Tugliq Énergie

Deployment project of two wind turbines at the Nunavik Nickel mining complex

AECOM

Nickel Wind Farm – Expo
Environmental and Social Impact Assessment

Document Responding to the KEQC's Questions and Comments, and Describing the Changes Made to the Impact Study

File number : 3215-10-016

Impact study submitted to the Ministère de l'Environnement et de la Lutte contre les changements climatiques

April 13, 2023

AECOM Delivering a better world

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Tugliq Energy

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Abbreviations, Symbols and Acronyms

CRI	Canadian Royalties Inc.
KEQC	Kativik Environmental Quality Commission
ESIA	Environmental and Social Impact Assessment
GHG	Greenhouse Gas
GWP	Global Warming Potential
LQE	Environmental Quality Act (*Loi sur la Qualité de l'environnement*)
MELCCFP	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs
NNiP	Nunavik Nickel Project
PFC	Perfluorocarbon

Introduction

This document includes questions and comments addressed to TUGLIQ Energy S.A.R.F. (hereinafter TUGLIQ) as part of the analysis of the Environmental and Social Impact Assessment (ESIA) for the deployment of two wind turbines at the Nunavik Nickel mining complex.

Questions and comments are issued following the review of impacts on the environment and social milieu based on all the information provided by the promoter, as well as the analysis carried out by the Kativik Environmental Quality Commission (KEQC), the “Direction de l'évaluation environnementale des projets miniers et Nordiques” and the “Direction de l'évaluation environnementale stratégique”, in collaboration with the administrative units concerned of the Ministère de l'Environnement, de la Lutte contre les changements climatiques, des Forêts et des Parcs (MELCCFP) and other government departments.

Following this review, some elements are not complete and further clarifications are required before the analysis can be pursued to conclude on the acceptability of the project. The questions and comments are organized according to the order in which they are presented in the impact study to facilitate understanding. For the same reason, TUGLIQ will follow the same sequence of answers in the present document. Sections for which no questions are asked are not represented.

1 Project Description

TUGLIQ is a Canadian company, based in Montréal, whose mission is to provide alternative energy solutions to self-sufficient grids and microgrids, such as islands, remote communities and mining operations that currently rely heavily on fossil fuels for their energy production. TUGLIQ has a successful track record in renewable energy, such as wind, solar and energy storage, specifically tailored to extreme climates in remote, difficult to access and logistically challenging environments, such as the Canadian Arctic, the Caribbean and remote regions of Africa.

Canadian Royalties Inc (CRI) is a Montréal-based private mining company operating a copper and nickel mine in Nunavik under the name of Nunavik Nickel Project (NNiP). Since the opening of the Nunavik Nickel mining complex by CRI in 2013 and up to this day, electricity production at the Expo site is provided by diesel-powered generators with a total capacity of 19.8 MW (6 generators of 3.3 MW each), emitting large quantities of CO_2. However, the winds in this region are powerful and therefore exploited by wind turbines. CRI called upon TUGLIQ to reduce the carbon footprint of its Expo site within the Nunavik Nickel Project by substituting fossil fuels with renewable energy.

The project consists in the installation of two wind turbines of 3 MW paired with a battery energy storage. These wind turbines will be installed a few kilometres from the Expo mine site, about 2 to 3 km east of the site. Once installed, it is estimated that these turbines will produce 17,500 MWh of electricity annually. To produce this 17,500 MWh under current conditions, the diesel generators consume 4.5 million liters of diesel (assuming 3.8 kWh of electricity from the generators per liter of diesel consumed). The consumption of 4.5 million liters of diesel by the generators emits over 14,000 tonnes of CO_2 equivalent into the atmosphere. The wind farm will therefore eliminate these greenhouse gas (GHG) emissions, representing a 10.5% reduction of the total GHG emissions currently produced by the CRI mining complex.

After analyzing the additional information provided, the KEQC requested further information and elements from the promoter to continue the analysis of the file and issue a decision regarding the authorization of the project. This document includes the answers to the KEQC's questions as well as a presentation of the adjustments planned for the project since June 2022. These adjustments are included in the answers when applicable.

2 Answers to questions

2.1 Presentation of the promoter

Section 1.1 of the directive issued in May 2022 mentions that the impact study must clearly present the administrative structure of the company that allows for the provision of the required financial guarantees when environmental restoration, decontamination, dismantling of infrastructure or other measures must be taken. This information was not presented in the impact study.

QC-1. *The promoter must present the administrative structure of the company and indicate what financial guarantees will be in place to ensure the dismantling and the costs associated with the risks listed above and who will be responsible for these financial guarantees.*

ANS-1. :

The administrative structure of TUGLIQ Energy is presented below, as of March 22, 2023.

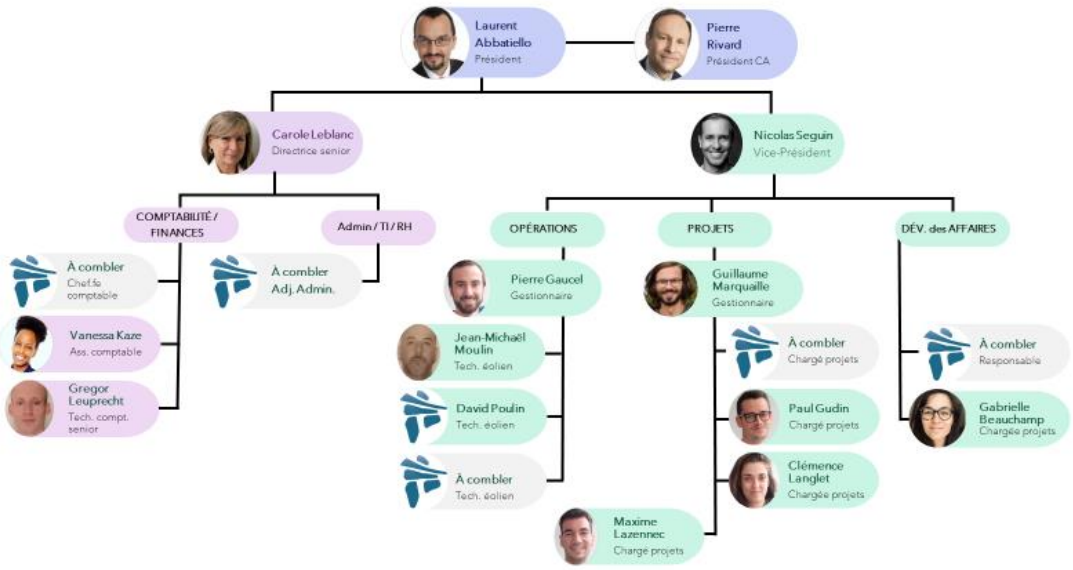

Figure 1: Hierarchical organization chart TUGLIQ Energy.

The mine operator Canadian Royalties Inc. is responsible and obligated to put in place the financial guarantees required when environmental remediation, decontamination, infrastructure dismantling and other measures are to be taken. This is an integral part of their demobilization plan at the end of the mine's life.

3 Analysis of the project variants

3.1 Wind farm location alternatives

In section 2.1 (page 11 of volume 1 of the Impact Assessment studies), the promoter mentions the three alternative locations for the wind farm that were analyzed and specifies that the option selected is to install the two wind turbines approximately 3 km east of the Expo site of the Nunavik Nickel mining complex. The information provided indicates that this is the best alternative from an economic, technical and environmental perspective.

QC-2. The *promoter must indicate whether social aspects were also considered in the final choice (e.g., land use, landscape). In this regard, the promoter must indicate whether the alternative locations for the wind farm and the final choice were discussed with the various stakeholders, including the northern villages of Kangiqsujuaq and Salluit, the local mining companies, the representatives of the Kattiniq-Donaldson airport and the Pingualuit National Park. In this matter, the promoter is being asked to ascertain the interest of the community of Puvirnituq in participating in the consultations or in being informed about the various aspects of the project, since, despite its geographic distance from the site, this community is a signatory to the Nunavik Nickel Agreement, in the same way as the villages of Kangiqsujuaq and Salluit.*

ANS-2. :

The wind turbine siting alternatives were not discussed with the various stakeholders. In fact, a primary analysis of the alternatives showed that it was not possible to build more than one wind turbine at the west site of the EXPO site (i.e., option 3 presented in Figure 2-1 of the impact assessment report). Thus, in order to install two wind turbines, one would have to be built at the western site and then another at the eastern site. For economic and technical reasons, but also in order to limit the impacts on the physical, biological and human environments, it was decided to group the two wind turbines on a single site. Thus, only the site located east of the EXPO site offered this possibility, i.e. options 1 and 2 presented in Figure 2-1 of the impact assessment report. Of the latter two options, the results of the wind simulations revealed that Option 1 could generate greater net energy production (Hatch, 2015). It is therefore on this last option that discussions were held with the various stakeholders, i.e. the northern villages of Kangiqsujuaq and Salluit, the nearby mining companies, the representatives of the Kattiniq-Donaldson airport and Pingualuit National Park. It should be noted that Option 2 was not eliminated from the project since it is part of the second phase of the wind turbine site expansion that could be developed in the future by TUGLIQ and which is presented in section 3.8 "Related developments and projects" of the impact study report. The necessary steps to obtain the authorizations related to this expansion will be started in due course by TUGLIQ.

Furthermore, as requested, the developer surveyed the interest of the community of Puvirnituq to participate in the consultations and to be informed on the various aspects of the project. Thus, the council of the Northern Village of Puvirnituq invited TUGLIQ Energy to come and present the project. A visit to the community of Puvirnituq took place on April 5 and 6, 2023, which allowed TUGLIQ Energy to meet with the entire council of the village as well as the general manager of the municipality on April 5. The mayor of the northern village of Puvirnituq (Mr. Paulusi Angiyou), the deputy mayor (Mr. Adamie Angiyou), 4 councillors (Mr. Muncy Novalinga, Mrs. Lucy Qalingo, Mrs. Louisa Kuannanack and Mr. Aipilie Kenuajuak), as well as the director general of the municipality (Mr. Paulossie Napartuk) were present. The meeting was an opportunity to present in detail the different aspects of the project as well as the results of the impact assessment carried out in 2022.

Various questions were asked by council members following the presentation by *TUGLIQ Energy*. First of all, the Deputy Mayor said he was pleased to see that the use of wind turbines at the EXPO site would significantly reduce diesel consumption, which would be beneficial for the environment.

Photo 1 **The village council of Puvirnituq, as well as the two representatives of TUGLIQ Energy at the April 5 meeting**

The mayor asked TUGLIQ for clarification regarding the construction of the proposed wind turbines, wanting to know if CRI was definitely going to build them or if they were still at the draft stage. This allowed TUGLIQ to clarify that although the impact assessment for the project had been filed, the authorities concerned (i.e. the MELCCFP and the KEQC) had not yet given their authorization for the project.

A few questions were asked by a Councillor about the developer. She wanted to know why the company was called *TUGLIQ Energy*, whether it had other projects elsewhere in Canada and whether it was working with *Les Énergies Tarquti* (a subsidiary of Makivik Corporation working in the field of renewable energy). She also wanted to know how long she had been involved in the present project. The various council members also asked questions specifically about the two planned wind turbines, including their expected lifespan, the risk of breakage (especially in Nunavik's high winds), the possibility of storing the energy they will produce, and what will happen to them when they reach the end of their life. A councillor also wanted to know if solar panels could be an alternative to the two proposed wind turbines. All the questions asked by the members of the council of the Northern Village of Puvirnituq as well as the answers provided by *TUGLIQ Energy* are presented in Table 1 in Answer 12 and answering question QC-12.

4 Project Description

4.1 Greenhouse gases (GHG)

4.1.1 Methodology

4.1.1.1 Sources of GHG emissions

In section 3.4.1.3 (page 30 of Volume 1 of the Impact assessment Studies), it is stated that fugitive emissions from the operation of electrical transmission and distribution equipment (e.g., capacitors, transformers) have not been quantified. These fugitive emissions are typically composed of gases such as SF6 or perfluorocarbons that have global warming potential 18,000 to 23,000 times higher than CO2. These emissions can occur during gas handling and transfer operations, equipment operation or mechanical failure. Since the project includes several electrical equipment (wind turbines, energy storage system, etc.).

QC-3. *Since the project includes several pieces of electrical equipment (wind turbines, energy storage system, etc.), the promoter must quantify fugitive emissions. In this regard, the promoter may refer to section 3.8 of the Greenhouse Gas Emissions Quantification Guide [1].*

ANS-3. :

The electrical equipment of the wind project does contain SF6 gas. It is located in the switchgear of the electrical network. SF6 gas prevents short circuits, accidents or fires because it is an excellent thermal insulator that can extinguish electrical arcs. Our wind project has a total of 4 switchgear, each equipped with 1.14 kg of SF6 gas. The electrical equipment of the project thus contains a total of 4.56 kg of SF6 gas

The amount of SF6 remains the same over the potential 25-year life of the project. At the end of the project's life, the initial load at disposal is therefore also 4.56 kg of SF6. The GHG emissions calculated here are due to fugitive emissions that are compensated by an annual recharge of SF6 during equipment maintenance.

During dismantling of the switchgear, SF6 gas will be recovered using specialized equipment designed to handle this gas. The gas can be recovered and purified for reuse or appropriately destroyed by incineration in certified facilities.

The entire process will be performed by certified workers, trained in the safe handling and disposal of SF6 gas in accordance with the regulations in effect.

According to section 3.8 of the Greenhouse Gas Quantification Guidebook updated in December 2022, we can use the equation to calculate greenhouse gas emissions related to fugitive emissions of SF6 gas.

$$Cht_{SF6} = 1.14 \times 4 = 4.56kg$$

$$ChiSF6_{EMR} = 4.56kg$$

$$E_{SF6} = (0.01 \times Cht_{SF6} \times 25years + 0.7 \times ChiSF6_{EMR}) \times 23000 \times 0.001$$

$$= (0.01 \times 4.56 \times 25years + 0.7 \times 4.56) \times 23000 \times 0.001$$

$$= 99.64\ tCO_{2\ eq.}$$

Finally, the fugitive emissions related to the use of SF6 gas in the electrical equipment reach 99.64 tons of CO2

[1] https://www.environnement.gouv.qc.ca/changements/ges/guide-quantification/guide-quantification-ges.pdf

equivalent. Bringing the total greenhouse gas emissions of the wind project previously announced from 327 to 427 tons of CO_2 equivalent.

The project equipment does not contain perfluorocarbon (PFC) gas.

Emissions related to the loss of carbon sequestration due to wetland destruction have not been quantified. The projected area of perturbation is small at the project scale (0.05 ha).

QC-4. *As there has been an evolution in the knowledge of GHG impacts on wetlands and the Greenhouse Gas Emissions Quantification Guide was updated in December 2022, the promoter must present this quantification by referring to section 3.12 of the guide.*

ANS-4. :

The promoter TUGLIQ Energy has implemented all possible means to limit the loss of wetlands. To this end, the engineering of the access road was modified to avoid crossing wetlands, resulting in a total loss of 0.05 hectares as calculated in section 6.3.1.1 of volume 1 of the impact assessment studies.

The most comparable climate domain with factors available in the IPCC reports is the boreal zone. The calculations below were made under the assumption that the project climate domain is similar to a boreal region.

Thus, following the recommendations of section 3.12 of the Greenhouse Gas Emissions Quantification Guide, and knowing that the climate is polar in Northern Quebec, we will consider the CO_2, CH_4 and N_2O emission factors attributable to the loss of forested wetlands for the Boreal (for CO_2) and Boreal - Nutrient Depleted (for CH_4 and N_2O) climate:

$$FE_{CO2} = 0.12\ tC/ha/year$$

$$FE_{CH4} = 7.0\ kgCH4/ha/year$$

$$FE_{N2O} = 0.22\ kgN2O/ha/year$$

Furthermore, the global warming potential (GWP) of CH4 and N2O are 25 and 298 respectively.

Thus the equation for calculating the emissions related to the loss of wetlands for our wind project is as follows:

$$E_{GES} = E_{CO2} + E_{CH4} \times PRP_{CH4} + E_{N2O} \times PRP_{N2O}$$

$E_{CH4}\ et\ E_{N2O}$ are expressed in tons of CH4 and tons of N2O per year, hence the conversion factor of 0.001 in the following equations:

$$E_{CO2} = P_{MH} \times FE_{CO2} \times {}^{44}/_{12}$$

$$E_{CH4} = P_{MH} \times FE_{CH4} \times 0{,}001$$

$$E_{N2O} = P_{MH} \times FE_{N2O} \times 0{,}001$$

With the loss of wetlands equal to $P_{MH} = 0{,}05\ ha$

$$E_{GES} = (0{,}05 \times 0{,}12 \times {}^{44}/_{12}) + (0{,}05 \times 7{,}0 \times 25 \times 0{,}001) + (0{,}05 \times 0{,}22 \times 298 \times 0{,}001)$$

$$= 0{,}022 + 0{,}00875 + 0{,}003278 = 0{,}034\ tCO_{2\ eq.}/year$$

Finally, the emissions related to the loss of the wetland following the installation of the project reaches 0.034 tons of CO2 equivalent per year before the restoration of the wetlands which will take place 25 years after the construction of the project. Thus, over the lifetime of the wind turbines, this value reaches: 0.85 tons of CO2 equivalent. Bringing the total greenhouse gas emissions of the wind project previously announced from 427 to 428 tons of CO2 equivalent.

However, the conclusion of section 3.4 of volume 1 of the impact assessment studies remains the same: the greenhouse gas emissions avoided by the project are far greater than the GHG emissions caused by the construction and operation of the wind farm. Each year the wind farm avoids the emission of 14,000 tons of CO2 equivalent.

3.4 Employment and training

3.5.3 Wind farm dismantling phase

QC-5. *In such a case, the promoter must indicate whether the costs of decommissioning, environmental restoration measures and decontamination will be assumed by the local communities. The promoter must also specify whether financial guarantees will be transferred to local communities and specify who will maintain the contribution to the latter.*

ANS-5.

If the life of the mine is longer than the life of the wind turbines, then their dismantling will be included in the mine decommissioning plan.

In the event that the mine life is shorter than the project life, and the assets are still capable of producing energy for several years, then the project will be offered for a buyout by a third party. Glencore's neighbouring mine, Raglan, or the surrounding communities could take over this project. As part of the buyout, the costs of decommissioning, environmental remediation and end-of-project decontamination will be part of the negotiations and will be included in the transfer contract.

QC-6. *The promoter must indicate what will happen to the wind power equipment if the mining project activities cease for unforeseen reasons.*

ANS-6. :

In the event the mining operations are terminated for unforeseen reasons before the end of the project's life (<25 years), the project could be sold, and transferred to a third party (the neighbouring Raglan mine or neighbouring communities). The dismantling of the wind farm will be part of the mine decommissioning. Canadian Royalties will be responsible for dismantling the wind farm.

In the event the mining activities were to cease without the mining project being dismantled, the wind turbines could be paused on the manufacturer's recommendation to preserve the asset’s condition, pending the restart of the mining activities or their dismantling.

3.7 Project costs

3.7.3 Project dismantling

QC-7. *The promoter must indicate if a decommissioning cost estimate has been completed and provide it, if applicable. If not, the proponent must confirm when the estimate will be completed.*

ANS-7. :

Decommissioning cost estimates have not been completed by the promoter; it will be carried out by the mine operator as part of the mine decommissioning activities. The proponent expects similar costs to the project's construction activities.

3.8 Developments and related projects

In section 3.8 (page 37 of volume 1 of the impact assessment studies), it is mentioned that a phase 2 of the project is being considered over the next few years.

QC-8. *Given that the current life of the wind farm project is estimated at 10 years, the promoter must indicate how this second phase will be integrated into the present project and what it consists of.*

ANS-8. :

The effective lifespan of the wind farm project is matched to the guaranteed lifespan of the mine, which is currently projected to be 10 years.

However, the anticipated mine’s lifespan is greater than the guaranteed lifespan and the wind turbines have a 25-year lifespan guaranteed by the manufacturer. In addition, Canadian Royalties has made a request to consider a phase 2 as they are in the process of expanding their mine. If this expansion occurs, the guaranteed lifespan of the mine will be extended, along with the lifespan of the wind project.

Also, if this expanded operation is completed, the electrical demand of the mine will increase accordingly and will allow for the additional integration of electrical energy generated from renewable sources.

The second phase, which consists of the installation of two additional wind turbines within a few hundred meters of the two turbines installed in the current project, is intended to further reduce the mine's CO2 emissions. However, this phase will only be integrated into the mining project if the guaranteed lifespan of the mine is extended, and the electrical demand is increased.

The developer will only commit to the construction of the second phase of the project if the wind farm can be in operation for at least 9 years. Below that the project would not be economically viable.

4.2 Assessing risks and vulnerabilities to climate change

4.2.1 Identification of Risk Treatment and Accommodation

4.2.1.1 Recommendation for mitigation measures for each project component

In section 3.12.7.2 (page 67 of Volume 1 of the Impact Assessment studies), mitigation measures for each project component are recommended by a consultant.

QC-9. *The proponent must commit to implement these measures in the project*.

ANS-9. :

The operator of the wind farm project commits to integrating the measures set out in section 3.12.7.2 of Volume 1 of the impact assessment studies. As a reminder, these measures are divided into three parts:

1. Design-related measures
2. Operations and maintenance-related measures
3. Policy-related measures

QC-10. *The promoter must indicate what measures will be put in place to ensure the stability of the exterior staircase of the wind turbine tower and battery energy storage foundation as well as roads in the face of thawing permafrost*.

ANS-10. :

The service staircase is the same as those installed on the two operating wind turbines at Raglan, installed in 2014 and 2018 respectively. The thawing of the permafrost has not yet had any impact on the stability of the service stairs. However, with the rapid advancement of climate change, it is possible for the stability of the service staircase to degrade, and it is proposed consequently to set up a semi-annual follow-up which would enter within the framework of the maintenance of the wind turbine. A close follow-up will thus be implemented. If a degradation of the stability of the service staircase is noted, then a structural modification of the base of the staircase will be considered in order to reinforce the support on the ground and ensure the safety of the users at all times.

The battery energy storage system will be installed on the man-made environment already in use by the mine, alongside existing electrical installations. It will be installed on a pile foundation to avoid any impact on the stability of the containers due to thawing permafrost. The storage system installation will be based on the existing storage system installation at Raglan since 2014, where the containers are installed on piles. Since 2014, the thawing of the permafrost had no impact on the stability of the facilities.

Finally, the design of the roads was thought out by the civil engineers in charge of drawing up the plans for the entire life of the wind turbines. Roads will not be excavated but material will be added to the ground to limit the impact of thawing permafrost. In the same way as for the service staircase, the project promoter is committed to carrying out a close follow-up of the evolution of the road's condition in summer and winter of each year to attest to the possible impacts of the permafrost thaw. If the promoter notices any disruption to the road condition, then a repair with the surface crews of the mine will be considered and reinforcement may be put in place before continuing to use the road.

It is worth noting that the roads are designed to accommodate all the non-standard equipment that makes up the wind turbine over the first year during construction. During operation, the road will only be used for the transportation of technicians working on the wind turbines, so the constraints on the road will be minimal during this period. At the time of dismantling the wind farm, an inspection of the quality of the road will be carried out to ensure that it is capable of handling the weight of the oversized trucks.

QC-11. *The promoter must agree to revise the risk analysis every 5 years to take into account the rapid advancement of knowledge in Northern Quebec.*

ANS-11. :

The project operator is committed to revising the risk analysis every five years to take into account the evolution of the knowledge of the northern environments of Northern Quebec with respect to climate change.

5 Community consultation

Consultation sessions were held with various stakeholders and groups in the region (northern villages of Kangiqsujuaq and of Salluit, mining companies in the area, representatives of the Kattiniq-Donaldson airport and of the Pingualuit National Park). Chapter 4 of Volume 1 of the impact assessment studies reports all the comments, concerns and questions raised by these stakeholders and groups. However, the promoter provides little or no comment or answer to the respondents' concerns and questions.

QC-12. *Thus, for the sake of clarity, the promoter must provide a synthesis table listing the comments, concerns, and questions, by category of stakeholders and groups, as well as the replies to them, and specify the adjustments that have been made to the project in response to them. The promoter must also indicate whether the community of Puvirnituq has expressed an interest in being informed or consulted about the project, as per the question QC -2 (see above).*

ANS-12. :

Table 1 provides a summary table of comments, concerns and questions from the consultations.

Table 1: Comments, concerns and questions raised by various stakeholders

Stakeholder	Comments, concerns and questions raised	Response or change made
Kangiqsujuaq (Population – September 2022)	Can the presence of wind turbines modify caribou migration routes or cause mortality in the bird populations that frequent the areas concerned?	TUGLIQ responded that follow-up studies conducted by Glencore show that the wind turbines at the Raglan mine have not had any significant effects on wildlife in 8 years of operation. TUGLIQ pointed out that these follow-up studies indicate that no birds have been killed or injured by the turbines. The studies also show that caribou adapt well to the presence of wind turbines, as do Arctic foxes. In order to address concerns about bird mortality, TUGLIQ has chosen to implement, from the design phase of the project, a turbine scheduling system to protect avian wildlife from the risk of collision. This system will allow TUGLIQ to define conditions for which the turbines will be shut down based on time parameters or meteorological data from sensors installed on the turbines. With respect to caribou migration, the *Rivière aux feuilles* herd migrates from south to north and north to south primarily in the western sector of the PNNi territory, more than 60 km from the turbines (AECOM and Canadian Royalties, 2023). The effect of wind turbines on caribou migration is therefore considered negligible.
	What impact have the two wind turbines currently operated by TUGLIQ at the Raglan mine had on wildlife so far?	
	What are the potential benefits to the community if the proposed wind turbines are built and operated?	TUGLIQ responded that it plans to award contracts to local businesses during the construction phase. TUGLIQ will also be able to provide training to people in the community on the operation and maintenance of the turbines. This could lead to the hiring of local people for the operation of the two proposed wind turbines. This training could also be used by the community in the event of the installation of wind turbines in Kangiqsujuaq. In this regard, TUGLIQ mentions that it would be possible to install smaller wind turbines or solar panels in the community or near the camps used by the people of the community on the territory. TUGLIQ also indicated that the use of wind turbines would allow CRI to reduce its diesel expenses, which could translate into greater profits for the company and therefore greater royalties for Kangiqsujuaq.
	How long will the proposed wind turbines be on the land?	TUGLIQ responded that the turbines are expected to be in place for the remainder of the operation of the Expo mine site, for a period of 10 years.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Kangiqsujuaq (northern village – September 2022)	Could other wind turbines be installed at the Expo site or at other CRI mining complexes in the coming years?	TUGLIQ responded to the question by mentioning that the first two turbines are planned to be built at the Expo site and that two additional turbines could be built at the same location in a later phase of the project (phase 2), for a total of four turbines. TUGLIQ also indicated that there are no plans to build additional wind turbines at the other CRI mine complexes in the next few years.
	The use of wind turbines will allow CRI to reduce the use of diesel, which is a good thing.	No answer required.
	The caribou seems to adapt well to the presence of the two wind turbines currently operated by TUGLIQ at the Raglan mine	No answer required.
	The two planned wind turbines will be located in an area where ptarmigans are found. Why is there no mention of this bird in the inventories conducted during the summer of 2022?	The presentation made to the people of Kangiqsujuaq focused on the inventories of at-risk species, such as caribou, or subject to special protection measures, such as waterfowl. Therefore, it did not contain data on ptarmigan. However, TUGLIQ indicated to the representatives of the Northern Village that the inventories had indeed made it possible to document the presence of ptarmigan on the territory concerned. This species is present on the entire territory of the PNNi
	Environmental monitoring studies should be conducted during construction and operation of the planned wind turbines.	TUGLIQ responded that CRI will conduct regular monitoring of the effect of the planned wind turbines on animal species during the operational period, but also during the construction period. To this end, CRI has produced a Wildlife Protection Plan (Appendix A) that commits CRI and its subcontractors to adopt appropriate behaviors with respect to wildlife in order to protect the species present that use the territory. In addition, CRI is currently following an environmental monitoring program that documents more than 36 different components, affecting both the natural and social environment.

Table 1 Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Kangiqsujuaq (Landholding corporation – September 2022)	The planned wind turbines will allow CRI to limit greenhouse gas emissions, which is a good thing	No answer required.
	Wind turbines produce noise and vibrations that may scare animals away to other areas.	UGLIQ responded that monitoring studies conducted by Glencore show that the wind turbines at the Raglan mine have not had any significant effects on wildlife in 8 years of operation. TUGLIQ pointed out that these monitoring studies indicate that no birds have been killed or injured by the turbines. The studies also show that caribou adapt well to the presence of wind turbines. TUGLIQ recalled that the first two turbines are planned to be built at the Expo site and that two additional turbines could be built at the same location in a later phase of the project (phase 2), for a total of four turbines. TUGLIQ has also indicated that there are no plans to build additional wind turbines at the other CRI mine complexes in the coming years. Thus, the impact will be concentrated in one location.
	Multiple wind turbines should be avoided at the various mine sites operated by CRI. They may encourage them to move to other locations	
	The caribou is not very comfortable with the presence of the two wind turbines already in operation at the Raglan mine.	
	TUGLIQ and the community of Kangiqsujuaq will have to work together and reach an agreement so that the community benefits from the project.	TUGLIQ responded that it plans to grant contracts to local businesses during the construction phase. TUGLIQ will also be able to provide training to people in the community on the operation and maintenance of the turbines. This could lead to the hiring of local people for the operation of the two planned wind turbines. This training could also be used by the community in the event of the installation of wind turbines in Kangiqsujuaq. In this regard, TUGLIQ mentions that it would be possible to install smaller wind turbines or solar panels in the community or near camps used by the community on the territory. TUGLIQ also indicated that the use of wind turbines would allow CRI to reduce its diesel expenses, which could translate into greater profits for the company and therefore greater royalties for Kangiqsujuaq.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Kangiqsujuaq (Landholding corporation – September 2022) (cont.)	It is important to have a good understanding of the land use of the different animal species in the area affected by the two planned wind turbines. It is important to know when these species will be present in the vicinity of the turbines in order to avoid affecting them.	TUGLIQ responded that the studies conducted to date as part of the impact assessment have covered these topics well. Moreover, as Glencore is already doing for the wind turbines installed at the Raglan mine, CRI will conduct regular monitoring of the effect of the planned wind turbines on animal species. In addition, TUGLIQ has committed to having the MELCCFP carry out a telemetric monitoring to document the home range of the peregrine falcon nesting within 20 km of the future wind turbines. Spring migration monitoring of birds, focusing primarily on raptors, will also begin during the week of April 6, 2023. Any problems identified with bird migration or mortality could lead to periodic scheduling of turbine shutdowns.
	The results of the monitoring studies conducted under this project should be shared with the community.	The mining operator, through the Nunavik Nickel Committee, undertakes to communicate to the landholding corporations and Northern villages concerned an executive summary of the results of the impact assessment and subsequent monitoring studies. The communities of Puvirnituq Salluit and Kangiqsujuaq are concerned.
Salluit (northern village and landholding corporation – October 2022)	This project will be done in collaboration with Les Énergies Tarquti, a subsidiary of the Makivik Corporation working in the field of renewable energy.	TUGLIQ responded that this project is only between TUGLIQ and CRI. TUGLIQ specified that the present project was initiated in 2015, before *Les Énergies Tarquti* was set up.
	Is TUGLIQ associated with other Inuit businesses in its various wind energy projects?	
	Are there any plans to employ local companies during the construction phase of the planned wind turbines?	TUGLIQ indicated that it is already planned to contract with a local company to transport materials and machinery during the construction phase. TUGLIQ added that other companies in the community could obtain contracts if they have the required qualifications.
	How long will the construction phase of the current project last and how long will the two proposed wind turbines operate?	TUGLIQ responded that the construction of the two planned wind turbines is expected to take place within an 8-month period and that the turbines are expected to be in place for the remainder of the operation of the Expo mine site, for a period of 10 years.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Salluit (northern village and landholding corporation – October 2022)	In the event that two additional turbines are built in addition to the two planned turbines, how soon could these two other infrastructures be implemented?	TUGLIQ indicates that no timeline has yet been determined for the potential construction of two additional wind turbines at the same site as the two already planned.
	How many kilometers will the road to the wind turbines be from the Expo mine complex?	TUGLIQ responded that the turbines will be located along an existing road. Therefore, a 2.4 km access road will be required from this road to access the two planned wind turbines.
	What is the projected length of the line that will connect the planned wind turbines to the CRI mining complex power grid?	TUGLIQ responded that the connection line will be 5 km long.
	Is the connection line planned to be underground? Foxes often chew on lines that are too close to the ground, damaging them. Will measures be taken to avoid this problem?	TUGLIQ indicated that the line will not be underground. TUGLIQ stated that the proposed tie line will be similar to the one in place for the Raglan Mine wind park, where there are also many foxes and no problems have been reported. As at Raglan, the connection cables of the two projected wind turbines will be covered with a thin layer of rock, which will prevent animals from damaging them.
	It is a good thing that a system to shut down the turbines when necessary is provided to prevent birds from being hit by the blades. However, snow geese sometimes fly at night, so it is important to ensure that the shutdown system can be activated during the dark hours if necessary.	The different monitoring that will be carried out by the operator, such as the search for carcasses and the monitoring of bird migration, will make it possible to detect a problem related to the migration or mortality of avian fauna and to program the shutdown of the wind turbines either for a defined period or for a specific time during the day. The system will be able to adapt to all situations, but it is impossible to guarantee the absence of mortality.
	Snow geese will only be at risk of being hit by the blades of the proposed turbines if they are flying low, which is unlikely in the area.	No answer required.
Salluit (northern Village - April 2023)	Many hunters from Salluit go to the territory, especially near Deception Bay and Duquet and Françoys-Malherbe lakes, where some members of the community have camps. Will it be possible to supply these camps with electricity from the two proposed wind turbines?	TUGLIQ mentioned that the project is only intended to provide power to the CRI EXPO site. Furthermore, TUGLIQ indicated that the planned wind turbines are too far from the camps used by the people of Salluit to supply them with electricity. The connection cable that would have to be put in place would be very long, which would result in a lot of energy being lost during transportation.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Salluit (northern village - April 2023)	How does TUGLIQ know that the planned wind turbines will have little impact on animals	TUGLIQ explained that it relies in particular on the operation of its two wind turbines at the Raglan mine site, pointing out that these two turbines are identical to the two projected wind turbines and recalling that the Raglan mine is located not far from the EXPO site. TUGLIQ thus emphasized that very little, if any, impact has occurred on wildlife in connection with the operation of the two wind turbines at the Raglan mine. Thus, no bird mortality has been reported. Moreover, the caribou seem to be well adapted to the presence of the two wind turbines (this was confirmed by Sam Gordon, who mentioned having seen the wind turbines at Raglan). TUGLIQ also mentioned that the impact assessment conducted in 2022 does not foresee any significant impact on wildlife.
	Northern Village representatives appreciate that the project will reduce CRI's diesel consumption at the EXPO mine site. They point out that this will be beneficial to the environment. They add that the reduction in the purchase of diesel by the mining company will result in a decrease in its expenses and therefore in a greater profitability of its activities on the territory of the PNNi. They conclude that the project could result in CRI paying more royalties to the community in relation to the operation of the EXPO site.	No answer required.
Salluit (population – April 2023)	Will people in the community of Salluit have jobs related to the project?	TUGLIQ indicates that it intends to grant contracts to local businesses during the construction of the two projected wind turbines. This will enable them to employ people from the community. In addition, TUGLIQ or Canadian Royalties intends to hire local resources to take care of the maintenance and operation of the wind turbines during their operation, which again could result in the creation of jobs in the community.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Salluit (population – April 2023)	Will it be possible to continue hunting near the proposed wind turbines?	TUGLIQ explained that the planned wind turbines will be installed near the EXPO site, on a territory that is not accessible to the users of Salluit because of the mining activities that take place there. Furthermore, the activities that are practiced elsewhere on the territory by the people of Salluit will be little affected by the construction and operation of the wind turbines. The effect will mainly be felt during the construction phase, along the road leading to the Raglan mine, during the passage of trucks and freighters transporting the machinery between the port facilities of Deception Bay and the EXPO site. Users of Salluit who practice activities along this road could then notice a sporadic increase in noise levels due to the temporary increase in heavy traffic.
	Generally, the infrastructures that produce energy are often down due to breakdowns. Will this be the case with the planned wind turbines? Will the turbines be able to withstand the strong winds that often blow in Nunavik?	TUGLIQ explained that the planned wind turbines will be designed to withstand strong winds. In this sense, they will be equipped with a system that will adjust the speed of rotation of the blades according to the strength of the wind. This will ensure the protection of the structure of the wind turbines, as well as their internal mechanisms. TUGLIQ has also pointed out that no major breakdowns have occurred on the wind turbines at the Raglan mine since the first wind turbine was put into operation in 2014.
	TUGLIQ tells us that the planned wind turbines will have minimal impacts on wildlife. Hydro-Quebec said the same thing about their dams and reservoirs. However, hydroelectric projects have a lot of impacts.	TUGLIQ explained that wind turbines have fewer negative impacts than hydroelectric projects, pointing out that the latter cause significant habitat modifications, particularly due to the creation of reservoirs. These projects thus have a lot of impacts on wildlife, particularly on fish. TUGLIQ pointed out that, conversely, the installation of wind turbines does not cause habitat modification. TUGLIQ also recalled that no significant impact on fauna and flora has been noted concerning the operation of the two wind turbines present at the Raglan mine site.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Salluit (population – April 2023)	Why doesn't TUGLIQ meet the population of the community at a public meeting?	TUGLIQ answered that the authorities of northern village and the Salluit Landholding Corporation suggested to him to make a presentation of the project on the radio, because this medium allows to reach a very large part of the population of the community. TUGLIQ also added that it was advised to make the presentation on the radio because of the fears that some people in the community have regarding COVID-19. Indeed, people in the community are less inclined to leave their homes and participate in public events. They would not have participated in a public presentation.
	Will the people of Salluit be able to use the turbines when CRI no longer needs them?	TUGLIQ indicates that the planned wind turbines will have a life span of 25 to 30 years. If it appears that CRI's activities at the EXPO site cease before the end of this period, the local communities (Kangiqsujuaq and Salluit) will be offered the opportunity to purchase them. If the local communities decline the offer, the turbines will be dismantled and resold to produce energy in another location. If the planned turbines reach the end of their life before CRI ceases operations at the EXPO site, they will be dismantled. The materials will then be removed from the site and transported to another location for proper disposal.
	Will it be safe to store the energy produced by the planned wind turbines?	TUGLIQ responded that this project would indeed store some of the energy produced for use when the winds are not strong enough to operate the turbines. TUGLIQ explained that it will be safe to store this energy and that it will not impact the environment.
	If the proposed wind turbines reduce CO2 emissions at the EXPO site without affecting animals, it will be a good project.	TUGLIQ reiterated that the primary goal of the project is to reduce diesel consumption at the EXPO site, which will result in lower CO2 emissions. TUGLIQ also reiterated that the projected impacts of the planned wind turbines on wildlife are minimal.
	Is it often foggy at the site where the two proposed wind turbines will be located?	TUGLIQ indicated that the climate at the EXPO site is similar to that of Salluit, so yes, there is a possibility of fog at the location of the two planned wind turbines.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Salluit (population – April 2023) (cont.)	Would it be more beneficial to build solar panels rather than wind turbines at the EXPO site?	TUGLIQ indicated that solar panels are often an interesting technology, but that it is not the most advantageous technology for CRI to use to supply energy to the EXPO site. TUGLIQ explained that the sun is not always present in Nunavik, especially during the winter months when the period of sunshine is shorter. On the other hand, the wind blows almost constantly at the EXPO site, which is a very interesting condition for the use of wind turbines. TUGLIQ also explained that in order to provide the same amount of energy as the two proposed wind turbines, several good-sized solar panels would have to be installed, which would take up much more space than the two planned turbines. This would result in a larger footprint, which would likely result in greater environmental impacts, including the destruction of more wetlands.
	Will it be possible for companies in Salluit to participate in the maintenance and repair of the turbines during the operation period?	TUGLIQ responded that during the operation phase of the planned wind turbines, employees will have to be hired to ensure their maintenance and proper functioning. It is possible that employees from the local communities (Salluit and Kangiqsujuaq) will be hired for this task. The repair of the wind turbines will be a complex task that will require highly qualified personnel. However, it will be possible to train local personnel (from Salluit and Kangiqsujuaq), who will be able to assist the outside personnel during eventual repairs.
	Will the two planned wind turbines be built on or near the water?	TUGLIQ responded that the two planned wind turbines would be built on land, at a distance from the water bodies. For example, they will be located just over 3 km from the nearest lake (Lac du Bombardier).
	TUGLIQ should build wind turbines in Salluit.	TUGLIQ responded that if the Northern Village of Salluit wishes to have wind turbines, the village authorities can make a request to the company. The company will be very happy to come and build one or more wind turbines in the community if it has a contract to do so.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Northern Village of Puvirnituq (April 2023)	The Village's Deputy Mayor says he likes the idea of reducing diesel consumption at the EXPO site, which would be very good for the environment.	TUGLIQ indicated that the primary goal of the project is indeed to reduce diesel consumption at the EXPO site. TUGLIQ further explained that the use of a wind turbine of the planned design at the EXPO site would reduce diesel consumption by 2 million liters per year.
	The mayor asked TUGLIQ to clarify whether CRI is going to build the wind turbines or whether it plans to do so.	TUGLIQ responded that the environmental assessment process for the project is still underway. Thus, the endorsement has not yet been given by the KEQC and the MELCCFP. It is therefore still a project.
	The Deputy Mayor wanted to know how long the turbines are expected to last and if there is a high risk of breakage.	TUGLIQ responded that the expected life span of the two planned wind turbines is 25 to 30 years. TUGLIQ added that it operates two similar wind turbines at the Raglan mine site and that there have been no major breakdowns on these two turbines since they began operating in 2014.
	The Deputy Mayor wanted to know if it will be possible to store the energy produced by the two proposed wind turbines.	TUGLIQ responded that the project does indeed plan to store the energy produced by the two planned wind turbines so that it can continue to power the EXPO site when winds are low.
	The mayor indicated that the people of Puvirnituq would like to see the EXPO mine site in the spring, when the snow melts, so that they can see the amount of dust, tailings and sediment produced by the mine flowing into the Puvirnituq River. The mayor reminds us that this river is used by many people in the community for different activities and that it also serves as a source of drinking water for the village. The mayor underlines that he would like TUGLIQ to communicate the request of the village to CRI.	TUGLIQ has indicated that it will forward the application of the Northern Village of Puvirnituq to CRI. However, TUGLIQ added that it cannot make any commitment on behalf of CRI. The members of the Northern Village Council mentioned that they fully understand TUGLIQ's position and thanked the company for passing on the message to CRI.

Table 1 Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Northern Village of Puvirnituq (April 2023)	A Councillor wanted to know how long and why TUGLIQ has been named as such.	TUGLIQ indicated that the company took this name when it was created about 10 years ago. The founder of TUGLIQ loves Nunavik and wanted a name in Inuktitut since the company's first major project was the installation of two wind turbines at the Raglan mine. TUGLIQ explained that its name means "the next one" in reference to the next source of energy, which is wind power.
	A Councillor wanted to know how long TUGLIQ has been involved in this project.	TUGLIQ indicates that the present project was initiated in 2019, when CRI approached TUGLIQ for the construction of wind turbines at the EXPO site. If the agreements are given by the various authorities, the construction should start during the year 2023.
	A Councillor wanted to know if TUGLIQ is involved in other wind projects elsewhere in Canada.	TUGLIQ recalled that it operates two wind turbines at the Raglan mine. The company also has a few projects under development in Nunavut.
	A Councillor wanted to know if TUGLIQ ever works in conjunction with *Les énergies Tarquti*.	TUGLIQ indicated that it is aware of *Les Énergies Tarquti*. However, it has no projects related to this company.
	A Councillor wanted to know if this project could include the installation of solar panels.	TUGLIQ indicated that solar panels are often an interesting technology, but that it is not the most advantageous technology for CRI to use to supply energy to the EXPO site. TUGLIQ explained that the sun is not always present in Nunavik, especially during the winter months when the period of sunshine is shorter. On the other hand, the wind blows almost constantly at the EXPO site, which is a very interesting condition for the use of wind turbines. TUGLIQ also explained that in order to provide the same amount of energy as the two proposed wind turbines, several good-sized solar panels would have to be installed, which would take up much more space than the two proposed wind turbines. This would result in a larger footprint, which would likely result in greater environmental impacts, including the destruction of more wetlands.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Northern Village of Puvirnituq (April 2023)	A Councillor wanted to know what will happen to the proposed wind turbines when they reach the end of their useful life or when CRI ceases operations at the EXPO site.	TUGLIQ explained that if CRI's activities at the EXPO site are terminated before the two projected wind turbines have reached the end of their lifespan, the local communities (Kangiqsujuaq and Salluit) will be offered the opportunity to recover them. If the local communities decline the offer, the turbines will be dismantled and resold to produce energy in another location. If the projected turbines reach the end of their life before CRI ceases operations at the EXPO site, they will be dismantled. The materials will then be removed from the site and transported to another location for proper disposal.
	A Councillor wanted to know how much energy a wind turbine like the ones being planned can produce?	TUGLIQ responded that each proposed wind turbine will be able to produce 8,000 MWh, which is equivalent to the energy consumption of a small village.
	A councillor pointed out that in Nunavik, the winds are often very strong and can blow for long periods of time. He therefore wanted to know how the planned wind turbines will be able to withstand these conditions.	TUGLIQ responded that it is expected that the blade speed of the two planned wind turbines will adjust according to the strength of the wind. Thus, if the winds are very strong, the speed of the blades will be able to slow down. It will also be possible to stop the turbines if the winds are too strong. This will protect the structure of the wind turbines, as well as their internal mechanism. The wind turbines will be able to withstand very strong winds, just like the wind turbines already operated by TUGLIQ at the Raglan mine.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Glencore Canada and Canadian Royalties Inc.	The slight increase in heavy traffic on the access roads leading to the Expo site to transport materials and machinery for the installation of the two proposed wind turbines will not have a significant impact on the current use of these roads.	No answer required.
Kattiniq-Donaldson airport	Request to view documents issued by Transport Canada and NAV Canada regarding this project.	These documents were transmitted on August 16, 2022. Following this, the airport authorities did not comment.
Pingualuit National Park	Concern about the visual impact of the two planned wind turbines from tourist and traditional park use sites (contrast with the natural landscape that characterizes these locations). Concern that the two planned wind turbines may produce "light pollution" that could interfere with the park's intended dark sky preserve certification.	Pingualuit National Park is located more than 23 km from the planned construction site of the two wind turbines. The crater of Lake Pingualuk, which is the main tourist attraction of this park, is located nearly 35 km from the planned construction site. The visual impact caused by the presence of the two planned wind turbines will therefore be very low, even negligible during the day. In addition, the planned wind turbines will each have a flashing white light during the day and a red light at night. The visibility of the turbines at night will be higher than during the day. During the day, the white lights of the turbines will blend in with the color of the turbines, the color of the sky and sun, and the light of the Expo site, so the impact is considered low. At night, the lights will be more visible as they will be red and flashing and will contrast with the environment. TUGLIQ has conducted a simulation of the expected visual effect (see answer to question 21) and is committed to conducting a perception survey of the landscape changes with representatives of Pingualuit National Park, its employees and visitors. This survey will be conducted following the first year of the operation phase of the two turbines and will document the perceptions of park users and representatives regarding the visual impact of the two turbines. This survey will also include a photo shoot to document the visual effect of the turbines. Should two additional turbines be installed at the Expo site, a new survey will be conducted following the first year of their operation.

Table 1: Comments, concerns and questions raised by various stakeholders (cont.)

Stakeholder	Comments, concerns and questions raised	Response or change made
Pingualuit National Park	Concerns about the impact of the two planned wind turbines on wildlife, particularly birds of prey. - Identify the main wildlife movement corridors in the affected area; - Conducting monitoring of potentially affected wildlife species before, during and after construction; - Determine a minimum threshold for wind turbine start-up speed (e.g., start-up threshold set at approximately 5.0 - 6.5 m/s) - Stop the operation of the wind turbines during the fledging period of juvenile birds, as well as during migration periods; - Scaring birds away by sound signals in the vicinity of proposed wind turbines; - Consult the Guide d'intégration des éoliennes au territoire, published by the Government of Quebec, to identify the best practices to be implemented during the construction and operation of proposed wind turbines.	A protection system for avian fauna, based on the programming of various environmental parameters, will be implemented to reduce the risk of collisions. Shutdowns will be implemented only if a problem is detected. A monitoring of the spring migration of birds (mainly raptors) will be carried out in the 2023 spring in order to determine the passage route(s) in the vicinity of the site and to identify potential problems for birds during operation, which will allow the management of the wind turbines to be adapted. The wind turbine will start producing electricity at a wind speed of 3.0 m/s. At this speed it will idle and therefore present only a minor hazard. The turbine will not reach rated speed until wind velocities of 7.0 to 8.0 m/s are reached. Caribou travel corridors are known and monitored by the MELCCFP. Several mitigation measures have been put in place by CRI and are presented in the Wildlife Protection Plan (see Appendix A). These measures will also be respected by TUGLIQ personnel. Wildlife (mammals and birds) surveys were conducted during the impact assessment (pre-project phase). CRI mitigation measures will be applied during the construction phase. Monitoring during the operation phase is also required by the MELCCFP, particularly concerning bird mortality (search for carcasses).
	Would like to have access to the data collected during the various surveys conducted as part of this impact assessment (whether concerning the natural, physical or human environment).	CRI will send an executive summary of the results of the impact assessment and subsequent monitoring studies to Nunavik Parks.

5.1 Inuit villages of Kangiqsujuaq and Salluit

5.1.1 Village of Salluit

In section 4.1.2 (page 73 of volume 1 of the impact assessment studies), the promoter mentions that a two-day visit to the village of Salluit in September 2022 has been scheduled to host "a public consultation session and meet with representatives of the Nordic Village». However, due to bad weather conditions that prevented travel to the village at that time, the visit and the public consultation session did not take place.

QC-13. *The promoter must confirm when it intends to hold a public consultation session in Salluit to present its project to the public and to hear their concerns and comments*.

ANS-13. :

A public consultation session was held at the local radio station in Salluit on April 4, 2023 to present the project to the population. A representative of TUGLIQ Energy presented the broad outlines of the project. He also spoke about the two wind turbines already operated by the company at the Raglan mine site, as well as the results of the impact assessment study conducted in 2022. This public consultation was also intended to be a place of discussion. Thus, following TUGLIQ Energy's presentation, people from the community were invited to call the radio station to ask questions or share their comments, expectations or apprehensions concerning the project. Throughout the session, a person from the community acted as a translator, allowing the TUGLIQ representative and community members to speak in English or Inuktitut. The public consultation lasted a total of two hours.

During the session, 14 people from the community spoke on different topics. Questions were asked concerning the impact of the presence of the wind turbines on the hunting activities of the people of the community, on the economic repercussions that the project could generate for the community, on the risks of breakage, on what will happen to the wind turbines at the end of their lifespan, or on the possibility that TUGLIQ Energy could build wind turbines for the people of Salluit (within the community or to supply camps located on the territory). All of the questions asked by the people of Salluit and the answers provided by TUGLIQ Energy are presented in Table 1, under answer 12 and answering question QC-12.

In addition to conducting a public consultation on the local radio station, TUGLIQ Energy representatives also took advantage of their presence in the community of Salluit to meet with two representatives of the Northern Village on the afternoon of April 4, 2023. The assistant to the general manager of the municipality (Mr. Sam Gordon), as well as the senior coordinator of the municipality (Mr. Lukasie Amamatuak) were present during this meeting. The meeting was an opportunity to present the various aspects of the project and to discuss the results of the impact assessment to be conducted in 2022. The meeting also allowed the two representatives of the Northern Village to ask questions and make comments regarding the project. In particular, the two men wanted to know if the project will be able to supply electricity to camps owned by people from Salluit and located in the vicinity of Deception Bay and Duquet and Françoys-Malherbe lakes. The two men also wanted to know if the two wind turbines would be owned by TUGLIQ or CRI. They also mentioned that they like the fact that the project aims to reduce CRI's diesel consumption at the EXPO site. They feel that this would be good for the environment. They added that a reduction in the purchase of diesel by the mining company will result in a decrease in its expenses and therefore a greater profitability of its activities on the territory of the PNNi. They therefore deduce that the project could result in CRI paying more royalties to the community in relation to the operation of the EXPO site. All of the questions asked by the two representatives of the Northern Village of Salluit, as well as the answers provided by TUGLIQ Energy, are presented in Table 1 in response 12 and answering question.

Photo 2: Public consultation session held on Salluit local radio on April 4, 2023.

6 Impact identification and assessment

6.1 Impact on biological environment

6.1.1 Flora of terrestrial and wetland environments

6.1.1.1 Building phase

In Table 6-13 (page 166 of Volume 1 of the impact assessment studies), the promoter mentions that a direct impact (permanent loss) of 467 m^2 will occur on the wetlands.

QC-14. *The promoter must demonstrate that all measures have been taken to avoid and minimize losses to wetlands. Permanent losses due to the construction will have to be re-justified at the time of submission of the application for ministerial authorization under section 22 of the Environmental Quality Act (Loi sur la Qualité de l'environnement). Finally, the promoter must commit to the restoration of disturbed sites as provided for temporary losses and provide additional mitigation measures to compensate for permanent wetland losses.*

ANS-14. :

Wetland losses will be caused by the road construction (59%) and the electrical cable routing (41%). The electrical cable would be installed directly on the ground when it is frozen, thus not altering the hydrology in the area.

Several access road alternatives were investigated (Map 2-1 of the impact assessment study, see below Figure 2) in order to avoid and minimize loss of wetlands and water environments. The selected scenario (No. 4) is the one that presents the least technical constraints (cliff avoidance) and has the least impact on wetlands and water environments.

A site characterization studies as well as the justification of the choices presented in the impact assessment study will also be submitted to the MELCCFP at the time of the request for ministerial authorization under section 22 of the Environment Quality Act.

The dismantling and reclamation of the wind farm will be part of the cessation of operations at the mine and will be handled by Canadian Royalties Inc. (CRI). CRI agrees to respect the "Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec" of the Ministère de l'Énergie et des Ressources Naturelles. To this end, financial compensation from CRI will be used to fund research projects to improve site reclamation in a northern context.

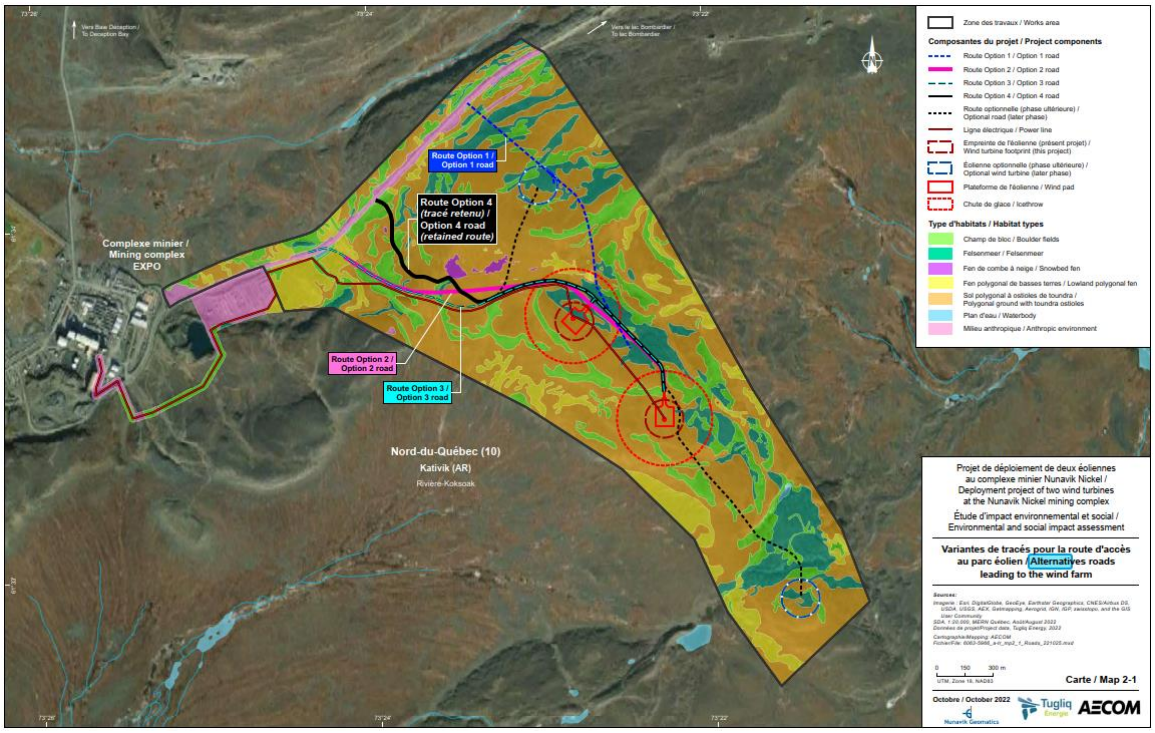

Figure 2: Alternative roads leading to the wind farm

In Table 6-13 (page 166 of Volume 1 of the impact assessment studies), the promoter mentions that an indirect impact (temporary loss) of 3,944 m^2 will affect the wetlands. The work will require the presence of heavy vehicles, excavators, concrete mixers, a crane, as well as trailers for the workers and equipment for the wind turbine installations. The maps, plans and specifications do not identify where these temporary disturbances will be located.

QC-15. *The promoter must specify what the work in question consists of and identify, where applicable, areas of temporary encroachment into wetlands and water environments. In addition, the promoter must specify the methods of remediation of disturbed sites and commit to restoring them.*

ANS-15. :

The indirect impact mentioned in Table 6-13 applies only to the operation phase. It is mentioned in the section 6.3.1.2 that indirect impacts are taken into consideration in areas where ice may fall from the rotation of the wind turbine blades. An area of approximately 500 m in diameter around the turbines was considered for this indirect impact. Although the risk of falling ice is possible only in winter when the ground is frozen, this impact was nevertheless considered since the fall of a piece of ice could slightly modify the configuration of the land or damage the vegetation when it is not covered with much snow.

No additional encroachment is planned beyond the proposed access road footprint, the wind pad and the transmission line (electrical cable installed on the ground). Work involving the presence of heavy vehicles and materials (gravel, wind turbines, construction trailers, etc.) will therefore be carried out entirely within the direct impact zones as mentioned in the section 3.3.1.3 of the impact study. The wind pad will be used as work areas for the storage of equipment and materials during the construction phase.

All engineered structures will be maintained until the end of the life of the wind turbines, 25 years after construction. As mentioned in question 14 (QC-14), the dismantling and restoration of the wind farm will be the responsibility of CRI.

6.1.1.2 Mitigating Measures

The mitigation measures described in section 6.3.1.4 (page 167 of Volume 1 of the impact assessment studies) do not include specific measures for status species or biodiversity.

QC-16. *The promoter must provide mitigation and/or follow-up measures regarding potential impacts on biodiversity that were characterized during the preliminary studies, particularly status species identified in the study area.*

ANS-16. :

Tremblay's (2006) study mentions 84 different vascular plant species in the area of NNiP, specifically on the Ivakkak, Méquillon and Expo sites. In 2022, an inventory conducted in the Delta area identified 99 different vascular plant species (AECOM and Canadian Royalties Inc., 2023). The floristic inventory carried out in the area where the wind turbines will be installed in the summer of 2022 led to the identification of 46 species, which is less than half of the diversity of species recorded on the site of NNiP. Of these, none are particular to the site of the wind turbines.

Floristic species with at-risk status have been identified on the site of NNiP during previous studies (Génivar, 2007; AECOM, 2022; CDPNQ, 2022). Quebec Natural Heritage Data Center (Centre de données sur le Patrimoine naturel du Québec – CDPNQ) also mentions the presence of the Ellesmere Island draba (Draba subcapitata), classified as a species likely to be designated at-risk or vulnerable in Quebec, northeast of the Expo mining camp, 3.7 km from the South Expo area.

Table 2 reports the potential status species at the wind turbine site.

Table 2: Plant species of at-risk status present on the NNiP **territory.**

Nom scientifique	Nom vernaculaire	Statut
Cephaloziella uncinata	Hooked Threadwort	Likely to become at risk
Draba arctica	Arctic draba	Likely to become at risk
Draba cayouettei	Cayouette's draba	Likely to become at risk
Draba corymbosa	Flat-top draba	Likely to become at risk
Draba micropetala	Small-flowered draba	Likely to become at risk
Draba pilosa	Pilose draba	Likely to become at risk
Draba puvirnituqii	Puvirnituq Mountain draba	Likely to become at risk
Draba subcapitata	**Ellesmere Island draba**	**Likely to become at risk**
Grimmia sessitana	*Grimmia sessitana*	Likely to become at risk
Ranunculus sulphureus	Sulphur buttercup	Likely to become at risk
Sabulina rossii	Ross' stitchwort	Likely to become at risk

An intensive search for plants with at-risk status was therefore conducted in the construction area in the summer of 2022, with a particular focus on the species mentioned in Table 2. During this inventory, no plant with at-risk status was listed. The main taxa found in the wetlands of this area are bryophytes, sphagnum and sedges while the taxa found in terrestrial environments are mainly sedges, the tufted hairgrass (Deschampsia cespitosa), the arctic cinquefoil (Potentilla hyparctica) and the four-angled mountain heather (Cassiope tetragona). It should be noted that the tufted hairgrass was removed in 2008 from the list of species likely to be designated as threatened or vulnerable according to the Act Respecting Treathened or Vulnerable Species.

In instances where plants of at-risk status are found on the site, mitigation measures are provided for in Annex 7 established by the Committee Nunavik Nickel (CNN, mitigation measures ESP1 to ESP4). Given the absence of any rare plants on the site of the wind turbines, mitigation measures have been defined to minimize impacts on habitat, on terrestrial and wetland environments (section 6.3.1.4 of the impact assessment study), but none has been specifically designed for plant species with at risk status.

Among the wildlife species identified on or near the wind turbine site, only the peregrine falcon has a legally protected status. A nest of peregrine falcon has been located within a 20 km radius south of the proposed turbine site. Following this observation, the MELCCFP (wildlife sector) has planned a telemetry survey of the pair, which will provide more information on their habitat use. This study will be financially supported under existing agreements between the Regional Wildlife Branch and the company.

In addition to the peregrine falcon telemetry study, mitigation measures to minimize impacts on the general avian fauna and mammals are presented in sections 6.3.2.4 and 6.3.3.4 of the impact assessment study respectively.

6.1.2 Caribou and other mammals

6.1.2.1 Construction phase

In the section 6.3.3.1 (page 177 of volume 1 of the impact assessment study), the promoter mentions that there were no collisions between trucks and caribou in 2021. This time frame does not provide a true representation of the direct mortality and frequency of disruption caused by the road network.

QC-17. *The promoter must provide sightings and collision data since the beginning of the annual monitoring, conducted by CRI, to document collisions between caribou and trucks on the roads (including the one linking the Expo site to Deception Bay).*

ANS-17. :

Collisions with caribou reported in annual CRI monitoring;

CRI's environmental monitoring program for collisions with caribou (monitoring #18) indicates that no collisions have occurred on the roads of the mining complex, but that collisions have occurred on Glencore's road leading to Deception Bay (Table 7-30). Between 2011 and 2022 five collusions have occurred implicating vehicles these roads and none within NNiP site operations area. All collisions occurred in July at the height of the migration. It was also noted that the collisions typically occurred either in the evening or at night when visibility was reduced. One collision in 2014 occurred during very foggy conditions that reduced visibility nearly to zero. Table 3 reports all incidents that have occurred since 2011.

Table 3: Collisions with Caribou having Occurred on the NNiP's Roads Between 2011 and 2022.

Date	Hour	Km	Road	Type of vehicle	# of deceased caribou
07-07-2014	Night	24	Katinniq – Déception Bay[A]	Truck	1
30-07-2018	00h15	6	Katinniq – Déception Bay	Truck and trailer	2
11-07-2019	20h00	56	Katinniq – Déception Bay	Truck with load	1
10-07-2020	1h30	14	Katinniq – Déception Bay	Truck with load	1
Total					**5**

[A]: This road is under the responsibility of Glencore.

Observations :

Noise sources and human presence may limit the use of areas located on the periphery of mining facilities, as indicated in the impact review by COSEWIC (2017). According to observations collected between 2020 and 2022 by CRI for the Méquillon deposit exploitation site, caribou continue to remain in the vicinity of the mining sites (see Tables 4 to 6). Some of the observations are estimates, since a very large number of caribou may be observed from time to time. These observations occur between June and September, during the migration period (see Figures 3 to 5 for details of observations over time). In 2020, 1,704 caribou sightings were reported, with the majority occurring in July. For the year 2021, only 585 sightings were reported, with a peak of sightings in early August. In 2022, 4,200 caribou sightings were compiled, with a peak in mid-July.

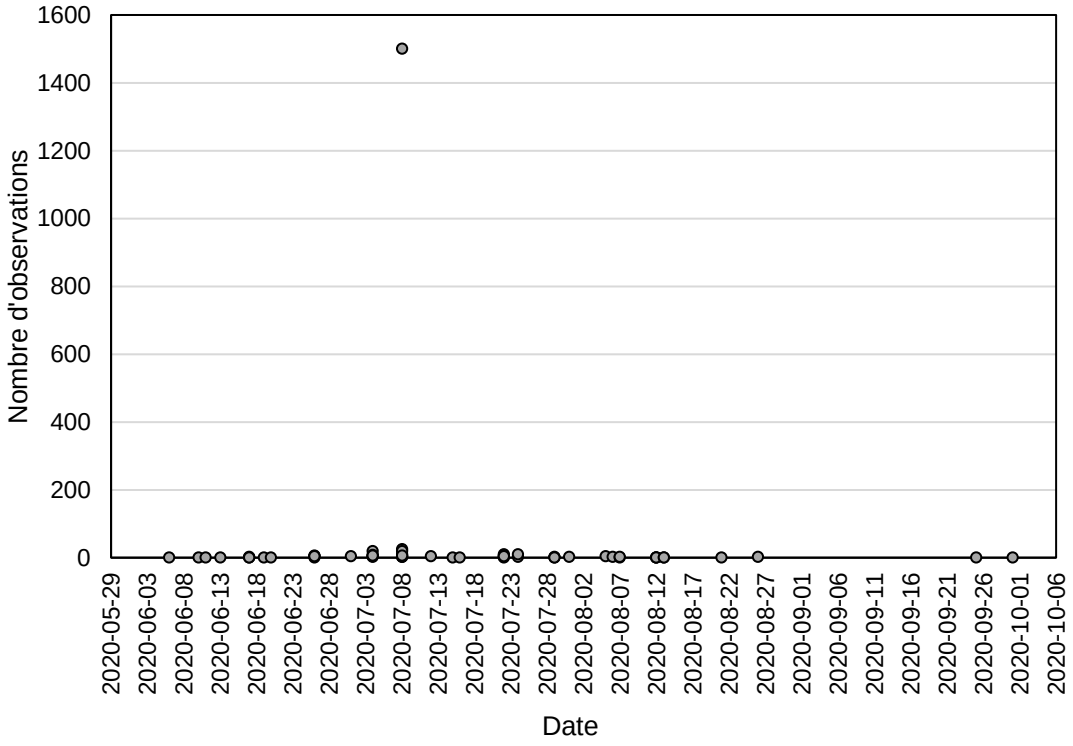

Figure 3: Caribou observations in the Méquillon area in 2020

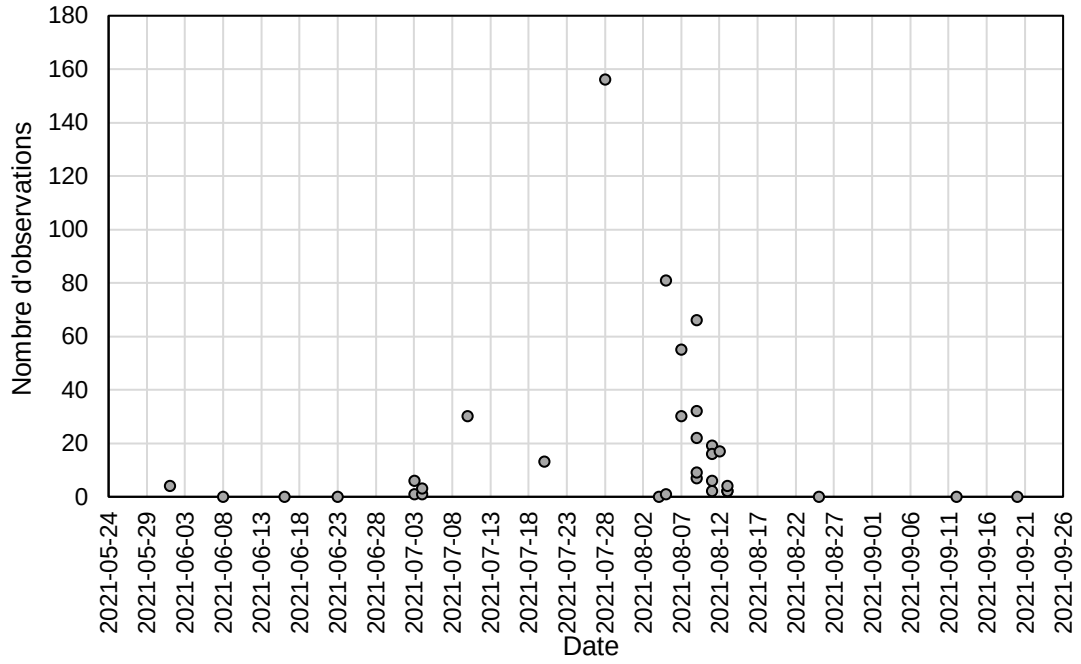

Figure 4*:* **Caribou observations in the Méquillon area in 2021**

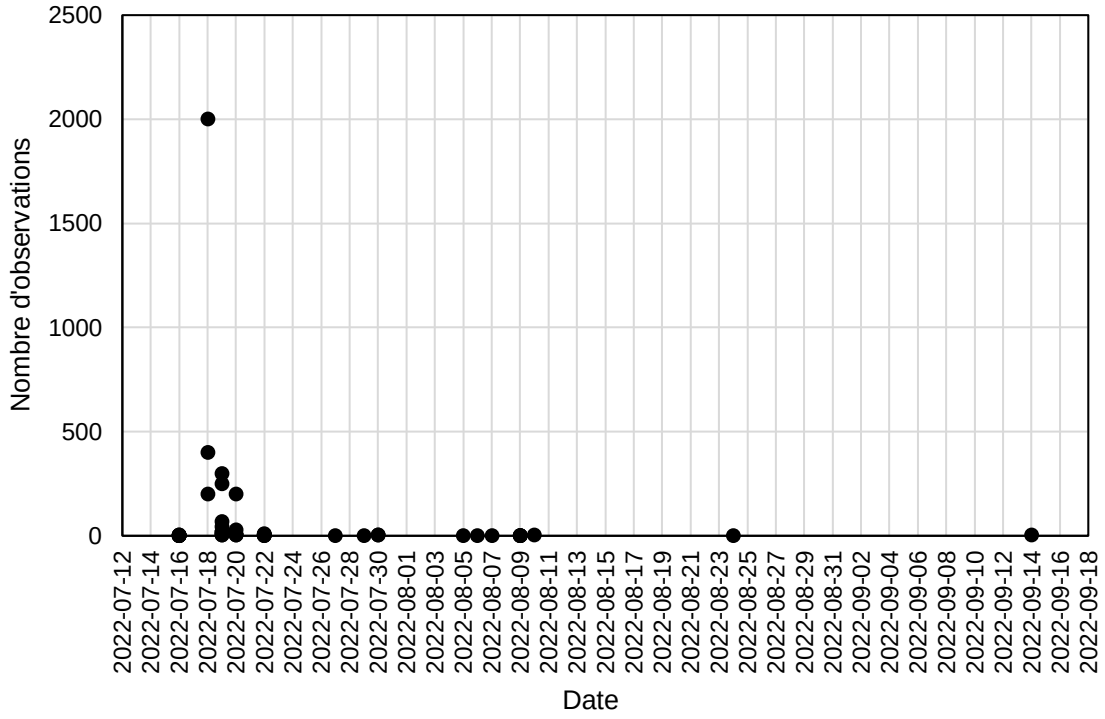

Figure 5*:* **Caribou observations in the Méquillon area in 2022**

Table 4: Caribou observations in the Méquillon area in 2020

Date	Number	Site	Location	Destination	Comments
2020-06-06	0			Esker Méquillon	
2020-06-10	0				
2020-06-11	0			Esker Méquillon	
2020-06-13	0			Méquillon Pit	
2020-06-17	1	North side of road	Km 3,5	Méquillon Pit	
2020-06-17	2	South side of road	Méquillon Quarry	Méquillon Pit	
2020-06-17	1	North side of road	Km 14	Méquillon Pit	
2020-06-19	0			Méquillon Pit	
2020-06-20	0			TR3	
2020-06-26	6	South side of road	Km 12	TR3	
2020-06-26	1	South side of road	Km 13		
2020-06-26	4	South side of road		Esker Méquillon	
2020-06-26	4	North side of road		TR2	
2020-07-01	4	South side of road	Km 3,5	Tr2	
2020-07-04	2	South side of road	Km 6		
2020-07-04	20	South side of road		Tr3	
2020-07-04	8	South side of road	Km 11		
2020-07-04	5	North side of road	Km 13		
2020-07-04	6	South side of road		Tr 2	
2020-07-08	10	North side of road	Km 1		
2020-07-08	3	South side of road	Km 2		
2020-07-08	3	South side of road	Km 4		
2020-07-08	25	South side of road		Tr 2	
2020-07-08	1500	South side of road	Km 7-MEQ		Estimation
2020-07-08	5	North side of road		Tr 2	
2020-07-08	20	South side of road	Km 13		
2020-07-08	6	North side of road	Km 18		
2020-07-12	4	South side of road	Km 17		
2020-07-15	1	South side of road	Km 13		

Table 4: Caribou observations in the Méquillon area in 2020 (cont.)

Date	Number	Site	Location	Destination	Comments
2020-07-16	0				
2020-07-22	10	North side of road	Km 4	Méquillon	
2020-07-22	3	North side of road	Km 6	Méquillon	
2020-07-22	1	North side of road	Méquillon Quarry	Méquillon	
2020-07-22	7	North side of road	Km 12	Méquillon	
2020-07-22	4	North side of road	Km 14	Méquillon	
2020-07-24	3	North side of road	Km 1.5	TR2	
2020-07-24	10	North side of road	Km 3	TR2	
2020-07-29	1	North side of road	Km 1	Méquillon	
2020-07-29	2	North side of road	Km 10	Méquillon	
2020-07-29	1	North side of road	Méquillon North Camp	Méquillon	
2020-07-31	2	North side of road	Km 4	TR2	
2020-08-05	5	North side of road	Km 2	Méquillon	
2020-08-06	3	South side of road	Km 2	Méquillon	There was one north of the road at km 2 and one south, the other was at TR2 to the south
2020-08-07	1	North side of road	Km 2	TR2	
2020-08-07	2	North side of road	Km 3	TR2	
2020-08-12	1	South side of road	Km 5		
2020-08-12	1	South side of road		TR2	
2020-08-12	1	North side of road	Km 1		
2020-08-13	1	North side of road		TR 2	
2020-08-13	1	North side of road	Km 15		
2020-08-21	1	South side of road		TR 2	
2020-08-26	2	South side of road	Km 2		
2020-09-25	0				
2020-09-30	0				End of the observation period; the migration is over
Total					**1704**

Table 5*:* **Caribou observations in the Méquillon area in 2021**

Date	Number	Site	Location	Destination	Comments
2021-06-01	4	South side of Méquillon road	Km 8.5	To Expo	1 male, 2 females et 1 juvenile
2021-06-08	0	N/A	N/A	N/A	RAS
2021-06-16	0	N/A	N/A	N/A	RAS
2021-06-23	0	N/A	N/A	N/A	RAS
2021-07-03	6	Méquillon road	Km 7	To expo	1 male, 3 females, 2 juveniles
2021-07-03	1	North side of Méquillon road	Tr4	N/A	1 female
2021-07-04	1	South side of Méquillon road	Km 16	To Expo	1 male
2021-07-04	3	South side of Méquillon road	Tr4	To Expo	3 females
2021-07-10	30	South side of Méquillon road			
2021-07-20	13	Before Cominga (MEQ to Expo)	Tr2	To Expo	13 caribou fairly scattered
2021-07-28	156	All on South side of Méquillon road	In several places along the road back to Expo: 36 at TR4, 6 at TR3, 78 between km 7 and 8, 2 at TR2, 2 at Cominga level, 27 around km 3	To Expo	Mostly females, often accompanied by their calves of about 1 month old; a few males in the background or accompanied by only one female; several juveniles whose sex was difficult to distinguish from a distance because they were not yet antlered; beginning of coat color change in most individuals
2021-08-04	0	N/A	N/A	N/A	RAS
2021-08-05	81	All on North side of Méquillon road	76 individuals around Tr-3 and 5 individuals at km 3	To Expo	Mostly females, often accompanied by their 1-2 month calves; I counted 3 mature males (possibly more) whose antlers had lost their velvet; several juveniles whose sex was difficult to distinguish from a distance; most individuals had either finished moulting or were in the final stages of moulting
2021-08-05	1	North side of Méquillon road	Near the waste rock pile of Expo deposit	To Expo	Male

Table 5*:* **Caribou observations in the Méquillon area in 2021 (cont.)**

Date	Number	Site	Location	Destination	Comments
2021-08-07	55	North side of Méquillon road	Approximately 40 individuals passed at TR-2 to Méquillon	To Méquillon	Mostly females, often accompanied by their calves of about 1-2 months; the herd was quite heterogeneous; I was not able to count the number of each category, too far away
2021-08-07	30	North side of Méquillon road	15 individuals near the waste rock pile of Expo- about 30 near Cominga	To Expo	Mostly females, often accompanied by their calves of about 1-2 months; the herd was quite heterogeneous; I was not able to count the number of each category, too far away
2021-08-09	7	North side of Méquillon road	Km 7 of Méquillon Quarry	To Méquillon	1 calf, 2 juveniles, 2 males et 2 females
2021-08-09	9	North side of Méquillon road	TR-2	To Méquillon	1 calf, 4 uveniles, 2 males 2 females
2021-08-09	22	North side of Méquillon road	Cominga	To Méquillon	5 males, 7 calves, 4 uveniles, 6 females
2021-08-09	66	North side of Méquillon road	Cominga	To Méquillon	Heterogenous
2021-08-09	32	North side of Méquillon road	Km 3	To Méquillon	3 males, 2 uveniles, 7 calves, 4 females (heterogenous)
2021-08-11	2	North side of Méquillon road	Méquillon quarry	To Expo	Females
2021-08-11	19	North side of Méquillon road	Km 3	To Méquillon	14 adults, 5 calves
2021-08-11	16	North side of Méquillon road	Km 1.5	To Méquillon	4 males
2021-08-11	6	North side of Méquillon road	Km 1		4 adutls, 2 calves
2021-08-12	17	North side of Méquillon road	Km 3	To Méquillon	17 adults, 4 calves
2021-08-13	2	North side of Méquillon road	Km 1	To Méquillon	2 adults
2021-08-13	2	North side of Méquillon road	Km 12.5	To Méquillon	2 adults
2021-08-13	4	North side of Méquillon road	14	To Vers Expo	4 adults
2021-08-25	0	N/A	N/A	N/A	None
2021-09-12	0	N/A	N/A	N/A	None
2021-09-20	0	N/A	N/A	N/A	None
Total					**585**

Table 6*:* **Caribou observations in the Méquillon area in 2022**

Date	Number	Site	GPS Coordinates	Destination	Comments
2022-05-14	0	1 km à l'ouest de la carrière 3,5	18 V 551317 6817541	Inconnu	Declaration of a worker Mining, traces were observed
2022-05-20	0	N/A	N/A	N/A	None
2022-05-24	0	N/A	N/A	N/A	None
2022-05-30	0	Route Ivakkak	N/A	N/A	None
2022-05-29	0	N/A	N/A	N/A	None
2022-06-05	30	TR3	18 V 572579 6821946	Inconnu	Adults, either lying down or eating
2022-06-05	30	Km 2	18 V 579942 6824626	Inconnu	Adults, either lying down or eating
2022-06-06	8	MQN-TR7	18 V 559174 6818164	West	On the move
2022-06-09	9	Km 14 sud de la route	18 V 569856 6820494	Inconnu	On the move
2022-06-12	4	Carrière 3,5	18 V 552473 6817888	West	Adults
2022-06-13	23	Km 7 sud	18 V 573669 6822410	West	Adults
2022-06-13	4	Km 8 sud	18 V 576409 6823843	West	Adults
2022-06-13	9	Km 8,5 sud	18 V 576095 6823772	West	Adults
2022-06-13	3	Km 10 sud	18 V 573669 6822410	West	Adults
2022-06-13	12	Km 5,5	18 V 578554 6824159	West	Adults
2022-06-13	7	Km 5	18 V 579168 6824259	West	Adults
2022-06-13	6	Km 4	18V 579474 6824368	West	Adults
2022-06-15	6	Km 6 sud	18V 577428 6824270	West	Adults
2022-06-15	6	Km 7 sud	18 V 573669 6822410	West	Adults
2022-06-15	2	Km 9 sud	18 V 575833 6823215	West	Adults
2022-06-15	4	Km 14 sud	18 V 569856 6820494	West	Adults
2022-06-15	2	TR-5	18 V 564813 6820892	West	Adults
2022-06-15	7	TR-7	18 V 559174 6818164	West	Adults
2022-06-15	10	UTE S	18 V 568705 6820426	West	Adults
2022-06-21	11	Km 5,5 sud	18 V 578554 6824159	Aucun	Adults, either lying down or eating

Table 6*:* **Caribou observations in the Méquillon area in 2022 (cont.)**

Date	Number	Site	GPS Coordinates	Destination	Comments
2022-06-22	2	Km 7 sud	18 V 573669 6822410	Aucun	Adults, either lying down or eating
2022-06-23	1	Km 10 sud	18 V 573669 6822410	Aucun	Adults, either lying down or eating
2022-06-23	15	Entre la carrière MQN et TR2 au sud	18 V 576193 6824881	Aucun	2 calves observed about 150-200m from the road; report of exploration workers
2022-06-24	20	Carrière MQN	18 V 574313 6824287	Aucun	Adults, either lying down or eating
2022-06-24	3	Km 15 nord	18 V 569399 6822988	Aucun	Adults, either lying down or eating
2022-06-25	1	Km 12,5 nord	18 V 574019 6824945	Aucun	Adults, either lying down or eating
2022-06-27	3	Km 12,5 sud	18 V 574973 6823578	Aucun	Adults, either lying down or eating
2022-06-27	14	Km 3 sud	18 V 580067 6825220	Aucun	Adults, either lying down or eating
2022-06-27	9	Km 1 nord	18 V 581180 6825899	Aucun	Adults, either lying down or eating
2022-06-27	10	Entre carrières Q3,5 et Q4	18 V 553700 6817819	Aucun	Adults and a few calves; they are not found near infrastructure and/or structures but more in the middle of the tundra; about 500 m to 1 km from roads
2022-07-01	3	Km 1,5 nord	18 V 581154 6825533	Aucun	Adults, either lying down or eating
2022-07-01	6	Km 6,5 sud	18 V 575240 6823070	Aucun	Adults, either lying down or eating
2022-07-01	7	Km 7 sud	18 V 573669 6822410	Aucun	Adults, either lying down or eating
2022-07-01	2	Km 9 nord	18 V 574821 6822771	Aucun	Adults, either lying down or eating
2022-07-01	2	Km 10 sud	18 V 573669 6822410	Aucun	Adults, either lying down or eating
2022-07-05	4	Km 1 nord	18 V 581227 6825843	Aucun	Adults, either lying down or eating
2022-07-05	3	Km 6 nord	18 V 575789 6824047	Aucun	Adults, either lying down or eating
2022-07-05	11	Km 8,5 sud	18 V 575338 6822895	Aucun	Adults, either lying down or eating
2022-07-05	10	Km 11,5 sud	18 V 572579 6821946	Aucun	Adults, either lying down or eating
2022-07-05	12	Km 13,5 sud	18 V 571909 6821692	Aucun	Adult caribou accompanied by 2 calves about 200 m from the road, the group moved eastward as the vehicle approached
2022-07-05	1	Km 16 nord	18 V 572595 6821787	Aucun	Adults, either lying down or eating
2022-07-06	20	TR2	18 V 577428 6824270	Southwest	Caribou, all adults moving southwest; they were scattered, but within 200 m

Table 6*:* **Caribou observations in the Méquillon area in 2022 (cont.)**

Date	Number	Site	GPS Coordinates	Destination	Comments
2022-07-06	1	Carrière 3,5	18 V 552508 6818059	Aucun	Caribou lying in the shade behind a rock about 100 m from the quarry 3.5; there was no activity at the quarry due to the Mining Department's shift change
2022-07-08	4	Km 2 sud	18 V 577428 6824270	Aucun	Adults, either lying down or eating
2022-07-08	3	Km Cominga	18 V 577428 6824270	Aucun	Adults, either lying down or eating
2022-07-08	7	Km 7 sud	18 V 574545 6822612	Aucun	Adults, either lying down or eating
2022-07-08	2	Km 10 sud	18 V 574527 6822907	Aucun	Adults, either lying down or eating
2022-07-08	3	Km 16 sud	18 V 564458 6821020	Aucun	Adults, either lying down or eating
2022-07-11	1	Km 3 sud	18 V 580067 6825220	West	Adults
2022-07-12	4	Km 2 sud	18 V 579942 6824626	Aucun	Adults, either lying down or eating
2022-07-12	3	Km 10 sud	18 V 573475 6823452	Aucun	Adults, either lying down or eating
2022-07-12	1	Km 12 nord	18 V 574317 6825272	North	Adult
2022-07-12	1	Km 12 sud	18 V 575126 6822166	Aucun	Adult
2022-07-13	200	Au bout du chemin Ivakkak	18 V 544688 6812157	Aucun	Mixed, 3 herds were observed (between 200-250) by night workers
2022-07-15	75	TR6	18 V 547283 6816356	Aucun	Mixed, either lying down or eating
2022-07-15	2	TR-2 sud	18 V 577428 6824270	South	Females
2022-07-15	1000+	Rivière Puvirnituq	18 V 577428 6824270	Aucun	5 km from the canyon (Pingualuit Park), some were lying on the snow flanks
2022-07-16	2	TR4 sud	18 V 570420 6820751	North	The caribou were walking quietly south of the road, one of them was starting to moult
2022-07-16	2	Km 13 nord	18 V 570546 6823812	West	1 female with 1 calf, walking north of the road westward along the road
2022-07-16	1	TR4	18 V 570420 6820751	North	One adult appeared to have a limp and was walking down the road creating a traffic jam, appeared tired and stressed, got off the road after 15 minutes. This same caribou was observed on our return and went off the road after 10 minutes to go north
2022-07-16	3	TR4	18 V 570420 6820751	South	2 females et 1 calf

Table 6*:* **Caribou observations in the Méquillon area in 2022 (cont.)**

Date	Number	Site	GPS Coordinates	Destination	Comments
2022-07-16	3	300 m avant Méquillon	18 V 568173 6820955	South	Adults
2022-07-16	1	Km 2	18 V 579942 6824626	South	An adult was walking on the road and was attempting to leave the road to the south, but due to the approaching vehicle, quickly turned around and took a descent to the north
2022-07-16	1	Km 0,2	18 V 581909 6825693	South	An adult caribou started following the road because of the vehicle behind it, after crossing the entire road along the Expo pit, it took a path that leads to Expo South
2022-07-18	2000	Km 14		South	For nearly an hour and a half, operations and traffic stopped; thousands of caribou were crossing the road to the south
2022-07-18	200	TR7	----------	South	Heading south by the hundreds
2022-07-18	400	Ivakkak	18 V 544950 6812300	South	Mixed herd; exploration drilling operations stopped; decision made by the Exploration Department
2022-07-19	3	Km 2 nord	18 V 580827 6826244	Aucun	Adults, either lying down or eating, 100 m from the road to the north
2022-07-19	3	Km 2,5 sud	18 V 581239 6825137	West	Adults, brown
2022-07-19	10	Km 7 sud	18 V 575720 6823333	Aucun	Observed at more than 1 km from the road
2022-07-19	45	Km 11,5 sud	18 V 572493 6821485	Aucun	Mixed herd, adults and calves; some are all brown and others are still white, lying down or eating
2022-07-19	300	Km 12,5 nord	18 V 571333 6821766	Aucun	Mixed herd, adults and calves; some are all brown and some are white, lying down or eating; about 40 are in the water north of the road
2022-07-19	20	Km 13 nord	18 V 571207 6821489	West	The majority of the caribou are still white, moving quietly westward to join a herd further on at 500 m, mixed
2022-07-19	70	Km 13 sud	18 V 570486 6820454	West	Small herd, 3 individuals have a huge antlers, some still have white legs or are spotted brown, eat and move quietly to the west
2022-07-19	20	Km 15 nord	18 V 570131 6821157	East	2 calves and the rest are adults; crossing the road to the east
2022-07-19	250	Méquillon	18 V 568607 6821662	None	Mixed herd with several calves, either lying down or eating within 2 km; cancellation and delay of blasting operations
2022-07-20	3	Km 2,5 nord	18 V 580340 6826263	East	Adults, 100 m north of the road
2022-07-20	7	TR-2 nord	18 V 577297 6824579	South	Adults
2022-07-20	30	TR-2 nord	18 V 578305 6824532	West	Adults and 6 calves, 50 m north of the road
2022-07-20	200	3 km à l'ouest de Ivakkak	18 V 542312 6812431	None	Helicopter overflight; mixed herd scattered over about 500 m, either lying down or eating
2022-07-20	5	Ivakkak	18 V 544950 6812300	None	Adults, either lying down or eating

Table 6*:* **Caribou observations in the Méquillon area in 2022 (cont.)**

Date	Number	Site	GPS Coordinates	Destination	Comments
2022-07-22	1	Km2 nord	18 V 580511 6825871	None	Does not seem to be disturbed by the vehicle, eating grass, no movement
2022-07-22	6	TR2 nord	18 V 577612 6824658	None	Do not seem to be disturbed by the vehicle; the coat is dark and a large male is present with very large antlers
2022-07-22	1	TR2 nord	18 V 577612 6824658	None	Caribou male, dark fur, eats grass so is not moving
2022-07-22	9	Km 10 nord	18 V 574285 6822974	East	3 calves, they go along the hill and move to Expo; 2 calves and 2 females still have white fur
2022-07-22	4	TR7	18 V 558868 6818460	None	2 adults and 2 calves, they are white and do not seem to care about vehicles
2022-07-22	4	Carrière 4	18 V 556519 6818651	East	2 adults and 2 calves, they are white and seem to be heading east towards Ivakkak
2022-07-22	3	Carrière 3,5	18 V 552606 6817939	None	1 calf, it is south of the road, is not moving
2022-07-27	0	Rte Expo- MQN	N/A	N/A	None
2022-07-29	1	TR2 sud	18 V 577428 6824270	East	A calf is eating while walking quietly to the southeast
2022-07-30	3	Km 13 nord	18 V 570546 6823812	West	Adult, calf and young adult heading west about 100 m from the road
2022-07-30	3	Km 9,5 nord	18 V 573344 6822812	None	2 adults and 1 calf; no movement, they were eating, no stress
2022-08-05	0	Rte Expo- MQN	N/A	N/A	None
2022-08-06	0	Rte Expo- MQN	N/A	N/A	None
2022-08-07	0	Rte Expo- MQN	N/A	N/A	None
2022-08-09	1	Méquillon	18 V 568607 6821662	None	Eating on the side of the road, north side, near the pad
2022-08-09	1	TR-2 sud	18 V 577428 6824270	North	Running towards the road
2022-08-09	1	Km 10 sud	18 V 574527 6822907	None	Eat on the lake shore with the geese
2022-08-09	1	TR-3 nord		None	Running in circles
2022-08-10	3	TR-2 sud	18 V 577428 6824270	None	2 adults were eating on the side of the road, and a juvenile white was lying nearby
2022-08-24	0	Route Expo-Méquillon	N/A	None	None
2022-09-14	3	Km 4,5 nord	18 V 570420 6820751	North	2 adults and 1 calf, walking eastward
Total					**4 283**

6.3.3.4 Mitigating Measures

QC-18. *The promoter must agree to strengthening the measure MTR1 (as referred to in table 6-19, page 179 of volume 1 of the impact assessment studies), by requiring workers to respect the decision tree concerning the presence of caribou (figure 6-2) that is available to all workers on the Nunavik Nickel project territory.*

ANS-18. :

The measure MTR1 specifies that workers must be informed, particularly as the calving season approaches, of the risks of disturbance to caribou and workers must be made aware of the appropriate behaviours that workers should adopt with respect to these animals. To this intent, all workers required to drive vehicles will be provided with the decision tree shown in figure 6, to ensure proper behaviour when travelling on the road. Workers are required to always follow this decision tree.

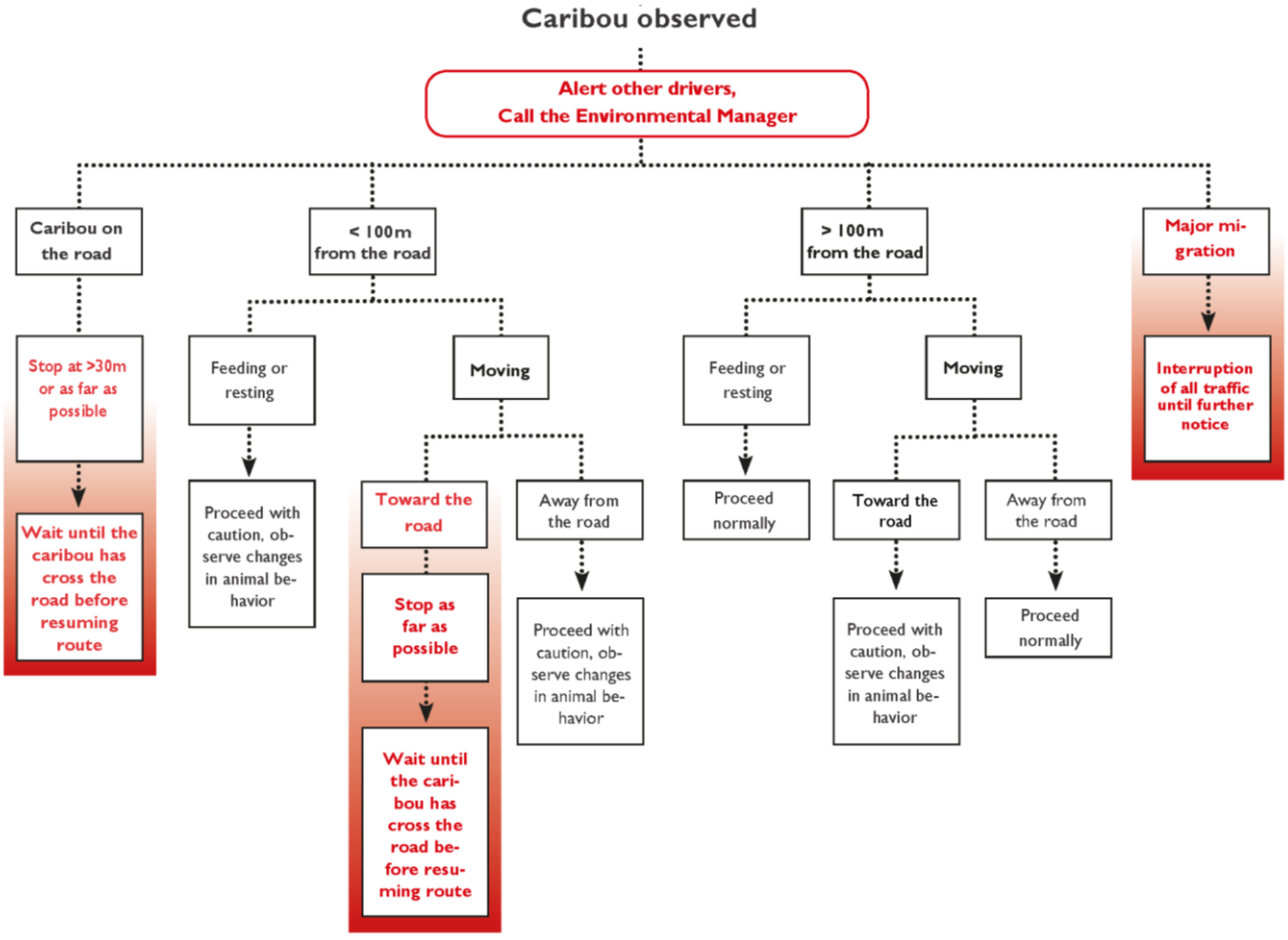

Figure 6: Decision tree for the presence of a caribou at less than 100 m of a road

6.4 Impacts on the human environment

6.4.3 Economy & Employment

For both the construction and the dismantlement phases of the project, the promoter plans to hire about twenty workers, some of whom could come from Inuit communities, and indicates that “there will be mitigation measures in place to limit the change in lifestyle for Inuit who will be working at the affected sites” (page 182 of volume 1 of the impact assessment studies).

QC-19. *The promoter must specify what is meant by « limiting lifestyle changes for Inuit» and if it is the ECO4 mitigation measures presented in the table 6-21, from the Agreement Nunavik Nickel between CRI and its inuits partners, or if they are new mitigation measures specific to the wind farm project.*

ANS-19. :

This is effectively the ECO4 mitigation measure presented in Table 6-21. This measure involves the integration of Inuit workers by informing them of the different living conditions and regulations on the NMP site, workers by describing the different programs available to them. It also includes the application of measures MOE1 to MOE10, which are found in Appendix 7 of the Nunavik Nickel Agreement A signed by CRI and its inuits partners.

6.4.3 Occupation and use of the land by non-Aboriginal people

6.4.3.1 Construction phase

QC-20. *The proponent must consider the conservation objective of the Fjord-Tursukattaq protected area, which aims to protect an area representative of the physiographic ensemble of the Georges Bay high plateau, characterized by an irregular and highly incised relief. The promoter must guarantee that the project will not have an impact on this conservation objective*.

ANS-20. :

The planned Fjord-Tursukattaq Biodiversity Reserve is regulated under the Natural Heritage Conservation Act (L.R.Q.c. C-61.01). This law prohibits, among other things, mining, gas or oil exploitation as well as the exploitation of hydraulic power and any commercial or industrial production of energy.

As mentioned on page 188 of the Impact Assessment study, the planned Fjord-Tursukattaq Biodiversity Reserve is located approximately 30 km from the proposed turbines. The noise produced by the passage of heavy traffic or the realization of the various works during the construction, operation and dismantling phase will not be perceptible there. Moreover, the noise produced by the wind turbines during their operation will not be perceptible at this location and the visual impact of the wind turbines for potential visitors to the biodiversity reserve will be negligible because of their distance (> 30 km). Thus, the realization of the project will have no impact on the conservation objective of this protected area.

6.4.6 Landscape

QC-21. *In addition to Map 6-1 on the description of the landscape and the anticipated visual impact, the promoter must provide simulated photos of the project's operational phase, according to the different visual access zones listed on pages 200 and 201 of Volume 1 of the impact studies. The promoter must also include day and night photo simulations, due to light pollution*.

ANS-21. :

Different visual simulations were carried out from photos taken on the site with the view towards the future wind turbines at several distances. Three sites were selected: Bombardier Lake (3.9 km as the crow flies from the turbines), Rocbrune Lake (nearly 6 km as the crow flies from the turbines), Saint-Germain Lake (a little more than 19 km as the crow flies from the turbines) and Pingualuk Lake Crater (a little more than 33 km as the crow flies from the turbines). For each site, three images are presented, one in the current situation (A), one in the future situation during the day (B) and one in the future situation during the night (C).

A) Current view from Bombardier Lake towards the Expo site and the future wind farm.

B) Visual simulation of wind turbines during the day

C) Visual simulation of the wind turbines at night. The white lights represent the Expo site in operation and the red lights represent the wind turbines.

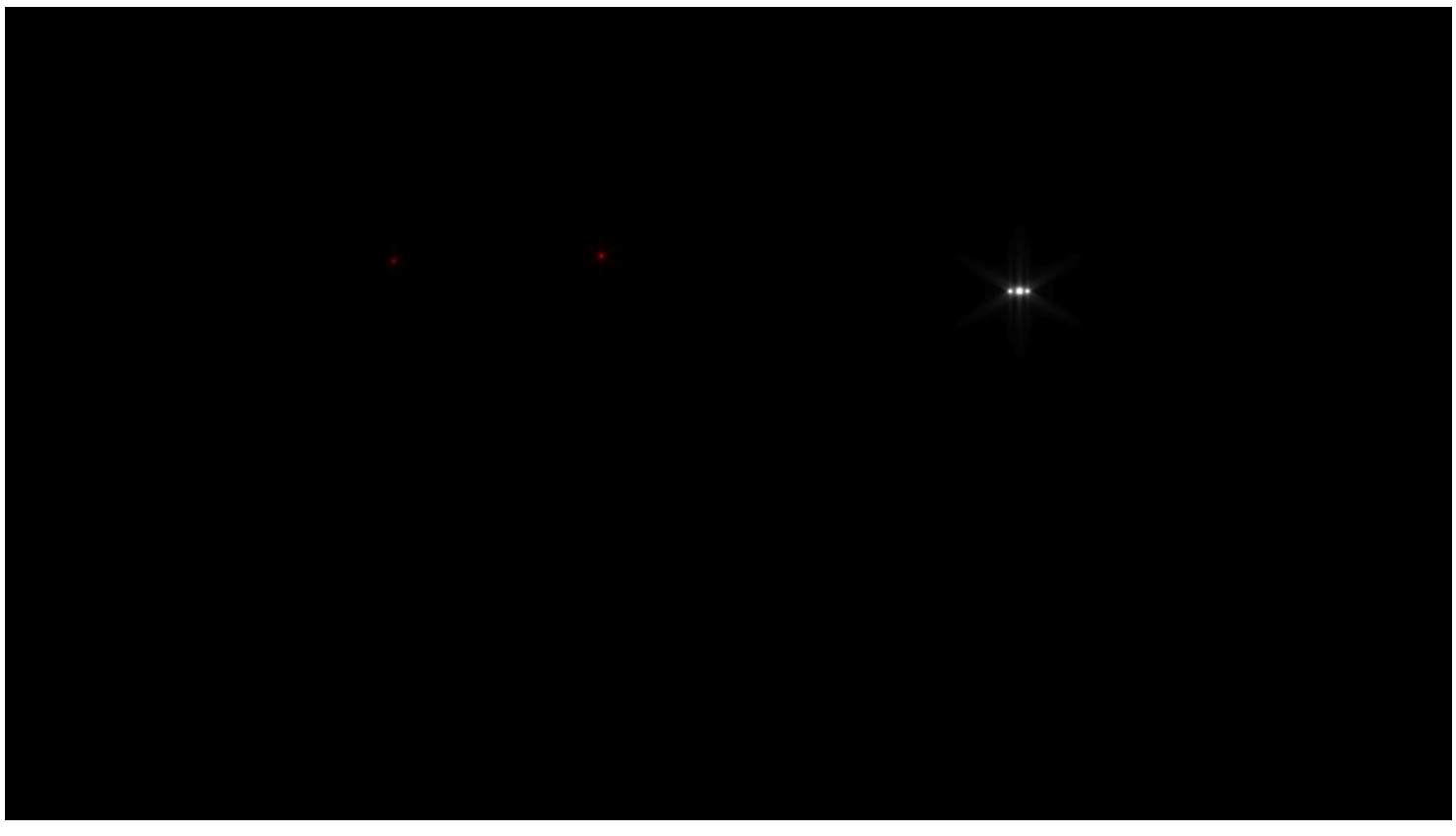

Figure 7: Visual simulations for Bombardier Lake

A) Current view from Lake Rocbrune towards the Expo site and the future wind farm

B) Visual simulation of wind turbines during the day

C) Visual simulation of wind turbines at night. The white lights represent the Expo site in operation and the red lights represent the wind turbines.

Figure 8: Visual simulations for Lake Rocbrune

A) Current view from Lake Saint-Germain towards the Expo site and the future wind farm.

B) Visual simulation of wind turbines during the day

C) Visual simulation of the wind turbines at night. The white lights represent the Expo site in operation and the red lights represent the wind turbines..

Figure 9: Simulations visuelles pour le lac Saint-Germain

A) Current view from the Pingualuk Lake crater towards the Expo site and the future wind farm.

B) Visual simulation of wind turbines during the day

C) Visual simulation of wind turbines at night. The white lights represent the Expo site in operation and the red lights represent the wind turbines.

Figure 10: Visual simulations for Bombardier Lake

7 Environmental monitoring programs

7.1 Environmental program

QC-22. *The proponent must specify whether it will join the monitoring committee already in place for the mining project Nunavik Nickel (Nunavik Nickel Committee) to provide the affected Inuit communities with updated information about the wind power project and the results of environmental and social monitoring, or if it plans instead to set up a monitoring committee specific to its project.*

ANS-22. :

Up-to-date wind project information will be shared by the CRI, user of the energy, as part of the committee Nunavik Nickel of which the company Canadian Royalties is a member. The wind power project will be managed as an integral part of the mine's operations. Information will be shared in a manner similar to what is in place for the exchange of wind turbine activity with the surrounding communities at the Raglan mine site.

The mining company will share the results of the environmental and social monitoring with the local communities within the scope of the committee (the communities of Puvirnituq, Salluit and Kangiqsujuaq).

7.1.1 Bird mortality monitoring

7.1.1.1 Adjustment of the bird protection system based on monitoring results

A protection system for avian fauna, based on the programming of various environmental parameters, will be implemented by the promoter in order to reduce the risks of collisions. In section 8.2.2.2 (page 227 of volume 1 of the impact assessment studies), it is indicated that rapid adjustments to the operation of the turbines can be made if a particular problem is perceived in birds.

QC-23. *The promoter must provide a list of the periods and weather conditions for which the wind turbines will be shut down, after consulting with avian biologists and the communities concerned with this subject.*

ANS-23. :

Monitoring of spring and fall bird migration as well as telemetry survey of peregrine falcons, which will take place in 2023, will further document the use of the territory by avian fauna. This data will allow to anticipate site-specific issues and potential turbine shutdown needs.

Bird mortality monitoring will also be conducted for the two planned wind turbines to follow the recommendations of the protocol for bird and chiropteran mortality monitoring in the context of wind turbine projects in Quebec (*Protocole de suivi des mortalités d'oiseaux et de chiroptères dans la cadre de projets d'implantation d'éoliennes au Québec* - section 8.2.2.1 of the impact assessment study). During these monitoring sessions, the potential cause of the birds' death will be noted. This monitoring must be carried out during the first 3 years of operation of the wind turbines, and every 10 years thereafter. The data analysis of the first years of operation will allow to detect whether significant mortality issues are present during specific periods (migration, nesting) or weather conditions.

There is currently little data on the actual impact of wind turbines on avian fauna in the North. In the North, only one two-turbine wind farm is currently in operation at the Raglan mine. Bird mortality data from this site, located approximately 20 km northwest of the proposed Expo wind turbines, are available for 2015, 2016, 2017, 2019 and 2020, while data for the years 2021 and 2022 are being compiled. The results of the environmental monitoring reports for the years 2015, 2016, 2017, 2019, and 2020 show no mortality since the operation of the two wind turbines. Thus, no programmable shutdown system has been installed. ENERCON, the manufacturer of the wind turbines installed at Raglan, and of those to be built at CRI, proposed to the promoter to install this new feature developed after the installation of the second wind turbine at Raglan on the new project under development. The

promoter TUGLIQ wished to integrate this shutdown system that could be activated in the case that bird mortality was detected. The phenomena observed in southern Quebec do not apply to the Arctic tundra environment. The presence of meteorological phenomena potentially problematic for the birds will be highlighted through this monitoring. It would not be advisable to schedule, for example, a shutdown of the wind turbines during foggy periods, which usually occur when there is no wind and therefore when the turbines will be shut down as a consequence. However, the turbines will be programmed so that any restart is made gradually and not in a rapid manner. Note that the wind farm project is currently limited to 2 wind turbines, and that the goal is to reduce diesel consumption as much as possible during the operation of the NNiP. An extended shutdown schedule for wind turbines, without any justification, could therefore compromise their installation and thus their contribution to the fight against greenhouse gas emissions in the economic development of Nunavik.

7.1.2 Light pollution and visual impact monitoring

At section 8.2.5 (page 227 of volume 1 of the impact assessment studies), it is stated that a light pollution monitoring program is already underway as part of the environmental monitoring activities carried out by the mining company CRI as part of the mining site operations NNiP. The impact of light pollution caused by the addition of the two wind turbines could be part of this monitoring program: « *It could also be improved to take into account several vantage points within the Parc national des Pingualuit and to document the visual impacts of the project, both during the day and at night*». Discussions with representatives of Pingualuit National Park are especially important as the park «*is currently in the application process to have the park's territory recognized as a Dark Sky Reserve*» (page 136 of volume 1 of the impact assessment study).

QC-24. *Given the concerns of the community and the importance it attaches to the natural component of the region, especially for the Pingualuit National Park, with its concerns about the light pollution generated by the two wind turbines planned (page 76 of volume 1 of the impact assessment studies*) *the promoter must agree to complete the landscape monitoring program with a perception survey of landscape changes due to the project, with representatives of Pingualuit National Park, its employees and visitors. This survey aims, among other things, to gather the views of park users and representatives on the landscape integration of the project in the environment.*

ANS-24. :

The wind project promoter commits to carrying out a landscape modification survey with representatives of Pingualuit National Park, its employees and its visitors. This survey will be conducted following the first year of operation of the two wind turbines and will provide information on the perceptions of users and representatives of the park regarding the visual impact of the two turbines. This survey will also include a photo documentation of the visual effect of the wind turbines. Should two additional wind turbines be installed at the Expo site, a new survey will be conducted following the first year of their operation.

7.2 Sharing of information with local communities

At the time of the promoter's consultations with the representatives of the northern villages of Kangiqsujuaq and Salluit in the preparation of the impact assessment study, the latter have expressed the will to be informed of the results of the different monitoring that could be carried out within the project. Thus, the proponent agrees to send "*the results of the various environmental monitoring during the construction phase and the environmental monitoring during the operation phase to the elected officials of the two northern villages, as well as to the representatives of their respective landholding corporations*» (page 228 of volume 1 of the impact assessment studies). In addition, the promoter is committed to provide Inuit communities with access to environmental monitoring and follow-up reports on its website.

QC-25. *To this end, the promoter must specify its communication strategy and commit to deploy the necessary means to keep the stakeholders interested in the project regularly informed, of the activities taking place on the site and the results of the environmental and social monitoring that will be carried out. The promoter shall, among other things, communicate by mail an executive summary of the information made available on the website to the relevant landholding corporations and northern villages. For the reasons mentioned in question QC -2 (see above), the promoter will have to do the same thing for Puvirnituq if the community has expressed the desire for it.*

ANS-25. :

During the construction phase, as mentioned in volume 1 of the impact assessment studies, a weekly report will be shared with the communities via the website, but also by email to the community representatives. Updates on the progress of the work, photos of the construction site and all relevant information will be shared by the developer.

During operations, environmental and social monitoring reports will be shared with the communities by the mining promoter, energy user and community representatives through the Nunavik Nickel Committee.

As for the Raglan project, the communities will have access to information on a regular basis, according to the protocol put in place by the mine since the start of wind turbine operations in 2014.

The community of Puvirnituq was consulted on April 5 and 6, 2023, some interest in the wind project was expressed. Puvirnituq will be among the communities that will receive information shared by the promoter during construction, as well as by the mining company during the entire operation phase.

The website set up to communicate the progress of the project is updated regularly and now includes the results of the impact study. The proponent TUGLIQ Energy noticed a site visit in the village of Puvirnituq following the meeting with the village representatives.

8 References

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CENTRE DE DONNÉES SUR LE PATRIMOINE NATUREL DU QUÉBEC (CDPNQ). 2008. *Les plantes vasculaires menacées ou vulnérables du Québec. 3e édition.* Gouvernement du Québec, ministère du Développement durable, de l'Environnement et des Parcs, Direction du patrimoine écologique et des parcs, Québec. 180 p.

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CANADIAN ROYALTIES INC. (CRI). 2023. *Projet Nunavik Nickel – Rapport de suivi environnemental 2022*.

GENIVAR. 2007. *Projet Nickélifère Raglan Sud – Rapport principal – Étude d'impact sur l'environnement et le milieu social*. Rapport de GENIVAR Société en commandite pour Canadian Royalties inc. 649 p. et annexes.

Appendix A
Wildlife protection plan in force in the NNiP territory

Fauna and Flora Protection Plan

Project number: 60635966

December 2022

Delivering a better world

Reservations and Limits

The attached report (the “Report”) was prepared by AECOM Consultants Inc. (“Consultant”) for the benefit of the client (“Client”) in accordance with the agreement between the Consultant and the Client, including the detailed scope of the services (the “Contract”).

The information, data, recommendations and conclusions contained in the Report (collectively, the “Information”):

- are subject to the scope of the services, the timeframe and the other constraints and limits contained in the Contract and the reservations and limits formulated in the Report (the “Limits”);
- represent the Consultant’s professional judgment in light of the Limits and the industry standards for preparation of similar reports;
- may be based on information provided to the Consultant which has not been verified independently;
- have not been updated since the date of issue of the Report and their accuracy is limited to the time period and the circumstances in which they were collected, processed, produced or issued;
- must be read as a whole and, consequently, no section of the Report should be read outside of this context;
- were prepared for the precise purposes described in the Report and the Contract;
- in the case of underground, environmental or geotechnical conditions, may be based on limited tests and on the assumption that such conditions are uniform and do not vary geographically or over time.

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AECOM 2015-04-13

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Reference to cite

AECOM 2022. Fauna and Flora Protection Plan Report presented to Canadian Royalties Inc. 58 pages and appendices.

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Introduction

Canadian Royalties Inc. (CRI) mines nickel and copper ores at its Nunavik Nickel Project (NNiP) mining complex. This mining project is located about 80 km west of Kangiqsujuaq and about 140 km southeast of Salluit in Nord-du-Québec. NNiP began in 2008 with the discovery of the Mesamax, Expo, Méquillon and Ivakkak deposits. The Allammaq and Puimajuq deposits were added subsequently to Global Certificate of Authorization No. 3215-14-007 (hereinafter "Global CA") issued by the Gouvernement du Québec. Over the past few years, several applications for amendment of the Global CA have been submitted to the Ministère de l'Environnement, de la Lutte contre les changements climatiques (MELCC) to ensure the sustainability of NNiP's operations, such as those for underground operation of the Expo (West and South), Méquillon, Mesamax, Ivakkak and Nanaujaq deposits.

An environmental and social impact assessment (ESIA) was conducted in 2007 (GENIVAR, 2007), allowing characterization of the receiving environment, including the biological environment. Inventories of the vegetation, aquatic fauna, herpetofauna, avian fauna and mammals were conducted and the potential impacts on them were assessed. A set of mitigation measures was developed, also covering the other components of the ESIA (physical environment, human environment). This set of measures was summarized in tabular form and is presented in Appendix 1. During this ESIA, a fauna and flora protection plan had been proposed as a mitigation measure to combine in one document the actions to be taken during construction and operational work to protect fauna and flora, as well as the observations to be noted during the work.

Additional environmental characterizations were also produced in the context of the applications for regional departmental authorizations, during the development of the NNiP. Moreover, any project not included in the 2007 ESIA was the subject of an addendum to this assessment, thus allowing the review and update of the mitigation measures, as applicable. Each of the new projects submitted for analysis to the MELCC is located in the study area of the 2007 ESIA, for which the new assessments were presented in the form of addenda to this main assessment. Complementary mitigation measures were developed under the addendum to the ESIA pertaining to the projects of Phase 2a and these are summarized in tabular form in Appendix 1.

The ESIA showed that there is little diversity of terrestrial environments and wetlands in the sectors where mining operations are conducted, in view of the prevailing harsh climate conditions. These conditions also have an adverse effect on the wealth of fauna and flora. However, wetlands typical of these northern regions are found there. In addition, on a seasonal basis, several animal species find suitable breeding habitats in these sectors, such as woodland caribou (*Rangifer tarandus caribou*; migratory ecotype, Leaf River Herd - LRH), rock ptarmigan and willow ptarmigan (*Lagopus mutus* and *L. lagopus*), snow bunting (*Plectrophenax nivalis*) and Canada goose (*Branta canadensis*). The ESIA made it possible to establish how the NNiP's activities can affect fauna, flora and their habitats.

An environmental monitoring program (EMP) was also deployed under the Global CA. This program includes 36 monitoring, including several pertaining to fauna, flora and their habitats:

- Environmental Monitoring 4 : Surface water – Effluent Receiving Waters;
- Environmental Monitoring 6: Surface water –water temperature of the receiving environment at Expo's final effluent;
- Environmental Monitoring 7: Surface water – Deception Bay;
- Environmental Monitoring 8 : Fish;
- Environmental Monitoring 9: Metal concentration in fish flesh in the Puvirnituq River;
- Environmental Monitoring 10 : Mercury Content in the flesh of fish from Lac du Bombardier;
- Environmental Monitoring 11: Lac du Bombardier fish population;
- Environmental Monitoring 12: Stability of culverts and free movement of fish;

- Environmental Monitoring 13: Passability of fish at Bombardier Lake outlet structure;
- Environmental Monitoring: Monitoring of the Puimajuq crossing;
- Environmental Monitoring : Sport fishing;
- Environmental Monitoring 16: Benthic Invertebrate Communities;
- Environmental Monitoring17[1] : Polar Bear Observation;
- Environmental Monitoring18: Collisions with caribou;
- Environmental Monitoring20: Draba in Allamaq
- Environmental Monitoring29: Marine Navigation in Deception Bay.

The EMP is updated as the NNiP projects are developed (e.g. addition of sampling stations, integration of new culverts into the passability monitoring, etc.). The results of the monitoring program are transmitted annually to the MELCC, Environment and Climate Change Canada (ECCC), the Kativik Regional Government and the signatories of the Nunavik Nickel Agreement.

In addition to the EMP, CRI has an environmental program, which was developed to apply the environmental policy and ensure the compliance of corporate activities with the regulations and its permits. In particular, it provides for regular inspections of all NNiP sites to ensure that the mitigation measures are deployed and effective, and that CRI's environmental procedures and any other legal requirements are respected. They cover construction, operational and mineral exploration activities. These inspections are structured by thematic inspection sheets and recorded on an online platform, thus facilitating monitoring of corrective actions, if applicable.

Finally, in 2012, CRI established a management procedure for interventions involving wildlife. The purpose this procedure, under the responsibility of the Occupational Health and Safety Department, is effective wildlife management with a goal of reducing the hazards for mining operations and workers, while ensuring compliance with the provisions of the Act respecting the conservation and development of wildlife (ACDW). It is presented in Appendix 2.

[1] Monitoring 17 of the 2022 revision of the EMP will also integrate the observations in progress under the Fauna and Flora Protection Plan.

Presentation of the Fauna and Flora Protection Plan

Objectives

The objective of this Fauna and Flora Protection Plan (FFPP) is to integrate in the same document the protection, surveillance and monitoring measures that must be applied to avoid and reduce the project's adverse effects on the fauna and flora environmental components of interest identified in the ESIA and its addenda.

It is based on all the characterizations produced by CRI, the mitigation measures established in the ESIA and its addenda, and the scientific literature applicable to the NNiP context. It also ensures compliance with the laws and regulations associated with protection of wildlife and plant species.

The inspections provided for in the environmental program, the EMP and the intervention procedure involving the fauna, described in the introduction, will be tools for application of this FFPP. They will be reviewed and updated, if required, after the protection plan comes into force.

The components of interest included in this plan are:

- Threatened or vulnerable plant species;
- Wetlands and water environments;
- Aquatic fauna;
- Avian fauna and protection of nests;
- Wolf, black bear and polar bear;
- Caribou;.
- Arctic fox and red fox;
- Chiroptera;
- Collisions with the fauna.

Each component is the subject of a separate and independent section. Thus, the sections concerned may be updated individually, as actions would have to be added or adapted. It should be specified that even though some sections highlight certain mitigation measures more directly related to protection of the targeted component (e.g. avian fauna), all the NNiP mitigation measures must be respected at all times.

This document is primarily intended for the CRI employees responsible for environmental protection, but also for the contractors and personnel working in the exploration, construction and operational activities of this project.

This document exclusively concerns the construction and operational activities related to the Ivakkak, Méquillon, Expo, Mesamax, Allammaq and Puimajuq deposits that are the subject of the ESIA and its addenda. For the project in development or under study by the government authorities, a revision of the current FFPP could be required.

Legal Requirements

The protection and monitoring measures of this document are based in particular, on the following laws and regulations:

Provincial

Ministère de l'Environnement, de la Lutte aux changements climatiques, des Forêts et des Parcs (MELCCFP)

- Environment Quality Act (chapter Q-2)
- Act respecting threatened or vulnerable species (R.S.Q., c. E-12.01)
- Regulation respecting threatened or vulnerable plant species and their habitats (E-12.01, r.3)
- Act respecting the conservation and development of fauna (chapter C-61,1)
- Regulation respecting animals that must be declared (C-61.1, r.4)
- Regulation respecting threatened or vulnerable wildlife species and their habitats (E-12.01, r.2)

Federal

Environment and Climate Change Canada (ECCC)

- Migratory Birds Convention Act, 1994 (S.C. 1994, c.22)
- Migratory Birds Regulations (R.S.C., c. 1035)
- Species at Risk Act (S.C. 2002 - 29

Fisheries and Oceans Canada (DFO)

- Fisheries Act (R.S.C. (1985), c. F-14)

Roles and Responsibilities

CRI is responsible for NNiP-related activities and for the implementation and management of this protection plan.

All managers, from department supervisors to the Vice-President/General Manager, including the superintendents, are responsible for reading and understanding the sections of this plan applicable to their sectors of activity, managing the personnel concerned regarding the protection and monitoring measures to be applied, and ensuring they apply them at all times.

All CRI personnel, contractors and visitors must familiarize themselves with the importance of fauna and flora, and understand the issues and the objectives of the plan.

The person responsible for Environment[2] becomes the resource person in the application and update of this plan. This person may inform, advise and follow up the actions taken and their appropriate documentation. He/she also becomes the company's spokesperson in its application to the legislative authorities and other stakeholders. He/she ensures that all the information that must be reported, as described in each chapter of the protection plan, has been recorded and archived in a Wildlife Event Report, as presented in the appendix of the Wildlife Intervention Management Procedure (see Appendix 2 of this document).

[2] Superintendent, Environment or representatives.

Notion of Species at Risk

A wildlife or plant species at risk is a threatened or vulnerable species or a species likely to be designated threatened or vulnerable (TVLS) or candidate for this status (Gouvernement du Québec). The data on wildlife and plant species at risk is processed by the Centre de données sur le patrimoine naturel du Québec (CDPNQ). Some species at risk, both wildlife and plant species, have been inventoried in the NNiP's territory and will be described in some of the chapters of the plan.

The species considered threatened or vulnerable are included in the *Regulation respecting threatened or vulnerable plant species and their habitats* and the *Regulation respecting threatened or vulnerable wildlife species and their habitats.* The list of species likely to be designated threatened or vulnerable is available from the CDPNQ (https://www.quebec.ca/gouvernement/gouvernement-ouvert/transparence-performance/indicateurs-statistiques/donnees-especes-situation-precaire)

Contact information for declarations to the MELCCFP under the *Regulation respecting animals that must be declared*

Several species included in this protection plan are animals included in the *Regulation respecting animals that must be declared* and must be the subject of a declaration to the MELCCFP in certain circumstances.

It should be specified that CRI usually prefers to contact the Kuujjuaq local office. However, a declaration to SOS Braconnage is an acceptable alternative.

- Kuujjuaq local office: 1-866-237-2442
- SOS Braconnage: 1-800-463-2191

  Email: centralesos@mffp.gouv.qc.ca
  Online: https://mffp.gouv.qc.ca/le-ministere/formulaires/braconnage-inscription/

Complementary Documentation

AECOM and Canadian Royalties Inc. 2022. *Addenda à l'étude d'impact environnemental et social – Phase 2a: Exploitation des gisements Expo Sud, Ivakkak UG, Méquillon UG2 et Nanaujaq* – Certificat d'autorisation no 3215-14-007: Project minier Nunavik Nickel. 251 pages (Volume 1) and appendices (Volume 2).

CANADIAN ROYALTIES INC. (CRI). 2022a. *Projet Nunavik Nickel – Rapport de suivi environnemental*. Version n° 5. 2022. Updated by Canadian Royalties Inc. Multiple pagination multiple and appendices.

GENIVAR. 2007a. *Projet Nickélifère Raglan Sud – Rapport principal – Étude d'impact sur l'environnement et le milieu social.* Rapport de GENIVAR Société en commandite pour Canadian Royalties inc. 649 p. and appendices.

GENIVAR. 2007 b. *Projet Nunavik Nickel – Étude sur la navigation maritime dans la baie Déception – Impacts sur les mammifères marins et les activités traditionnelles Inuites. Rapport final – Révision n°1 – Rapport sectoriel – Étude d'impact sur l'environnement et le milieu social*. Rapport de GENIVAR pour Canadian Royalties inc. 75 p. and appendices.

FAUNA AND FLORA PROTECTION PLAN

1 Plant Species at Risk

1.1 Presentation of Species and Range

The plant species at risk considered in the context of the NNiP are species likely to be threatened or vulnerable, as follows: *Draba cavouettei, Draba micropetala, Draba corymbosa*, *Draba subcapitata and Ranunculus sulphureus.* These are small herbaceous plants of genus *Draba* and *Ranonculus*, belonging to the boreal hemisphere, with yellow or white petals.

Draba are often found in tundra ostiole polygonal soil, periglacial terrain with liquefied mud and silty and sandy fine materials, while *Ranonculus* is more frequently encountered in lowland polygonal fens (see photos below).

Maps 1-1 to 1-3 illustrate the location of observations of species at risk; Map 1-1 is also included in Environmental Monitoring 20 of EMP.

Photo 1-1: Tundra Ostiole Polygonal Soil

Photo 1-2: Lowland Polygonal Fen

Table 1-1: Species at Risk Already Observed in the NNiP Study Area.

	***Draba cayouettei:*** In a tundra ostiole on a sandy-pebbly loam substrate. In an ostiole in black slate-schist outcrops and levees. Calcareous environment with southern exposure. Found near the Puvirnituq Mountains, Lake Rocbrune, in the vicinity of the Mesamax and Allammaq site.
 	***Draba micropetala:*** At a certain distance from bodies of water. Found near the Allammaq site. Xerophilic, calciphilic, maintaining small populations of isolated individuals in periglacial environments. They grow on calcareous slate-schist outcrops where tundra ostioles predominate, formed at the expense of relatively fine deposits. The species also colonizes well-drained sandy soil embankments and slopes in the region.
 	***Draba corymbosa:*** About 3 km southwest of Lac du Bombardier. Calcicolic, xerophilic, well adopted to rocky and pebbly summits, exposed with little snow cover. Mainly found in marine environments.
 	***Draba subcapitata:*** On the flat-topped summit of a more or less circular rock dome jutting into the plain. Rock levees on an exposed high ledge, on the margin of tundra ostioles, on sandy-pebbly loam. Found near the Allammaq site.
	***Ranunculus sulphureus:*** Upper hydrolittoral, between the boulders and pebbles of a riparian platform, on a sandy-silty and slightly moist humus substrate. Inventoried along the Méquillon-Ivakkak road (Map 1-3).

73°30'0"

Vers la baie Déception /
To Deception Bay

73°25'0"

73°20'0"

73°15'0"

Vers l'aéroport Donaldson /
To Donaldson airport

61°36'0"

61°34'0"

SECTEUR / SECTOR 2

632 individus / individuals

0 100 m

SECTEUR / SECTOR 2

595 individus / individuals

0 100 m

SECTEUR / SECTOR 1

0 100 m

SECTEUR / SECTOR 4

173

SECTEUR / SECTOR 4

0 100 m

Lac du Bombardier

Rivière de Puvirnituq

SECTEUR / SECTOR 2

975

920

SECTEUR / SECTOR 1

78

4

Mesamax

Allammaq

Kativik (AR)
Rivière-Koksoak, NO

SECTEUR / SECTOR 5 *

68

** Un seul petit groupe et 2 regroupements de plus forte densité / Only one small group and 2 groups of higher density*

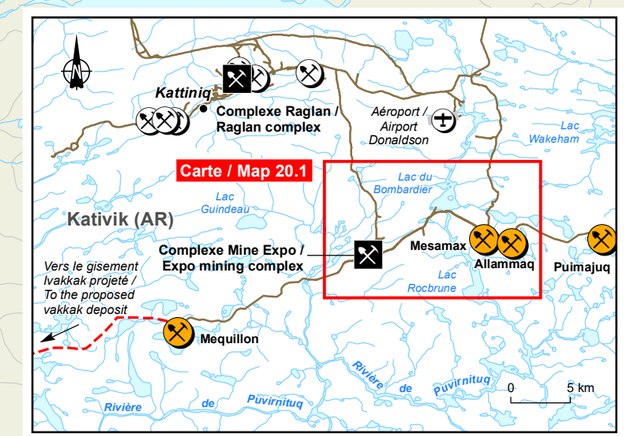
Complexe Mine Expo / Expo mining complex

A

33 individus / individuals

31 individus / individuals

0 10 m



Stations d'échantillonnage / Sampling stations

- Individus ou petits groupes d'individus inventoriés / Individuals or small groups of individuals inventoried
- Densité importante de plants /High density of plants
- Secteur d'inventaire / Inventory sector

78 — *Nombre de plants / Number of plants*
Espèce / Species

Espèces et nombre d'individus / Species and number of individual

Draba cayouettei	*Draba micropetala*
1 à 5	*1 à 5*
11 à 25	*6 à 10*
26 à 50	*11 à 25*
51 et plus / and over	*26 à 50*

Composantes du projet / Project components

- Infrastructures minière et routière / Mining infrastructure and road
- Complexe minier / Mining complex
- Gisement / Deposit

Baux octroyés par le MERN / Leases granted by the MERN

- Fins de parc à résidus miniers / Ends of tailings pond

Infrastructures / Infrastructure

- Aérodrome / Airport
- Route locale / Local road
- Sens de l'écoulement / Direction of flow

Projet Nunavik Nickel / Nunavik Nickel Project

Programme de suivi environnemental / Environmental monitoring program

Inventaire des draves / Draba inventory

Sources:

Orthophoto, 8-18-2019_Ortho_ColorBalance_MTM8, 2019
Imagerie/Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
BNDT, 1;50,000, RNCan, 2007
Adresses Québec, MERN Québec, Mai/May 2020
Baux de villégiature, MERN Québec, Janvier/January 2021
SDA, 1/20 000, Juillet/July 2021
Données de projet/Project data, Canadian Royalties, 2021

Cartographie/Mapping: AECOM
Fichier : 6063-5966_a-tr_c20_1_draves_220322.mxd

0 450 900 m
UTM,Zone 18, NAD83
Équidistance des courbes : 50 pieds / Equidistance of curves: 50 feet

Carte / Map 1-1

Mars / March 2022

AECOM · NUNAVIK NICKEL · CANADIAN ROYALTIES INC.

1.2 Issues (Apprehended Impacts)

- Potential loss or alteration of habitats of species at risk;
- Potential loss of plant species at risk, particularly concerning draba;
- Disturbance of soils or their characteristics that can alter the survival of species at risk.

1.3 Objectives

- Protect habitats and their integrity;
- Protect species at risk:
  - In the context of the NNiP, there are primarily four draba species and one ranunculus species present with TVLS status in Québec: *Draba subcapitata*, *D. micropetala*, *D. corymbosa*, *D. cayouettei* and *Ranonculus sulphureus.* These species were encountered in the various inventories conducted in the territory (see Table 1-1);
  - Other northern plant species with TVLS status could be observed in the NNiP's territory (*D. Puvirnituqii*, *D. pilosa*, *D. arctica*, *Cephaloziella uncinata*, *Grimmia Sessitana* and *Sabulina rossii*). Up to now, none of these species has been observed in the NNiP's territory;
- Avoid disturbance of the soils, drainage conditions and vegetation adjacent to the work areas.

1.4 Environmental Protection Measures

- Machinery must not circulate outside work area boundaries (unless otherwise authorized), (Measure VEG 1). Mark the authorized areas;
- The small-flowered draba species were identified on the Nanaujaq site were excluded from the work area. The sector where a small-flowered draba was seen will be visited again prior to the installation of construction work at the Nanaujaq site. A biologist or a technician trained in identification will check if the species are still present there and, if necessary, the location will be marked by visual cues and protected (Measure VEG 1a);
- For the road sections located near sector 1, 2 and 4 of Map 1-1 and along the Ivakkak-Méquillon road near km 24 (Map 1-3), In dry, windy weather, dust reducers (calcium chloride or water) will be sprayed. The humidification frequency will be adjusted according to the meteorological conditions and the dust emissions observed. Dust control agents will comply with the BNQ 410-300 standard or will be approved by the Ministère des Transports du Québec (MTQ). The choice of dust reducers must take account of the proximity of wetlands or bodies of water (Measures AIR 2 and AIR 2a of Appendix 1);
- Install visual references around colonies of species at risk or individuals inventoried during environmental characterizations to ensure adequate protection of individuals. The places where visual references must be permanently present are:
  - Rock dome at Allammaq to protect the environment and avoid its use (see Sector 1 on Map 1-1);
  - *Draba micropetela* specimen on the future Nanaujaq site (Map 1-2);
  - The *Renonculus sulphureus* individuals along the Ivakkak-Méquillon road near km 24 (Map 1-3).
- In the case of work or traffic near known species or sightings, mark the sites and install fences at least 10 m from the identified individuals.

1.5 Surveillance and monitoring if Applicable

- Ensure compliance with the protection areas for plants at risk during exploration, construction and operational work by systematically conducting inspections in the sectors indicated on Maps 1-1, 1-2 and 1-3:
  - Use the thematic inspection sheets relevant to the context (drilling work, construction work, etc.). Record the observations on the online platform and follow up the corrective actions, as applicable.
- Perform environmental monitoring of draba as described in the environmental monitoring program (Enivironmental Monitoring 20);
- Record any new occurrence of species at risk and alert the MELCCFP.

73°41'0" 73°40'30" 73°40'0" 73°39'30"

61°30'50" 61°30'40"

Vers le site EXPO / To the EXPO site

Conduite de rejet projetée / Planned discharge pipeline

Vers le site MEQUILLON / To the MEQUILLON site

Bernache du Canada / Canada goose (fèces / faeces)

Caribous (fèces et environ 40 individus / faeces and approx. 40 individuals)

Caribous (plus d'une centaine d'individus observés du côté nord de la route Expo jusqu'à ce point / more than a hundred individuals observed from the north side of the road Expo up to this point)

Zone d'étude 2021 / Study area 2021 (22.29 ha)

Pluvier semi-palmé / Semipalmated plover

QS_NAN_1

Lemming sp. (terrier / burrow)

Plectrophane des neiges / Snow bunting

O_NAN1-1 O_NAN1-2 O_NAN1-3

Plongeon huard / Common loon

Lemming sp. (nid d'hiver / winter nest)

Lemming sp. (nid d'hiver / winter nest)

O_NAN2-1 O_NAN2-2 O_NAN2-3

Caribous (traces / tracks)

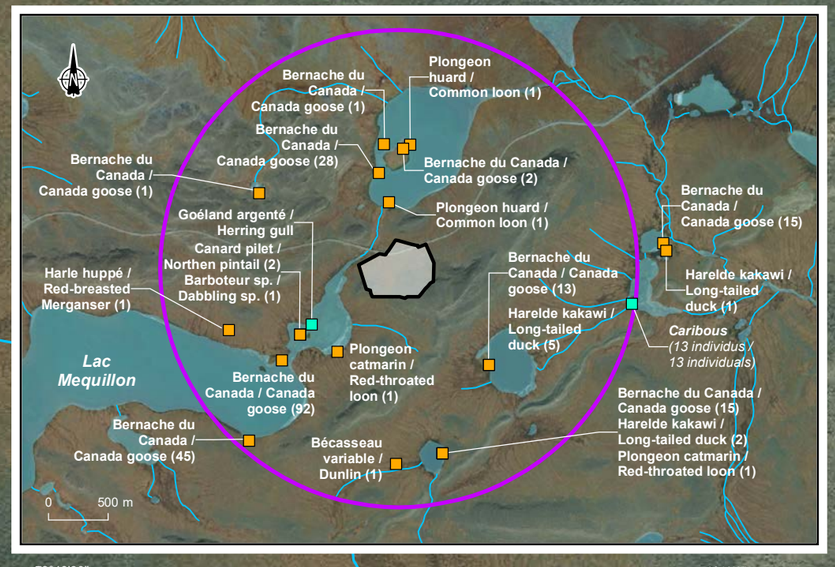
Plectrophane lapon / Lapland longspur

O_NAN3-1 O_NAN3-2 O_NAN3-3

Lac Mequillon

VN1 VN2 VN3 VN4 VN5 VN6 VN7 VN8 VN9 VN10 VN11 VN12 VN13 VN14

Draba micropetala



Composantes du projet / Project components

- Zone d'étude / Study area
- Infrastructure de surface projetée / Planned surface infrastructure

Faune / Wildlife

- Observation de sauvagine et d'oiseaux aquatiques / Waterfowl and waterbird observation (1) nbre d'individus / (1) number of individuals
- Observation fortuite / Casual observation
- Transect d'inventaire des oiseaux terrestres et limnicoles / Inventory transect of terrestrial and limnicolous birds
- Parcelle d'inventaire des oiseaux terrestres et limnicoles / Terrestrial and limnicolous birds inventory plot
- Parcelle d'inventaire de la sauvagine et des oiseaux aquatiques / Waterfowl and waterbird inventory plot

Stations d'inventaire / Survey stations

- Échantillonnage de l'eau de surface / Surface water sampling
- Échantillonnage de sédiments / Sediment sampling

Végétation / Vegetation

- VN1 Station d'inventaire de la végétation / Vegetation inventory station
- Espèce floristique à statut précaire / Plant species at risk

Milieu humide / Wetland

- Fen polygonal de basses terres / Lowland polygonal fen

Milieu terrestre / Terrestrial environment

- Champ de blocs / Boulder fields

Hydrographie / Hydrography

- Cours d'eau / Watercourse
- Plan d'eau / Waterbody

Milieu anthropique / Anthropogenic environment

- Route / Road

Phase 2a

Addenda à l'étude d'impact environnemental et social / Addendum to the Environmental and Social Impact Assessment

Projet Nunavik Nickel / Nunavik Nickel Project

Certificat d'autorisation nº 3215-14-007

Inventaires du milieu naturel dans la zone d'étude de Nanaujaq / Inventories of the natural environment in the Nanaujaq study area

Sources:

Imagerie/Imagery, Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
CanVec, 1;50,000, RNCan, 2019
Données de projet/Project data, Canadian Royalties, 2022
Conduit traitement des eaux vers MQ 19 avril.dxf
Nanaujuaq-Aménagement surface (19 avril 2022).dxf

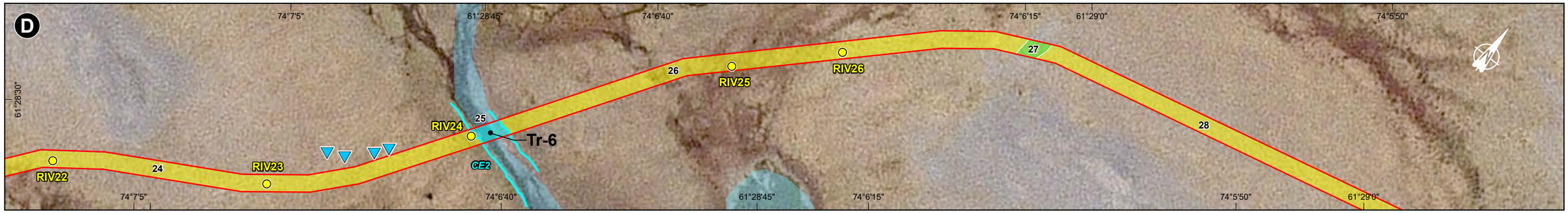
Inventaire et cartographie/Inventory and mapping: AECOM
Fichier/File: 6063-5966_a-tr_c6_3_Nanau_220531.mxd

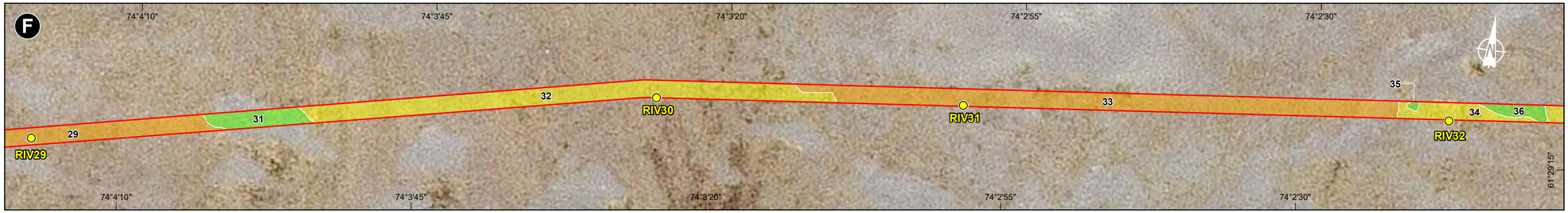
0 40 64 m
UTM, Zone 18, NAD83

Carte / Map 1-2

Juin / June 2022

AECOM NUNAVIK NICKEL CANADIAN ROYALTIES INC.





Composantes du projet / Project Components

- Emprise de la route projetée / Right-of-way of the proposed road
- 1 — Identifiant de tronçon homogène / Homogeneous segment identifier
- Tr — Traverse projetée / Proposed Crossing

Hydrographie / Hydrography

Inventaire au terrain / Field inventory

- Cours d'eau permanent (incluant la LHE) / Permanent Watercourse (Including LHE)
- Cours d'eau intermittent (incluant la LHE) / Intermittent Watercourse (Including LHE)
- Cours d'eau permanent (incluant la LHE) / Permanent Watercourse (Including LHE)
- Cours d'eau intermittent (incluant la LHE) / Intermittent Watercourse (Including LHE)
- Étang / Pond

Base cartographique / Cartographic Base

- Plan d'eau / Waterbody (GRHQ)

Végétation / Vegetation

- RIV1 — Station d'inventaire / Survey Station
- Espèce en situation précaire / Species at Risk (*Ranunculus sulphureus*)

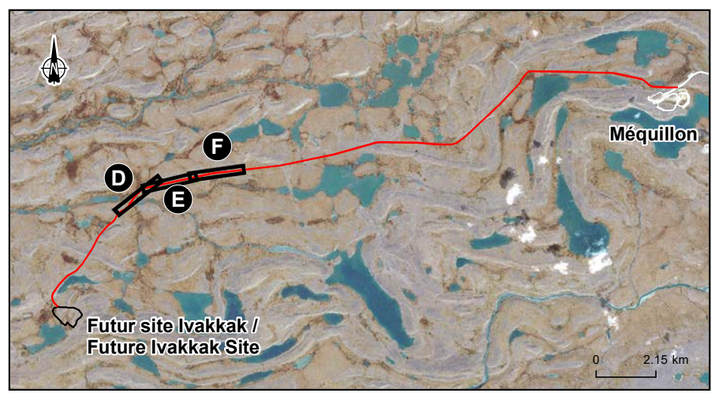
Milieux humides / Wetlands

- Fen de combe à neige / Snowbed Fen
- Fen polygonal de basses terres / Lowland Polygonal fen

Milieux terrestres / Terrestrial Environments

- Champ de blocs / Boulder Fields
- Felsenmeer / Felsenmeer
- Sol polygonal à ostioles de toundra / Polygonal Ground with Tundra Ostioles
- Milieu anthropique / Anthropogenic Environment

Milieu / Environment	Catégorie de milieu / Type of environment	Superficie / Area (ha)
Terrestre / Terrestrial	Anthropique / Anthropogenic	0.79
	Felsenmeer / Felsenmeer	2.52
	Champ de blocs / Boulder Fields	12.40
	Sol polygonal à ostioles de toundra / Polygonal Ground with Tundra Ostioles	6.75
Humide / Wet	Fen de combe à neige / Snowbed Fen	1.86
	Fen polygonal de basses terres / Lowland Polygonal Fen	33.26
Hydrique / Water	Cours d'eau intermittent / Intermittent Watercourse (inclut / Including LHE)	0.01
	Cours d'eau permanent / Permanent Watercourse (inclut / Including LHE)	0.15
	Étang / Pond	0.05
TOTAL		57.79



Les éléments de cette légende sont communs aux cartes 2A à 2F et peuvent ne pas se retrouver sur une ou l'autre de ces cartes. / Elements of this legend are common to maps 2A to 2F and may not find themselves on either of these maps.

Caractérisations environnementales sur le site du Projet Nunavik Nickel / Environmental characterizations on the Nunavik Nickel Project site

Espèces en situation précaire présentes le long du tracé de la route reliant Méquillon à Ivakkak / Species in a precarious situation present along the route of the road linking Méquillon to Ivakkak

Sources:

Orthophoto, SPOT-7 (CNES/Airbus), 19 Août/August 2019
Géobase du réseau hydrographique du Québec (GRHQ), MERN Québec, nov. 2019
Données de projet/Project, Canadian Royalties, 2020

Cartographie/Mapping: AECOM
Fichier/File: 6063-5966_a-tr_c1_3_Rte_Ivak_221207.mxd

0 50 100 m
UTM, Zone 18, NAD83

Carte / Map 1-3

Décembre / December 2022

AECOM · Nunavik Nickel · Canadian Royalties Inc.

2 Wetlands and Water Environments

2.1 Presentation of Species and Environments

Nunavik is one of the leading subarctic and Arctic peatland regions of northern Québec. In the sector concerned, which is a very northern environment, the vegetation units frequently are very homogeneous in terms of plant species, soil conditions and biophysical indicators. According to the inventories conducted by AECOM since 2017, two types of wetlands are dominant in the NNiP study area:

- Snowbed fen wetlands (Photo 2-1) are found at the foot of snowbeds and in late snowmelt zones. The plant cover is low (< 50%) and dominated by grasses, sedges and cottongrass *Eriophorum*, see Photo 2-3);
- Lowland polygonal fen wetlands (Photo 2-2) are found in valley bottoms well supplied with water. Their plant cover is consequential to this, almost continuous and generally composed of grasses and mosses. The plant cover is punctuated by water drainage channels and networks of cracks.

Photo 2-1: Snowbed Fen

Photo 2-2: Lowland Polygonal Fen

Photo 2-3: *Eriphorium angustifolium*

Before disturbing the soil, inventories and a delineation of the different environments are always done to define the location of the terrestrial environments, wetlands and water environments clearly, as well as the constraints resulting from these inventories. Map 2-1 presents all of the wetlands that had been identified by photointerpretation during the impact assessment and thus gives an overview of their abundance in the NNiP's territory.

Maps presenting the more precise delineations of the environments, resulting from characterization done in the field, are available for all the ministerial authorizations of the NNiP (Méquillon, Puimajuq, Ivakkak, etc.). The readers are invited to consult them depending on the situations encountered.

2.2 Issues (Apprehended Impacts)

- Loss and/or alteration of wetlands and water environments during work in the construction and operational phases on the mine sites and along the access roads;
- Alteration of the banks and shoreline of watercourses during servicing or maintenance operation of multiple and stacked culverts;
- Risk of erosion and intake of fine sediments in the water environments;
- Risk of introduction of invasive alien species related to transport of machinery and materials from the south.

2.3 Objectives

- Minimize the alteration and destruction of wetlands and water environments;
- Protect the habitats of the plant and wildlife species associated with these environments;
- Reduce the change to vegetation, soil and surface drainage to reduce the impact on wetlands and water environments;
- Prevent contamination of aquatic environments from water environments or wetlands connected to them;
- Prevent the introduction of invasive alien species (IAS) into the environments.

2.4 Environmental Protection Measures

- Apply the mitigation measures presented in the ESIA and its addenda (see Appendix 1) regarding:
  - Air quality;
  - Soil quality;
  - Water and sediment quality;
  - Hydraulic and sediment quality;
  - Vegetation.
- Sensitize the workers to the risks of alteration of wetlands and water environments by traffic off the access roads and the long-term effect of ruts on these environments and to the appropriate behaviours in case of access to off-site areas;
- Machinery must not circulate outside work area boundaries planned under the conditions of the ministerial authorizations, unless otherwise authorized by the person responsible for Environment (Mitigation Measure VEG 1). The areas authorized for traffic will have been marked before the work;
- Habitats next to jobsites must be protected (particularly close to stream banks) (Mitigation Measure VEG 2);
- Compensation for wetland areas lost through contributions to PEIIC (Program for Environmental Improvement in Inuit Communities).) (Mitigation Measure VEG 3) ;
- Make easily accessible at all times an emergency recovery kit for petroleum products and hazardous materials (kits in vehicles and site facilities) and apply the spill management procedure “PRO-NENV-1211-01-F *Intervention en cas d'incident environnemental*” (Response in case of environmental incident), which ensures the safe, fast, efficient and comprehensive management of a spill to minimize the environmental impact (Mitigation Measure SOIL 2a);
- Provide for machinery parking, washing and maintenance areas at least 60 m from any watercourse and ensure the machinery is refuelled under constant supervision, at least 30 m from any watercourse (Mitigation Measure QES 8);
- Resuspension of material should be minimized when adding or removing material in water RHS 9);
- Excavated material will be disposed of in a way that minimizes the spread of suspended solids (Mitigation Measure QES 5) and store the overburden and muck outside the riparian strip (Mitigation Measure RHS 10);
- In dry, windy weather, dust reducers (calcium chloride or water) will be sprayed on certain areas. The humidification frequency will be adjusted according to the meteorological conditions and the dust emissions observed. Dust control agents will comply with the BNQ 410-300 standard or will be approved by the Ministère des Transports du Québec (MTQ). The choice of dust reducers must take account of the proximity of wetlands or bodies of water. (Mitigation Measures AIR 2 and AIR 2a);
- Ensure that any machinery accessing the job site is free of plant debris (e.g. rhizome, seeds) to avoid contaminating the work areas by IAS from southern Québec.

Map 2-1: Map 19 Taken from the Initial Impact Assessment on Vegetation for the NNiP Site (GENIVAR, 2007)

Carte 2-1 :Carte 19 tirée de l'étude d'impact initiale sur la végétation pour le site du PNNi (GENIVAR, 2007).

2.5 Surveillance and monitoring if Applicable

- Perform environmental monitoring during work near wetlands and water environments and conduct inspections of the work areas:
  - Use the appropriate thematic inspection sheets (construction work, culvert development, drilling work, etc.). Record the observations on the online platform and follow up the corrective actions, as applicable.
- If an alteration is observed, determine the surfaces impacted and the components affected (vegetation, soil and water). The offsets for wetland offsets will be determined according to the agreement established between CRI and the MELCCFP for the payments to be made to the PAECI.

3 Aquatic Fauna

3.1 Presentation of Species and Environments

The NNiP study area is crisscrossed by several lakes and watercourses (Map 3-1). Permanent water environments (continuous presence of water) with a depth allowing the movement of fish are generally used by fish at one time or another during the year. In addition, the NNiP has activities as far as Deception Bay (see Map 3-1) due to marine transportation. Thus, the activities carried out under the NNiP may have an effect on fish and the quality of fish habitat, as well as on marine mammals.

As in the case of wetlands in the previous section, readers are invited to consult the maps included in the various ministerial authorizations for a more precise visual representation of the watercourses of each sector of the NNiP.

3.1.1 Fish

Among freshwater fish, the NNiP's territory contains three fish species regularly caught within the NNiP study area:

- Arctic char (*Salvelinus alpinus*);
- lake trout (*Salvelinus namaycush*);
- slimy sculpin (*Cottus cognatus*) and mottled sculpin (*Cottus bairdii*).

Note that brook trout (*S. fontinalis*) common whitefish (*Coregonus artedi*) potentially could be found in certain bodies of water.

3.1.1.1 Lake Trout

Lake trout breed at night in the fall. Lake trout can breed at a wide variety of depths, from 0.5 to 55 m (Bradbury et al., 1999). It is known that lake trout breeding sites are usually composed of a rocky substrate, such as coarse gravel (>2 cm), pebbles and shingles, interspersed with boulders (Bradbury et al., 1999). To allow a good survival rate for the eggs, clogging by sediments at the breeding site must be low.

The eggs normally take 4 to 5 months to incubate. About one month after hatching, the young lake trout generally look for deeper water. In northern lakes, they may stay in the waters of the shoreline for months or even years, because the temperature there remains fairly cool. However, the biology of young lake trout is little known (Scott and Crossman, 1974).

3.1.1.2 Arctic Char

Arctic char is a salmonid widespread in northern Québec. This species mainly may appear in two forms: the anadromous form (which migrates at sea and returns to fresh water to spawn) and the freshwater form (lives exclusively in fresh water). In the study area, only the freshwater form is present.

Like the lake trout, the Arctic char spawns in fall, generally in September and/or October. The spawning sites are located on shoals composed of gravel or rocks in lakes or the calm trenches of rivers, at a depth ranging from 1 to 4.5 m. The eggs hatch at the beginning of April, but the fry emerge from the nest later (around mid-July), when they measure about 25 mm (Scott and Crossman, 1974).

Contrary to other salmonids, such as Atlantic salmon (*Salmo salar*), Arctic char cannot leap over obstacles. It must therefore wait for the tides (for the anadromous form) or rising water levels (freshwater form) to cross obstacles (Scott and Crossman, 1974).

3.1.1.3 Brook Trout

In the northern regions, brook trout start breeding in August. The adults reascend the rivers to reach the spawning areas characterized by a gravel substrate and located at the head of watercourses. The fry emerge in the following spring. They live in the fresh, clear, well-oxygenated waters of streams, rivers and lakes (Bernatchez and Giroux, 2000).

3.1.1.4 Cottids

In general, mottled sculpin (*Cottus bairdi*) and slimy sculpin (*C. cognatus*) are often found in sympatry with lake trout or brook trout, for which they may serve as prey. Cottids live in streams and rivers with a medium to strong flow, composed of a rocky substrate, or in deep, clear lakes. These species generally feed on benthic invertebrates, such as crustaceans and insect larvae. They may also consume small fish (Bernatchez and Giroux, 2000). During breeding, which occurs in spring, the male attracts females to the nest he will have chosen in advance under a rock. Several females will stick their eggs to the ceiling of the nest, which then will be fertilized by the male and guarded by him for a few weeks.

3.1.1.5 Common Whitefish

Anadromous populations of common whitefish are found in the north in the James Bay and Hudson Bay regions, and in large rivers and lakes. In these regions, they spawn in the deep trenches at the foot of rapids. The common whitefish is of great ecological importance, because it is the main prey of lake trout and other sport species. This species reaches its sexual majority at between 3 and 6 years (Desroches and Picard, 2013).

3.1.1.6 Fish in the Marine Environment

The number of fish species in the marine environment is very large. According to the inventories conducted in the context of the impact assessment for the activities to be carried out in the marine environment under the NNiP, only seven distinct species were caught in Deception Bay:

- Daubed shanny (Leptoclinus maculatus)
- Lumpenus sp (Lumpenus sp.)
- Arctic shanny (Stichaeus punctatus)
- Rock gunnel (Pholis gunnellus)
- Arctic staghorn sculpin (Gymnacanthus tricuspis)
- Grubby (Myoxocephalus aenaeus)
- Shorthorn sculpin (Myoxocephalus scorpius)
- Myoxocephalus sp. (Myoxocephalus sp.)
- Moustache sculpin (Triglops murrayi)

74°50'0" 74°40'0" 74°30'0" 74°20'0" 74°10'0" 74°0'0"

62°15'0" 62°10'0" 62°5'0"

Détroit d'Hudson / Hudson Strait

False Passage

Île Siurartuuq

Main Channel

Île Arctic

East Channel

Pointe Rouge

Colline Avvajalik

Baie Ujararjuaq

Pointe Noire

Rivière Qungapalik

Baie Kangirsugaarjuk

Port de Baie Déception / Deception Bay port

Baie Déception / Deception Bay

Déception

Baie-d'Hudson, NO

Rivière-Koksoak, NO

Rivière

Déception

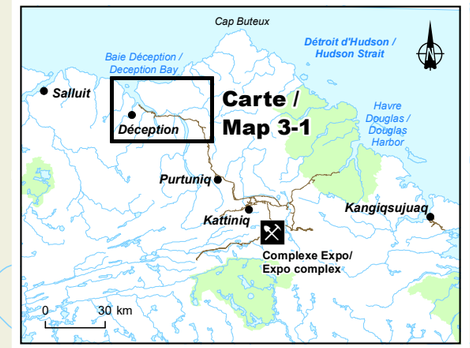
Lac Duquet

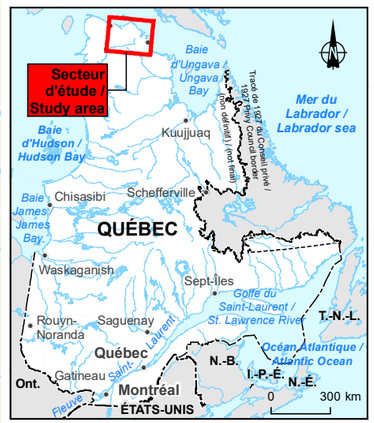
Nord-du-Québec (10)

Kativik (AR)

Lac François-Malherbe

Lac Paumart





Composantes du projet / Project components

- Bail / Lease

Infrastructures / Infrastructure

- Aérodrome / Aerodrome
- Route locale / Local road
- Autre route / Other road

Limites / Boundaries

- Municipalité / Municipality
- Parc national / National park
- Sens de l'écoulement / Direction of flow

Plan de protection de la faune et de la flore / Fauna and flora protection plan

Localisation des infrastructures à Baie Déception / Location of infrastructure in Deception Bay

Sources:

BNDT, 1/250 000, RNCan, 2007
Orthophoto, WV3, 19 Août/August 2019
Adresses Québec, MERN Québec, 1er Mars/March 2022
Aire protégée du Québec, MDELCC, 31 Décembre/December 2017
SDA, 1/20 000, MERN Québec, Juillet/July 2020
Données de projet/Project data, Canadian Royalties, 2021

Cartographie/Mapping: AECOM
Fichier/File: 6063-5966_a-tr_c3_1_BD_faune_220919.mxd

0 1,25 2,5 km
UTM, fuseau 18, NAD83

Carte / Map 3-1

Septembre / September 2022

AECOM NUNAVIK NICKEL CANADIAN ROYALTIES INC.

3.1.2 Marine Mammals

According to the initial impact assessment, about ten marine mammal species can be found in Deception Bay (GENIVAR, 2007a; see Table 3-1).

Table 3-1: Marine Mammals Likely to Use Deception Bay (taken from GENIVAR, 2011).

Nom français	Nom latin	Nom anglais	Abondance relative[2]	Remarque[2]
Béluga	*Delphinapterus leucas*	White whale	Moyenne	Le béluga est chassé dans la baie Déception par les Inuits de Salluit.
Narval[1]	*Monodon monoceros*	Narwhal	Rare	Plus souvent observé dans le passé.
Épaulard	*Orcinus orca*	Killer whale	Faible	Plus souvent observé dans la baie Déception depuis les dernières années. Présence variable d'une année à l'autre. L'épaulard n'est pas chassé par les Inuits.
Petit rorqual	*Balaenoptera acutorostrata*	Minke whale	Moyenne	Souvent observé dans la baie Déception.
Baleine boréale[1]	*Balaena mysticetus*	Bowhead whale	Rare	Fréquente occasionnellement la baie Déception. Quelques individus y sont observés chaque année.
Morse	*Odobenus rosmarus*	Walrus	Rare ou absent	Pas observé dans la baie Déception.
Phoque annelé	*Phoca hispida*	Ringed seal	Élevée	Espèce la plus chassée par les Inuits et présente à l'année le long des côtes.
Phoque du Groenland	*Pagophilus groenlandica*	Harp seal	Inconnue	Espèce chassée par les Inuits, surtout à l'automne.
Phoque barbu	*Erignathus barbatus*	Bearded seal	Inconnue	Population stable selon les Inuits interviewés. Espèce chassée par les Inuits.
Phoque commun	*Phoca vitulina*	Harbour seal	Rare ou absent	Espèce non signalée par les Inuits interviewés.

Source : GENIVAR (2007b)
1 Selon les témoignages des Inuits interviewés (GENIVAR, 2007a)

3.2 Issues (Apprehended Impacts)

- Degradation of water and sediment quality by work near hydroconnected bodies of water or wetlands (transport of contaminants or suspended materials);
- Encroachment on the shoreline of bodies of water.

3.3 Objectives

Ensure protection of wetlands hydroconnected with a permanent body of water, and the shoreline of permanent bodies of water located near the work. This objective seeks to comply with section 128.6 of the *Act respecting the conservation and development of wildlife*[3] and section 35.1 of the *Fisheries Act*.[4]. All activities occurring on the water or on the shoreline must be authorized by the MELCCFP and Canada's Department of Fisheries and Oceans (DFO).

[3] No person may, in a wildlife habitat, carry on an activity that may alter any biological, physical or chemical component peculiar to the habitat of the animal or fish concerned.

[4] No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.

3.4 Environmental Protection Measures

- No work may be performed in fish habitat without having obtained the permits or approval required by the government authorities concerned (DFO, MELCCFP, etc.). The mitigation and avoidance measures required in the certificates of authorization will be respected;
- For all the crossings identified as priorities by the DFO, Canadian Royalties undertakes to maintain the free circulation of fish on both sides of the road. To do this, the bottom culvert will be buried at least 20 cm in the bed of the watercourse, present a slope of at least 0.5% and maintain a minimum depth of water of 20 cm, on condition that the flow is sufficient to allow it (Mitigation Measure FAQ 55);
- Culverts shall be laid at the same slope as the natural stream bed and deflectors shall be installed if flow exceeds 1.2 m/s (Mitigation Measure FAQ 16);
- Clean granular material shall be used for cofferdams (imperviousness prefererably being achieved using non-granular materials) (Mitigation Measure FAQ 22);
- Fine particle transport shall be prevented in the aquatic environment beyond the immediate work area (Mitigation Measure FAQ 24);
- Areas disturbed byu earthwork (e.g. slopes and banks) shall be stabilized progressively as the work is completed (Mitigation Measure FAQ 25);
- Machinery shall be moved away from streams as soon as possible (Mitigation Measure FAQ 31);
- Emergency gear shall be on hand in case of spills and workers shall know how to use it (Mitigation Measure FAQ 34);
- A fishing program shall be established to provide guidelines for fishing in a number of bodies of water(Mitigation Measure FAQ 19);
- Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping period and increased hunting by Inuits) (Mitigation Measure FAQ 47);
- Comply with the mitigation measures pertaining to air, soil, water and sediment quality (see Appendix 1) in order to limit the disturbance of fish habitat.

3.5 Surveillance and monitoring if Applicable

- Perform environmental monitoring during work near fish habitat and any water environment and conduct inspections of the work areas:
  - Use the appropriate thematic inspection sheets (construction work, culvert development, drilling work, etc.). Record the observations on the online platform and follow up the corrective actions, as applicable.
- Perform the following environmental monitoring as described in the EMP:
  - Surface water – Watercourse receiving mine effluents and water temperature of the receiving environment of the final effluent at Expo (Environmental Monitorings 4 and 6);
  - Environmental effects monitoring (EEM) of effluents – Fish and benthic communities (Environmental Monitorings 8 and 16);
  - Metal concentration in fish flesh in the Puvirnituq River (Environmental Monitoring 9);
  - Mercury concentration in fish flesh in Lac du Bombardier and fish populations in Lac du Bombardier (Environmental Monitorings 10 and 11);

- Stability of culverts and free circulation of fish (Environmental Monitoring 12) ;
- Passability of the bridge sill at the outlet of Lac du Bombardier (Environmental Monitoring 13);
- Arctic char spawning areas (Environmental Monitoring 14);
- Sport fishing (Environmental Monitoring 15);
- Surface water –Deception Bay (Environmental Monitoring 7);
- Marine navigation in Deception Bay (Environmental Monitoring 29).

4 Avian Fauna and Nest Protection

4.1 Presentation of Species and Environments

Map 4-1 presents the inventory of avian fauna produced during the 2007 ESIA. Readers are invited to consult the ESIA for the full list of species.

More recently, the inventories conducted by AECOM in July 2021 allowed observation of several aquatic, shore and land bird species (Table 4-1) that are likely to be found in the work area in addition to what was already known for the NNiP area (Appendix 4).

Table 4-1: Bird Species Inventoried in 2021 in the NNiP Area

Species	Latin name	Species	Latin name
Horned lark	*Eremophila alpestris*	Red-breasted merganser	*Mergus serrator*
Semipalmated sandpiper	*Calidris pusilla*	Rock ptarmigan[B]	*Lagopus muta*
Canada goose	*Branta canadensis*	Willow ptarmigan[B]	*Lagopus lagopus*
Sparrow sp.	Not applicable	Ptarmigan sp. [B]	*Lagopus sp.*
Rough-legged buzzard[B]	*Buteo lagopus*	Shorebird sp.	Not applicable
Peregrine falcon[A,B]	*Falco peregrinus*	Buff-bellied pipit	*Anthus rubescens*
European herring gull	*Larus argentatus*	Snow bunting	*Plectrophenax nivalis*
Common raven[B]	*Corvus corax*	Lapland longspur	*Calcarius lapponicus*
Snow goose	*Anser caerulescens*	Red-throated loon	*Gavia stellata*
Long-tailed duck	*Clangula hyemalis*	Common loon	*Gavia immer*
Snowy owl[B]	*Bubo scandiacus*		

[A] Species designated vulnerable in Québec and of special concern in Canada according to the Species at Risk Act.
[B] Species that are part of a family excluded from section I of the Migratory Birds Convention.

Among the birds of prey, some fairly common species were observed, such as the rough-legged buzzard (*Buteo lagopus*) and the snowy owl (*Bubo scandiacus*). (*Bubo scandiacus*). A species designated vulnerable in Québec and of special concern in Canada is also present in the NNiP area, the peregrine falcon (*Falco peregrinus*). . It should be specified that all birds of prey are included in the *Regulation respecting animals that must be declared*, and thus must be declared to a wildlife protection officer if injured or dead specimens are observed.

Among the nesting birds, i.e. the species that establish their nest in the NNiP's territory, the Canada goose (*Branta canadensis*) is the only species observed in 2021 among those identified in Table 4-1. However, nesting status is considered possible or confirmed for several other species observed following many inventories conducted in the NNiP's territory (see Table 4-2). For example, a snow bunting nest (of a ground nesting species) was inventoried in 2022 on the site of the future powder magazine for the Nanaujaq site (Photo 4-1), whereas no nest had been observed in this sector in 2021. This supports the importance of conducting ornithological surveys in the nesting period before performing work, as described in the section on environmental protection measures. It should be specified that the destruction of any bird nest is prohibited under section 26 of the *Act respecting the conservation and development of wildlife*.

Among the species protected in the Migratory Birds Convention Act, 1994 inventoried in the NNiP's territory, the snow bunting was observed nesting on the site of the future powder magazine of the Nanaujaq site. This Act includes the additional protection provisions (authorizations) for the species concerned.

Table 4-2: List of Bird Species for the NNiP (taken from the initial impact assessment of GENIVAR, 2007)

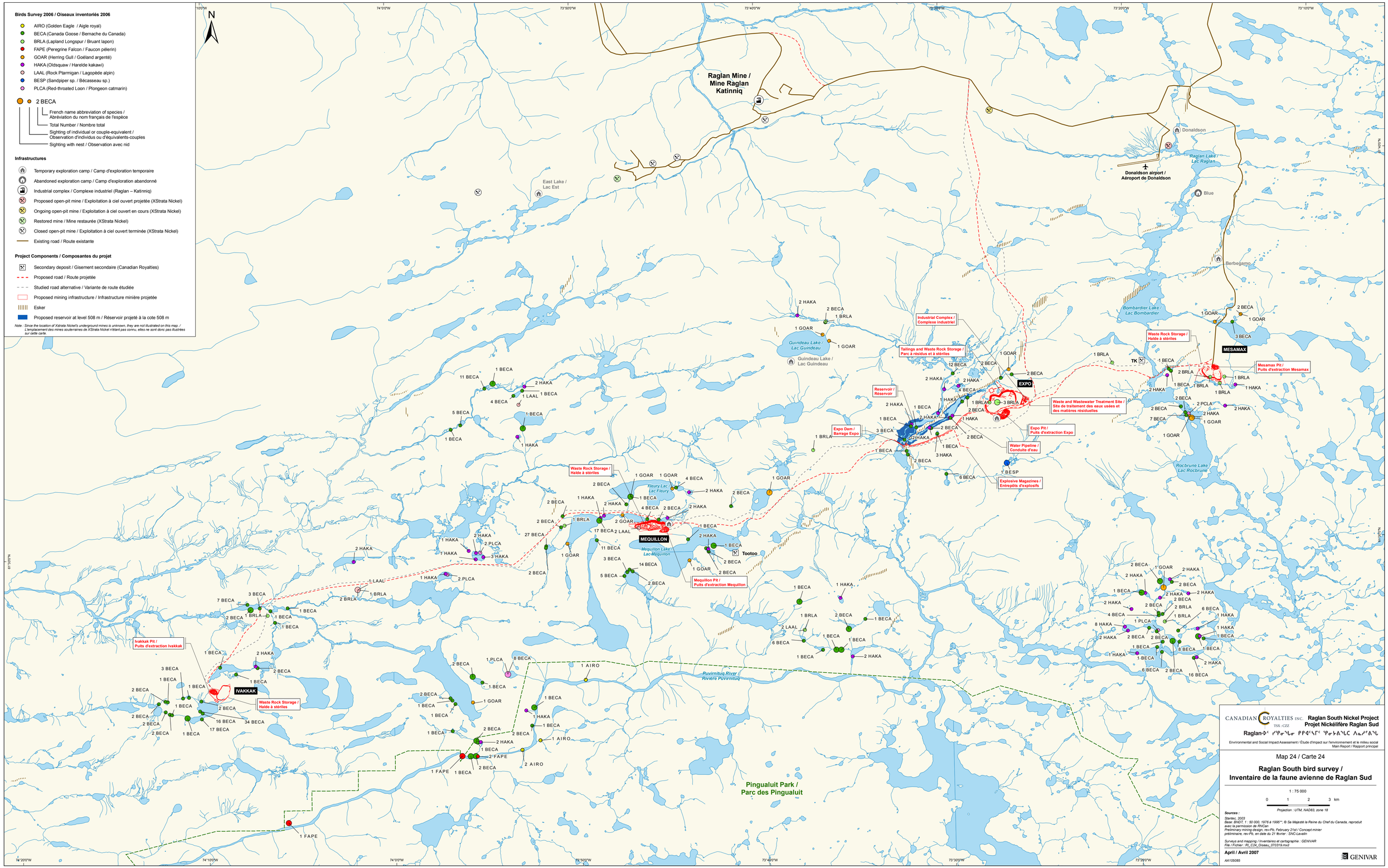
French name	Latin name	English name	Status for the study area [A]	Source					Special status	
				President study	Roche (2005)	Jacques Withford (2003)	Godfrey (1986)	Roche (1993) Deception Bay	In Québec [B]	In Canada [C]
Bird species present in the study area										
Snow goose	*Chen caerulescens*	Snow Goose	Npo	x	x		x	x		
Canada goose	*Branta canadensis*	Canada Goose	Nc	x	x	x	x	x		
Cygne siffleur	*Cygnus columbianus*	Tundra Swan	Mig	x			x			
Canard noir	*Anas rubripes*	American Black Duck	Obs	x						
Canard colvert	*Anas platyrhynchos*	Mallard	Obs	x						
Long-tailed duck	*Clangula hyemalis*	Oldsquaw	Npr	x	x	x	x	x		
Grand Harle	*Mergus merganser*	Common Merganser	Npr	x						
Red-throated loon	*Gavia stellata*	Red-throated Loon	Nc	x	x	x	x	x		
Common loon	*Gavia immer*	Common Loon	Npr	x	x	x	x	x		
European herring gull	*Larus argentatus*	Herring Gull	Nc	x	x	x	x	x		
Pluvier argenté	*Pluvialis squatarola*	Black-bellied plover	Nc	x						
Pluvier semipalmé	*Charadrius semipalmatus*	Semipalmated Plover	Npo	x	x	x	x	x		
Bécasseau à croupion white	*Calidris fuscicollis*	White-rumped Sandpiper	Mig	x				x		
Bécasseau à poitrine cendrée	*Calidris melanotos*	Pectoral Sandpiper	Mig	x			x			
Bécassine de Wilson	*Gallinago delicata*	Wilson's Snipe	Obs	x						
Phalarope à bec étroit	*Phalaropus lobatus*	Red-necked Phalarope	Npo	x		x	x			
Golden eagle	*Aquila chrysaetos*	Golden Eagle	Npo	x		x	x	x	Vuln.	
Buse pattue[D]	*Buteo lagopus*	Rough-legged Buzzard	Npo	x		x	x	x		
Faucon pèlerin *tundrius*[D]	*Falco peregrinus tundrius*	Peregrine Falcon	Nc	x	x		x	x		Concern
Faucon gerfaut[D]	Falco rusticolus	Gyrfalcon	Npo	x		x	x	x		
Harfang des neiges[D]	*Nyctea scandiaca*	Snowy Owl	Npo	x			x	x		
Grand Corbeau[D]	*Corvus corax*	Common Raven	Npo	x	x	x	x	x		
Lagopède alpin[D]	*Lagopus muta*	Rock Ptarmigan	Nc	x	x	x	x	x		
Horned lark	*Eremophila alpestris*	Horned Lark	Npo	x			x	x		
Buff-bellied pipit	*Anthus rubescens*	American Pipit	Npo	x						
Bruant des prés	*Passerculus sandwichensis*	Savannah Sparrow	Npo	x		x	x			
Junco ardoisé	*Junco hyemalis*	Dark-eyed Junco	Obs	x						
Bruant lapon	*Calcarius lapponicus*	Lapland Longspur	Nc	x	x	x	x	x		
Bruant des neiges	*Plectrophenax nivalis*	Snow Bunting	Nc	x	x	x	x	x		
Sizerin sp.	*Carduelis sp.*	Redpoll sp.	Npo	x						

Table 4-2: List of Bird Species for the NNiP (taken from the initial impact assessment of GENIVAR, 2007) (continued)

French name	Latin name	English name	Status for the study area [1]	Source					Special status	
				President study	Roche (2005)	Jacques Withford (2003)	Godfrey (1986)	Roche (1993) Deception Bay	In Québec [2]	In Canada [3]
Bird species likely to be present in the study area										
Bernache cravant	*Branta bernicla*	Brant	Mig			x	x			
Canard pilet	*Anas acuta*	Northern Pintail	Npo		x		x	x		
Eider à tête grise	*Somateria spectabilis*	King Eider	Mig			x	x	x		
Red-breasted merganser	*Mergus serrator*	Red-breasted Merganser	Npo			x	x	x		
Labbe pomarin	*Stercorarius pomarinus*	Pomarine Jaeger	Mig			x	x	x		
Labbe parasite	*Stercorarius parasiticus*	Parasitic Jaeger	Npo			x	x	x		
Labbe à longue queue	*Stercorarius longicaudus*	Long-tailed Jaeger	Mig			x	x	x		
Goéland arctique	*Larus glaucoides*	Iceland Gull	Mig			x	x	x		
Goéland bourgmestre	*Larus hyperboreus*	Glaucous Gull	Mig			x	x	x		
Sterne arctique	*Sterna paradisaea*	Arctic Tern	Npo			x	x	x		
Grue du Canada	*Grus canadensis*	Sandhill Crane	Mig				x			
Semipalmated sandpiper	*Calidris pusilla*	Semipalmated Sandpiper	Npo			x	x	x		
Phalarope à bec large	*Phalaropus fulicaria*	Red Phalarope	Npo			x	x	x		
Hibou des marais[D]	*Asio flammeus*	Short-eared Owl	Obs/Npo			x	x		TVLS	Concern
Lagopède des saules[D]	*Lagopus lagopus*	Willow Ptarmigan	Npo			x	x	x		
Traquet motteux	*Oenanthe oenanthe*	Northern Wheatear	Mig			x	x			
Bruant hudsonien	*Spizella arborea*	American Tree Sparrow	Npo				x			
Bruant à couronne white	*Zonotrichia leucophrys*	White-crowned Sparrow	Npo				x	x		
Sizerin flammé	*Carduelis flammea*	Common Redpoll	Npo			x	x			

Table 4-2: List of Bird Species for the NNiP (taken from the initial impact assessment of GENIVAR, 2007)

French name	Latin name	English name	Status for the study area [A]	Source					Special status	
				President study	Roche (2005)	Jacques Withford (2003)	Godfrey (1986)	Roche (1993) Deception Bay	In Québec [B]	In Canada [C]
Bird species present in the study area										
Snow goose	*Chen caerulescens*	Snow Goose	Npo	x	x		x	x		
Canada goose	*Branta canadensis*	Canada Goose	Nc	x	x	x	x	x		
Cygne siffleur	*Cygnus columbianus*	Tundra Swan	Mig	x			x			
Canard noir	*Anas rubripes*	American Black Duck	Obs	x						
Canard colvert	*Anas platyrhynchos*	Mallard	Obs	x						
Long-tailed duck	*Clangula hyemalis*	Oldsquaw	Npr	x	x	x	x	x		
Grand Harle	*Mergus merganser*	Common Merganser	Npr	x						
Red-throated loon	*Gavia stellata*	Red-throated Loon	Nc	x	x	x	x	x		
Common loon	*Gavia immer*	Common Loon	Npr	x	x	x	x	x		
European herring gull	*Larus argentatus*	Herring Gull	Nc	x	x	x	x	x		
Pluvier argenté	*Pluvialis squatarola*	Black-bellied plover	Nc	x						
Pluvier semipalmé	*Charadrius semipalmatus*	Semipalmated Plover	Npo	x	x	x	x	x		
Bécasseau à croupion white	*Calidris fuscicollis*	White-rumped Sandpiper	Mig	x				x		
Bécasseau à poitrine cendrée	*Calidris melanotos*	Pectoral Sandpiper	Mig	x			x			
Bécassine de Wilson	*Gallinago delicata*	Wilson's Snipe	Obs	x						
Phalarope à bec étroit	*Phalaropus lobatus*	Red-necked Phalarope	Npo	x		x	x			
Golden eagle	*Aquila chrysaetos*	Golden Eagle	Npo	x		x	x	x	Vuln.	
Buse pattue[D]	*Buteo lagopus*	Rough-legged Buzzard	Npo	x		x	x	x		
Faucon pèlerin *tundrius*[D]	*Falco peregrinus tundrius*	Peregrine Falcon	Nc	x	x		x	x		Concern
Faucon gerfaut[D]	Falco rusticolus	Gyrfalcon	Npo	x		x	x	x		
Harfang des neiges[D]	*Nyctea scandiaca*	Snowy Owl	Npo	x			x	x		
Grand Corbeau[D]	*Corvus corax*	Common Raven	Npo	x	x	x	x	x		
Lagopède alpin[D]	*Lagopus muta*	Rock Ptarmigan	Nc	x	x	x	x	x		
Horned lark	*Eremophila alpestris*	Horned Lark	Npo	x			x	x		
Buff-bellied pipit	*Anthus rubescens*	American Pipit	Npo	x						
Bruant des prés	*Passerculus sandwichensis*	Savannah Sparrow	Npo	x		x	x			
Junco ardoisé	*Junco hyemalis*	Dark-eyed Junco	Obs	x						
Bruant lapon	*Calcarius lapponicus*	Lapland Longspur	Nc	x	x	x	x	x		
Bruant des neiges	*Plectrophenax nivalis*	Snow Bunting	Nc	x	x	x	x	x		
Sizerin sp.	*Carduelis sp.*	Redpoll sp.	Npo	x						



Carte 4-1 : Inventaire de la faune avienne de Raglan Sud (tiré de l'étude d'impact initiale de GENIVAR, 2007).

It is also possible that the golden eagle (*Aquila chrysaetos*) (species designated vulnerable in Québec and with no status in Canada), or the harlequin duck (*Histrionicus histrionicus*; species on the TVLS list in Québec and of special concern according to the *Species at Risk Act* in Canada) may occasionally cross (by flight) or feed at the work sites.

Photo 4-1: Snow Bunting Nest.

4.2 Issues (Apprehended Impacts)

- Destruction of active nests on the ground or in shrubs;
- Disturbance of nesting couples and migratory birds present near the work areas of the mine site and along the access roads.

4.3 Objectives

- Protect the active nests of nesting couples, from egg laying to flight.
  - The nests are protected under the Migratory Birds Regulations and by Chapter III, s. 26 of the Act respecting the conservation and development of wildlife, stipulating that it is forbidden to destroy, disturb or damage a nest;
- Apply section 68 of the Act respecting the conservation and development of wildlife, and its Regulation respecting animals that must be declared:
  - Ensure appropriate action in case of an incident involving animals that must be declared;
  - Ensure efficient communication with the government authorities in case of an incident involving animals that must be declared.
- Reduce the impacts on annual breeding and young nestling production period;
- Limit disturbance of nesting couples during brooding and migration of birds near the work areas of the mine site and along the access roads;
- Ensure the follow-up required in case of occurrence of reportable events.

4.4 Environmental Protection Measures

- Traffic must be limited to work areas (Mitigation Measure FAV 1);
- The habitats next to job sites will be protected (Mitigation Measure FAV 2);
- The extent of the stripping and levelling shall be limited (Mitigation Measure FAV 3);

- It is prohibited to fly over the cliffs located southwest of Méquillon on the shore of the Puvirnituq River from June to September (peregrine falcon and golden eagle nesting period) (Mitigation Measure FAV 4). The cliff sector is located within the limits of Pingualuit Park (Map 4-1);
- Install bird scaring devices near the minewater collection ponds;
- To avoid the destruction of active nests, when work is planned near the nesting period (between mid-May and mid-August according to ECCC, 2018), conduct an inventory in the active nest sector no later than five days before the performance of the work by following the protocol presented in Appendix 3. If the presence of an active nest is noted, mark the location and protect it until flight (nesting species such as Snow Bunting) or departure of the nestlings (nesting species such as Willow Ptarmigan). Depending on the size of the sector concerned by the work, the inventory may be spread over a few days, to comply with the maximum five (5) day window between the inventory and the start of the work in a portion of the sector. The inventory will be produced by trained personnel, particularly CRI environmental technicians and a biologist;
- If work is planned in the sectors where nests were identified during environmental characterizations (these sites may be consulted on the maps produced during these environmental characterizations), and if they cannot be moved outside the nesting period of the birds (between mid-May and mid-August) because of their criticality for the activities, prevent nesting of birds by scaring (see Appendix 3) from the beginning of May to the beginning of the construction work (around mid-July). The absence of nests on the work site can be confirmed by a field visit by a biologist or an environmental technician and by taking photographs before the beginning of the work.

4.5 Actions to Be Taken Depending on the Situation

The following situations are addressed in this section:

4.5 1 Work area: Fortuitous observation of an active nest	4.5 2 Work area : observation of a complementary activity	4.5 3 Observation of sick or injured birds	4.5 4 Observation of dead birds\	Collision with a bird (see section 9)

4.5.1 Work area: Fortuitous observation of an active nest

- The nest is protected under the Migratory Birds Regulations and may not be disturbed or destroyed. The performance of activities that could disturb the nestlings and their parents must be avoided. Complete the bird nest inventory sheet of the bird nest inventory protocol (see Appendix 3) and follow the instructions of sections 2.3 to 2.6 of this protocol;
- Establish the protective buffer zones and ensure compliance with it during the laying, incubation and rearing period.

4.5.2 Work area: Observation of a complementary activity

- If the bird exhibits one of the following behaviours, establish a protective perimeter, because an active nest is probably present nearby:
  - Transports food or a fecal sac[5] to a specific location;
  - Simulates an injury or diverts attention;
  - Comes and goes frequently near the area;
  - Make cries of alarm and attacks when the area is approached.

[5] The fecal sac is a sturdy whitish mucous pouch containing the excreta of nestlings. The adults eat the fecal sacs or transport and abandon them several metres from the nest, which ensures the hygiene of the nest and prevents nearby excreta from revealing the presence of the nest to predators.

- If no nest is present nearby but the area seems frequently used by one or more birds (feeding area, movement corridor, etc.):
  - Complete a Wildlife Event Report (see the form in Appendix 2 of this document, which may be consulted after the Management of Interventions Involving Wildlife procedure);
  - Mark the area with tape on the grounds so it is easily detectable;
  - Avoid disturbances and traffic in the area as much as possible.

4.5.3 Observation of sick or injured birds

- Leave the bird where it is and do not intervene except if otherwise indicated by an avifauna specialist or a veterinarian;
- Notify CRI's Environmental Coordinator and provide the information so this person can complete the Wildlife Event Report (appendix to the Management of Interventions Involving Wildlife procedure). The Environmental Coordinator then will notify the regional wildlife protection officer to receive the appropriate instructions depending on the species and its condition.

In the case of a bird of prey (animal that must be declared), in addition to the above instructions, refer to the Management of Interventions Involving Wildlife procedure and apply the following elements in particular:

- Notify the dispatcher, who will have to notify the Environmental Coordinator;
- The Environmental Coordinator will declare the observation to the MELCCFP (see the contact information in the presentation of the document) and will apply their instructions, as applicable.

If there is reason to believe that the injured or dead bird is potentially infected by the avian flu virus, it is very desirable for the Environmental Coordinator to contact the MELCCFP at 1-877-346-6763 to obtain follow-up instructions. The Gouvernement du Québec requests everyone's cooperation for rapid detection of avian flu cases. Avian flu symptoms in birds are, in particular:

- a lack of energy and appetite;
- a decrease in egg production and laying of many eggs with soft shells or without shells;
- swelling of the head, eyelids, crest, wattles and hocks;
- coughing, sneezing and nervous signs;
- diarrhea;
- lack of coordination.

4.5.4 Observation of dead birds

If the cause of death is due to a collision, refer to the collision section.

If the cause of death of the bird is not due to predation or a collision, it may involve the avian flu virus. In this case, follow the steps below:

- Collect the specimen as follows:
  - Always wear gloves;
  - Place one hand at the bottom of a double plastic bag;
  - Grasp the bird with the bag;
  - Turn the bag back over the bird;
  - Close the bag.

- Move the bag containing the bird to an isolated and cool location, if possible;
- Wash your hands carefully with soap and water;
- Bring the bag containing the bird to the Environmental Coordinator and provide the information for this person to complete the wildlife report.

If the bird's death is likely to be due to avian flu, the person responsible for environment is encouraged to contact the MELCCFP at 1-877-346-6763 to obtain the follow-up to the instructions.

In the case of a bird of prey, also follow the instructions below:

- Notify the dispatcher and specify the information to the Environmental Coordinator.
- The Environmental Coordinator will declare the observation to the MELCCFP (see the contact information in the presentation of the document) and will wait for their instructions before disposing of the carcass. In some cases, it may be required to turn over the carcass to a wildlife officer If the bird's death is likely to be due to avian flu, the person responsible for environment is encouraged to contact the MELCCFP at 1-877-346-6763 to obtain the follow-up to the instructions.
- If the bird is a species at risk, the person responsible for Environment must contact the *Canadian Wildlife Service* for species under federal jurisdiction (e.g. waterfowl) and the Ministère des Forêts, de la Faune et des Parcs for species under provincial jurisdiction (e.g. birds of prey) (see possible species in Table 4-1).
- If the death of the bird does not appear related to avian flu and does not involve a bird of prey, a special at risk or a game species found outside the permitted hunting period, the bag containing the bird may be discarded and disposed of at the northern landfill site (NLS).

4.6 Surveillance and monitoring

- For all the CRI employees, contractors and visits, report to the dispatcher the direct or indirect observation of clues indicating the presence of birds of prey, as required in the Management of Interventions Involving Wildlife procedure PRO- NSST – 1211-05a;
- Follow up bird nests prior to the construction work if it is performed between June 1 and August 17 (see Appendix 3 of this document – Bird Nest Inventory Protocol);
- Follow up active nests present in the work area (see Appendix 3);
- Update the nest register;
- Complete a Wildlife Event Report in the following situations (see Appendix 2):
  - Observation of behavioural activities in a work area;
  - Observations of sick, injured or dead birds.

5 Wolf, Black Bear and Polar Bear

5.1 Presentation of Species and their Range

Wolves, black bears and polar bears occasionally visit the NNiP's territory. It should be specified that these three species are included in the *Regulation respecting animals that must be declared*, and therefore must be declared to a wildlife protection officer if injured or dead specimens are observed. Moreover, all direct and indirect polar bear observations must be reported in the context of Environmental Monitoring 17 of the EMP of CRI.

The wolf (*Canis lupus*), whose pelt may vary from white to black, is a mammal active mainly a night, who usually lives in a pack. It populates varied habitats of Arctic tundra, boreal forest or mixedwood forest, with home range ranging up to more than 13,000 km^2. Its diet is mostly composed of large mammals, but it may also be attracted by dump areas, which increases the risks of encounters with humans. However, it is still rare for a wolf to attack people (MFFP, 2016). This mammal is rarely present near CRI's mining facilities, but the discovery of caribou cadavers in certain sector of the NNiP indicates the use of the sector by large predators, such as wolves.

The black bear (*Ursus americanus*), which may also have a brown or cinnamon pelt, frequents habitats of dense forests, tundra, rivers or swamps. It is solitary, mainly active at dawn and dusk, and is adept in water, on land (can run up to 55 km/h) and in trees. The black bear winters between the end of November and March/April. The females give birth between mid-January and the beginning of February. The cubs stay with their mother for between 16 and 18 months, and the mother defends them ardently. It is common for black bears to visit dumps, campgrounds and inhabited areas in search of food. The black bear is generally timid of humans, but aggressive behaviours may occur on rare occasions (MFFP, 2016).

The polar bear (*Ursus maritimus*) is a species designated vulnerable at the provincial level[6] and of special concern at the federal level.[7] It is generally found along the Arctic coasts in summer (up to 200 km inland) and on pack ice in winter. Outside its hibernation period, it is active by day and night and is mostly solitary, except between the end of June and the end of July, when gatherings occur. After denning (December-January), the cubs stay with their very protective mother for about two-and-a-half years. Although timid by nature, curiosity the search for food of defence of cubs may cause polar bears to approach humans, and even attack. This mammal is rarely9 encountered near CRI's mining facilities.

Diagrams 5-1 to 5-3 present the distribution of these predators in Québec and in the Arctic for polar bears.

[6] According to the *Regulation respecting threatened or vulnerable wildlife species and their habitats*.
[7] According to the *Species at Risk Act*.

Diagram 5-1: Wolf Range in Québec (taken from Répartition du loup au Québec (gouv.qc.ca))

Diagram 5-2: Black Bear Range in Québec (taken from repartition-ours-noir.pdf (gouv.qc.ca))

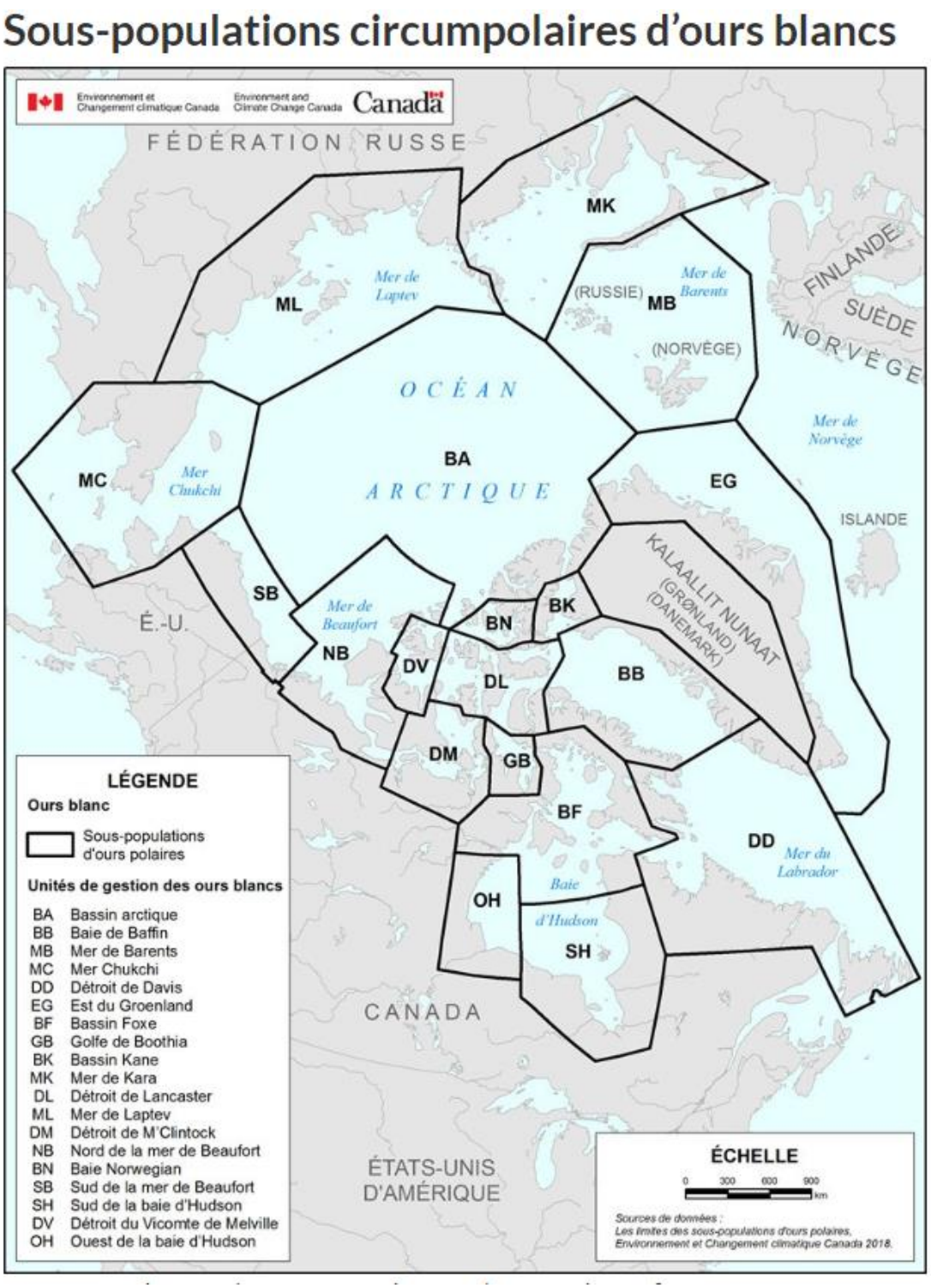


Diagram 5-3: Range of Polar Bear Sub-populations in the Arctic
(Extracted from https://www.canada.ca/en/environment-climate-change/services/biodiversity/maps-sub-populations-polar-bears-protected.html

5.2 Issues (Apprehended Impacts)

- Impact of the work on polar bears (species at risk: designated vulnerable in Québec and of special concern in Canada);
- Loss of terrestrial habitats used for feeding and breeding of the species;
- Dietary disturbance and conditioning of species to humans by the presence of waste or food residues of human origin on the perimeter of the mine site and road accesses;
- Increase in the risk for human safety due to the absence of suspicion and presence of signs of aggression displayed against workers near and on the mine site, and near access roads;
- Increase in the risk of collisions and conflicting interactions with wildlife.

5.3 Objectives

- Limit the potential sources of conflicts and interactions with wildlife and reduce the risks of collisions with wildlife;
- Ensure the workers' safety regarding the potential presence of polar bears, black bears and wolves;
- Pay special attention to preservation of the polar bear, which is a species designated vulnerable;
- Ensure compliance with section 67 of *the Act respecting the conservation and development of wildlife,* which stipulates that:
  - *"No person nor anyone lending him assistance may kill or capture an animal attacking him or causing damage to his property or property under his care or maintenance unless he is unable to frighten the animal away or prevent it from causing damage.*
  - *No person may kill or capture an animal that causes damage to property or must be moved in the public interest, except on the conditions determined by regulation of the Minister.* "
- Apply section 68 of the *Act respecting the conservation and development of wildlife*, and its *Regulation respecting animals that must be declared:*
  - Ensure appropriate action in case of an incident involving animals that must be declared;
  - Ensure efficient communication with the government authorities in case of an incident involving animals that must be declared.
- Ensure appropriate action in case of bear or wolf sightings;
- Ensure efficient communication on the site and with the neighbouring Glencore authorities in case of polar bear sightings.

5.4 Environmental Protection Measures

- Preliminary and regular inspection of machinery to ensure it is in good condition and good working order (limit noise emissions) (Mitigation Measure LMA 1);
- Limit machinery traffic in the work areas (Mitigation Measure LMA 2);
- Prohibit workers from feeding the species and inform them of the consequences this could have (Mitigation Measure LMA 4) on animal health and human safety;
- Store domestic waste in closed containers before incineration (Mitigation Measure LMA 5);
- Conduct regular information campaigns on the dangers of feeding wild animals.

5.5 Actions to Be Taken Depending on the Situation

The following situations are addressed in this section:

5.5 1 Observation or sign of the presence of bears or wolves				5.5 2 Contact with the animal	Collision with an animal (see section 9)
Observation of the animal – does not seem to represent a potential danger	Observation of the animal – seems to represent a potential danger	Observation of the animal – seems to represent a potential danger	The animal's presence represents an immediate danger for workers' safety		

5.5.1 Observation or Sign of the Presence of Bears or Wolves

Refer to the Management of Interventions Involving Wildlife procedure and apply the following elements, in particular:

- Notify the dispatcher:
  - If the observation occurs on the roads managed by Glencore, also notify the Kattiniq dispatcher and wait for that person's instructions.
- The dispatcher will report the information to the Security and Emergency Preparedness (SEP) Supervisor and the Environmental Coordinator;
- A Wildlife Event Report (appended to the Management of Interventions Involving Wildlife procedure) will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation;
- In case of a confirmed polar bear sighting, the dispatcher will notify the Glencore dispatcher;
- If the animal observed is **dead or injured**, in addition to the generic instructions above:
  - Leave the animal where it is and do not intervene except if a specialist indicates otherwise;
  - The Environmental Coordinator will declare the observation to the MELCCFP (see the contact information in the presentation of the document) and will wait for their instructions before disposing of the carcass, if applicable.
- If the animal is found near the mine site or road accesses and represents a potential danger or an immediate danger or does not present a potential danger, in addition to the generic instructions above:
  - Refer to the Management of Interventions Involving Wildlife procedure for the actions to be taken;
  - It should be specified, as mentioned in the objectives, that section 67 of the ACDW stipulates that no person may kill or capture an animal that causes damage to property or must be moved in the public interest;
  - If the attempts at scaring the animal do not work and human safety is at stake, the authorized personnel then may kill the animal:
    - The event will be declared to the MELCCFP as described above for cases of inured or dead bears or wolves. A wildlife protection officer then may require that the carcass be turned over to him. In the case of a polar bear, the wildlife protection officer then may turn over the animal carcass to the beneficiaries of the northern agreements for disposal. If the person who killed the bear is a beneficiary of the northern agreements, this person may keep the killed animal;
    - If the carcass must be kept, try to move it to a remote and cool location so as not to attract scavengers.

5.5.2 Contact with the Animal

If a worker has been bitten or clawed by an animal or in contact with its saliva, refer to the Management of Interventions Involving Wildlife procedure and apply the following elements:

- Notify the dispatcher;
- Communicate immediately with the mine site's Health Department team to report the situation and obtain the actions to be taken subsequently;
- While waiting for the medical team to take charge, clean the wound, even if it is minor, with soap and water for at least 10 minutes;
- A Wildlife Event Report will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation.
- Surveillance and monitoringFor all CRI employees, contractors and visitors, report to the dispatcher the direct or indirect observation of clues indicating the presence of a bear or wolf, as required in the Management of Interventions Involving Wildlife procedure;
- Ensure that a Wildlife Event Report was completed for any direct or indirect observation of a bear or wolf;
- Include the Wildlife Event Reports and the complementary observations relating to the polar bear in the EMP annual monitoring report.

6 Caribou

6.1 Presentation of the Species and its Range

The caribou subspecies (*Rangifer tarandus*) living near the project is the woodland caribou. The adults generally are dark brown, with a creamy white neckline. Both sexes generally have antlers, but those of the females are smaller and more linear, and they may keep them all winter.

The gestating females lead the spring migration to the traditional calving areas, where they gather year after year. The calving season is a sensitive period for caribou. Indeed, habitat loss, anthropogenic activities, climate change (which reduces the availability of their food or increase the presence of insects) are important stress factors that may compromise the calves' survival.

These factors, associated with the low breeding rate, jeopardize the species. Moreover, several subspecies and populations are designated species at risk. The woodland caribou of the Leaf River Herd present in the NNiP area, migratory ecotype, does not have any species at risk status, contrary to the mountain ecotype (designated a threatened species in Québec and endangered at the federal level) and the woodland ecotype (designated a vulnerable species in Québec and threatened at the federal level).

It should be specified that caribou are included in the *Regulation respecting animals that must be declared*, and therefore must be declared to a wildlife protection officer if injured or dead specimens are observed.

6.2 Issues (Apprehended Impacts)

- Potential loss of habitat and food for caribou.
- Local change of spatial use of habitat by the caribou present near work areas and access roads;
- Disturbance by human activity and noise related to construction work and land and air transportation, which may lead to avoidance (temporary or permanent) of certain habitats located on the periphery of the mine site and access roads;
- Disturbance of calving by sudden high-intensity noises generated by construction and operational activities (for example, blasting) (Wildlife Resource Consulting Services MB Inc., 2019);
- Increase in the risk of road collisions in the summer period.

6.3 Objectives

- Minimize the loss and the alteration of the pattern of use of habitats visited by caribou near the mine site and road accesses;
- Reduce the disturbance sources (e.g. noise) and minimize their effects on the use of habitats surrounding the mine site and the access roads;
- Avoid road collisions and individual mortality;
- Ensure appropriate action in case of incidents involving animals that must be declared;
- Ensure efficient communication with the government authorities in case of incidents involving animals that must be declared;
- Take action in real time to minimize disturbance or any change in behaviour if caribou approach the work areas;

- Apply section 68 of the *Act respecting the conservation and development of wildlife*, and its *Regulation respecting animals that must be declared*:
  - Ensure appropriate action in case of an incident involving animals that must be declared;
  - Ensure efficient communication with the government authorities in case of incidents involving animals that must be declared;

6.4 Environmental Protection Measures

6.4.1 General

- Prohibition for non-Native workers to hunt caribou.
- Store domestic waste in closed containers before its incineration (Mitigation Measure LMA 5) to avoid the presence of large predators, such as wolves and black bears, that could compromise the calves' survival;
- Sensitize the workers, particularly at the approach of the calving period, to the risks of disturbance for caribou and appropriate behaviours.
- Regularly conduct information campaigns on the danger of feeding wild animals;
- Mobile equipment and vehicles must yield the right of way to wildlife such as caribou.

6.4.2 Habitat

- Limit machinery traffic in the work areas (Mitigation Measure LMA 2);
- Spread dust suppressant (calcium chloride or water) on certain surfaces (on the mine sites. The moistening frequency will be adjusted according to the weather conditions and the dust emissions observed. The dust suppressants used will be in compliance with standard BNQ 410-300 or will be approved by the Ministère des Transports du Québec (MTQ). The choice of dust suppressant must account for the proximity of a wetland or water environment (Measures AIR 2 and AIR 2a);
  - Use dust suppressants in the road segments located near potential feeding habitats for caribou, primarily wetlands.

6.4.3 Behaviour

- Preliminary and regular inspection of machinery to ensure it is in good condition and good working order (limit noise emissions) (Mitigation Measure LMA 1);
- Avoid work in the Ivakkak sector (Ivakkak Quarry 3.5, Ivakkak Quarry 4[8] and Ivakkak Quarry 7, road, mine site), during the calving period (from May 15 to July 15) if caribou are observed nearby;
- Do not honk at caribou or adopt behaviour that would be stressful for them.
- Sensitize the helicopter pilots to the susceptibility of caribou to disturbances in the calving period. During any helicopter trip in the study territory, notify all pilots to ensure compliance with the instructions presented in Table 6-1 (below);
- Avoid any direct movement of equipment (including ATVs, snowmobiles or helicopters) and people toward caribou observed near job sites or access roads.
- Participation in a research project with Caribou Ungava on the impacts of linear structures on caribou behaviour.

[8] CRI undertook, in the context of the MELCCFP authorizations for construction of the Ivakkak road and Ivakkak Quarry 4 (ref. MELCCFP: 7610-10-01-70080-81/402026453 and 7610-10-01-84841-00/402092779) to apply this protective measure for these two projects and also undertook to apply it to the entire sector.

Table 6-1: Avoidance Distance for Caribou According to the Time of Year and the Number of Individuals for Helicopter Transportation (inspired by the Blue Star Gold Corp. wildlife protection plan, 2021).

Season	Number of caribou	Avoidance distance for helicopter carriers
Beginning of summer (May 15 to July 31)	Group > 250	610 m vertical 4 km horizontal
Beginning of summer (May 15 to July 31)	Group > 50	610 m vertical 2 km horizontal
All other seasons (August 1 to May 14)	Group > 50	300 m vertical 1 km horizontal

6.5 Actions to Be Taken Depending on the Situation

The following situations are addressed in this section:

6.5 1 Dead of inured caribou	6.5 2 Presence of a caribou near a road access	6.5 3 Incident involving a caribou	Collision with a caribou (See section 9)

6.5.1 Dead of injured caribou

In case of observation of a dead or injured caribou, whether due to an incident/accident involving workers or not, refer to the Management of Interventions Involving Wildlife procedure and apply the following elements, in particular:

- Leave the animal where it is and do not intervene except if a specialist indicates otherwise;
- Notify the dispatcher (animal that must be declared) and the dispatcher will have to notify the Environmental Coordinator;
- A Wildlife Event Report (appended to the Management of Interventions Involving Wildlife procedure) will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation;
- The Environmental Coordinator will declare the observation to the MELCCFP (see the contact information in the presentation of the document) and will wait for their instructions before disposing of the carcass, if applicable.

6.5.2 Presence of a caribou near a road access

- Apply the decision tree presented in Diagram 6-1 (below). If, at a distance of 30 m, the caribou remain(s) on the road after several minutes of waiting without seeming to be disturbed by the vehicle's presence, advance 5 m as gently as possible and wait again. Repeat the operation as needed. Do not honk or adopt any other behaviour stressful for the animal;
- Report to the dispatcher any situation that may constitute a risk for the workers' safety, as mentioned in the Management of Interventions Involving Wildlife procedure, or any other observation that appears significant.

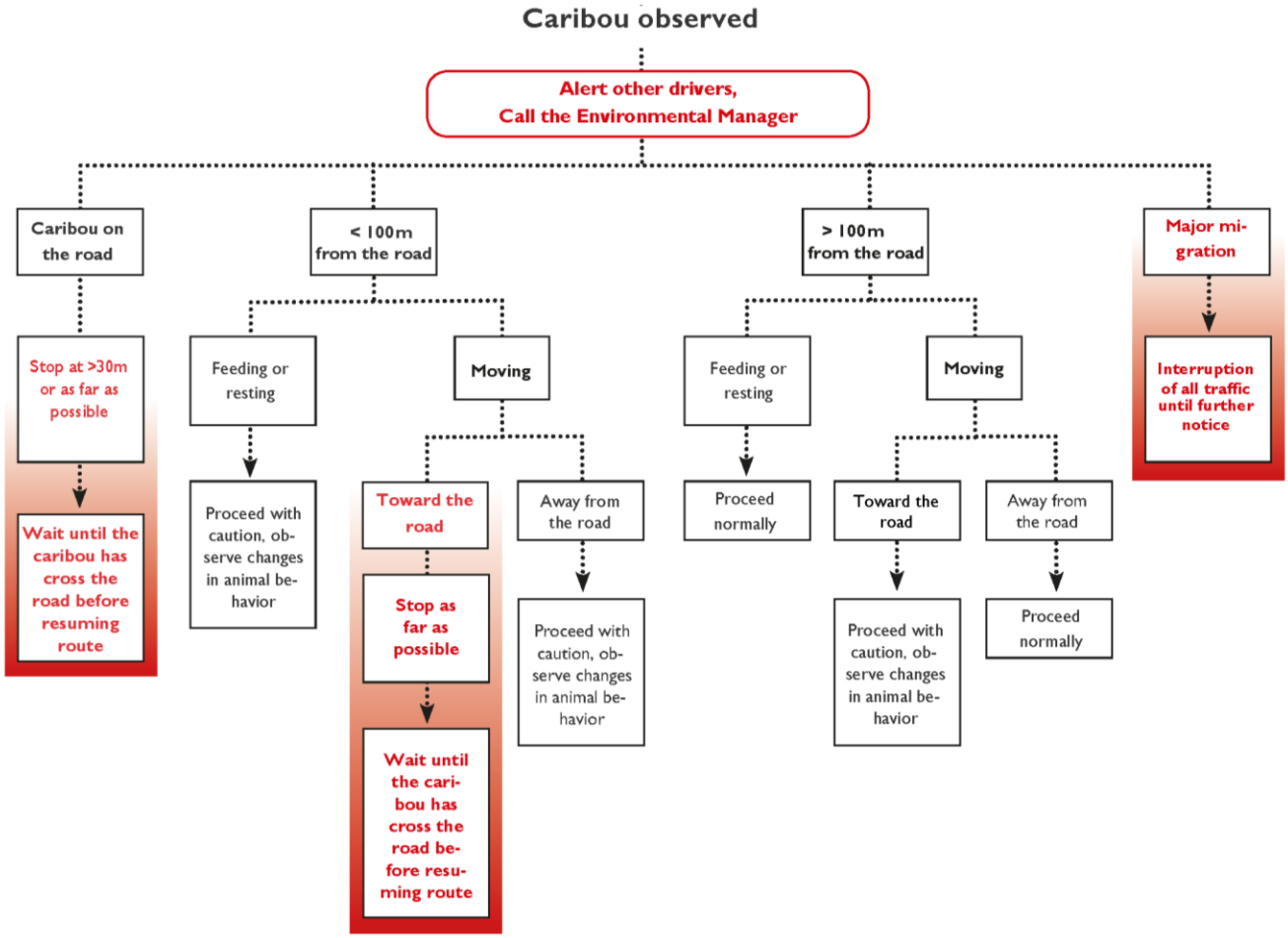


Diagram 6-1: Decision Tree Concerning the Presence of Caribou on Beside the Access Road.

6.5.3 Incident Involving a Caribou

Refer to the Management of Interventions Involving Wildlife procedure (see Appendix 2) and apply the following elements, in particular:

- Notify the dispatcher, who will have to notify the Environmental Coordinator;
- A Wildlife Event Report (appended to the Management of Interventions Involving Wildlife procedure) will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation.

6.6 Surveillance and monitoring

- Record the observations of the presence of caribou on the Expo – Ivakkak road, throughout the period of their presence near the facilities. This information includes the number of individuals, their location and the observation date and is transmitted annually to the MELCCFP, as described in Environmental Monitoring 18 of the EMP;

- Ask the helicopter pilots to transmit the caribou locations and the number observed during their return trip to the base so that the sectors where they are present are identified;
- For all CRI employees, contractors and visitors, report to the dispatcher the observations of caribou behaviours that are unusual or could be problematic for the health and safety of the workers, as required in the Management of Interventions Involving Wildlife procedure (see Appendix 2);
- Complete a Wildlife Event Report in the following circumstances:
  - Unusual caribou behaviour and situation at risk for workers' health and safety;
  - Incident involving a caribou.

7 Chiroptera

7.1 Presentation of Species

In Québec, eight bat species are present, five species of which are classified as resident and three species as migratory. The resident species spend the winter in hibernacula, which may be mines or grottoes, while the migratory species spend the winter farther south and return to Québec in summer. Among the five resident species, the northern myotis (*Myotis septentrionalis*), the little brown myotis (*M. lucifugus*), and the tri-coloured bat (*Perimyotis subflavus*) are classified as endangered acceding to the Federal Government's *Species at Risk Act*. Acceding to the recovery plan for these three species (Équipe de rétablissement des chauves-souris du Québec, 2019), their confirmed range is found below the 54th parallel. Only the little brown myotis and the northern myotis can potentially be found in Nunavik.

Currently, the site used by NNiP does not contain a wintering or resting habitat because no grotto or crevasse is found in the area used by the NNiP. The only possible locations to shelter and rest and buildings constructed by CRI, containers, unused buildings or any other little used or unused anthropogenic structure.

According to information collected during public hearings in fall 2012, two people affirm they noticed bats in Kuujjuaq and Quaqtaq (GENIVAR, 2013). Mentions of bats in flight were also reported in Salluit and Kangiqsujuaq (Équipe de rétablissement des chauves-souris du Québec, 2019).

Although bats have never been observed on the project site, the MELCCFP wants the observations to be compiled.

7.2 Issues (Apprehended Impacts)

- Potential disturbance of colonies or individuals by the work, light, ultrasound production or the vibrations produced by construction work and air and land transportation;
- Potential alteration of feeding habitats, such as wetlands;
- Damage to and/or suppression of dormitories or maternity shelters during the closure and restoration phase or during demolition of certain buildings.

7.3 Objectives

- In the presence of bats inventoried on the site in the CRI buildings or other structures, ensure maintenance of existing dormitories or shelters on the mine site and its perimeter;
- In the presence of bats inventoried on the site in the CRI buildings or other structures, follow the survival of these colonies;
- Minimize the loss of potential feeding habitats;
- In case of the presence of bats inventoried on the site, minimize the disturbance by reducing ultrasound production in the nocturnal period.

7.4 Proposed Protective Measures

- In the case that decommissioned old buildings (small of large) have to be demolished or altered, produce an inventory of maternity shelters or dormitories that can shelter chiroptera. Mainly target unused old facilities and buildings present on CRI facilities;
- In the confirmed presence of chiroptera near the mine site and access roads, minimize ultrasound production that risks interfering with the search for food of these mammal species;
- In the presence of chiroptera nearby, concentrate the construction work during the day, whenever possible, to disturb the nocturnal activities of bats as little as possible;
- Gather all data and observations concerning chiroptera in the Wildlife Event Report (see Appendix 2);
- Share any data with the MELCCFP by contributing to the colony reporting network.

7.5 Actions to Be Taken Depending on the Situation

7.5.1 In the Presence of a Maternity Shelter

- Contact the person responsible for Environment and stop all work on the structure or building used as a maternity shelter. See to its protection while informing the MELCCFP of its presence;
- Establish the geographic position and characterize the site and the habitat type;
- Inform of and deploy measures to minimize disturbance during the summer;
- Collect this information by completing the Wildlife Event Report (see Appendix 2).

7.5.2 If a Dead Bat is Found:

- Contact the person responsible for Environment;
- Complete the Wildlife Event Report (see Appendix 2);
- Establish the geographic position, identify the species (https://chauve-souris.ca/sites/default/files/AFF_Chauves-souris_Final.pdf) and, if possible, identify the potential cause of mortality;
- Use gloves, put the individual in a plastic bag, and keep it cold before turning it over to the MELCCFP.

7.6 Surveillance and monitoring if Applicable

- Compile the observations performed on bats during construction and operation, including mortality, via Wildlife Event Reports.
- Report the observations in the EMP annual report.

8 Arctic Fox and Red Fox

8.1 Presentation of Species and Range

The Arctic fox (Alopex lagopus) is Canada's smallest canid. Thanks to the diversity of its diet and its adaptations to the cold, this fox has a very wide range, throughout the circumpolar lands of the Arctic. The fox populations sometimes are abundant near dumps and other anthropogenic food sources. It should be noted that Arctic foxes are the leading host of rabies, a fatal disease for humans. The authorities recommend reducing anthropogenic food sources as much as possible to reduce the risks of transmission.

The red fox (*Vulpes*) may also be brown or black. Its territory generally covers 4 to 8 km^2 around the den, but young foxes in search of new territory may cover up to 250 km. It is one of the most widespread mammals in Canada and is found today in all of Canada's provinces and territories. It prefers to hunt at sunsets, in the evening and at night. Sometimes Arctic foxes compete with red foxes for lairs and hunting areas.

Like the Arctic fox, the red fox may represent a public health hazard when it is a carrier of rabies.

Here are the main symptoms of rabies to identify it:

- Furious form: extreme excitement, aggression, the animal bites its paws, attacks inanimate objects, other animals or humans;
- Paralytic form: the animal stops fearing humans, becomes active by day, may seem depressed or amorphous, may exhibit symptoms of partial or complete paralysis (abnormal facial expression, excessive salivation, collapse of the head and jaw, strange sounds).

8.2 Issues

- Loss of terrestrial habitats used for feeding and breeding;
- Possible loss or abandonment of Arctic fox lairs;
- Increase in the risk for human safety by the absence of suspicion and the presence of signs of aggression displayed against workers nearby and on the mine site, as well as near road accesses;
- Transmission of rabies to employees by Arctic fox and red fox;
- Increase in the risk of collisions and conflicting interactions with wildlife.

8.3 Objectives

- Limit the impacts of activities at the mine site or near road accesses near Arctic fox lairs.
- Limit the potential sources of conflict and interactions with wildlife;
- Reduce the risks of collisions with wildlife;
- Ensure workers' safety during construction work and in the operational phase;
- Ensure workers' safety against transmission of rabies;
- Ensure management of the populations near sites in exploitation (see point 7.6 of the Management of Interventions Involving Wildlife procedure (Appendix 2).

8.4 Environmental Protection Measures

- Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (minimizing noise) (Mitigation Measure MTR 1);
- Machinery traffic shall be limited to work areas (Mitigation Measure MTR 2);
- **Workers shall be prohibited from feeding Arctic foxes** and informed of the consequences that might have (Mitigation Measure MTR 4) for animal health and human safety;
- Avoid any contact with foxes;
- Household waste shall be stored in closed containers before being incinerated (Mitigation Measure MTR 5);
- Regularly conduct information campaigns on the danger of feeding wild animals;
- An inventory of fox lairs will be produced during the performance of impact assessments for the exploration of any new esker not covered by the 2007 ESIA and its addenda.

8.5 Actions to Be Taken Depending on the Situation

The following situations are addressed in this section:

8.5 1 Fox sighting	8.5 2 Contact with the animal	Collision with an animal (see section 9)

8.5.1 Fox Sighting

If one or more foxes found near the mine site or the accesses represents a potential danger (e.g. familiar behaviour) or an immediate danger or does not represent a danger:

- Refer to the Management of Interventions Involving Wildlife procedure for the actions to be taken;
- It should be specified, as mentioned in the objectives, that section 67 of the ACDW stipulates that no person may kill or capture an animal that causes damage to property or must be moved in the public interest;
- If scaring attempts do not work and human safety is at stake, the authorized personnel may kill the animal;
- As mentioned in the Management of Interventions Involving Wildlife procedure, the IET (Inuit Employment and Training) advisors must be involved in the population management decisions for Arctic foxes present on the NNiP;
- A Wildlife Event Report (appended to the Management of Interventions Involving Wildlife procedure) will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation.

8.5.2 In Case of Contact with an Animal

If a worker has been bitten or clawed by an animal or in contact with its saliva, refer to the Management of Interventions Involving Wildlife procedure and apply the following elements:

- Notify the dispatcher;
- Communicate immediately with the mine site's Health Department team to report the situation and obtain the actions to be taken subsequently;
  - Consult the Health Department even if there is no apparent trace of injury.

- While waiting for the medical team to take charge, clean the wound, even if it is minor, with soap and water for at least 10 minutes;
- A Wildlife Event Report will be completed by the SEP Supervisor or the Environmental Coordinator depending on the situation.

8.6 Surveillance and monitoring

- Complete a Wildlife Event Report in the following situations (see Appendix 2):
  - Observation of fox behaviours that are familiar, present a danger, are unusual or otherwise significant;
  - Incident involving foxes.

9 Collisions with Wildlife

9.1 Issues (Apprehended Impacts)

- Mortality or injury inflicted on a wild animal;
- Endangerment of workers' safety;
- Alteration of road traffic and material losses.

9.2 Objectives

- Reduce the risks of injuries or mortality in wildlife species;
- Ensure protection of species at risk or of interest to Inuit communities;
- Ensure workers' safety on the mine site and access roads;
- Ensure appropriate action in case of incidents involving animals that must be declared;
- Ensure efficient communication with the government authorities in case of an incident involving animals that must be declared.

9.3 Proposed Protective Measures

- Machinery traffic shall be limited to work areas (Mitigation Measure MTR 2);
- **Workers shall be prohibited from feeding Arctic foxes** and informed of the consequences that might have (Mitigation Measure MTR 4);
- Household waste shall be stored in closed containers before being incinerated (Mitigation Measure MTR 5);
- Observed the speed limits imposed on the roads;
- Report any wildlife observations that could be a problem for health and safety.

9.4 Actions to Be Taken Depending on the Situation

- Notify the dispatcher. The dispatcher will notify the Environmental Coordinator;
- A Wildlife Event Report (appended to the Management of Interventions Involving Wildlife procedure) will be completed by the SEP Supervisor or the Environmental Coordinator, depending on the situation;
- Refer to the Management of Interventions Involving Wildlife procedure (see Appendix 2);
- Complete the Wildlife Event Report (see Appendix 2);
- If the collision occurred with an animal that must be reported9 (e.g. caribou, bear, wolf, bird of prey) and it is injured or dead, the Environmental Coordinator will declare the observation to the MELCCFP (see the contact information in the presentation of the document) and will wait for their instructions before disposing of the carcass, as applicable;
- Except if otherwise indicated by the MELCCFP, the carcass should be offered to the Inuit via the IET (Inuit Employment and Training) advisors present on the site if the condition of the carcass allows. Otherwise, the carcass must be disposed of at the northern landfill site as soon as possible. In addition to the general instructions above.

9.5 Monitoring and surveillance

- Ensure that the Wildlife Event Report was completed, as well as the complementary information, particularly if Inuit stakeholders or the MELCCFP were involved.

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Appendix 1
Mitigation Measures Taken from the Impact Assessments

Table 1 Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Air quality	Construction	Road traffic, use of generators, equipment traffic and soil stripping	Increased airborne dust and exhaust emissions	EA: p. 307	***General:*** **AIR1**: Vehicles, to the extent possible, shall not be left running when not in use. **AIR2**: Dust reducers (calcium chloride or water) shall be sprayed on certain areas in dry, windy weather. **AIR3**: Machinery used shall comply with Environment Canada emission standards.	Minor	General monitoring and follow-up during construction
	Operation	Road traffic, equipment traffic, mine pits, mineral processing plant and concentrate transshipment at Deception Bay	Increased airborne dust	EA: p. 309	***General:*** **AIR2**: Dust reducers (calcium chloride or water) shall be sprayed on certain areas around the industrial complex in dry, windy weather. **AIR4**: Crushers and grinders shall be equipped with dust collectors leading to a dust extractor. **AIR5**: Generators used shall have low contaminant emissions. **AIR6**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly. ***Specific:*** **AIR7**: Expo mine tailings shall be covered progressively. **AIR8**: Dikes shall be built on three sides of the tailings pile to shelter tailings from wind, and waste rock shall be piled on top of the tailings once at their maximum height. **AIR9**: Conveyors used shall be enclosed. **AIR10**: The chute for loading concentrates into the bulk-ore carrier hold shall be canvas-covered.	Minor	Monitoring of dust emissions (EA: p. 532); Monitoring and control of asbestos fibres inside the crushing and grinding unit (EA: p. 532–533)
		Tailings and waste rock storage site	Airborne tailings				
		Producing power with generators, incinerating wastes and blasting	Greenhouse gas and pollutant emissions				
Soil	Construction	Road traffic, equipment traffic and fuel depots	Risk of soil contamination	EA: p. 320–321	***General:*** **SOL1**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (not leaking hydrocarbons). **SOL2**: An emergency kit for recovering petroleum products and hazardous materials shall be readily accessible at all times, construction site machinery shall have absorbent material in order to respond quickly, and polluted soil and wastes shall be disposed of in accordance with applicable legislation and regulations. **SOL3**: Non-acid-generating waste rock shall be used as granular material during the operational phase in order to minimize encroachment upon eskers. ***Specific:*** **SOL4**: Soil stripped and material excavated in building port land facilities shall be largely reused to build the wharf pier, reducing the use of borrow pit material.	Minor	General monitoring and follow-up during construction
		Soil stripping and borrow pit operation	Loss of soil usable for other purposes				
	Operation	Transport of ore and concentrate, tailings and waste rock storage, and concentrate handling	Localized increase in metal concentrations on the soil surface	EA: p. 323	***General:*** **SOL5**: To prevent subsidence due to the soil heating, major buildings shall rest on piles and lighter buildings shall be on ventilated foundations. **SOL6**: Metal concentrates shall be handled outdoors within enclosures. **SOL7**: Tailings water content shall be kept around 27% and tailings shall be pumped to minimize spreading to the environment. ***Specific:*** **SOL8**: Dikes shall be built on three sides of the tailings pile to shelter tailings from wind, and waste rock shall be piled on top of the tailings once at their maximum height. **SOL9**: The final cover shall include an impervious membrane and an erosion protection layer. **SOL10**: Measures shall be taken when building major civil structures to prevent permafrost from thawing.	Moderate	Monitoring of dust emissions (EA: p. 532)
		Industrial complex and access roads	Risk of soil slump				
		Road traffic, equipment traffic, fuel depot and waste incineration	Risk of soil contamination with hydrocarbons				
		Presence of four open-pit mines	Environmental liability that may affect long-term soil use				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Hydraulic and sediment regimes	Construction	Access roads, berm-bridge and port infrastructure	Change in flow pattern during construction	EA: p. 326	*General:* RHS1: Culverts shall be laid during the summer low-flow period (July to September). RHS2: Drainage ditches along the planned road shall stop a few metres above the natural high-water level of streams crossed. *Specific:*	Minor	General monitoring and follow-up during construction
		Laying culverts, building the berm-bridge and building port infrastructure	Change in sediment regime		RHS4: A geomembrane shall be installed downstream of crossings and around work areas in order to catch particles that are stirred up. RHS5: A containment curtain shall be installed in the water if granular material is taken less than 75 m from a lake. RHS6: Road banks at stream crossings shall be covered with a geomembrane and riprap.		
				Addendum No. 2: p. 22	*Specific:* RHS3: A sedimentation pond shall be built at the end of the roadside ditch on the left (west) bank of the Puvirnituq berm-bridge.		
	Operation	Berm-bridge, reservoir, roads, mine pits, waste rock piles, tailings storage site and port infrastructure	Change in surface runoff pattern	EA: p. 330–331	*General:* RHS8: Stones removed during grading earthwork shall be reused to stabilize banks and hollows. RHS9: Resuspension of material shall be minimized when adding or removing material in water. RHS10: Earth removed and fill shall be stored outside the buffer strip. RHS2: Drainage ditches along the planned road shall stop a few metres above the natural high-water level of streams crossed. RHS11: Culverts shall be large enough to not significantly reduce the flow cross-section at stream crossings. RHS14: A drainage system shall be built on the port infrastructure site.	Minor	Monitoring of the stability of culverts and the free circulation of fish (EA: p. 533–534)
		Berm-bridge, reservoir, bridge, roads and port infrastructure	Possible increase in erosion and sediment transport in streams		*Specific:* RHS6: Road banks at stream crossings shall be covered with a geomembrane and riprap. RHS13: During earthwork on steep slopes, the bottom of ditches shall be progressively stabilized with a cover of well-drained granular material and riprap.		
				Addendum No. 2: p. 21	*Specific:* RHS12: Adequate instream flow shall be maintained in the Puvirnituq River between June and September for the fish pass to work properly. RHS7: A 1.1-m^3/s instream flow shall be maintained in spring when filling the reservoir upstream of the berm-bridge.		
Thermal and ice regimes	Construction	Shipping in Deception Bay	Change in the ice cover from ship passage	EA: p. 336	*Specific:* RTG1: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits).	Very minor	General monitoring and follow-up during construction
				Navigation: p. 35, 37–38, 42	*Specific:* RTG2: Ships shall not travel at speeds exceeding 7 knots in Deception Bay.		
	Operation	Reservoir	Change in thermal regime	EA: p. 338	*Specific:* RTG1: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits).	Minor	Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Shipping in Deception Bay	Change in the ice cover from ship passage	Navigation: p. 35–39, 42–43, 61	*Specific:* RTG2: Ships shall not travel at speeds exceeding 7 knots in Deception Bay. RTG3: Only two trips shall be made during the ice period unless agreements are negotiated with the community of Salluit. RTG4: Ships shall always take the same route in Deception Bay, i.e., the Xstrata shipping route, in order to minimize the impact on pack ice. RTG5: Ships shall travel along an S-shaped route in Deception Bay in winter to fragment the ice less.		

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Water and sediment quality	Construction	Exploration work	Risk of calcium chloride contamination of water during drilling	EA: p. 340–342	***General:*** **QES1:** Precautions shall be taken to avoid spills near boreholes and to recover any residual chemicals should a spill still occur. **QES2:** Inspections shall be performed to ensure that land and sea machinery (clamshell and barge), as well as temporary tanks are in good condition. **QES3:** Any machinery that must cross a stream outside the winter period shall be inspected and cleaned. **QES4:** Heavy machinery shall only be used within the road right-of-way and borrow pit access roads. **QES5:** Excavated material shall be disposed of in a way that minimizes the spread of suspended solids. **QES6:** Stones removed during grading earthwork shall be reused to stabilize banks and hollows. **QES7:** Drainage ditches along the planned road shall stop a few metres above the natural high-water level of streams crossed. **QES8:** Machinery parking, washing and maintenance areas shall be at least 60 m from any stream, and machinery shall be refuelled under constant supervision at least 30 m from any stream. **QES9:** Culverts shall be laid during the summer low-flow period (July to September). **QES10:** A clamshell dredge shall be used to reduce the proportion of sediment released during dredging. **QES11:** Clay shall be handled with care during dredging operations to minimize liquefaction. **QES12:** The clamshell shall be raised and lowered at speeds of less than 0.6 m/s. **QES13:** The imperviousness of hopper barge compartments shall be monitored during dredging operations. **QES14:** The hopper barge shall be filled to only 90% of its capacity to reduce the risk of any overflow. **QES15:** The hopper barge shall be monitored for smooth operation during dredging. ***Specific:*** **QES16:** A geomembrane shall be installed downstream of crossings and around work areas in order to catch particles that are stirred up. **QES17:** Road banks at stream crossings shall be covered with a geomembrane and riprap. **QES18:** A containment curtain shall be installed in the water if granular material is taken less than 75 m from a lake. **QES33:** A 3-m strip shall be kept intact between the drainage ditches and the bank of the highly productive stream next to the Mequillon waste rock pile.	Minor	General monitoring and follow-up during construction
		Berm-bridge, roads, bridge and soil stripping	Temporary deterioration of water quality				
		Road traffic, equipment traffic and fuel depots	Risk of water and sediment contamination with hydrocarbons				
		Dredging and backfilling for the wharf, and disposal of material dredged offshore	Temporary deterioration of water and sediment quality in the marine environment				
				CEAA: MPO27	***Specific:*** **QES32:** A containment curtain shall be installed in Deception Bay around the wharf during construction to control the spreading of suspended solids.		

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Water and sediment quality (cont.)	Operation	Road traffic, equipment traffic, fuel depots and fuel transshipment	Risk of water and sediment contamination with hydrocarbons	EA: p. 345–347	*General:* QES19: The top of mine tailings and waste rock piles shall be kept at a 1% to 3% gradient to minimize infiltration. QES20: Water in the sedimentation ponds downgradient of the waste rock piles at the Ivakkak, Mequillon and Mesamax mines, and Expo industrial complex process water shall be treated by adding lime and flocculants before entering the final effluent. QES21: Solids shall be removed from domestic sewage using a mobile biodisc treatment unit and the waste water shall be disinfected using ultraviolet treatment. QES22: Temporary ore storage sites shall rest on a compacted gravel base surrounded by a collecting ditch to channel drainage water to the sedimentation pond, from which it shall be pumped into the process water tank. QES23: The kitchen shall be equipped with oil and grease traps. QES24: Only phosphate-free soaps and detergents shall be used. QES25: Special care shall be taken to avoid spilling ammonium nitrate beside blast holes when loading them, an operation always done using equipment to inject the explosives directly into the blast holes. QES26: Abrasives and de-icing chemicals shall only be spread on dangerous locations or during ice-storms. QES7: Drainage ditches along the planned road shall stop a few metres above the natural high-water level of streams crossed. QES2: Prior and regular inspections of machinery and tanks shall be performed. QES27: Fuel tanks shall be surrounded by a berm high enough to contain a spill equal to the largest capacity tank plus 10%. QES31: Fuel transshipment facilities shall be equipped with automatic valves detecting fuel leaks and off-shore hydrocarbon recovery gear shall be available at all times. *Specific:* QES28: Acid-generating waste rock (Mequillon, Expo and Mesamax) shall be covered with neutral granular material and an impervious membrane. QES29: Geomembranes shall be placed beneath mine tailings cells, on dike walls and on the top of tailings and waste rock piles. QES17: Road banks at stream crossings shall be covered with a geomembrane and riprap. QES30: During earthwork on steep slopes, the bottom of ditches shall be progressively stabilized with a cover of well-drained granular material and riprap.	Minor	Monitoring of final effluent and receiving water quality (EA: p. 527–529); Sediment quality monitoring (EA: p. 531)
		Tailings storage site, waste rock piles, pit water and mine pits	Possible deterioration of water and sediment quality downstream of the mine drainage and final effluent outfalls during operation				
		Presence of roads and their maintenance	Possible increase in suspended solids and chlorides downstream of crossing points				
		Plane-de-icing during winter	Possible addition of glycol to surface water				
		Tailings and waste rock storage	Possible deterioration of water and sediment quality after mine rehabilitation				
Vegetation	Construction and operation	Presence of mine and port facilities	Loss of terrestrial and wetland habitats	EA: p. 372–372	*General:* VEG1: Machinery shall not circulate outside work area boundaries (unless otherwise authorized) and a fence shall be put up around the protection perimeter. VEG2: Habitats next to jobsites shall be protected, particularly close to stream banks.	Minor	General monitoring and follow-up during construction
		Presence of mine and port facilities	Potential loss of special-status plant species or species considered rare.				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Aquatic wildlife and sea mammals	Construction	Construction in or near water (culvert, berm-bridge, bridge, wharf, etc.)	Avoidance by fish of areas around work in water	EA: p. 376–377, 398–399 Navigation: p. 35–37, 42, 61	***General:*** FAQ1: Culverts shall be laid during the summer low-flow period (July to September). FAQ2: Vehicle and construction machinery traffic shall be avoided within 20 m of a perennial stream or within 5 m of an intermittent stream and, if such traffic is unavoidable, any water flowing into ruts shall be diverted to an area of vegetation located at least 20 m from a stream. FAQ3: The berm-bridge shall be built in winter or in the summer low-water period. FAQ4: Blasting on and near the shores of Deception Bay shall comply with the limits set out by Wright and Hopky (1998), taking appropriate measures to limit to 100 kPa the intensity of shock waves in the aquatic environment. FAQ5: A clamshell dredge shall be used to reduce the proportion of sediment released during dredging. FAQ6: Clay shall be handled with care during dredging operations to minimize liquefaction. FAQ7: The clamshell shall be raised and lowered at speeds of less than 0.6 m/s. FAQ8: The imperviousness of hopper barge compartments shall be monitored during dredging operations. FAQ9: The hopper barge shall be filled to only 90% of its capacity to reduce the risk of any overflow. FAQ10: The hopper barge shall be monitored for smooth operation. ***Specific:*** FAQ11: A 3-m strip shall be kept intact between the drainage ditches and the bank of the highly productive stream next to the Mequillon waste rock pile. FAQ47: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits). FAQ48: All dredging operations shall be interrupted if a cetacean is seen within 200 m of a dredge site, disposal site or barge. FAQ50: Ships shall not travel at speeds exceeding 7 knots in Deception Bay.	Minor	General monitoring and follow-up during construction; Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Berm-bridge construction	Temporary loss of aquatic habitat				
		Shipping, dredging and disposal of dredged material at sea to build the wharf	Temporary disturbance of aquatic habitat				
		Building of temporary structures	Temporary loss of aquatic habitat	CEAA: MPO42	***General:*** FAQ20: The free movement of fish shall be ensured at all times when a stream is temporarily diverted. FAQ21: The diversion channel and its banks shall be stabilized using riprap or a geomembrane. FAQ22: Clean granular material shall be used for cofferdams (imperviousness preferably being achieved using non-granular material). FAQ23: Temporary structures shall be stabilized using a geomembrane or riprap. FAQ24: Fine particle transport shall be prevented in the aquatic environment beyond the immediate work area. FAQ25: Areas disturbed by earthwork (e.g., slopes and banks) shall be stabilized progressively as work is completed. FAQ26: Surplus material shall be disposed of at a specially designated site. FAQ27: Vehicle maintenance and refuelling, and hydrocarbon storage and handling, shall be at a distance of more than 30 m from the natural high-water level. FAQ28: Machinery shall be prohibited from fording streams. FAQ29: Vehicle traffic shall be restricted to designated and clearly identified roadways. FAQ30: Hydrocarbon-absorbing floating booms shall be installed downstream of work in streams, as well as in lakes and areas with low flow. FAQ31: Machinery shall be moved away from streams as soon as possible. FAQ32: Machinery used shall be clean and in good condition. FAQ33: Waste oil from machinery shall be taken to a specially designated site. FAQ34: Emergency gear shall be on hand in case of spills and workers shall know how to use it. FAQ35: The diversion channel shall be backfilled and restored to its original condition. FAQ36: Areas of streams affected by construction shall be restored to their initial characteristics (substrate, width, depth and vegetation).		
		Use of machinery	Temporary disturbance of aquatic habitat				
		Site restoration	Temporary disturbance of aquatic habitat				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Aquatic wildlife and sea mammals (cont.)	Construction (cont.)	Blasting near Deception Bay	Disturbance of and potential injury to sea mammals	CEAA: MPO18	***Specific:*** **FAQ39:** Blasting shall only be performed at low tide. **FAQ40:** A sea mammal exclusion zone shall extend up to 1 km from the work area and blasting shall only be performed after having confirmed that no sea mammals are present in that zone. **FAQ41:** An observer shall be posted to watch for sea mammals in the exclusion zone. **FAQ42:** Care shall be taken not to frighten sea mammals that may be found in the exclusion zone. **FAQ43:** Buoys shall be used to mark out the exclusion zone.	Minor	General monitoring and follow-up during construction; Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Pile driving and drilling in Deception Bay	Disturbance of sea mammals	CEAA: MPO30	***Specific:*** **FAQ44:** Work related to pile driving and drilling shall only be performed when no sea mammals are within 600 m. **FAQ45:** An observer shall be posted during pile driving and drilling to ensure that no sea mammals are within 600 m. **FAQ46:** The buoys used to mark out the exclusion zone (FAQ43) shall not be installed at night.		
	Operation	Tailings storage site, waste rock piles, mine pits and mine effluents	Mortalities and possible change in aquatic communities downstream of outfalls	EA: p. 382–383, 398–399	***General:*** **FAQ12:** Culverts shall be installed so as not to impede the flow of water (base of culverts set beneath the natural stream bed, riprap used for stabilization, etc.). **FAQ13:** A mobile mine drainage treatment unit shall be installed downgradient of Ivakkak, Mequillon and Mesamax waste rock piles and a permanent treatment unit shall be used to purify process water at the Expo industrial complex. **FAQ14:** Solids shall be removed from domestic sewage using a mobile biodisc treatment unit and the waste water shall be disinfected using ultraviolet treatment. ***Specific:*** **FAQ16:** Culverts shall be laid at the same slope as the natural stream bed and baffles shall be installed if flow exceeds 1.2 m/s. **FAQ17:** Culverts shall be laid in steps to concentrate flow during the low-water period. **FAQ18:** No measures shall be taken to accommodate fishermen (e.g., transportation, preserving catches) in order to reduce fishing pressure. **FAQ19:** A fishing program shall be established to provide guidelines for fishing in a number of bodies of water. **FAQ47:** Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits).	Minor	Monitoring fish populations (EA: p. 530); Monitoring benthic invertebrate communities (EA: p. 530–531); Toxicity tests (EA: p. 531–532); Monitoring of fish catches by mine employees (EA: p. 534); Monitoring of the stability of culverts and the free circulation of fish (EA: p. 533–534); Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Berm-bridge, reservoir, port infrastructure and access roads	Loss and modification of fish habitat				
		Workforce	Increased fishing pressure near mine facilities				
		Port facilities and shipping	Occasional disturbance of fish and sea mammal activity in Deception Bay	Addendum No. 2: p. 21 Navigation: p. iv, 35–37, 42	***Specific:*** **FAQ15:** Adequate instream flow shall be maintained in the Puvirnituq River between June and September for the fish pass to work properly. **FAQ37:** A 1.1-m^3/s instream flow shall be maintained in spring when filling the reservoir upstream of the berm-bridge. **FAQ38:** The berm-bridge shall have a fish pass to ensure the free movement of fish. **FAQ49:** Ships serving the mine complex shall, to the extent possible, be equipped with propellers designed to minimize cavitation (reducing noise and air bubbles). **FAQ50:** Ships shall not travel at speeds exceeding 7 knots in Deception Bay. **FAQ51:** Only two trips shall be made during the ice period unless agreements are negotiated with the community of Salluit. **FAQ52:** The tonnage of ships shall be maximized to minimize the number of trips required.		
Land mammals	Construction	All construction work and air transport	Noise disturbance for several mammal species	EA: p. 398–399	***General:*** **MTR1:** Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly. **MTR2:** Machinery traffic shall be limited to work areas. ***Specific:*** **MTR3:** A survey of Arctic fox dens shall be conducted in all eskers likely to be used during mine construction.	Minor	General monitoring and follow-up during construction
		Borrow pit operation	Possible loss of Arctic fox dens				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Land mammals (cont.)	Operation	All mine facilities	Habitat loss for all land animals and Arctic fox behaviour modification	EA: p. 403–404	***General:*** **MTR4:** Workers shall be prohibited from feeding Arctic foxes and informed of the consequences that might have. **MTR5:** Household waste shall be stored in closed containers before being incinerated. **MTR1:** Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (minimizing noise). **MTR2:** Machinery traffic shall be limited to work areas. ***Specific:*** **MTR6:** A wildlife and flora protection plan shall be developed.	Minor	Monitoring wildlife (collision with large animals) (EA: p. 534)
		Road system, road traffic, machinery operation, mine pits and service buildings	Possible change in caribou migration patterns				
		Road network, road traffic, machine operation, pits and service buildings	Possible change in caribou migration patterns	KEQC: p. 81			
Birds	Construction	All exploration activities and construction work	Disturbance of breeding pairs and migrating birds near construction sites and along roads	EA: p. 407–408	***General:*** **FAV1:** Traffic shall be limited to work areas. **FAV2:** Habitats next to jobsites shall be protected. **FAV3:** The extent of stripping and levelling shall be limited. ***Specific:*** **FAV4:** It shall be prohibited to fly over the cliffs southwest of Mequillon from June to September (peregrine falcon and golden eagle breeding period).	Minor	General monitoring and follow-up during construction
	Operation	All mine facilities and ore-mining activities	Breeding and feeding habitat loss	EA: p. 410	***General:*** **FAV1:** Traffic shall be limited to work areas. **FAV2:** Habitats next to jobsites shall be protected. ***Specific:*** **FAV4:** It shall be prohibited to fly over the cliffs southwest of Mequillon from June to September (peregrine falcon and golden eagle breeding period).	Minor	General follow-up
		Land, air and sea transportation	Disturbance of breeding pairs and migrating birds near facilities				
		Presence of access roads (increased access to region)	Increased harvesting pressure				
		Presence of reservoir	Creation of potential habitats for certain bird species				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Health and nutrition	Construction	All construction activities	Risk of work-related accidents	EA: p. 423	***General:*** **SAN1**: An occupational health and safety program shall be introduced. **SAN2**: Awareness shall be promoted among workers and training given to them regarding this issue. ***Specific:*** **SAN3**: At Deception Bay, the soil shall be sprayed before stripping to minimize airborne asbestos.	Very minor	General monitoring and follow-up during construction
		Presence of asbestos on the site where port facilities will be built	Potential health risk for workers				
	Operation	All routine mine activities	Risk of accidents and disease for workers	EA: p. 425–426	***General:*** **SAN1**: An occupational health and safety program shall be introduced. **SAN2**: Awareness shall be promoted among workers and training given to them regarding this issue. **SAN4**: Special measures shall be taken to protect workers exposed to asbestos fibre. **SAN5**: Equipment shall be used to protect employees against copper and nickel dust if the time-weighted average exposure value exceeds 1 mg/m^3). **SAN6**: A workplace hazardous materials information system (WHMIS) shall be implemented. ***Specific:*** **SAN7**: Crushers and grinders shall be equipped with dust collectors leading to a dust extractor. **SAN8**: Filter canisters used shall be designed so that they are sealed inside a bag when they are removed or, if of another design, shall be used in conjunction with appropriate safety gear.	Moderate	Monitoring and control of asbestos fibres inside the crushing and grinding unit (EA: p. 532–533); Monitoring of drinking water quality (EA: p. 533), Monitoring of dust emissions (EA: p. 532)
		Machinery operation and traffic, open-pit mines	Risk of drinking water contamination				
		Berm-bridge and reservoir	Possible increase in reservoir fish mercury levels				
		Mine activities	Inuit lifestyle and diet changes				
Transport-ation and communicat-ions	Construction	Road system	Increased access to the territory	EA: p. 436	***General:*** **TRC1**: The road shall be marked and traffic signs put up where snowmobile and ATV trails intersect the road. ***Specific:*** **TRC2**: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits).	Very minor	General monitoring and follow-up during construction; Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Shipping	Disrupted travel in Deception Bay				
				Navigation: p. 35, 37, 42, 61	***Specific:*** **TRC5**: Ships shall not travel at speeds exceeding 7 knots in Deception Bay.		

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Transport-ation and communicat-ions (cont.)	Operation	Road system	Increased access to the territory	EA: p. 438 Navigation; p. 35–39, 42–43, 61	***General:*** **TRC1**: The road shall be marked and traffic signs put up where snowmobile and ATV trails intersect the road. ***Specific:*** **TRC2**: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits). **TRC3**: A prior agreement shall be negotiated with the Inuit if CRI needs to bring ships into the bay during the break-up period. **TRC4**: A warning protocol shall be established for ships travelling in Deception Bay. ***Specific:*** **TRC5**: Ships shall not travel at speeds exceeding 7 knots in Deception Bay. **TRC6**: Only two trips shall be made during the ice period unless agreements are negotiated with the community of Salluit. **TRC7**: Ships shall always take the same route in Deception Bay, i.e., the Xstrata shipping route, in order to minimize the impact on pack ice. **TRC8**: Ships shall travel along an S-shaped route in Deception Bay in winter to fragment the ice less. **TRC9**: An information program shall make local communities aware of the open ice cover in order to minimize the risks and its impact on hunting and fishing. **TRC10**: An ice bridge with adequate signage shall be maintained off Pointe Noire, if needed, to reduce the detour for snowmobilers (via the Xstrata ice bridge at the port).	Minor	General follow-up; Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Shipping	Disrupted travel in Deception Bay				
Land and resource manage-ment	Operation	Mine facilities and activities	Maintenance of resource sustainability and waste production	EA: p. 441	***General:*** **GTR1**: Possession of firearms shall be prohibited on the mine site. **GTR2**: No measures shall be taken to accommodate fishermen (e.g., transportation, preserving catches) in order to reduce fishing pressure. **GTR3**: Waste shall be disposed of in containers provided for that purposes to avoid having debris thrown into the water. **GTR4**: A waste management program shall be implemented, based on the 4R-D principle (reuse, reduction, recovery, recycling and disposal). ***Specific:*** **GTR5**: A fishing program shall be established to provide guidelines for fishing in a number of bodies of water (fishing rotated between two or three lakes, and possibly Deception Bay as well).	Minor	Monitoring of fish catches by mine employees (EA: p. 534); Monitoring wildlife (collision with large animals) (EA: p. 534)
Land and resource use	Construction	All construction activities	Disruption of traditional Inuit activities inland	EA: p. 445–446 Navigation: p. 61	***General:*** **URT1**: No measures shall be taken to facilitate sports fishing (e.g., no transportation by helicopter). **URT2**: Possession of firearms on the mine site shall be prohibited (except with a special approval for protection against polar bears). **URT3**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (to avoid producing excessive noise). ***Specific:*** **URT4**: Lakes used by the residents of Salluit and Kangiqsujuaq shall remain accessible. **URT5**: No measures shall be taken to accommodate fishermen (e.g., transportation, preserving catches) in order to reduce fishing pressure. **URT6**: A fishing program shall be established to provide guidelines for fishing in a number of bodies of water. **URT7**: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits).	Minor	General monitoring and follow-up during construction; Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Construction of a sea port and shipping	Disruption of traditional Inuit activities in Deception Bay				

Table 1 (cont.) Summary of Nunavik Nickel Project mitigation measures.

Component Affected	Project Phase	Source of Impact	Description of Impact	Source[1]	Mitigation Measures	Significance of Residual Impact	Follow-up
Land and resource use (cont.)	Operation	Mine facilities and activities	Disruption of traditional Inuit activities inland	EA: p. 448–449 Navigation: p. 61	***General:*** **URT3**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (to avoid producing excessive noise). **URT1**: No measures shall be taken to facilitate sports fishing (e.g., no transportation by helicopter). **URT2**: Possession of firearms shall be prohibited on the mine site. ***Specific:*** **URT6**: A fishing program shall be established to provide guidelines for fishing in a number of bodies of water. **URT5**: No measures shall be taken to accommodate fishermen (e.g., transportation, preserving catches) in order to reduce fishing pressure. **URT4**: Lakes used by the residents of Salluit and Kangiqsujuaq shall remain accessible. **URT7**: Shipping in Deception Bay shall be avoided during the break-up period from mid-March to mid-June (period of seal pupping and increased hunting by Inuits). **URT8**: Local communities shall be advised of the arrival and itinerary of ships in Deception Bay. **URT9**: A prior agreement shall be negotiated with the Inuit if CRI needs to bring ships into the bay during the break-up period.	Minor	Monitoring of fish catches by mine employees (EA: p. 534); Monitoring wildlife (collision with large animals) (EA: p. 534); Monitoring of shipping in Deception Bay (Navigation: p. 61)
		Shipping	Disruption of traditional Inuit activities in Deception Bay				
Recreation and tourism	Operation	Air transport	Possible nuisance for users of Pingualuit National Park	EA: p. 451	*No mitigation measures are planned*	Minor	No follow-up is planned
Archaeology and heritage	Construction	All construction activities	Discovery of archaeological or historic remains during construction	EA: p. 453	***General:*** **ARC1**: If remains of importance are discovered, the site supervisor shall be informed immediately and measures taken to protect the site.	Minor	General monitoring and follow-up during construction
Ambient noise	Construction	All construction activities	Increased noise level around the construction site	EA: p. 455	***General:*** **SON1**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (to avoid producing excessive noise). **SON2**: Machinery traffic shall be limited to work areas. **SON3**: The main sources of noise shall be insulated with a sound-absorbing material, when possible. **SON4**: It shall be mandatory for workers to wear hearing protectors if they are exposed to prolonged noise exceeding 85 dB.	Minor	General monitoring and follow-up during construction
	Operation	All mining activities	Increase noise level within the industrial complex, and near mine facilities and roads	EA: p. 457	***General:*** **SON1**: Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (to avoid producing excessive noise). **SON2**: Machinery traffic shall be limited to work areas. **SON3**: The main sources of noise shall be insulated with a sound-absorbing material, when possible. **SON4**: It shall be mandatory for workers to wear hearing protectors inside very noisy buildings (e.g., the crushing and grinding unit).	Minor	Monitoring of noise level inside the plant (EA: p. 533)
Landscape	Construction	Presence of construction sites and storage areas	Deterioration of surrounding scenery	EA: p. 459	***General:*** **PAY1**: Stripping, clearing, excavation, backfilling and grading shall be minimized to maintain the natural topography. **PAY2**: When construction is completed, work areas shall be rehabilitated and restored so that they blend in as much as possible with the natural landscape (regrowth of vegetation).	Minor	General monitoring and follow-up during construction
	Operation	All mine facilities	Deterioration of surrounding scenery	EA: p. 461	***General:*** **PAY3**: The waste rock and tailings piles shall be rounded so that they blend in better with the surrounding landscape. **PAY4**: After the mine closes, disturbed sites shall be rehabilitated and restored by encouraging plant growth so they blend in with the natural landscape as much as possible, and mine facilities shall be dismantled and taken back south.	Minor	General follow-up

1 – Sources: EA = Environmental Assessment Main Report (Genivar, 2007)
CEAA = Document with answers to questions asked by the Canadian Environmental Assessment Agency (November 2007) (in French only)
KEQC = Document with answers to questions asked by the Kativik Environmental Quality Commission (October 2007)
Addendum No. 2 = Construction of a Berm-Bridge at Bombardier Outlet (Genivar, October 2007)
Navigation = Study on Maritime Navigation in Deception Bay (Genivar, November 2007)

Valued Environmental Component	Project phase	Source of Impact	Potential Impact	Ref. Source	Mitigation measures #	Mitigation Measures	Significance of Residual Impact	Follow-up
Air Quality	Construction and Operations	Soil stripping Development and use of borrow pits Transportation & traffic (Main and access roads) Storage and handling of overburden, ore, waste rocks Underground and Open pit mining	Emissions of air pollutant (exhaust, particles fumes) Dust emissions	Allamaq ESIA Table 8.1, p.145 Section 8.6.1, p. 148 Puimajuq ESIA Section 7.2.1, p. 61 Table 7.3, p.62	1 2 3 4 6	Make sure that machinery complies with Environment Canada emission standards for on- and off-road vehicles Avoid leaving vehicles running when not in use. Stop machinery engine when possible between work periods. Spray dust reducers (calcium chloride/sodium chloride and water) on areas where traffic could raise dust in dry, windy weather. The dust reducer must comply with Standard NQ 410-300 or be approved by the MTQ. Prefer generators with high-combustion-efficiency four-stroke engines having lower air pollutant emission rates Inspect and repair as needed exhaust and anti-pollution systems to minimize air pollutant emissions	Minor	Annual environmental monitoring programs
Soil	Construction and Operations	Soil stripping Development and use of borrow pits Transportation & traffic (Main and access roads) Storage and handling of overburden, ore, waste rocks Underground and Open pit mining Fuel depot Hazardous materials storage areas	Loss of soil Risk of soil contamination in case of spills	Allamaq ESIA Table 8.1, p.145 Section 8.6.2, p. 150 Puimajuq ESIA Table 7.4, p. 63 Section 7.2.2, p. 62	5 7 8 9 10	Perform prior and regular inspections of machinery to ensure that it is in proper working order, clean and not leaking hydrocarbons. Restrict the use of heavy machinery to within work areas and the right-of-way of the main road and borrow pit access roads in order to preserve the integrity of the tundra. A fence will be put up around the protective perimeter when the work begins and will remain in place throughout the work. Keep on site an adequate supply of absorbent material and well-labelled leak-proof containers to hold petroleum products and wastes and containing pails for cleaning in case Report any spill immediately to the coordinator of the project emergency plan to be developed and approved prior to the work (Section 10). The area affected will be staked out immediately and cleaned up promptly. Remove contaminated soil, dispose of it in an authorized location and characterize it using the methods set out in the MDDEFS*oil Protection and Rehabilitation of Contaminated Sites Policy*	Minor	Annual environmental monitoring programs Dust emissions monitoring
Water & Sediment Quality	Construction and Operations	Soil stripping Development and use of borrow pits Transportation & traffic (Main and access roads) Storage and handling of overburden, ore, waste rocks Fuel depot Hazardous materials storage areas Mine effluent	▪ Temporary decrease of water&sediment quality ▪ Risk of water contamination in case of spills ▪ Possible increase of suspended solids and chlorides downstream of crossing points and road construction ▪ Possible deterioration of water &sediment quality downstream of the mine drainage outfall	Allamaq ESIA Table 8.1, p.145 Section 8.6.3, p. 153 Puimajuq ESIA Section 7.2.3, p. 63 Table 7.5, p. 66	11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Minimize the spreading of suspended solids to the stream crossed by taking great care in earthwork using material excavated nearby. Make sure that there is no fine material (fine sand, silt or clay) in the surface course of the stream crossing roadway. Ensure coating of road section above stream crossing is exempt of fine particles. Reuse rocks, stones removed during earthwork to stabilize road banks and the ground around culverts, and to backfill and stabilize hollows. Prohibit machinery from fording the stream. Move machinery away from the stream as soon as it is no longer in use. Have drainage ditches along the planned road stop about 20 m above the natural high-water level of the stream crossed so that drainage flow slackens and suspended solids settle. Lay culverts between July and mid-August when the flow is weakest to minimize the rise in suspended solids and the disturbance to spawning in the stream crossed. Locate machinery parking and maintenance areas at least 60 m from any stream. Machinery shall be refuelled under constant supervision at least 30 m from any stream. Dispose of used oil from machinery and wastes in a specially designated site and according to regulations. Install a geomembrane downstream of the crossing to catch particles stirred up during earthwork Cover road banks at the stream crossing with a geomembrane and riprap to stabilize them and keep soil from being eroded into the aquatic environment. Only use de-icing chemicals and abrasives on roads during ice storms and in accident risk areas (bends, gradients and intersections). Construct a collecting ditch to direct site into to the retention pond. Surround the temporary ore storage area with a ditch that collects drainage water and channels it to the sedimentation pond, where it will then be treated, if necessary, before being discharged into the tributary. Keep the top of the waste rock pile at a 1% to 3% slope so that rain water flows quickly to the sedimentation pond, minimizing infiltration. Add lime and flocculants to treat, if necessary, the water contained in the sedimentation pond down gradient of the waste rock pile in order to adjust the pH and precipitate metals. Make sure that the sedimentation pond is large enough to contain the 100-year runoff so as to minimize the risk of it overflowing, potentially leading to acid shock. Avoid erosion problems during earthwork on steep gradients by progressively stabilizing the bottom of ditches with a layer of well-drained granular material and riprap. Build a series of baffles at the bottom of ditches , if necessary.	Minor	Annual environmental monitoring programs
Rare Plants (Biological Environment)	Construction and Operations	Soil stripping Development and use of borrow pits Transportation & traffic (Main and access roads) Storage and handling of overburden, ore, waste rocks Allamaq underground mining operations Workforce	Possible deterioriation of land environment quality Loss of special-status Draba plant species	Allamaq ESIA Table 8.1, p.145 Section 8.7.1, p. 161 Puimajuq ESIA Section 7.3.2, p. 67 Table 7.8, p. 69	28 29 *Puimajuq ESIA* 30	Protect land environments next to the jobsite, particularly close to stream banks Spray dust reducers (calcium chloride) in dry, windy weather around Allammaq mine surface infrastructure, where traffic could raise dust Optimize road layout of the access road near the Allammaq mine to avoid the rocky dome, an area hosting several colonies of draba with special status Put up some visual marks around the borrhardt to prevent access to the location of colonies of special-status Draba species , especially Draba subcapitata	Moderate	Annual environmental monitoring programs
Aquatic Wildlife	Construction and Operations	Soil stripping Transportation & traffic (Main and access roads) Storage and handling of overburden, ore, waste rocks Mine effluent	Fish avoiding aquatic habitat near stream crossing point Change and loss of fish aquatic habitat at stream crossing point Change and loss of fish aquatic habitat downstream of discharge point	Allamaq ESIA Table 8.1, p.145 Section 8.7.2, p. 164 Puimajuq ESIA Section 7.3.3, p. 69 Table 7.9, p. 70	31 32 33 34 35	Keep a 3-m strip between drainage ditches and the banks of the stream crossed in order to preserve the integrity of spawning grounds and prevent excessive sediment buildup. This protective strip shall be clearly delineated and machine operators shall be informed of the ban on vehicular traffic there. Lay culverts at different levels in way that does not impede the flow of water. The base of the lowest culvert shall be driven into the natural stream bed to a depth of at least 20% of the culvert's height. The ends of the culvert shall extend a maximum of 30 cm beyond the base of the backfill and shall be adequately stabilized with riprap Lay culverts at different levels so that flow during the low-water period is concentrated in the lowest culvert, favouring the free movement of fish. Slope culverts following the natural gradient of the stream bed Include a stilling basin downstream of the culverts	Minor	Annual environmental monitoring programs
Human Environment & Inuit land use	Construction and Operations	All Allamaq / Puimajuq construction and operations activities	Disturbance of Inuit traditional activities		36 37 39 40	Prohibit firearms on the mine site, except with special authorization for protection from polar bears. Ensure machinery is maintained in good working order so that it does not generate excessive noise. Conduct preventive and regular inspections of machinery in order to ensure good conditions, cleanness and exempt of leakage. Prohibit sportive fishing during the construction phase. Reduce fishing pressure by setting up a fishing program for non-beneficiaries employees to enhance and regulate fishing in several lakes near the mine infrastructure.	Minor	Annual environmental monitoring programs
IBA provisions Section 12.3		12.3. Authorization of Project	Subject to Canadian Royalties performing its obligations pursuant to this Agreement, Makivik shall not institute any legal proceedings or engage in or undertake any other actions or activities to prevent or delay authorization of the Nunavik Nickel Project as described in subsection 3.1.		41	Modify and amend NNA section 12.3 which refrain Inuit parties to engage any legal proceedings should Nunavik Nickel Project provokes and/or results in any adverse and irreversible environmental impacts.		

Sub-committee members:

Jean-Marc Seguin (Signature)

Andre Dumais (Signature)

Willie Keatainak (Signature)

Stephane Twigg (Signature)

Table 7-36: Assessment of Potential Impacts and Mitigation Measures for the Ivakkak UG, Méquillon UG2, Nanaujaq and Expo South Underground Mining Projects and Associated Related Projects.

Component	Project phase[A]	Impact source (additional compared to the 2007 ESIA)	Impact description	Source	Mitigation measures		Residual impact significance	Monitoring
					Nº	Description		
Air Quality	Construction and operation	Increase in road transport and machinery traffic on the sites, presence of soil stripping, extraction of materials in authorized quarries, removal of specific structures during closure, soil reworking during restoration.	Increase in airborne dust and exhaust fumes.	IA: p. 324, 327	AIR1	Vehicles, to the extent possible, shall not be left running when not in use.	Minor	General surveillance and monitoring during construction, operation, closure and restoration, dust emissions monitoring
					AIR2a	In dry, windy weather, dust reducers (calcium chloride or water) will be sprayed on certain areas. The humidification frequency will be adjusted according to the meteorological conditions and the dust emissions observed. Dust control agents will comply with the BNQ 410-300 standard or will be approved by the *Ministère des Transports du Québec* (MTQ). The choice of dust reducers must take account of the proximity of wetlands or bodies of water.		
				IA: p. 324	AIR3	Machinery used must meet Environment and Climate Change Canada's emission standards for on- and off-road vehicles.		
		Increased energy production through satellite generators, increased burning of waste materials.	Atmospheric particles and greenhouse gas emissions	IA: p. 327	AIR5	Use generators with low contaminant emission rates.	Minor	
					AIR6	Prior and regular inspection of machinery will be performed to ensure that it is in good condition and working properly. See also AIR6a.		
					AIR6a	Apply the mechanical service preventive maintenance program to ensure optimal operation of machinery and that equipment vibrations are reduced to a minimum, as to reduce emissions to a minimum.		
	Operation	Expansion of ore and waste rock storage areas resulting in waste rock and ore stockpiling activities. Crushing waste rock for backfilling underground.	Increase in airborne mining dust.		AIR4a	Equip the crushers and grinders with dust control agent equipment. See also AIR4b.	Minor	
					AIR4a	The waste rock crusher will be equipped with a dust control system, which will be checked daily and cleaned regularly.		
					AIR4b	At the Expo ore stockpile, application of dust reducers or watering the road and the machinery operation area (active zone) of the ore storage area (loading zone, up to the concentrator). Watering the loading areas before unloading ore.		
					AIR4c	Limit handling the Expo ore stockpile during periods of high wind.		
Ground Quality	Construction	Soil stripping and using quarries and eskers.	Localized soil loss, soil remodeling.	IA: p. 340-341	SOL3	Non-acid-generating waste rock shall be used as granular material during the operational phase in order to minimize encroachment upon eskers.	Minor	General surveillance and monitoring during construction, operation, closure and restoration, dust emissions monitoring
	Construction and operation	Increase in road transport, machinery traffic, underground mining activities, number of fuel storage pad on the ground and increase in waste incineration.	Risk of soil contamination by hydrocarbons.	IA: p.340-341	SOL1	Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (not leaking hydrocarbons).	Minor	
					SOL1a	Apply the mechanical service preventive maintenance program to ensure optimal operation of machinery (verify there are no hydrocarbon leaks).		
				IA: p.340-341	SOL2	An emergency kit for recovering petroleum products and hazardous materials shall be readily accessible at all times, construction site machinery shall have absorbent material in order to respond quickly, and polluted soil and wastes shall be disposed of in accordance with applicable legislation and regulations. See also SOL2a.		
					SOL2a	Apply the spill management procedure "PRO-NENV-1211-01 Response to an Environmental Incident" which ensures the safe, fast, efficient and comprehensive management of a spill as to minimize the environmental impact.		
					SOL15	Use double-walled tanks for storing fuel, compliant with the requirements of the *Building Act*.		
	Operation	Addition of new surface infrastructures and access roads.	Risk of subsidence.	IA: p.343-344	SOL5	To prevent subsidence due to the soil heating, major buildings shall rest on piles and lighter buildings shall be on ventilated foundations.	Minor	
					SOL10	Measures shall be taken when building major civil structures to prevent permafrost from thawing.		
			Environmental liability that may affect long-term soil use.		SOL12	Remove and dispose of contaminated soils in an authorized location and perform a characterization according to the terms in the *Politique de Protection des Sols et de Réhabilitation des Terrains Contaminés: Plan d'Action 2017-2021* (MDDELCC, 2017) and the *Guide d'intervention – Protection des Sols et Réhabilitation des terrains Contaminés* (Intervention Guide – Soil Protection and Restoration of Contaminated Sites) (Beaulieu, 2021). Apply the procedures presented in the ERP for spills.		
					SOL13	The PAG waste rock generated by the new exploitations will be returned to the underground mine tunnels.		
		Transportation of ore, use of the tailings disposal site at Expo and storage of waste rock in the dumps.	Localized increase in metal concentrations on the soil surface.	IA: p.343-344	SOL9	The final cover shall include an impervious membrane and an erosion protection layer.		
					SOL14	Apply the AIR4a, AIR4b, AIR4c, AIR4d mitigation measures air quality protection relating to mining dust.		

[A] The operation phase includes the closure and restoration phases when applicable.

Note: A grey background indicates a new measure since Annex 7 established with the Nunavik Nickel Committee.

Source: IA = Impact assessment (GENIVAR, 2007).

Table 7-36: Assessment of Potential Impacts and Mitigation Measures for the Ivakkak UG, Méquillon UG2, Nanaujaq and Expo South Underground Mining Projects and Associated Related Projects (cont.)

Component	Project phase[A]	Impact source (additional compared to the 2007 ESIA)	Impact description	Source	Mitigation measures		Residual impact significance	Monitoring
					Nº	Description		
Sediment and water quality	Construction	Soil stripping	Risk of an increase in suspended solids in the water of adjacent watercourses and bodies of water.	IA: p.363-365	QES5	Excavated material will be disposed of in a way that minimizes the spread of suspended solids.	Minor	General monitoring and surveillance during construction
					QES6	Stones removed during grading earthwork will be reused to stabilize banks and hollows.		
		Use surface explosives if required.	Risk of ammonium nitrate dispersal when explosives are loaded in surface water and sediment.	IA: p.369-371	QES25	Special care shall be taken to avoid spilling ammonium nitrate beside blast holes when loading them, an operation always done using equipment to inject the explosives directly into the blast holes.	Minor	General monitoring and surveillance during construction
	Construction and operation	Increase in road transport, machinery traffic, underground mining activities and refuelling.	Risk of water and sediment contamination by hydrocarbons during refuelling, or in the event of damage and an accident along a watercourse or wetland.		QES2a	Carry out inspections to ensure that the temporary hydrocarbon storage tanks are in good condition.	Minor	General surveillance and monitoring during construction, operation, closure and restoration.
				IA: p.369-371	QES4	Heavy machinery will only be used within the road right-of-way and borrow pit access roads.		
					QES8	Machinery parking, washing and maintenance areas shall be at least 60 m from any watercourse, and machinery shall be refuelled under constant supervision at least 30 m from any watercourse.		
					QES27	Fuel tanks will be surrounded by a berm high enough to contain a spill equal to the largest capacity tank plus 10%.		
					QES28	Acid-generating waste rock (Méquillon, Expo South and Ivakkak) will be progressively covered with layers of neutral granular material and a waterproof membrane.		
					QES34	Apply the mitigation measures SOL1, SOL1a, SOL2, SOL2a and SOL3 to limit the risk of water and sediment contamination.		
	Operation	Water from drainage ditches, tailings disposal site, waste rock and ore piles.	Possible degradation of water quality by increased sediment downstream of mine drainage discharge points and clean water ditches.	IA: p.369-371	QES19	The top of mine tailings and waste rock piles shall be kept at a 1% to 3% gradient to minimize infiltration.	Minor	Comprehensive environmental monitoring program affecting discharged water, surface water, runoff and ditches.
					QES35	Treat the water contained in the collection pond located downstream from the waste rock pile on the Nanaujaq site (it will be sent to the Méquillon WTP for treatment).		
				IA: p.369-371	QES22	Temporary ore storage sites would rest on a compacted gravel base surrounded by a collecting ditch to channel drainage water to the sedimentation pond, from which it shall be pumped into the process water tank.		
					QES26	Abrasives and de-icing chemicals will only be spread on dangerous locations or during ice-storms.		
					QES29	Geomembranes shall be placed beneath mine tailings cells, on dike walls and on the top of tailings and waste rock piles.		
		Runoff water from roads, access roads and disturbed soil areas.	Risk of degradation in water quality near roads, access roads and soil disturbance areas.	IA: p.369-371	QES30	During earthwork on steep slopes, the bottom of ditches shall be progressively stabilized with a cover of well-drained granular material and riprap.	Minor	
Water and sediment regime	Construction and operation	In fact, the construction of a collection pond, waste rock and ore piles, as well as drainage and collection ditches at the Nanaujaq site. Development of two ditches at the Ivakkak UG site.	Modification of the surface water flow pattern.		RHS2a	Interrupt drainage ditches 10 m from the natural high water mark when watercourses or bodies of water are present nearby.	Minor	General monitoring and surveillance during operation
			Possible increase in erosion and sediment transport in watercourses.	IA: p.351-352	RHS8	Re-use stones removed during grading work to stabilize banks and hollows.		
Vegetation	Construction and operation	Presence of surface infrastructure (access road, cement slurry plant, portal, ditches, storage pad, ventilation raise, collection pond, waste rock and ore piles, administrative infrastructure, powder magazines, etc.).	Loss of surface area in terrestrial environments (21.54 ha) and wetlands (28.37 or 29.98 ha depending on the alternative selected) for the Ivakkak UG, Méquillon UG2, Expo South and Nanaujaq projects, and loss of ecological functions for wetlands.	IA: p.401	VEG1	Machinery must not circulate outside work area boundaries (unless otherwise authorized).	Minor	General surveillance and monitoring during construction, operation, closure and restoration.
					VEG2	Habitats next to jobsites must be protected (particularly close to stream banks).		
					VEG3	Compensation for wetland areas lost through contributions to PEIIC (Program for Environmental Improvement in Inuit Communities).		
			Potential loss of at-risk plants species at the Nanaujaq site.	IA: p.401	VEG1	Machinery must not circulate outside work area boundaries (unless otherwise authorized).	Minor	
					VEG1a	The small-flowered draba species were identified on the Nanaujaq site were excluded from the work area. The sector where a small-flowered draba was seen will be visited again prior to the installation of construction work at the Nanaujaq site. A biologist or a technician trained in identification will check if the species are still present there and, if necessary, the location will be marked by visual cues and protected.		
		Circulation of machinery and employees.	Risk of trampling of vegetation by personnel or machinery, deposit of dust and risk of contamination to natural environments.		VEG4	Apply the mitigation measures VEG1, AIR3, SOL1, SOL1a, SOL2, SOL2a, and SOL3.	Minor	

[A] The operation phase includes the closure and restoration phases when applicable.
Note: A grey background indicates a new measure since Annex 7 established with the Nunavik Nickel Committee.
IA = Impact assessment (GENIVAR, 2007).

Table 7-36: Assessment of Potential Impacts and Mitigation Measures for the Ivakkak UG, Méquillon UG2, Nanaujaq and Expo South Underground Mining Projects and Associated Related Projects (cont.)

Component	Project phase[A]	Impact source (additional compared to the 2007 ESIA)	Impact description	Source	Mitigation measures		Residual impact significance	Monitoring
					Nº	Description		
Aquatic wildlife and their habitats	Construction and operation	All activities of the four underground mining projects and their related projects.	Possible damage to aquatic organisms located in watercourses and bodies of water near the various activities.		FAQ59	Apply mitigation measures for air, soil, water and sediment quality.	Minor	General surveillance and monitoring during construction, operation, closure and restoration.
Birds and their habitats	Construction	All construction activities of the four underground mining projects and their related projects.	Loss of accessible habitat for birds (loss of 21.54 ha in land and 28.3754 or 29.98 ha in wetlands depending on the alternative selected).	IA: p.441 IAAC.E2	FAV1	Traffic must be limited to work areas	Minor	General surveillance and monitoring during construction, operation, closure and restoration.
			Disturbance of breeding pairs and migrating birds near construction sites and along roads leads to a risk of nest abandonment. Potential destruction of nests.	IA: p.441 IAAC.E2	FAV2	Habitats next to jobsites will be protected	Minor	
					FAV5	Apply the fauna and flora protection plan		
	Operation	All operation, closure and restoration activities of the four underground mining projects and their related projects.	Disturbance of breeding pairs and migrating birds near facilities	IA: p.443-444	FAV1	Traffic must be limited to work areas	Minor	
					FAV2	Habitats next to jobsites will be protected		
					FAV4	It is prohibited to fly over the cliffs southwest of Méquillon from June to September (peregrine falcon and golden eagle nesting period).		
					FAV5	Apply the fauna and flora protection plan.		
Caribou and other land mammals	Construction and operation	All activities.	Disrupting several species by noise, i.e., caribou. Possibility of hurting or killing an animal during road transport.	IA: p.430-431, 436-437	MTR1	Prior and regular inspection of machinery shall be performed to ensure that it is in good condition and working properly (minimizing noise).	Minor	General surveillance and monitoring during construction, operation, closure and restoration. Collisions with caribou monitoring
					MTR2	Machine circulation will be limited to work areas.		
					MTR6	Apply the fauna and flora protection plan.		
At-risk wildlife and plant species	Construction and operation	Presence of surface infrastructure (access road, cement slurry plant, portal, ditches, storage pad, ventilation raise, collection pond, waste rock and ore piles, administrative infrastructure, powder magazines, etc.) and other related projects.	Potential loss of at-risk plants species at the Nanaujaq site.		ESP1	VEG1 and VEG1a.	Minor	General surveillance and monitoring during construction, operation, closure and restoration.
					ESP2	Apply VEG4.		
Human environment - Economy and employment	Construction and operation	All activities from the various mining sites.	Job creation and local and regional economic benefits.	IA: p. 448-449	ECO1	Hiring will give preference to Inuit workers.	Major (positive impact)	Continue the monitoring regarding the Inuit communities information program.
					ECO2	Maintain the information and recruitment program in the Inuit villages.		
					ECO3	Maintain the training program intended and adapted for future Inuit workers.		
					ECO4	Encourage Nunavik-based companies with the skills for the tasks requested in the call for bids procedure, before undertaking requests to companies based in Abitibi, elsewhere in Quebec or abroad.		
					ECO5	A sales outlet for Inuit handcrafted goods will be established on the Expo industrial complex.		
				IA: p.452	ECO7	Promote the integration of Inuit workers hired for construction into the operation phase.		
					ECO9	Respect the updated Nunavik Nickel Agreement policies related to the hiring of Inuit workers as well as royalties.		
			Substantial workforce mobility and lifestyle changes at the Expo mining complex.	IA: p. 454-455	MOE1 to MOE10	Integrate new workers by explaining the different living conditions and regulations on the NNiP site, as well as the different programs available. All of these measures can be found in Annex 7 of the Nunavik Nickel Agreement.	Minor	

[A] The operation phase includes the closure and restoration phases when applicable.

Note: A grey background indicates a new measure since Annex 7 established with the Nunavik Nickel Committee.
IA = Impact assessment (GENIVAR, 2007).
IAAC2= 2nd response document to the Impact Assessment Agency of Canada (February 2008).

Table 7-36: Assessment of Potential Impacts and Mitigation Measures for the Ivakkak UG, Méquillon UG2, Nanaujaq and Expo South Underground Mining Projects and Associated Related Projects (cont.)

Component	Project phase[A]	Impact source (additional compared to the 2007 ESIA)	Impact description	Source	Mitigation measures		Residual impact significance	Monitoring
					Nº	Description		
Human environment - Land use by the Inuit	Construction, operation, closure and restoration	All activities from the various mining sites.	Disruption of traditional Inuit activities within the NNiP territory.	IA: p.470	ORS1a	Possibility for Inuit workers to do a shorter work rotation (two weeks on, followed by two weeks off), so they can spend more time in their community.	Moderate	General monitoring and surveillance during operation
				IA: p.473	TRC1	Mark new access roads and post traffic signs where snowmobile and all-terrain vehicle trails intersect these roads or the main road when required.		General monitoring and surveillance during operation
					TRC11	Install signs mentioning the presence of traffic lanes or work/operation areas in proximity to inform Inuit users who may travel through or practice activities in the sector.		
				IA: p.487-488	URT1	No measures will be taken to facilitate sports fishing by the workers (e.g., transportation by helicopter).		General surveillance and monitoring during construction, operation, closure and restoration. Monitoring continuation regarding the plan for evaluating NNiP perceptions and sport fishing monitoring.
					URT2a	Prohibit the possession of firearms at CRI sites (except with special authorization for protection against polar bears), as to limit sport hunting activities practiced by employees.		
				IA: p.487-488	URT3	Prior and regular inspection of machinery will be performed to ensure that it is in good condition and working properly (to avoid producing excessive noise).		
				Navigation (p.65)	URT4	Lakes used by the residents of Salluit and Kangiqsujuaq will remain accessible.		
				Navigation (p.65)	URT6	Continue to set up fishing programs governing this activity in the targeted bodies of water.		
					URT10	In the event that traffic must be temporarily or permanently impeded on trails used by Inuit users, provide bypasses or new safe travel routes together with the Salluit and Kangiqsujuaq communities. Inform the population of the Salluit and Kangiqsujuaq communities of the bypassing routes or new travel routes.		
					URT11	Regularly inform the Salluit and Kangiqsujuaq communities of the work carried out on the NNiP territory affected (nature of the work/operations, location of the work/operations, schedule, potential dangers for Inuit users).		
					URT12	Regularly inform CRI workers of the potential presence of Inuit users in the territory concerned by NNiP's Phase 2a.		
				IA: p.494-495	SON2	Machine circulation will be limited to work areas.		Continue the sound monitoring in the Pingualuit National Park.
					SON3	If possible, isolate the main sources of noise with a sound-absorbing material, when possible.		
Human environment - Archaeology and heritage	Construction	All construction activities for the four underground mining extension projects and their related projects.	Discovery of archaeological or historic remains during construction	IA: p.492	ARC1	If remains of importance are discovered, the site supervisor shall be informed immediately and measures taken to protect the site.	Minor	General monitoring and surveillance during construction.
Human Environment - Soundscape	Construction and operation	All activities from the various mining sites.	Increase noise level around the construction site and mining activities.	IA: p.494-495	SON1	Preliminary and regular inspections of the machinery to ensure it is in good condition and working properly (so no excess noise is generated)	Minor	Continue the sound monitoring in the Pingualuit National Park.
					SON2	Machine circulation will be limited to work areas.		
					SON3	If possible, isolate the primary sound sources with absorbent material		
					SON4	It shall be mandatory for workers to wear hearing protection devices when inside noisy buildings (e.g., crushing and grinding unit)		
Human Environment - Landscape	Construction, operation and closure	All construction, operation and closure activities for the four underground mining extension projects and their related projects.	Deterioration of surrounding scenery	IA: p.499	PAY1	Minimize stripping, clearing, excavation, backfilling and grading to maintain the natural topography as much as possible.	Minor	Monitoring continuation regarding the plan for evaluating NNiP perceptions and general monitoring during activities.
				IA: p. 501 KRG	PAY5	Installation of directional sodium lighting to limit the light dispersion around the mining complex		
	Restoration	Activities related to site restoration after closure.	Site restoration	IA: p.499	PAY2	When construction is completed, work areas shall be rehabilitated and restored so that they blend in as much as possible with the natural landscape (regrowth of vegetation).	None	

[A] The operation phase includes the closure and restoration phases when applicable.

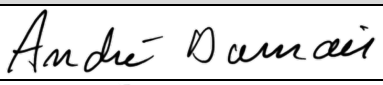
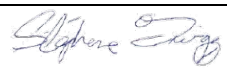
Note: A grey background indicates a new measure since Annex 7 established with the Nunavik Nickel Committee.
IA = Impact assessment (GENIVAR, 2007).
KRG = Response document to the Regional Administration Kativik (March, 2008).

Appendix 2
Management of Interventions Involving Wildlife and Wildlife Event Report Form

Gestion des interventions impliquant la faune

La seule copie originale et officielle de la présente politique est celle disponible sur le système Intranet de Canadian Royalties Inc. et qui est mis à la disposition et pour le bénéfice des employés de Canadian Royalties Inc. seulement. Toute autre version ou reproduction de la présente politique à des fins publiques est strictement interdite et toute version papier de la présente politique ne pourra en aucun temps être considérée un document officiel.

Numéro de référence	PRO-NSST-1211-05a-F
Date d'entrée en vigueur	2012-12-01
Département responsable	Mesures d'urgence
Personnel visé	Employés CRI, entrepreneurs et visiteurs

Approuvé par	Département	Signature	Date
André Dumais	Directeur Général		2018-01-17
Stéphane Twigg	Surintendant Environnement		2018-01-08
Suzanne Paradis	Chef Santé-Sécurité & Mesures d'urgence		2018-01-08

Registre de l'historique du document :

# de la version	Raison de la nouvelle version	Nom du modificateur du document	Date de la modification
1.0	Création initiale	Département de l'environnement	
1.1	Révision annuelle	Marie-Eve Ratthé/Christian Rochefort	2013-12-20
1.3	Révision annuelle	Stéphane Twigg/Myriam Bédard	2015-02-26
1.4	Révision annuelle	Marie-Eve Ratthé	2016-11-11
a	Révision annuelle	Suzanne Paradis	2017-12-20

1- DÉFINITIONS:

- **MFFP :** Ministère des Forêts, de la Faune et des Parcs.
- **Animaux à déclaration obligatoire :** carcajou, caribou, loup, bœuf musqué, ours blanc et tous les oiseaux de proie.
- **Incident :** Événement causant des blessures à l'animal, portant atteinte à son intégrité physique ou à son habitat ou ayant provoqué sa mort.
- **Évenement rapportable :** Tout incident ou observation concernant les animaux à déclaration obligatoire ou non et pouvant inclure mais ne s'y limitant pas : l'observation indirecte ou directe d'animaux représentant un risque pour la sécurité des travailleurs, l'observation de comportement aggressif, inhabituel ou la prolifération anormale d'une èspece faunique les site de Canadian Royalties.
- **Déconditionnement niveau 1 :** effarouchement avec méthodes légères, tel que gesticuler, crier, faire du bruit.
- **Déconditionnement de niveau 2 :** effarouchement avec méthode agressives, tel que corne de brume, projectiles pyrothecniques, balles de peinture, balles de capsine.

2- EXIGENCES LÉGALES :

- Loi sur la conservation et la mise en valeur de la Faune (LRQ, c. C-61.1)

3- BUT :

- Assurer le suivi requis en cas d'occurrence d'événement rapportable;
- Assurer le suivi médical requis en cas de contact ou d'agression d'un animal;
- Assurer une action adéquate en cas d'incident impliquant des animaux à déclaration obligatoire.
- Assurer une action adéquate en cas d'observation d'ours blancs;
- Assurer une communication efficace avec les autorités gouvernementales en cas d'incident impliquant des animaux à déclaration obligatoire;
- Assurer une communication efficace au site et avec les autorités voisines de Glencore en cas d'observation d'ours blancs;
- Assurer un plan efficace de gestion de la faune contribuant à réduire les dangers pour les opérations minières, ainsi que pour les travailleurs.

4- PORTÉE:

- Cette procédure s'applique à toutes les observations et/ou incidents impliquant la faune du Nunavik.

5- DOCUMENTS COMPLÉMENTAIRES:

- FORM-ENV-002-Rapport d'incident ou d'observation de la faune
- INS-ENV-001-Lignes directrices – Rencontre d'un ours blanc
- INS-ENV-030- Lignes directrices pour la gestion et le contôle des loups
- FORM-ENV-030-Fiche d'observation loup
- ANNEXE A – Lignes directices –Gestion des incident liés aux renards arctiques
- Plan de mesures d'urgence (PMU)

6- RESPONSABILITÉS:

6.1 Général

- Tous les employés, entrepreneurs et visiteurs doivent connaître et appliquer cette procédure;
- Il est interdit de nourrir, d'harceler ou de déranger tout animal circulant près des installations du PNNi;
- Rapporter au répartiteur toute collision d'un véhicule ou incident avec des animaux à déclaration obligatoire;
- Rapporter au répartiteur l'observation directe d'un ours blanc ou d'indices indiquant sa présence;
- Rapporter au répartiteur l'observation directe ou indirecte d'indice indiquant la présence d'animaux à déclaration obligatoire;
- Rapporter toutes observations de la faune pouvant être problématique pour la santé et sécurité des travailleurs;
- Lors d'un incident impliquant la mort d'un animal, le personnel n'est pas autorisé à conserver la carcasse. Elle doit être offerte aux communautés Inuits via les conseillers en ressources humaines Inuits présents au site si l'état de la carcasse le permet. Dans le cas contraire la carcasse doit être disposée dans un lieu d'enfouissement et enterrée sur le champ;
- Consulter immédiatement le Service de santé si contact physique ou agression d'un animal et compléter une déclaration d'événement avec l'aide de votre superviseur;
- Le non respect de cette procédure sera traité de la façon la plus appropriée, dépendamment de la situation, en accord avec la procédure disciplinaire de Canadian Royalties Inc., qui peut inclure une réprimande et qui peut aller jusqu'au congédiement;
- La compagnie se réserve le droit de modifier et d'amender ce document sans préavis et selon les besoins de ses opérations.

7- DESCRIPTION DES ACTIONS / DU CONTENU :

7.1 Observation / incidents avec des animaux à déclaration obligatoire

a) Rôle de l'employé témoin/ responsable :

- Avise immédiatement le répartiteur sur la fréquence RTE Expo ou 2911;
- Si l'incident ou l'observation survient sur les routes gérées par Glencore aviser aussi le répartiteur de Katinniq et attendre ses instructions;
- Lors d'un incident causant la mort d'un animal à déclaration obligatoire, la carcasse ne doit pas être déplacée avant qu'un agent de protection de la faune ait été avisé.
- S'il y a agression ou contact physique avec un animal, consulter immédiatiatement le Service de Santé. Par la suite, compléter une déclaration d'événement et l'acheminer au département Santé & Sécurité.

b) Rôle du répartiteur :

- Rapporte au superviseur sureté et au superviseur MU ou son remplaçant, au gérant en devoir et au coordonnateur en environnement, le plus rapidement possible l'information recueuillie auprès des témoins;
- Avise la répartition Glencore lors de l'observation confirmée d'un ours blanc.

c) Rôle du superviseur MU ou des superviseurs SMU :

- S'assure que cette procédure est connue et appliquée par tout le personnel;
- Effectue le suivi des actions posées lors d'un incident impliquant des animaux à déclaration obligatoire, d'évenement rapportable ou lors de l'observation d'ours blanc.
- Interviennent et coordonnent les interventions sur le terrain lorsque requis;
- Maintiennent les communications entre les intervenants.

d) Rôle du coordonnateur en environnement :

- Avise les autorités gouvernementales lorsque surviennent des incidents impliquant des animaux à déclaration obligatoire;
- Communique avec le MFFP, bureau local de Kuujjuaq si l'animal est blessé, mort et s'il est sur la liste des animaux à déclaration obligatoire;
- S'assure que les carcasses d'animaux morts soient offertes aux communautés inuites avant tout autre mode de disposition;
- Coordonne les actions requises selon le type d'événement rapporté.

e) Rôle du gérant en devoir :

- Coordonne toutes les activités entourant la gestion de la situation, selon les circonstances et s'assure que tous les intervenants soient impliqués concrètement dans toutes les interventions;
- Donne l'autorisation pour l'utilisation des armes à feu lorsque la situation le requiert;
- En cas de présence d'ours blanc près des installations du site, émet un avis d'interdiction de sortie à l'extérieur et la retire quand le danger est passé.

f) Rôle des Conseillères emploi et formation inuit (EFI) et de l'Officier de communication Inuit

- Communiquent aux employés Inuit qu'une carcasse est disponible sur le site;
- Identifient un chasseur Inuit parmi les employés de CRI présents au site;
- Au besoin, communiquent les avis d'incidents aux communautés de Salluit et Kangiqsujuaq.

7.2 Incident avec des animaux à déclaration obligatoire

Le superviseur SMU ou son délégué :

a) doit prendre des photos sur le lieu de l'incident des dommages au véhicule, de la carcasse de l'animal, des blessures, etc;
b) Est responsable de l'utilisation des armes à feu lorsque la situation le requiert;
c) Doit compléter un rapport d'incident, en collaboration avec le témoin et le coordonnateur l'environnement;
d) Le formulaire de rapport d'incident doit être remis au coordonnateur en environnement dans un délai de 24 heures.

7.3 Observation d'ours blancs

Le superviseur SMU ou son délégué :

a) S'assure que les témoins et les intervenants sont hors de danger lors de l'observation d'ours polaire ou lors d'évenement rapportable présentant des risques pour la santé et la sécurité des travailleurs;
b) Lors d'observation ou confirmation d'indices de la présence d'un ours blanc, le superviseur SMU s'assure que le(s) témoin(s) et les intervenants sont hors de danger et vérifie le registre de sorties du camp;

c) Émet un communiqué de prévention aux employés du PNNI lors de l'observation d'ours polaire ou d'évènement rapportable impliquant un risque pour les travailleurs et avise les autorités responsable chez Glencore;
d) Dans la mesure du possible et sans mettre leur sécurité en danger, le superviseur SMU et coordonnateur environnement se rendent sur place afin de documenter l'observation (traces, photos, indices, etc.)

7.4 Gestion et prévention des loups familliers

a) Le superviseur SMU s'assure que le(s) témoin(s) et les intervenants sont hors de danger et vérifie le registre de sorties du camp;
b) Sans mettre leur sécurité en danger, le superviseur SMU et le coordonnateur environnement se rendent sur place afin de documenter l'observation en remplissant la Fiche d'observation loup FORM-ENV-030 et applique les Lignes directrices pour la gestion et le contrôle des loups (INS-ENV-030) ;
c) En collaboration avec le coordonnateur environnement, le superviseur SMU assure le suivi des d'observation de loups familiers près des installation du PNNi.
d) Si le loup est toujours présent sur le site et mais ne présente aucun comportement menaçant, (voir tableau 1), un **déconditionnement de niveau 1** est initié par le superviseur SMU en collaboration avec un représentant du département de l'environnement (INS-ENV-030)
e) Dans la mesure où le processus précédent s'avère inefficace, et que le loup n'est toujours pas menaçant, Le SMU et le représentant environnement passe au **déconditionnement de niveau 2**
f) Le passage au méthodes de gestion létale est requis lorsqu'un cas de loup familier présente un risque élevé ou quand les méthode de déconditionnement niveau 1 et 2 n'ont pas donné de résultats satisfaisants (tableau 1)

Tableau 1. Classification des comportements

CLASSIFICATION	DESCRIPTION
Conditionné ou intrépide	L'animal réapparait après une tentative d'effarouchement
Récompensé	L'animal présente un intérêt pour la nourriture de provenance humaine ou pour les objets humains
Tolérant	En cas de doute, l'animal peut être classé tolérant jusqu'à ce que d'autres essais soient concluants
Menaçant	Comportements d'agression, nécessite des mesures immédiates

7.5 Contacts externes

MFFP	1-866-237-2442
Glencore	KEnviro@glencore-ca.com RAgentSecurite@glencore-ca.com prevention@glencore-ca.com

7.6 Gestion de surpopulation du renard arctique

a) La surpopulation du renard arctique autours des installations du PNNi peut devenir problématique pour la santé et la sécurité des travailleurs. Une surpopulation peut-être identifiée par un ou plusieurs des points suivants :

- L'observation d'un nombre croissant de renard près des différentes installations;
- L'observation de dommages aux installations (ex. : bris des fils électriques) ;
- L'observation de comportements familiers de la part d'un ou plusieurs individus;
- L'observations de comportement agressifs et d'attaque de la part de l'animal.

b) Lorsqu'une surpopulation est identifiée sur un ou plusieurs sites du PNNi, un plan d'action est réalisé par le département de l'environnement, conjointement avec Sûreté et Mesures d'urgence:

- Une investigation est réalisée afin de déterminer les causes de la surpopulation;
- En collaboration avec le département de la Sûreté & Mesures d'urgence, une évaluation des différents moyens de contrôle de la population est réalisée;
- Lorsque l'option de contrôle de la population par moyen létal est choisie, le département de l'environnement présente la problématique aux conseillers ressources humaines Inuit.
- Les conseillers Emploi et Formation Inuit prennent contact avec les trappeurs et/ou chasseurs Inuit et organisent la venue des chasseurs/trappeurs. Un contrat de service doit être signé avec ceux-ci.

ANNEXE A - Lignes directices –Gestion des incident liés aux renards arctiques

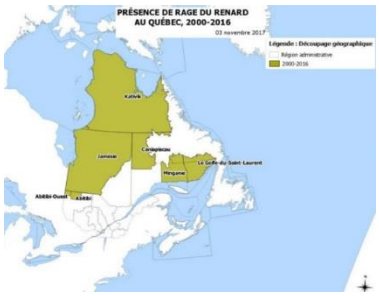
Le renard arctique et la Santé & Sécurité

Ils sont beaux. Ils ont l'air inoffensifs mais…

Saviez vous que :

- 80% des renards arctiques sont porteurs de la rage
- La rage est une maladie mortelle
- Vous avez 24 heures pour être traité suite à la morsure d'un renard

La rage est un enjeu important de santé publique au nord du 55ème parallèle (Nunavik). Le principal hôte de cette maladie est le renard arctique. C'est dans les années 40 que la rage a été détectée chez les renards arctiques pour la première fois dans le nord du Canada. Ce virus a ensuite été transmis chez les populations de renards roux plus au sud.



Pour votre sécurité - Consignes à appliquer en tout temps en présence de renards :

- ✓ Éviter tout contact avec les renards
- ✓ ***Il est interdit de les nourrir***

Toute personne ne respectant pas cette consigne est passible de mesures disciplinaires pouvant mener jusqu'au congédiement.

- ✓ Nourrir un renard le rend familier avec l'humain. Il demeure cependant un animal sauvage dont les réactions sont imprévisibles.
- ✓ Un renard qui devient familier comporte un risque important de transmission de la rage
- ✓ Signaler tout renard au comportement familier à la répartition sur la fréquence RTE-Expo ou au #2911.
- ✓ Rapporter tout incident, bris de matériel, même mineur, causé par un renard à la répartition
- ✓ ***Consulter immédiatement*** le Service de Santé en cas d'agression de la part d'un renard même s'il n'y a aucune blessure apparente.

En collaboration avec les chasseurs / trappeurs inuit, tout renard devenu familier sera euthanasié afin d'assurer la sécurité des travailleurs.

Rapport d'évènement faune

FORM-ENV-002

Compléter et envoyer à technicien.environnement@canadianroyalties.com. Contacter le poste 2565 pour informations.
Ne pas oublier d'inclure dans le courriel les photos de l'évènement.

Lors d'accidents et/ou blessures, remplir le «Rapport d'accident, d'incident, de quasi-accident du travail» (FORM-SST-002)

INFORMATION GÉNÉRALE

Date du rapport	Heure du rapport	Rapport rédigé par	Poste téléphone	Fonction/département/compagnie
Date de l'évènement	Heure de l'évènement	Incident constaté par		Fonction/département/compagnie
Autres personnes/compagnies impliquées dans l'évènement (nombre et/ou noms)				

DESCRIPTION DE L'ÉVÈNEMENT

Animal impliqué	Ours Blanc	Ours Noir	Caribou	Loup	Renard	Boeuf musqué	Carcajou	Oiseau de proie (mentionner l'espèce)	Autres
	☐	☐	☐	☐	☐	☐	☐	☐	☐
Commentaires									

Description de l'animal	Sexe		Âge				Présence de petits	Comportement				Autres
	Mâle	femelle	juvénile	Jeune adulte	adulte	Vieux ou malade		En détresse	effrayer	curieux	menaçant	
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Commentaires												

Évènement	Collision	Observation	Contact(décrire la nature)	Déconditionnement	Abattage	sauvetage	Autres
Cocher tout ce qui s'applique	☐	☐	☐	☐	☐	☐	☐
Disposition de la carcasse							
Commentaires							

Véhicule impliqué	
Lieu (description et données GPS)	
Circonstances	
Description dommages matériel	
Identification des blessés et leur état	
Commentaires	

MESURES CORRECTIVES ET PRÉVENTIVES

Lieux où un incident similaire est susceptible de survenir
Actions/mesures entreprises pour éviter qu'un tel incident survienne de nouveau

À compléter par le département de l'environnement

Commentaires	
AUTORITÉ AVISÉ MRNF ☐ CDPNQ ☐	Avis émis à une autorité externe (nom, titre, date et heure)
	Avis émis à une autorité externe (nom, titre, date et heure)

Appendix 3
Inventory Sheet of Bird Nests and Associated Protocol

ANNEXE 3 : FICHE D'INVENTAIRE DES NIDS D'OISEAUX ET PROTOCOLE

Table des matières

Annexes

1. Introduction

La phase 2a du Projet minier Nunavik Nickel (PNNi) a fait l'objet d'une étude d'impact qui a permis de répertorier 30 espèces d'oiseaux dans la zone d'étude, dont 23 sont considérées nicheurs confirmés, probables ou possibles. Au Canada, le nid d'une espèce d'oiseau migrateur est protégé en vertu du *Règlement sur les oiseaux migrateurs* (C.R.C., ch. 1035) et ne peut être dérangé ou détruit. La réalisation d'activités qui pourraient déranger les oisillons et leurs parents doit ainsi être effectuée à la fin de la période de reproduction, lorsque les oisillons auront quitté le nid. Lorsque des travaux doivent être effectués durant la période de reproduction et de nidification (mi-mai à la mi-août selon ECCC, 2018), il est nécessaire de réaliser un inventaire de nids d'oiseaux avant la réalisation de toutes activités dans l'aire de travaux. Il est ensuite nécessaire d'établir un périmètre de protection lorsqu'un nid est présent dans la zone. Un suivi des nids doit également être réalisé afin de prévoir le moment où les oisillons quitteront le nid et ainsi établir le moment où pourront commencer les travaux dans le périmètre de protection.

Ce protocole a pour objectif de présenter la méthode d'inventaire des nids d'oiseaux à réaliser avant toutes activités de construction prévue entre la mi-mai et la mi-août. Il propose également une méthode de délimitation du périmètre de protection autour du nid, ainsi qu'une méthode de suivi des nids d'oiseaux durant les travaux.

2. Méthodologie

2.1 Identification de la surface d'inventaire et établissement du plan d'échantillonnage

La première étape est d'obtenir une carte précise ou un fichier de forme « shapefile » du secteur où l'inventaire des nids sera fait. Des repères doivent être disponibles sur le terrain pour déterminer avec précision l'aire qui fera l'objet de la recherche. Les limites de l'aire d'inventaire seront transférées dans un GPS sur lequel il est possible de visualiser les tracés effectués pour la recherche de nids et ainsi s'assurer de couvrir l'entièreté de l'aire.

L'aire doit être parcourue selon des transects dont la distance entre chaque transect dépendra de la densité du couvert végétal ou de la topographie du sol (gros blocs enchevêtrés par exemple). Cette distance pourra ainsi varier de 25 m lors d'une belle visibilité et 50 m pour les milieux dont la topographie est très hétérogène.

2.2 Réalisation de l'inventaire

L'inventaire consiste à parcourir, à l'aide d'une corde munie de clochettes, l'aire prévue des travaux de construction le long de transects afin de repérer et d'identifier les nids d'oiseaux qui se trouvent au sol.

La corde, qui ne doit pas être trop lourde (corde à deux brins, pas en coton) doit mesurer entre 25 et 50m (longueur à ajuster selon le terrain). Des petites clochettes doivent être accrochées à tous les mètres le long de la corde, afin de favoriser l'effarouchement. Deux personnes de front réalisent l'inventaire, une à chaque extrémité de la corde, en laissant trainer la corde sur le sol.

Les signes suivants indiquent la présence probable ou confirmée d'un nid :

- Adulte transportant de la nourriture à un endroit précis;
- Oiseau simulant une blessure ou détournant l'attention;
- Adulte effectuant des va-et-vient toujours vers ou à partir du même site;
- Adulte transportant un sac fécal à partir d'un endroit précis;
- Œufs ou jeunes en duvet observés dans un nid;
- Cris d'alarme et attaques fréquentes et soutenues des adultes lorsque les spécialistes s'approchent d'un endroit précis.

Dans les endroits où la densité du couvert arbustif est très dense et/ou la méthode de la corde serait infaisable, les spécialistes devraient dans la mesure du possible se munir d'un bâton de 2 à 3 m de long afin de frapper délicatement et régulièrement la végétation de part et d'autre du transect afin de faire fuir les adultes qui seraient assis sur le nid et ainsi permettre la détection du nid lors de l'envol des adultes. Cette technique doit également être mise en application dans les aires composées de prairies herbeuses. En effet, certains adultes vont demeurer immobiles sur le nid à moins d'être dérangés à très courte distance.

S'il y a découverte d'un nid au sol, il faut s'assurer :

- d'effectuer les relevés (localisation, espèce, nombre d'œufs ou de jeunes, etc.) le plus rapidement possible;
- d'éviter de mettre un marqueur à proximité;
- et dans le cas où un adulte se serait envolé du nid en laissant les œufs à découvert, recouvrir le nid de brindilles pour empêcher qu'il ne soit détecté par des prédateurs aériens

Une fois la présence d'un nid confirmé ou probable, il faut saisir les coordonnées GPS, identifier l'espèce nicheuse si possible, vérifier la présence d'œufs ou d'oisillons et déterminer l'état de développement des oisillons (en duvet, recouvert de plumes sur la moitié du corps, totalement recouvert de plumes). Ces données doivent être saisies dans le formulaire type présenté à l'annexe A du présent document. Des photos doivent également être prises pour faciliter l'identification et le repérage ultérieur du nid. Ces informations permettront aux spécialistes d'évaluer l'âge de la nichée et d'estimer les dates probables d'envol hors du nid. D'autres données telles que le comportement des oiseaux et le support du nid sont également requises dans le formulaire lorsqu'applicables. Il est obligatoire de remplir ce formulaire même si aucun nid n'a été trouvé lors des recherches en indiquant l'absence de nids.

2.3 Établissement du périmètre de protection

Si un nid est découvert sur le site des travaux (même si on ne peut percevoir les œufs ou le nid), ou si un comportement est observé chez les oiseaux pouvant indiquer la présence d'un nid, une zone de protection minimale de 10 mètres (rayon) devra être identifiée et mise en place autour du nid ou de l'endroit présumé du nid afin de protéger ce dernier lors des travaux de construction. Le périmètre de protection devra être rubané de manière qu'il soit clairement et facilement détectable sur le terrain. Les rubans pourront être attachés à la végétation ou encore à des piquets pour bien délimiter la zone d'exclusion tout en s'assurant à ce qu'ils soient bien attachés. Dans tous les cas, le nid lui-même NE doit PAS être identifié à l'aide de ruban de signalisation ou d'autre matériel semblable. Identifier un nid augmente significativement le risque de prédation et peut faire peur aux adultes, qui abandonneront le nid.

Si le nid est celui d'une espèce en situation précaire, le responsable en environnement doit contacter la DGFa-10 afin de déterminer si des mesures de protection supplémentaires sont nécessaires.

Aucune activité ne pourra prendre place à l'intérieur du périmètre de protection tant qu'il sera en place. La réalisation d'activités impliquant des vibrations devrait aussi être évitée à proximité du périmètre.

2.4 Saisie des données dans le registre

La saisie des données dans un registre s'avère un élément très important du protocole compte tenu des obligations et des engagements que CRI a à l'égard de la protection des nids d'oiseaux. Il faut d'une part réaliser des inventaires au maximum cinq jours avant la date de début des travaux de construction et en cas de présence d'un nid actif, il faut effectuer un suivi régulier de l'état de la nidification. Les dates prévues de construction, les dates où la construction a effectivement eu lieu, de même que les dates d'inventaire et de suivi des nids sont des données obligatoires qu'il faut

inscrire, car elles sont la preuve que CRI a respecté les délais et mis en place adéquatement les mesures de protection pour les nids d'oiseaux. Ce registre sera mis à jour et conservé pour consultation au besoin des actions prises.

Les données de l'inventaire doivent alors être transférées dans le registre et complétées par les informations additionnelles requises telles que mentionnées ci-dessus. L'annexe B présente les données requises au registre. Il est également important de consigner chaque inventaire de recherche de nids, que des nids aient été trouvés ou non.

2.5 Suivi des nids actifs et mise à jour du registre

Pour tous les nids actifs découvert et inscrit au registre, un suivi devra obligatoirement être réalisé afin de déterminer l'état de développement de la nichée et le moment de l'envol. En effet, les activités de construction ne pourront pas être effectuées à l'intérieur du périmètre de protection tant et aussi longtemps que la nichée n'aura pas quitté le nid et l'entourage immédiat de ce dernier.

La fréquence du suivi va dépendre de l'état de la nidification au moment de la découverte du nid. Ce suivi peut être effectué par le surveillant de chantier ou le spécialiste. Pour connaître la durée de nidification pour une espèce donnée, il faut consulter le spécialiste aviaire ou encore des ouvrages comme l'atlas des oiseaux nicheurs du Québec méridional de 1995 (Gauthier et Aubry, 1995) ou de 2019 (Robert et al. 2019).

2.6 Retrait du périmètre de protection

Le périmètre de protection pourra être retiré au moment où les oisillons auront quitté le nid.

2.7 Effarouchement

Advenant que des travaux devaient avoir lieu pendant la période de nidification des oiseaux migrateurs présents au site et qu'un site de nidification aurait été documenté dans ce milieu pendant la caractérisation environnementale préalable à la délivrance des autorisations gouvernementales, il faudrait être en mesure d'effaroucher les oiseaux pour éviter l'utilisation du site pour la nidification. Les techniques d'effarouchement sont soient sonores ou visuelles. Plusieurs techniques plus ou moins coûteuses peuvent être mises en place.

Pour les dispositifs visuels, il y a les épouvantails, les ballons et les leurres représentant un oiseau de proie. Pour les dispositifs sonores, une grande variété est accessible soit : canon à propane, haut-parleurs et klopotec.

Les dispositifs visuels et sonores peuvent être utilisés en alternance pour ne pas créer d'accoutumance.

3. Bibliographie

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Robert, M., M.-H. Hachey, D. Lepage et A. R. Couturier (sous la direction de). 2019. Deuxième atlas des oiseaux nicheurs du Québec méridional. Regroupement Québec Oiseaux, Service canadien de la faune (Environnement et Changement climatique Canada) et Études d'Oiseaux Canada. Montréal. Xxv + 694 p.

Annexe A : Fiche d’inventaire des nids d’oiseaux

FICHE D'INVENTAIRE DES NIDS D'OISEAUX

No Fiche
Projet - Secteur / No suivi*
/

Projet :
Secteur :
Date :
Heure début :
Heure fin :
Observateur :
No GPS :
No Caméra :
Nature des travaux/Raison de la visite :
Description du secteur d'inventaire :
Date prévue des travaux :
Nid(s) observés) : ☐ Oui ☐ Non

Transect		Description du nid									Description du support (si applicable)				
Pt GPS début	Pt GPS Fin	Pt GPS Nid	No photo	État**	Diamètre (cm)	Épaisseur (cm)	Habitat	Espèce	Note sur le comportement	ID Nid ***	Type	Hauteur (m)	Orientation	Vitalité	Surplomb (m)

* No. suivi : première visite = 00, deuxième visite = 01, …

** Indiquer s'il s'agit d'**œufs** ou d'**oisillons**, ainsi que le **nombre**. S'il s'agit d'oisillons, indiquer l'état de développement : Duvet (**D**), moitié du corps recouvert de plumes (**MP**), totalement recouvert de plumes (**TP**)

*** ID Nid : Code du projet – code du secteur – code d'espèce

Annexe B: Registre des nids d’oiseaux

REGISTRE DES NIDS D'OISEAUX

Date d'inventaire (mm/jj/aaaa)	Projet - Secteur	Obs.	Nid observé / présumé présent (oui/non)	Espèce	ID Nid	No suivi	No fiche	Commentaires sur le nid*	Date prévue des travaux (mm/jj/aaaa)	Date de début des travaux (mm/jj/aaaa)	Commentaires sur les mesures de protection**

* Non occupé, nombre d'œufs/oisillons, âge, couvé, état, etc.

** Date de mise en place du périmètre, nature de la protection, aucune restriction, etc.

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