. • In the decommissioning phase, maintain continuous treatment at the water treatment plant, as long as the concentrations of measured parameters exceed the applicable standards. In DFO's opinion, the mitigation measures in relation to fish and fish habitat proposed by the Proponent appear necessary and relevant to mitigate the Project's effects on this valued component. However, certain additional measures and standards seeking to avoid and mitigate the deleterious effects on fish and fish habitat could be required later by DFO, during the regulatory phase in the context of examination of the Project under the Fisheries Act, which occurs after the federal environmental assessment. ECCC also mentions that it is always difficult to do an objective assessment of the appropriateness and effectiveness of the measures provided to preserve surface and groundwater quality. In fact, their effectiveness will be demonstrated only at the time of their application on the job site. Consequently, ECCC considers that the rigorous deployment of all the mitigation measures enumerated or discussed above, together with the monitoring and follow-up program presented below, would make it possible to confirm the importance of the effects and take corrective actions, if necessary. **Monitoring Requirements** • A follow-up to assess the effectiveness of all the elements of the fish habitat offsetting plan, ensure the achievement of the offsetting objectives set and deploy corrective actions adapted to the results of the follow-up. This program will have to be improved in the event that the follow-up demonstrates that the Project leads to greater residual effects than anticipated. • A follow-up of water quality at the final mine release point to comply with the Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012), particularly by conducting sublethal toxicity tests and measuring the SPM concentrations and indicator metals, including lithium. The results, in particular, must be compared with the environmental release objectives defined by the MELCC and tend toward them. The environmental release objectives account for human health and seek to protect fish farming resources for future generations. The MELCC also has surface water quality criteria for lithium to ensure protection of aquatic life (and chronic effects).

Components	Key Mitigation Measures and Monitoring Requirements

	• Follow-up of surface water quality with sampling stations in the natural environment, non-exhaustively considering the following elements:
	  ◦ The water samples must be collected around the effluent inlet point at the final release point (Stream CE2), in the baseline areas and in the areas selected in the context of biological follow-up, with at least one sampling point in each of Streams CE1 to CE5, and in Lac Asiyan Akwakwatipusich and the “nameless” located in the north of the LSA. The follow-up in these two lakes should allow demonstration of the level of risk of deposition of airborne particulate matter during the construction and operating phases.
	  ◦ The Proponent must ensure that the runoff water reaching Stream CE3 is not charged with particles coming from erosion of the accumulation areas.
	• Follow-up of the quality of the water that will accumulate in the pit during the post-restoration phase.
	• Follow-up of groundwater quality, as specified in Quebec Directive 019 pertaining to the mining industry (MDDEP, 2012). A network of monitoring wells must be deployed around facilities that risk affecting groundwater quality. This network must include a sufficient number of monitoring wells, spatially well located, upstream and downstream of each facility at risk, including the haulage road sections located outside the piles and an additional observation well, southwest of PO29-2021. During the operating phase, follow-up must also be carried out for the haulage road sections without an impermeable lining. Follow-up must be done at a seasonal frequency and measures must be provided in case of eventual groundwater contamination, such as a drainage trench, a pumping well or an investigation by the dipole method and repair work.
	• Follow-up of the streamflows and water levels at critical control points of Streams CE2, CE3 and CE4 to validate the accuracy of the models that made it possible to estimate the changes to the hydrological regime engendered by the Project, verify the accuracy of the environmental assessment and judge the effectiveness of the mitigation measures. The follow-up must be carried out effective from the construction phase and continue until at least three years after the end of the restoration activities. This program must be prepared and presented to the authorities responsible for examination and comments so that it is finalized before the beginning of the work. The follow-up program must specify at least:
	  ◦ The location of the measuring sites, the frequency of measurements and the duration of follow-up.
	  ◦ The methodology, the content and the frequency of the reports.
	  ◦ The intervention thresholds, including the type of streamflows used for these thresholds, and the adaptive measures, does not result in adverse effects on fish or fish habitat, in case of non-compliance with these thresholds.
	• Follow-up of the physicochemical quality of the sediments during the operating phase, in compliance with the indications of the *Guide de caractérisation physico-chimique de l’état initial du milieu aquatique avant l’implantation d’un Project industriel* (Guide to physicochemical characterization of the initial

Components	Key Mitigation Measures and Monitoring Requirements
	state of the aquatic environment before implementation of an industrial project). The Proponent must do this follow-up at the same stations as for follow-up of surface water quality. • Monitoring of the geochemical behaviour of the tailings and waste rock under conditions representative of reality in order to make changes, as the case may be. These follow-ups should also allow validation or modification of the restoration concept during the operating phase.
Wetlands	**Key Mitigation Measures** • Avoidance of work in wetlands, whenever possible. If work were to take place in the wetlands, the required mitigation measures would be put in place and the loss of functions would be compensated. • Development and implementation of a compensation plan for wetland or water loss related to the Project, in collaboration with the Cree Nation of Eastmain, the Cree Nation Government and the relevant authorities. As part of this plan, the Proponent is encouraged to identify research or compensation projects with a view to contributing to or collaborating on them. The detailed compensation plan must: ◦ Be based on the Operational Framework for Use of Conservation Allowances (Environment Canada, 2012) and be implemented before wetland loss occurs; ◦ Demonstrate clearly how it will meet the objective of reducing wetland function losses, specifying the functions that will be compensated and the post-compensation loss balance; ◦ Identify and justify the performance indicators that will assess the success of the compensation measure and establish additional measures that could be implemented if the performance indicators are not met; ◦ Demonstrate that the compensation will be sustainable over time; ◦ Be submitted to the Cree Nation Government and the appropriate authorities as soon as possible for review and comment, and before the start of construction. • Apply measures to limit erosion and leaching of materials. • Maintain drainage conditions in wetlands adjacent to the work areas, including the construction of a clay berm along stripped areas to prevent drainage of peatlands around infrastructure. • Prevent the introduction of invasive alien plant species into the Project study area by cleaning construction equipment prior to arrival at the mine site to ensure that it is free of mud, animals, or plant fragments.

Components	Key Mitigation Measures and Monitoring Requirements
	• Delineate areas containing invasive alien species to ensure land management without risk of spread. • Clean up any vehicles and machinery that have driven through an area containing invasive alien species. In addition, compliance with the key measures identified in the other chapters of this report would minimize effects on other environmental components affected by the Project that could impact wetlands. Adjustments to the mitigation measures could be made where appropriate to minimize adverse environmental effects. **Monitoring Requirements** • Document the actual direct and indirect effects of the Project on wetlands, such as the impact of hydrological changes caused by pit dewatering and drainage ditches on plant communities and maintenance of ecological functions; • Verify the accuracy of the environmental assessment predictions; • Assess the effectiveness of mitigation measures and compensation projects; • Propose adaptive management measures, if existing measures are not adequate to avoid, reduce and control effects on wetlands. This monitoring program must be submitted as soon as possible to the Agency, the Cree Nation Government and the relevant authorities for comment, in order to review the objectives, methodology, performance indicators and duration required to adequately assess the effectiveness of the mitigation measures that have been implemented for the wetlands. In addition, the Proponent must follow up on the project-related wetland loss compensation plan, allowing corrective action to be taken as appropriate. This monitoring should be carried out for at least five years following the implementation of the plan to ensure that wetlands have recovered their functions and that these are maintained over time. During all phases of the Project, the Proponent must verify annually whether invasive alien species have established themselves in the Project area and surrounding wetlands. This monitoring must be done at least once more after the mine has been restored.
Migratory Birds and Birds at Risk	**Key Mitigation Measures** • Carry out the Project, including vegetation clearing and blasting, in a manner that protects migratory birds and birds at risk and avoids injuring, killing, or disturbing them, or destroying, disturbing, or taking their nests or eggs. It is important that measures be deployed to avoid the adverse effects on birds, their nests and their eggs during all the Project phases, and more specifically for the period from the end of April to mid-August. Implement the measures

Components	Key Mitigation Measures and Monitoring Requirements
	that comply with the *Migratory Birds Convention Act, 1994*, the *Migratory Birds Regulations*, and SARA; In this regard, account for the ECCC Guidelines to reduce risk to migratory birds. In doing so: ◦ Whenever possible, conduct any activity likely to impair nesting of migratory birds and species at risk, including deforestation, outside the nesting periods, usually extending from the end of April to mid-August; ◦ Determine the dates of the nesting period on the basis of the best information available for any year during which activities associated with each stage of the Project could impair nesting of migratory birds and birds at risk. It should be noted that, when the dates of the nesting period apply to a large territory, it is possible that the local nesting period differs from the dates selected due to microclimate conditions specific to certain places or interannual climate variations (e.g., early spring, cold and rainy summer); ◦ If deforestation work must be done during the nesting period, do not do active searches for nests, except if they are easy to identify. To determine if migratory birds make their nests in an area at a specific time, use non-intrusive monitoring methods, such as listening stations, to avoid disturbing the birds during nesting; ◦ If nests are found in the work area, implement protective measures around the nest until nesting has ended. Develop these measures in advance in consultation with ECCC, the Cree Nation Government, the Cree Nation of Eastmain and the tallyman of trapline RE02. Present these measures to the Agency and the Cree Nation Government before implementing them. ◦ Do not frighten the birds, even before the beginning of the nesting period, which would result in the risk of harmful effects on migratory birds and birds at risk. • Delineate, prior to the commencement of clearing, the areas to be cleared, including along roads, and do not undertake clearing outside these areas unless necessary for health and safety reasons. • Apply noise and light reduction measures to minimize disturbances for migratory birds and birds at risk. The effectiveness of these measures must be presented annually to the Cree Nation Government, the Cree Nation of Eastmain and the tallyman of trapline RE02 and they must be adjusted as needed. • Implement measures to avoid the use of water management ponds for migratory birds and birds at risk. • Implement measures to avoid the use of borrow pits by the Bank Swallow. These measures must be consistent with the recommendations formulated in the document Bank swallow (*Riparia riparia*) in sandpits and quarries (ECCC, 2021a). • Gradually rehabilitate the components of the Project to revegetate the cleared areas and thus create a suitable habitat for migratory birds.

Components	Key Mitigation Measures and Monitoring Requirements
	• Gradually restore the environment at the end of the work, as the disturbed areas are no longer used. Prefer the creation of favourable habitats for species at risk present or potentially present in the Project area, at the time of restoration. • Include a component on protection of avian fauna in the training of employees. In particular, this must sensitize employees to the presence of migratory bird nests and the measures to be implemented in the event a nest is discovered. The training must also sensitize employees to report any use of water management ponds by avian fauna to the environment manager. **Monitoring Requirements** • Develop and present to the Agency, the Cree Nation Government and ECCC a detailed general follow-up program for migratory birds and birds at risk before the beginning of the construction work, considering the knowledge of the users of the territory. This follow-up program must apply to all the phases of the Project. Before the performance of the work, inventories could be necessary to establish appropriate and up-to-date baseline values, because the last inventory was conducted in 2017. This program, in particular, must: ◦ Identify the birds present on the periphery of the deforested area and in the restored habitats, indicating the density, the abundance and the location of these birds. All the bird species seen and heard during inventories must be listed, and special attention must be given to the following special-status bird species: Common Nighthawk, Rusty Blackbird, Short-eared Owl, Bank Swallow, Olive-sided Flycatcher, Canada Warbler, Red-necked Phalarope, Yellow Rail and Hudsonian Godwit. ◦ Establish performance indicators to assess the effectiveness of the mitigation measures and determine if additional mitigation measures are required. All the types of residual effects foreseen must also be assessed and documented, including those related to collisions and mortality; ◦ Include adaptive management measures, if applicable, to mitigate any unforeseen negative environmental effect; ◦ Present the following items in the follow-up reports: methodology, Cree participation in the follow-up work, results, analysis of the results, and additional mitigation measures, if applicable. A schedule of follow-up reports must be established according to the different activities and phases of the Project. • Before the beginning of the construction work, deploy a monitoring program for activities that risk having an effect on migratory birds and birds at risk during all the phases of the Project. For each activity, determine the measures to be deployed to ensure reduction of nuisances or disturbance, particularly during the nesting period. The monitoring program shall include, non-exhaustively, the issues relating to use of water management ponds by avian fauna and use of borrow pits for Bank Swallow nesting. The program must also deal with monitoring of the work to be performed in order to ensure that it does not cause any destruction of nests or eggs of migratory birds. Account, in particular, for bird species at risk, particularly the Common Nighthawk and the Rusty

Components	Key Mitigation Measures and Monitoring Requirements
	Blackbird, whose presence has been confirmed. Periodically update the monitoring program to account for changes in the regulations, particularly the revision of the status of wild species by the COSEWIC or SARA. • Follow up the recovery of vegetation on the restored surfaces. The objective of this follow-up is to ensure that the site restoration activities have allowed the establishment of an appropriate vegetation density to protect against erosion and to ensure appropriate revegetation of the areas disturbed by mining activity. The follow-up will seek to characterize the recovery of the vegetation and the species composition in the restored areas, identify the signs of erosion and to verify the use of restored surfaces by avian fauna. The follow-ups must be conducted for five years.
Transboundary Environmental Effects – Greenhouse Gas Emissions	**Key Mitigation Measures** • With the goal of reducing greenhouse gas (GHG), nitrogen dioxide and particulate matter emissions resulting from combustion, use zero-emission equipment and vehicles. If they are unavailable, use equipment and vehicles running on diesel in accordance with the Group 4 emissions standards, or equipment and vehicles running on fuel with low carbon content, such as natural gas, propane, renewable fuel or hydrogen; • Prioritize purchasing of energy-efficient equipment and vehicles based on the best technology available on the market in terms of energy consumption, if this is technically and economically feasible; • Produce an official watch program involving monitoring of any technological advance in the energy field to reduce dependence on fossil fuel and implement the projects envisioned in the event of the supply of sufficient electric power for all of the Project's infrastructure; • Provide ecodriving training to the truck drivers transporting materials; • Do not idle engines, except in case of exceptions related to weather conditions; • Use the equipment and follow the construction and development standards, procedures and operating modes intended to achieve energy efficiency; • Establish the speed limits on the roads located within the limits of the Project's property, accounting for the recommendations of *Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities*. Require and ensure that every person observes the established speed limits, during every phase of the Project; • Whenever possible, avoid burning of felling and brush cutting residues on the work site. Prefer shredding and spreading of these residues on the work or any other use that would allow their valorization, use or recycling; • Monitor consumption of fuel and electricity. **Monitoring Requirements**

Components	Key Mitigation Measures and Monitoring Requirements
	Given the Project's low contribution to GHG emissions on the provincial and national scale, the Committee considers that follow-up is unnecessary to verify the transboundary effects of the mitigation measures. However, the Committee notes that the projected emissions would exceed the reporting threshold of 25 kilotonnes of CO_2 eq per year. Consequently, the Proponent must monitor its GHG emissions and communicate them every year to ECCC and the Quebec Government.
Species at Risk	**Key Mitigation Measures** General • Take light and noise reduction measures. The effectiveness of these measures must be reported annually to the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02. The measures are to be adjusted as needed. Woodland Caribou • Set up a joint working group with the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation to discuss the monitoring to be performed for caribou. The frequency of the meetings will be determined with the participants. • Limit deforestation, soil stripping and close-cut clearing to the Project area (Figure 5 of Chapter 2). • Implement a communication system for employees and subcontractors, including truck drivers, to promptly report the presence or signs of caribou in the Project's zone of influence (500 m around the mine footprint) and on the ore transportation route. All observations must be reported to the operations manager and the environmental manager. • Work with the Cree Nations to develop and implement, prior to the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government and the Agency and must include the following: • A protocol for radio communications between the drivers and the mine site; ◦ Monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures; ◦ The distribution of heavy truck traffic through the day and the week. • In cooperation with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02, implement an action plan in the event caribou are observed near the mine or on the ore transportation route. The action plan, whose effectiveness depends on the rapid detection of individuals, is intended to reduce the risk of disturbance to caribou. It must include procedures to be followed if caribou or signs of the presence of caribou are detected within a 4 km radius of the mine site, and mitigation measures to be implemented based on the most likely scenarios, including the risk of collision on the

Components	Key Mitigation Measures and Monitoring Requirements
	ore transportation route. Before the action plan is implemented, the Proponent must consult the Cree Nation Government, the affected Cree Nations, the Agency and the appropriate authorities, including ECCC, to ensure that it is executed optimally, with the aim of protecting individuals of the species. • Transport the ore in a convoy of at least two trucks if caribou are present in the Project's zone of influence. • Develop and present a training module to educate employees and subcontractors regarding the precarious situation of the species and how to identify any sign of caribou presence. The module should also explain the existing communication system and action plan in the event caribou are observed, and the importance of reporting any caribou sightings in the mine's zone of influence or on the ore transportation route. • Educate workers not to feed animals or leave food lying around to avoid attracting wildlife near work areas. • Limit wildlife access to food waste by installing a composter and bear-proof lids on garbage cans. • Revegetate the mine site and the roads running through it during the decommissioning phase. Rehabilitation of the site should be gradual, as disturbed areas are no longer used, with a focus on creating habitats suitable for species at risk, including Woodland Caribou. <u>Northern Myotis and Little Brown Myotis</u> • Perform clearing operations outside chiropterans' breeding season, whenever possible, to avoid injuring, killing or disturbing these species. • If clearing has to be done during chiropterans' breeding season for technical or economic reasons, have an expert conduct a survey beforehand in order to verify the presence of maternity or resting places for males in natural sites. If necessary, a protection zone must be set up and no deforestation must be carried out within this zone during the breeding period of chiropterans. The expert must work with land users to identify areas frequented by chiropterans. • Before any building dismantling operations, have an expert conduct a survey to determine whether there are any maternity or roosting sites in the Project area. The expert must work with land users to identify areas frequented by chiropterans. • If signs of chiropteran presence are observed or maternity or roosting sites are identified, implement protective measures to ensure the animals' survival, such as installing a new shelter in a location protected from disturbance and monitoring its use and integrity annually. <u>Wolverine</u> • Establish a protocol for prompt reporting of signs of Wolverine presence. Have the protocol validated by the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02.

Components	Key Mitigation Measures and Monitoring Requirements
	Monitoring Requirements To verify the accuracy of the predicted effects on species at risk and the effectiveness of the proposed mitigation measures, the Committee recommends a follow-up program containing the following requirements: • Implement a general monitoring program for species at risk, including measures to educate land users. The program must be submitted to the Agency, the Cree Nation Government and the appropriate authorities, such as ECCC, before construction begins. In particular, the program must identify the activities that may have an effect on species at risk and, for each species, indicate what measures need to be implemented to reduce the nuisance or disturbance. The program must be updated periodically to reflect changes in regulations, including revisions to the status of wild species by the COSEWIC or in SARA. These changes may require the implementation of additional measures to mitigate the Project's effects on species affected by changes in their status. • Implement a monitoring program for Woodland Caribou in conjunction with the joint working group. The program must be presented to the Agency and the appropriate authorities before the Project begins. The program must: ◦ Include monitoring of predators' use of the site to ensure that waste is being properly managed and is not increasing predator densities significantly in the vicinity of the mine; ◦ Provide for gradual rehabilitation of areas disturbed by the Project, except for the pit. For this purpose, consult with the appropriate authorities and the tallyman of trapline RE02 to determine which species should be used for revegetation, a necessary aspect of gradual rehabilitation of areas disturbed by the Project. These plant species must support the creation of habitats suitable for species at risk such as the Woodland Caribou; ◦ Be of sufficient duration to ensure the success of reforestation and assess the value of implementing additional measures, such as control of hardwood species in recovered habitats to ensure that they are suitable for caribou as quickly as possible; ◦ Provide for the collection of Indigenous knowledge regarding caribou habitat fragmentation and the development of appropriate measures to mitigate the Project's potential effects on caribou harvesting for current and future land users; ◦ Participate in monitoring the evolution of local Woodland Caribou populations. • Starting at the construction stage, implement a monitoring program for chiropterans to estimate actual habitat losses. The program must include five-year inventories from the first year of operation to the fifth year following closure.

Components	Key Mitigation Measures and Monitoring Requirements
Current Use of Lands and Resources for Traditional Purposes by the Cree Nations	**Key Mitigation Measures** • Work with the Cree Nations to develop and implement, before the construction phase, a traffic management plan for all phases of the Project, including heavy trucking activities. The plan must be submitted to the Cree Nations, the Cree Nation Government and the Agency and must include the following: ◦ A protocol for radio communications between the drivers and the mine site; ◦ Monitoring of accidents along Billy Diamond Highway to identify any recurrence, determine the source of the problems and, if necessary, propose corrective measures; ◦ The distribution of heavy truck traffic through the day and the week. • Regular education for workers, including drivers, regarding the following: ◦ The Cree culture and the practice of traditional activities by users of the land, particularly in the vicinity of Billy Diamond Highway; ◦ The requirement to obey road safety rules; ◦ Compliance with speed limits on Billy Diamond Highway to avoid creating convoys of vehicles; ◦ The courtesy required for the safety of land users who park along the roadside to carry out their harvesting. • Work with the Cree Nations concerned, the Cree Board of Health and Social Services of James Bay (CBHSSJB) and the Cree Nation Government to develop and implement a communication plan for the mine's entire lifespan. In particular, the plan must communicate the following to the Cree Nations, the employees of the Kilometre 381 truck stop, land users and mine employees: ◦ The schedule for mine construction, operation and decommissioning activities; ◦ The blasting schedule and timetable; ◦ Incidents and complaint handling; ◦ Issues and risks associated with the operation of the mine site; ◦ The results of follow-ups, including those carried out during the recovery and post-recovery phases; ◦ Responses to Cree Nation concerns regarding traditional foods to minimize resource avoidance; ◦ The recovery plan.

Components	Key Mitigation Measures and Monitoring Requirements

	• Post the follow-up reports annually in English on a special website, and present them to the tallymen if they so desire. Hold sessions to present and explain the follow-up results to the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi once or twice a year.
	• Offer the tallymen of traplines RE02, VC33 and VC35 and Eastmain's environmental services the opportunity to participate in environmental monitoring and follow-up activities.
	• Work with the Cree Nation of Eastmain to develop a calendar specifying the annual periods for the goose and moose hunting seasons, each lasting two weeks. During these two periods, carry out Project activities as follows:
	  ◦ Reduce daily handling of waste rock by 30%;
	  ◦ Reduce concentrate trucking on Billy Diamond Highway from 12 to 10 round trips per day;
	  ◦ Carry out the trucking between 9:00 a.m. and 7:10 p.m.;
	  ◦ After these two periods, verify with the Cree Nation of Eastmain, the Cree Nation Government and the tallyman of trapline RE02 that the measures are sufficient. If changes in the mitigation measures are needed, they must be communicated to the above stakeholders and to the Agency before being implemented the following year.
	• Use blasting mats when blasting within 500 m of the truck stop and Billy Diamond Highway to control flyrock.
	• During the annual goose hunting season established in collaboration with the Cree Nation of Eastmain, plan blasting as follows:
	  ◦ Reduce the number of blasting operations to one per week;
	  ◦ Conduct blasting operations between 1:00 and 3:00 p.m.;
	  ◦ Where possible, conduct blasting operations on days of the week when the weather is not suitable for goose hunting.
	• Allow Cree workers access to traditional foods on the work site, by setting aside space in the freezer for traditional food, for example.
	• Include a clause in the employment contracts of employees, including subcontractors, to prohibit hunting, trapping and fishing on the mine site and within the mining lease. Prohibit employees from possessing firearms and hunting, trapping or fishing equipment. Include penalties for non-compliance with this prohibition in employment contracts.
	• Work with the tallyman of trapline RE02 to establish an for traditional activity exclusion zone for safety reasons.

Components	Key Mitigation Measures and Monitoring Requirements
	• Before construction begins, establish a system for receiving and handling complaints until the mine closes. The response time for complaints should be 48 hours. The Proponent will prepare a report on the nature of complaints received and how they were handled. The number and resolution of complaints received must be shared through the communication plan. The system for receiving and handling complaints could allow for the implementation of additional mitigation measures. • Hire a liaison officer from the Cree Nation of Eastmain for all phases of the Project. The officer's role will be to inform the Cree Nations of the jobs and contracts offered by the company, ensure the harmonious integration of Cree workers into the mine's workforce, educate workers regarding Cree culture and traditional stewardship of the land, communicate the Cree Nations' concerns to the company, including land users, and participate in dispute resolution. • Work with the Cree Nation of Eastmain to develop and implement a fish management plan for Lake Kapisikama before it is dewatered. • Work with the tallyman of trapline RE02 to perform a beaver inventory before the Project starts and in watercourse CE2 once a year thereafter for the life of the Project. Inspect the beaver dams at regular intervals to identify any changes in the flow and water level of watercourse CE2, and inform the Cree Nation of Eastmain of those changes. • Develop and implement a black bear management protocol to ensure that any intervention (e.g., relocation) is consistent with the land users' values and practices. Relocation must be carried out with the support of Protection de la faune du Québec. The necessary permits must be obtained in advance. • Offer to consult with the tallyman of trapline RE02 on the mine recovery plan before it is submitted to the Ministère de l'Énergie et des Ressources naturelles (MERN) for approval or before it is implemented. Offer to present the final mine recovery plan to the members of the Cree Nation of Eastmain and the tallymen of traplines VC33 and VC35 before and after its approval by the MERN so that they will be aware of the scenario selected and of the residual changes to the territory. • Retain the services of an independent third-party environmental monitor to oversee the implementation of the follow-up programs outlined in this Environmental Assessment Report. The monitor would report its findings to the Proponent, the Agency and the Cree Nation Government. **Monitoring Requirements** The Committee recommends that the Proponent develop and implement a follow-up program to verify the effectiveness of the mitigation measures and the predictions regarding the current use of land and resources for traditional purposes by the users of traplines RE02, VC33 and VC35. The follow-up would be based mainly on meetings with the tallymen of these traplines and their families to discuss the effectiveness of the measures taken. Other stakeholders could be consulted regarding follow-up on specific issues, including the tallymen of traplines RE01, RE03 and R08, the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation involved in the follow-up of traffic management and access to camps and trails. The Proponent will consult with the tallymen of the Cree First Nation of Waswanipi to discuss their involvement in this follow-up program. A baseline survey must be conducted before construction. The follow-up program would document the following:

Components	Key Mitigation Measures and Monitoring Requirements
	• The use and frequentation of the study area; • An assessment of the condition of wildlife resources; • Cree knowledge of wildlife species; • Traditional hunting, fishing, trapping and other activities; • Snowmobile routes and other modes of transportation; • Residual effects on navigability; • The frequentation and tranquility of camps and access to camps during hunting seasons; • Access to activity areas and movements; • Changes that have occurred and the perceived effects; • Evaluation of mitigation measures implemented; • The effectiveness of the traffic management plan. The Committee recommends that the frequency of this follow-up be discussed with the users of traplines RE02, VC33 and VC35 and minimally be carried out at the end of the construction phase; and one year after the mine recovery work. The results of the follow-up would be presented to the concerned Cree Nations, the Cree Nation Government, the CBHSSJB and others, as detailed in the communication plan. If, after a few follow-ups, no significant changes are observed for the users of traplines VC33 and VC35, the follow-up would be limited to the users of trapline RE02. In addition, if the Proponent determines that the mitigation measures are effective, it could consult with the above-mentioned parties to reassess how often follow-up would be required over the remaining life of the Project. If the measures are not deemed effective by the parties, adjustments to the mitigation measures could be made to minimize adverse effects on the current use of the land and resources for traditional purposes. If residual effects on these components persist, Health Canada recommends that the Proponent invest in community-based initiatives and programs, as determined by the Cree Nations, as compensation. The Committee also recommends follow-up on the effectiveness of the rehabilitation of areas disturbed by the Project five years after rehabilitation. In particular, the Proponent should check soil stability and the growth and diversification of the plant species used for revegetation.
Cree Health	**Key Mitigation Measures** <u>Air Quality</u> • Implement a dust management plan to assess the effectiveness of the design and mitigation measures considered in the Proponent's modelling. This plan shall include an adaptive mitigation management program, including a framework for implementing additional mitigation measures that specifies when these

Components	Key Mitigation Measures and Monitoring Requirements
	measures would be implemented based on the results. This plan should also include criteria for determining the most appropriate times to apply dust suppressants. The dust management plan should be maintained, and updated as necessary, throughout all phases of the Project, namely based on the results of air quality monitoring and complaints received. This plan will have to be established in consultation with the Cree Nations concerned, the Government of the Cree Nation, the RE-02 trapline tallyman, those in charge of the truck stop at kilometre 381 and the relevant authorities. This plan will have to be filed with the Board of Health and Social Services of James Bay and the relevant authorities three months before the start of the construction phase; • Regularly spray the roads and work areas with water. If necessary, use dust suppressants on surfaces where traffic is likely to raise dust despite regular watering; • Implement a road watering management program and monitor the effectiveness of planned mitigation measures. Keep a record of water application and dust suppression during site construction and operation. This will ensure that the frequency and intensity of road watering roads are adapted to weather conditions and air quality monitoring; • Use non-friable, non-clay materials and with good road abrasion resistance for road surface construction and maintenance; • Maintain roads on a regular, thorough and documented basis to maintain a good road surface and low silt. Documentation of road maintenance should be available for inspection as required; • Install, inspect daily and maintain dust collectors on drills and in the industrial complex during operations. The dust collected by these devices must be disposed of in a manner that prevents its dispersion; • Implement additional measures to prevent the dispersion of dry, fine material deposited on the surface due to drilling activities, including blasting; • Prevent wind erosion at material storage sites and during blasting. For example, avoid blasting and handling of granular materials during periods of high winds or when prevailing winds can transport dust to sensitive areas, such as the truck stop, to avoid dispersal of dust, silica and blasting gases off the mine site; • Use splash mats when blasting within 500 metres of the truck stop and the Billy-Diamond Highway to limit rock splash; • Plan and implement mitigation measures in the event that conditions are not optimal during blasting activities. The measures should minimize nitrogen dioxide emissions that can be directed to receptors near the site, such as the truck stop. The Proponent should establish specific criteria that would drive the implementation of these measures;

Components	Key Mitigation Measures and Monitoring Requirements
	• Enclose the external conveyors in the industrial area in watertight structures; • Ensure that exhaust and dust collection systems on vehicles and machinery are in good condition and operating optimally to minimize emissions of contaminants into the air; • With the goal of reducing greenhouse gas (GHG), nitrogen dioxide and particulate matter emissions resulting from combustion, use zero-emission equipment and vehicles. If not available, use diesel-powered equipment and vehicles that meet Tier 4 emission standards, or equipment and vehicles that run on low-carbon fuels such as natural gas, propane, renewable fuel or hydrogen; • Prioritize the purchase of energy-efficient equipment and vehicles based on the best available technology on the market for energy consumption, if technically and economically feasible; • Optimize the number of transport vehicle trips during the construction and operation phases (for equipment, excavated or backfilled soil, personnel, etc.) to reduce air emissions; • Shut down all unused electrical or mechanical equipment, including trucks waiting for a load for more than five minutes, to reduce fuel consumption and the use of engine heaters and to reduce disturbances from exhaust, smoke, dust or any other contaminant likely to come from machinery; • Limit the speed of vehicles on the mine site following the recommendations set out in the *Best Practices for the Reduction of Air Emissions from Construction and Demolition Acivities*. Require that all persons comply with this limit and post road signs to this effect in appropriate locations to reduce vibration and dust emissions; • Perform regular inspection and maintenance of site equipment and generators; • Inspect concentrate transport trucks and clean them when necessary, specifically: clean the underbody, tires and wheels of trucks before they enter the public highway so as not to contaminate the roadways or make them dangerous (presence of mud or other materials); • Whenever possible, avoid burning of felling and brush cutting residues on the work site. Prioritize the shredding and spreading of these residues on the work site or any other use that would allow them to be recovered, reused or recycled; • Limit deforestation, soil stripping and flush cutting to the Project area (Figure 5 in Chapter 2); • Gradually equalize the dumps as soon as possible, to minimize particulate matter emissions generated by wind erosion;

Components	Key Mitigation Measures and Monitoring Requirements
	<u>Noise Environment</u> • Comply with the noise limits imposed by Directive 019 on the mining industry and the noise standards contained in Instruction Note 98-01 on noise in Quebec; • At the construction stage, implement MELCC guidelines for noise levels from an industrial construction site; • During the operations phase, the Proponent intends to develop a tailings mound at the southern perimeter of the eastern dump, to create a screen effect between the mobile equipment circulating at the top of the dump and the truck stop. This mound would evolve according to the elevation of the dump; • Develop and implement a communication plan throughout the life of the mine, in collaboration with the Cree Nations concerned, the Cree Nation Government and the Cree Board of Health and Social Services of James Bay. This plan will include communicating the following to Cree Nations, truck stop staff, land users and mine employees: ◦ Schedule of mine construction, operation and closure activities; ◦ Blasting schedule and timetable; ◦ Incidents and complaint handling; ◦ Issues and risks associated with the operation of the mine site; ◦ Monitoring results, including those performed during the remediation and post-remediation; phases; ◦ Responses to Cree Nations concerns over traditional foods to minimize resource avoidance; ◦ Remediation plan. • Establish a system for receiving and handling complaints, before construction begins and until the mine closes, to confirm that the noise environment associated with the mine site and road transport is not causing any effects on land users. The response time for complaints should be 48 hours. The Proponent will prepare a report on the nature of the complaints received and how they were handled. The number and handling of complaints received will need to be shared through the communication plan. This complaint reception and handling system could allow for the implementation of additional mitigation measures; • Develop and implement, prior to the construction stage and in collaboration with the Cree Nations, a traffic management plan to reduce traffic noise;

Components	Key Mitigation Measures and Monitoring Requirements
	• Equip motorized equipment (trucks, loaders, dozers, backhoe loaders, etc.) with efficient mufflers that are in good condition; • Prohibit the use of engine brakes within the work area. Educate truckers to limit the use of engine braking outside the mine site, in areas where Cree camps are located and in areas where traditional activities are practised more intensely; • Regularly inspect machinery to ensure exhaust systems are in good condition to limit noise emission; • Conduct detonations within 800 metres of the truck stop in the absence of thermal inversion and carrying winds, to comply with the criterion of Mining Directive 019, i.e., 128 decibels; • Use an electronic detonator so that the number of holes exploding in the same eight milliseconds does not exceed four for an explosive charge of 175 kilograms per hole. <u>Traditional Foods</u> • Assess the human health risks associated with fish consumption if significant exceedances occur during water quality monitoring. The implementation of the key measures identified in the other chapters of this report, including those related to water quality and presented in Section 5.1 (Fish and Fish Habitat), would minimize the effects on other environmental components affected by the Project that could have an impact on Cree health. **Monitoring Requirements** <u>Air Quality</u> • Air quality monitoring program, including monitoring of total particulate matter, respirable particulate matter, fine particulate matter, nitrogen dioxide, metals (including arsenic and chromium) and crystalline silica. The monitoring program will have to be submitted to the Agency, in consultation with ECCC and other relevant authorities, before the start of the construction phase. The monitoring should: ◦ Start the program prior before the construction phase to assess temporal variability; ◦ Provide an adequate portrait of air quality in the direction of sensitive receptors, including the truck stop; ◦ Refer, where possible, to Canadian ambient air quality standards and any other relevant standards or criteria based on human health effects, in addition to determining compliance of mining operations with MELCC's Quebec air quality standards and criteria;

Components	Key Mitigation Measures and Monitoring Requirements
	◦ Allow measurements to be taken at an air and meteorological measurement station on the mine site; ◦ Verify the Proponent's conclusions regarding the impacts on air quality during the construction and operation phases; ◦ If necessary, allow the modification or addition of mitigation measures based on the results obtained to ensure the protection of Cree health, in collaboration with the Cree Nation of Eastmain, the Cree Nation Government, the tallyman of trapline RE-02, land users and the Cree Board of Health and Social Services of James Bay; ◦ In the event that exceedances of air quality criteria are anticipated or measured, allow for the implementation of adaptive mitigation measures as outlined in the dust management plan and risk communication through the communication plan; ◦ For nitrogen dioxide and fine particulate matter, which are non-threshold substances, establish triggers resulting in the implementation of additional mitigation measures, with the aim of keeping levels as low as possible. • Air quality monitoring program during the construction and operation phases to ensure compliance with standards. This program must be developed in collaboration with the Agency, ECCC and other relevant authorities and presented to them before the start of the construction phase. <u>Noise Environment</u> • Annual sound monitoring program at the truck stop, during all phases of the Project, using sound readings. This monitoring should make it possible to compare the measured sound levels with the relevant health indicators (% HA, sleep disturbance, interference with speech), taking into account all sources of noise. This monitoring plan must be submitted to the Cree Nation Government, the Agency and the relevant authorities before the start of the construction phase. <u>Drinking Water</u> • Program to monitor the quantity and quality of water in the drinking water supply well at the truck stop. Supply drinking water to the truck stop or drill a new drinking water well if the Project renders the truck stop's drinking water well unusable. <u>Traditional Foods</u> The monitoring of traditional food presented below will, among other things, validate the conclusions of the toxicological risk assessment.

Components	Key Mitigation Measures and Monitoring Requirements
	• Program to monitor the quality of plants consumed by Cree Nations as traditional food in order to identify any changes in the chemical composition of the main foods used by Cree Nations. Monitoring must be done on an annual basis, i.e., one sampling campaign per year. This program will have to be developed in collaboration with the Cree Nations, the Cree Nation Government, the RE-02 trapline tallyman and the Cree Board of Health and Social Services of James Bay to target the species being monitored. This program must be implemented with the participation of the Cree Nation of Eastmain. The Proponent will determine the levels of baseline contaminants in traditional (plant) foods consumed by the Cree before the construction phase. A preliminary version of the program must be presented to the Cree Nations for discussion. The program will be provided prior to the commencement of construction and be to the satisfaction of Cree Nations and relevant authorities, including Health Canada and the Cree Board of Health and Social Services of James Bay; • Program to monitor the quality of game tissues consumed by Cree Nations as traditional food, to identify any changes in chemical composition. This program must include a sampling campaign every five years. This program must be developed in collaboration with the Cree Nations, the Cree Nation Government, the RE-02 trapline tallyman and the Cree Board of Health and Social Services of James Bay to target the species being monitored. This program must be implemented with the participation of the Cree Nation of Eastmain. The Proponent must establish background levels in game tissues before the construction phase. The program must be provided before the start of construction and be to the satisfaction of Cree Nations and the relevant authorities, including Health Canada and the Cree Board of Health and Social Services of James Bay; • Monitor potential sources of contamination during construction and operation to identify unanticipated sources.
Physical and Cultural Heritage	**Key Mitigation Measures** Before the start of construction: • Provide training to workers on the identification of any archaeological or cultural remains that may be discovered in the designated Project area. The training must be provided by a qualified person. The Proponent must document worker participation in the training. • Develop a glossary of Cree place names that identifies, in the Cree language, geographic locations within the Project area, in consultation with the Cree Nation of Eastmain and the Cree Nation Government's Social and Cultural Development Department. If artifacts are found: • Immediately halt work at the location of the discovery;

Components	Key Mitigation Measures and Monitoring Requirements

	• Delineate an area of at least 30 metres around the discovery as a no-work zone. The no-work requirement does not apply to actions required to protect the integrity of the discovery;
	• Notify the following stakeholders in a timely manner of any archaeological discoveries or the undertaking of work of an archaeological nature:
	  ○ The RE02 tallyman;
	  ○ The Band Council of the Cree Nation of Eastmain;
	  ○ The Cree Nation Government;
	  ○ The Aanischaaukamikw Cree Cultural Institute;
	  ○ The Ministère de la Culture et des Communications du Québec.
	• Have the site of the discovery evaluated by a qualified person as required by Quebec's *Cultural Heritage Act* to determine the extent of the work required (e.g., excavation) to safeguard the archaeological discoveries;
	• Offer the RE02 tallyman and any other stakeholder identified for this purpose by the Cree Nation Government the opportunity to oversee work of an archaeological nature;
	• After consultation with the Cree Nation of Eastmain, the Aanischaaukamikw Cree Cultural Institute and the competent authorities, comply with all legislative requirements regarding the discovery, recording, transfer and safeguarding of structures, sites or things of historical, archaeological, paleontological or architectural significance. Additional measures may be taken in light of these consultations, such as holding a commemorative ceremony.
	
	Monitoring Requirements
	The Committee recommends the implementation of a follow-up program on physical and cultural heritage. As part of this follow-up, the Proponent must verify, before the start of construction and then every five years during operation, the state of knowledge of the users, including the history of their use of the territory.

Socio-economic Conditions	**Key Mitigation Measures** The Committee believes that the key mitigation measures recommended in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would prevent significant residual effects on users who earn income from traditional activities. The Committee does not recommend any additional measures concerning the Project's effects on the socio-economic conditions of the Cree Nations. **Monitoring Requirements**

Components	Key Mitigation Measures and Monitoring Requirements
	The Committee believes that the follow-up program recommended in Section 6.1 (Current Use of Lands and Resources for Traditional Purposes by Cree Nations) would verify the effectiveness of mitigation measures and the predictions regarding the maintenance of current land use, which is essential to the practice of traditional activities from which income and other benefits are derived. No other specific follow-up programs are recommended for this valued component.
Other Socio-economic Effects under the Agreement	**Key Mitigation Measures** • No additional mitigation measures are required. **Monitoring Requirements** • No monitoring program is required.
Accidents and Malfunctions	**Key Mitigation Measures** • Apply all reasonable measures to prevent accidents and malfunctions that could lead to adverse environmental effects. Mitigate any adverse environmental effect that could occur; • Draw up an Emergency Preparedness Plan in consultation with the Cree Nation of Eastmain, the Cree First Nation of Waskaganish, the kilometre 381 rest area managers and the competent authorities. Complete and communicate the Emergency Preparedness Plan before the construction phase. Maintain this Plan up to date throughout the Project. This Plan must include, non-exhaustively, the following points: ◦ Detail all the types of accidents and malfunctions and that all the measures to be taken for each of the scenarios envisioned, including those for the purpose of protecting the sensitive components of the environment, such as surface water, wetlands, fish, migratory birds and any other sensitive species concerned; ◦ Develop and include special response procedures, including the road network and the rest area, particularly in case of spill of hydrocarbons or any other hazardous substances; ◦ In collaboration with the CBHSSSJB, identify the resources for the exclusive use of the Project in case of emergency. Distinguish these resources from those that may also be used by the public, including the ambulance at the rest area, to avoid any confusion in an emergency; ◦ Specify the evacuation and containment criteria according to the different types of accidents and malfunctions; ◦ Establish a Communications Plan (alarm system diagram) in case of emergencies to quickly inform the Cree Nation Government, the Cree Nations and the responders concerned. Include the contact information of the representatives of the Cree Nations and toll-free emergency numbers, particularly the toll-free emergency numbers of the external organizations, particularly the rest area;

Components	Key Mitigation Measures and Monitoring Requirements
	◦ Specify the parties to contact in case of accidents or malfunctions that have an effect on the environment, such as the Cree Nation Government, the Cree Nations and the stakeholders concerned, as well as the competent authorities, such as the Agency, the CBHSSJB, ECCC and the Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC); ◦ Determine in concert with the Cree Nations the nature of the information they hope to be shared with them in case of accidents or malfunctions; ◦ Include the particularities of the site that it would be better to communicate to the external emergency responders likely to respond on the site, particularly concerning cell phone reception; ◦ Specify how the rest area would be notified in the event of detection of an anomaly in the water quality parameters. As applicable, establish the mechanisms that would make it possible to supply drinking water quickly to the rest area users; ◦ Number the copies of the Emergency Preparedness Plan and accompany them with an appropriate ID of the holder to ensure transmission of the updates; ◦ Place the Emergency Preparedness Plan in an easily accessible location and visible to all employees. Integrate into the Plan a map of the sensitive components of the human environment and the key components that could be affected by an accident or a malfunction in the context of an emergency response. Keep the map of sensitive components of the environment up to date. • Implement the Emergency Preparedness Plan in case of accidents or malfunctions, which includes the application of appropriate measures to minimize the adverse environmental effects; • Ensure the presence and availability of the necessary equipment to respond to the emergency scenarios. Locate this equipment strategically on the mine site; • Provide for enough emergency kits for recovery of petroleum products and hazardous materials on the mine site. These kits must be complete, permanent, located in the sensitive places and easily accessible at all times. They must include a sufficient provision of absorbent materials and related materials (shovels, gloves, leak plugs, etc.) and clearly identified leakproof receptacles, intended to receive petroleum residues and other hazardous residual materials. Secondary emergency kits may be necessary at certain locations. The contents of these kits must be checked periodically. Any machinery required for the Project must also contain a sufficient quantity of absorbents to allow a quick response. The list of spill response material and devices must be approved by the supervisor. • Provide for training for the employees in maintenance and use of the response material; • Ensure that the employees responsible for handling and transportation of hazardous products have received specific training in advance on the handling to be done and the related hazards, whether Transportation of Hazardous Materials, the Workplace Hazardous Materials Information System (WHMIS) or any

Components	Key Mitigation Measures and Monitoring Requirements
	other training appropriate to the job. The information contained in the material safety data sheets of the hazardous products used must be known to the employees; • Ensure, through frequent inspections, the good working order of the machinery, which must be clean and free of any contaminant product leak, and the perfect tightness of the fuel and lubricant tanks. A finding of a leak must result in an immediate repair of the tank involved; • Proceed with refuelling and maintenance of the vehicles and machinery at the places designated for this purpose and according to the good practices in force; • Take the usual precautions during maintenance and refuelling of vehicles and machinery on the work site to avoid any accidental spill; • Equip with a leakproof recovery system any stationary equipment containing oils or fuel and positioned within 60 metres of a body of water or a watercourse. Equipment must be equipped with absorbents in order to respond quickly and effectively to accidental spills. **Monitoring Requirements** The Committee recommends instituting a pile monitoring program to reduce the risks of collapse. No other follow-up or monitoring program is recommended. If the Project goes ahead, the Proponent nonetheless will have to ensure implementation of the above-mentioned measures.
Environmental Effects on the Project	**Key Mitigation Measures** The Committee considered the Proponent's proposals and the advice of the federal experts and the Cree Nations consulted to conclude that the implementation of a contingency plan, as outlined above, is a key mitigation measure to ensure that the Project does not cause significant adverse environmental effects. **Monitoring Requirements** The Committee considers that no follow-up program is required. If the Project goes ahead, the Proponent will still have to ensure that it implements the prevention and mitigation measures it has proposed.
Cumulative Environmental Effects	**Key Mitigation Measures** • No additional mitigation measures are required. **Monitoring Requirements** • No monitoring program is required.

Annex D: Summary of Consultations with Cree Nations

This appendix contains a summary of comments received from members of the Cree Nation of Eastmain, the Cree of the Waskaganish First Nation and the Cree First Nation of Waswanipi during consultations held as part of the environmental assessment. The comments are combined with responses provided by the Proponent, Galaxy Lithium (Canada) Inc., and the Joint Assessment Committee (the Committee) up to the time of release of the draft Environmental Assessment Report.

Table 32: Summary of Concerns Raised during the Consultations with Cree Nations

c	Summary of comment/concern	Summary of Proponent's response	Committee response
Fish and fish habitat	The Cree Nations are concerned about the Project's effects on **aquatic environments** and **fish**, particularly because of the **dewatering of Lake Kapisikama** caused by the creation of the pit.	The Proponent proposes numerous measures to minimize the Project's effects on fish and fish habitat. During the construction phase, the Proponent undertakes to carry out the in-water work outside the breeding periods of the species present. In addition, the Proponent plans to develop and implement a compensation plan for fish habitat losses caused by the Project. Throughout the Project, mine water and materials would be managed in accordance with existing regulations. The Proponent recommends that a follow-up program be implemented to verify the effectiveness of the mitigation measures (and the compensation plan) and the accuracy of fish and fish habitat predictions. The program would include a water quality monitoring component based on current standards and requirements.	Fisheries and Oceans Canada indicates that the mining project would result in adverse effects on fish and fish habitat, including the destruction and alteration of habitat for several fish species in watercourses CE3 and CE4 and Lake Kapisikama. The Committee is nevertheless satisfied with the key mitigation measures and the follow-up measures proposed by the Proponent. The Committee believes that the compensation plan may offset the modification of functions and the loss of fish habitat. The Committee notes, however, that the use of Lake Kapisikama would be permanently lost. The Committee recommends that consultations be held with Cree land users to gather their suggestions and comments on the type of compensation preferred. In the Committee's opinion, Cree land users could nevertheless continue fishing in other parts of the area.

c	Summary of comment/concern	Summary of Proponent's response	Committee response
Use of land and resources for traditional purposes	The Cree Nations consulted are concerned about the massive influx of non-Indigenous workers, which would put **pressure on available hunting and fishing resources**.	The Proponent states that it would prohibit weapons and hunting, fishing and trapping equipment on the entire mine site, including the worker camp. Employees entering the mine site from the road would be required to stop at the site entrance to identify themselves and declare that they are not carrying any hunting, fishing or trapping equipment. All vehicles entering and leaving the site would be systematically searched. The Proponent intends to enforce this prohibition by having employees and contractors initial clauses in their contracts, by including specific disciplinary measures, and by searching vehicles at the mine entrance. The Proponent would also provide mandatory Cree cultural awareness workshops regarding hunting and fishing on the land.	The measures put in place by the Proponent should mitigate the pressure on wildlife resources following the arrival of non-Indigenous workers. The Committee is satisfied with the measures proposed by the Proponent and believes that they may have a significant deterrent effect. However, they only partially address the Cree Nations' concerns. Employees could obtain hunting or fishing permits and harvest wildlife resources during their days off.
	The Cree Nations consulted expressed concern about the effects of **blasting** and **haulage of concentrate** by heavy trucks on **wildlife abundance and avoidance**. These effects could reduce harvests, particularly during the goose and moose hunting seasons.	According to the Proponent, mining activities (e.g., blasting and haulage) could disrupt traditional activities, particularly on the periphery of the site. To minimize these effects and respond to the concerns raised by the Cree Nations, the Proponent proposes various measures, including a traffic management plan and a communication plan to provide Cree land users with relevant, timely information about mining activities. The Proponent proposes special measures for the annual goose and moose hunting seasons. These periods, each lasting two weeks, would be based on the corresponding breaks included in the Cree Nation of Eastmain's school calendar. The Proponent would reduce the handling of waste rock on the mine site by 30% to decrease dust and noise emissions. The reduced need for truck drivers in those periods would make it easier	In the Committee's judgement, the Project would reduce the abundance of small game around the mine site, and the construction of mining facilities would result in the loss of use of and access to parts of the area, including some beaver trapping locations. The Committee is satisfied that the Proponent has consulted the Cree Nations to develop measures for the annual moose and goose hunting seasons. The Committee believes that the Proponent's commitment to implement a traffic management plan and to cut back haulage and blasting may limit the disturbance to wildlife and land users. The Committee is reassured by the Proponent's proposed follow-up program on traditional land use and by the proactive dissemination of the mining activity schedule to land users.

C	Summary of comment/concern	Summary of Proponent's response	Committee response
		for Cree workers to take vacation time to engage in traditional activities. Concentrate haulage on Billy Diamond Highway would be reduced from 12 to 10 round trips by double road trains. During moose hunting season, the Proponent would reduce the number of blasting operations from three per week to one. Concentrate haulage and blasting would not be carried out early in the morning, to avoid disturbances during a part of the day that is good for hunting. In addition, the Proponent would implement a follow-up program on traditional land use that would address such matters as the Project's effects on traditional hunting, fishing, trapping and other activities. In the event that measures are deemed ineffective, adjustments could be made to minimize adverse effects on the current use of land and resources for traditional purposes.	
	The Cree Nation of Waswanipi is concerned about the **increased risk of fatal collisions for big game**, particularly caribou.	The Proponent asserts that as far as is currently known, caribou have not frequented the large wildlife study area in the past decade. The Proponent would install signage indicating collision risk areas and would implement various measures to reduce collision risks, such as a communication system for prompt reporting of the presence or signs of caribou, an action plan in the event of caribou sightings near the mine or on the ore haul road, a heavy trucking management plan, and a caribou training module for employees and contractors. In addition, the Proponent would create a joint caribou working group to discuss caribou	In the Committee's judgement, there is a strong likelihood that caribou hunting by the Cree Nations affected by the mining project will be more successful outside the study area during the life of the Project. The Committee is satisfied with the Proponent's proposed plan to reduce the risk of collision between trucks and game. The Committee also recommends a follow-up program on the effectiveness of the mitigation measures.

C	Summary of comment/concern	Summary of Proponent's response	Committee response
		monitoring and document past and future use of the traplines by caribou.	
Cree health	The Cree Nations consulted raised concerns about the **effects of dust** on their health and asked what measures would be taken to control those emissions.	The Proponent indicated that the Project could emit contaminants into the air during site preparation, facility construction, truck movements and operations. According to the Proponent's toxicological risk assessment, concentrations of air contaminants (fine particulate matter, carbon monoxide, sulphur dioxide, nitrogen dioxide, metals and crystalline silica) are not expected to pose a significant health risk to people frequenting the study area. The Proponent proposes mitigation measures such as a dust management plan, regular watering of roads, maintenance of dust collectors, and optimization of stripping. The Proponent would also develop a communication plan and an air quality monitoring program to verify the conclusions of the environmental assessment and, if necessary, modify or add mitigation measures.	The Committee notes that Health Canada and Environment and Climate Change Canada (ECCC) have not identified any major Cree health issues. ECCC nevertheless indicates that mitigation measures should be implemented rigorously to be effective and to significantly reduce the Project's potential adverse effects on air quality. The Committee believes that the proposed dust management plan is critical for assessing the effectiveness of the design and mitigation measures. The Committee is satisfied with the communication mechanisms that would be in place for reporting situations of concern and the results of monitoring programs.
	The Cree Nations consulted expressed concern about **noise** and its impact on animal behaviour and the sound environment in Cree camps.	According to the Proponent, the Project could temporarily disrupt the peace and quiet that is conducive to the practice of traditional activities on the land. The Proponent notes that the increase in noise might be noticeable at the Kilometre 381 truck stop in the construction and subsequent phases. According to the sound propagation simulation carried out by the Proponent, the Project would adhere to the criteria set out in Quebec's guidelines for noise levels from an industrial construction site and noise instruction note 98-01 and to Health Canada's	The Committee is satisfied with the measures proposed by the Proponent. The Committee believes that with the noise monitoring plan, it would be possible to verify the Proponent's predictions, assess the effectiveness of the proposed mitigation measures, and make adjustments, if necessary. The plan would provide an opportunity to discuss the effect of noise on land users' well-being.

c	Summary of comment/concern	Summary of Proponent's response	Committee response
		criterion of the change in the percentage of the population who become highly annoyed. The Proponent believes that the Project's impact on the noise environment at Cree camps, which are located at least 5 km from the mine site, would be virtually nil. The Proponent proposes various measures to minimize the Project's noise impact, such as fitting motorized equipment with high-performance mufflers and informing land users of the blasting schedule. During the operation phase, the Proponent intends to build up a tailings mound at the southern edge of the eastern dump with the aim of providing some screening between the motorized equipment moving around at the top of the dump and the truck stop. The Proponent would also carry out a noise monitoring plan by conducting noise readings at the truck stop every year.	
	The Cree Nations have concerns about the risk of **groundwater contamination** and the Project's effects on the **drinking water at the truck stop**. The Cree Nations say they are concerned about the **accessibility of water quality monitoring results**.	The Proponent states that the Project would have no impact on groundwater quality in the truck stop area, since water flows toward the mine. The Proponent notes that to prevent groundwater contamination, a geomembrane would be installed under the haul roads, the ore dump, and the industrial water basin located between the concentrator and the worker camp. A layer of impermeable clay would be laid down in the footprint of the north water management pond where no natural clay is present. Waste rock and tailings would be deposited on a solid foundation, with the exception of the southwest dump, which would be placed under approximately 1.5 m of clay. These measures are proposed in order	In the Committee's opinion, the mitigation and follow-up measures would minimize the Project's residual effects on the quality and availability of drinking water and the quality of surface water and groundwater. The Committee is satisfied with the way the Proponent would share the monitoring results with the people concerned. The Proponent should nevertheless verify that the Project's activities have no significant impact on the quality of water used at other locations in the area, or that measures are taken to prevent its use.

C	Summary of comment/concern	Summary of Proponent's response	Committee response
		to meet the standard in Quebec's Directive 019 on percolation flow for managing mine tailings. The water collected would ultimately be treated and discharged into watercourse CE2. The Proponent indicates that it would monitor mine effluent, nearby watercourses, groundwater, and water quantity and quality in the truck stop's well. If necessary, it could provide drinking water or drill a new well in the event that the Project leaves the truck stop's well unusable. The monitoring results would be shared with the Cree Nations, Band Councils, land users, truck stop staff and others through the communication plan. The environmental monitoring reports would also be posted on the Proponent's website.	
	The Cree Nations consulted are concerned about the Project's effects on the **quality of traditional food**, including beaver meat. The members may **perceive** traditional food to be **contaminated** by the Project.	According to the Proponent, mining has the potential to emit gaseous compounds and particulate matter into the atmosphere. These emissions could contaminate traditional food sources, thereby posing health risks to Cree who consume that food. The Proponent assessed the toxicological risks associated with consuming traditional foods in the study area (game, plants, fish). The Proponent determined that risks to human health would be negligible for people who consume traditional food from an area within 5 km of the mining facilities. The Proponent also proposes to implement a traditional food quality monitoring program to identify any changes in its chemical composition. The program would be developed in conjunction with the land users	Health Canada considered the Project's potential impacts on Cree health resulting from chemical changes in traditional foods. After reviewing the results of the toxicological risk assessment, Health Canada determined that the risks to human health would be negligible. The Committee believes that the proposed management, mitigation and monitoring measures would minimize the Project's residual effects on traditional food.

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		to properly identify the plant and game species that would be monitored. By combining the data collected with the data obtained through air, water and sediment quality monitoring programs, the Proponent would be able to determine whether there is potential for contamination and, if so, implement additional mitigation measures.	
Physical and cultural heritage	The Cree Nation of Eastmain wants a **ceremony to honour** Mother Nature before construction begins.	The Proponent undertakes to work with the Cree Nation of Eastmain in organizing a recognition ceremony for Mother Nature.	The Committee is of the opinion that the commitment made by the Proponent would meet the need stated by the Cree Nation of Eastmain.
	The Cree Nation of Eastmain has concerns about the **state of the site after its restoration**. The tallyman of Cree Nation of Eastmain trapline RE02 also regrets the **possible loss of a hill** where the pit would be located.	The Proponent believes that the Cree Nations would be able to use the Project site for traditional purposes after restoration of the mine site. The Proponent indicates that wildlife would quickly be able to start frequenting the area. However, the Proponent notes that the site would retain a residual post-industrial visual appearance after the mine is closed. As required by the *Mining Act*, the Proponent must restore the mine site, and it would consult with the tallyman regarding the restoration plan. However, the Proponent does not plan to reshape the hill valued by the tallyman of trapline RE02. The Proponent plans to shape the top of the waste rock dump, rounding it off and incorporating it into the landscape.	The Committee is of the opinion that the final restoration scenario proposed by the Proponent would influence the future reuse of the mine site. The Committee believes that consultation with the tallyman and the various Cree stakeholders in designing the mine restoration plan would contribute to reuse of the land by future generations. Ongoing communication and collaboration with Cree Nation members throughout the life of the Project could assist in the future planning of land use by the Cree, the tallyman and his family.

c	Summary of comment/concern	Summary of Proponent's response	Committee response
Socio-economic conditions	The Cree Nations are concerned about the effects of increased traffic on the **safety of motorists** on Billy Diamond Highway and the **safety of pedestrians and cars (theft, vandalism or accidents)** on the sides of Billy Diamond Highway.	The Proponent would implement a traffic and heavy trucking management plan and a communication plan to provide Cree land users with timely, relevant information about mining activities. The Proponent also proposes to reduce concentrate haulage on Billy Diamond Highway, which will lower the risk to the safety of land users. In addition, the Proponent would implement a follow-up program on traditional land use that would address such matters as the Project's effects on traditional hunting, fishing, trapping and other activities. In the event that measures are deemed ineffective, adjustments could be made to minimize adverse effects on the current use of land and resources for traditional purposes. The Proponent also commits to setting up a system for receiving and handling complaints before construction starts. The system would remain in place until the mine closes. A liaison officer would receive complaints from the Cree community, including land users, and would ensure that they were dealt with promptly and effectively in conjunction with the company.	The Committee believes that the increase in road traffic could pose a safety hazard to children and pedestrians on the roadside. In the Committee's judgement, the haulage reduction associated with the annual hunting seasons could help reduce these disturbances, and the complaint reception and processing system is a good way to collect and address comments from the Cree Nations. In short, the Committee's view is that the mitigation measures proposed by the Proponent are appropriate, but that they cannot fully mitigate the concerns raised by the Cree Nations. The Committee also notes that it must confine itself to federal responsibilities in its environmental assessment.
	The Cree Nations would like some specifics regarding the **number of daily truck trips** on Billy Diamond Highway.	The Proponent states that the interval between truck departures corresponds to the filling time, i.e., 15 to 20 minutes. Haulage would take place during the day using Billy Diamond Highway from the mine to Matagami, a distance of 385 km. The Proponent estimates that 238 vehicles (trucks, buses and cars) would access the mine site each week. There would be a 21.6% increase in trips compared with 2017 figures.	The Committee is satisfied with the information provided regarding increased road traffic.

C	Summary of comment/concern	Summary of Proponent's response	Committee response
		The Proponent plans to reduce concentrate haulage during the annual moose and goose hunting seasons. The Proponent does not anticipate any accelerated deterioration of the highway due to increased traffic.	
	The Cree Nation of Eastmain stresses the importance of training the region's **young people and women** so that they will have **access to the jobs** available at the mine site.	The Proponent notes that it would arrange a job fair, résumé preparation and submission workshops, and visits to local schools to discuss available training and employment. The Proponent would encourage the training and employment of women in the mining sector. The Proponent also aims to encourage the retention of young people in the region. Consultations would be held with the community to determine expectations regarding employment at the mine and establish a skills pool.	The Committee considers the mitigation measures proposed by the Proponent to promote training and access to employment, particularly for Cree women, to be appropriate. However, the Agency must act in accordance with federal jurisdiction and therefore cannot make those measures binding.
	The women of the Cree Nation of Eastmain are concerned about the **judgement and discrimination** they might experience in working a rotating schedule.	The Proponent states that, depending on the nature of their positions, employees living in the community of Eastmain might have a schedule of four days on and three days off or a typical schedule of five days on and two days off (Monday to Friday). The Proponent would also like to set up offices in the community of Eastmain so that it could provide women with a better work-life balance and a more structured work week than on the mine site. In addition, the Proponent is exploring the possibility of adopting Australia's Flexible Work Arrangement Standard so that it can offer added value to Canadian employees, including women, who would benefit from a flexible work schedule.	The Committee considers the mitigation measures proposed by the Proponent to be appropriate. However, the Agency must act in accordance with federal jurisdiction and therefore cannot make those measures binding.

c	Summary of comment/concern	Summary of Proponent's response	Committee response
	The women of the Cree Nation of Eastmain are concerned about their **safety and the increased risk of sexual harassment**.	The Proponent indicates that employees would remain at the worker camp during their shifts. Alcohol and drug use would be prohibited on the mine site, and no visitors would be allowed. The Proponent adds that in accordance with company policies, harassment and discrimination would not be tolerated. Sanctions would be based on the severity of the actions. In addition, the Proponent states that the site would be fenced off and would have a gatehouse and closed-circuit cameras at strategic locations. The Proponent notes that a Cree woman would be part of the human resources team and would sit on the monitoring committee.	In the Committee's opinion, the Proponent has adequately documented the control and prevention of sexual harassment and its commitment to the safety of women. However, the Agency must act in accordance with federal jurisdiction and therefore cannot make those measures binding.
Accidents and malfunctions	The Cree Nations mentioned the **possibility of accidental spills**. Members of the Cree Nation of Eastmain noted in particular the risk of **chemical spills** in watercourse CE5, which is valued by tallyman of trapline RE02.	The Proponent proposes the implementation of an emergency measures plan, which includes prevention and response measures for each scenario considered, including accidental spills. The plan would be updated annually, readily available and easy to consult. The Band Councils of the Cree Nation of Eastmain and the Cree of the Waskaganish First Nation, the managers of the truck stop and the appropriate authorities would be consulted in the development of the plan. It would include an emergency communications plan to keep all parties concerned properly informed. Moreover, the Proponent deliberately designed the Project in such a way that there would be no discharge into watercourse CE5 and no facilities in the vicinity.	The Committee is satisfied that the Proponent has considered the environmental effects that could result from accidents or malfunctions, has documented those effects and has developed an appropriate emergency measures plan. The Proponent has satisfactorily identified the risks inherent in its Project and would implement appropriate preventive measures, including facility design, inspection and maintenance.

Annex E: Species Reserved for Exclusive Use of the Crees, the Inuits, and the Naskapis

- Fur-bearing animals:
    - All mustelids (i.e. mink, ermine, weasels, marten, fisher, otter, skunk and wolverine)
    - Beaver
    - Lynx
    - Foxes
    - Polar bear
    - Muskrat
    - Porcupine
    - Woodchuck
    - Black bear (in the Cree traplines north of the 50th parallel)
    - Wolves (north of the 55th parallel)
    - Fresh water seals
- Fish:
    - Whitefishes (non-anadromous)
    - Sturgeon
    - Suckers
    - Burbot
    - Hiodons (Mooneye and Goldeye)

Source: *James Bay and Northern Quebec Agreement* Section 24, Annex