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By email only

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Subject: **Final Advice from Environment and Climate Change Canada for the Rose Lithium Tantalum Mining Project**

Ms. Lalande,

Further to your request for a final advice dated January 13, 2010, in the context of the environmental assessment of the Rose Lithium Tantalum Mining Project (file number 80005), please find attached Environment and Climate Change Canada's (ECCC) final advice.

As an expert federal government department, ECCC has analyzed issues within its mandate: air quality, surface water and sediment quality, hydrology, groundwater quality, soil quality, greenhouse gases, wetlands, migratory birds, species at risk, and accidents and malfunctions. Depending on the issue, different ECCC experts were consulted in order to build this advice based on the documentation made available as part of the environmental assessment of the project as well as the questions transmitted through your letter requesting a final advice.

I hope that this advice meets your expectations. Please accept my sincere greetings.

Karine Gauthier
Analyst - Environmental Assessment
Environment and Climate Change Canada

p.j. Final Advice from Environment and Climate Change Canada

Table of Contents

Element of the environment : Air

APPENDIX 1 - Questions on environmental components whose changes caused by the project may have an effect on the valued components identified by the committee

The questions in this appendix address each of the following environmental elements and will help guide your advice on these elements.

- Air

Existing environment and basic conditions

1) Is the baseline condition of each of the elements of the environment adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which these may influence the environmental analysis.

ECCC Response :

The current state of ambient air quality is described in Volume 1 (Section 6.9.5 Current Conditions) of the Main EA Report (WSP, March 2018a) for gaseous contaminants, particulate matter and metals. Due to the lack of measurement stations near the study site, the description of this component is based primarily on concentrations recommended for northern projects in the MELCC Guidebook (MELCC, February 2017), with the exception of $PM2_{.5}$ for the annual period. The initial concentrations recommended for northern projects (north of the 51st parallel) were reproduced in Table 6-58 of the impact study. With respect to $PM2_{.5}$, the proponent used measurements from the Pémonca station, which is located, according to the proponent, in an area that is "representative of the study site".

According to ECCC, the description of initial ambient air quality conditions in the IA (WSP, March 2018a) had some shortcomings, such as the absence of respirable particulate matter less than ten microns (PM10) and volatile organic compounds (VOCs). In addition, the initial $PM2_{.5\ particulate}$ matter concentration was based on measurements from the Pémonca station located 425 km from the mine site. However, the choice of this station was not justified according to ECCC.

According to the proponent, the risk of wildfire in the area of the study site is considered significant. The proponent has taken this risk into account by specifying the frequency of forest fires and their potential impact on the ambient air quality of the region and the project site in particular. The proponent determined that an initial $PM2_{.5}$ concentration of 15 µg/m3 for the daily period takes into consideration the impact of forest fires on air quality in the study area and would therefore be representative of the existing ambient air quality. Moreover, this is the concentration recommended by the MELCC for a project located in a northern environment and far from other industrial sources. However, the proponent seems to have studied only one case of an average fire of 75 km2 during a single day to support its conclusion. ECCC is of the opinion that it is difficult to draw a firm conclusion on this basis alone, without measured data. Indeed, it is known that smoke plumes (forest fires) typically generate very high concentrations of $PM2_{.5\ (of\ the}$ order of a few hundred µg/m³).

Although the proponent has completed the description of ambient air quality taking into account PM10, VOCs and the impact of forest fires, the description of this component presents some

uncertainties regarding the concentrations of contaminants already present, particularly particulate matter.

For the initial concentration of NO2, the proponent had initially based its approach on the values recommended by the MELCC for projects in remote areas. However, the proponent felt that these values were too conservative and not representative of the conditions that would currently exist in the study area. This finding was based on the exceedances obtained during the atmospheric dispersion modelling of contaminants. Two new approaches were then suggested by the proponent to demonstrate that the initial NO2 concentration is overestimated by using the initial generic MELCC concentrations. The adoption of these two approaches would have had the effect of decreasing the contribution of the initial state to the total concentrations and thus reduce the anticipated impact of the project on air quality.

According to ECCC, the RSQAQ Saint-Anicet station used in the first approach is not the most representative of the study site and could not be used to determine initial concentrations in the project study area. In the absence of measurement stations close to the site, it is generally recommended that measurement stations be installed prior to project implementation and that data be recorded over a period of time that allows seasonal variations to be taken into account. The latter measurement would have made it possible to describe the reference state for NO2 in particular with greater confidence.

The second proposed approach, which is based on the use of remote sensing NO2 measurements to assess an initial concentration in the area of the mine site, should not be used either. Indeed, this technique does not allow the measurement of low NO2 concentrations. Furthermore, measurements made on a larger scale could not be extrapolated to a smaller scale without risk of error. For this reason, ECCC considers that only the use of generic NO2 concentrations recommended by the MELCC for projects in remote areas is acceptable for this project.

Despite a few shortcomings identified during the review of the impact study, and following the responses and clarifications provided by the proponent to the Joint Assessment Committee's (JAC) requests for additional information, the baseline condition was adequately described considering the project's location in a remote region and all the available information.

Changes caused by the project

2) Have the changes that may be caused by the project on each of these environmental components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any changes to the environment that were poorly or not identified.

ECCC Response :

Potential environmental effects on air quality were described in section 6.9.6 of the Main EA Report (WSP, March 2018a) and in Sector Report RS-6 (WSP, March 2018b). These effects were primarily documented by modeling contaminant concentrations and atmospheric dispersion in the study area for the construction and operation phases. The activities likely to affect air quality are essentially related to all construction activities, but also to those of operation. For the construction and pre-production phase, these are works and equipment related to site preparation and construction, including deforestation, stripping, handling of materials (waste

rock) and their transportation. For the mining phase, it includes road transportation, blasting, material handling (co-disposal area) and ore processing.

All these activities would produce gaseous air pollutants (combustion products) and dust (fugitive emissions). The potential adverse effects of the project would be the deterioration of air quality conditions during the construction and operation phases.

The methodology used by the proponent to assess the project's impact on air quality is based on the MELCC's atmospheric dispersion modelling guide. Two scenarios were considered: construction and operation. An additional scenario including a mitigation measure specific to crystalline silica was also carried out.

The contaminants considered in the original impact study were nitrogen dioxide (NO2), carbon monoxide (CO), sulphur dioxide (SO2) and particulate matter (PMT and $PM2_{.5)}$ as well as 19 metals and metalloids and crystalline silica. The effect on air quality was assessed using the *Clean Air Regulations* (CAR) and the Canadian Ambient Air Quality Standards (CAAQS).

The proponent also conducted modelling of the maximum monthly dust deposition at sensitive receptors (Cree camp, workers' camp and lakes 18 and 19), located near the mine, and the results are presented in Tables CEAA-59-1 (construction phase) and CEAA-59-2 (operation phase) (WSP, December 2019b). Metals show no exceedances for both modelling scenarios while crystalline silica shows exceedances of both hourly and annual criteria (WSP, March 2018b).

The atmospheric dispersion study for the assessment of air quality impacts during construction and operation indicates that the project is likely to result in an increase in the concentration of particulate matter close to the standards, as well as an increase in the concentration of nitrogen dioxide and crystalline silica above the standards or criteria on some occasions.

NO2 concentrations

The proponent states that the main sources contributing to the modelled maximum one-hour concentrations for NO2 are exhaust from mobile equipment for both construction and operation scenarios. The isoconcentration curves are shown on maps CEAA-60-3 to CEAA-60-6 for each of the periods considered. Taking into account the initial concentration recommended by the MELCC in a northern environment, only the NO2 concentration at the Cree camp for the operation phase scenario would exceed the hourly CAAQS standard for this substance.

Crystalline Silica - Attenuation Scenario for Operation

According to mine planning, waste rock, with an estimated silica content of 20.8%, was to be used as road aggregate. The basic modeling that was done with this grade resulted in significant overruns for crystalline silica. In addition, road traffic would represent the main source of these emissions with more than 75% of the concentrations. Thus, to limit crystalline silica emissions, the proponent considered the use of amphibolite as an aggregate on roads with an estimated silica content of 0.55%. Amphibolite is one of the lithologies that make up waste rock.

An additional scenario was therefore modeled by including amphibolite as an aggregate on the roads (scenario referred to as "mitigation"). Scenarios were also conducted with and without blasting for the baseline and mitigation cases (Sectoral Report R-6. Table 14). The results for both scenarios are presented below.

- For the baseline scenario, using waste rock as aggregate on roads :
    - For the hourly period and one day with waste rock blasting, the maximum modeled concentration represents 889% of the criterion in the "area of application" and

195% of the criterion at sensitive receptors.

- For the annual period and annualized scenario, the maximum modeled concentration represents 871% of the criterion in the "field of application" and 147% of the criterion at sensitive receptors.
- For both periods, the main contributing source is road traffic for more than 75% of the concentrations.

- For the scenario designated "mitigation" with the use of amphibolite on roads :
  - For the hourly period and one day with waste rock blasting, the maximum modeled concentration represents 766% of the criterion in the field of application and 117% of the criterion at sensitive receptors.
  - For the annual period and the annualized scenario, the modeled concentration of crystalline silica represents 314% of the criterion in the field of application and 77% of the criterion at sensitive receptors.
  - For the hourly period and one day with or without ore blasting, the modeled concentration of crystalline silica represents 663% of the criterion in the field of application (191 hours of exceedances per year) and 29% of the criterion at sensitive receptors.

In summary, according to the modeling, only the scenario designated "mitigation" with the operating variants "day with blasting" and "day without blasting" would meet the standards for the annual and hourly periods at sensitive receptors.

Dust Deposition

Although there is no specific standard in Quebec, the estimation of dust deposition is considered important by ECCC, particularly at the level of identified sensitive receptors, including water bodies in the vicinity of the mining project, such as lakes 18 and 19. The proponent also mentions on page 6-66 of the IA (WSP, March 2018a) that during the operation and maintenance phase, wind erosion of the mine tailings is likely to emit dust that could be transported over long distances and deposited on water bodies located near the dry tailings pond.

The proponent conducted modelling of monthly total particulate matter (PMT) deposition. The results compiled for sensitive receptors, including the various lakes near the mine site, are presented in Tables CEAA-59-1 to CEAA-59-4 (WSP, December 2019b), for each month and for the construction and operation scenarios.

- For the construction scenario, the maximum monthly deposition occurs at the Cree camp where a maximum deposition of 0.05 g/m2 is modeled. The maximum deposition for the workers' camp is obtained during the month of December with a value of 0.05 g/m2. For the lakes, a maximum monthly deposition of 0.89 g/m2 is modelled.
- For the operating scenario, the modelled monthly deposition occurs at the Cree camp and the workers' camp with maximum deposition of 0.26 g/m2 and 0.28 g/m2 , respectively. For the lakes, a maximum monthly deposition of 4.57 g/m2 is modeled.

By comparing the results with the former deposition standard of 7.5 g/m2 per month of the former *Air Quality Regulation of the* Province of Quebec (repealed), no exceedances are likely to occur at sensitive receptors. However, the modelling of dust deposition did not take into account the contribution of particulate matter already present in the air (background noise). The results obtained may therefore be underestimated. Consequently, ECCC recommends that the proponent conduct water and sediment quality monitoring in lakes 18 and 19 (see monitoring and follow-up section of the Surface Water advice).

For particulate matter, modelled concentrations and deposition of dust were obtained using a 75% attenuation rate in the calculations. According to ECCC, this rate is overestimated and, in practice, could not be achieved at all times. The modelled concentrations of particulate matter, including silica, as well as their deposition off-site on sensitive receptors could therefore be underestimated and, possibly, exceed the standards in effect at the time of the project.

The choice of scenarios (e.g. the 75% mitigation measure incorporated in the modeling, the choice of gear types such as Tier 4) can influence the modeling results. Thus, the significance of environmental effects could be assessed differently in different cases. It would therefore be important to qualify the effects described by the proponent for the scenarios it deems reasonable. This concerns, in particular, the mitigation rates related to particulate matter emissions, including silica, and dust deposition, as well as the use of Tier 4 certification equipment that emits less nitrogen dioxide than the less recent Tier 4 certification equipment.

Finally, taking into account the proponent's responses to requests for additional information and considering all available information, the potential environmental effects on air quality have been adequately described overall, except for the 75% mitigation rate for dust emissions, which ECCC considers overly optimistic. The interpretation of environmental effects on air quality must therefore be adjusted accordingly.

Mitigation Measures

3) Among the mitigation measures presented by the proponent in relation to changes to the environment, please identify those that you consider to be key measures[1]. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential and that were not proposed by the proponent.

ECCC Response :

Potential environmental effects on air quality are associated with emissions of dust, particulate matter, crystalline silica and gaseous contaminants during construction and operation activities. Due to the anticipated exceedances and uncertainties outlined above, ECCC believes that the mitigation measures proposed by the Proponent should be rigorously implemented in order to significantly mitigate the adverse effects of the Project on air quality.

Although it is the set of measures considered that would help reduce the overall impact on air quality, it is still possible to identify the following mitigation measures as key measures for the construction and operation phases :

- Use non-friable, non-clayey, low silica materials with good road abrasion resistance for road construction and maintenance;
- Use amphibolite as aggregate on roads;
- Maintain roads on a regular basis to maintain a good running surface and low silt levels;
- Water roads and work areas regularly and apply dust suppressants to surfaces where traffic may cause dust to rise despite regular watering, and implement a road watering management program to monitor the effectiveness of the planned control measures;

[1] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

- Avoid handling granular materials in high winds or when the wind is blowing towards the Cree camp or other sensitive receptors and apply dust suppressants, if necessary, when traffic may cause dust to rise despite regular watering;
- Temporarily cover the docks with straw or granular materials, depending on the ground and weather conditions;
- Limit blasting of waste rock when winds are blowing towards the Cree camp or other sensitive receptors;
- Wet blast areas to avoid dispersion of fine material deposited on the surface by drilling activities;
- Install a blasting mat during blasting to retain particles in the work area;
- Limit idling;
- Optimize the number of trips for transport vehicles used in the construction and operation phase (equipment, excavated or backfilled land, personnel, etc.);
- Install, inspect daily and maintain the dust collectors of the drills as well as the dust collectors used in the industrial complex during the operation. The dust collected by these devices will be eliminated in order to prevent its dispersion;
- Carry out regular inspection and maintenance of site equipment and generators.

The proponent has committed to using only Tier 4 certification machinery for the operations phase, where available. Exclusive use of Tier 4 certification machinery would reduce NOx emissions by 43%. This mitigation measure should therefore also be respected by the proponent.

In addition, the proponent has committed to put in place a dust management plan that contains all of the key mitigation measures described above prior to the start of the construction phase. The proponent will also be required to rigorously apply all of these measures and revise the plan based on the results of the air quality monitoring.

Monitoring [2]and follow-up programs [3]

4) Please identify in the monitoring program, the essential measures to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate changes to the environment. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

5) Please identify measures in the follow-up program that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate changes to the environment caused by the project. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

ECCC Response :

[2] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[3] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

The monitoring and follow-up programs were presented in a single document with a dust management plan. This plan will have to be implemented at the start of construction activities.

The developer plans to install a meteorological station and an air quality measurement station. Monitoring of particulate matter (PMT, PM10 and $PM2_{.5}$), metals and silica would be carried out during construction and operation, but dust deposition and monitoring of nitrogen dioxide concentrations would not be measured, with the exception of NO2 monitoring generated during blasting activities. The proponent will have to modulate the monitoring based on the results collected and will have to provide for the application of adaptive management measures if necessary.

The proponent's approach not to track NO2 may be justified due to the remote location of the project and the proponent's commitment to use only Tier 4 certification equipment.

However, as the use of equipment on the project site could represent a significant contribution of NO2, ECCC recommends that the proponent add this contaminant to the monitoring for the operations phase if the proponent is unable to use Tier 4 certification equipment.

The proponent has also planned a monitoring program for fine particles in the event of forest fires. This program, if implemented when the mine site is exposed to a plume of smoke, should help mitigate the effects of this increase in contaminants.

Aside from the uncertainty regarding NO2, ECCC considers the monitoring and follow-up programs submitted by the proponent to be adequate.

Environmental Element: Surface Water and Sediment

APPENDIX 1 - Questions on environmental components whose changes caused by the project may have an effect on the valued components identified by the committee

The questions in this appendix address each of the following environmental elements and will help guide your advice on these elements.

- Surface water
- Sediments

Existing environment and basic conditions

1) **Is the baseline condition of each of the elements of the environment adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which these may influence the environmental analysis.**

ECCC Response :

A first preliminary characterization of the quality of surface water and sediments in the natural environment was made from samples collected in the field in 2011 (Sectoral Report RS-4: WSP, February 2017b). The bodies of water sampled are lakes 1 to 5 and Eastmain 1 reservoir.

A more focused characterization was conducted by the proponent in 2018 and 2019. Indeed, more precise location of the mining facilities was available and allowed a better selection of reference water bodies. The results are presented in Appendix CEAA-46 (WSP, December 2019b). Surface water was sampled five times in Stream A between June and October 2018 and once in June 2019. Lakes 3, 4 and 6 were sampled four times between August and October 2018 and once in June 2019. Lakes 18 and 19 were sampled once in June 2019. Sediments were sampled in Stream A and lakes 3, 4 and 6 in 2018.

The results showed that the surface water had low concentrations of suspended solids (SS), low turbidity and total dissolved solids concentrations ranging from 21 to 110 mg/L. It is a sensitive medium to acidification. Water hardness is also low with values below 10 mg/L. With respect to metals, the MELCC's criterion for the protection of aquatic life (chronic effect HVAC) for aluminum was exceeded in several samples. The concentration of most other metals remained below the criteria for the protection of aquatic life. Overall, the water in the study area is of good quality, low mineralization and low in nutrients.

The results of the characterization of the 45 sediment samples show occasional exceedances of the CES (threshold effect concentration) for the following metals: arsenic, cadmium, chromium and copper. One sediment sample showed a copper concentration above the OEC (Occasional Effect Concentration) in Lake 3 and two samples showed an arsenic concentration above the OEC, one in Lake 4 and one in A Creek. ECCC is of the opinion that these exceedances of metal quality criteria are likely consistent with regional background levels and are not of concern.

ECCC is of the opinion that the characterization of the receiving environment includes enough lakes and streams to allow a good description of the initial state. With the exception of tantalum, the proponent measured all substances that could be found in surface water and sediment in the study area as a result of the project. Tantalum should be measured as soon as possible so that the proponent can fully assess the effects of its project once it is in operation. Monitoring of surface water and sediment quality should continue at the sampling stations used during the 2018 and 2019 characterization campaigns, as they better represent the study area than those used in 2011.

Changes caused by the project

2) Have the changes that may be caused by the project on each of these environmental components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas of uncertainty. Please describe any changes to the environment that may or may not have been properly identified.

ECCC Response :

<u>Construction phase</u>

During the construction phase, clearing, stripping, excavation, grading and installation of culverts and cofferdams would generate suspended solids in nearby streams and water bodies. There would also be a risk of accidental petroleum hydrocarbon spills associated with the use, refuelling and maintenance of vehicles and machinery (WSP, March 2018a, section 6.4.5).

According to section 3.7.1 of the main IR Report (WSP, March 2018a), runoff would be collected through ditches and small ponds until the storage pond and water treatment unit (WTU) is completed. More specifically, during the dewatering of lakes 1 and 2, temporary sedimentation basins would be used to dampen the flow and allow the TSS to settle. Prior to the installation of the accumulation basin and the WWTP, runoff from the road surrounding the pit would be returned to the pit on a temporary basis. Runoff from the overburden pad and the main access road would

be directed to the B1 and B2 retention ponds. According to the proponent, four sedimentation basins installed at low points would be used to collect, by gravity, runoff from the main road. As soon as the accumulation basin and the WWU are installed, all of this runoff would be pumped to the treatment facilities and then discharged into stream A. The next construction steps would be the construction of the industrial apron and the road leading to the explosives storage facility. From this point on, all runoff would be directed by gravity or pumping to the ETU for treatment.

Operation phase

Mine water drainage

In section 3.7 of the EA (WSP, March 2018a), the proponent mentions that water from the industrial sector, pit dewatering water (mine water) and runoff from ore stockpiles and co-deposition piles (dry tailings and waste rock) would be collected and directed to the accumulation basin and then to the CTU. Runoff from road ditches and the overburden stockpiles would also be added to this volume of mine water that would be directed to the tailings pond and the UTE (Response CEC 30, 31 and 35, WSP December 2020).

The locations of all drainage, treatment and pumping facilities mentioned are shown on Map 03-03 (WSP, Appendix 30, December 2020). It is important to note that there would be four final discharge points as defined by the *Metal and Diamond Mining Effluent Regulations* (MMER) flowing into Stream A, and Lakes 3, 4 and 6.

Processing unit

The CTU would be equipped with an Actiflo® type treatment process that would decontaminate the main effluent by adding micro-sand, a coagulant (ferric sulphate) and a polymer to optimize the coagulation and flocculation phenomena. The flocs weighed down by the micro-sand would then be decanted into a tank whose contact surface is increased by means of inclined lamellae. The proponent also mentions in response CEAA-27 (WSP, December 2019b) that the first step of the treatment process would be to increase the pH to between 9.0 and 9.5, which would allow the dissolved metals to be transformed into insoluble form. When they are no longer dissolved, the metals precipitate and combine more easily with particles and flocs, allowing them to be removed by settling at a very high rate according to the proponent.

Once treated, the effluent from the WWU would be discharged directly into stream A, without passing through a polishing basin. The pH would be corrected if necessary before discharge, using hydrated lime or sulphuric acid. It should be noted that, just as Lake 1 would be dewatered to make way for the pit, Stream A would also be dewatered between Lake 1 and the WWTP effluent discharge point. The WWTP effluent would thus become the only water input (flow) to Stream A (Map 2 Appendix CCE-27, WSP December 2020).

Pumping water at the periphery of the pit

In order to reduce the volume of mine water during operations, the proponent would install nine wells at the periphery of the pit to lower the water table (Section 3.7: WSP, March 2018a and Sector Study RS-2: WSP, November 2017a). The proponent plans to discharge this pumped water into lakes 3, 4 and 6 in order to minimize impacts on stream base flows and water levels in the affected area. However, the quality of the peripheral pumping water is still unknown. It would be somewhere between the natural groundwater quality of the study area (characterization available in Sector Study RS-3: WSP, November 2017b) and the quality of the mine water. Indeed,

the groundwater that will be pumped to lower the water level in the pit may mix to some extent with the mine water.

ECCC notes that groundwater sampling results (2017 and 2019 characterizations) show, among other things, that fluoride and several metals exceed CCME quality criteria for the protection of freshwater, including silver, cadmium and copper.

Sedimentation ponds would be installed prior to discharge to the lakes in order to reduce the amount of TSS in the effluent; the pH could also be corrected in these ponds if necessary.

Metal leaching and acid mine drainage

According to the geochemical characterizations carried out by the proponent, the waste rock, ore and tailings would not be likely to generate acid mine drainage (AMD). These materials would not present metal leaching potential (contaminated neutral drainage - or CND), according to the criteria of MELCC Directive 019, for the majority of the metals analyzed, including tantalum and lithium, which are the metals sought in the Rose Project (WSP, March 2018a, Volume 3, Appendix 3-3 [Lamont, 2017]) (WSP, February 2019a, Appendix G [Lamont, 2018]), (WSP, December 2019b, CEAA Appendix 15 [Lamont, 2019]). However, six of the twenty-one waste rock samples analyzed in total were considered potentially leachable for copper. These samples are mostly (5/6) amphibolite. Since amphibolite lithology is the material that is expected to be used for the construction of road foundations and mine site decks, drainage water from these structures should be directed to appropriate treatment to control potential copper releases. However, copper concentrations measured in the leachate during wet cell testing remained below the MELCC water quality criterion for resurgence in surface water (WSP, December 2019b, Appendix CEAA-15).

ECCC notes that the overburden has not been analyzed for its acid mine drainage potential nor for its metal leaching potential. During the geochemical characterization of the overburden, no metals were found in excess of the MELCC soil criteria in the samples analyzed (WSP, February 2019a, Appendix G [Lamont, 2018]). In this situation, Directive 019 states that overburden can be classified as "metal leaching potential free" without further testing. However, the proponent has committed to conducting soil acidity tests on overburden samples in the summer of 2021 to determine the acidogenicity of the material.

Tantalum

Tantalum is a rare metal and has recently been exploited for the development of new technologies (e.g. electronic components and electric cars). Tantalum's characteristics appear to make it less of an environmental concern than other trace metals, due in part to its low solubility. There are no standards or criteria for this element in Canada. The Proponent estimates, based on what it calls conservative assumptions, that the maximum values for total tantalum and dissolved tantalum in Project contact waters would be 1.6 µg/L and 0.1 µg/L respectively. The maximum concentration of tantalum in groundwater in the project area would not exceed 0.1 µg/L. The proponent obtained these values from a mass balance using tantalum concentrations in geological samples collected during the technical feasibility study for the project in 2017 and during the geochemical characterization leaching tests (Lamont, 2018). The results converge with information currently available in the scientific literature. As tantalum is very poorly soluble, it is present only at very low, or even undetectable, concentrations in freshwater around the world. Dissolved tantalum values reported by the promoter are all below 0.1 µg/L, even in mineralized zones and at a mine site where tantalum has been mined for several decades.

Other effects during the operating phase

The mining project presents a risk of accidental petroleum hydrocarbon spills related to the use, refuelling and maintenance of vehicles and machinery during the mining phase (WSP, March 2018a, section 6.4.5).

Maintenance, washing and refueling of vehicles and machinery could generate discharges of petroleum hydrocarbons and TSS into the aquatic environment (WSP, March 2018a, section 3.5.5). The use of diesel pumps for perimeter pumping and pumping of mine water could also result in the release of hydrocarbons into the aquatic environment.

Closure and restoration phases

The effects during the closure and remediation phases would be the same as during the operations phase, except for the effects associated with peripheral pumping, which would cease at the end of the operations phase.

ECCC is of the opinion that the description of the environmental effects during the construction and closure and remediation phases on the surface water component is summary, but sufficient to allow the assessment of these phases of the project. The description of the effects during the operation phase is sufficiently detailed, with the exception of the determination of the acid generating potential of the overburden, which will be completed by the proponent in 2021.

Mitigation Measures

3) Among the mitigation measures presented by the proponent in relation to changes to the environment, please identify those that you consider to be key measures[4]. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential and that were not proposed by the proponent.

ECCC Response :

Construction phase

During the early construction phases, before the WWU is available, several of the Proponent's generally applicable mitigation measures for clearing, excavation and earthwork and culvert installation (Table 5-6: WSP, March 2018a) would limit the release of TSS to surface waters. General mitigation measures related to the use of vehicles and machinery to minimize hydrocarbon releases are also outlined in Table 5-6. Also, according to section 14.3.4 of the EIS (WSP, March 2018a), the Proponent would ensure that wash water from concrete mixers and similar equipment would be recovered and sent to an off-site disposal site. Urgent maintenance work to be done on site would be carried out in the designated areas.

Operation phase

Capacity of the water treatment unit

The proponent proposes to continuously measure pH and turbidity using sensors installed on the main discharge pipe to determine whether the effluent is of sufficient quality to be discharged to

[4] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

the receiving environment. These sensors would be installed in redundancy [5](Response CEC 26 B, WSP December 2020), in order to increase the reliability of continuous effluent quality monitoring.

If the turbidity or pH was not within the desired range, the effluent would be returned to the accumulation basin using automated valves for further treatment. According to the proponent, turbidity would be a sufficient indicator to determine whether the effluent quality meets TSS and metal standards. However, a calibration curve would have to be established beforehand in order to link the turbidity values measured by the continuous sensor with the TSS values of effluent samples measured in the laboratory. The recirculation principle would be used in order to avoid the construction of a large polishing tank after the treatment process. If effluent recirculation were to occur, the proponent estimated that the accumulation basin could contain a volume of water corresponding to 10.4 days of operation for a 10-year flood recurrence and 2.5 days for a 100-year flood recurrence.

ECCC notes that the proponent did not accurately estimate the level of efficiency of its treatment unit by saying that the information would be provided during detailed engineering. ECCC is of the view that the Proponent could have provided information on the efficiency of a treatment system prior to this stage, in a theoretical manner, by providing comparative data on metal removal rates, for example, and by providing summary modelling of the operation of the proposed recirculation process in order to be able to justify the absence of a polishing pond downstream of the WWU.

Peripheral pumping water

The proponent proposes to install one or more secondary water treatment units (WWTPs) downstream of the sedimentation basins where the Lake 3, 4 and 6 outfalls are located. This type of installation would be required only if standards or criteria were to be exceeded during water quality analyses in the sedimentation ponds. The estimated time before a secondary WWU would be operational would be 6 months according to the proponent. The type of treatment process proposed would be the same as for the primary WWTP. In order to avoid the discharge of non-compliant effluent, the proponent proposes to shut down the peripheral pump(s) causing the exceedances. If too much water accumulates in the pit, the proponent proposes to add additional pumps to convey this additional water to the accumulation basin and the main WWTP.

TSS in the final effluent

In addition to achieving environmental discharge objectives (EDOs) defined by the MELCC, the proponent commits to a TSS limit of 10 mg/L as a monthly average, and 20 mg/L in a grab sample (WSP, December 2019c; QC2-37, WSP, July 2020, QC3-12). For comparison, the maximum monthly average TSS required by Directive 019 and the MMERMMD is 15 mg/L. ECCC is of the opinion that the proponent's commitment to respect a limit of 10 mg/L of TSS is an important mitigation measure since an efficient treatment to reduce TSS would contribute to reduce several other contaminants in the effluent, including metals, notably tantalum.

Accumulation, sedimentation and retention basins

The proponent has committed to covering the bottom of the main accumulation basin, which is located upstream of the main WWTP, with a geomembrane in order to minimize the risk of contaminant infiltration into the soil and groundwater.

[5] In engineering, redundancy is the duplication of critical components or functions of a system in order to increase system reliability, or to improve actual system performance.

The proponent plans to use till to waterproof[6] basins 2 and 3, which are adjacent to the co-deposit pile, the ditches around the pile, and the three sedimentation basins located upstream of lakes 3, 4 and 6. The till that would be collected during the pit stripping would be analyzed beforehand using standardized tests to determine whether its hydraulic conductivity, or permeability, is not too high. The proponent mentions that if the till characterization showed a hydraulic conductivity higher than $^{-10}6$ cm/s, a geomembrane would be installed instead.

Water from the garage

Garage wastewater from maintenance work and washing of vehicles and equipment would be directed to sand traps and an oil separator to reduce TSS and petroleum hydrocarbon levels.

Closure and restoration phases

According to response CEC-38 (WSP, December 2020 and email update January 12, 2021), the main WWTP would remain in operation as long as necessary, during the closure and post-closure periods, to treat the final effluent from the site prior to discharge to Stream A. Should any exceedances of the final effluent criteria reveal a problem not anticipated (e.g. metal leaching) by the results of the geochemical studies already conducted as part of this EA, the proponent should correct the situation by modifying the WWTP process. Verification would also be done by taking samples of solids from the co-deposit pile and from the pile's drainage water, or any other alternative deemed necessary by the experts examining the issue, in order to find the source of the contamination. Once identified, the source of contamination could be removed or addressed by specific measures, if possible. It should be noted that the pumps at the periphery of the pit would be shut down when extraction activities cease and there would be no need to maintain any secondary ETUs.

Advice and recommendations

Information on measures to control TSS during the construction phase remained sketchy, and not all the details requested from the proponent were provided. However, ECCC is of the opinion that the proposed measures should be sufficient if rigorously applied. Mitigation measures for surface water quality during the operation phase are generally adequate and ECCC agrees that the optimal and rigorous application of these measures would minimize the adverse effects of the project on this component.

Although it is the set of measures envisaged by the proponent that would contribute to reducing the effects on water quality, ECCC believes that the following mitigation measures are key measures for the different phases of the project :

Construction phase

- Install temporary and permanent sedimentation ponds to minimize TSS discharges, and install a functional UTE as soon as construction begins (Maps 20-1 to 20-5, Appendix 30).

Operation phase

- Collect and treat industrial sector water (including the ore concentration process), pit dewatering water (mine water), water from peripheral pumping, runoff from ore stockpiles,

[6] Glacial deposit left directly by the ice, and consisting of clay, sand, gravel and boulders mixed in any proportion.

co-deposition (dry tailings and waste rock) and overburden, as well as runoff from road ditches on the mine site.

- Respect a maximum monthly TSS concentration of 10 mg/L for all final discharge points.
- Install a treatment process in addition to sedimentation and pH correction if contaminants from the pit or groundwater are present in the peripheral pumping water (e.g. metals, nitrates and/or fluorides). The secondary water treatment unit(s) (SWTU(s)) would be installed downstream of the sedimentation ponds where Lakes 3, 4 and 6 outfalls are located, as required.
- Provide measures to identify the source of tantalum and treatment, if necessary, if the concentration of dissolved tantalum in all effluents increases beyond the values estimated by the proponent to be in the order of 0.1 µg/L.

Closure and restoration phases

- Continue continuous treatment at the main WWTP as long as there is final effluent and provide for adjustments to optimize treatment if monitored parameters are exceeded.

Finally, ECCC is of the opinion that there remains uncertainty as to the capacity of the accumulation basin to contain all the additional water volumes should the pumping water from the peripheral wells exceed the quality standards or criteria during the period of installation of the secondary WWUs. ECCC recommends that the proponent revalidate its water balance with this eventuality in mind to ensure that the accumulation basin and the main WWU will be able to supply if the peripheral pumping water were to be diverted from this side for a period of at least 6 months. The proponent should submit the results of the water balance for this scenario to the Agency and the appropriate authorities.

Monitoring [7]and follow-up programs [8]

4) Please identify in the monitoring program, the essential measures to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate changes to the environment. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

ECCC Response :

Construction phase

In section 14.2.2 of the EA (WSP, March 2018a), the proponent states that during the construction phase, an environmental monitor would conduct regular work area visits and verify the general

[7] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[8] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

mitigation measures listed in Table 5-6 of the EA and related to clearing, excavation and grading and culvert installation (WSP, March 2018a).

Operation phase

Efficiency of the treatment unit

In response CEC 36B, as well as in its associated clarification of information (email dated January 19, 2021), the proponent mentions that monitoring of treatment efficiency would be performed manually by the PTU operators. The effluent would be sampled 3 times per week for TSS and pH, once per week for 8 indicator metals (As, Cu, Fe, Pb, Ni, Zn, as well as Li and Ta) and once per month for acute toxicity. These samples would be measured on site by the operators using standardized methods and validation would be performed by a certified external laboratory. If exceedances were observed, effluent recirculation would be activated manually using the operator interface.

Tantalum

In response to EAC 36C (WSP, October 2020), the proponent proposes as a specific measure for tantalum, given the lack of quality criteria for this substance, close monitoring of tantalum concentrations in the receiving environment. This would be accomplished by measuring tantalum in the receiving stream during the construction phase using monthly sampling (WSP Maps 20-1 to 20-5, December 2020). During the operational phase, tantalum monitoring would be conducted at the same frequencies as those prescribed by existing regulatory requirements for other metals. Thus, in the case of the MMERMER, this means that the proponent would add tantalum to the final effluent and receiving water quality analysis on a quarterly basis. The results of the tantalum analysis will verify that the proponent's estimates are accurate.

Should the concentration of tantalum increase beyond the estimated concentration values of 0.1 µg/L, the proponent states that it would implement actions to identify the source of tantalum and reduce the excess. Possible actions to reduce tantalum releases described in response CEC 36C include increased tantalum recovery at the concentrator to reduce tantalum concentrations in the tailings, segregation of tailings that may contain more tantalum for alternative disposal, and improvement of the effluent treatment system.

Peripheral pumping water

As described in response CEAA-30B (WSP, December 2019b), the three sedimentation basins that will collect water from the peripheral pumping will be subject to continuous pH sampling using automatic sensors so that this parameter can be adjusted as required. Monitoring similar to that of the main effluent will also be implemented by the water treatment operators: 3 times per week for TSS and pH, 1 time per week for 6 indicator metals (As, Cu, Fe, Pb, Ni, Zn) and 1 time per month for acute toxicity.

Closure and restoration phases

In response CCE-38 (WSP, December 2020, updated: e-mail of January 12, 2021), it is mentioned that "*for the period covering the closure and post-closure, since the main water treatment plant (WTP) will be in operation as long as necessary, possible exceedances of the criteria applicable to the final effluent from the site (Stream A) would reveal a problem not suspected in the geochemical studies previously carried out, and this situation would be addressed in particular by modifying the treatment process of the water treatment plant. A monitoring, including the collection of samples of solids in the co-deposition hall as well as in the drainage water of the hall, or any other alternative deemed necessary by the experts who would*

address the question, could be put in place in order to target and address the source of the observed problem". ECCC notes that the proponent undertakes to provide for the necessary adjustments to optimize treatment in the event that the parameters monitored at the main WWTP are exceeded. It should also be noted that during this phase, the secondary WWUs will no longer be operational since the pumps at the pit periphery will be shut down.

Advice and recommendations

According to ECCC, because of the uncertainty regarding the quality of the peripheral pumping water, it would be important that monitoring of the quality of this water also be carried out prior to its discharge into lakes 3, 4 and 6, at the same time and in the same manner as the monitoring plan for the main WWTP effluent. ECCC recommends that the proponent conduct weekly monitoring of these waters at the beginning of operations to obtain a more accurate and complete picture and to analyze the results in a comprehensive manner before installing an additional treatment system at the sedimentation ponds.

In addition to tantalum and lithium, fluorides and metals exceeding CCME water quality guidelines should be added to this monitoring program as exceedances of these parameters have been observed during some groundwater sampling campaigns as mentioned above. The recommended sampling frequency for fluorides and additional metals would be once per week.

5) Please identify measures in the follow-up program that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate changes to the environment caused by the project. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

ECCC Response :

The proponent has provided information regarding the monitoring of effluent compliance with regulatory requirements (Directive 019 and MMERMD) in the following documents: WSP, March 2018a (section 14.5.1) and WSP, October 2020, (Response EAC 38). However, it did not provide a follow-up plan for surface water quality as required in the guidelines (CEA Agency, 2012, section 11.4 - Follow-up Program) to verify the accuracy of the EA and to determine the effectiveness of the measures that will be implemented to mitigate the environmental effects of the project in the receiving environment.

Advice and recommendations

ECCC is of the opinion that the proponent should prepare a monitoring program for surface water and sediment quality in the receiving environment. The sampling stations and parameters used to establish the initial state of water bodies and streams presented in Appendix CEAA-46 (WSP, December 2019b) provide an excellent basis for monitoring effects on surface water. However, it is important to add to the monitoring plan, in addition to the metals identified in the initial state of the water bodies, tantalum and lithium, as these are the metals sought by the project and are present on the site.

Because of the risk of dust deposition, the proximity of the co-deposition pile and the risk of exfiltration from this pile, ECCC recommends that lakes 18 and 19 be included in the monitoring program. ECCC also recommends that the surface water quality monitoring plan be applied from the beginning of the work and that it be maintained during all phases of the project, i.e. construction, operation, closure and post-closure.

Note that the groundwater monitoring plan presented by the proponent in Appendix QC2-74 of the MELCC's Answers to Additional Questions (WSP, December 2019c) contains relevant information that can be used as a reference to establish the surface water quality monitoring plan.

Since tantalum tends to adsorb to particles, it may ultimately end up in the sediments of the receiving environment. Thus, ECCC recommends adding tantalum monitoring to the sediments of stream A, which will receive the main effluent. Since tantalum is a metal for which little information on effect thresholds is available, one way to estimate its potential to bioaccumulate in aquatic organisms would be to begin collecting information on sediment concentrations. In addition, given the low dissolution of tantalum, ECCC recommends that the proponent measure the total concentration of tantalum in water in addition to the dissolved concentration and incorporate this consideration into its follow-up plan.

Environmental Element: Hydrology

APPENDIX 1 - Questions on environmental components whose changes caused by the project may have an effect on the valued components identified by the committee

The questions in this appendix address each of the following environmental elements and will help guide your advice on these elements.

- Surface water - hydrology

Existing environment and basic conditions

1) **Is the baseline status of each of these elements adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which they may influence the environmental analysis.**

ECCC Response :

The baseline hydrological conditions were first described in the Main EA Report (WSP, March 2018a) and in Sector Study RS-1 (WSP, February 2017a). It was then updated in Appendix E in WSP (February 2019a) and in response to question CEC-26 in WSP (October 2020 and December 2020).

The project encroaches on 6 small watersheds of 1.7 to 8.3 km2 (Table 2-1 of WSP, October 2020) right next to the Eastmain Reservoir. The proponent described the basic surface water conditions, in terms of low flow, flooding and seasonal and interannual variation, as well as the boundaries of the watersheds.

The estimation of summer and winter low water flows was accomplished using the method for estimating low water flows in the regions of northern Quebec, developed by the MELCC. Average

monthly flows were estimated using the basin transfer method with the Rivière de l'Eau Claire, the closest hydrometric station to the project. Flood flows were estimated using the rational method. Field measurements provided the flows and water levels needed to calibrate a HEC-RAS model.

ECCC is of the opinion that the Proponent has described the basic surface water conditions, in terms of low flow, flooding, seasonal and interannual variation, and watershed boundaries, using conservative methods. ECCC is satisfied with the description of the baseline hydrological conditions.

Description of changes caused by the project

2) **Have the changes that may be caused by the project on each of these environmental components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas of uncertainty. Describe any changes to the environment that may or may not have been properly identified.**

ECCC Response :

The description of the effects of the project on hydrologic conditions was presented in the Main EA Report (WSP, March 2018a) and updated in Appendix E of WSP (February 2019a), in Appendices CCE-26 and CCE-27 of WSP (October 2020) and in response to questions CCE-26, CCE-33 and CCE-34 (WSP, December 2020).

The expected changes are mainly related to : (1) changes to watershed boundaries (project encroachment), (2) lowering of the water table and loss of groundwater to surface water, and (3) discharges from the Water Treatment Plant (WTP) and pumping water from wells surrounding the pit. Estimates of low flows, flood flows, and average monthly flows were completed using the size of the modified watersheds as well as the expected project discharges. For the UTE discharges in particular, the proponent plans to make intermittent discharges so that the low flow periods of the watercourses are minimally disrupted. The pumping water from the peripheral wells would be distributed between lakes 3, 4 and 6 in order to mitigate the impacts caused by the lowering of the water table. The HEC-RAS model, calibrated with field measurements, was used to estimate the effects of the project on water levels. The proponent foresees no residual impact after the complete closure of the site, other than the creation of a new lake inside the old pit.

ECCC notes that detailed engineering is not completed and that flow forecasts may still change, but not significantly. ECCC also notes that two scenarios for the distribution of water pumped from the peripheral wells were considered in the determination of effects, but that the 3-point discharge scenario (lakes 3, 4 and 6) was selected.

The proponent does not anticipate any adverse effects on watercourses following the closure phase of the project. However, the proponent did not submit detailed information on surface water drainage at the mine site during closure and post-closure. ECCC is of the opinion that the proponent should have presented the boundaries of the various sub-basins taking into account the configuration of the mine site at closure (presence of dumps and pits), the drainage pattern and the drainage regime, including the flows and volumes of water draining to the receiving environments (lakes and rivers). The proponent indicated that calculations and modelling for surface water drainage at the mine site in post-closure can be carried out once the remediation

plan is finalized and approved. ECCC is of the opinion that there remains uncertainty in the assessment of the effects of the project on the hydrological regime and consequently on fish habitat after the restoration and closure of the mine.

However, ECCC is of the opinion that the Proponent has estimated the effects of the Project for the construction and operation phases sufficiently for the purposes of the environmental assessment.

Mitigation Measures

3) **Among the mitigation measures proposed by the proponent in relation to the elements of the environment, please identify those that you consider to be key measures[9]. Please propose corrective measures to the proposed measures (if necessary) or any other measures that you consider essential to avoid or mitigate changes to the environment and that would not have been proposed by the proponent.**

ECCC Response :

Mitigation measures for the project's effects on local hydrology are first described in section 6.2.6 of the main EA Report (WSP, March 2018a). Question CEC-26 (WSP, October 2020) asked the proponent to present mitigation measures that could be put in place in the event that low water levels in the watercourses are greater than anticipated. However, the answers to this question in both WSP (October 2020) and WSP (December 2020) do not contain any mitigation measures. Appendix CCE-27 of WSP (October 2020) revisits mitigation measures in the context of fish habitat mitigation.

Among the mitigation measures submitted by the proponent, ECCC considers the following measure to be key. This measure has been modified to take into account the latest update of the water bodies receiving the pumping water (WSP, December 2020):

- While considering pumping water from peripheral wells as final discharge points as defined by the MMERMMD, manage discharge flows to Lakes 3, 4 and 6 in proportion to the drawdown of the water table caused by the pumping, as described in Table 26-3 in response to EAC-26 (WSP, December 2020).

In addition, CCCT recommends the following additional key action:

- Operate the UTE in such a way as to reproduce the natural flow variations of stream A, taking into account the storage capacity of the sedimentation basin.

With the recommended modifications and addition, ECCC believes that the application of mitigation measures would minimize the effects of the project on local hydrology.

Monitoring and follow-up programs

4) **Please identify in the monitoring program the monitoring measures that are essential to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate changes to the environment. Please propose corrective actions to the proposed measures (if necessary) or**

[9] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

propose any other measures that you consider essential.

5) **Please identify in the follow-up program the follow-up measures that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate changes to the environment. Please propose corrective measures to the proposed measures (if required) or propose any other measures that you consider essential.**

ECCC Response :

The proponent has presented its stream hydrology monitoring program in several documents : WSP (March 2018a), WSP (October 2020) and CEC-26A (WSP, December 2020).

In the main EA Report (WSP, March 2018a), the proponent suggests a monitoring program for streams for which a significant flow reduction (>10%) is expected without specifying which type of flow would be used as a basis for comparison (average monthly flows, low flows, flood flows) or the monitoring methodology. According to the proponent's effects estimate (Tables 1 and 2 and Map 1 and 2 in Appendix CCE-27 [WSP, October 2020]), streams A, C, E, F, M and N would be monitored during the life of the project.

In response to Question CEC-26A (WSP, December 2020), the proponent proposes a monitoring program for streams A, C, N, M, F and E but does not specify, among other things, the frequency (years) of monitoring and the measurement sites. According to the proponent, a detailed monitoring protocol will be developed in the next phase of the project and submitted for approval prior to implementation.

ECCC recommends that the proponent submit a monitoring program for water levels and flows during all phases of the project, including the water levels and flows in each of the identified watersheds, in order to verify the accuracy of the environmental assessment and to judge the effectiveness of the mitigation measures. This monitoring program should specify, at a minimum, the location of the measurement sites, their frequency and duration, the methodology, content and frequency of reports, the action thresholds including the type of flows used for these thresholds, as well as the adaptive measures in the event of non-compliance with these thresholds.

For the final remediation phase of the site, ECCC recommends that the follow-up program be designed to confirm the effects on watercourses for at least one year after the completion of remediation activities, as well as the predicted effects after the pit filling period, which is expected to last 22 years. This monitoring should take into account updated calculations and modeling for surface water drainage at the mine site in post-closure, as discussed in the section on describing changes to this environmental component.

Finally, ECCC recommends that the detailed monitoring program related to the surface water hydrology component be developed and submitted to the responsible authorities for review and comment so that it can be finalized prior to the commencement of work.

Environmental Component: Groundwater

APPENDIX 1 - Questions on environmental components whose changes caused by the project may have an effect on the valued components identified by the committee

The questions in this appendix address each of the following environmental elements and will help guide your advice on these elements.

- Underground water

Existing environment and basic conditions

1) **Is the baseline condition of each of the elements of the environment adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which these may influence the environmental analysis.**

ECCC Response :

The description of groundwater quality is presented in section 6.5 of the main EA Report (WSP, March 2018a). In order to determine the initial status of groundwater quality, the Proponent conducted two sampling campaigns in 2017 (April and July) and 2019 from observation wells. The results of these characterizations are presented in the Sector Study: RS-3 of Volume 2 of the IA (WSP, November 2017b) and in Appendix CCE-27 of the Responses to CNSA Questions and Comments document (WSP, October 2020). Map 1 of the RS-3 Sector Study illustrates the location of observation wells. The list of parameters measured included major ions, C10-C50 petroleum hydrocarbons, several metals and other inorganic compounds, and TSS. With the exception of tantalum, the proponent measured all substances that could be found in the groundwater in the study area.

The hardness of the receiving medium being low (less than 10 mg/L), the MELCC surface water resurgence criteria (SWR) values for certain metals are very restrictive and exceedances were noted in the majority of samples for the metals: Ag, Cu, Mn, Ni, Pb and Zn. Natural background grades were therefore evaluated from the groundwater samples collected. It should be noted that the calculated background grade for copper is above the RES criterion. The proponent also mentions that silver and copper concentrations in groundwater could occasionally exceed the RES criteria during future sampling campaigns without these exceedances necessarily being attributable to the new activities of the future complex.

ECCC is of the opinion that, overall, the proponent has adequately described the groundwater component. However, it recommends that tantalum be measured at observation wells prior to the commencement of construction to complete the initial status of groundwater quality in the study area.

Changes caused by the project

2) **Have the changes that may be caused by the project on each of these environmental components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas of uncertainty. Please describe any changes to the environment that may or may not have been properly identified.**

ECCC Response :

The risks of metal leaching and acid mine drainage related to mining activities were assessed by the proponent through geochemical studies. Due to the geological context of the area, these risks are considered low by the proponent. Nevertheless, standard measures will be put in place to collect and treat any process water or runoff that may have been in contact with the waste

rock, tailings or ore. Groundwater will benefit from increased protection as a result. Details are discussed in other sections of this advice.

Another potential source of impact on groundwater quality identified by the proponent is the risk of contamination from accidental spills of hydrocarbons, solvents or other hazardous liquids (section 6.5.6 of the main IS Report). The proponent states that if a spill occurred in sufficient volume, the portion of the product not fixed to the soil would migrate to the groundwater table to leave a pure phase floating or flowing depending on the density of the liquid and partially dissolving in the groundwater. In the case of heavy solvents, the product would infiltrate until it is fully absorbed by the soil particles or until it reaches an impermeable horizon. The proponent also mentions that till and rock are generally of low permeability, which would limit the percolation rate.

The risks associated with accidental spills are covered in section 11.2.5 of the main IS Report (WSP, March 2018a). The effects of accidental spills are well documented in this section. More details are provided in the Accidents and Malfunctions section of this advice.

Overall, ECCC agrees with the proponent's assessment of the changes in groundwater quality caused by the project.

Mitigation Measures

3) Among the mitigation measures presented by the proponent in relation to changes to the environment, please identify those that you consider to be key measures[10]. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential and that were not proposed by the proponent.

ECCC Response :

Mitigation measures identified by the proponent to reduce the project's effects on groundwater quality focus primarily on the prevention of accidental spills. These measures are the same as those described in the Accidents and Malfunctions section of this advice.

In addition, ECCC emphasizes the importance of the mitigation measures that will be put in place to protect surface water and soils, as they will contribute to the protection of groundwater. These are described in the sections of this advice dealing with these components.

ECCC is of the opinion that, if all mitigation measures identified by the Proponent, as well as those recommended by ECCC are implemented in a timely manner, the effects of the Project on groundwater quality and associated risks will be minimized.

Monitoring [11]and follow-up programs [12]

4) Please identify in the monitoring program, the essential measures to verify and control the implementation of mitigation measures and to ensure that they are

[10] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

[11] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[12] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

appropriate to diminish, avoid or mitigate changes to the environment. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

ECCC Response :

Not applicable.

5) Please identify measures in the follow-up program that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate changes to the environment caused by the project. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.

ECCC Response :

The groundwater monitoring program is presented in sections 6.5.9 and 14.4.4 of the Main EA Report (WSP, March 2018a) and in Appendix QC-59 of the MELCC Answers to Questions and Comments document (WSP, February 2019b). Appendix CCE-21 of the CNSA Q&A document (WSP, October 2020) presents an enhanced version of the follow-up program. The proponent mentions that a total of 18 observation wells, located upstream and downstream hydraulically from the mining infrastructure, will be used for the follow-up. The location of the sampling wells is shown on Map 1 and the analytical program is described. The parameters taken into account for the follow-up are presented in Table 4 and are essentially the same as those used to establish the initial status of groundwater quality. However, thallium and mercury are not included because of the large number of samples with thallium and mercury concentrations below detection limits in the initial characterizations. Tantalum was not measured in the 2017 characterizations, but is shown in Table 4. Barium and beryllium had also been measured for initial characterization but are not included in the proposed monitoring parameters. However, ECCC is of the opinion that the latter metals (barium and beryllium) should be included as part of the parameters measured in the follow-up. By including these additional parameters, as well as tantalum, as proposed by the proponent, ECCC is of the opinion that the follow-up program covers all substances that could be found in the groundwater of the mine site sector.

The proponent also described the comparison criteria that will be used to analyze the monitoring results. The results will be compared to the MELCC Surface Water Resurgence (SWR) criteria and an alert threshold (AT) of 50% of the value of the SWR criteria will be applied. The proponent also explains that background levels that have been assessed prior to the work will be used as comparison criteria when they exceed the RES criteria. For parameters with no criteria, the results will be compared to the values generally observed in groundwater and to the concentrations obtained under initial conditions. ECCC is of the opinion that the proposed comparison criteria are adequate and that it will be important to establish the baseline status for tantalum in groundwater prior to commencing work. Since there are currently no criteria for this parameter, monitoring results can be compared to the concentrations that will be measured at baseline conditions.

In Appendix CCE-21, it is mentioned that the sampling campaigns will be carried out twice a year, in spring and summer, as soon as operations begin, and that the program may be re-evaluated during follow-up based on the results obtained, in collaboration with the MELCC. However, according to Appendix QC-52, it is planned that a network of new observation wells will be set up during the construction phase and that an initial sampling of these wells will be carried out a

few days after installation. Thereafter, sampling would be carried out twice a year. The same applies to the operation, post-operation and restoration phase. The proponent plans to continue its groundwater quality monitoring program over a 5-year period, as mentioned in its response to question QC-60 (WSP, February 2019b). It then plans to discontinue it, provided that the water quality meets the requirements of Directive 019. According to ECCC, monitoring of groundwater quality should begin at the beginning of the work and be maintained during all phases of the project, including the construction phase (the frequency of the surveys could be adjusted based on the results).

ECCC is of the opinion that the groundwater quality monitoring program submitted by the proponent is adequate. However, it is recommended that it be applied from the beginning of the work and that it be maintained during all phases of the project, i.e. construction, operation, closure and post-closure. ECCC also recommends the addition of barium and beryllium to the list of proposed monitoring parameters.

Environmental Element: Soil

APPENDIX 1 - Questions on environmental components whose changes caused by the project may have an effect on the valued components identified by the committee

The questions in this appendix address each of the following environmental elements and will help guide your advice on these elements.

- Sol

Existing environment and basic conditions

1) **Is the baseline condition of each of the elements of the environment adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which these may influence the environmental analysis**.

ECCC Response :

The description of the baseline soil quality condition is presented in section 6.6 in Volume 1 of the main EA Report (WSP, March 2018a) and in Sector Study RS-3 in Volume 2 (WSP, November 2017b). According to Appendix QC-61 of the responses to MELCC's questions and comments (CRC, 2019), no previous activities were likely to have affected the soil quality of the site. In addition, it is mentioned that the proponent commits to carry out a complementary soil characterization in order to complete the baseline condition. Appendix QC2-63 of the answers to the MELCC's questions and comments (WSP, February 2019b) presents the work plan for this study.

Taking into account future data from the complementary characterization, the proponent has described the component with the available information and adequately considering the geology and previous activities carried out on the site.

However, ECCC recommends that further characterization include tantalum soil analyses to obtain a complete picture of natural surface concentrations at the site.

Changes caused by the project

2) Have the changes that may be caused by the project on each of these environmental components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas of uncertainty. Please describe any changes to the environment that may or may not have been properly identified.

ECCC Response :

The proponent has identified only one source of effect on soil quality, namely the risk of contamination from accidental spills of hydrocarbons, solvents or other hazardous liquids (section 6.6.5 of Volume 1 of the main IS Report). However, effects due to metal and metalloid contamination in soils through the deposition of dust from mine operations are possible. Various sources of dust are described in Table 6 of Sector Report RS-6 (Volume 2 of the Main EA Report). Accumulated deposition could modify the quality of the soil. In addition, the reworking and relocation of material, including the use of waste rock as fill for roads and mining infrastructure, could also cause a change in soil quality due to erosion, leaching or dust emission. These potential effects, although they could be minor, should have been presented and discussed in the impact study.

The risks associated with accidental spills are covered in section 11.2.5 of the main IS Report. Contamination risks associated with dust deposition are discussed in Appendix CEAA-136 of the CEAA's Responses to Questions and Comments document (WSP, December 2019b). The risks of waste rock leaching are assessed in Appendix 3-3 of Volume 3 of the Main EA Report and in Appendix G of the CEA Agency's Request for Information for the Concordance of the Environmental Impact Statement (WSP, February 2019a).

The effects caused by accidental spills are well documented by the proponent. More details are provided in the Accidents and Malfunctions section of this advice. The risks of surface soil contamination by metals and metalloids associated with the deposition of dust from the pit, roads and tailings pond appear to be low. Indeed, according to the information provided, the natural levels of metals and metalloids would be increased by less than 10% by the deposition of dust in the nearby area exposed to prevailing winds. According to the studies provided, the waste rock appears to be poorly leachable and therefore the effects on soil quality are estimated by the proponent to be low.

Based on the proponent's analysis of the project's residual effects on soil quality, the significance of the effect is estimated to be low or very low during the various phases of the mine. Overall, ECCC agrees with the proponent's assessment of the changes caused by the project on soil quality.

Mitigation Measures

3) **Among the mitigation measures presented by the proponent in relation to changes to the environment, please identify those that you consider to be key measures[13]. Please**

[13] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

propose corrective measures (if necessary) or recommend any other measures that you consider essential and that were not proposed by the proponent.

ECCC Response :

Current mitigation measures are presented in Section 5.2.3 of Volume 1 of the Main EA Report and in Appendix 32 of the Responses to CEAA Questions and Comments (WSP, December 2019b). Specific soil quality measures are also identified in Section 6.6.6 of Volume 1 of the main EA report.

Common mitigation measures associated with soil quality identified by the proponent are as follows :

- Perform maintenance on vehicles and other mobile machinery in the garage. If mobile equipment must be maintained on site, absorbent pads or other types of absorbent material will be put in place to prevent accidental spills.
- Limit the number of machinery refueling sites to a minimum to reduce the number of at-risk sites.
- Designing petroleum product transfer sites and opting for equipment and tanks that comply with good industrial practices.
- Delimit hazardous material storage areas to identify areas at risk of contamination.
- Carry out a pre-inspection and then regular inspection of the machinery and trucks used to ensure that they are in good condition, clean and free of oil leaks. Their exhaust and emission control systems will also be inspected and repaired as required.
- Store all hazardous materials in a designated area. The storage area for hazardous materials must be away from vehicular traffic and located at a reasonable distance from drainage ditches or sumps and any other sensitive elements.
- Dispose of residual materials in containers provided for this purpose. The site manager will ensure that the waste is recovered and deposited in authorized sites.
- Dispose of excess concrete or asphalt and water used to clean concrete mixers, vehicles and equipment in a designated area and in a manner that avoids contamination of the environment.
- Store waste temporarily in a single location.
- At the end of the work, clear the work areas of equipment, machinery parts, materials, temporary installations, waste, scrap, rubble and debris from the work. Redesigns and restores work areas to blend into the natural landscape (e.g., feathering and loosening soil; softening slopes). Scarify segments of abandoned roads or pathways. Use stored topsoil to cover areas. Seed right-of-way slopes to quickly stabilize them. Revegetate all areas that will not be useful for the operations phase.
- To reduce the risk of erosion on sloping terrain, use methods such as the installation of retaining embankments, swales or diversion ditches perpendicular to the slope, or other methods.
- Complete the restoration work by revegetation within one year of completion of the restoration work.
- Unless authorized, prohibit the movement of machinery outside the boundaries of work areas. At the beginning of the work, install a fence at the limit of the protective perimeter.

The fence must be maintained in place and in good condition throughout the duration of the work.

Although not specifically mentioned in section 6.6.6, the following common mitigation measures are also considered important by ECCC for soil quality:

- Keep stripping, clearing, excavation, backfilling and grading of work areas to a strict minimum to respect the natural topography and prevent erosion.
- Strip service areas and storage areas of excavated and backfilled materials and retain the organic soil layer to be replaced during site remediation.
- Ensure the training of workers assigned to the transfer and handling of bulk petroleum hydrocarbons.

In addition, although not identified as mitigation measures, the following practices presented in section 3.10.3 of Volume 1 of the main EA report and in responses CEAA-53, CEAA-55 (WSP, December 2019b) and CC47 (WSP, October 2020), are considered key by ECCC in mitigating the effects of the project on soil quality:

- Soil quality after the remediation phase should be of similar quality to the natural background levels established prior to the construction phase and adequate to allow for re-vegetation and future activities. The analytical parameters used to characterize the soils of the ore storage and transfer areas during the closure phase will be the same as those used for natural background grades. Certain organic parameters (e.g. C10-C50 petroleum hydrocarbons, PAHs and MAHs) may also be analyzed if it is suspected that machinery may have been subject to leaks.
- In the area of the ore stockpiles, in the event that certain areas have been contaminated, the soils will be characterized, excavated and then treated on site or in an authorized center. Ore transfer areas will also be characterized prior to remediation.

ECCC recommends that :

1) Closure phase characterization is performed for all inorganic and organic substances likely to be emitted or released by project activities, including tantalum;
2) Natural background levels be established for these substances as specified in the Guide de caractérisation physico-chimique de l'état initial des sols avant l'implantation d'un projet industriel (MELCC, 2016) for the establishment of background levels.

ECCC is of the opinion that if all mitigation measures identified by the proponent, as well as those recommended by ECCC, are implemented in a timely manner, the effects of the project on soil quality and associated risks will be minimized.

Monitoring [14]and follow-up programs [15]

[14] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[15] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

4) **Please identify in the monitoring program, the essential measures to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate changes to the environment. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.**

ECCC Response :

Not applicable.

5) **Please identify measures in the follow-up program that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate changes to the environment caused by the project. Please propose corrective measures (if necessary) or recommend any other measures you consider essential.**

ECCC Response :

Not applicable.

Valued Component: Greenhouse Gas Emissions

APPENDIX 2 - Valued Components Identified by the Committee for the Environmental Analysis of the Project

The environmental assessment report will address the assessment of effects on the following valued components :

- Transboundary effects - Greenhouse gas emissions

Reference state

1) **Is the baseline condition of each of the valued components adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where inaccuracies remain. Explain the extent to which they may influence the environmental analysis.**

ECCC Response :

The proponent did not provide any information on baseline conditions for greenhouse gas emissions.

[16]**Potential Environmental Effects**

2) **Have the potential environmental effects on each of the valued components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe**

[16] **Environmental effects** are those specified in Section 5 of the *Canadian Environmental Assessment Act* (2012).

the potential environmental effects that may or may not have been adequately identified.

ECCC Response :

Greenhouse gases are primarily generated by the combustion of fuels by vehicle engines, the production process, the use of explosives, the heating of buildings, generators and transportation associated with the project.

The GHG emissions for the entire project are summarized in Table 6-63 of the Main EI Report (WSP, March 2018a). Detailed calculations were presented first in Technical Note 2 NT-2 GHG Estimates (WSP, February 2018a) and then in Appendix K (WSP, February 2019a) and Appendix CEAA-72 (WSP, December 2019b) following requests for additional information from the Agency. The final version of the greenhouse gas emission estimate is presented in Appendix CEAA-72 (WSP, December 2019b). It takes into account all of the recommendations and comments made by the Joint Assessment Committee (JAC) during the environmental assessment.

Construction

The sources considered for the estimation of GHGs are :

- Diesel combustion by machinery.
- Generators and off-road vehicles used in site development and construction of operating facilities.
- Explosives used for construction.

Operation

The sources considered for the estimation of GHGs are :

- Diesel combustion by machinery and off-road vehicles used on the site to carry out operations.
- The combustion of natural gas in stationary sources such as combustion devices (furnaces and boilers) in production facilities.
- The use of explosives in extraction activities.
- Transportation of materials and consumables as well as personnel to the project site.
- GHG emissions due to the transportation of finished products to the Port of Trois-Rivières.

Indirect emissions associated with the use of electrical energy were also estimated.

Closing and restoration

The sources considered for the estimation of GHGs are :

- Diesel combustion by machinery and off-road vehicles used in the dismantling of operating facilities and site remediation.
- Emissions associated with the transportation of materials and consumables as well as personnel to the project site.

Total emissions would be 51,980 tonnes of CO2eq for the construction phase, 84,283 tonnes of CO2eq annually for the operation phase and 34,163 tonnes of CO2eq for the closure and remediation phase.

During mine operations, direct GHG emissions would represent 0.34% of the emissions from the Industry sector, of which the project is a part, and 0.1% of total emissions at the provincial level.

Mitigation Measures

3) Among the mitigation measures proposed by the proponent, please identify those that you consider to be key measures[17] . Please propose corrective measures (if necessary) or recommend any other measures that you consider essential to avoid or mitigate environmental effects that were not proposed by the proponent.

ECCC Response :

Greenhouse gas estimates and mitigation measures have been improved and developed in response to requests for information.

Several methods and practices are proposed in section 5 of the CEAA-72 Appendix to minimize GHG emissions during the construction and operation of the Rose mining project:

- Limitation of operation when motorized equipment is at a standstill;
- Use of motorized equipment in good working order;
- Use of energy efficient equipment, building and layout standards, procedures and operating procedures;
- Preferred use of electrical equipment in the operation of the mine;
- Review of energy conservation programs to reduce emissions;
- Eco-driving training for the drivers of the trucks that transport the ore from the pit to the crusher.
- Consider energy efficiency when purchasing new or replacement equipment by being up-to-date on the best available technologies on the market in terms of energy consumption;
- Use of biofuel such as biodiesel;
- Monitoring of fuel and electricity consumption.

ECCC believes that mitigation measures will reduce GHG emissions if rigorously applied. While all of the measures considered will contribute to reducing GHG emissions, the following mitigation measures are considered to be key:

- Use of electrical equipment whenever possible in the operation of the mine;
- Limitation of engine idling;
- Use of the most recent engines (Tier4);
- Use of energy efficient equipment, building and layout standards, procedures and operating procedures;

[17] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

- Eco-driving training for drivers of trucks transporting materials.

Residual environmental effects

4) Have the residual environmental effects (after the implementation of mitigation measures) for each of the valued components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual environmental effects that may or may not have been adequately identified.

5) What are, according to ECCC, the residual environmental effects of the project on each of the valued components?

6) Do the mitigation measures, including the follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures you feel are essential to avoid, mitigate, monitor or follow up on residual environmental effects.

ECCC Response :

The impact study did not address the residual environmental effects related to greenhouse gas (GHG) emissions.

While the above mitigation measures will reduce emissions, GHGs would be emitted during all phases of the project and would contribute to Canadian and global GHG emissions. Therefore, residual environmental effects are expected for this component.

Cumulative effects

7) Have the cumulative effects[18] on each of the valued components for which a residual effect remains adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which they may influence the environmental analysis.

8) Are the mitigation measures proposed by the proponent to avoid or mitigate cumulative effects adequate and sufficient? If not, please explain and propose alternative measures.

9) Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider to be key measures. Please propose remedial measures (if required) or recommend any other measures that you consider essential to avoid or mitigate cumulative effects that have not been proposed by the proponent.

ECCC Response :

The impact study did not address the cumulative effects related to greenhouse gas (GHG) emissions.

[18] **Cumulative Effects** : Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

While the above mitigation measures will reduce emissions, GHGs would be emitted during all phases of the project and would contribute to Canadian and global GHG emissions. Therefore, it is expected that the project will contribute to the cumulative effects related to GHG emissions.

Monitoring [19]and follow-up programs [20]

10) Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to diminish, avoid or mitigate the environmental effects on each of the valued components? Please justify your answer.

11) Please identify in the monitoring program the monitoring measures that are essential to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate environmental effects. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

ECCC Response :

See the section on mitigation measures.

12) Will the follow-up program verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project? Please justify your answer.

13) Please identify in the follow-up program the follow-up measures that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project. Please propose corrective measures (if required) or recommend any other measures you consider essential.

ECCC Response :

Not applicable.

Valued Component: Wetlands

APPENDIX 2 - Valued Components Identified by the Committee for the Environmental Analysis of the Project

Questions on the Valued Wetlands component for which ECCC has expertise

Reference state

[19] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[20] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

1) **Is the reference condition for the valued component adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where there are still inaccuracies. Explain the extent to which they may influence the environmental analysis.**

ECCC Response :

In general, ECCC is of the opinion that the baseline condition for the valued wetland component is adequately described in order to proceed with the environmental analysis of the project.

The proponent characterized the wetlands present in the study area in section 7.1.4.3 of the Main EA Report (WSP, March 2018a). Wetlands represent 30.5% of the natural environments in the study area. Eight classes of wetlands are present, with open bogs being the most abundant class (74.9% of wetlands).

The proponent has mapped the different wetlands present on its territory in Map 7.4 of the main EA Report (WSP, March 2018). The proponent assessed the ecological value of the wetlands in the study area in Sector Study RS-7 (WSP, February 2017d). Four wetlands were rated as having high ecological value, forty-three were rated as medium and four were rated as low.

SCCC wishes to clarify that the project will not be carried out in an area where wetland loss or degradation is at critical proportions (Environment Canada, 1996, Appendix 2).

The proponent also assessed the different ecological functions of wetlands in the study area in response to CEAA-80 (WSP, December 2019b). The Proponent described the habitat function for migratory birds in section 7.4.4.6 of the main EA report (WSP, March 2018a).

The description of the ecological functions of wetlands allows, in particular, to appreciate their role as habitat for avian fauna. ECCC notes, however, that the habitat function for species at risk has been treated summarily and that the socio-economic functions of wetlands have not been assessed.

The promoter specified that no floristic species of special status were detected during the vegetation inventories.

21Potential Environmental Effects

2) **Have the potential environmental effects for the valued component been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe the potential environmental effects that may or may not have been adequately identified.**

ECCC Response :

ECCC is of the opinion that the proponent has identified the main sources of impact and the main potential environmental effects (direct and indirect) of the project on wetlands.

The proponent identifies the effects of the project on wetlands and their functions in section 7.1.5 of the Main EA Report (WSP, March 2018) as well as in its response to CEAA-80 (WSP, December 2019b).

[21] **Environmental effects** are those specified in Section 5 of the *Canadian Environmental Assessment Act* (2012).

The proponent determined that the project would result in the loss of 173.55 ha of wetlands. The four wetlands with high ecological value would be affected by the project. Two of them would be completely destroyed since they are located within the footprint of the pit (WSP, February 2019b, Question QC-68).

The proponent also identified the modification of the surface water and runoff pattern, the risks of accidental oil spills, and the introduction and spread of invasive exotic species as potential effects of the project on wetlands.

The Proponent quantified the loss of wetlands that are frequented by migratory birds and estimated, for open bogs, that a maximum of 200 breeding pairs could be affected due to habitat loss.

Mitigation Measures

3) Among the mitigation measures proposed by the proponent, please identify those that you consider to be key measures[22] . Please propose corrective measures (if necessary) or recommend any other measures that you consider essential to avoid or mitigate environmental effects that were not proposed by the proponent.

ECCC Response :

ECCC considers avoidance of wetland work to be a key mitigation measure and the most effective one. The proponent states that it followed the "avoid-minimize-compensate" sequence with respect to wetlands in selecting the location of the various project components (WSP, March 2018a). ECCC is satisfied with the application of the avoid-minimize-compensate sequence that led the Proponent to select the location of the Project components in a manner that limited the permanent loss of wetlands and their functions.

ECCC is also satisfied with the mitigation measures proposed by the Proponent which are listed below. They are key measures to reduce the effects of the project on adjacent wetlands and to minimize the risk of contamination and spread of invasive alien species. (*see* section 7.1.6.1 of the main EA report [WSP, March 2018a], and response to CEAA Question 82 [WSP, December 2019b]):

- Maintain drainage conditions in wetlands adjacent to work areas;
- Where machinery must operate in a wet environment, use machinery with low ground pressure. Operate when the ground is frozen or during periods of low water conditions;
- Apply measures to limit the risk of oil spills;
- Implement measures to limit the spread of invasive alien species;
- In the closure phase, restore natural drainage and stream banks.

<u>Compensation</u>

The proponent has committed, in response to CEAA-81 (WSP, December 2019b) and EAC-48 (WSP, October 2020 and WSP, December 2020), to compensate for wetland losses. The

[22] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

preliminary wetland compensation plan is presented in Appendix CEE-48 (WSP, October 2020). The Proponent proposes to develop a mosaic of wetland and terrestrial areas in 5 former borrow pits in the Project area. The area of the developed wetlands would be a minimum of 42.1 ha. The Proponent justifies the compensated area by the fact that there would be few options for restoring or creating wetlands in the project area and that the wetlands created will have greater ecological value than those that will be destroyed.

ECCC highlights the proponent's commitment to compensate for the loss of wetland functions. ECCC is of the opinion that the implementation of compensatory measures would meet the objectives of the Federal Policy on Wetland Conservation (FWCP) and compensate for the loss of function, including the loss of habitat for migratory birds and species at risk.

- ECCC recommends that a detailed version of the wetland loss compensation plan be developed as soon as possible and prior to the start of construction. The detailed compensation plan should include
- Clearly demonstrate how the compensation plan will meet the objective of reducing the loss of wetland function, specifying the functions that will be compensated and the balance of losses after compensation.
- Identify and justify the performance indicators that will make it possible to evaluate the success of the compensation measure and, identify additional measures that could be implemented in the event that the performance indicators are not met.
- Demonstrate that the sustainability of the compensation will be ensured over time.
- Be submitted to the Agency and Competent Authorities as soon as possible for review and comment.

ECCC believes that the compensation measure should be implemented before the loss of wetlands occurs as recommended by the ECCC Operational Framework for the Use of Conservation Allowances (2012).

Residual environmental effects

4) Have the residual environmental effects (after the implementation of mitigation measures) for the valued component been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual environmental effects that may or may not have been adequately identified.

ECCC Response :

ECCC is of the opinion that the residual environmental effects of the project on wetlands have been adequately identified and documented by the proponent. The assessment of the significance of the residual environmental effects on wetlands is presented in section 7.1.7 of the Main EA Report (WSP, March 2018a).

5) What are, according to ECCC, the residual environmental effects of the project on each of the valued components?

ECCC Response :

According to the proponent, significant effects on wetlands are expected for mining facilities (pits, stockpiles, roads, etc.) and pit operations. However, ECCC considers that these effects will be mitigated by the compensation project proposed by the proponent.

6) **Do the mitigation measures, including the follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures you feel are essential to avoid, mitigate, monitor or follow up on residual environmental effects.**

ECCC Response :

Taking into account the mitigation measures that the proponent commits to implement, ECCC is of the opinion that the mitigation measures planned by the proponent (proponent's commitments), including the implementation of a compensation plan submitted for review by the competent authorities, will make it possible to minimize the residual environmental effects of the project on wetlands.

However, ECCC emphasizes that because of the uncertainties inherent in the implementation of any wetland compensation project, it should include a follow-up program that will allow, if necessary, to identify the corrective measures that may need to be implemented, as mentioned by the proponent in Appendix CCE-48.

Cumulative effects

7) **Have the cumulative effects[23] on each of the valued components for which a residual effect remains adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which they may influence the environmental analysis.**

ECCC Response :

The proponent has assessed cumulative effects on wetlands in response to CEAA-82 (WSP, December 2019b). The Proponent assessed the residual cumulative impact on wetlands as moderate (not significant), due to the abundance of wetlands in the Project area and existing compensation programs that offset, in part, wetland losses caused by past and present projects.

CCCT considers the analysis of cumulative effects for wetlands to be very sketchy. The proponent did not support its cumulative effects analysis for this component on a baseline condition or on the consideration of past, present and future events. It is therefore difficult to make a judgment on the significance of potential cumulative effects.

However, CSCT believes that special attention should be paid to wetlands since, according to the Implementation Guide for Federal Land Managers (Appendix 2), the project is located in an area where wetland losses are deemed to be moderate.

[23] **Cumulative Effects** : Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

8) Are the mitigation measures proposed by the proponent to avoid or mitigate cumulative effects adequate and sufficient? If not, please explain and propose alternative measures.

ECCC Response :

No additional mitigation or environmental follow-up measures have been proposed to mitigate cumulative effects on this component.

9) Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider to be key measures. Please propose remedial measures (if required) or recommend any other measures that you consider essential to avoid or mitigate cumulative effects that have not been proposed by the proponent.

ECCC Response :

Not applicable

Monitoring [24]and follow-up programs [25]

10) Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to diminish, avoid or mitigate the environmental effects on each of the valued components? Please justify your answer.

11) **Please identify in the monitoring program the monitoring measures that are essential to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate environmental effects. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential**.

ECCC Response :

The proponent indicates in section 7.1.8 of the main EA Report (WSP, March 2018a) that an environmental monitoring program will be implemented to ensure compliance with applicable laws, policies (including the CTFP) and regulations, the proponent's commitments and obligations, the plans and specifications, and the various mitigation measures proposed to minimize effects on wetlands.

ECCC is satisfied with the proponent's commitment to integrate wetland monitoring into the environmental monitoring program. The monitoring program should also aim to quickly identify unanticipated sources of potential effects that may occur, such as encroachment or spills resulting from accidents or malfunctions.

12) Will the follow-up program verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project? Please justify your answer.

[24] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[25] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

13) Please identify in the follow-up program the follow-up measures that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project. Please propose corrective measures (if required) or recommend any other measures you consider essential.

ECCC Response :

The proponent proposes in section 7.1.8 of the main IS Report (WSP, March 2018a) a follow-up on invasive alien species in the areas that will be restored and revegetated at the end of construction.

The proponent has also committed to carry out a follow-up of the compensation during the first 5 years following the work and has presented the main objectives of the compensation (WSP, October 2020, Appendix CCE-48). ECCC is satisfied with the proponent's commitment to carry out a follow-up program on the wetlands that will be compensated or restored. However, ECCC is of the opinion that the duration of the monitoring could be reviewed and adjusted based on the results obtained.

ECCC recommends developing and implementing a monitoring program for wetlands at and near the mine site to verify the accuracy of the environmental assessment predictions and to ensure the effectiveness of mitigation measures.

ECCC recommends that the wetlands follow-up program be submitted as soon as possible to the Agency and the competent authorities for comments, including the MELCC (which also has expertise on wetlands) in order to review the objectives, methodology, performance indicators and duration required to adequately assess the effectiveness of the mitigation or compensation measures that will have been implemented for wetlands.

ECCC believes that monitoring of invasive alien species in restored wetlands should also be conducted after the closure phase.

Federal Policy on Wetland Conservation[26] (the Policy)

14) Is the project located in an area where wetland loss or wetland functions require special measures[27]?

ECCC Response :

Based on the information available to us, the project would be located in an area where wetland loss and degradation is considered to be moderate (Environment Canada, 1996, Appendix 2). For this reason, ECCC is of the opinion that special care should be taken to limit any additional losses in this region.

15) Is the project likely to affect wetlands designated as ecologically or socio-economically important to a region[28]?

[26] Government of Canada (1991). The Federal Policy on Wetland Conservation. 16 pages

[27] As defined in: Environment Canada, 1996. The Federal Policy on Wetland Conservation: Implementation Guides for Wetland Managers. 26 pages and appendices

[28] From : Environment Canada, 1991. The Federal Policy on Wetland Conservation. 15 pages.

ECCC Response :

No, not to our knowledge.

16) Should the committee require the sponsor to have no net loss of function? Please explain.

ECCC Response :

See our response in the mitigation measures section.

17) Explain how the proponent has applied the "avoid - minimize - compensate" mitigation sequence. If deficiencies are identified, please describe them and identify measures that could be put in place to address them.

ECCC Response :

See our response in the mitigation measures section.

18) As a result of your analysis, is compensation for wetland functions necessary? If compensation is necessary, will the preliminary compensation plan presented by the proponent be able to compensate for the net loss of wetland function? Please explain.

ECCC Response :

As the proponent has already committed to compensating for wetland losses, ECCC has no further recommendations to make (see the responses to the sections on mitigation and cumulative effects for more details).

Valued Component: Birds including migratory birds and avian species at risk

APPENDIX 2 - Valued Components Identified by the Committee for the Environmental Analysis of the Project

The environmental assessment report will address the assessment of effects on the following valued components :

- Migratory birds and birds at risk and their habitat, including the effects of blasting on geese and the success of goose harvesting, taking into account the proponent's proposed measure to limit the effects during goose hunting periods (the proponent commits to reducing the number of blasts from seven to three during goose hunting periods)

Reference state

1) Is the baseline condition of each of the valued components adequately and sufficiently described and documented? Please explain your response and identify any gaps or

areas where inaccuracies remain. Explain the extent to which they may influence the environmental analysis.

ECCC Response :

In general, ECCC is satisfied with the description of the use of the study area by avian fauna. The abundance and use of the study area by birds during the different periods of the year were adequately described in order to proceed with the environmental analysis of the project.

The Proponent presented the baseline status of the migratory birds and avian species at risk component in section 7.4 of the main IA Report (WSP, March 2018a). The Proponent has developed a portrait of the avifauna for each of the major bird groups using different existing data sources, data from inventories conducted in 2012 and 2016, and incidental observations made during field work. The proponent described the bird species that are likely to frequent all the habitats present in the study area during the different periods of the year (winter, spring and fall migration and nesting period) and provided abundance indices.

ECCC is also satisfied that the proponent has paid attention to species at risk potentially present in the study area and has conducted specific inventories for some of them when required.

The proponent assessed the potential for the recovery of avian species at risk in the study area in section 7.4.4.7 of the main IS Report (WSP, March 2018a) and mapped the potential habitats for these species. Nesting American Nighthawk and Short-eared Owl were confirmed in the Study Area, while Olive-sided Flycatcher, Rusty Blackbird and Canada Warbler are considered potentially breeding species, although they were not inventoried during the breeding season (WSP, March 2018a, page 7-106).

Based on the information presented, ECCC confirms that no critical habitat for avian wildlife at risk is present in the project area.

For avian species that are not protected by the *Migratory Birds Convention Act, 1994* (MBCA) (e.g. birds of prey) and more particularly for those that also have a species at risk status under the *Species at Risk Act* (SARA) (Short-eared Owl and Rusty Blackbird), ECCC suggests that the Agency consult the Quebec Ministry of Forests, Wildlife and Parks (MFFP), which is responsible for their management and protection in Quebec.

[29]**Potential Environmental Effects**

2) Have the potential environmental effects on each of the valued components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe the potential environmental effects that may or may not have been adequately identified.

ECCC Response :

ECCC is of the opinion that all potential environmental effects (direct and indirect) of the project on this valued component have been adequately identified and documented by the proponent.

The Proponent presented the potential effects of the Project during the construction, operation and closure phase on the various groups of migratory birds and on avian species at risk in section

[29] **Environmental effects** are those specified in Section 5 of the *Canadian Environmental Assessment Act* (2012).

7.4.5 of the main EA report (WSP, March 2018a) as well as in the answers to questions CEAA-84, CEAA-87, CEAA-88 and CEAA-89 (WSP, December 2019b) and EAC-49 (WSP, October 2020).

The proponent determined the losses of each major breeding habitat type and estimated the number of breeding pairs affected by these losses.

The proponent has also determined that nest destruction, disturbance by noise (blasting, transportation, use of equipment, etc.), light and dust emission, collision mortality risks, as well as risks of accidental oil spills and contamination could be potential effects of the project on avian fauna.

ECCC would like to point out that, in general, losses of nesting and feeding habitat also have potential effects on birds, especially on breeding pairs that will have to relocate to similar habitats nearby. When similar habitats become more scarce, this can lead to an increase in the density of birds in the same habitat, leading to resource scarcity and increased predation. In general, habitat destruction and degradation contributes directly or indirectly to the decline of some more vulnerable species. Some pairs of birds will succeed in establishing themselves elsewhere, while others will not, given their greater vulnerability to disturbance of their breeding habitat, intra- and interspecific competition or predation.

ECCC is satisfied with the information provided by the proponent to document the potential effects of the project on avian species at risk. ECCC notes that for the Common Nighthawk, Short-eared Owl, Olive-sided Flycatcher, Rusty Blackbird and Canada Warbler, the recovery documents identify habitat loss or degradation on the breeding grounds as a potential threat to the recovery or survival of these species.

Furthermore, for avian species at risk, the proponent has demonstrated that potential habitats for these species that will be lost or disturbed by the project are available elsewhere in the area (WSP, March 2018a).

Mitigation Measures

3) Among the mitigation measures proposed by the proponent, please identify those that you consider to be key measures[30] . Please propose corrective measures (if necessary) or recommend any other measures that you consider essential to avoid or mitigate environmental effects that were not proposed by the proponent.

ECCC Response :

The Proponent presented in section 7.4.6 of the main EA Report (WSP, March 2018a) the mitigation measures it proposes to implement in order to minimize the effects of the Project on avian fauna and their habitat. An update of the mitigation measures that the proponent commits to implement in order to prevent and minimize adverse effects on migratory birds and avian species at risk is presented in response to questions CEAA-85, CEAA-87, CEAA-89 (WSP, December 2019b) and EAC-49 (WSP, October 2020).

ECCC is generally satisfied with the mitigation measures proposed by the proponent and listed below. These are key measures to reduce the effects of the project on birds and their habitats:

- Implement measures to protect migratory bird habitat (e.g., limit deforestation to work

[30] **Key Measures** : Mitigation measures that are essential to avoid or mitigate environmental effects and that could be made into conditions under CEAA, 2012

areas).

- To carry out, as much as possible, the deforestation outside the nesting period, between May 30 and August 15 in order to prevent the destruction of nests.
- Ensure that no nests are present in the work area, in the event that work is carried out during the nesting period.
- Implement protective measures in the event of the discovery of nests in the work area.
- Apply noise and brightness reduction measures.
- Implement a contingency plan to prevent the use of the accumulation basin by migratory birds.
- Restore the middle at the end of the work.

ECCC recommends that the proponent consider ECCC's *Risk Reduction Guidelines for Migratory Birds.* The measures that the proponent will implement must be consistent with the Migratory Birds *Convention Act*, the *Migratory Birds Regulations* and the *Species at Risk Act*. It is important that measures be put in place to avoid adverse effects on birds, their nests or eggs during all phases of the project and particularly during the period from late April to early September. General bird nesting periods are determined using the best information available. However, since these dates often apply to a large area, i.e. the Upper Rupert Plateau Ecodistrict, it is possible that locally the nesting period may begin and end earlier or later than the dates used due to microclimatic conditions specific to certain locations, or due to interannual climatic variations (e.g. early spring, cold and rainy summer).

Nesting period

For species at risk, ECCC recommends taking into account the specific nesting periods of each species in order to target activities that may be detrimental to the species.

ECCC reiterates that the best way to avoid adverse effects on migratory birds (i.e. injury, killing or disturbance of migratory birds, or destruction and disruption of their nests and eggs) is to carry out the work outside the nesting period. Since the proponent has not committed to carrying out site preparation work, including clearing and brushing, outside the nesting period, a risk of causing negative effects on migratory birds persists, particularly if such work is carried out during the nesting period.

If deforestation is to occur during the nesting period, ECCC recommends that active nest searching should not be undertaken unless nests are easily located. This is because nest seekers may disturb or stress nesting birds. Also, in most habitats, the probability of locating all nests in a given search area is low or non-existent. To determine if migratory birds are nesting in an area at a particular time, non-intrusive monitoring methods should be considered to avoid disturbing migratory birds while nesting (e.g., listening stations).

If nests were found in the work area, ECCC recommends that a protection zone be established around the nest until nesting is complete. It is important to note that birds react differently depending on the level of disturbance. This level can be determined by considering the intensity, duration, frequency and proximity of the activity, but also the cumulative effect of all activities in the vicinity of the nest. Thus, protection distances must take into account this interaction between factors, being more extensive for types of activities that are likely to cause greater disturbance. In particular cases, specific recommendations or requirements may apply and may be found in documents such as recovery strategies for species at risk or other official documents.

Light, noise, dust

ECCC is satisfied with the proposed mitigation measures to reduce the effects of noise, light and dust.

Accumulation basins

ECCC is of the opinion that the development and implementation of a contingency plan in the event that migratory birds use the pond is an appropriate measure to avoid contamination. ECCC recommends that the proponent consider ECCC's beneficial management practices in developing its response plan.

Catering

ECCC is satisfied with the proponent's commitment to restore the site at the end of the project. However, ECCC recommends that site restoration be carried out in a phased manner, as the disturbed areas are no longer used. Furthermore, ECCC recommends that site restoration should focus on the creation of habitat favourable to avian species at risk present or potentially present in the project area at the time of restoration.

Residual environmental effects

4) Have the residual environmental effects (after the implementation of mitigation measures) for each of the valued components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual environmental effects that may or may not have been adequately identified.

ECCC Response :

The Proponent presented the assessment of the Project's residual effects on migratory birds in section 7.4.7 of the main IA Report (WSP, March 2018a). An update of the analysis of residual effects was presented in response to CEAA-34 (WSP, December 2019b). The Proponent concludes that the residual effects of the Project on the avian wildlife component are insignificant, and significant for avian species at risk.

ECCC believes that the analysis of residual effects should have been done by bird group and species for migratory birds that have a species at risk status.

5) What are, according to ECCC, the residual environmental effects of the project on each of the valued components?

ECCC Response :

The implementation of the mitigation measures listed above will help reduce the negative effects of the project on birds. Furthermore, ECCC is of the opinion that residual effects will remain due to disturbance caused by noise (blasting, transportation, use of equipment, etc.), light, loss, modification or alteration of habitat, as well as mortality caused by collisions and other causes.

6) **Do the mitigation measures, including the follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures you feel are essential to avoid, mitigate, monitor or follow up on residual environmental effects.**

ECCC Response :

ECCC is of the opinion that the mitigation measures outlined above will reduce the effects of the Project on migratory birds, particularly for healthy and resilient populations, provided that all the mitigation measures outlined above are put in place in a timely manner.

For avian species at risk considered by the Proponent, ECCC is of the opinion that the mitigation measures outlined above will reduce the effects of the Project on these species or their habitat. Given that these are species with a wide distribution in Quebec, and according to the information provided by the proponent, these species are not very common in the project area, and there is a potential availability of breeding habitat at the regional level.

Cumulative effects

7) **Have the cumulative effects[31] on each of the valued components for which a residual effect remains adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which they may influence the environmental analysis.**

8) **Are the mitigation measures proposed by the proponent to avoid or mitigate cumulative effects adequate and sufficient? If not, please explain and propose alternative measures.**

9) **Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider to be key measures. Please propose remedial measures (if required) or recommend any other measures that you consider essential to avoid or mitigate cumulative effects that have not been proposed by the proponent.**

ECCC Response :

The proponent has identified migratory birds as a valued ecosystem component. For the purposes of its analysis of cumulative effects, the proponent considered the priority and stewardship bird species of the Bird Conservation Region (BCR) 8 of Quebec as well as the 5 species at risk present or potentially present in the project's area of influence. The analysis of cumulative effects on migratory birds and avian species at risk is presented in sections 10.7.2 and 10.7.3 of the main IA Report (WSP, March 2018a). The proponent considered the baseline condition, as well as past, present and future projects, actions and events in the study area. The proponent concludes

[31] **Cumulative Effects** : Cumulative effects are defined as changes to the environment caused by the project in combination with other past, present and reasonably foreseeable future work or projects.

that there will be no significant cumulative effects on migratory birds and avian species at risk and considers that no additional mitigation measures are required to offset cumulative effects on migratory birds.

ECCC considers the proponent's analysis of cumulative effects for migratory birds and species at risk to be summary. It is therefore difficult to make a statement on the significance of cumulative effects on this component.

Given the uncertainties as to the reasons for the decline of avian species at risk, any additional losses or changes in habitat are likely to have an effect on these species. The activities of the Rose Mine project as well as past, present and future projects, actions and events identified by the proponent may have cumulative effects on the nesting habitat of species at risk (modification and loss of habitat) as well as on the nesting activities of these species (disturbance due to the presence of infrastructures and activities). Even if habitats are present in abundance in the vicinity of the project, the accumulation, over time, of residual effects may reduce the availability of quality habitats for species, thus increasing intra- and inter-specific competition.

However, due to the abundance of habitat on a regional scale, ECCC is of the opinion that the Rose Mine Project is not expected to contribute significantly to the cumulative effects associated with the loss or degradation of breeding or migration habitat for migratory birds and avian species at risk.

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

Monitoring [32]and follow-up programs [33]

10) Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to diminish, avoid or mitigate the environmental effects on each of the valued components? Please justify your answer.

11) Please identify in the monitoring program the monitoring measures that are essential to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate environmental effects. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

ECCC Response :

In response to question CEAA-85 (WSP, December 2019b), the proponent proposes to monitor the work to ensure that the activities do not result in the destruction of migratory bird nests or eggs. Thus, if the clearing work is planned during the nesting period, the proponent plans to carry out an inspection of the areas to be cleared before they are authorized.

[32] **Monitoring Program**: The objective of a monitoring program is to ensure that appropriate measures and controls are in place to reduce the potential for environmental degradation during all phases of project development, and to provide clear action plans and emergency response procedures to protect the health and safety of humans and the environment.

[33] **Follow-up Program**: The purpose of a follow-up program is to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project.

The proponent is also planning a training and awareness program for employees on the presence of migratory bird nests and the measures to be implemented in the event that the nest is discovered.

ECCC recommends that the development of the monitoring program be completed and submitted prior to the start of construction. The monitoring program should not be limited to deforestation activities only, but should include all activities or operations that may affect birds and avian species at risk during all 3 phases of the project. For each activity, the proponent should determine the measures to be implemented to ensure that nuisance or disturbance is reduced, particularly during the nesting period. The monitoring program should pay particular attention to bird species at risk, especially the Common Nighthawk, which is likely to use the bare vegetation areas in the project area.

ECCC is satisfied with the proponent's commitment to implement a worker awareness program as this is an important aspect of monitoring during construction and operations and during remediation activities.

ECCC recommends that the monitoring program be updated periodically to take into account changes in regulations, such as the review of the status of wildlife species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or SARA. Indeed, these amendments may require additional measures to mitigate the effects of the project on species whose status changes.

12) Will the follow-up program verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project? Please justify your answer.

13) Please identify in the follow-up program the follow-up measures that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project. Please propose corrective measures (if required) or recommend any other measures you consider essential.

ECCC Response :

In response to question CEAA-90 (WSP, December 2019b), the proponent proposes to conduct a follow-up at the beginning of the operation and closure period in order to validate the presence and use of the area around the project by species of special status. According to the proponent, the objective of the follow-up would be to determine the composition and abundance of birds nesting on the periphery of the infrastructures. Thus, it proposes to carry out monitoring from the first year of operation of the mine and every 5 years thereafter. During the closure phase, an inventory specific to the Common Nighthawk would be carried out to evaluate the use of the waste rock pile, the filtered tailings park and the overburden pile by this species.

The proponent also committed, in response to question CEAA-85 (WSP, December 2019b), to develop a specific response plan due to the risks of contamination of migratory birds using the accumulation basin, notably through the installation of recognized scaring equipment.

ECCC is of the view that the information submitted by the proponent on the follow-up program is summary in nature, and that a more detailed version should be developed and submitted prior to the commencement of construction. The follow-up program should verify the accuracy of the environmental assessment conclusions and the effectiveness of mitigation measures. In addition, the follow-up program may serve as a basis for adaptive management, where appropriate.

ECCC is also of the opinion that the monitoring program should also cover the construction phase and that pre-project inventories may be required to establish adequate and up-to-date baseline values since the last inventories were conducted in 2016.

ECCC is satisfied with the proponent's commitment to monitor the use of habitats peripheral to the project by avian fauna at risk.

In addition, due to the uncertainties associated with the use of restored sites by avian wildlife and more specifically by avian species at risk, ECCC recommends that monitoring of restored areas target all species at risk present or potentially present in the study area at the time of restoration. The duration of monitoring should be long enough to allow the habitat to become suitable for these species again and thus avoid inventorying habitat at too young a stage of development.

ECCC also recommends that the monitoring program include, during the operational phase, a follow-up program to monitor the use of the pond by migratory birds to ensure the effectiveness of the measures provided for in the response plan that will have been implemented.

Impacts on the Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples

14) Based on your mandates and expertise, does ECCC have concerns about the project's impact on the current use of lands and resources for traditional purposes by Aboriginal peoples? If so, please explain your concerns and identify any gaps or areas of uncertainty.

a. the effects of blasting on geese and the success of goose harvesting, taking into account the measure proposed by the proponent to limit the effects during goose hunting periods (the proponent commits to reducing the number of blasts from seven to three during goose hunting periods).

ECCC Response :

ECCC does not have all the expertise and information necessary to adequately assess the effects of blasting on goose hunting success in the study area and to determine the frequency or number of blasts to limit the effects on an activity such as subsistence hunting. A priori, the noise and vibrations generated by blasting are likely to frighten and scare away the birds that would be in the vicinity of the blast, and this during all seasons, including the hunting season.

In addition to the frequency or number of blasts, we believe that other elements or variants should be considered in assessing the effects of blasting on migratory birds and the potential impact on hunting success (e.g., proximity to water bodies, where geese congregate, distance between the geese and the blasting site, location of hunting sites, power of the blasting charge, abundance and annual productivity of geese, climatic conditions, tolerance and acclimatization of geese to noise, etc.).

Since much of this information is held by the tallyman as well as the proponent, we suggest that consideration be given to setting up an information exchange and discussion mechanism between the parties to promote the development of a protocol or measures to minimize the effects of blasting on hunting success.

Valued Component: Other Species at Risk

APPENDIX 2 - Valued Components Identified by the Committee for the Environmental Analysis of the Project

The environmental assessment report will address the assessment of effects on the following valued components :

- Other species at risk, their residence and habitat (excluding fish), including effects on caribou recovery in the Human Environment Study Area, to assist the committee's analysis of the ability of the Cree Nations to resume caribou hunting in the future.

Reference state

1) Is the baseline condition of each of the valued components adequately and sufficiently described and documented? Please explain your response and identify any gaps or areas where inaccuracies remain. Explain the extent to which they may influence the environmental analysis.

ECCC Response :

ECCC is satisfied with the description of the use of the study area by terrestrial species at risk. The abundance and description of the use of the study area by species at risk during the different periods of their life cycle have been adequately described in order to proceed with the environmental analysis of the project.

According to the information provided by the proponent in the main EA report (WSP, March 2018a), five species at risk are likely to frequent the study area, namely the Little Brown Bat, the Northern Bat, the Woodland Caribou, Boreal Population, the Eastern Migratory Caribou and the Wolverine.

Endangered Chiropterans (Little Brown Bat and Northern Bat):

The Proponent presented the baseline status of the chiropteran at risk component in section 7.7.4. of the main EA Report (WSP, March 2018a) and in response to CEAA-90 (WSP, December 2019b) and QC-76 (WSP, February 2019b). The chiropteran endangered chiropteran land use profile was developed using various existing data sources and inventory data. According to the proponent, no maternity or hibernacula are known within a 10-km radius of the mining project.

The description of chiropteran land use is satisfactory and ECCC has no specific comments on this component.

Woodland Caribou, Boreal Population and Eastern Migratory Caribou :

The Proponent presented the baseline status for woodland caribou and migratory caribou in section 7.6.4 of the main EA report (WSP, March 2018a) and in response to questions CEAA-91 and CEAA-93 (WSP, December 2019b).

The land-use profile of these two species at risk was drawn up using data from Quebec government inventories as well as scientific articles and reports.

Woodland Caribou :

The proponent indicates that the project is located in the Quebec (QC-6) range of boreal caribou, where the rate of habitat disturbance is estimated at 30% and the population is likely to be self-sustaining (Recovery Strategy 2012).

According to the promoter, the Rose mining project is located in an area where the disturbance rate is already 99% within a 5-km radius of the project, of which 31% would be natural disturbances (WSP, March 2018).

Habitats with the biophysical characteristics required by the boreal caribou to carry out their life processes have been identified and illustrated on maps 7-18 to 7-21 (WSP, March 2018a). ECCC is of the opinion that the proponent has correctly interpreted the various critical habitat components identified in the recovery strategy. The biophysical characteristics required by the boreal caribou to carry out its vital processes have been identified and are relevant to the context of the Quebec population (QC-6). Indeed, this local population is located in the ecoregions of the Boreal Shield (central) and the classes selected by the proponent to establish potential habitat (large-scale, calving and wintering) are consistent with the biophysical characteristics identified in Table H-4c of the Recovery Strategy (ECCC, 2020).

According to the Progress Report on the Implementation of the Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada, 2012-2017, the rate of disturbance in the QC-6 range is estimated at 32%. The local Nottaway population, found in the project area, numbers more than 100 individuals and is in decline (Environment Canada, 2017).

Migratory Caribou :

It should be noted that COSEWIC has recommended, in 2017, the status of endangered species for the Eastern Migratory Caribou population. ECCC is of the opinion that the assessment of the baseline status for the migratory caribou is satisfactory, albeit succinct. ECCC notes that, according to the proponent, the study area is located at the edge of the historical range of migratory caribou and considers the presence of Leaf River herd caribou in the project area to be marginal.

Wolverine :

The proponent submitted the reference condition for wolverine in response to CEAA-96 (WSP, December 2019b). The wolverine land-use profile was developed using various existing data sources. According to the proponent, the probability of finding this species in the study area is low.

Although summary, the description of the wolverine's land use is satisfactory. Due to the absence of recent confirmed sightings of individuals, considerable uncertainty remains as to the persistence of the wolverine population in Quebec. In this context, although the project is located within the species' range, potential habitats and potential food sources for the species are in the project area, its presence is unlikely.

For this reason, the proponent has not identified specific mitigation measures for wolverine and ECCC will not provide advice on this species in subsequent sections.

Potential environmental effects5

2) Have the potential environmental effects on each of the valued components been adequately identified and documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe the potential environmental effects that may or may not have been adequately

identified.

ECCC Response :

Endangered Chiropterans (Little Brown Bat and Northern Bat):

The Proponent presents the potential effects of the Project on chiropterans at risk in section 7.7.5 of the Main EA Report (WSP, March 2018a) as well as in response to CEAA-90 (WSP, December 2019b).

According to the proponent, habitat loss and fragmentation, disturbance (noise, light and vibration), risks of collision, risks of accidental spills of contaminants in the feeding sites, the presence of contaminants in the accumulation basin, are the potential effects of the project on this component.

ECCC is satisfied with the analysis of the effects of the project on the Little Brown Bat and the Northern Bat and their habitat. The identification and description of potential effects appear to be complete and consistent with the threats identified in the recovery strategy (ECCC, 2018).

Woodland Caribou and Migratory Caribou:

The Proponent presents the potential effects of the Project on Boreal Caribou and Migratory Caribou in section 7.6.5 of the Main EA Report (WSP, March 2018a) as well as in response to questions CEAA-94 to CEAA-96 (WSP, December 2019b) and CEE-51 (WSP, October 2020).

According to the proponent, the potential effects of the project for all phases are habitat loss, degradation and fragmentation, disturbance (noise and light), and risk of collision fatalities. Losses of habitat with the biophysical characteristics required by the boreal caribou to carry out its life processes were quantified in section 7.6.5.1 of the main EA report (WSP, March 2018a). Total habitat loss for caribou is estimated at 41.43 ha.

Woodland caribou:

ECCC is satisfied with the assessment of the effects of the project on Woodland Caribou and their habitat. The identification and description of the effects potentially induced by the project appear to be complete and consistent with the threats identified in the recovery strategy (ECCC, 2020).

The population and distribution objectives identified in the recovery program are to maintain existing self-sufficient local populations at their current state. According to the Boreal Caribou Recovery Progress Report, the rate of disturbance in the Quebec (QC-6) range has increased over the past 5 years from 30% to 32% (ECCC, 2017). The recovery strategy sets a minimum 65% undisturbed habitat as the threshold for disturbance management that would allow a local population to be self-sustaining. The local population of Quebec Boreal Caribou (QC-6) is therefore considered self-sufficient.

Due to the nature of the critical habitat of the Boreal Caribou, the precise location of this 65% undisturbed habitat within each range will vary over time. This habitat availability and arrangement should be such that boreal caribou can move throughout their range to access the required habitat when they need it. The key element of this designation is the achievement and maintenance of a continuous overall range status that ensures a dynamic system of habitat availability and biophysical characteristics that the boreal caribou require to function. It is this dynamic system that provides the habitat status necessary for boreal caribou recovery.

As described in the Boreal Caribou Recovery Strategy, range plans are expected to be developed by the appropriate authorities responsible for land and natural resource management. No range

plan for the local Quebec population (QC-6) or equivalent document has been developed by the Government of Quebec to date.

Migratory Caribou :

The proponent very briefly assessed the effects of its project on migratory Caribou. However, ECCC expects the effects of the project to be similar to the effects described by the proponent for boreal caribou. Thus, the remainder of ECCC's advice will focus on Woodland Caribou.

Mitigation Measures

3) Among the mitigation measures proposed by the proponent, please identify those that you consider to be key measures6. Please propose corrective measures (if required) or recommend any other measures that you consider essential to avoid or mitigate environmental effects and that have not been proposed by the proponent.

ECCC Response :

Endangered Chiropterans (Little Brown Bat and Northern Bat):

The Proponent presented its proposed mitigation measures for chiropterans in section 7.7.6 of the main EA report (WSP, March 2018a), as well as in response to CEAA-90 (WSP, December 2019b). In addition to the standard measures for the protection of terrestrial vegetation and wetlands and for noise and light management, the proponent plans to implement specific mitigation measures for chiropterans, namely :

- Carry out deforestation, if the schedule permits, outside the chiropteran breeding season;
- Before dismantling a building, check if it is used by chiropterans. If so, preserve the building or install a protection zone. Dismantle the building after the chiropteran breeding period and install a new shelter nearby.

ECCC is of the opinion that the mitigation measures proposed by the Proponent are appropriate. However, ECCC is of the opinion that deforestation outside of the breeding period of these species is a key mitigation measure to avoid injuring, killing or disturbing chiropterans.

The potential for resting habitats such as maternity colonies or resting sites for males was not assessed in the forested areas of the study area. Indeed, forested areas with snags could provide this type of summering habitat, which is of great importance for the life cycle of chiropterans. The recovery strategy (ECCC, 2018) identifies the destruction or degradation of resting habitats as a threat to the recovery of these species. Since the proponent has not committed to carrying out the deforestation work outside the breeding period, ECCC considers that the project is likely to have negative effects on chiropterans, despite the monitoring proposed by the proponent.

Woodland caribou:

The mitigation measures that the proponent commits to implement for Woodland Caribou are presented in section 7.6.6 of the main EA Report (WSP, March 2018a). Specific mitigation

measures for the effect of noise on caribou have been updated in response to question CEC-51 (WSP, October 2020 and WSP, December 2020).

The main mitigation measures identified by the proponent in order to reduce the impacts on woodland caribou and their habitat are :

- Apply measures to protect terrestrial vegetation (e.g. limit deforestation to work areas) and wetlands.
- Apply noise and light reduction measures.
- Develop a training module for employees and subcontractors.
- Set up a communication system to report the presence of caribou near the mine.
- Develop and implement an action plan in the event of the presence of caribou near the mine.
- Restore, during the closure phase, areas disturbed by resinous species to avoid the phenomenon of colonization by deciduous species.

ECCC is satisfied that the proponent plans to develop and implement an action plan to minimize the effects of the project on individuals and considers this to be a key measure. However, ECCC notes that the implementation of the action plan relies on the rapid detectability of caribou in the vicinity of the project. Thus, the effectiveness of detection will influence the success of subsequent measures identified in the action plan that would be implemented to avoid effects on individuals.

ECCC recommends that the proponent also consider in its action plan the risk of caribou collisions during the transportation of ore to the transshipment site and identify measures to minimize this risk. ECCC notes that the proponent has not yet submitted its action plan. ECCC recommends that the Agency and the competent authorities, including ECCC and the Government of Quebec, be consulted prior to the implementation of this plan in order to ensure that it is carried out in the most optimal way possible to protect the individuals of this species.

Although not specified by the Proponent, ECCC believes that the mitigation measures proposed for woodland caribou will also benefit migratory caribou.

<u>All species at risk</u>

ECCC is satisfied with the mitigation measures proposed by the proponent to mitigate the effects on species at risk and their habitats during all phases of the project.

ECCC is of the opinion that all relevant mitigation measures to minimize the effects of the project on the individuals and habitat of these species should be implemented in a timely manner, regardless of the significance of the effects.

ECCC is also satisfied with the proponent's commitment to restore the site at the end of the project. However, ECCC recommends that site restoration be carried out in a phased manner, as the disturbed areas are no longer used. ECCC also recommends that site restoration should focus on creating habitat for species at risk, including woodland caribou.

Residual environmental effects

4) Have the residual environmental effects (after the implementation of mitigation measures) for each of the valued components been adequately identified and

documented by the proponent? Please explain your response and identify any gaps or areas where uncertainty remains. Please describe any residual environmental effects that may or may not have been adequately identified.

5) **What are, according to ECCC, the residual environmental effects of the project on each of the valued components?**

6) **Do the mitigation measures, including the follow-up plans proposed by the proponent (if applicable), address the remaining uncertainties? Please explain your answer and propose any other measures you feel are essential to avoid, mitigate, monitor or follow up on residual environmental effects.**

ECCC Response :

The Proponent assessed the residual effects of its project on woodland caribou in section 7.6.7 and on chiropterans in section 7.7.7 of the Main EA Report (WSP, March 2018a). Residual effects were deemed not significant for woodland caribou and both chiropteran species.

ECCC is satisfied with the proponent's assessment of residual effects on these species at risk. To the extent that all mitigation measures identified by the Proponent are implemented in a timely manner, ECCC is in agreement with the Proponent's conclusion regarding the residual effects of the Project on each of the species at risk. Furthermore, ECCC is of the opinion that some environmental effects will remain despite the implementation of the mitigation measures.

Cumulative effects

7) **Have the cumulative effects on each of the valued components for which a residual effect remains been adequately documented? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which they may influence the environmental analysis.**

8) **Are the mitigation measures proposed by the proponent to avoid or mitigate cumulative effects adequate and sufficient? If not, please explain and propose alternative measures.**

9) **Among the mitigation measures proposed by the proponent to reduce cumulative effects, please identify those that you consider to be key measures. Please propose remedial measures (if required) or recommend any other measures that you consider essential to avoid or mitigate cumulative effects that have not been proposed by the proponent.**

ECCC Response :

The proponent selected the Little Brown Bat, Northern Bat and Woodland Caribou as VECs for the cumulative effects analysis.

<u>Endangered Chiropterans (Little Brown Bat and Northern Bat):</u>

The analysis of cumulative effects on chiropterans at risk is presented in section 10.7.4 of the main EA Report (WSP, March 2018a) and in response to CEAA-96 and CEAA-97 (WSP, December 2019b). The Proponent concludes that there will be no significant cumulative effect on chiropterans at risk and considers that no additional mitigation measures are required to offset cumulative effects on chiropterans at risk.

ECCC is satisfied with the proponent's analysis of the cumulative effects on the 2 chiropteran species. ECCC recognizes that the loss of habitat caused by forest fires and the anthropic activities identified by the proponent in the study area contribute mainly to the cumulative effects on chiropterans at risk whose populations are already very fragile due to the white snout syndrome. ECCC is of the opinion that the contribution of the Pink Mine Project to cumulative effects is small, but that habitats suitable for chiropterans should remain available at the regional level to support local populations.

Woodland Caribou :

The analysis of cumulative effects on woodland caribou is presented in section 10.7.1 of the main EA report (WSP, March 2018a). An update of the analysis is presented in response to CEAA-92, CEAA-96 and CEAA-97 (WSP, December 2019b) and CEE-50 (WSP, October 2020). The Proponent concludes that there will be no significant cumulative effects on caribou and considers that no additional mitigation measures are required to offset cumulative effects on caribou.

ECCC is satisfied with the analysis of cumulative effects on Woodland Caribou presented by the Proponent and recognizes that in the cumulative effects study area, hydroelectricity production, linear structures (roads and power lines) and forest fires have contributed most to the cumulative effects in this sector of the QC-6 range.

In the absence of a range plan, it is difficult to accurately assess the long-term effects within the QC-6 range and to ensure that a minimum of 65% undisturbed habitat is always maintained. However, based on the information provided by the proponent, and according to the Report on the Progress of the Implementation of the Recovery Strategy for the Woodland Caribou, Boreal Population (ECCC, 2017), it appears that the population and distribution objectives identified in the Boreal Caribou Recovery Strategy for the Quebec (QC-6) range would not be compromised in the short or medium term.

According to the proponent's analysis, within the cumulative effects study area, the project will contribute to the loss of 0.01% of undisturbed habitat that has the biophysical characteristics required for woodland caribou to meet their life cycle needs. For the entire range of Quebec (QC-6), ECCC considers that the contribution of the Pink Mine project to the rate of disturbance appears negligible and that the project is unlikely to compromise the objective of maintaining a minimum of 65% undisturbed habitat in this range.

Monitoring8 and follow-up programs9

10) Does the monitoring program verify and control the implementation of mitigation measures and ensure that they are appropriate to diminish, avoid or mitigate the environmental effects on each of the valued components? Please justify your answer.

11) Please identify in the monitoring program the monitoring measures that are essential to verify and control the implementation of mitigation measures and to ensure that they are appropriate to diminish, avoid or mitigate environmental effects. Please propose corrective measures (if necessary) or recommend any other measures that you consider essential.

ECCC Response :

Endangered Chiropterans (Little Brown Bat and Northern Bat) :

In section 7.7.6 of the Main EA Report (WSP, March 2018a), the proponent committed to conducting an inspection of the buildings prior to their dismantling to verify if they are used by chiropterans. In response to question CEAA-90 (WSP, December 2019b), the proponent presented the monitoring program that it committed to implement to verify the presence of maternity wards in natural sites in the event that deforestation work was carried out during the chiropterans' breeding season.

ECCC is satisfied with the proponent's commitment to implement a monitoring program during the construction phase for chiropterans. However, ECCC believes that success in detecting resting sites in buildings or natural sites will influence the effectiveness of subsequent measures that will be implemented to avoid killing, injuring or disturbing individuals.

Woodland Caribou :

The proponent committed in section 7.6.6 of the main EA Report (WSP, March 2018a) to develop and implement an action plan during the construction and operation phases in the event of the presence of caribou in the vicinity of the mine.

ECCC is satisfied with the proponent's commitment to implement a woodland caribou monitoring program during construction and operations. As mentioned in the mitigation measures section, this is a key measure to minimize the effects of the project on individuals. ECCC would like to remind that the action plan should also be implemented in the event that caribou are observed during the transportation of ore from the mine site to the transshipment site.

ECCC notes that the proponent mentions in response to question CCE-51 (WSP, December 2020) that it could reach an agreement with the MFFP and the tallymen of the Cree territories in order to notify the person in charge of the mine if caribou were heading towards the mine or any other sign of presence within a radius of 4 km around the mine. ECCC highlights the proponent's initiative to implement such an agreement and believes that early detection of individuals in the periphery of the mine will contribute to the success of the measures that will be implemented to minimize the effects on caribou.

Advice and recommendations

ECCC recommends that a monitoring program for species at risk be developed and submitted to the Agency and appropriate authorities prior to the start of construction. It would be important that this program identify, among other things, the activities or operations that may have an effect on species at risk and, for each of these, determine the measures to be put in place to ensure that the nuisance or disturbance is reduced.

ECCC recommends that the monitoring program be updated periodically to reflect regulatory changes, including COSEWIC or SARA reviews of wildlife status. These changes may require additional measures to mitigate the effects of the project on species affected by changes in their status.

12) Will the follow-up program verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project? Please justify your answer.

13) Please identify in the follow-up program the follow-up measures that will verify the accuracy of the environmental assessment or determine the effectiveness of the measures implemented to mitigate the environmental effects of the project. Please propose corrective measures (if required) or recommend any other measures you

consider essential.

ECCC Response :

Endangered Chiropterans (Little Brown Bat and Northern Bat):

In response to CEAA-90 (WSP, December 2019b), the proponent proposed an acoustic monitoring program for chiropterans to evaluate the effectiveness of mitigation measures.

ECCC is satisfied with the proponent's commitment to conduct acoustic monitoring to evaluate the effectiveness of the mitigation measures and considers this monitoring to be a key measure. In section 7.7.6 of the main EA Report (WSP, March 2018a), the proponent committed to install a chiropteran shelter in the event of the destruction of a building used by this group of species. Should this measure be implemented, ECCC is of the opinion that the proponent's follow-up should also include monitoring the use of this structure as well as an annual monitoring of its integrity. Indeed, since the objective of this artificial structure is to compensate for habitat loss in the long term, it is essential that it be maintained in good working order. ECCC recommends that the Agency and the competent authorities be consulted prior to the development and implementation of this monitoring.

Woodland Caribou :

No follow-up specific to Woodland Caribou was presented by the proponent in section 7.6.8 of the main EA Report (WSP, March 2018a).

The Proponent committed in section 7.6.6.2 of the main IS Report (WSP, March 2018a) to use softwood species in the restoration of disturbed areas to avoid colonization of the site by hardwood species. The proponent indicates in section 6.3 of the Site Reclamation and Restoration Plan for the Rose Lithium Tantalum Project presented in Appendix QC-41 (WSP, February 2019b) that it plans to carry out an annual agronomic follow-up, over a minimum period of 5 years, of the project areas that will have been restored.

ECCC recommends that the proponent develop and submit to the Agency and the competent authorities, prior to the project's implementation, a specific follow-up program for woodland caribou. The follow-up program should verify the accuracy of the conclusions of the environmental assessment and assess the effectiveness of the mitigation measures. In addition, the follow-up program may serve as a basis for the implementation of adaptive management, if necessary.

ECCC is satisfied with the proponent's commitment to monitor the reforested areas to ensure a quick and adequate restoration of the mine site. In particular, the proponent's commitment to revegetate the mine site using softwood species could prove favourable to woodland caribou in the long term. However, ECCC recommends that the duration of the agronomic follow-up be long enough to ensure the success of the reforestation and to evaluate the relevance of implementing additional measures such as the control of hardwood species so that the restored habitats become suitable habitats for woodland caribou as quickly as possible.

APPENDIX 4 - Issues Related to the Application of the *Species at Risk Act*

The committee is seeking expert advice from Environment and Climate Change Canada (ECCC) on the following issues related to species at risk14 (excluding fish).

1) Based on the information filed by the proponent as well as your expertise, which species at risk under the *Species at Risk Act* (SARA) or species with COSEWIC15 status are likely to be affected by the project? Please provide justification.

ECCC Response :

See the section on reference status.

2) Has the proponent adequately and completely identified the adverse effects of the project on these species at risk and their critical habitats16? Please explain your response and, if applicable, identify any gaps or areas where uncertainty remains. Describe any adverse effects that were inadequately or not identified.

ECCC Response :

See the section on effects.

3) Would the mitigation measures proposed by the proponent avoid or mitigate the effects and control them? Explain your answer.

ECCC Response :

See the section on mitigation measures.

4) Are the proposed mitigation, monitoring and follow-up measures consistent with the best available information, including applicable recovery strategies or action plans, and do they meet SARA requirements for the protection of individuals, residences and critical habitat of species at risk? Please explain your response and, if applicable, identify any gaps or areas where uncertainty remains.

ECCC Response :

See sections on mitigation measures and monitoring and follow-up.

5) Which of the mitigation measures proposed by the proponent are key measures to avoid or mitigate adverse effects? Please recommend any other measures that you consider essential and that were not proposed by the proponent.

ECCC Response :

See the section on mitigation measures.

6) Which of the monitoring and follow-up measures proposed by the proponent are necessary to monitor for adverse effects? Please recommend any other measures

that you feel are essential and that have not been proposed by the proponent.

ECCC Response :

See the section on monitoring and follow-up.

7) Based on the information provided by the proponent, will ECCC be required to issue a permit or agreement under *SARA*? Please specify if so.

ECCC Response :

No.

8) Based on the information you have at this time, has the proponent considered all alternatives that could minimize the negative consequences of the activity for the species' critical habitat and demonstrated that the best alternative has been selected? Explain your answer.

ECCC Response :

See the section on mitigation measures.

9) Based on the information you have at this time, has the proponent demonstrated that it will take all measures to minimize the negative impacts of project activities on the species' critical habitat, if any? Explain your answer.

ECCC Response :

See the section on mitigation measures.

10) In the event that a species at risk is incidentally affected by the project or there is a risk of affecting or destroying a component of the critical habitat of that species, based on the information you have at this time, can measures be put in place to ensure that the maintenance or recovery of that species is not adversely affected? Please explain.

ECCC Response :

See sections on mitigation measures and monitoring and follow-up.

Accidents and Malfunctions

APPENDIX 3 - Questions about other effects to be considered

Depending on your expertise and the information available, please refer to the following questions to guide your advice on accidents and malfunctions:

1) Is the risk analysis for accidents or malfunctions adequate to determine the environmental effects that could result from accidents or malfunctions resulting from the project? Please explain your response and identify any gaps or areas where uncertainty remains. Explain the extent to which they may influence the environmental analysis.

ECCC Response :

The Proponent has indicated in Section 11.2 of the Main EA Report (WSP, March 2018a) that the approach to assessing the effects of accidents and malfunctions is based on the following steps:

- Identification of risks and development of accident scenarios
- Evaluation of the consequences of accident scenarios
- Estimation of probability of occurrence
- Determination of risk levels

The main hazards identified related to the activities are presented in section 11.2.5 of the same document.

The proponent has developed several accident and malfunction scenarios likely to occur during the construction and operation phases of the mine based on the accidentology related to the processing of metallic ore. To do so, it used the ARIA database of the Bureau d'analyse des risques et pollutions industriels (BARPI) of the French Ministry of Ecology and Sustainable Development and presented the results of case research since 1990 in Table 11.4 (section 11.2.3) of the main EA Report (WSP, March 2018a). The level of risk for each scenario was established using a matrix (Table 11-3) taking into consideration the probability of the scenario occurring and its severity.

The analysis of the technological risks identified in the IA are summarized in Table 11-28 (WSP, March 2018a). Among the accident scenarios for which the proponent assessed a "medium" level of risk, we paid particular attention to the following four scenarios:

- Hazardous material spills (Road transport)
- Non-conforming discharge to final effluent (Mine water treatment)
- Petroleum Product Spills (Storage and Use of Petroleum Products)
- Slope instability of mine waste rock piles (Tailings and waste rock accumulation area)

<u>Hazardous Materials Spills (Road Transportation)</u>

The proponent indicated in section 11.2.5.10 (WSP, March 2018a) that there is a risk of a spill from a tanker truck containing petroleum products (diesel, gasoline) during the road transportation of goods on the Nemiscau-Eastmain-1 road. As a result, accidental contamination of soil, surface water and groundwater with petroleum or chemical products, as well as a forest fire could occur.

<u>Non-conforming discharge to final effluent (Mine water treatment)</u>

A mine water treatment plant would be built in the vicinity of the industrial apron (Section 11.5.2.8 of the Main EA Report). It would collect all the water drained by the ditches surrounding the waste rock and tailings pit, the ore pit and the industrial apron. A malfunction of the water treatment system could result in the accidental release of harmful substances in the final effluent.

<u>Petroleum Product Spills (Storage and Use of Petroleum Products)</u>

The proponent mentions in section 11.2.5.3 of the Main EA Report (WSP, March 2018a) that four petroleum product tanks (diesel and gasoline) are planned to be used on site for a total of 150,000 L. Factors likely to cause a spill were described (e.g. tank breakage due to collision, corrosion of equipment, overflow during filling). The location of the tanks is shown on map CEAA-52 (WSP, December 2019b).

Slope instability of mine waste rock piles (Tailings and waste rock accumulation area)

The proponent explains in section 11.2.5.9 of the main IS Report that instability of the slopes of the dumps, caused by extreme weather conditions or construction errors, could result in the collapse (slippage) of tailings or mine waste rock outside the containment area.

Advice and recommendations

ECCC is of the opinion that the analysis of the risk of accidents and malfunctions has been adequately presented in the IA. The risk assessment methodology used is based on the MELCC guide entitled: "Analyse de risques d'accidents technologiques majeurs" (Théberge, 2002) (hereafter referred to as the MELCC Guide). The proponent used BARPI's ARIA database and its search was extended to metal ore processing in general. Additional information regarding some of the scenarios developed was also provided in response to requests for information (WSP, February 2019a and December 2019b).

2) **Has the proponent identified the sensitive elements of the environment (biophysical and human) that could be affected by potential accidents and malfunctions? According to your expertise and based on available information, should other sensitive elements of the environment have been identified? Please specify these elements and describe the uncertainties related to the fact that they were not taken into account.**

ECCC Response :

Sensitive elements that could be affected by accidents and malfunctions were identified in section 11.2.2 of the main IS Report (WSP, March 2018a) and in the Supplementary Information to the IS (WSP, February 2019a).

Wetlands

Five watercourses are located on the project site and could be affected in the event of an accidental spill of a contaminant. Lakes 4, 6, 7, 14, 15, 18 and 19 will not be dewatered and are in close proximity to the Project site (see Map 6-3 of the Main EA Report) and therefore could be affected by a major accident on the Project site. In addition, seven classes of wetlands are present in the vicinity of the Project site, including peat bogs and marshes. Four wetlands have a high ecological value.

Biological environment

The proponent states that several species of fish are present in the watercourses of the study site. In addition, several species of migratory birds, including waterfowl, are valued by Aboriginal and local communities and are found in or near the study area to perform functions such as feeding, resting, nesting and migration. Furthermore, the proponent mentions that five species of birds with special status have been inventoried on the site or its surroundings. The proponent also mentions that several species of mammals and herpetofauna are present in the sector of the site

or likely to frequent it. However, no special-status species have been inventoried on the site. Similarly, no special-status plants have been observed.

Sensitive components of the Study Area are illustrated in Map 3 of the Supplementary Information to the IA (WSP, February 2019b). The general site development plan is presented in Map 3 of the main IS Report (WSP, March 2018a).

ECCC is of the opinion that the proponent has adequately identified the sensitive elements of the environment that could be affected by potential accidents and malfunctions.

3) Have the environmental effects caused by accidents and malfunctions been adequately documented by the proponent? Please explain your answer. If applicable, please identify any gaps or areas where uncertainty remains and describe the environmental effects that may or may not have been adequately identified.

ECCC Response :

The Proponent presented in Section 11 of the main EA Report (WSP, March 2018a) the potential environmental effects for each accident and malfunction scenario that could occur. Potentially affected sensitive elements were identified and the potential effects on them were explained in general terms.

Environmental effects in the event of a hazardous material spill

A hazardous material spill on the Nemiscau-Eastmain-1 road could eventually occur because hazardous materials and other chemicals will be transported by truck. This could lead to contamination of surface water, groundwater and soil with petroleum or chemical products, as well as a forest fire. The spill, depending on the location of the incident, could contaminate soils and reach a watercourse. Reaching a watercourse could affect fish habitat and migratory bird feeding, resting and nesting areas. An uncontrolled fire turning into a forest fire could also have a significant impact on the environment.

Environmental effects in case of non-compliant discharge of the final effluent

A malfunction of the water treatment system due to design or operational error, human error or mechanical failure could result in the accidental release of harmful substances to the final effluent. An untreated or partially treated discharge of mine water could contaminate the waters of Stream A and adversely affect fish habitat and migratory bird feeding, resting and nesting areas.

Environmental Effects of a Petroleum Spill

The proponent states that an accidental spill of petroleum products could contaminate the soil with hydrocarbons at the site of the spill and/or a watercourse and that the impact would depend, among other things, on the location of the spill, the volume of products spilled and the uniqueness or repetition of the problem (e.g., leakage). In the case of a watercourse spill, petroleum products could affect fish habitat as well as feeding, resting and nesting areas for migratory birds.

Environmental effects related to instability of the slopes of the halts

The proponent mentions that a collapse of tailings or mine waste rock, depending on its location, could have repercussions on infrastructures (buildings, power lines, roads, etc.) and that the presence of workers would increase its severity. It does not, however, explain what the effects would be on the components of the environment.

Advice and recommendations

In summary, the proponent provided general information on the potential environmental effects of accidents and malfunctions on the components of the environment that could be affected. ECCC is of the opinion that more details could have been provided regarding the adverse effects of certain scenarios on sensitive components of the environment, particularly with respect to the scenario of instability of the slopes of the tailings and waste rock piles. This last aspect would have benefited from being developed for the preparation of the site's emergency measures plan. However, the environmental effects caused by accidents and malfunctions were, on the whole, adequately described for the purposes of the environmental assessment.

4) Please provide your views on the Proponent's proposed protective measures, preliminary emergency response protocols or preliminary emergency response plans. Are they adequate and sufficient to reduce the risk or consequences of accidents or malfunctions? If not, please explain and propose alternative measures.

5) Among the measures proposed to reduce the risk of accidents and malfunctions or to minimize their consequences, please identify those that you consider to be key measures. Please propose any other measures that you consider essential to avoid or mitigate the risk of accidents or malfunctions or the environmental effects that may result from them that have not been proposed by the proponent.

ECCC Response :

The proponent states that despite prevention, should accidents and malfunctions occur, it would be important to be able to minimize environmental effects through the development and implementation of appropriate mitigation measures. Prevention measures to minimize the potential risks associated with an accident or malfunction for each scenario are presented in Chapter 11 of the main EA Report (WSP, 2018a) and additional information was provided in response to information requests (WSP, February 2019a and December 2019b).

ECCC is of the opinion that the mitigation measures submitted by the Proponent are adequate. For each type of potential accident, the Proponent has identified prevention and mitigation measures to reduce the risk of accidents and malfunctions and to minimize their effects on the environment.

FCCC considers the following measures to be key actions :

- Maintaining an up-to-date emergency measures plan that includes a procedure for responding to a spill of oil or other hazardous substances.
- Design petroleum product transfer areas outside the pit, away from traffic, on designated surfaces that will be constructed with physical barriers such as rip rap or a catchment ditch. Develop and implement a petroleum product transfer procedure.
- Provide one or more complete, permanent and easily accessible emergency recovery kits for petroleum products and hazardous materials at all times on the job site. The kit must include a sufficient supply of absorbent materials and related equipment (shovels, gloves, leak plugs, etc.) to deal with any situation, as well as clearly identified leak-proof containers to receive petroleum residues and other hazardous residual materials. Secondary emergency kits may be required at certain locations on the job site. Each piece of construction equipment must also contain a sufficient quantity of sorbents to be able to respond quickly. The list of spill response equipment and devices must be approved by the supervisor.

- Any accidental spillage must be reported immediately to the person in charge of the project's emergency plan, which will have been developed and approved prior to the work. The affected area must be immediately contained and cleaned up without delay. Contaminated soil must be removed and disposed of in an authorized site and a characterization must be carried out according to the terms of the MELCC's Soil Protection and Contaminated Land Rehabilitation Policy. In the event of a spill of hydrocarbons or any other harmful substance, the Environment and Climate Change Canada (1-866-283-2333) and MELCC alert network (1-866-694-5454) should be notified without delay.

Emergency Measures Plan (EMP)

In addition to the prevention and mitigation measures that will be implemented, the Proponent has provided for the development of an Emergency Response Plan (ERP) and has submitted a draft of this plan in section 11.3 of the Main EA Report (WSP, March 2018a).

The proponent states that the objectives of the emergency measures plan are :

- Identify the resources and equipment needed to deal with an emergency event.
- Develop response strategies and tactics to control an emergency situation and protect lives, the environment and company assets.

The proponent also provides a brief description of the main roles and responsibilities of the EMP stakeholders, as well as the alerting process to be triggered in emergency situations. Evacuation of the site may be required during an environmental emergency, and therefore, an outline of the evacuation process is also presented. The proponent indicates that a report will be required following an emergency situation. Training will be required for all persons likely to be involved in an emergency situation in order to familiarize themselves with emergency procedures and their roles.

SCCC is of the opinion that the protective measures, response protocols and preliminary emergency response plans proposed by the Proponent are sufficient and adequate as they address the types of emergencies that could reasonably be expected to occur, including on-site consequences, related prevention, alerting and preparedness issues, and remedial and recovery actions. The proponent confirms that the draft EMP submitted by the proponent provides only an outline of the information to be included in the EMP. ECCC notes that this preliminary plan will be completed prior to the project going into production, when the project definition will be more detailed.

Concerning the PMU, ECCC would like to emphasize the importance of the following actions:

- Place the plan in an easily accessible location and in view of all employees. Incorporates into the plan a mapping of sensitive elements that could be affected by an accident or malfunction. Maintains the emergency plan and environmental sensitivity map.
- Detail the measures to be taken to respond to emergencies for each of the main accident risks considered, including measures to protect the environment. In particular, describe what is planned in the event of a hazardous material spill to protect sensitive elements of the environment, including surface water, groundwater and wetlands, fish, migratory birds or any other sensitive species involved.
- Identify the equipment needed to respond to these emergencies and locate it to ensure its availability.
- Provide staff training in the maintenance and use of intervention equipment.

- Provide a detailed spill notification procedure and an emergency communication plan for external parties.

Effects of the environment on the project

6) Based on your mandates and expertise, does ECCC have concerns about the effects that the environment13 may have on the project? If so, please explain your concerns and identify any gaps or areas of uncertainty.

ECCC Response :

The effects of the environment on the project were addressed in Section 12 of the main EA Report (WSP, March 2018a). Additional information was provided in the MELCC's Responses to Questions and Comments document (WSP, February 2019b). One of the issues addressed under this theme is the impact of climate change and extreme weather conditions on the project, particularly on the capacity of infrastructures such as accumulation and sedimentation basins. This topic is discussed in the surface water section of this advice.

Consulted documents

Environment and Climate Change Canada. 2020. Modified Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, Canada. Species at Risk Act Recovery Strategy Series, Environment and Climate Change Canada, Ottawa. xiv + 155 pp.

Environment and Climate Change Canada. 2018. Recovery Strategy for the Little Brown Bat (Myotis lucifugus), Northern Bat (Myotis septentrionalis) and Eastern Pipistrelle (Perimyotis subflavus) in Canada, Species at Risk Act Recovery Strategy Series, Environment and Climate Change Canada, Ottawa. ix + 189 p.

Environment and Climate Change Canada. 2017. Report on Progress in Implementing the Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada, 2012-2017. Species at Risk Act Recovery Strategy Series, Environment and Climate Change Canada, Ottawa, ix + 108 p.

Environment Canada, 1996. The Federal Policy on Wetland Conservation: An Implementation Guide for Federal Land Managers. 32 pages

MELCC. February 2017. Instruction guide for the preparation and implementation of air emission dispersion modeling for MELCC mining projects.

WSP. December 2020. Lithium Tantalum Rose Project - Responses to the mismatch in the second request for information from the CISA. Document produced for the Critical Elements Corporation. CEA File 005327. 46 pages and appendices.

WSP. October 2020. Lithium Tantalum Rose Project - Responses to the second request for information from the CIA. Document produced for the Critical Elements Corporation. CEA File 005327. 162 pages and appendices.

WSP. July 2020. Lithium Tantalum Rose Project - Answers to MELCC's additional questions and comments. Document produced for the Critical Elements Corporation. File 3214-14-053. 23 pages and appendices.

WSP. February 2020. Lithium Tantalum Rose Project - Responses to the mismatch in the first request for information from the CIA. Document produced for the Critical Elements Corporation. CEA File 005327. 26 pages.

WSP. December 2019a. Rose lithium-tantalum project. Surface water and sediment characterization to establish the initial state of the environment prior to project implementation. Activity report 2018 and 2019. Report produced for Critical Elements Corporation. Project No.: 181-05541-07. 45 p. and appendices.

WSP. December 2019b. Lithium Tantalum Rose Project - Responses to CEAA Questions and Comments. Document produced for the Critical Elements Corporation. CEAA File 005327. 222 pages and appendices.

WSP. December 2019c. Rose Lithium Tantalum Mining Project - Answers to MELCC's additional questions and comments. Document produced for the Critical Elements Corporation. File 3214-14-053. 69 pages and appendices.

WSP. February 2019a. Pink Lithium Tantalum Mining Project - Information requested by CEAA for Impact Study Concordance. Document produced for the Critical Elements Corporation. CEAA File 005327, Ref WSP: 181-05541-03. 32 pages and appendices.

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