

In 2008, NNiP operations led to an impact-benefit agreement, known as the Nunavik Nickel Agreement, between the proponent, the landholding corporations of Salluit and Kangiqsujuaq, the municipality of Puvirnituq and the Makivik Corporation. Through exchanges with the signatories of the Agreement and the specific sub-committee for Phase 2 of NNiP (including Phase 2b), the proponent asserts that “no new concerns, specific to the Delta project, have been raised” (page 33 of the request). Among the mitigation measures for possible impacts on Inuit use of the territory, the proponent intends to regularly inform “the community members of Salluit and Kangiqsujuaq of the works being carried out on the territory affected by Phase 2b” (page 299 of the request).

- QC - 3.** Considering that the last consultations date back to 2006 and that the information visits to the communities planned after March 2020 had to be cancelled (page 231 of the request), the proponent must:
- indicate whether it intends to inform and consult the residents of the Inuit communities of Salluit, Kangiqsujuaq and Puvirnituq regarding Phase 2b, beyond the monitoring committee provided for in the Agreement,
 - specify the means of communication it plans to use to inform community residents of the project,
 - present an update on these visits, which “were resumed at the end of 2022 with a view to carrying them out in early 2023,” and on the results of the information sessions,
 - specify how it plans to “respond to concerns raised by communities in the run-up to and during the Delta project” (page 34 of the request), and specify the mechanisms by which it intends to collect and respond to the concerns, indicating, in particular, the means of communication it intends to use.

The proponent reports that condition 7.2 of the NNiP’s certificate of authorization called for a plan to be drawn up to assess the land users’ perceptions of the project, “more specifically to evaluate the effectiveness of the methods of communicating the monitoring results and to receive, when appropriate, complaints and comments from land users in relation to project activities” (page 231 of the Phase 2b amendment request; courtesy translation). However, the proponent points out that due to COVID-19 restrictions, the timetable for implementing this plan had to be revised. The proponent indicates its intention to distribute a survey on the perceptions of the Inuit population “as soon as village visits are possible in compliance with COVID-19 restrictions” (page 232 of the Phase 2b amendment request; [courtesy translation]).

- QC - 4.** The Commission asks the proponent to submit an updated schedule of the steps it intends to take to meet condition 7.2 of the NNiP’s certificate of authorization.

Further mining exploration

- QC - 5.** In Section 1, the proponent mentions that exploration will be pursued. The Commission asks the proponent to present the areas currently being explored. It must justify whether it foresees the possibility of opening new deposits and, if so, it must locate them. It must specify whether any sectors could be the object of a mining request in the next 10 years and present a timetable.

Brief description of the project and completion variables

Choice of variants

Generally speaking, the reasons given in section 5.1 of the request to amend Phase 2b for the variants seem to be based on environmental considerations. This is the case, for example, for the varying modes for operating the Delta site and for choosing the sites of the main infrastructure and the camp, all of which will have significant impacts on wetlands and water environments, flora and fauna.

- QC - 6.** The Commission asks the proponent to demonstrate that it has “avoided and minimized” in developing and selecting its variants. The proponent must provide more technical, economic and environmental justification for its choices.

In section 5.1.1.8 of the appendix, operating mode #2 is identified as the option with “the least impact on biological, physical and human environments” and therefore the most environmentally acceptable. Furthermore, the proponent concludes that this variant is more cost-effective than operating mode #1, and that it shows no technical feasibility constraints. Nevertheless, CRI favours operating mode #1, arguing that open-pit mining is crucial to operating the ore processing plant at the Expo site.

To support its choice, CRI refers to Figure 5-1 illustrating the annual tonnage of ore sent for processing to the Expo complex during extraction at the Delta pit. This figure shows the annual tonnage as per the deposits’ extraction schedule (Table 3-1). However, according to the extraction schedules the proponent presented in previous reports, these tonnages are not only subject to change, they vary greatly, as the various sites continue their operations throughout the entire period of operation. The risk of the mine shutting down for lack of ore therefore seems lower than what the proponent claims.

- QC - 7.** The Commission asks the proponent to provide more explanation regarding the risks of treatment plant shutdowns and provide further detail on the conditions that could lead to such a shutdown. Among other things, the proponent must document any periods since the start of its operations during which lack of ore has required the operations to shut down. It must also provide the actual quantities extracted since the start of operations to allow for a better understanding of the conditions that can lead to shutdowns. The proponent must also demonstrate that there are no other options for meeting needs at the concentrator, such as pre-empting or increasing production from any of the deposits presented in Table 3-1. It must also present the project feasibility study

Section 5.1.4 Positioning of access gates mentions that the gate to the northeast of Lake #3 encroaches on a colony of sulphur buttercups (*Ranunculus sulphureus*), but it is not possible to assess the extent of this encroachment. Map 6-1 also shows that the waste rock stockpile and water collection basin would encroach on sulphur buttercup colonies.

- QC - 8.** For the variants to be compared on the basis of this sensitive environmental element, the Commission asks the proponent to include the scope of the sulphur buttercup colonies and list the areas inventoried. The proponent must present the variants on the environmental inventory maps (e.g. Map 6-1). The proponent must present the retained project variant so the significance of the impacts can be better understood. The proponent must present mitigation measures to limit impacts on sulphur buttercup colonies.

Roads

- QC - 9.** In section 5.2.1.1 Surface infrastructure, the proponent must justify why the access road to the water intake is as wide (22 m) as the road to the Delta deposit, since it will not be used by mining trucks.
- QC - 10.** In section 5.2.7.1 Variants for the access road, the proponent must specify whether it has considered implementing measures to reduce erosion and sediment transport in the drainage ditch, in sloping areas and at water crossings.

Water Supply

- QC - 11.** In section 5.1.7.2 Variants for the access road, the proponent mentions that Variants 1a and 1b concern the development of the pumping station in the Petite rivière de Puvirnituk (Site #1). On

Map 5-4, Site #1 refers to a body of water southwest of the Delta deposit. The Commission is asking the proponent to clarify this statement.

The proponent must also explain why a water supply from the Petite rivière de Puvirnituk was not considered, as it is closer to the Delta site, offers higher low-water flows than Lake #4 (section 7.2.3.2) and, unlike Site #2, would not involve watercourse crossings.

If the choice of location was made solely because of the downstream location of the mining and sanitary effluent discharge point, the proponent must indicate whether it would have been possible to consider another upstream location in the Petite rivière de Puvirnituk Stream, located on the same axis as the effluent pipe.

- QC - 12.** Some 48,750 L/day would be drawn from Lake #4, based on the use of 325 L/person/day for 150 workers. This volume does not seem to take needs for mining activity into account. The Commission asks the proponent to indicate whether there will be any additional water requirements (e.g. process water) in addition to workers' sanitary needs. Where applicable, it must indicate the additional volumes of water and their source.
- QC - 13.** The Commission asks the proponent to justify its choice of a source for pumping the water for road watering. For example, at km 14, a small, isolated lake further away from the road has been selected, whereas there is a lake closer to the north of the road (Map 5-5).

Point of discharge

- QC - 14.** According to Map 5-6, the sanitary wastewater treatment system is in the satellite camp area. However, on the map, there is no pipe connecting the system to the final discharge point. The proponent must indicate on the map how sanitary wastewater will be conveyed from the system to the final discharge point.
- QC - 15.** The Commission asks the proponent to confirm that it has taken the potential arctic char spawning grounds in the Petite rivière de Puvirnituk into account when choosing the location of its discharge point. These grounds must be identified on Map 5-3. The watercourse CE-D13 must also be identified.
- QC - 16.** The Commission asks the proponent to undertake to ensure that all basins containing water from the mines (contact water) are waterproofed to prevent the water contained in the basins from migrating off-site, particularly through the mollisol layer.

Tailings and mine waste rock management

Permafrost is a major consideration in the long-term management of the site tailings. It is particularly crucial, given the geochemical profile of the waste rock, to keep the tailings from being affected by the mollisol. However, the documents submitted do not present a strategy for maintaining permafrost in the accumulation areas.

- QC - 17.** Given that accumulation areas have a long lifespan, appropriate measures, particularly dikes, must be put in place to ensure the stability of the accumulation areas. Dikes must be built in such a way that they are not affected by significant change in permafrost behaviour. The Commission asks the proponent to detail and present the strategies it intends to implement to ensure the final design of the accumulation areas takes these elements into account.
- QC - 18.** The Commission asks the proponent to describe the technique for disposing of potentially acid-generating (PAG) waste rock in the pit. The information expected in connection with the

disposal of PAG mine tailings in an open pit is detailed in the Ministry's information sheet on groundwater protection from tailings accumulation in an open pit.¹

For acid-generating tailings managed by flooding, the proponent must provide an estimate of the time required for complete flooding. It must demonstrate that PAG waste rock will be flooded before the anticipated onset of acid-mine-drainage reactions.

- QC - 19.** The Commission asks the proponent to indicate the expected geochemical characteristics of the pit water, taking the concentrations of contaminants leached from PAG mine waste rock into account. It must indicate whether the mineralogy of the rock of the pit walls within the active soil layer (mollisol) can contribute to the generation of acidogenic compounds.
- QC - 20.** The Commission asks the proponent to present a cross-sectional view showing the final projected surface of the water elevation in the pit and the final surface position of the potentially acid-generating waste rock placed in the pit.
- QC - 21.** The Commission asks the proponent to indicate the probability that water in the pit is contaminated and could migrate to receiving environments. As part of the project, it must assess the probability of contaminant migration to the deep aquifer via a through talik (thawed portion of year-round permafrost) generated by mining activities (pit and underground workings) or by the active part of the ground (mollisol) during the warm season. The proponent must also describe the preventive measures it will adopt.

Considering the potentially acid-generating and leachable nature of the mine waste rock that will be disposed of in the pit and underground workings, the risks of contamination of the deep aquifer by contaminated water circulating in a through taliks cannot be overlooked.

- QC - 22.** In section 5.2.11.1 Pit restoration, the proponent mentions that the partial or complete filling of the pit will be studied at a later date through thermal and water-quality modelling, taking into account climate change and thermal cap or geomembrane covering. The Commission asks the proponent to present the results of the thermal modelling it refers to. It must also specify the method it had chosen to prevent the initiation of sulfide oxidation and leaching reactions according to the layout of the mine waste rock in the underground workings.
- QC - 23.** Delta's mine tailings are planned to be managed on the Expo site. The proponent must detail its Tailings Management Plan at the Expo site. It must demonstrate that it has the necessary storage capacity to store not only Delta's tailings, but also those from other sites that are or will be in operation in coming years. Without this plan, the project cannot be authorized.
- QC - 24.** The proponent states that mine waste rock will be used to backfill underground structures. Since lithologies were not differentiated during the geochemical characterization, the Commission asks the proponent must indicate whether all the waste rock generated by the underground extraction will be returned underground in backfilling.
- QC - 25.** According to the geochemical characterization report of the Delta ore body and waste rock according to static tests presented in Appendix C, graphite and non-graphite sediments, volcanic mafics and gabbro are potentially acid-generating (PAG) and/or leachable. Since Appendix C is in draft form, the Commission asks the proponent to submit a final, signed version of the geochemical characterization report.

¹ Ministère de l'Environnement et Lutte contre les changements climatiques. February 2021 *Fiche d'information : Accumulation de résidus miniers dans une fosse à ciel ouvert – Protection des eaux souterraines*. [Online] <https://www.environnement.gouv.qc.ca/eau/souterraines/fiche-info-accumulation-residus-miniers.pdf>

QC - 26. Section 5 of the geochemical characterization report presented in Appendix C, contains recommendations for mineralogical analysis by X-ray diffraction, assessment of the risk of self-heating of the ore, and kinetic testing. The Commission asks the proponent to indicate whether geochemical characterization has been continued, as recommended. It must specify any additional tests that have been or are being carried out and present the results where appropriate. If not, the proponent must justify why the recommendations were not followed.

Overburden

QC - 27. The proponent plans to temporarily store approximately 7,500 m³ of topsoil for use in the restoration of the waste rock pile. The Commission asks the proponent to indicate the approximate volume, excluding this topsoil, of overburden to be stripped and stockpiled on the waste rock pile footprint. The proponent must also characterize the overburden and present the results.

Camp

QC - 28. The Commission asks the proponent to specify the characteristics of the generators to be used for Phase 2b. No information has been provided on the number of the camp's units, their individual wattage, the total planned capacity and the noise emitted. The proponent must provide this information.

QC - 29. It would appear in section 5.1.8 Location of satellite camp and related infrastructure that the area for variant #2 was overestimated (26.80 ha compared with 4.12 ha for variant #1). The Commission asks the proponent to confirm the encroachment areas of the two variants and justify the difference.

Northern Landfill Site

QC - 30. The Commission asks the proponent to further justify the opening of a northern landfill on the Delta site, considering the significant impact of this facility and its short lifespan. The proponent must provide justification for locating the Delta project's northern landfill in an area where caribou passage is frequent. In the absence of satisfactory justification, the proponent must place the landfill in a location with little or no caribou use and support this choice.

Quarries and eskers

QC - 31. The proponent mentions that three "potential quarries" will be set up along the Delta-Ivakkak Road to supply construction materials (page 67). The commission asks the proponent to provide all the information required to assess the impacts of each of these quarries, including:

- map location,
- operating area and depth,
- volumes of materials extracted, and
- equipment used.

The proponent must also detail the impacts on the physical and biological environment and the mitigation measures put in place.

QC - 32. In section 7.3.5.2, the proponent refers to "eskers likely to be operated for the Delta project." The Commission asks the proponent to provide all the information needed to assess the impact of each of these quarries, including:

- map location,
- extraction area and depth,
- volumes of materials extracted, and
- equipment used.

It must also detail the impacts on the physical and biological environment and the mitigation measures put in place.

Restauration works

QC - 33. The analysis of the Rehabilitation and Restoration Plan (RRP) in relation to Section 232.1 of the Mining Act is carried out in a separate and parallel process to the analysis of the request to amend the certificate of authorization. The Commission asks the proponent to provide the Administrator with a copy of the RRP as filed with the MRNF.

QC - 34. In section 8.1.9.2, the proponent mentions “re-establishing the vegetation of certain sectors of the mine site that will not be disturbed in the future (during restoration) and using regional native species [courtesy translation]” as an adaptation measure to climate change. The Commission asks the proponent to describe what it intends to achieve by this in this project’s northern setting.

QC - 35. Section 7.3.2.2 states that site closure and restoration works do not currently include the dismantling of waterway crossings. The Commission asks the proponent to describe the reasons behind such a statement and whether it is consistent with the latest version of the NNiP rehabilitation and restoration plan.

Description of the receiving environment

Air quality

In section 6.2.2 Air quality, the proponent indicates that “Considering that meteorological conditions at the Delta site are similar to those of the Expo site, and that activities at the Delta site will be on a smaller scale than those at the Expo site, air quality modelling, in addition to that presented in the 2007 ESIA, has not been carried out as part of this addendum. Atmospheric modelling, in compliance with the requirements of the Clean Air Act (CAR), is currently underway and will be submitted to the MELCCFP during the ministerial authorization request process [courtesy translation].” In addition, the proponent indicates that airborne contaminant emissions from the Delta site would come from ore loading, waste rock crushing and stockpiling, and transportation to the various stockpile sites. Since 2007, MELCCFP requirements have evolved considerably regarding the assessment of contaminant emission rates, which are the modelling inputs. The proponent may refer to the Ministry’s instruction guide on preparing and conducting dispersion modelling of air emissions for mining projects.² The proponent also mentions that the main atmospheric contaminants emitted during the construction and extraction phases would be nitrogen oxides (NOx), sulphur dioxide (SO₂), carbon monoxide (CO), volatile organic compounds (VOCs) and particulate matter.

QC - 36. Atmospheric modelling, consistent with the requirements of the RAA, must be provided at this stage of the assessment procedure and not at the time of the application for ministerial authorization as stated by the proponent. The Commission requests the proponent to report all sources of emissions from the mine site and the contaminants emitted from those sources.

² Ministère du Développement durable, de l’Environnement et de la Lutte contre les changements climatiques (MDDELCC). February 2017 *Guide d’instructions – Préparation et réalisation d’une modélisation de la dispersion des émissions atmosphériques – Projets miniers*. [Online] https://www.environnement.gouv.qc.ca/air/criteres/secteur_minier.pdf

The Commission requests that the proponent ensure that atmospheric dispersion modelling includes all contaminants that may be emitted, including metals and crystalline silica.

- QC - 37.** Considering that, on public land, it is necessary to assess compliance with atmospheric quality standards and criteria where land uses result in the frequent or prolonged human presence, the proponent must provide, in the form of an updated map, the current and potential use (over the project's lifespan) of the territory by Inuit communities. Receptors must be added at locations identified by the Inuit communities and compliance with atmospheric quality standards and criteria must be assessed by modelling the atmospheric dispersion of contaminants. In addition, if a receptor is identified within 1 kilometre of the proposed 16-kilometre road linking the Ivakkak and Delta mine sites or the northern landfill, emissions from these activities will also have to be modelled.

Soil quality

- QC - 38.** The Commission asks the proponent to carry out a preliminary characterization for Phase 1 on the Delta deposit site to identify and present the site areas potentially at risk of contamination. The proponent must also carry out a Phase-2 characterization study to determine parameter concentrations in soils. If there are no risk areas or human activities, an initial soil assessment must be carried out to determine background soil levels, in keeping with the recommendations in the guide to the physico-chemical characterization of soils prior to the implementation of industrial projects.³ Where there are human activities, the MELCCFP's land characterization guide⁴ must be applied. In all cases, the proponent must present the results of these assessments.
- QC - 39.** The Commission asks the proponent to carry out and submit a preliminary characterization for Phase 1. This characterization must ensure the absence of risk zones and therefore of potential soil contamination to be excavated along two road alignments: the Ivakkak-Delta Road and the road to Lake #4. When risk zones are discovered, Appendix 1 of technical sheet #5 of the MELCCFP's intervention guide on soil protection and rehabilitation of contaminated land⁵ must be applied. This technical sheet presents the standard characterization procedure to be carried out when there are linear strips. Excavated soils must be managed according to Appendix 5 of this intervention guide.

Groundwater

- QC - 40.** The Commission asks the proponent to determine local background groundwater levels. The proponent must describe its methodology in detail. It must clearly justify the set of parameters for initial groundwater condition analysis. These must cover the contaminants likely to be generated by future mine activities, the process, the nature of the ore, mine tailings, etc. Table 2.1 in section 2.3.2.2 of Directive 019 presents the parameters to be analyzed and that must be applied.

³ Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC). 2015. *Guide de caractérisation physicochimique de l'état initial des sols avant l'implantation d'un projet industriel*. Online: <https://www.environnement.gouv.qc.ca/sol/terrains/guide/caracterisation-avant-projet-industriel.pdf>

⁴ Ministère de l'Environnement. 2003. *Guide de caractérisation des terrains contaminés*. Online: <https://www.environnement.gouv.qc.ca/sol/terrains/guide/guidecaracterisation.pdf>

⁵ Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC). 2021. *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés*. Online: <https://www.environnement.gouv.qc.ca/sol/terrains/guide-intervention/guide-intervention-protection-rehab.pdf>

Noise

- QC - 41.** Table 6-48 shows the maximum and minimum sound levels recorded in the Parc des Pingaluit. The proponent reports maximum measured sound intensities of 70–80 dB. The Commission asks the proponent to explain the source of these relatively high noise levels.

Water quality and sediments

- QC - 42.** The selected treatment is a moving bed biofilm reactor, a technology included in the Ministry's guide for the study of conventional domestic wastewater treatment technologies.⁶ The Commission wishes to remind the proponent that it must submit a request for environmental discharge objectives (EDOs).
- QC - 43.** The Commission asks the proponent to validate the values in Table 7-17 and 7-18. For example, the maximum copper and nickel concentrations in Table 7-18 for average flow and for Q2.7 (average water flow) should be lower than those in Table 7-17.
- QC - 44.** In section 7.2.4.2.1, the conclusion that the mine discharge could affect the receiving environment over a distance of a few hundred metres is based on perfect and instantaneous dilution of the effluent with the water of the receiving stream. This occurs rarely, particularly when discharge is located in a lentic section of the watercourse. The Commission asks the proponent to further explain this conclusion and specify the distance at which the first fast-flowing (lotic) zone is found downstream of the effluent discharge point.

Wetlands

- QC - 45.** To compensate for the project's impact on 60.7 ha of wetlands, the proponent proposes mitigation measure VEG3 (Table 7-24), which provides for the compensation of wetland areas through contributions to the Inuit Community Environmental Program. The Commission asks the proponent to detail the additional contributions to the ICEP that it is currently considering as a way to compensate the nearly 61 ha of wetland losses caused by this project. The proponent must also provide a progress report on the current ICEP. It should be noted that projects submitted under the ICEP program may be subject to authorization by the MELCCFP.

Wildlife

The Commission considers that the project, as submitted, has significant shortcomings, particularly considering that the latter is situated in the caribou calving area. The Commission considers that the effects of the Project on caribou populations are of concern and require special attention. A more in-depth analysis, based on up-to-date data, should be conducted to assess wildlife issues and impacts of harvesting activities on wildlife and, in particular, migratory caribou. In addition, the documents provided by the promoter include inconsistencies, particularly in the citation of studies, and present dated data (see questions below).

- QC - 46.** The proponent's portrait of caribou physical condition is based on data dating back more than 20 years. The Commission asks the proponent to provide a portrait based on more recent data on the physical condition of caribous, as detailed in Taillon et al. (2016). The Commission also

⁶ Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. Guide pour l'étude des technologies conventionnelles de traitement des eaux usées d'origine domestique. [Online] <https://www.environnement.gouv.qc.ca/eau/eaux-usees/domestique/index.htm>

recommends that the proponent takes into account Inuit knowledge in updating the picture of caribou physical conditioning.

Finally, the Commission recommends that the proponent consult with the *Direction de la gestion de la faune du Nord-du-Québec* to obtain up-to-date and relevant caribou data for the analysis of its project.

- QC - 47.** In section 7.3.4.2, the following sentence is incorrect: “This herd has hundreds of thousands of individuals, of which only a small portion circulates within the NNiP area according to the figures above.” The Leaf River herd was recently estimated at less than 200,000 caribou. According to the number of tracking devices within a 30 km radius of the infrastructure under study, more than 35% of the marked individuals are likely to be disturbed by the project. The Commission requests that the proponent reviews and updates this section of the document with accurate and up-to-date data and references.

Moreover, it appears to the Commission that the characterization of the environment carried out by the promoter is quite minimalist. The proponent limits inventories and description of impacts to areas that will be destroyed by the project; however, a larger study radius (up to 1 km around the affected area, for example) makes it possible to better assess impacts, because they usually go beyond the boundaries of infrastructure and destroyed areas.

- QC - 48.** The Commission asks the proponent to improve the field inventories in order to include the effects of the project on a larger area rather than only at the edge of its infrastructure.

Finally, the different scenarios selected by the proponent do not minimize the impacts on wildlife, particularly migratory caribou. The following mitigation sequence: AVOID, MINIMIZE and COMPENSATE was not followed in this case. The Commission recommends that the promoter refer to the Guidelines for the Conservation of Wildlife Habitats⁷.

- QC - 49.** The Commission asks the proponent to submit a complete wildlife protection plan for each of the project’s active mine sites and infrastructures or for those under analysis, including the Delta site.

- QC - 50.** The Commission asks the proponent to provide more information in its wildlife protection plan on the intensity of the impact of mining activities on caribou and the repercussions of these activities on the caribou’s behaviour. For example, the proponent must assess and justify how far the sounds of explosive detonations and waste rock crushing can be felt by and have an impact on caribou in a northern setting. It must assess the risks of these disturbances on pregnant females and fawns.

- QC - 51.** The Commission requests the proponent to conduct and present an appropriate analysis of the impact of caribou habitat fragmentation that would result from the completion of Phase 2 b, as well as any changes in migratory behaviour that would result. The avoidance of the site and the road would cause a perpendicular obstacle to the migration over about 20 km of a migration corridor about 80 km wide and may influence the migratory route of a significant share of the population. Thus, the potential impacts of fragmentation far exceed the net habitat loss assessed by the proponent.

The Commission asks the proponent to consider the functional loss of habitat caused by fragmentation due to development activities. Although there are no facilities at these locations, fragmentation results in habitat loss for the species.

⁷ https://cdn-contenu.quebec.ca/cdn-contenu/faune/documents/habitats/DIR_conservation_habitats_fauniques_MFFP.pdf

- QC - 52.** In section 7.3.4.2, the proponent states that 5 collisions occurred between caribou and trucks between 2011 and 2022. These collisions were recorded in July, during the caribou migration period. With reference to mitigation measures MTR12, MTR14 and MTR17, the Commission requests that the proponent provide more information to justify road transport during the calving period of caribou rather than helicopter transport at a sufficient altitude. At an adequate altitude and on a trajectory avoiding the aggregations of individuals, the transport by helicopter potentially causes less disturbance than road travel and significantly reduces the risk of collision. The Commission also asks the proponent if it has considered slowing down or stopping all road transport during caribou migration.
- QC - 53.** In section 7.3.4.4, the proponent refers to a one-kilometre detection radius for caribou as the trigger for its MTR14 mitigation measure. Considering the sensitivity of the caribou to noise, this perimeter is largely insufficient to be considered a mitigation measure, especially in the case of blasting and other explosions where detonation can be felt well beyond one kilometer. confirm the location of the potential spawning ground with the point of discharge into the Petite rivière de Puvirnituk Stream, as well as its use. If the spawning ground is located upstream of the point of discharge into the Petite rivière de Puvirnituk Stream, the proponent must justify its choice of location for the effluent. justify such a detection radius.
- QC - 54.** Regarding mitigation measure MTR17, the Commission asks the proponent to compare the benefits of using intermittent road convoys at all times (when a group of more than 50 individual caribou is reported). If this is more advantageous, it must commit to always using convoys and not only after the presence of a group of more than 50 individuals has been reported, as mentioned in Table 7-31. The proponent must also undertake to continuously monitor traffic according to vehicle type.
- QC - 55.** In section 7.3.4.5, the proponent states that *“When the Delta mine goes into operation, approximately 171 ha will have been impacted by the Delta project in the caribou calving grounds and range. This represents less than 0.001% of available caribou habitat. By applying mitigation measure MTR6a, impact will be confined to the construction and operation zones [courtesy translation].”*
The Commission asks the proponent to review this statement and the content of Table 7-34 in light of its forthcoming updates to the wildlife protection plan (mitigation measure MTR6a) so as to adjust its assessment of impacts on caribou and their habitat.
- QC - 56.** Maps 7-3 and 7-6 show the project’s impacts on the natural environment, particularly on caribou movement, as well as the results of the inventories carried out. The Commission wishes to remind the proponent that it must choose the location of crossings for caribou in areas identified as areas of frequent caribou movement. Which does not appear to have been done, according to maps 7-3 and 7-6.
- QC - 57.** The Commission requests that the proponent confirm the location of the potential spawning area and its use relatively to the discharge point in the Petite rivière de Puvirnituk. If the spawning area is located downstream of the discharge point in the Petite rivière de Puvirnituk, the Commission asks the proponent to justify the choice of effluent location.
- QC - 58.** The Commission asks the proponent to ensure that the natural flow of the Petite rivière de Puvirnituk Stream will not be altered by sanitary and mining effluents. The proponent must specify the effects of this effluent on flows into the Puvirnituk River and provide flow modeling, including the calculations it has used.

QC - 59. The Commission asks the proponent to justify its choice of flow options to sanitary and mine effluents discharged at the CE-D13 tributary. The proponent should specify whether it has considered the option of reducing the flow of these effluents to avoid water draw.

QC - 60. The Commission requests the proponent to confirm the use of the 10 m² potential spawning site observed in Lake # 1 by conducting a comprehensive inventory, including electric fishing.

In Table 5-31, the proponent concludes that the permanent watercourses TR-D5, TR-D2, TR-D1, TRI-D3 and TRI-D4 are not fish habitats, based on the presence of impassable obstacles downstream and the lack of any catches during fishing, carried out for only two days of characterization. The inventory effort is not sufficient to conclude that there are no fish and that the work has no impact on these waterways. Even in the presence of impassable obstacles for fish downstream, permanent streams can still be fed with fish produced upstream, especially in the presence of water bodies, and thus constitute fish habitats.

QC - 61. To support this conclusion, the Commission asks the proponent to provide the fishing effort that was conducted in each stream, the date of the fishing, and the hydrological conditions that prevailed at the time of the inventory (water level in the stream). The proponent must provide more detail to confirm the absence of fish or provide a greater capture effort. The use of DNAe could be considered to confirm the absence of fish.

QC - 62. In section 6.3.2.4.1.1, the proponent refers to experimental fisheries without specifying when they were conducted, their location, the fishing effort, and the fishing techniques used. The Commission requests the proponent to provide this information for each surveyed watercourse. This information appears to be provided only for water bodies in section 6.3.2.4.2.

QC - 63. In section 6.3.2.4.1.1, it is noted that the CE-D13 stream has medium habitat potential for the three fish-critical components and has a potential spawning area of approximately 5 m². However, in the table, 6-6, for this same stream, the spawning potential is described as nil. The Commission requests that the proponent validate the information about this watercourse and make the required corrections.

In Section 6.3.2.4.1.2 and maps 6-1 and 6-4, Lake No. 4 was not characterized, primarily its shoreline area, but the presence of lake trout and Arctic char would have been confirmed by angling with a 19-minute effort. However, this lake will be subject to significant year-round water withdrawal for the water supply to the mine site, which could lead to a drop in its water level, especially during the long Arctic winter. This drop in water level would result in a loss of water and fish habitat, which should be quantified and compensated for, where appropriate. The same is true for lakes 1, 2 and 3, which will have their water supply reduced (see mitigation measure FAQ60).

QC - 64. The Commission reminds the proponent that potential habitat loss must be characterized and quantified. The proponent must update the map by considering the legal definition of fish habitat according to the *Règlement sur les habitats fauniques de la Loi sur la conservation et la mise en valeur de la faune*.

QC - 65. The Commission wishes to remind the proponent that in section 7.3.2.2, the anticipated impacts on fish habitat on the four lakes in the vicinity of the Delta deposit must be documented in more detail, as well as additional mitigation measures that will be put in place if the change in water level limits or prevents fish complete life cycle.

QC - 66. The Commission asks the proponent to provide modelling of stream flows that will be modified by the Project. The proponent shall provide the shape files illustrating the current high water

line and the estimated high water line of the water bodies and streams in the study area, taking into consideration the anticipated changes in hydrology for the operating period.

- QC - 67.** The Commission wishes to remind the proponent to detail the losses and gains (if applicable) in fish habitat in the study area and to report the net losses. In particular, it is required to specify the areas of feeding and breeding habitat that would be lost in lakes if their water supplies are reduced and by the exondation of the shallow zone of these bodies of water. The proponent must provide a comprehensive and explicit account of fish habitat loss, both in terms of quantification (m²) and characterization (habitat type), including losses resulting from any modification of the hydrological regime of the sub-speciesproject-affected watersheds.
- QC - 68.** A fish habitat loss compensation plan must be submitted if net losses are expected. The Commission asks the proponent to describe the likely effects of the mining project on fish populations, aquatic habitats, water quality and potential fish contamination. The proponent must detail the elements of the compensation plan envisaged to minimize the negative impacts and the chances of its success. It must indicate the stakeholders consulted in the development of this plan, including the communities and users of the territory. Shoreline and stream shoreline areas that have not been accounted for in the fish habitat compensation plan will need to be included in the wetland and water compensation plan.
- QC - 69.** In section 7.3.2.1 (4th paragraph on page 270 of the document), the proponent states that the development of stream crossings could temporarily disturb approximately 1400 m² of aquatic area. The installation of culverts during the operating period being considered a permanent impact, the Commission wishes to remind the proponent that encroachment into water environments of approximately 1400 m² must be offset by an increase in contributions to the Inuit Community Environmental Improvement Program (CICEP). To this end, the proponent must provide the maximum amount of encroachment at the shoreline boundary of each stream crossed, distinguishing between water loss and potential fish habitat loss.
- QC - 70.** In section 6.3.2.3.4, the proponent states that the Snow Owl (*Bubo scandiacus*) nesting area would be further north. The Commission asks the promoter to validate this statement with more recent studies.
- QC - 71.** The proponent did not conduct an inventory of Short-eared Owl (*Asio flammeus*) in the study area although it is a species likely to be designated as threatened or vulnerable. The Commission recommends that an inventory adapted to the species, the latter being rather nocturnal, be carried out during the breeding season and that the results be presented. In the event of the species' presence in the study area, the Commission reminds the proponent to submit mitigation measures and to include a section in the wildlife protection plan.

Flora

The proponent states that “during all inventories and movements at the different study sites, an active search for plants with precarious status was conducted.” Identification of potential habitats of threatened or vulnerable or susceptible plant species to be so designated (EFMVS) and conducting inventories by systematically scanning these habitats are generally preferred approaches for rare species inventories.

- QC - 72.** The Commission asks the proponent to specify the preferred habitats targeted for each of the potential vascular EFMVS in the study area and to specify the framework for conducting the inventories. The proponent should locate these habitats on a map and detail the methodology and selection criteria used to identify them. The methodology and selection criteria for identifying potential habitats in the study area should be detailed.

Table 5-7 of the document presents the areas disturbed by the project according to the different variants. This table also explains the abundance of EFMVS, such as sulphur buttercup. Work is planned within areas that have not been inventoried, or have only been partially inventoried.

QC - 73. The Commission asks the proponent to explain the reasons for the absence of inventories or the completion of partial or incomplete inventories. Also, inventories conducted in July are early and therefore cannot be considered complete or representative of actual diversity at species and vegetation level.

The Commission requests the proponent to locate these areas on a map and provide an assessment of the potential presence of EFMVS in the study area, following an adequate inventory. The proponent should conduct additional surveys at the appropriate time for areas where potential EFMVS habitats have been identified in the study area. The purpose of these surveys is to verify whether other EFMVS are present in the study area and whether there are more occurrences of EFMVS than previously reported. The proponent must also provide the GPS tracks of biologists who have inventoried the areas identified as having a higher potential for the presence of EFMVS.

For example, the Puvirnituuq Mountain Drave (*Draba puvirnituuqii*) is an endemic species and designated as threatened, grows exclusively on pebbles stripped of ultrabasic rocks (peridotites in the broad sense). The presence or absence of this type of substrate must be validated within the study area.

The proponent must familiarize itself with the lists of plant species with threatened or vulnerable status in Quebec or likely to be so designated. This list was updated in December 2022. It must also familiarize itself with the guides for carrying out the required inventories:

- List of threatened vascular plants (59 species)⁸
- List of vulnerable vascular plants (18 species)⁹
- Vascular plants likely to be designated threatened or vulnerable in Quebec (235 taxa)¹⁰
- Inventory of threatened species of in Quebec - Information sheet¹¹
- Field form - Plants with threatened status in Quebec

QC - 74. The Commission wishes to remind the promoter that sectors where subcapita dredge (*Draba subcapitata*) and cayouette dredge (*Draba cayouettei*) have been noted should be visited again in the appropriate period, in August or early September. Individuals must be counted. The data collected must be transmitted to the Centre de données sur le patrimoine naturel du Québec (CDPNQ). A standard form¹² is provided by the CDPNQ as a guide.

⁸ Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. *Liste des plantes vasculaires menacées (59 espèces)*. December 2022 [Online]

<https://www.environnement.gouv.qc.ca/biodiversite/especes-designees-susceptibles/listes/menacees-floristiques.pdf>

⁹ Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. *Liste des plantes vasculaires vulnérables (18 espèces)*. December 2022 [Online]

<https://www.environnement.gouv.qc.ca/biodiversite/especes-designees-susceptibles/listes/vulnerables-floristiques.pdf>

¹⁰ Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. *Les plantes vasculaires susceptibles d'être désignées menacées ou vulnérables au Québec (235 taxons)*. December 2022. [Online] <https://www.environnement.gouv.qc.ca/biodiversite/especes-designees-susceptibles/listes/vasculaires.pdf>

¹¹ Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. *Inventaire d'espèces en situation précaire au Québec - Aide-mémoire*. 2022 [Online]

<https://www.environnement.gouv.qc.ca/biodiversite/especes-designees-susceptibles/aide-memoire.pdf>

¹² Available online: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fcdn-contenu.quebec.ca%2Fcdn-contenu%2Ffaune%2Fdocuments%2Fprecaire%2FFO_Signalement_animaux_EMVS.xlsx&wdOrigin=BROWSELINK

- QC - 75.** The Commission considers that measure ESP4, which aims to conserve and reuse the soil, is not an acceptable mitigation measure to ensure the species recolonization of the site once restored. This is an experimental measure and therefore does not guarantee successful recolonization. The proponent must therefore provide further details on this approach and the references justifying its choice and relevance.
- QC - 76.** Section 7.3.1.1 mentions that a 4.01-ha sulphur buttercup colony will be affected by the construction of the waste rock pile and water collection basin. The Commission asks the proponent to assess the relative magnitude of this impact by presenting the relative proportion of buttercup colonies (in terms of number of plants or the surface area of the colonies) that would be affected by the project compared to those that have been inventoried. This information must also be presented on a map. It must be superimposed on the map of the proposed mining infrastructures and the identified sulphur buttercup colonies.
The Commission also invites the proponent to provide a summary of the other locations where sulphur buttercup has been observed in previous NNiP inventories. It must improve section 7.3.1.5 of the request to include cumulative impacts on the sulphur buttercup.

Residual Materials

- QC - 77.** The waste management program states that paper, cardboard and plastics will be burned as fuel. Given that these materials can be recycled, the Commission asks the proponent to justify this choice and present the measures it intends to put in place to limit the burning of recyclable materials. Where applicable, the proponent must present its policy for recycling paper, cardboard and plastics instead of burning them.

Climate change and greenhouse gases

- QC - 78.** The Commission reminds the proponent to assess the resilience of the project for its full life. The exploitation phase and the restoration phase must be presented with their respective duration, especially since the main vulnerabilities to climate change are found at the restoration level (Bussi re et al., 2017). The proponent will also be required to submit climate projections to 2076-2100 to cover the restoration phase of the site.
- QC - 79.** The Commission asks the proponent to include extreme events and events in its assessment of resilience and adaptation to climate change. Not only have these hazards already occurred in the past, as indicated in the context, but it is also projected that they will intensify in the future climate and could be the source of potential impacts.
- QC - 80.** The Commission asks the proponent to clarify the adaptation measures selected. For example:
- For permafrost-related adaptation measures, the proponent should indicate, for each relevant component and sub-element (Table 8-2), how they will be resilient to subsidence and how they will not worsen permafrost thawing. Solutions should be based on geotechnical analyses carried out at the scale of each building or infrastructure.
 - For built areas on road surfaces, the proponent shall specify how “The consulting engineering firm hired to design the Delta site infrastructure, Golder Associates, will ensure that climate change is integrated with a view to avoiding adverse environmental consequences.”
 - For adaptation measures related to water management, the proponent must indicate the percentage of increase retained for their capacity to be adequate in future climate.

- The proponent should indicate which risks will be mitigated and the level of residual risk associated with each accommodation listed in section 8.1.9.2. To do this, the proponent must add a column to Table 8-10.

QC - 81. According to the proponent's data, the project will be responsible for the loss of 61 ha of wetlands. These environments are important carbon sinks and their disappearance releases significant amounts of GHG into the atmosphere. The Commission asks the proponent to quantify GHG emissions related to wetland loss. To do this, it can refer to section 3.12 of the *Guide de quantification des émissions de GES*¹³.

QC - 82. The five GHG reduction measures presented by the proponent are considered to be very modest; nowadays they are basic measures that all organizations must minimally apply. Furthermore, they would not provide any additional reductions, since the calculation submitted by the proponent was carried out considering compliance with these five measures. Therefore, they cannot be considered as mitigation of the project's GHG emissions. The Commission requests that the proponent submit effective mitigation measures to reduce the project's GHG emissions.

Monitoring and follow-up programs

QC - 83. Section 7.3.2.1 states that an additional assessment of the potential use of the char spawning area in the Little Puvirnituk River will be completed in late summer 2023. Based on the results of this work, the proponent proposes to add the spawning area(s) to the NNiP environmental monitoring program (follow-up #14). Although such a measure is desirable, the Commission would point out that, in the presence of confirmed spawning grounds downstream of the effluent discharge point, the first measure to be considered is to verify the possibility of avoiding the impact, otherwise compensation must be offered. The Commission asks the proponent to present the results of this assessment.

Accident risk management

In its Emergency Response Plan (ERP) presented in Appendix Z, the proponent refers to a risk analysis produced as part of a previous request for authorization (2021). However, this risk analysis is neither presented in Chapter 10 nor included in the appended ERP.

QC - 84. The Commission asks the proponent to present the risk analysis to which it refers. It must also ensure that the following steps have been taken:

- Identification of hazards, in particular the presence of hazardous materials (petroleum products, explosives, chemicals, etc.), which must specify the quantities, characteristics and locations of the hazards as well as the number of refuelling operations required during Phase 2b;
- Identification and mapping of sensitive natural and man-made elements that could be affected by a technological accident;
- Inventory of past accidents;
- Development of standardized and, where appropriate, alternative scenarios;
- Assessment and evaluation of consequences (spills, toxic clouds, fires, explosions);
- Risk assessment and evaluation, where applicable.

¹³ Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC). 2022. Guide de quantification des émissions de gaz à effet de serre. En ligne : <https://environnement.gouv.qc.ca/changements/ges/guide-quantification/guide-quantification-ges.pdf>

Authorizations, permits and fees required

The Commission would like to remind the proponent that it must obtain any authorization, permit or fee required for the development and operation of the elements presented in its application for amendment of CA, issued by the Government of Quebec, following a decision by the KEQC. The Commission invites the proponent to contact the Direction régionale du Nord-Du-Québec of the MELCCFP and the Direction générale de la gestion du territoire public (DGGTP) of the Ministère des Ressources naturelles et des Forêts (MRNF) to validate the subsequent requests to be provided.

In addition, in section 5.2.7, it is noted that materials that will be used for road construction or other accesses may be derived from acid-generating waste rock from the Ivakkak or Delta sites. The Commission wishes to remind the promoter that the recovery of the Ivakkak waste rock has not yet been authorised and that the use of the Delta waste rock must be the subject of complementary geochemical characterisations to demonstrate that it is not leachable, before being allowed.