



## Meeting summary

The 273rd meeting was held in Montreal on December 14 and 15, 2022.

Present:	Pierre Philie	David Annanack
	Daniel Berrouard	Joseph Annahatak
	Cynthia Marchildon	Charlie Arngak
	Thérèse Spiegele	Lisa Koperqualuk

Executive Secretary: Florian Olivier

### PROJECTS AND OTHER MATTERS

### DISCUSSIONS OR DECISIONS

<b>Innavik Hydroelectric Project in Inukjuak (3215-10-005)</b>	<ul style="list-style-type: none"> <li>The Commission decided to send questions and comments regarding the condition 13 of the certificate of authorization</li> </ul>
<b>Project of dismantling, Cleanup and Restoration of Mobile Camp Sites (3215-21-014)</b>	<ul style="list-style-type: none"> <li>The Commission considers the conditions are met for request 9, 10 and 11</li> <li>The Commission expects a dismantling report after the work is done for request 13</li> </ul>
<b>Project of expansion of the tank farm in Salluit (3215-22-018)</b>	<ul style="list-style-type: none"> <li>After analysis and discussion, the Commission decided to exempt this project</li> </ul>
<b>Project of construction of a new thermal generating station on the territory of the Northern Village of Puvirnituk (3215-10-014)</b>	<ul style="list-style-type: none"> <li>The Commission decided to authorize the project under conditions</li> </ul>
<b>Raglan Mine Project by Glencore: temporary surface crushing of a portion of the ore (3215-14-019)</b>	<ul style="list-style-type: none"> <li>The Commission decided to authorize the modification of the certificate of authorization</li> </ul>
<b>Phase II of the Nunavik Nickel Project (3215-14-007)</b>	<ul style="list-style-type: none"> <li>The Commission decided to send the promoter a series of questions and comments in order to decide on the authorization of the modification of the CA for this project</li> </ul>
<b>Project to Implement a Contaminated Soil Treatment Centre in Puvirnituk, by Services Environnementaux Avataani inc. (3215-16-062)</b>	<ul style="list-style-type: none"> <li>The Commission decided to exempt this project</li> </ul>
<b>Project of development of an end-of-life vehicle storage site in Quaqtak (3215-16-063)</b>	<ul style="list-style-type: none"> <li>The Commission decided to send the promoter a series of questions and comments in order to decide on the exemption of this project</li> </ul>
<b>Meeting with representatives of Les Énergies Tarquti inc</b>	<ul style="list-style-type: none"> <li>The Commission met with three representatives of Énergies Tarquti Inc</li> </ul>



In this context and according to the promoter, the Innavik project is a unique and excellent opportunity to deepen the understanding of the impact of hydroelectric development on permafrost, carbon transport and the cycling and accumulation of mercury in traditional foods.

Innavik Hydro's financial participation, which totals \$200,000, will enhance certain aspects of the project specifically targeting the community of Inukjuak. This participation will be divided into the themes described below:

Theme 1: Monitoring the impact of race flooding on the release of contaminants from permafrost

This part of the project aims at addressing the issue of mobilization of suspected mercury stocks in permafrost, in order to answer to the concerns of communities affected by the thawing of the permafrost.

Theme 2: Setting up a science camp for the youth from the community of Inukjuak

This part of the project consist in the transfer of knowledge via the organization of a science camp for the youth of the village and the hiring of secondary students for scientific activities.

Theme 3: Monitoring the presence of contaminants in fish

This part of the project consist in the monitoring of contaminant in fish flesh and its communication to the population, in order to comply with condition 10 of the CA.

Theme 4: Long-term monitoring of the impact of race flooding on permafrost thawing

This last part of the plan consist in the monitoring of the permafrost to the project in order to identify the potential presence of taliks (permanently unfrozen zones of the permafrost situated under the raceway) and their configuration until 2027

After reviewing the information provided by the proponent and discussion, the Commission sought further information so as to be able to render its decision. Thus, the Commission asked the proponent to respond to the following series of questions and comments:

QC-1. Overall, in addition to its involvement via financial contribution, the Commission asked the proponent to demonstrate that other compensation options have been considered and evaluated. It must describe these latter and explain why they were not selected.

QC-2. Thus, the Commission asked the proponent to enhance its present wetland and water compensation plan with specific works to create or restore wetlands or natural and water environments, particularly for fish habitat.

Although the compensation plan submitted by the proponent was favourably received by the monitoring committee and the proposals seem relevant and innovative, it does not offset the loss of wetlands and water bodies. It would have been desirable for the proponent to also foresee concrete restoration or enhancement works on wetlands and waterways or compensation works for other natural environments or environmental problems. It is still important that the compensation plan incorporate some measures specifically aimed at improving wetlands and water environments, or at least natural environments.

QC-3. The Commission asked the proponent to specify whether and how feedback will be provided to the project monitoring committee in Innavik on the implementation of the compensation plans. It should also specify whether there will be a broader transfer of knowledge to the community. In addition, the proponent must undertake to inform the Commission annually of the implementation of the compensation plans, including the results of the various follow-ups.

Let us remember that the proponent committed, prior to project authorization, to compensating unavoidable wetland losses. To this end, it planned consultations with municipal stakeholders (Uumajuit Warden, municipality, elders, youth, women, etc.). The proponent indicated that other measures will also be proposed at the plans and specifications stage for the construction of the infrastructure. These details will allow us to target all the components for which mitigation measures will have to be proposed in order to limit the project impacts, particularly on wetlands.

QC-4. The Commission asked the proponent to demonstrate how this compensation plan will offset the unavoidable loss of wetlands and fish habitat and whether all identified municipal stakeholders have been consulted. If so, the proponent must identify the concerns and comments raised by these stakeholders and how it has improved the compensation plan. If not, the proponent must justify why these stakeholders were not consulted.

Let us remember that, prior to the authorization of the project, the proponent committed to discussing the possibilities of compensation with the relevant authorities, including the Ministère des Forêts, de la Faune et des Parcs (MFFP) and Fisheries and Oceans Canada (FOC).

QC-5. Although FOC determined that no compensation is required, the Commission wished to remind the proponent to consult with the MFFP in order to submit its fish habitat compensation plan and improve upon it, if necessary.

The proponent has also committed to ensuring monitoring, over a period of 10 years, on the developments that will be carried out (e.g. creation of habitats, improvement works or other) following the recommendations of the community members consulted on the

establishment of appropriate compensation measures for the modification of fish habitat. The monitoring program was to be developed in collaboration with MFFP and FOC stakeholders.

QC-6. The Commission asked the proponent to indicate whether such a monitoring program has been developed and, if so, submit it. If not, it must specify when the program will be developed and forwarded to the Provincial Administrator.

QC-7. The Commission asked the proponent to specify how and when it will fulfil its obligations under Condition 10 of the August 23, 2019, certificate of authorization, in regards to communicating the results of the fish mercury monitoring program to the public and to the Commission, in consultation with the relevant government agencies, including the Nunavik Regional Board of Health and Social Services.

**Action: send a letter to the Administrator – questions and comments**

## **5. Project of dismantling, Cleanup and Restoration of Mobile Camp Sites (3215-21-014)**

5.1. Request #9 by Jack Humes Adventures inc.

*Task: For discussion, decision*

According to the proponent's dismantling reports, the sites contained between three and six buildings, all of which were dismantled. For logistical reasons a site initially scheduled to be dismantled in 2021 was also dismantled during summer 2022.

After analysis of these reports and discussion, the KEQC considers the proponent has carried out the works in accordance with the information it provided in the preliminary information. Furthermore, and as agreed when the preliminary information was submitted, the proponent has filed a copy of the dismantling report within nine months of completion.

Given that 2 of the 6 camps are located Naskapi area of interest, the KEQC is informing the Nation.

**Action: send a letter to the Administrator –condition met**

5.2. Request #10 by Club Chambeaux inc.

*Task: For discussion, decision*

According to the proponent's dismantling reports, the sites contained between four and eight buildings, all of which were dismantled. For logistical reasons a site initially scheduled to be dismantled in 2021 was also dismantled during summer 2022. For the record, for logistical reasons the dismantling for MCS 10508-26 and SCM 10508-27 had previously been rescheduled for 2022.

After analysis of these reports and discussion, the KEQC considers the proponent has carried out the works in accordance with the information it provided in the preliminary

information. Furthermore, and as agreed when the preliminary information was submitted, the proponent has filed a copy of the dismantling report within nine months of completion.

Given that 9 of the 10 camps are located in Naskapi area of interest, the KEQC is informing the Nation.

**Action: send a letter to the Administrator – condition met**

5.3. Request #11 by Pourvoirie Rivière aux Feuilles

*Task: For discussion, decision*

According to the proponent's dismantling report, the site contained seven buildings, all of which were dismantled.

After analysis of these reports and discussion, the KEQC considers the proponent has carried out the works in accordance with the information it provided in the preliminary information. Furthermore, and as agreed when the preliminary information was submitted, the proponent has filed a copy of the dismantling report within nine months of completion.

**Action: send a letter to the Administrator – condition met**

5.4. Request #13 Caribou expedition

*Task: For discussion, decision*

According to the proponent's dismantling report, the site contained 14 buildings, all of which have been inventoried for subsequent dismantling.

The Commission reminded the proponent that it expects to receive a dismantling report within nine months of completion of the work.

**Action: send a letter to the Administrator – waiting for the dismantling report**

**6. Project of expansion of the tank farm in Salluit (3215-22-018)**

6.1. Complementary information to the environmental and social impact assessment

*Task: For discussion, decision*

In January 2020, the Fédération des Coopératives du Nouveau-Québec (FCNQ) sent preliminary information for the Salluit oil depot expansion and modernization project. Given the scope of the project, the major issues raised and the anticipated environmental and social impacts, the KEQC decided to subject the project to the environmental and social impact assessment and review procedure. A first set of questions and comments was sent to the proponent on June 16, 2020, which stood in for directives on this project.

The proponent submitted responses to these questions and comments on February 19, 2021, which were considered the project's official impact statement. A second round of questions

and comments was sent to the proponent on June 23, 2021, that the proponent answered on September 9, 2022.

After reviewing the information provided by the proponent and discussion, the Commission sought further information so as to be able to render its decision on the authorization of the project. Thus, the Commission asked the proponent to respond to the following series of questions and comments:

## **Social issues**

### *Safety and risk of accident*

It is stated on page ii of Appendix 1 of the responses to the second set of questions and comments that: *“The consequence assessment is an industry standard and internationally recognized study for emergency planning purposes resulting from potential accident scenarios. However, the results of such an assessment do not provide a complete picture of the risk to workers, citizens, and the environment. This requires a quantitative risk analysis involving the analysis of the probability of the accident scenarios assessed and any other likely scenario regardless of the severity of the consequences [courtesy translation].”*

Thus, as itself admits, the proponent should have continued its risk analysis by calculating the probability of occurrence of each of the accident scenarios and by presenting an individual risk assessment, as suggested in chapters 3 and 4 of the *Guide - Analyse de risques d'accidents technologiques majeurs - June 2002 - MDDEP*,<sup>1</sup> when the potential consequences of the alternative scenarios exceed the property limits of a project.

Given the presence of several homes near the proposed tanks and therefore within the radius of potential consequences in the event of a technological accident involving the hazardous materials stored in these tanks, we are unable to conclude that the risk generated by the project is acceptable.

**QC3- 1.** As requested in QC2-1 of the June 25, 2021, document, the Commission asked the proponent to carry out and provide the individual risk assessment to determine if the risk levels correspond to the land uses, as set out by the individual risk acceptability criterion developed by the Major Industrial Accidents Council of Canada in 1995 and revised in 2008 by the Canadian Society of Chemical Engineering.

### *Public consultation*

As requested in QC-32 of the January 25, 2021, document and in QC2-2 of the June 25, 2021, document, the Commission had asked the proponent to inform and consult the residents of the Northern Village of Salluit about the project and its potential impacts. To this effect, the proponent stated that a public consultation was planned for fall 2022. A meeting was held on October 12, 2022, during which the Ministry transmitted various

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<sup>1</sup> <https://www.environnement.gouv.qc.ca/evaluations/documents/guide-risque-techno.pdf>



documents to the proponent concerning the public information and consultation process. We wish to reiterate the importance of taking these documents into account in the public consultation that will be carried out.

**QC3- 2.** The Commission asked the proponent to inform and consult the residents of Salluit and to inform us in turn of the community's concerns regarding the project, more specifically with regard to potential nuisances (odours, air quality, etc.) and apprehended risks (worries, feeling of insecurity, etc.). The proponent must also explain how it has taken these concerns into account in its project design and what it intends to do if concerns persist despite the measures foreseen to mitigate risks and nuisances for the public.

### **Biophysical issues**

#### *Emissions and air quality monitoring*

Section 44 of the Clean Air Regulation (CAR) states that any aboveground tank with a capacity equal to or greater than 4 m<sup>3</sup> that is intended for the storage of volatile organic compounds with a vapour pressure at storage conditions equal to or greater than 10 kPa must be equipped with a submerged fill line.

**QC3- 3.** Therefore, the Commission asked the proponent to demonstrate that it will comply with Section 44 of the CAR and use submerged fill lines for the fuel tank. As requested in QC2-3 of the June 25, 2021, document, the proponent must demonstrate with supporting evidence (e.g. plans and specifications, photographs) that the fill lines will be submerged or are submerged if this provision is not already in place.

The modeling results show exceedances of air quality standards at sensitive receptors when the wind speed is less than 2 m/s and blowing towards the sensitive receptors. To avoid these exceedances, the proponent mentioned that the transfer of gasoline should be carried out when the wind speed is greater than 2 m/s (7 km/h; 4 knots) and is not blowing from the west, since the homes and other sensitive receptors are located to the east of the oil depot.

**QC3- 4.** The proponent must confirm it is committed to carrying out gasoline transfers under wind conditions that protect the population (2 m/s). Considering the exceedance of standards at sensitive receptors if unloading is carried out when winds are blowing at less than 2 m/s and in the direction of sensitive receptors, the proponent must also examine the possibility of planning a last resort alternative if unloading must be carried out under these conditions.

In reviewing the fuel MSDS, two contaminants do not appear to have been retained in the air dispersion study, diesel fuel C9-18 -Alkane - branched and linear 1159170-26-9 and kerosene (petroleum) - hydrodesulfurized 64742-81-0.

**QC3- 5.** The Commission asked the proponent to justify why these contaminants were excluded

To determine the emission rates attributable to tank filling, the composition of the products was determined from their Material Safety Data Sheets. The maximum concentration of each substance in the product was used. However, when the total of the maximum concentrations of the substances exceeds 100%, the mass fraction of each substance is adjusted in the model so that the total reaches exactly 100%.

The assumption of using the maximum concentration from the MSDS to establish emission rates is considered to be valid. However, for gasoline, the type of adjustments made to reduce the sum of the mass fractions to 100% underestimates the maximum emission rates by about 25% and no longer replicates the worst-case foreseen contaminant concentrations based on the period of application of the limit value as laid out in Appendix H of the CAR.

The adjustment was made because the mass fractions are then converted to mole fractions, needed in the use of Raoult's Law to determine the emission rate. However:

**QC3- 6.** In order for the modeling scenario to reproduce the expected worst-case contaminant concentrations based on the period of application of the limit value in accordance with Appendix H of the CAR, the Commission asked the proponent to make adjustments to the gasoline mass fractions to ensure that the contaminant mole fractions are maximal. The proponent must submit an update to the air dispersion modeling that includes this adjustment.

Section 45 of the CAR specifies the requirements for certain tanks. These requirements are applicable to the storage of volatile organic compounds having a certain vapour pressure at storage conditions. This section applies to all new and existing tanks. In this case, based on the vapour pressure data provided, Tank 2, which is to contain gasoline, must be equipped with a floating roof.

The proponent also mentioned that it made another request to the Ministry to exempt gasoline tanks from section 45 of the CAR for the 14 petroleum depots operated by the FCNQ.

The Commission understands that a process for an exemption is currently undergoing, however, not being able to foresee the result of this process, the Commission is in no position to authorize a project that would not respect laws and regulations.

**QC3-7.** The Commission asked the proponent to respect the regulations in force and to plan to equip Tank 2 with a floating roof. It must also complete and submit an additional modeling scenario, which includes the gasoline tank equipped with a floating roof. The Commission asked the proponent to explain what it would do in the case of an exemption from section 45 of the CAR.

As described by the proponent on page 16 of its air dispersion modeling report, gooseneck sources should be modeled as volume sources. The  $\sigma_y$  is calculated as the lateral dimension of the gooseneck divided by 4.3 and the  $\sigma_z$  is calculated as the building height divided by 2.15. However, in Table 6 of the report, the proponent presents  $\sigma_z$  that do not match the result of this calculation, if we use the source height presented in the same table.

**QC3- 8.** Since this factor can have a significant impact on atmospheric dispersion, the Commission asked the proponent to submit an update to the atmospheric dispersion modeling displaying this correction.

In the results tables of the air dispersion modeling report, the proponent mentions annual and daily correction factors.

**QC3- 9.** In order to properly position itself in relation to the air dispersion modeling results, the Commission asked the proponent to specify what these factors are and what results in the tables have been reduced by these factors, if any results have been corrected. Such corrections must also be explained. Only the annual concentrations and exceedance frequencies can be corrected by a factor corresponding to the number of hours of actual operation divided by the number of hours modeled.

Section 197 of the CAR states that no person shall, on or after June 30, 2011, construct or modify a stationary source of contamination or increase the production of a good or service if it is likely to result in an increase in the airborne concentration of a contaminant listed in Schedule K of the CAR and above the limit value prescribed for that contaminant in Column 1 of that Schedule or above the concentration of a contaminant for which that limit value is already exceeded.

**QC3- 10.** In order to verify compliance with Section 197 of the CAR, the Commission wished to remind the promoter that if any modeled concentrations exceed air quality standards or criteria in the next version of the modeling, the proponent will be required to submit a modeling scenario corresponding to the currently permitted activities for comparison with concentrations resulting from the currently permitted situation.

### **Soil, wetlands and water**

The proponent did not respond to QC2-10 of the June 25, 2021, document. This question requests a demonstration that the project will not cause deterioration of the bed and banks of the watercourse that runs along the east side of the embankment and drains into the Salluit Fjord.

**QC3- 11.** As requested in QC2-10 of the June 25, 2021, document, the Commission is asking the proponent to indicate whether erosion is already visible and compare the flow that will be discharged during the emptying of the basin to

the flow that currently flows into this waterway. The proponent shall also describe the protective works it undertakes to install where deemed necessary.

Lastly, the Commission wished to indicate its understanding of the fact that the project addresses an important energy supply issue in Salluit, therefore the Commission recommended the proponent to respond diligently and satisfactorily to this series of questions and comments.

**Action: send a letter to the Administrator –**

**7. Project of construction of a new thermal generating station on the territory of the Northern Village of Puvirnituk (3215-10-014)**

7.1. Request of a certificate of authorization – environmental and social impact assessment

*Task: For discussion, decision*

In the context of the present project, Hydro-Québec plans to build a new generating station in the Northern Village of Puvirnituk. This project plans for the new station to be equipped with four generating sets for a total installed capacity of 6.50 MW to 7.5 MW. The planned location for the new station is approximately 2.5 km west of the centre of Puvirnituk. The developed area will be approximately 15,000 m<sup>2</sup> and will house the station, a fuel farm equipped with two exterior stocking tanks of 75,000 litres each, and storage areas for operational needs. The station is slated to start operating in 2026.

After review and discussion of all the information submitted to it, the Commission decided to authorize the project of power station.

However, the authorization is under five conditions, including the coordination with the northern Village regarding the disposal of residual material at Puvirnituk's landfill. The conditions are stated in the decision report reproduced in Appendix C of this report.

**Action: send a letter to the Administrator – authorization of the project and decision report**

**8. Raglan Mine Project by Glencore: temporary surface crushing of a portion of the ore (3215-14-019)**

8.1. Request for an amendment of the certificate of authorization

*Task: For discussion, decision*

The proponent stated that the capacity of the ore crushing equipment in the Katinniq underground mine is insufficient to maintain the targeted production rate.

On November 24, 2021, the proponent filed a request, in accordance with section 30 of the Environment Quality Act (R.S.Q., c. Q-2), to modify the ministerial authorization to temporarily crush ore on the surface (for a period of eight months), at a maximum rate of 3,200 tonnes per day, on the waste rock pile of Mine 8. The Ministère de l'Environnement,

de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) issued an amendment to the ministerial authorization on January 28, 2022. The MELCCFP had previously indicated to the proponent that an amendment to the certificate of authorization was not required, considering that the activity was temporary and its impacts limited.

Crushing was carried out for four months, starting on January 30, 2022, and was interrupted on May 27, 2022, due to a strike at the mine. Activity resumed in November 2022. During the 53 days of surface crushing, a total of 103,896 t of ore was crushed, an average of 1,960 t per day.

The proponent intends to develop a permanent solution to meet its crushing needs. In the meantime, it seeks to extend the temporary surface crushing until the end of 2026. The MELCCFP indicated that amendments to the certificate of authorization and the ministerial authorization were required for both the temporary crushing until 2026 and the permanent solution.

The maximum of ore crushed on the surface is 3,200 t per day. It is crushed 2 out of 3 days, 16 hours per day.

Knowing that the goal of this amendment to the CA is to allow the proponent to meet its production objectives, the Commission noted that:

- The selected site is already disturbed by mining activities;
- Runoff is properly managed considering the geochemical characteristics of the waste rock and ore;
- Emissions of particulate matter to the atmosphere will be low due to the planned mitigation measures;
- The environmental and social impacts are limited to the mine site.

Thus, after analysing and discussing the information transmitted to it, the Commission decided to authorize the amendment of the certificate of authorization.

Action: send a letter to the Administrator – authorization of modification of the certificate of authorization.

## NEW DOSSIERS

### 9. Phase II of the Nunavik Nickel Project (3215-14-007)

#### 9.1. Request for a modification of the global CA - environmental and social impact assessment

*Task: For discussion, decision*

The Nunavik Nickel Project (NNiP), by Canadian Royalties Inc. (CRI), adhered to the environmental and social impact assessment process, which led to its certification of authorization for the entire NNiP mining site on May 20, 2008, pursuant to section 201 of the Environmental Quality Act. Since then, 24 amendments to the certificate of

authorization (CA) have been authorized, the most recent on June 30, 2022, for works on the electric supply at the Deception Bay camp and the installation of fibre optics.

The NNiP now includes six nickel and copper mines (Mesamax, Expo, Méquillon, Ivakkak, Allammaq and Puimajuq), an industrial complex at Expo, as well as port infrastructures located at Deception Bay, approximately 110 km from the workers' camp. The mining complex is located approximately 80 km west of Kangiqsujuaq and approximately 140 km southeast of Salluit. The operation of these deposits is foreseen through 2032.

The current request to amend the CA relates to the Phase 2a of the NNiP, which would allow the proponent to maintain mining operations until at least 2032 while taking advantage of existing facilities such as the port infrastructures in Deception Bay, the access roads network, and the ore treatment facility at the Expo site. The request includes the addition of the Nanaujaq deposit by way of underground access, as well as underground extensions to the Expo Sud, Méquillon (Méquillon UG2) and Ivakkak (Ivakkak UG) deposits. The proponent indicated that the daily quantity of ore processed at the facility, with an authorized limit of 4500 tonnes per day, would not be changed. The request to amend the CA also includes a series of related projects required to pursue the operations, including expanding the capacity of the worker camp at Expo.

The Expo pit will be used to store most of the Phase 2a tailings until January 2031. It will be completely filled when the maximum water level of 534.49 m has been reached. Thus, the storage capacity is not sufficient to handle the full volume that is currently foreseen for all of Nunavik Nickel's mining activities. Additional tailings management infrastructure, which are not laid out in this amendment request, will therefore be required to store remaining NNiP tailings and was questioned by the Commission.

After reviewing the complementary information provided by the proponent, and discussion, the Commission sought further information so as to be able to render its decision on the authorization of the project. Thus, the Commission asked the proponent to respond to a series of questions and comments, reproduced in Appendix D of this report.

**Action: send a letter to the Administrator – questions and comments**

#### **10. Project to Implement a Contaminated Soil Treatment Centre in Puvirnituk, by Services Environnementaux Avataani inc. (3215-16-062)**

10.1. Request of exemption – preliminary information

*Task: For discussion, decision*

The project involves the permanent installation of two profiled pads waterproofed with a geotextile/geomembrane combination. The first would be for the treatment soils and would measure 625 m<sup>2</sup>, while the second, for the reception of the soils, would measure 225 m<sup>2</sup>. Remediation works will be done by ventilated biotreatment, as per the *Lignes directrices pour le traitement de sol par biodégradation, bioventilation ou volatisation* (MELCC,

1999). The pad's treatment capacity is estimated at 1,000 m<sup>3</sup> of soil per year. A fence is also planned around the site to contain the operations and ensure public integrity and safety.

The Commission considers the environmental impact of the project to be minor, if not slightly positive, taking into account the reduction in greenhouse gas emissions associated with transporting contaminated soil to treatment centres in the south of the province. In addition, the project could also have a positive economic impact for the village of Puvirnituk.

In view of the information presented the Commission decided not to submit the project to the environmental and social assessment and review procedure.

**Action: send a letter to the Administrator – exemption**

## **11. Project of development of an end-of-life vehicle storage site in Quaqtak (3215-16-063)**

### 11.1. Request of exemption – preliminary information

*Task: For discussion, decision*

The project consists of developing a fenced site measuring approximately 5,000 m<sup>2</sup> of gravel surface. The vehicles, which would be previously decontaminated at the municipal garage, would then be stored there to make them available to residents of the Northern Village, particularly for spare parts. Vehicles that have no more parts available can then be compacted and stacked on site for eventual recovery. Compaction activities will not take place on site until metal recovery service is available in Quaqtak.

After analyzing the preliminary information provided to it, and having discussed it, the Commission would like to obtain further information from the promoter in order to render its decision on the exemption of the project of the environmental and social impact assessment and review procedure.

The Commission asked the promoter to answer the following series of questions and comments:

**QC1.** Considering that end-of-life vehicles include different types of vehicles (e.g. cars, snowmobiles, ATVs, etc.), the Commission asked the promoter to specify whether it has planned to set up separate areas in order to facilitate the management and recovery of parts for these different vehicles. If not, the proponent must justify why.

**QC2.** The Commission asked the promoter to specify whether the site is also intended to accommodate small-motorized (e.g. outboard motors, snowblowers, etc.) and heavy equipment. If so, the proponent must detail the methods for their decontamination and storage.

- QC3.** The storage of residual hazardous materials and tires is not detailed in the preliminary information. The Commission asked the promoter to specify the methods it intends to use for storage and management of these materials.
- QC4.** Considering that the northern landfill may contain end-of-life vehicles that have not been adequately prepared for storage and eventual recycling, the proponent must indicate whether there are plans to transfer these vehicles to the new end-of-life vehicle site. If so, the Commission asked the promoter to explain their decontamination and where this work will take place.
- QC5.** The proponent mentioned that it plans to compact the end-of-life vehicles once a metal recovery service becomes available. The Commission asked the promoter to specify what it intends to do with the crushed vehicles and what recovery service it is referring to.
- QC6.** The Commission asked the promoter to indicate whether the project will have any impact on wildlife. In this regard, the proponent is invited to consult the Centre de données sur le patrimoine naturel du Québec to identify the species potentially found on the project site; it must then undertake to implement appropriate mitigation measures, if necessary.

**Action: send a letter to the Administrator – questions and comments**

## **12. Varia**

- 12.1. Meeting with representatives of Les Énergies Tarquti inc.

The Commission met with three representatives of Énergies Tarquti Inc.: Joë Lance, Executive Director, Janice Grey, Director of Communication and Community Engagement, and Justin Bulota, Director of Project Development.

Funded by Makivik Corporation and the Fédération des coopératives du Nouveau-Québec (FCNQ) Tarquti Energy Inc. is presenting itself as a company dedicated to the energy transition in Nunavik whose priority is community engagement and partnerships with Inuit communities. The goal is for communities to own local renewable energy projects, thanks to the partnership and support of Énergies Tarquti Inc. The vision of Énergies Tarquti Inc. is also to promote energy efficiency in Nunavik in collaboration with communities to facilitate the energy transition.

The members of the Commission, like Mr. Charlie Arngak, appreciate the mission of Energies Tarquti Inc. but had a few questions to clarify their understanding of its mission.

Ms. Lisa Koperqualuk asked how the issue of local labour was addressed. The representatives explained that any project starts with a Memorandum of Understanding with the communities that identifies who brings what resources to the partnership. On the other hand, Énergies Tarquti Inc. is already in charge of training the local workforce as part of ongoing projects.



Ms. Cynthia Marchildon asked who takes the financial risks in the projects and was answered that it depends on the level of stakeholder involvement in the limited liability companies (LLC) created for each project.

Mr. David Annanack, stressed that the education of the younger generations is important for the energy transition. Janice Grey responded that activities are being organized with youth, specifically the “local champions” project.

The president, Pierre Philie, asked what would happen to the financial losses caused by the decrease in fossil fuel consumption, distributed by the FCNQ or local communities. He was told that local communities, through the land corporations, own renewable energy projects. As a result, the resulting revenues offset at least some of the revenue losses caused by lower fossil fuel consumption.

Mr. David Annanack asked if migratory birds are considered in wind energy projects. He was told that migratory birds are taken into account in the spring studies conducted by a specially commissioned firm

Thérèse Spiegele asked if solar energy projects were considered, and she was told that plans had been drawn up.

Mr. Daniel Berrouard asked if the local companies are the promoters of the projects, and he was told that this is indeed the case.

Ms Lisa Koperqualuk emphasised the need for good, quality local consultations, including social and environmental criteria. Janice Grey responded that she is sensitive to this aspect as a communications and community leader.

Mr. Joseph Annahatak asked about the relationship between Énergies Tarquti Inc. and Innavik Hydro. He is told that there is no formal relationship at the moment, without excluding a possible future relationship. The current relationship is indirect: energy efficiency initiatives that have an impact on community energy demand is the only link to Innavik Hydro at the moment.

Mr. Joseph Annahatak asked the question of taking climate change into account in renewable energy projects. Mr. Justin Bulota replied that climate change is taken into account, in particular by adapting the technologies used and by including complementary means of production or recovery to counter the risks.

Finally, Mr. David Annanack asked whether the end-of-life of renewable energy production facilities is included in the projects. Mr. Justin Bulota responded that this is the case, although recycling facilities are not available locally. It is not excluded that local recycling facilities may emerge in the future to address the end-of-life of the facilities.

### **13. Next meetings**

The next KEQC meeting will be held in Montreal on February 22, 2023.



## NEW DOSSIERS

### **9. Phase II of the Nunavik Nickel Project (3215-14-007)**

9.1. Request for a modification of the global CA - environmental and social impact assessment

*Task: For discussion, decision*

### **10. Project to Implement a Contaminated Soil Treatment Centre in Puvirnituk, by Services Environnementaux Avataani inc. (3215-16-062)**

10.1. Request of exemption – preliminary information

*Task: For discussion, decision*

### **11. Project of development of an end-of-life vehicle storage site in Quaqtak (3215-16-063)**

11.1. Request of exemption – preliminary information

*Task: For discussion, decision*

### **12. Varia**

### **13. Next meetings**

## **DOSSIERS UNDER ANALYSIS**

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**Environmental monitoring report 2021 Raglan Mine Project, phases II and III by Glencore (3215-14-019)**

**Environmental and social monitoring report 2020, direct shipping ore project, project « 2a » (Goodwood) by Tata Steel Minerals Canada, (3215-14-014)**

**Raglan Mine Project, phases II and III by Glencore – follow up to conditions 1 and 3 of the certificate of authorization of July 11, 2017 (3215-14-019)**

**Raglan Mine Project, phases II and III by Glencore - follow up to conditions 4 of the certificate of authorization of July 11, 2017 (3215-14-019)**

**Nunavik Nickel Project by Canadian Royalties Inc. Annual report (3215-14-007)**

**Project to repair and widen a 5 km section of a road and the replacement of 13 culverts by the Kativik Regional Government (3215-05-009)**

**Project to widen the access road and install guardrails at the Quaqtak airport, by MTQ (3215-07-010)**

**Deployment Project of Two Wind Turbines at the Nunavik Nickel Mining Complex by Tugliq Energy S.A.R.F (3215-10-016)**

**Project of Expansion and Modernisation of the tank farm in Aupaluk, by FCNQ petro (3215-22-022)**



<b>Project of refection and widening of a 5 km section of a road and replacement of 13 culverts in Kuujjuaraapik by KRG</b>	MELCC to proponent	Questions and comments	sent Oct. 5, 2022		
<b>Project of rehabilitation of 5 sites of the former Mid-Canada radar surveillance line by MELCC</b>	MELCCFP to KEQC	Attestation of exemption	sent Nov. 3, 2022		
<b>Project of construction of a new thermic power generation station in the northern village of Kangiqsujuaq, by Hydro-Québec</b>	MELCCFP to proponent	Guidelines for environmental and social impact study	sent Nov. 4, 2022		
<b>Project of widening and replacement of guardrails on the access road to Quaqtaq's airport by MTQ</b>	MELCCFP to KEQC	Complementary information (answers to the Q&C)	Rec'd Nov. 11, 2022		
<b>Project of refection and widening of a 5 km section of a road and replacement of 13 culverts in Kuujjuaraapik by KRG</b>	MELCCFP to KEQC	Complementary information (answers to the Q&C)	Rec'd Nov. 23, 2022		
<b>Project to dismantle, clean and refurbish mobile camp sites - Request #9 by Les Aventures Jack Hume Inc.</b>	MELCCFP to KEQC	Dismantling report	Rec'd Nov. 23, 2022		
<b>Project to dismantle, clean and refurbish mobile camp sites - Request #10 by Club Chambeaux Inc. (3215-21-014)</b>	MELCCFP to KEQC	Dismantling report	Rec'd Nov. 23, 2022		
<b>Project to dismantle, clean and refurbish mobile camp sites - Request #11 by Pourvoirie Rivière aux Feuilles</b>	KEQC to MELCCFP	Dismantling report	Rec'd Nov. 23, 2022		
<b>Project to dismantle, clean and refurbish mobile camp sites - Request #13 by Caribou expédition</b>	MELCCFP to KEQC	Dismantling report	Rec'd Nov. 23, 2022		
<b>Extension of the temporary crushing at the surface of a portion of the ore, Raglan by Glencore Canada inc.</b>	MELCCFP to KEQC	preliminary information (modification of the CA)	Rec'd Nov. 25, 2022		
<b>Project to Deploy Two Wind Turbines with a Battery Energy Storage System at the Nunavik Nickel Mine, by Tugliq Energy in partnership with Canadian Royalties Inc.</b>	MELCCFP to KEQC	Environmental and social impact study	Rec'd Nov. 28, 2022		

<b>Project of refection and widening of a 5 km section of a road and replacement of 13 culverts in Kuujjuaraapik by KRG</b>	MELCCFP to KEQC	Complementary information (answers to the Q&C)	Rec'd Nov. 28, 2022		
<b>Project of rehabilitation of 5 sites of the former Mid-Canada radar surveillance line by MELCC</b>	KEQC to MELCC	Attestation of exemption	sent sep. 20, 2022	A/R sep. 20, 2022	





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### *Introduction*

Hydro-Quebec's project to build a backup thermal generating station in the Northern Village of Puvirnituk is subject to the environmental and social impact assessment and review procedure provided for in Title II of the Environment Quality Act (EQA), since its capacity is greater than 3 MW. Consequently, an impact study for the project was filed on September 30, 2021, with the Provincial Administrator of the *James Bay and Northern Quebec Agreement* (JBNQA).

## **Background**

In the demographic context of Nunavik and, more specifically, given the growing energy demand in the Northern Village of Puvirnituk, Hydro-Québec plans to build a new generating station to replace the existing power plant. This station is slated to ensure the supply of electricity to Puvirnituk starting in 2026.

With a design life of 50 years, the new station will be equipped with four generating sets (a fifth may be added if necessary) for a total installed capacity of 6.50 MW and a maximum capacity of 7.44 MW. The guaranteed capacity will ensure grid reliability for over 30 years.

As part of the environmental and social impact assessment and review process, the Kativik Environmental Quality Commission (KEQC) analyzed the preliminary information for the generating station in Puvirnituk provided by the Ministère du Environnement Environnement et des Parcs (MDDEP). In a directive issued on October 15, 2020, the KEQC informed the Administrator of Section 23 of the JBNQA of the scope and content of the impact study to be conducted. The impact study and related documents were sent to the KEQC on October 12, 2021. A set of questions and comments was sent to the proponent on December 16, 2021, and this latter replied on May 5, 2022.

## **General description of the project and its components**

The project consists of building a new thermal generating station in the Northern Village of Puvirnituk. The station is planned to be operated the next 50 years. The planned location for the new station is approximately 2.5 km west of the centre of Puvirnituk. The developed area will be approximately 15,000 m<sup>2</sup> and will house the station, a fuel farm equipped with two exterior stocking tanks of 75,000 litres each, and storage areas for operational needs. Fuel for the backup generating station would be supplied by the Fédération des coopératives du Nouveau-Québec (FCNQ), while fuel transportation and storage will be handled by Halutik Enterprises.

A phase 2 of the project is planned as part of Hydro-Quebec's commitment to convert its power plants from off-grid to cleaner and cheaper energy. The implementation of a wind farm in the Puvirnituk region is therefore foreseen for this second phase of the project. Also, in terms of renewable energy, the building roof will be equipped with 35 solar panels to power the station. These solar panels, as well as heat recovery from the engines, will allow the building to be energetically autonomous. Finally, in the aim of making the building more welcoming, the work of an Inuit artist from the community will be mounted on a panel on the facade of the power plant.

## **Project schedule and cost**

The proponent wishes to commission the backup thermal generating station in February 2026. More specifically, the granular material piling and earthworks are planned for summer and fall 2023. The construction of the Puvirnituk generating station, the installation of the equipment and the final layout would be spread out from the spring 2024 to December 2025, with commissioning of the plant foreseen for February 2026.

*Presentation of the project's environment*

The community of Puvirnituk has a population of approximately 1,700 and is located on the northeast coast of Hudson Bay, about 100 km south of the small community of Akulivik. Located in the continuous permafrost zone, the village is on the north shore of the Puvirnituk River.

According to 2016 Census data from Statistics Canada, the active population is about 700 people (67% of residents), working mostly in healthcare, social services and education. The unemployment rate was 11% in 2016. Although Puvirnituk has a more diversified economy than other Nunavik communities, hunting, fishing and trapping continue to be very important activities, especially in fall when migrating caribou cross the Puvirnituk River.

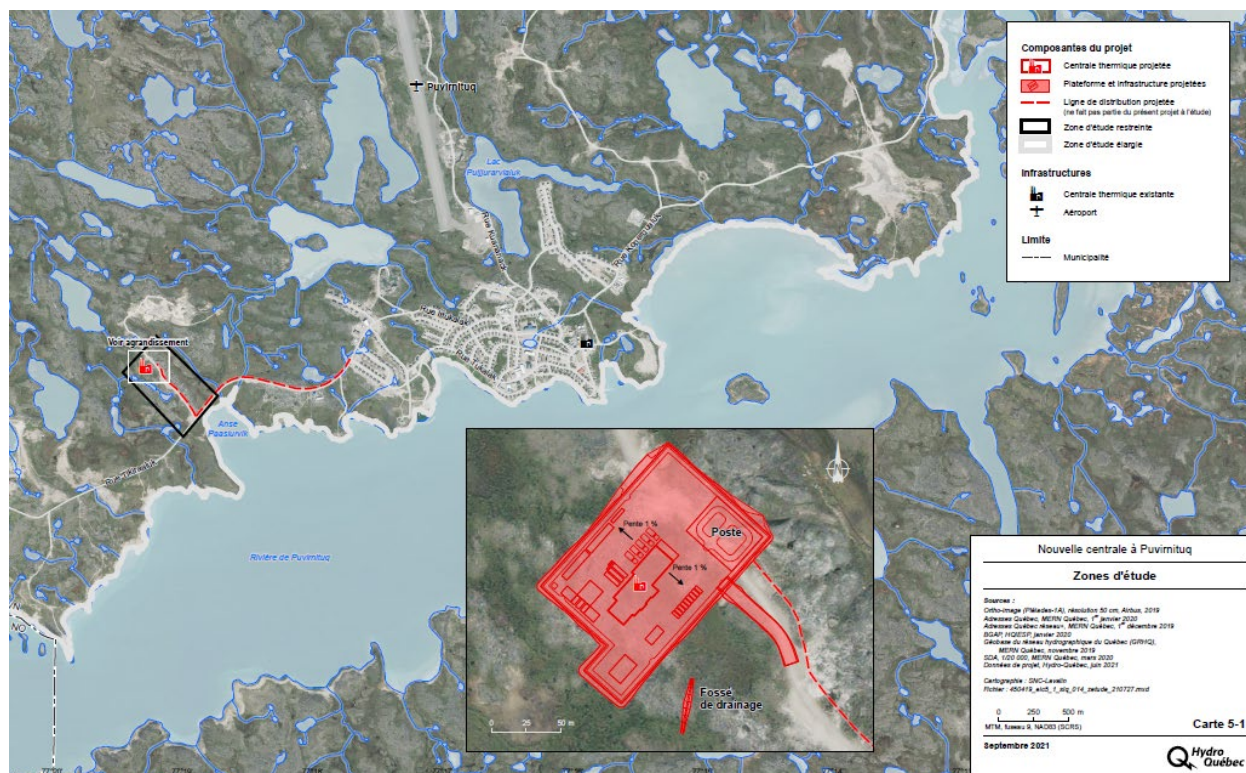
Puvirnituk's climate is typical of northern Quebec. The average annual temperature is -6°C and the average monthly temperatures vary from a minimum of -25°C in February to a maximum of 11°C in July. The Puvirnituk River generally begins to freeze in November and ice cover remains until the end of May. The project area is located in an area of continuous permafrost and where thaw season last 40 days on average.

Unlike other Nunavik communities, Puvirnituk did not sign the *James Bay and Northern Quebec Agreement* (JBNQA) in 1975. Instead, together with Ivujivik, they formed the Inuit Tungavivat Nunamini (ITN), a movement aimed to defend the two communities' rights during negotiation of the JBNQA. Puvirnituk is also the only community without a Landholding Corporations Association (LCA) and one of only two communities in Nunavik not located on Category I lands.

The new thermal backup generating station project is located on Category III lands. Since the new plant is located within municipal boundaries, Hydro-Québec must obtain authorization from the northern village and a temporary occupation permit from MERN. Furthermore, it is located at a distance of more than one kilometre from the village's residential areas or areas with residential potential.

Analysis carried out by the proponent as part of the impact study considered two zones, namely an extended study zone, with a surface area of 2,549.2 ha, and a restricted study zone, with a surface area of 22.8 ha. The two study areas are illustrated below, on Map 1.

### Map 1 - Extended and Restricted Study Areas



Source: From the impact study, Volume 1, September 2021

#### *Presentation by the proponent*

Hydro-Québec's distribution, procurement and shared services division is the proponent of the new backup generating station development and operation project. Through its autonomous power systems division, Hydro-Québec is responsible for supplying electricity to communities that are not connected to the grid. To this end, the division is responsible for designing, operating and maintaining the electricity-generation infrastructure in these communities.

#### *Community consultations by the proponent*

The proponent has implemented a consultation program focused on informing and consulting the groups affected by the new backup generating station. Its purpose was to raise awareness about the project, learn the community's concerns, meet the information needs and ensure follow-up with the various stakeholders. Since the project is within municipal limits and on Class III lands, the land use permit must be issued by MERN. Land users and the Kativik Regional Government (KRG) are stakeholders and were consulted on all matters related to land use and development. In 2019 and 2021, the proponent held public consultations and meetings with the Puvirnituq municipal council. Specifically, the proponent held information meetings with the municipal council on September 5, 2019, and January 23, 2020.

Due to the COVID-19 pandemic, the project was also presented to community members via local radio, on December 11, 2020. Following this information session, a questionnaire and a document explaining the project were distributed on January 11, 2021. Pursuant to these steps, on March 24, 2021, the Puvirnituq municipal council accepted the project proposed by Hydro-Québec.

Finally, the proponent committed to annually communicate information on the progress of the project, to create and develop the new community gathering place, and to continue its

consultation efforts by organizing other meetings, which could be held in-person or remotely depending on current public health guidelines.

#### *Main issues*

The following sections present the analysis of the project's main issues, as per the documents submitted by the proponent and the expert opinions obtained during the intergovernmental consultation.

## **Management of waste and hazardous waste**

Waste management in northern Quebec is a major issue. Consequently, it is crucial the proponent ensures that the residual materials generated during the construction, operation and decommissioning of the station will be disposed of in accordance with applicable legislation, notably the Regulation respecting the landfilling and incineration of residual materials (chapter Q. 2, r. 19). It will be important to ensure that unused materials or machinery brought in by contractors are not abandoned at the station and are returned to southern Quebec or recovered on site. The following sections lay out estimates of the types and quantities of residual materials generated by the project's different phases the mitigation measures and management methods planned.

#### Construction phase

During the construction phase, the total amount of residual materials produced is estimated at 300 m<sup>3</sup>. They will be made of several types of materials, according to the following percentages:

Wood: 39.3%

Cardboard: 29.5 %

Masonry: 14.8 %

Gypsum: 10.0 %

Plastic: 4.9 %

Steel, aluminium: 1.2 %

Copper: 0.3 %

### Operating phase

During the operation phase, the generated residual materials will mainly consist of the following products:

- Lubricating oil for generating sets (drained)
- Waste oil (oil mixed with water in the building's interception wells)
  - Coolant (drained)
  - Cleaning products, degreasers, solvents
  - Household waste (packaging, putrescible materials)
  - Septic sludge

### Shutdown phase

During the shutdown phase, all of the materials previously listed for the construction and operation phases will also be generated, in addition to the following items, which will be dismantled:

- Generating sets
- Tanks

### Mitigation measures and management options

Overall, the proponent applies standard mitigation measures for at-source reduction of the impacts of its interventions on the environment. These measures are described in Hydro-Québec's standard environmental clauses (SEC) presented in Appendix B the impact study. More specifically, Sections 16 and 17 of the SEC deal with residual and hazardous materials. In addition to the measures provided for in the SECs, the proponent has committed to implementing a waste management plan in three main stages: inventory, sorting and temporary storage, and disposal. In sum, when a residual material is recorded, the site manager must complete the form by specifying the nature of the waste material and the quantity produced, and by estimating the quantities destined for reuse, recycling or disposal.

Following this step, the materials would be divided into three groups: residual hazardous materials (RHM), residual materials that can be reused by the community and, finally, residual materials for disposal. The RHMs will be stored in sealed containers (two indoor tanks with a total capacity of 4.5 m<sup>3</sup> and 52, 205-litre barrel drums). Materials that can be reused will be stored in a trailer. Residual materials destined for disposal will be stored in three containers: a 3-m<sup>3</sup> container for metals, a second 3-m<sup>3</sup> container for dry materials, and a waste container for putrescible and household waste.

Finally, the disposal of residual materials will also follow three channels. RHMs will be disposed of in locations authorized by the MELCC. More specifically, the RHMs will be stored in sealed drums and transported by truck to the dock, from where they will be shipped by boat to Hydro-Québec's hazardous materials processing centre via the Port of Bécancour. Materials that can be reused will be donated to the Northern Village of Puvirnituk. Finally, during the construction, operation and closure phases, residual materials for disposal will be sent to southern Quebec to facilities authorized by the MELCC, or to Puvirnituk's northern landfill site, subject to acceptance by site managers. It should be noted that during the construction and dismantling phases, the proponent indicates that the choice of the disposal site will be left to the discretion of the company carrying out the work. However, Hydro-Québec requires, through contractual clauses (among others, SECs 16 and 17), compliance with relevant laws and regulations, including disposal at authorized sites. In all cases, the proponent shall provide additional information, including the identification of the disposal sites and the agreements ensuring these sites' acceptance or refusal of the residual materials generated by the project. A more detailed description of the storage conditions for hazardous waste should also be provided.

## Soundscape

The thermal generating station project may have an impact on the soundscape, namely from construction and decommissioning activities and from station operations. The noise may be a nuisance for some people living or working near the infrastructures as well as for land users. It is therefore important that the proponent follow certain rules so that the increase in ambient noise stays at acceptable levels. The impact study presents the characteristics both of the existing soundscape and of the anticipated changes in the areas surrounding the projected backup generating station site in Puvirnituk. In all likelihood, once the power plant currently in operation is dismantled, Puvirnituk's soundscape will improve since, unlike the current plant, which is located in the village centre, the new station will be far from the village's developed area.

### Initial soundscape

The initial soundscape corresponds to the noise level perceived in the study area before any change brought by the project. It is the sum of noise from many close-by and distant sources, each of which have a distinct stability, duration and intensity. The proponent conducted a sound survey around the existing station as part of the impact study. According to the information presented in its impact study, this environment has noise levels between 50 and 62 dBA during the day and between 28 and 41 dBA at night.

### **5.2.1 Impacts in the construction phase**

All of the construction work, including grading, backfilling, earthworks, transportation, traffic, and installing equipment, will result in an increase in ambient noise during the works. According to the information the proponent presents, no permanent or secondary residences are located in the vicinity. The sensitive areas most likely to be affected will be the residences on the road leading from the unloading dock to the new generating station site. The loudest noises will be caused by truck traffic from the dock or borrow pits to the new station site. Given its distance from the new generating station site, the noise generated by machinery on the construction site will have low impact on the village.

To mitigate the project's impacts on the soundscape during the construction phase, the proponent has undertaken to apply and respect Section 2 (Noise) of the Hydro-Québec ENC's in Appendix B of the impact study, during the construction phase. In addition, the proponent has committed to hooking up a telephone line that residents can call for information about the progress of the works and for requests about specific problems.

### **5.2.2 Impacts in the operating phase**

During the operating phase, noise emissions will come mainly from the generators and heaters, and will then diffuse through the walls of the plant and through the ventilation openings.

#### Applicable noise limits

The proponent undertakes to apply and comply with MELCC instructional note 98-01 *Traitement des plaintes sur le bruit et exigences aux entreprises qui le génèrent*<sup>1</sup> (IN 98-01). The most restrictive criterion in the instructional note was used to determine the applicable noise limits of 45 dBA during the day and 40 dBA at night. These are intended for areas with single or semi-detached dwellings, schools, hospitals or other educational, health or convalescent service facilities.

#### Modelling of the soundscape

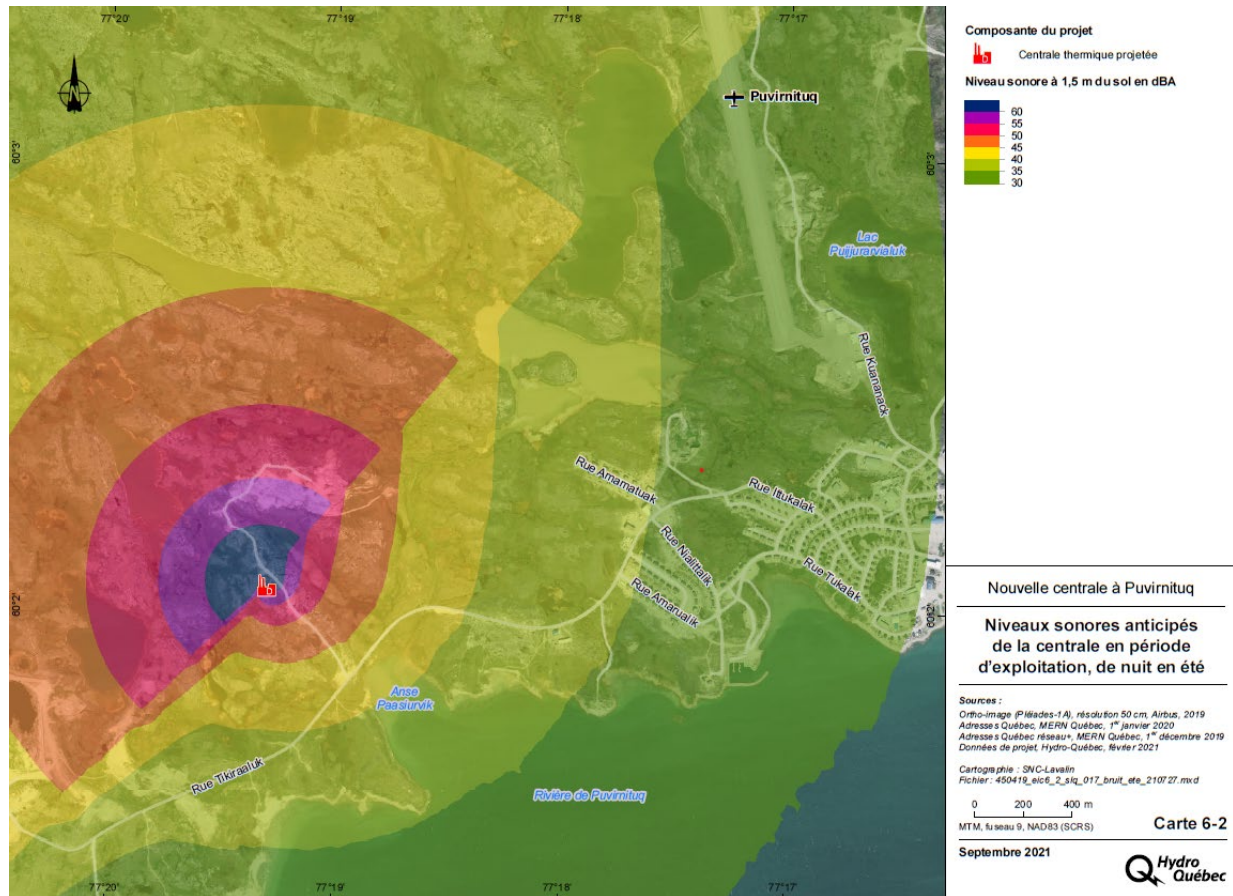
The proponent submitted soundscape modelling carried out during the impact study in winter and on a summer night to assess the project's noise compliance during operations. The predicted noise level at the edge of the village is approximately 39 dBA (Map 2). The proponent mentions in its impact study that during the detailed engineering phase, additional mitigation measures will be studied and that sound monitoring will be carried out to ensure compliance with NI 98-01.

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<sup>1</sup> <https://www.environnement.gouv.qc.ca/publications/note-instructions/98-01/note-bruit.pdf>



*Map 2 - Example of anticipated sound levels from the plant during the operational phase, at night in summer*



Source: From the impact study, Volume 1, September 2021

### Residual impact study

The impact study shows that there will be little impact on the soundscape during the construction phase of the new generating station. The noisiest activities are trucking from the dock or borrow pits to the construction site. The implementation of the mitigation measures planned during the operation phase will make it possible to maintain a noise level below those emitted by the current plant, i.e., below 40 dBA in the vicinity of residential areas. Finally, an analysis of the impacts of the project on the environment has been proposed, including a monitoring of the soundscape during the first year of operation. This will be done once the new station is in operation.

The monitoring will have two components. It will:

- measure the sound level of equipment to validate the modelling of the present study against the real volumes, and
- monitor the receiving points.

Mitigation measures will be considered if the criteria are exceeded.

## **Soil quality and permafrost conditions**

The extended study area is part of the natural province of the Ungava peninsula. It is a huge plateau that has a slightly undulating surface and slopes to the west. Elevations increase slightly from Hudson Bay but rarely exceed 400 m. Within the larger study area, elevations range from 0 to 30 m. More locally, the elevation of the land at the site selected for the generating station is about 10 m. The Northern Village of Puvirnituq is situated on bedrock covered by reworked till or emergent shoreline deposits. Permafrost in the region is continuous, ice-rich and generally over 150-m thick. The active layer (the surface soil layer subject to the annual freeze-thaw cycle) reaches a depth of 1.5 to 1.7 m.

Due to anticipated climate change in Nunavik, permafrost degradation caused by increasing air temperatures and precipitation could lead to issues of instability in current and future built infrastructure, as well as the risks linked to land degradation, active layer deepening and instabilities on infrastructure (e.g. roads, poorly adapted buildings and airport runways). Due to its large quantities of in-ground ice, the region of Puvirnituq is characterized by a high level of constraint because of the land subsidence of thawing permafrost.

Soundings were carried out at the site as part of the studies carried out prior to the submission of the impact study. In total, the 22 exploration wells reveal and confirm the presence of surface rock over the entire site. The geotechnical study of the type and quality of the soils on the implementation site shows that surface deposits consist of a layer of sand and gravel till, varying between 0.28 and 1.46 m, located under a thin layer of organic soil. The bedrock is located at depths varying between 0.38 and 1.51 m. The environmental soil characterization concludes that the soils are not contaminated at the investigated locations.

To ensure the resilience of the new generating station for its lifetime and the integrity of the permafrost, the design of the plant's foundation is based on a non-gelatinous granular fill. The digging and filling works are planned directly on solid rock and in keeping with the requirements of the geotechnical study mentioned above. Moreover, the engineering works are based on the guideline for best practices in housing construction in Nunavik produced by the Société d'habitation du Québec.

### **5.3.1 Impacts in the construction phase**

During the construction phase, the main risks of soil contamination arise from accidental spills of petroleum products or inadequate management of construction waste. The proponent will implement its SECs to mitigate the project's impacts on soil quality during construction. Appendices 6, 17 and 24 of the SECs deal with accidental spills of contaminants, residual materials and contaminated soils, respectively. In addition, Section 8.5 of the impact study presents information on equipment and safety measures during the construction phase, while Section 8.6 deals with an emergency measures plan during the construction phase. More details are presented in Section 6.6 - Health, safety and accident risk management of this report.

### **5.3.2 Impacts in the operating phase**

During operations, it is the station storage and refueling, and used oil management that pose the risks of soil contamination, given these can lead to accidental spills. It should be noted that the fuel will be transported from the port of Puvirnituk to the proposed generating station over a distance of approximately 4.5 km, with 7 fuel deliveries per week. Fuel supply and delivery to the facility will be done by the Fédération des coopératives du Nouveau-Québec (FCNQ) with whom Hydro-Québec has a contractual agreement. In order to mitigate these risks, the proponent mentions in its impact study that fuel will be stored in outdoor tanks that are compliant with applicable regulations. Presented in the impact study, Table 8.6 identifies the sources of potential release into the environment, as well as the prevention or protection measures for each piece of equipment or activity that is a potential source of release.

In addition to the prevention or protection measures mentioned above, the proponent also plans to collect and store used oil in airtight containers inside the main building, prior to disposal. In addition, Section 8.2 of the impact study presents information on accident prevention measures and the safety of the facilities during the operating phase, while Section 8.3 deals with an emergency measures plan for the operating phase. More details are presented in Section 6.6 - Health, safety and accident risk management of this report.

## **Air quality**

The impact study mentions that there is no government air quality monitoring station in Puvirnituk or elsewhere in northern Quebec but that, due to the distance from major urban areas, the air quality is good most of the time. The main sources of air pollutants in Puvirnituk are oil-fired heating systems and the thermal generating station currently in operation. The main contaminants would be nitrogen oxides (NO<sub>x</sub>) and fine particles (PM<sub>2.5</sub>).

### **5.4.1 Impacts in the construction phase**

All activities related to the construction works (grading, backfilling, earthworks, traffic, etc.) will result in air emissions into the environment, particularly from the vehicles and machinery used, as well as from the dust generated by vehicles.

In order to mitigate the project's impacts on air quality during the construction phase, the proponent will implement its SECs, including Sheet 20 on air quality. This sheet mentions, among other things, that the contractor must comply with the applicable regulations, in particular the Clean Air Regulation (chapter Q-2, r.4.1) (CAR), and that it will be forbidden to let the vehicles' engine idle for more than 3 minutes per hour.

### 5.4.2 Impacts in the operating phase

The main source of contaminants that could impact air quality during the operational phase is obviously the operation of the station itself.

In order to assess the compliance of air contaminant emissions from the proposed thermal generating station with the emission standards set out in CAR, the proponent presented in the impact study an air dispersion study. The contaminants of interest to this study are nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), total particulate matter (TPM) and fine particulate matter (PM<sub>2.5</sub>). The level of odour generated by the engines around the plant was also verified and compared to MELCC criteria. The atmospheric modelling study concludes that all results fall below CAR standards and MELCC odour criteria at the receptors of interest. Considering the results obtained and that the modelling was done according to industry best practices, the project is expected to meet CAR requirements.

Finally, it should be noted that the currently operating thermal generating station is located in the Northern Village of Puvirnituk and operates continuously, while the backup thermal generating station will be located on the outskirts of the village. Therefore, based on the information presented in the impact study, a significant improvement in air quality in the village of Puvirnituk is anticipated.

#### *Other considerations*

The following sections present the analysis of the project's secondary issues, as per the documents submitted by the proponent and the expert opinions obtained during the intergovernmental consultation.

## **Adaptation to climate change**

The proponent consulted the Ouranos Climate Portraits tool to present future climate projections for the project area. Considering the approximate lifetime of the thermal generating station, two timelines were considered: a short-term horizon (2041–2070) for the mechanical components and a long-term horizon (2071–2100) for the buildings. Analysis of climate projections for the proposed station area shows a marked increase in average and maximum temperatures well as in total annual precipitation. As a result of these findings, the potential impacts of climate change on the project are:

- insufficient drainage systems and flooding of some sensitive components during extreme rainfall,
- failures in electricity supply to Puvirnituk, due to the increased frequency and intensity of extreme weather events,
- expansion or contraction of power lines during extreme temperature events, and
- damage to the access road and utility poles by thawing permafrost.

To take the potential impacts of climate change into account, the proponent considers the following:

- Constructing the proposed generating station on a site with bedrock outcrops, to avoid instability caused by thawing permafrost and, to guide the engineering, completion of a geotechnical study determining the depth and nature of the bedrock.
- The access road to the generating station is built on a non-frost-prone fill, making it less susceptible to freezing and thawing. In addition, an emergency action plan specific to the inability to access the site will be developed. The current contingency plan already includes the process of setting up an emergency cell as well as the associated communication logistics and the roles and responsibilities of each stakeholder.
- For fuel supply by boat, 6 days of fuel autonomy is required on site. Currently, there is an 11-day fuel reserve to compensate for possible supply problems. The integration of energy from the wind farm could double the number of days of autonomy by reducing the amount of diesel needed to power the village.

In addition to the main potential impacts listed above, the proponent also presented adaptation measures in its impact study. The final level of risk, after consideration of the proponent's accommodation measures, is considered to be low for each of the potential impacts.

## Greenhouse gases (GHG)

### Construction phase

The majority of GHG emissions to the atmosphere will come from vehicles and machinery used for site development and construction of the station (i.e. from the combustion of diesel and gasoline).

The proponent estimates that the total GHG emissions will be 1,032 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e).

To track and possibly better control the project's construction-phase emissions, the proponent undertakes to implement a construction-phase GHG-emissions-monitoring plan based on daily construction records.

### Operating phase

During the operational phase, the new backup generating station in Puvirnituk will emit GHGs while in use, and during maintenance and servicing activities requiring the use of machinery and vehicles. However, GHG emissions from maintenance and servicing activities were deemed to be negligible. With respect to emissions from plant operation, the proponent indicates that annual GHG emissions from plant operation will be approximately 9,000 tCO<sub>2</sub>e until 2027. In fact, starting in 2027, Hydro-Québec is aiming to integrate 46–62% wind energy into the grid. It indicates that space has been provided for the addition of a fifth generating set, which is likely to be required in the very long term. It is nonetheless relevant to mention that this addition will require a request to amend the certificate of authorization to eventually have this addition authorized.

## Avifauna

The proponent consulted various databases to determine which bird species are likely to be present in the expanded study area. The number of bird species in the extended area was then estimated to be 55. We should mention the presence of species with special status, namely that of the peregrine falcon and the red-necked phalarope.

The impact study mentions the removal of vegetation and the presence of the thermal generating station will result in little loss of habitat for avifauna. Furthermore, none of the special-status bird species are likely to be disturbed by the construction, provided that there is no encroachment into wetlands outside the plant site, particularly where the red-necked phalarope nests. The impact will be limited since the various bird species' use of the environment will only be modified in the immediate area of the station. The impact is expected to have a short duration for bird species currently nesting in the restricted study area, as they will be able to use the tundra environments after construction. It is also thought to be short in terms of disturbance of birds during the works. Overall, the negative impact on birds is considered minor.

## Socio-economic spin-offs

During the construction phase, the project will employ 19 to 30 workers, between July 2023 and December 2025. The proponent mentions that the majority of these workers will come from outside the Northern Village of Puvirnituq, but that it plans to hire local workers, according to their availability. It is planned that external workers will be housed in three worker camps belonging to various owners and already existent in the village. The contractor who will be mandated for the works will be able, after agreement with the owner(s), to use one or more existing camps to house approximately 35 workers. The presence of external workers could generate indirect benefits, via the purchase of goods and services in the community. The proponent also mentions that the hiring of local suppliers, mainly those required to operate heavy machinery and to supply and transport granular materials, will also provide local economic spin-offs.

To maximize local economic benefits during the construction phase, the impact study presents the following measures:

- Implementation of measures to facilitate local workers' access to project-related employment and business opportunities and to promote their retention;
- Encourage the hiring and training of local employees;
- Include incentives for Indigenous hiring in subcontractor tenders;
- Give preference to hiring local suppliers of goods and services.

In order to quantify the local and regional economic benefits, the proponent must, to the extent possible, detail local workforce training and hiring initiatives.

In the operation phase, no significant changes are anticipated; it is expected that the two people involved in the operation of the power plant currently in operation will be reassigned to the new thermal generating station. Station maintenance will be carried out by specialized outside employees. In addition, certain services will be required to maintain the site, such as snow removal and fuel supply.

## Archaeology

As part of the impact study, the proponent had the archaeological potential of the study area assessed. It should be specified that, to date, no archaeological site has been identified directly at the new generating station site. However, the potential for archaeological discoveries in this sector is qualified as “average” and therefore of interest.

It is mainly the construction (excavation, grading, earthworks, etc.) of the proposed thermal generating station project that holds the potential for impact on the archaeological heritage, though waste management could also have an impact. These activities could damage or destroy archaeological remains.

The proponent mentions the need to carry out a systematic archaeological inventory (visual inspections and surveys), before the start of the construction work, in order to validate the presence or absence of archaeological sites in the targeted sector. It also points out that the task is essential to ensuring the absence of archaeological remains in the construction area.

Further, to mitigate the impacts of the new generating station, the proponent has committed to applying its SECs, and more specifically Sheet 19, which essentially stipulates that the contractor must halt the construction works and notify Hydro-Québec in the event of an incidental archaeological discovery. Where appropriate, the proponent states that the necessary protective actions will be implemented, with the support of the relevant authorities. Among these actions, we should mention salvage excavation, as well as the marking of the vestiges to indicate their presence and sensitivity to people passing through the vicinity.

Finally, it should be noted that under Section 74 of the Cultural Heritage Act (ch. P-9.002): “A person who discovers an archaeological property or site must inform the Minister of it without delay.” Therefore, the proponent will also be required to notify the Minister in the event of an archaeological discovery.

## Health, safety and accident risk management

### *Health and safety*

During the construction phase, the main impacts of the project on health and safety will be increased transportation and traffic, and the presence of external workers. Greater traffic is likely to increase the number of accidents among residents and other road users and may also cause inconvenience, such as noise and dust. The presence of external workers is likely to put additional pressure on Puvirnituk and have negative social impact, particularly in regards to alcohol and drug use.

To mitigate the project’s impacts on health and safety in the community Puvirnituk, the proponent undertakes to implement the following mitigation measures:

- Inform the municipal council of the schedule of the works and the number of workers expected to come to the community;

- Establish, in cooperation with the municipal council, a transportation plan for equipment and materials. This plan will take into account the location of the community's most sensitive areas, such as the school, playgrounds and daycares, as well as school attendance times and the routes taken by school children;
- Implement appropriate road signs to increase user safety;
- If necessary, use flaggers or a security escort when moving trucks;
- Maintain and clean public roads used by heavy vehicles and use certified dust collectors, as required;
- Make workers from outside the community aware of the issues spurred by their presence, provide them with a code of conduct and ensure that they are aware of it;
- Ensure that external contractors are aware of the code of conduct;
- Inform external workers of Puvirnituk's regulations on alcohol use;
- Encourage external workers to abstain from using alcohol or drugs during their stay.

In the operational phase, apart from the truck traffic for the supply of diesel to the station, the proponent does not anticipate other potential impacts on the health and safety of Puvirnituk residents. However, it should be noted that a technological accident could have health and safety impacts. This aspect is discussed in further detail below.

#### Technological accident risk management

To evaluate the consequences of an accident on sensitive elements in the environment, the proponent analyzed the technological risks in both the construction and operating phases. During the construction phase, the accidents that could occur would mainly be contaminant releases or fires involving, in particular, the hydrocarbons on the site.

To minimize the risk of accidents and the impact of an accident occurring during construction, the proponent mentions in the impact study that the environmental specifications will be binding for the selected contractors. Further, a Hydro-Quebec environmental supervisor will see to their enforcement. These specifications include the following:

- Refueling should be done under constant supervision and at dedicated locations;
- Fuel tanks on the site must be double-walled or equipped with a retention tank;
- Provision of a temporary storage area to facilitate consolidation (e.g. drumming) to allow contractors to finalize packaging and labelling prior to shipment to authorized locations;
- Emergency response kits and portable fire extinguishers must be provided at strategic locations on the job site.

In addition to the specifications mentioned above, it should also be noted that the proponent undertakes to develop a specific plan for emergency response during the construction phase. The construction contractor will be contractually obligated to have this emergency response plan in place and the proponent will ensure their compliance. A draft construction-phase contingency plan has been filed as an appendix to the impact study.

During the operations phase, the accidents that could occur would be similar to those listed for the construction phase, notably contaminant releases or fires involving, in particular, the hydrocarbons on the site. Table 1 below presents the main hazardous substances on the site during the operations phase, as well as their storage method.



*Table 1: Main hazardous substances at the generating station during the operations phase*

Nom	Entreposage	Quantité maximale sur le site <sup>a</sup>
Diesel	2 réservoirs extérieurs	2 x 75 m <sup>3</sup>
	2 réservoirs journaliers intérieurs	2 x 2,0 m <sup>3</sup>
Huile lubrifiante pour les groupes électrogènes	1 réservoir intérieur et 66 barils <sup>b</sup>	2,5 m <sup>3</sup> (réservoir) 13,53 m <sup>3</sup> (66 barils de 205 l)
Liquide de refroidissement et antigel (éthylène glycol) pour les groupes électrogènes	1 réservoir intérieur et 7 barils <sup>b</sup>	2,0 m <sup>3</sup> (réservoir) 1,43 m <sup>3</sup> (7 barils de 205 l)
Huile isolante pour les transformateurs	2 transformateurs à l'huile	10 m <sup>3</sup> (5 000 l par transformateur)
Huile usée	1 réservoir intérieur et 66 barils <sup>b</sup>	2,5 m <sup>3</sup> (réservoir) 13,53 m <sup>3</sup> (66 barils de 205 l)
Huile de rebut	1 réservoir intérieur et 4 barils <sup>b</sup>	2,5 m <sup>3</sup> (réservoir) 0,82 m <sup>3</sup> (4 barils de 205 l)
Liquide de refroidissement et antigel usé	Barils	Indéterminée

a. Ces données sont approximatives. Le nombre de barils variera selon la fréquence de fonctionnement et l'utilisation réelle de la centrale.

b. Le réservoir et les barils ne sont normalement pas tous pleins en même temps.

Source: From the impact study, Volume 1, September 2021

The impact study mentions that the relatively small amount of diesel stored on site, the use of double-walled outdoor diesel tanks, and the retention and capture of releases from other equipment and tanks located inside the main building are expected to help reduce the risks inherent to the project.

In order to minimize the risk of accidents and the damage an accident during the operation phase could cause, the proponent presents several measures in the impact study and in the responses to questions and comments. These measures include the following:

- The site will be fenced and the access controlled;
- The outdoor diesel tanks will be double-walled;
- The equipment and indoor tanks will be located in basin rooms with sumps;
- RHM will be stored in a shelter set up for this purpose;
- Use of an automated fire protection system to protect the generator bay, indoor tank room and pump room;
- Emergency response kits and portable fire extinguishers must be provided at strategic locations on the site;
- The personnel assigned to the management of hazardous materials will be required to follow training in the (marine and road) transporting and storing hazardous materials, recovering hazardous materials, and operating a hazardous materials recovery centre.

In addition to the mitigation measures to which the proponent has committed, it should be noted that the proponent undertakes to draft an emergency measures plan for the operations phase and to consult the Puvirnituk municipal council and other relevant authorities as part of this exercise. A draft operations-phase contingency plan has been filed as an appendix to the impact study.

## **Wetlands and water environments (WWE)**

According to the information presented in the impact study, the extended study area of the proposed generating station would include 591.5 ha of wetlands, or approximately 23% of its surface area. The vast majority of these would be undefined peatland-type wetlands. A field visit to characterize the wetlands in the restricted study area was conducted in July 2020. As a result, 9 wetlands, totalling an area of nearly 2.3 ha, were characterized within the restricted study area by means of 18 stations. The detailed characterization sheets are presented in Appendix D of the impact study.

A portion of a shrub swamp wetland (MH02) will be directly affected by the preparatory work and the installation of the construction site, as well as by the grading, filling and earthworks. As a result, a 26.8 m<sup>2</sup> area of this wetland will be destroyed. The construction of a drainage ditch will indirectly affect the wetland. The proponent mentions that this work is necessary to avoid an accumulation of water near the foundations. A south-facing drainage ditch towards wetland MH03 will be built.

*Table 2: Altered area of wetland MH02, by impact type*

Source d'impact	Type d'impact	Superficie altérée (m <sup>2</sup> )	Impact sur le milieu humide	Principale fonction écologique affectée
Plateforme	Direct	26,8 <sup>a</sup>	Perte de superficie permanente	Conservation de la biodiversité : légère perte d'habitat pour la faune
Drainage	Indirect	520	Modification de l'intégrité et de la composition du milieu	Régulation du niveau d'eau : légère perte d'efficacité de cette fonction en raison de l'aménagement du fossé qui favorisera le drainage de l'eau au lieu de sa rétention

a. Les 26,8 m<sup>2</sup> sont inclus dans les 520 m<sup>2</sup> de la superficie totale.

Source: From the impact study, Volume 1, September 2021

In terms of the water environments in the extended study area, the proponent has determined based on topographic data that a total surface area of 250.8 ha is made up of water environments (i.e. waterways, lakes and ponds). There are no watercourses within the restricted study area. In sum, 7 wetlands and 1 perennial stream were identified within the restricted study area. However, no impact is expected on the WWEs since the thermal generating station project is designed to avoid permanent or temporary encroachment. More specifically, the wetlands closest to the site are located more than 45 m from the proposed station, while Stream CE01 is more than 100 m from the station.

## Special-status species

### *Plant species designated as threatened or vulnerable, or likely to be so designated*

In order to verify if such plant species are found in the restricted study area of the generating station project, a request was submitted to the Centre de données sur le patrimoine naturel du Québec (CDPNQ). Furthermore, the potential for habitat supporting such species was analyzed using various data sources. Field inventories were also conducted in July 2020.

According to data obtained from the CDPNQ, there are no known occurrences of threatened or vulnerable species in the restricted study area. However, 5 occurrences of species likely to be designated as threatened or vulnerable, including 4 historical ones, have been identified in the vicinity of the Northern Village of Puvirnituk. Analysis of habitat potential for vascular species has further showed that the area is a potential habitat for 13 special-status plant species. Lastly, no special-status species were observed during the field inventory.

### Special-status wildlife species

The impact study mentions that, based on known ranges, habitats considered suitable for the species and available habitats, 7 special-status wildlife species are likely to frequent habitats in the extended study area. These species include the pygmy weasel, wolverine, polar bear, golden eagle, peregrine falcon, short-eared owl and narrow-billed phalarope. However, it also states that the CDPNQ does not report any occurrences of threatened or vulnerable wildlife species, or species likely to be so designated, within the extended study area.

## **Environmental monitoring**

In order to ensure that all of its SECs and commitments are implemented in the field, the proponent states that it will carry out environmental monitoring at all stages of a project's development. In particular, the proponent will write the environmental clauses into the calls for tenders and draft an environmental monitoring program in which all the environmental commitments will be collated in table form. All clauses and commitments will be forwarded by the selected contractors to the construction manager coordinating the works. The construction manager and Hydro-Québec's environmental supervisor will be responsible for ensuring that environmental requirements and protection are being met on the site. At the end of the works, the environmental supervisor will ensure that the site is restored, proceed with the environmental acceptance of the works and certify that the works have been carried out as planned. Finally, during the operation phase, the proponent must ensure that in all its activities the environment is protected.







- QC-5.** The Commission asked the promoter to provide the expected performance of the new dissolved air flotation treatment system (for commercially available equipment) compared to the treatment system currently in place.

### **Northern Landfill Site (NLS)**

In Section 5.2.5.5, it is difficult to understand why the platform for sludge filtration using geotubes is built in the NLS and not next to the wastewater treatment system. The proponent must explain this. It must also explain where the water from the geotubes flows into the NLS during drying and how this water is then managed.

- QC-6.** The Commission wished to remind the promoter that it will have to obtain a ministerial authorization under section 22 of the EQA to add a landfill cell to the NSL.

### **Geochemical characterization**

According to the data the proponent has presented, most of the waste rock and ore are potentially acid-generating (PAG) and their sulphur content, which is sometimes very high (e.g. the Expo Sud ore is an average 23%), could cause the sulphide oxidation reaction to set in quickly when the rock is exposed to water and ambient air.

The request to amend the certificate of authorization for Phase 2a indicates that some analyses are not yet available regarding PAG and that the proponent has not yet clearly laid out its high-risk tailings management practices that would be safe for the environment.

Section 5.2.5.1.2 mentioned that the anticipated time to acidification of the Phase 2a mine tailings is not yet known, as kinetic testing has not yet been started for these deposits. Moreover, in appendices D and E, the consultant hired by the proponent recommended kinetic tests be carried out to evaluate the reactivity of the materials, the time before the development of acidic conditions and the future quality of the contact water with the tailings from the Nanaujaq and Expo Sud deposits.

Moreover, section 5.0 of Appendix E indicates that there is some potential for self-heating of the ore, depending on its exposure to water and air. For the deposition of tailings in the pit, it is mentioned that ensuring a high saturation rate will be required during operations (maintenance of a supernatant in the pit). The Expo pit will also have to be covered quickly after its backfilling in order to prevent the development of acid-mine drainage. Table 7–9, mitigation measure QES28 calls for “covering acid generating waste rock (Méquillon, Expo Sud and Ivakkak) with layers of neutral granular impermeable material and an impermeable liner [courtesy translation]”; however, this measure is not included in the description of these mine sites (instead, it is stated that all waste rock will be returned underground for backfilling of the underground mine galleries).

According to the proponent, a mineralogical study, as well as kinetic tests on ore samples from the Nanaujaq project, will be carried out in order to evaluate material reactivity, the delay before the development of acidic conditions and the future quality of the contact water. The results will be used to evaluate the control methods for ore, waste rock, tailings and loose deposits that may be required during storage, even if temporary, of these materials, as well as during redevelopment and restoration work.

- QC-7.** The Commission asked the promoter to submit further information regarding the planned additional geochemical characterization program, including the approximate schedule for conducting the tests and producing the characterization reports. The characterization study report, including the results of the kinetic tests, must be provided. Among other criteria, this report must include demonstration of compliance with Mining Industry Directive 019, concordance with the June 2020 *Tailings and Ore Characterization Guide*, and explanations that the results from detailed engineering of the ore dump and management of contact water at the Nanaujaq mine site have been taken into consideration.



## Exploration and mining

- QC-8.** The Commission wondered whether thawed areas, such as pockets of water, may be present during underground operations, depending on the depth at which they will take place. If so, the proponent will need to clarify how this water would be managed, and confirm whether the water management and treatment infrastructure has sufficient capacity to manage this potential excess water.
- QC-9.** Section 5.2.1.3 indicates that additional drilling is planned for the exploration and delineation of the underground portion of the Ivakkak deposit once the access road is completed. The Commission asked the proponent to confirm whether further exploration is underway or planned for the four Phase 2a mineralized zones and to discuss the prospects for potential resource expansion presented in Table 3-2.

## Waste rock management for Ivakkak

- QC-10.** The Commission asked the promoter to specify how PAG and non-PAG waste rock will be separated when extracted from the Ivakkak site and whether an expansion of the waste rock storage areas will be required to complete underground mining at the Ivakkak site. The proponent mentioned that waste rock will be used to backfill the underground galleries. It must specify whether PAG or non-PAG waste rock will be used for backfill, and the volume of each.

## Crushing and management of waste rock at Mequillon

- QC-11.** The Commission asked the promoter to present the proposed location of the crushing facility at Mequillon and provide a detailed description of its waste rock management methods. It must also detail the impacts of the crushing plant development and present all measures it intends to implement to prevent and limit the emission or dispersion of contaminants from the crushing plant and stockpiles, including the protection of air and water quality.

## Design of the Nanaujaq waste rock pile

According to the proponent, the waste rock generated during the operation of the Nanaujaq mine will be managed in a temporary waste rock pile that will occupy an area of 170 m x 140 m, south of the main water collection basin. Due to the topography, all contact water with the waste rock will flow directly into the catchment basin just by gravity.

- QC-12.** The Commission asked the promoter to provide more information regarding the design of the waste rock pile and its geotechnical stability. In particular, it must show the position of the catchment basin's open water flow boundary when the project is flooded relative to the waste rock pile boundary, and explain how the proximity of the catchment basin may affect its geotechnical stability.

## Expo Sud

According to the proponent, the authorized surface area of the waste rock pile on the Expo site is 199,960 m<sup>2</sup>, which represents a quantity of material of approximately 9.5 Mt at 2.05 t/m<sup>3</sup>. However, the amount of waste rock generated during the operation of the Expo pit resulted in the occupation of an additional 125,970 m<sup>2</sup>. The amount of waste rock stored on the entire pad will be approximately 15.6 Mt at the end of Phase 2a, a significant increase.

**QC-13.** In this context, the Commission asked the proponent to provide more information regarding the design of the waste rock pile and present an analysis of its geotechnical stability.

**QC-14.** The Commission considered the information provided on the proposed operation of the Expo Sud site incomplete, and therefore did not allow for analysis of the project. The Commission asked the proponent to detail the proposed works, the facilities it plans to install, the location of the infrastructures, the impacts of the project, etc. The proponent must provide a map showing the location of the study area of the Expo Sud mine site and the current and projected facilities.

### **Management and treatment of mining water**

According to the proponent, the mining wastewater generated at the Nanaujaq site will be directed to the main water collection basin. The design of the basin includes the construction of a dike. The proponent must provide more information about the design of the catchment basin and the dike.

**QC-16.** The Commission asked the promoter to provide the following information: design details and criteria for the catchment basin, proposed groundwater protection measures, conceptual details for the dike, and a geotechnical stability assessment.

According to the proponent, the mining wastewater generated on the Nanaujaq site will be sent to the catchment basin on the Méquillon site for treatment at its treatment plant.

**QC-17.** The Commission asked the promoter to provide water balances for the Nanaujaq site for normal and wet conditions and confirm that the capacity of the water management infrastructures available on the Méquillon site are sufficient to safely manage surplus water. Moreover the promoter must specify the new facilities required, including the length of the pipe and its flow rate.

According to the proponent, potentially contaminated water from the Expo Sud site will be directed to the existing main catchment basin at Expo. There will therefore not be any change to the water treatment system.

**QC-18.** The Commission asked the promoter to provide water balances for Expo Sud site for normal and wet conditions and confirm that the capacity of the water management infrastructures on the Expo site are sufficient to safely manage surplus water.

**QC-19.** Since underground drilling in permafrost requires the use of a calcium chloride solution and some of this water could end up in mine water storage basins, the Commission wished to know whether the effluent monitoring conducted to date shown elevated chloride concentrations, and, if so, if the water needed to be treated for chloride.

### **Tailings management**

According to the proponent, the time anticipated for the acidification of tailings from Phase 2a is not yet known, since kinetic testing has not yet been carried out for these deposits. However, this information is key to developing measures to prevent the oxidation of tailings during in-pit storage and restoration.

**QC-20.** Thus, the Commission asked the promoter to provide a summary of the kinetic testing program it proposes and explain how it intends to use the results to optimize the management and remediation of the Expo Pit.

Section 5.2.5.1 of the request states that the Expo pit will accommodate the majority of the Phase 2a tailings, while section 5.2.5.1.2 states that additional tailings management infrastructure, which is not described in the document, will be required to store the tailings. The proponent indicated that studies will be carried out to precisely identify the other disposal site(s) that will be required to dispose of tailings once the Expo pit is filled. According to the proponent, by the end of filling the pit in 2030, there will no longer be sufficient volume to contain either the project flood, which is a 24-hour rainfall with a recurrence period of 1,000 years, or snowmelt, without overflowing into the environment. It emphasized that the progression of the open water level in the Expo pit will be carefully monitored. In the event that the water elevation in the pit significantly exceeds the predictions of the water management plan, excess water will have to be redirected to other water management infrastructures. The design of this infrastructure, however, is not included in this request to amend the certificate of authorization.

**QC-21.** The Commission asked the promoter to provide a preliminary description of the options under consideration for the development of this surplus water management infrastructure and a description of the option it selects.

According to the proponent, the Expo pit capacity is insufficient to accumulate the entire volume of tailings foreseen in the current mine plan. The proponent must present the volume of tailings from Phase 2a that will not be able to be stored in the Expo pit. Additional tailings management infrastructure, which are not laid out in this amendment request, will therefore be required starting in 2031 to store remaining tailings.

**QC-22.** The Commission asked the promoter to submit the complete tailings management plan and provide at least a preliminary description of the options under consideration. The proponent must submit a timeline to allow the Administrator to make a decision early enough on in the process, regarding the option that may be selected. This description is important considering the acid-generating properties of the tailings as well as the natural (topography, hydrographic network, etc.) and anthropogenic (existing mining infrastructures) constraints that may considerably limit the possibility of establishing a new tailings accumulation area near the Expo mining complex.

### **Mine reclamation and restoration**

Mine waste rock will be used as backfill in the underground galleries of the Ivakkak, Méquillon, Nanaujaq and Expo Sud underground mines. For the Méquillon and Nanaujaq sites, the waste rock is considered to be PAG. It will be brought up to the surface and stored before being partially returned underground.

**QC-23.** For the Ivakkak site, the Commission asked the proponent to specify the quantity of waste rock that will be returned underground for the backfilling of the tunnels. Since this site has one PAG waste rock pile and another NPAG, the Commission considers that the promoter should favour the return of the PAG waste rock underground in order to limit the problems of generating acidity during restoration. In addition, for the Ivakkak, Méquillon and Nanaujaq sites, the Commission considers that the sterile used for filling should be used, if possible, directly underground with no transition through the surface as planned for the Expo Sud site. This would avoid handling waste rock and reduce the amount of waste to be stored on the surface and restored.

### **Inventory of the receiving environment**

**QC-24.** In section 6.1, it is indicated that additional inventories will be carried in some areas over summer 2022 to characterize the natural environment and to check for the presence of special-status plant species. The Commission asked the promoter to provide the detailed findings of this inventory, specifying in particular whether sensitive elements of the

environment have been identified (e.g. the presence and location of special-status plant species).

- QC-25. It is mentioned in section 7.4.3.1 that archaeological inventories are planned in 2022 to validate the absence of archaeological remains on the sites where stripping and reworking of soils are foreseen for Phase 2a. If a full archaeological inventory report cannot be provided, the Commission asked the promoter to submit a report on the works, indicating whether any new archaeological sites have been discovered, including their location, if applicable.

### **Agreement with Indigenous communities**

- QC-26. The proponent describes the impact benefit agreement (IBA) that has been place with the Indigenous communities up until now in section 3.5. As part of this project, the Commission asked the proponent to address the development of discussions on this subject. The proponent must report on the progress of discussions regarding the NNiP, and the inclusion of Phase 2a, with the Nunavik Nickel Committee, as well as with local and regional authorities, in relation to the provisions of the project's IBA.

In section 3.5, it is mentioned that if unanticipated impacts are identified, additional mitigation measures must be put in place to reduce them to a level deemed acceptable. In the event that the level of residual impact is not deemed acceptable, compensatory measures must be negotiated.

- QC-27. Therefore, the Commission asked the promoter to indicate whether such situations have occurred since the start of the NNiP and provide concrete examples. The Commission wanted to stress here that all changes to the project must be previously authorized through this request procedure.

### **Impact of mining activities**

- QC-28. The Commission asked the promoter to confirm whether the addition of waste rock crushing activities at the Méquillon site will impact the soundscape in Parc des Pingualuit. If they do, the proponent must specify what measures will be put in place to reduce this impact.
- QC-29. The Commission asked the promoter to explain the noise peaks of 70 dB or more measured in the Parc des Pingualuit, given the absence of noise anomalies (section 6.4.7) and of perceptible influence of mining activities (section 7.4.4.1), in the presence of low audible wind. If noise peaks were sometimes attributable to mining operations, the proponent must specify the measures it would put in place to reduce the noise impact in Parc des Pingualuit.
- QC-30. Since acute effluent toxicity problems have occurred in the past, the Commission asked the promoter to indicate what measures it would take to prevent this from happening in the future. For example, contaminated water from the Nanaujaq site will be sent to the Méquillon site for treatment. With the addition of a contaminant load, has the proponent planned measures at Méquillon to ensure that the effluent is not toxic? In addition, the proponent must specify whether the capacity of the Méquillon mine wastewater treatment plant must be increased in order to treat water from the Nanaujaq site.

In section 6.2.2, it is mentioned that ore loading and crushing activities, as well as ore storage on dry stockpiles, would be the main sources of dust and metal emissions. It is also cited that investigations have been conducted since 2021 to implement mitigation measures to reduce these emission sources.

- QC-31.** The Commission asked the promoter to summarize the current status of investigations undertaken in 2021 and whether new mitigation measures are currently being considered to minimize dust from these emission sources.
- QC-32.** Section 7.2.1.2 mentions that mitigation measures for dust control will be adapted during the summer season to the weather conditions. The Commission asked the promoter to explain how it intends to coordinate the watering of dry surfaces with the weather.
- QC-33.** With the implementation of Phase 2a activities, the Commission asked the promoter to clarify whether an increase in trucking is anticipated on the roads in NNiP, as compared to the current situation, and, if so, the increase in trucking frequency and impact assessment will need to be specified for each road segment.

### **Cement milk factory**

- QC-34.** The Commission asked the promoter to specify the source and quantity of the water used daily for the production of cement milk. The proponent must submit the required salt water facilities, i.e., the equipment required for heating water and storing salt, if applicable.
- QC-35.** For the cement milk plant in Méquillon, the Commission asked to know what measures will be put in place to prevent the dispersion of cement powder into the atmosphere or leaching into drainage ditches.

### **Compensation for wetland and water body losses**

- QC-36.** The proponent refers to the Inuit Community Environmental Program (ICEEP) a kind of compensation of wetland and water losses. The Commission asked the promoter to present the projects and programs that have benefited from the ICEEP since its inception and the projects that are currently being developed or discussed with local communities or organizations. The proponent must specify how the communities were involved in the development and implementation of these projects and how ICEEP fits into the request to amend the certificate of authorization. After agreement is reached with the Inuit communities or organizations, the proposed projects must also be submitted and authorized by the Administrator.

### **Perceptions assessment plan**

As mentioned in section 6.4.9, the Nunavik Nickel inc. Project's perception assessment plan must be completed every five years. The results of this monitoring were therefore to be presented in the 2020 annual follow-up report, but this could not be done due to the restrictions imposed by the COVID-19 pandemic.

- QC-37.** Now that most of the restrictions have been lifted, the Commission asked the promoter to specify a new schedule for conducting this monitoring, including the distribution of a survey and visits to the relevant villages.

### **Number of Inuit employees**

Section 7.4.1.1 stated that Phase 2a will both maintain jobs currently held by Inuit employees and create new jobs for Inuit communities in Nunavik. In 2020, 46 Inuit employees were working at the Nunavik Nickel mining complex, which represents about 8% of the 568 employees. It also mentioned plans to hire an additional 10 Inuit employees by 2021.

- QC-38.** The Commission asked the promoter to specify the number of Inuit employees currently working at the Nunavik Nickel mining complex and whether it plans to implement new measures to encourage the hiring of more Inuit employees in the coming years, particularly with the expansion of the camp at Expo and the addition of new satellite mines.

### **Resilience to climate change**

- QC-39.** The approach presented in the climate change resilience and adaptation study is, overall, consistent with the guidelines set out in the *Guide à l'intention de l'initiateur de projet*. However, the Commission asked the promoter to add the following items to complete it:
1. The resilience assessment should cover the entire life of the project. In the case of a mining project, both the operating and restoration phases must be presented, especially since the main vulnerabilities to climate change are found during restoration. The climate projections put forward must therefore be adjusted to a longer timeline, i.e. until the beginning of the mining sites' post-closure period.
  2. Although section 2.6 discusses climate change adaptation measures, it neither specifies for which risks they have been put in place nor whether they reduce the risk in an acceptable manner to ensure the resilience of the project. Accommodation measures and the residual risk level with the implementation of these measures must be added in a column in Table 2-10. Also, instead of citing reports, the proponent must explain in the document the adaptation measure it has put in place. For example, on p. 2–17, the statement “Conduct capacity studies for drainage systems to install systems with adequate capacity [courtesy translation].” Must be developed to explain how the adequate capacity of drainage systems in the future climate was calculated as well as how the design of drainage systems was modified to continue to be efficient.
  3. The storm hazard should also be considered in assessing the resilience of the project's operational phase. Snow, ice and heavy rain storms are expected to increase in the future and could cause power outages and temporary lack of access to the mine site. The proponent must indicate how such situations would be managed to not only maintain worker safety but also to ensure the stability and integrity of the mining infrastructure and the protection of the environment.
  4. The impacts of the project on permafrost and the measures put in place to conserve it must be explained. It is stated on p. 2-5 that, on the northeast side of the Expo mine, the buildings will be supported on piles, which will ensure that the heat from the building does not spread into the permafrost. The proponent must describe what, if any, other design, operation or maintenance measures will be implemented.
  5. In section 8.1.4, the main recommendation of the climate change resilience assessment for NNiP and Phase 2a is the development of a climate change adaptation plan. The proponent must confirm whether it intends to complete such a climate change adaptation plan and, if so, it must file this plan with the Administrator for information purposes.
  6. Note that each project's climate resilience should be assessed periodically to take new knowledge into account.

### Greenhouse gas emissions (GES)

The calculation of GHG emissions from the project amendment for construction, operation, and site closure activities was performed using the MELCCFP's *Guide de quantification des émissions de gaz à effet de serre*.

In general, the calculations the proponent have presented are adequate; however, the amendment to the project will cause the loss of a wetland area of 28.37 ha or 29.98 ha, depending on the alternative selected. This loss of wetlands is also considered a source of GHG emissions. Wetlands are indeed important carbon sinks and their disappearance releases significant amounts of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O into the atmosphere.

**QC-40.** The Commission asked the promoter to present its calculation of GHG emissions due to wetland loss. The *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*<sup>1</sup> can be used for this purpose.

In section 8.2.5 of the amendment request, it is mentioned that Canadian Royalties has been participating in Quebec's cap-and-trade system (SPEDE) since 2013 and that it offsets a portion of its GHG emissions by purchasing carbon credits.

**QC-41.** In order to better assess the portion of emissions being offset, the Commission asked the promoter to provide annual estimates of GHG emissions associated with Phase 2a and the portion of emissions that will be submitted to SPEDE.

**QC-42.** Table 9-1 presents the environmental monitoring program for the Nunavik Nickel project. There is no mention of GHG emissions monitoring. The Commission asked the promoter to commit to submitting a GHG emissions monitoring program for the NNiP, including for Phase 2a.

**QC-43.** The Commission considers the mitigation measures proposed in section 8.2.5 of the request to amend the certificate of authorization to be modest at best, since they are now just the basic measures that all organizations should follow without exception. Considering the magnitude of the project's GHG emissions and the objectives set by the Government of Québec, the Commission asked the promoter to present a more ambitious decarbonization strategy for Phase 2a. It must submit a more substantial mitigation plan, including an evaluation of the associated GHG emission reductions and implementation costs.

In section 3.3, it is mentioned that phase-adapted measures will be put in place to avoid and reduce GHG emissions. Discussed in section 3.4.3.1, one of these measures involves consolidating consumption onto fewer generators via power cables. This would reduce annual diesel consumption by 13.5%. In addition, the proponent stated that a 2019 study by BBA optimized the central generator set at Expo and stabilized diesel consumption despite increased occupancy at the mine complex.

**QC-44.** The proponent must present the findings of this study and indicate what recommendations it has put forward to optimize diesel consumption by the generators at the Expo complex.

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<sup>1</sup> <https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/>

## General comments

- QC-45.** So that each of the operating sites presented in the request for amendment can be located in the receiving environment, the Commission asked the promoter to present an image of the entire site, showing all existing or proposed infrastructure and including a 150-m zone beyond the facilities.

## Towards Sustainable Mining (TSM) initiative

The proponent participates in the Mining Association of Canada's Towards Sustainable Mining (TSM) initiative, which includes an energy consumption and GHG emissions management protocol to promote comprehensive systems for reducing energy consumption and related emissions.

According to the results of the TSM Energy and GHG Emissions Management Protocol Assessment for 2021, for the three indicators related to energy use management and GHG emissions, the Nunavik Nickel project has been rated as a Level B or C. In sum, for these indicators, the project does not meet the protocol's minimum compliance levels,<sup>2</sup> i.e. level A.

- QC-46.** The Commission invited the promoter to submit, for information purposes, a copy of the detailed TSM protocol assessment report for NNiP for 2021. It is also invited to present the measures it intends to implement to improve energy and GHG emissions management in order to achieve an "A" rating for the three above-mentioned indicators.

## Environmental monitoring program

- QC-47.** It is mentioned in section 9.2 that the environmental monitoring program will be updated as mining activities evolve, in order to include the monitoring required during the post-mining and post-restoration phases. The Commission would like to clarify that proposed changes to the monitoring program should not be submitted for information purposes, as mentioned on page 244 of the addendum to the NNiP environmental and social impact study; rather, these proposed changes must be submitted for approval.

## Industrial discharge reduction program

- QC-48.** The Commission wished to remind the promoter that NNiP is covered by the Industrial Discharge Reduction Program (IRRP) under Section 0.1 of the Industrial Facilities Operation Regulation (IFOR). In the event that the amendment to the certificate of authorization is approved, the authorization (formerly the "remediation certificate") will also need to be amended to incorporate all of the NNiP's operating conditions. The amendment must be made in keeping with the provisions of the second paragraph of the first subsection of section 31.17 of the EQA.

Moreover, given its renewable nature, the authorization allows for progressive tightening of environmental requirements. NNiP must seek reauthorization in the next few years. At the time of this renewal, the IRRP aims to focus on controlling key parameters of the mining sector, by phasing in additional discharge standards for copper and nickel. Thus, the company must put forward continuous improvement processes and efforts to reduce its environmental discharges.

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<sup>2</sup> <https://mining.ca/companies/canadian-royalties/>



### **Wastewater and drinking water**

- QC-49.** As the wastewater treatment system will be fully modified, the Commission wished to remind the promoter that the increase in treatment capacity of the Expo complex and all the technical details of the new treatment system must be submitted in a request for authorization under Section 22 of the EQA.

Drinking water for employees at the Ivakkak site will be provided by the water treatment system at the Expo site and delivered in 20-L bottles. Fresh water from the Bomber Lake will also be transported by tanker truck and stored in a 10,000-L tank located near the Ivakkak site service building.

- QC-50.** The Commission asked the promoter to indicate the capacity of the water treatment plant at the Expo site and assess whether it is sufficient to meet the needs of employees at the Ivakkak, Méquillon UG2 and Expo Sud UG sites. Potential increases in the capacity of the water treatment systems at the Expo complex will require an application for ministerial authorization under Section 22 of the EQA.

### **Leases**

The documents provided by the proponent do not make it possible to verify whether the area required for the expansion of the rock piles at the Expo site will be within the limits of the lease granted by the MRNF. The proponent must obtain an expansion of the lease for tailings facilities for the Expo piles if the expansion is not within the current limits. In addition, an industrial lease must be obtained before the works are started for the surface facilities of the Expo and Expo Ouest deposits that are not within the mining lease.

- QC-51.** The Commission wished to remind the promoter that it has to apply for a lease expansion prior to increasing the capacity of the northern landfill site (NLS).

The documents provided by the proponent do not make it possible to locate the work camp on the mining lease.

- QC-52.** The Commission wished to remind the promoter that if the camp is not located within a right issued by the MNRF, the proponent must obtain an industrial work-camp lease.

For the Ivakkak in-pit portal (Alternative 3), the documents provided by the proponent are insufficient for validating whether or not the area required for its development and those of the other related facilities fall within industrial lease 002331-21-910 or within the mining lease.

- QC-53.** The Commission wished to remind the promoter to obtain an extension to the lease before starting construction, if the Ivakkak pit development and associated facilities are not within the current limits.

- QC-54.** The Commission wished to remind the promoter that if facilities are to be developed outside of the mining lease on the Nanaujaq mine site, the proponent must obtain an industrial lease from the MRNF before starting work. In addition, if facilities are required prior to the issuance of the mining lease, the proponent must also obtain an industrial lease.

- QC-55.** The Commission wished to remind the promoter that if facilities are to be developed outside of the mining lease for the Mequillon site, the proponent apply to the MRNF for an industrial lease. In particular, an industrial lease will be required for the granular fill pad that will be used for container storage and the ventilation stack. In addition, an industrial lease is required



**Summary of commitments, conditions and monitoring**

- QC-60.** The addition of new mining sites or infrastructure on existing sites, combined with nearly 30 amendments to the May 20, 2008, certificate of amendment make it difficult to monitor commitments and authorization conditions. Therefore, Commission asked the promoter to provide a document listing all conditions, commitments, mitigation measures, monitoring, etc. since the beginning of the Nunavik Nickel inc. Project (May 20, 2008). This document could also include a summary of the capacity and infrastructure of each mine site.

**Regularization of built but unauthorized components**

Sections 5.2.5.2.2 and 5.2.5.3.2 request the regularization of previously constructed waste rock and ore stockpile expansions.

The current authorized capacity of the Expo camp is 360 workers, and 484 workers during the construction period. However, it is mentioned that, during summer 2022, the Expo camp will be occupied by 528 employees, with a peak occupancy of 547 employees. It appears that some of the works to expand the Expo camp may have already been carried out, although these works have not yet been authorized.

- QC-61.** The Commission wished to remind the proponent that such works must be authorized before they are completed.