CRITICAL ELEMENTS LITHIUM CORPORATION

LITHIUM-TANTALUM ROSE PROJECT – ANSWERS TO THE NON-COMPLIANCE OF THE SECOND INFORMATION REQUEST FROM THE IAAC

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Table of Contents

APPENDICES

1. INTRODUCTION

Critical Elements Lithium Corporation (CEC) submitted for the Lithium-Tantalum Rose Project in James Bay its answers to second information request of the Impact Assessment Agency of Canada (IAAC) on October 29th 2020. Following examination of the document, the joint evaluation committee determined that some information had to be submitted before the analysis of the environmental impact assessment (EIA) could proceed. This information is identified in a letter of non-compliance sent to CEC on November 16th 2020. Subsequently, an amendment to the letter of non-compliance was sent to CEC on December 14th 2020.

Section 2 of this document transcribes the information requested by IAAC, followed by CEC's responses. To facilitate the distinction between different texts, the information requested by the IAAC on November 16th 2020 and December 14th 2020 is in *italic*.

2. QUESTIONS FROM THE AGENCY

Question CCE 4 - Alternatives – Energy sources

In question CCE 4, the proponent was asked to integrate the emissions of the main air contaminants (NO_2, CO, PMT, PM_{10}, $PM_{2.5}$, SO_2 and NH_3) as well as any other relevant contaminant in the analysis and the choice of energy sources.

On the one hand, the promoter replied that the emission of greenhouse gases (GHG) is not the only factor that has been looked at and refers to table ACEE-5a (document Responses to questions and comments from the ACEE, WSP, December 2019) where economic and technical criteria are presented in the line entitled "scenario realism". However, GHGs are not the only factors to be considered in terms of environmental impact. The impacts of contaminants, including the main air contaminants, should also be analyzed in addition to GHGs.

On the other hand, the proponent replied that the inclusion of key air contaminants according to the energy sources considered "must be evaluated only if fuel is used, and would add little to the analysis grid." The proponent's response seems to indicate that no fuel source would be used at the site, but adds in the same sentence that "it would just make the difference between diesel and natural gas." However, according to table CEAA-5a (WSP, December 2019), the energy sources considered that would supply the mine site are, in terms of fuels, biomass and natural gas. Diesel and propane are not mentioned here. In addition, according to the project description, electricity will be used for most of the fixed equipment while the buildings will be heated with liquefied natural gas.

In short, the promoter was asked to carry out an analysis taking into account all the direct or indirect aspects of the variants that may contribute to the impacts associated with each of the options. It is therefore a matter of integrating into the analysis the emissions of contaminants for each of the potential energy sources (in addition to the GHGs and other criteria already integrated). According to the proponent's responses, these variants could be biomass and fossil fuels (natural gas, propane and diesel). For example, the analysis grid and the decision matrix should integrate an estimate or an order of magnitude of the emission quantities for each of these energy sources considered in order to be able to evaluate them.

The proponent must specify which fuel sources would be used on the site and redo the analysis of the variants by integrating the contaminant emissions for each of the potential energy sources.

ANSWER

An update version of Table CEAA-5a can be found below.

Table CEAA-5a Analysis table of the variants of the energy source supplying the mine site

Criterion	Energy					
	Hydroelectric	Solar	Biomass	Wind turbine	Geothermal	Natural gas
GHG emissions	Low (6 to 17 g CO_2 eq/kWh)	Way (64 g CO_2 eq/kWh)	Way (51 to 90 g CO_2 eq/kWh only for biomass planting)	Low (14g CO_2 eq/kWh)	Low (0 g CO_2 eq/kWh, excluding those issued during the construction of the installations)	Way (422 g CO_2 eq/kWh)
Emission of air contaminants	Low, few	Low, few	High, due to combustion.	Low, few	Low, few	Medium: more contaminants than hydropower and less than biomass, for example. https://fr.davidsuzuki.org/wp-content/uploads/sites/3/2011/07/Gaz-naturel-solution-changements-climatiques-Canada-rapport-final.pdf
Price of kW/h produced	First $ 210 000 kWh at 5.03 ¢/kWh Remaining energy consumed 3.73 ¢ / kWh (Source : Hydro-Québec, 2019. Rate M. Retrieved from : http: // www.hydroquebec.com/business/space-customers/tariffs/tariff-m-general-clientele-average-power.html)	19.2 to 22.6 ¢/kWh (Source: Vision Biomasse Québec, 2015. What is the cost price of the heating system to forest biomass in terms of energy? Retrieved from: https://visionbiomassequebec.org/?p=652)	8.7 ¢/kWh (Source: Vision Biomasse Québec, 2015. What is the cost price of the heating system to forest biomass in terms of energy? Retrieved from: https://visionbiomassequebec.org/?p=652)	8.0 ¢/kWh (Source: Vision Biomasse Québec, 2015. What is the cost price of the heating system to forest biomass in terms of energy? Retrieved from: https://visionbiomassequebec.org/?p=652)	22 to 32 ¢/kWh (Source: Vision Biomasse Québec, 2015. What is the cost price of the heating system to forest biomass in terms of energy? Retrieved from: https://visionbiomassequebec.org/?p=652)	5.2 ¢/kWh
Realism of the scenario	Realistic. It is only necessary to move the Hydro-Québec line. In fact, Hydro-Québec takes 95.33% of its electricity from hydropower. (Source: Hydro-Québec, 2015. Québec Electricity, Clean Energy par excellence ISBN 978-2-550-74447-4 Retrieved from: https://www.hydroquebec.com/data/sustainable-development /pdf/15094F.pdf)	Not realistic because knowing 25 m ² panel can provide 3,000 kWh / year, so it would take 1 km ² solar panel to supply 13.5 MW required. Also, solar power is intermittent while the energy needs of the mine are continuous . (Source: Ooreka, 2019. Photovoltaic Solar Panel: Dimensions and Efficiency, retrieved from: https://solar-board.ooreka.com/complaint/dimensional-resolution-solar-photovoltaic-panel)	http://www.bmatech.ca/f_biomasse3.html	Not realistic because the power supply to the mine would require the installation of 3 to 39 large wind turbines , because each of them can produce between 350 kW to 5 MW. In addition, the concentrator needs a continuous supply of electricity while the energy produced by the wind turbines is intermittent. This means that the mine can not depend mainly on this source of energy. Thus, the installation of wind energy source would still require an alternative solution. (Source: Ooreka, 2019. Wind power, retrieved from: https://eolienne.ooreka.fr/astuce/voir/352953/puissance-eolienne)	Not realistic. For a system with vertical underground loops, 10 m ² allows the production of 2.9 kW whereas horizontal underground loops require between 100 and 150 m ² for the same power. Thus, it would take 46 650 m ² of vertical area and at least 466 500 m ² to supply the mine with 13.5 MW of power, which is unrealistic. (Source: Office of Energy Efficiency and Innovation , Geothermal Energy, Detailed Fact Sheet Retrieved from: https://transitionenergetique.gouv.qc.ca/fileadmin/medias/pdf/agroalimentaire_agricole/16-Ge- thermae .pdf)	Realistic. LNG supply is possible in Quebec. (Source : discussion with Énergir)
Operation	Continuous	Intermittent	Continuous	Intermittent	Continuous	Continuous

Question CCE 10 B - Air Quality Monitoring - Compliance with Sensitive Receptor Standards and Addition of NO_2

In its response, the proponent explained that in the absence of site-specific data, a second approach was used to assess an initial concentration in the area of the mine site. He used remote sensing measurements of nitrogen dioxide (NO_2). He concludes that the assessment of NO_2 concentrations presented in response CEAA-60 (document Responses to questions and comments from CEAA, WSP, December 2019) presents a conservative picture given the initial concentration considered. A more accurate assessment of the initial concentration showed that no exceedance of the standard is expected at the Cree camp.

Comment:

According to Environment and Climate Change Canada (ECCC), the approach based on the use of remote sensing measurements of NO_2 to assess an initial concentration in the area of the mine site should not be used. Indeed, this technique does not make it possible to measure low concentrations of NO_2 and the measurements carried out on a larger scale cannot be extrapolated to a smaller scale since the error would be too great. For this reason, ECCC recommends instead the use of generic concentrations recommended by the Quebec Ministry of the Environment and the Fight against Climate Change for projects in remote areas. Only the presentation and interpretation of the results taking into account this initial concentration are acceptable.

ANSWER

The argument on the initial concentrations presented in the answer to question CCE 10 was intended to demonstrate that the initial concentration of MELCC offers a conservative assessment. Indeed, this is larger than an initial concentration based on measurements from the Saint-Anicet station, on the outskirts of Montreal. Satellite data, for their part, showed that the concentrations of NO_2 at the mine site are much lower than those at the Saint-Anicet station.

Although ECCC does not recommend the use of an initial concentration from satellite measurements to qualify the total concentrations of modeled NO_2, the most important element of the argument presented in the answer to question CCE 10 concerns the reduction of emission rate.

Indeed, it is discussed that the promoter's commitment, for the operational phase, to use only Tier 4 certification machinery, when available, reduces NOx emissions by 43%. However, for the case of the maximum modeled concentration at the Cri camp of 80.4 $\mu g/m^3$ (based on the sum of the initial concentration of 50 $\mu g/m^3$ and the project contribution of 30.4 $\mu g/m^3$), such a decrease reduces the total modeled concentration below the cut-off value. In fact, it has been identified that machinery exhaust gases account for 94% of the maximum modelled concentrations of the project in operation. A 43% reduction in exhaust gases would therefore bring the project's contribution to about 17.3 $\mu g/m^3$, for a total modeled concentration of 67.3 $\mu g/m^3$ considering the initial concentration. This concentration then represents 85% of the standard. Thus, even considering the initial MELCC concentration for projects in remote areas, no exceedance of the standard is modeled at the Cree camp for the construction and operation phases of the project. Consequently, no NO_2 monitoring is proposed.

Question CCE 11 A - Air Quality Monitoring - Toxic Gases (CO and NO_2) during blasting, dust, $PM_{2.5}$, PM_{10} and Total and Fine Particles

The proponent submitted in its response an update of the dust management plan, including the air quality monitoring program. This update includes monitoring of particulate matter ($PM_{2.5}$ and PM_{10}) as well as a description of all sampling methods and analysis frequencies. For crystalline silica, the promoter proposes a sampling frequency of once every 15 days, adjustable according to the results. According to experts, a shorter sampling frequency would ensure better information collection. Experts recommend a closer collection frequency, starting with a frequency of once every six days and then adjusting based on the results obtained.

The proponent should assess the option of committing to increasing the sampling frequency of crystalline silica monitoring to allow for better information collection.

ANSWER

The monitoring of crystalline silica proposed in the dust emission management plan is indeed based on a sampling frequency of once every 15 days. However, it is important to remember that the sampling duration proposed by the protocol established with the MELCC is five days. This means that crystalline silica will then be measured 33% of the time for the whole year. This sampling time is necessary in order to allow a detection limit lower than the annual MELCC crystalline silica criterion and to verify its compliance. With respect to the MELCC one-hour criterion, this method does not allow for verification of compliance, and in fact, there is no documented and approved environmental monitoring method for such verification.

However, in a context where the objective of this monitoring is the verification of an annual criterion, a sampling frequency of every 15 days and a duration of five days (or representing 33% of the time) is considered excellent.

Question CCE 12 - Air Quality Monitoring - Adaptive Management with Respect to Dust

The proponent states in its response, "the effectiveness of the mitigation measures can be verified through continuous particle monitoring which will then be implemented." In Table 2 of the Ambient Air Sampling Plan presented in Appendix Q-7BIS (Answers to additional questions from MELCC, WSP, February 2019), fine particulate matter ($PM_{2.5}$) will be monitored continuously. However, according to the dust management plan and the answer to question CCE 11, continuous monitoring is only planned if the monitoring by sampling showed concentrations above the air quality standards.

The proponent should clarify if there is a plan to implement a continuous particulate matter monitoring plan. If not, justify.

ANSWER

The air quality monitoring program described in the Dust Emission Management Plan, updated in August 2020, is the one selected and will be implemented. The details of this air quality monitoring program supersede the Ambient Air Sampling Plan in Appendix Q-7BIS (Answers to the MELCCC supplementary questions, WSP, February 2019). As described, this air quality monitoring program initially provides for monitoring by sampling for particulate matter. This program provides for the addition of continuous particulate monitoring in the event that the sampling monitoring shows concentrations above the air quality standards.

Question CCE 18 - Effects of Road Transport

On page 25 of the response document to the second information request, the predicted noise levels are presented for different distances. However, it cannot be determined from the information provided whether the human receptors are within 55 meters of the road or beyond. The distribution of traffic over a 24-hour period is also absent. Road traffic can impact human receptors near roads, as proximity to a noise source influences noise perception and noise sensitivity is higher during periods of sleep.

In addition, the promoter presented on page 23 of the response document that the expected truck trips per day are 24 (12 round trips) during the construction phase and 68 (34 round trips) during the operating phase. (critical scenario). However, on page 25, the proponent indicated that, for its analysis of the noise level, it considered 48 trips per day in construction (24 round trips) and 136 in operation (68 round trips). The proponent also determined the potential increase in the average noise level caused by the increase in road transport, but without determining the effects.

The promoter must:

i) Determine the minimum distance between the camps and the Nemiscau-Eastmain-1 road. Use this distance to estimate the noise levels and the percentage of highly annoyed people (% Highly annoyed or% HA). Provide these new estimates.

ii) Calculate the minimum distance that would be necessary between the camps and the roads that would be used for the project in order to comply with the indicators of human health effects associated with noise relevant to the context of this project (day level (dL), night level (nL) and day and night level (dnL) (including an adjustment of 10 decibels to take account of night noise) and% HA).

iii) Identify the times of the day when increased traffic is anticipated.

iv) Confirm that the expected truck trips per day are 24 (12 round trips) in the construction phase and 68 (34 round trips) in the operations phase (critical scenario). The promoter must also confirm that the analysis of the effects on the noise environment has been carried out with these figures. If not, the promoter must redo and provide this analysis with the correct figures.

v) Evaluate the expected effects on the sound environment of the increase in traffic on the road network at a distance deemed appropriate from the project. The promoter must determine and justify this distance.

ANSWER

i) The camp closest to the Nemiscau-Eastmain-1 road is at a distance of 80 metres. Figure 1 shows camp locations.

Figure 1 removed for confidentiality

Calculations were made using TNM v. 2.5 on a straight, flat gravel segment. The land adjacent to the road was considered to be forested. Truck speed at 70 km/h with 48 truck passes per day in construction (24 round trips) and 136 truck passes per day in operation (68 round trips). In operation, only the trucks carrying the concentrate (22 trucks per day) will have a 24-hour schedule. The remaining trucks will operate during the daytime period. During the construction phase, trucks will operate during the daytime period only.

In the existing condition, we do not have accurate traffic flow data. Based on information obtained by Hydro-Québec for service vehicles between the Nemiscau camp and Eastmain-1 Powerhouse, traffic data on the Route du Nord and records of vehicle passages during the measurement campaign, we assume that 90 vehicles per day travel the Nemiscau-Eastmain-1 road.

The following table presents the calculated road noise levels at a distance of 80 metres from the Nemiscau-Eastmain-1 road corresponding to the closest workcamp.

Table 1 Road noise level on the Nemiscau-Eastmain-1 road south of the mine site (dBA)

	Existing situation				Mining project				Existing + mining project			
At 80 metres	**dL**	**nL**	**dnL**	**%HA**	**dL**	**nL**	**dnL**	**%HA**	**dL**	**nL**	**dnL**	**%HA**
Exploitation	37.2	33.4	40.6	0.6	42.2	35.8	43.9	1.0	43.4	37.8	45.6	1.2
Construction	37.2	33.4	40.6	0.6	36.0	0.0	34.0	0.3	39.7	33.4	41.5	0.7

Note : dL : Average noise level during the day (7 a.m. to 10 p.m.);
nL : Average noise level at night (10 p.m. to 7 a.m.);
dnL : 24-hour average noise level to which a +10 dBA adjustment is applied during the period between 10 p.m. and 7 a.m.;
%HA : percentage of highly annoyed people

ii) The main recommended maximum noise levels to avoid health effects are 55 dBA outdoors for interference with speech understanding and 40 dBA outdoors for sleep disturbance. Traffic noise levels on the Nemiscau-Eastmain-1 road are not sufficiently high and constant (point noise produced when a truck passes) to consider a risk of hearing loss. With regard to the high level of long-term discomfort, the maximum recommended level is a variation in the percentage of people with severe discomfort of 6.5% HA.

Table 2 shows the distances corresponding to the noise level of 55 dBA during the day (Ld) outdoors for interference with speech understanding and 40 dBA at night for sleep disturbance.

Table 2 Distance corresponding to the maximum recommended noise level to avoid health effects

	Distance (m)		
Situation	**55 dBA**	**40 dBA**	**6.5%HA**
Exploitation	25	68	20
Construction	18	48	14

iii) The period of the day with the highest increase in traffic is during the day. Only the trucks carrying the concentrate (22 trucks per day) will have a 24-hour schedule, the other trucks in both the construction and operation phases will operate during the daytime period only.

iv) The analysis of the effects on the sound environment was carried out with the figures indicated in point i).

v) At 80 metres, which represents the distance from the workcamp closest to the Nemiscau-Eastmain-1 road, the variations in road noise levels (between the existing and projected situation) are calculated to be 6.2 dBA and 4.4 dBA in the operating phase for the day and night periods respectively. While for the construction phase, the variations are 2.5 dBA and 0 dBA.

Question CCE-25* - *Environmental Hazards Associated with Tantalum

A) The proponent shall consider that tantalum dissolved in water is adsorbed to colloids and particles. The response provided is based entirely on the dissolved tantalum content, which is indeed very low, instead of the measurement of total tantalum in the water. The propensity of tantalum to be adsorbed, although this limits aqueous exposure to fish and other aquatic organisms, will result in an accumulation in sediments and a possible hazard for benthic invertebrates and benthivorous fish.

The Committee acknowledges the proponent's commitment to monitor the effluent if the dissolved tantalum is higher than 0.1 µg/L. By measuring the total tantalum, as required by the Metal and Diamond Mining Effluent Regulations, it is very likely that the tantalum will exceed the threshold of 0.1 µg/L in the effluent. Faced with this contingency, the proponent shall propose water treatment or management practices limiting the tantalum releases to the lowest possible levels. The proponent shall also confirm whether the commitment to monitor the efflunt is added to the environmental follow-up program.

The proponent must also confirm whether it is committed to measuring natural concentrations of tantalum in groundwater, surface water and sediment for this follow-up program. If not, justify. The proponent must also evaluate the option of including in this follow-up program a commitment to participate in the development of a freshwater quality criterion for the protection of aquatic life and studies on the solubility of tantalum in natural waters. If not, justify.

ANSWER

The question concerns the adsorption of tantalum to colloids and particles. We understand that this part of the question relates to adsorption into the receiving environment since fish and benthos are mentioned. It is true that once the effluent is released, it is possible that the dissolved tantalum could be adsorbed and that depending on the size of the colloids or particles and the speed of the water, it could settle in a stream or a lake.

The second part of the question concerns the monitoring of total tantalum in the effluent that can be monitored. The answers to the questions (see the memo from Lamont, 2020) focused on dissolved tantalum. It is possible to consider the contribution of suspended solids (SS) to estimate the total tantalum.

At the final effluent, the promoter has undertaken to respect the discharge of a maximum of 10 mg/L of suspended solids. Being excessively cautiously, if we attribute a tantalum concentration of 149 ppm which is the maximum average concentration in the tantalum ore to the suspended solids and add the dissolved tantalum concentration to it, we would reject 1.6 µg/L of total tantalum in the environment. In practice, this concentration is overestimated because it is unlikely that all SS from the mine site will have the maximum average concentration of the ore. Rather, we would expect a concentration of around 3 ppm of tantalum in SS, which is the tantalum concentration in the waste rock. This corresponds to a discharge of around 0.1 µg/L. Considering these values to be the two extremes, the concentration of total tantalum in the final effluent could therefore vary between 0.1 and 1.6 µg/L.

The proponent will monitor the quality of the water by measuring the total metals in the effluent. The proponent will take care not to increase tantalum concentrations in the receiving environment once the mine is in operation. If it turns out that the concentration of tantalum released is greater than the of background levels, the possibility of reducing the amount of SS released into the receiving environment by modifying the treatment system should be investigated. The SS treatment methods are known and would be adapted to the situation of the Rose project.

D) and E) The proponent shall consider the total tantalum (colloidal and particulate) in its dispersion model, as explained in A). For question E) specifically, the proponent shall account for tantalum in the treatment process sludge, tailings and waste rock in its dispersion model.

ANSWER

As explained previously, if we consider tantalum in SS, then we could measure a total tantalum concentration between 0.1 and 1.6 µg/L. This source concentration at the point of release will be rapidly mitigated by dilution factors. As presented in the previous model, it was estimated that the dissolved tantalum concentration would reach a maximum value of 0.1 µg/L and total tantalum between 0.1 and 1.6 µg/L. The agency asks to consider a decrease in dissolved tantalum because of the possibility of adsorption of tantalum to solid particles. It would have the effect of increasing tantalum concentrations in the sediments. Assuming that 100% of the tantalum contained in the water was adsorbed (which is highly improbable or even impossible), it is a concentration of 0.1 µg of tantalum per liter of water that would be added to the suspended solids which are of 10 mg/L. You cannot precipitate more than the amount available in water which corresponds to the maximum soluble concentration in water.

G) The proponent reiterated that co-deposit without a sealing barrier of the waste rock, tailings and treatment process sludge met the mining industry requirements for mining waste management, particularly those of the Global Industry Standard on Tailings Management of the International Council on Mining & Metals, published in August 2020. However, the experts consider that little information is available to date on the mobility and toxicity of tantalum and that preventive measures must be taken to minimize the risk to the environment. Moreover, during leaching tests serving to determine the hazard associated with tailings, the proponent only measured the dissolved tantalum and not the tantalum associated with colloids and particles, as explained in A). Tailings leaching is therefore underestimated.

According to Directive 019 (2012) and Schedule 2 of Quebec's Soil Protection and Contaminated Sites Rehabilitation Policy, criteria indicative of soil contamination are not published or established for all the existing parameters. The list provided is therefore neither exhaustive nor limitative. The user shall report all the quantified parameters, even if the grid does not provide criteria for these parameters, as in this case for tantalum. The new Global Industry Standard on Tailings Management published last August recommends minimizing the risks to the environment and the public. The Tailings Guide of the Mining Association of Canada also suggests considering protection of the environment.

The proponent, even though it provides for close monitoring for the final mining effluent, must consider installing a sealing barrier at this co-deposit pad and, in the negative, must provide justification.

ANSWER

The agency informs the proponent that the leaching tests done on the tailings underestimate the tantalum concentrations. We have appended (see Annex CCE-25) the procedure for performing leaching tests on tailings to this memo. This procedure includes the TCLP, SPLP, CTEU-9 and CTEU-10 tests. The protocols are described there. Remember that the purpose of leaching tests is to assess the mobility of metals and other inorganic species. Leaching tests are designed to know the leachable elements under different leaching conditions. The purpose of leaching tests is not to analyze total metals, but to identify dissolved metals. These tests are those recommended by Directive 019 on the mining industry but also by several other provincial, federal and international organizations. We are quite comfortable with the choice to have followed the protocols for the leach tests and we understand the limitations of the tests we have performed.

Critical Elements considered the installation of a waterproofing barrier. However, the barrier would only reduce the infiltration of water from the stockpile to groundwater. However, there is currently no indication that the integrity of the groundwater is threatened by the presence of the dump on the surface. The waterproofing barrier would have no effect on the runoff and exfiltration water at the foot of the stockpile. SS are fine particles that are captured in ditches and ponds, but SS does not infiltrate into groundwater. Therefore, the maximum concentration of tantalum infiltrated to groundwater would be in the order of 0.0001 mg/L. We believe that the presence of a waterproofing barrier is not required in this project.

Question CCE 26 A - Débits d'étiage des cours d'eau

Dans le document de réponse à la deuxième demande d'information, la valeur de zéro litre par seconde a été attribuée aux débits retenus (tableau 2-3 de l'annexe CCE-26) des bassins versants de cinq kilomètres carrés et moins. La méthodologie basée sur la région hydrographique 09 du Nord-du-Québec est acceptable en raison de la localisation nordique des bassins versants et l'insuffisance de données hydrométriques historiques.

Afin de valider les estimations, le promoteur doit indiquer les suivis qui seront mis en place afin d'évaluer la tendance à long terme des débits d'étiage (par exemple la fréquence et la localisation des stations de mesure des débits).

RÉPONSE

In order to validate the estimates regarding the anticipated flows in the watercourses, and in particular the low water flows, a monitoring program will be set up in the watercourses impacted by the project. The following activities will be carried out at three periods during the year (spring, summer and fall) :

- Installation of a rain gauge for the period between the spring and fall campaigns. The recording of rainfall will provide a better understanding of the variations in water levels and water flow in the watercourse..
- Installation of a level probe in each of the 6 watercourses potentially impacted by the project, namely watercourses A, C, N, M, F and E. These probes will be installed in the spring, once the streams are free of ice, and removed in the fall, before the freeze-up period.
- Realization of gaugings (velocity measurements to calculate the flow) in the 6 watercourses potentially impacted by the project, at the level of the level probes. One gage will be carried out when the level probes are installed in the spring, another one when they are removed in the fall. Finally, another gauging will be carried out during the summer.
- Realization of gaugings in a watercourse not impacted by the project, as a comparison.

These activities will be carried out annually during the monitoring period. The absence of a survey during the winter period is explained by the presence of snow and ice, which makes gauging impossible.

A detailed monitoring protocol will be developed in the next phase of the project and submitted to the Ministry for approval prior to implementation. This detailed protocol will contain, among other things, a map showing the exact location of the measuring instruments, and a detailed schedule of the various campaigns planned.

Question CCE-26 B - Low-Level Streamflows

Precision 1

Table 2.6 (Annex CCE-26 of the response document to the second request for information) shows the impact of the project on low flow rates with the variant retained with four discharge points. At point "A1 + M1", flow reductions of up to -100% (zero flow) are indicated. Also, in appendix CCE-27, it is mentioned that the effluent from the water treatment unit (WTE) would flow intermittently, so that in low water, there should be no flow in stream A. Taking into consideration the following elements:

- *The values of 0% entered in table 2.6 (annex CCE-26), at points "A1" and "M1", for all the years during the low-flow period, seem to indicate that there will be no effect. of the project on flows in rivers A and M during the two low-flow periods.*
- *Table 2.7 (Annex CCE-26) presents the impact of the project on average flows. The project leads to significant increases in average monthly flows in winter (months 1, 2, 3, 4 and 12), where small streams such as stream A are in low water winter conditions with almost zero flow rates.*
- *Table 2-5 (appendix CCE-26) presents the estimated average monthly flow rates (in liters per second) at the outlet of the WTE. Releases are expected every month of the year.*

The promoter must:

i) Specify whether Table 2-5 (Annex CCE-26) applies to the four-point variant. Otherwise, provide an equivalent table for this variant.

ii) Provide a detailed schedule of expected discharges into stream A and other receiving environments (lakes 3, 4 and 6), for each month, and specify whether the discharges will be continuous during each of these months. If applicable, indicate how the volumes of water discharged daily will be determined (for example the maximum or minimum thresholds). For stream A during periods of winter and summer low flow, indicate the decision threshold leading to stopping the discharge at the WTE and specify the period during which the discharge will remain zero at the WTE.

Precision 2

Tables 2.6, 2.7 and 2.8 (Appendix CCE-26) show percentage variations only. For Table 2.6, in particular, the variations of 0% indicated for watersheds of five square kilometers and less do not demonstrate the potential impacts on fish and their habitat during the low-water period since these values indicate an absence of changes. which is unlikely.

The proponent must provide the quantitative values of the flows under current and projected conditions that are the source of tables 2.6, 2.7 and 2.8 in order to allow a better assessment of the effects of the project.

Note: For reference, see Appendix E - Hydrology of the Information Requested by CEAA for Concordance of Environmental Impact Assessment document (WSP, February 2019). In Appendix A - Characteristic flow rates at the conditions projected in this document, the tables present the type of data sought.

Precision 3

Table 3.2, shown in Appendix B of Appendix CCE-27, presents the impacts of the project (variant with 4 discharge points) on the water levels in the rivers.

The proponent must also indicate the variations for year 13 and specify the reference depths (current conditions) used for the calculation of the variation in water levels.

Precision 4

Considering that in appendix CCE-3, for the variant with 4 discharge points, it is mentioned that in watercourse A the average monthly flows will not exceed the current 2-year flood flow and that the response provided to question CCE-20 indicates that the hydrogeological modeling was not revised following the removal of the dike at Lake 3 (this being conservative in terms of the projected flow reductions), the proponent must provide the following information:

i)Specify whether the projected average monthly flows will be greater than the two-year flood flows for the other watercourses that will receive the discharges from the peripheral wells (watercourses C, E and F).

ii)Indicate whether the projected increases in flow could be underestimated given that the drawdown of the water table would be less significant in the absence of the dike at Lake 3, as mentioned in the hydrogeological modeling. If applicable, specify whether it is possible that the projected average monthly flows could be greater than the two-year flood flows.

ANSWER

Precision 1

i) Table 2-5 (Appendix CCE-26) is applicable to both the single discharge point and 4 discharge point variants. The site water balance has been updated, and the new estimated average monthly discharge rates at the WWTP for a year of average rainfall (for both scenarios) are shown in Table 2 below.

ii) Table 1 summarizes the sources of releases to the various receiving environments for the two scenarios studied.

- Discharges of the WTP to stream A are identical in both scenarios. As shown in Table 1, these discharges to the WTP are intermittent, depending on the rainfall at the site. Indeed, the operation of the WTP depends on water management at the site, depending on the amount of runoff water collected, and the storage capacity at the site. Therefore, the WTP may be shut down if no rain (or very low rainfall) falls on the site for a long period of time. However, it is also possible that the WTP may be in operation during periods of low rainfall. For example, the retention basin upstream of the WTP may fill up during a period of heavy rainfall, or during snowmelt. If a period of low rainfall occurs when the basin is full, the WTP could still operate in order to empty the basin.

  The discharge rate is limited by the maximum capacity of the WTP. Thus, the maximum discharge rate is 650 m^3/h (0.18 m^3/s) for years 1 and 2, and 920 m^3/h (0.26 m^3/s) for years 3 to 17, for a maximum daily discharge volume of 15,600 m^3 for years 1 and 2, and 22,080 m^3 for years 3 to 17. The expected average monthly discharge rates from the WWTP to Stream A are shown in Table 2. They are derived from the site water balance for a year of average rainfall, recently updated.

- Discharge of pumping water from the peripheral wells is continuous throughout the year, but varies depending on the year of operation considered. Indeed, more wells will come into operation as mining activities progress. The average discharge rate estimated for different years is shown in Table 3.

Table 26-1 Expected releases to the different receiving environments for both scenarios

	Scenario with 1 discharge point	Scenario with 4 discharge points
Stream A	- WTP (intermittent) - Peripheral well pumping water (continuous, but varies with years of operation)	- WTP (intermittent)
Stream E (lake 3)	/	Part of the water pumped from the peripheral wells (continuous, but varies according to years of operation)
Stream C (lake 4)	/	Part of the water pumped from the peripheral wells (continuous, but varies according to years of operation)
Stream F (lake 6)	/	Part of the water pumped from the peripheral wells (continuous, but varies according to years of operation)

Table 26-2 Projected average monthly flows (L/s) at the outlet of the UTE (discharge to stream A)

Month	Years 1-3 (phase 1)	Years 4-17 (phase 2)
January	134	134
February	135	136
March	138	140
April	168	187
May	181	256
June	181	256
July	181	194
August	173	191
September	181	234
October	181	237
November	181	170
Décember	143	137

Table 26-3 Average discharge rates of water pumped from peripheral wells (L/s) into the various receiving environments

	Scenario with 1 discharge point			**Scenario with 4 discharge points**		
	Year 1	Year 4	Year 9 and +	Year 1	Year 4	Year 9 and +
Stream A	0	55,6	111,2	0	0	0
Stream E (lake 3)	0	0	0	0	0	55,6
Stream C (lake 4)	0	0	0	0	27,8	27,8
Stream F (lake 6)	0	0	0	0	27,8	27,8

Precision 2

Estimated quantitative values of low, high and average monthly flows under current and projected conditions are presented in the tables in Appendix CCE 26B.

Note that the figures have not been updated following the update of the water balance (and therefore the discharge flows at the WTP). The figures affected would only be the values of projected flows for Stream A (points A3 and A2) under average monthly flow conditions (April to November). However, these changes would not significantly affect the results, and the conclusions are unchanged. Furthermore, taking into account all the contingencies related to the calculation of the projected flow and water level values presented, this confirms that the impact of the water balance update on the projected flow values presented is minimal. Finally, the proposed follow-up to the answer to question CCE26-A will make it possible to validate the order of magnitude of the projected flows and the more precise effect of the project on the watercourses.

Precision 3

Table 3.2 in Appendix CCE-26 has been updated with the impacts of the project on water levels in Year 13 in Table 4 below. In addition, the reference depths considered (current conditions) are shown in Table 5. It should be noted that water depths vary greatly within the same watercourse, depending on whether the section considered is a control section (outcropping rocks) or a trough, in an area of low slope or on the contrary in a drop zone. Table 5 shows the range of depths encountered in the stream, as well as the average.

Table 4 Impacts of the mining project on the water levels of the six watercourses under consideration for the scenario with four discharge points

Stream	VARIATION OF WATER LEVELS (cm)		
	Low-water flows	Mean monthly discharge	Flood flows
A	• No flow (as current conditions)	Upstream effluent : • Up to -20 cm • No flow from December to April Downstream of the effluent : +5 to +30 cm	2 years : -10 to -15 cm 100 years : -10 to -25 cm
C	Upstream : • Year 1 : no flow (as current conditions) • Years 4, 9, 13 and 17 : low flow (none currently) Downstream : • Year 1 : -1 cm to -5 cm • Years 4, 9 and 13 : +1 cm to +3 cm • Year 17 : ≈ -2 cm	Year 1: 0 to -2 cm Year 4, 9 and 13 : 0 to +5 cm Year 17: -2 cm to +2 cm	0 to -4 cm
F	Year 1 : no flow (as current conditions) Years 4, 9, 13 and 17 : low flow (none currently)	Year 1: 0 to -3 cm Years 4, 9, 13 and 17 : +2 cm to +10 cm	2 years : ≈ -1 cm 100 years : -1 to -4 cm
E1	Years 1 and 4 : no flow (as current conditions) Years 9 and 13 : low flow (none currently) Year 17 : no flow (as current conditions)	Years 1 and 4 : -2 to -6 cm Years 9 and 13 : 0 to +4 cm Year 17 : -2 to -5 cm	2 years : -7 to -20 cm 100 years : -5 to -40 cm
M2	• No flow (as current conditions)	Year 1 : minimal decrease in water levels Years 4, 9, 13 and 17 • Up to -15 cm • No flow in winter for years 13 and 17	Year 1 : ≈ 0 cm Years 4, 9, 13 17 : • 2 years : -10 to -20 cm • 100 years : -10 to -30 cm
N2	• No flow (as current conditions)	Year 1 : minimal decrease in water levels Years 4, 9 and 13 : -1 to -5 cm Year 17 : • -1 to -10 cm • No winter flow upstream	Year 1 : ≈ 0 cm Years 4, 9, 13 and 17 : • 2 years : -3 to -9 cm upstream 0 to -3 cm downstream • 100 years : -4 to -15 cm upstream 0 to -1 cm downstream

Table 5 Baseline depths (current conditions) in the six streams under study

Stream	VARIATION OF WATER LEVELS (cm)		
	Low-water flows	Low-water flows	Low-water flows
A	No flow (zero depth)	From 5 cm to 1.3 m (average 25 cm)	2 years : From 10 cm to 1.5 m (average 65 cm) 100 years : From 30 cm to 1.7 m (moyenne 90 cm)
C	Upstream : No flow (zero depth) Downstream: From 5 cm to more than 1 m (average 35 cm)	From 5 cm to 2.1 m (average 65 cm)	2 years : From 10 cm to 2.2 m (average 80 cm) 100 years : From 15 cm to 2.3 m (average 90 cm)
F	No flow (zero depth)	From 5 cm to 1.4 m (average 55 cm)	2 years : From 20 cm to 2.5 m (average 75 cm) 100 years : From 20 cm to 2.6 m (average 90 cm)
E1	No flow (zero depth)	From 15 cm to 1 m (average 40 cm)	2 years : From 35 cm to 1.5 m (average 75 cm) 100 years : From 45 cm to 2 m (average 1 m)
M2	No flow (zero depth)	From 5 cm to 1 m (average 35 cm)	2 years : From 25 cm to 1.4 m (average 65 cm) 100 years : From 40 cm to 1.5 m (average 80 cm)
N2	No flow (zero depth)	From 5 cm to 55 cm (average 30 cm)	2 years : From 15 cm to 1 m (average 60 cm) 100 years : From 25 cm to 1.25 m (average 70 cm)

Precision 4

i) As can be seen in the tables in Appendix CCE 26B presenting the estimated quantitative flow values, as well as in the summary in Table 4 below, it is expected that the estimated average monthly flows under projected conditions in the streams in the Study Area will not exceed the 2-year flood flows estimated under present conditions.

Table 4 Comparison of current 2-year flood flow and projected average monthly flows

Point of interest	Current 2-year flow rate	Max. average monthly flow rate
A2	1.08	0.28 (may and june, year 17)
E	1.21	0.15 (june, year 9)
C3	0.99	0.19 (june, year 4)
F1	1.30	0.17 (june, year 4)

ii) The calculation of the average monthly flows takes into account the effect of pit dewatering on the base flow of the watercourses around the pit. And the hydrogeological study that was used to quantify this impact considers the presence of a dike in the lake, which is no longer the case, which means that the drawdown of the water table will actually be less than that used for the calculations. The average monthly flows presented are therefore slightly underestimated from this point of view.

However, the impact of this change is not major, and does not change the conclusion that the projected average monthly flows will not exceed the 2-year recurring flood flow estimated under current conditions.

Indeed, the effect of the drawdown of the water table on nearby rivers was estimated at a loss of about 0.02 m^3/s to 0.4 m^3/s (the exact figure varies depending on the point of interest and the year considered). Based on the flow values presented in Appendix CCE 26B, as well as in Table 4 above, even if the effect of drawdown were to be completely neglected (which is conservative), the average flows would be increased, but would not exceed the estimated flood flows under current conditions.

Question CCE 27 - Effects on Fish and Fish Habitat of Changes in Surface Water and Groundwater Supplies

Precision 1

Considering that Lake 3 and watercourses G, E and H will be affected by the drying up of Lake 2 and the lowering of the water table during the operation phase and this, up to 22 years after closure, fish and their habitats are also likely to be affected. Due to the anticipated duration of these effects, deterioration or disturbance of fish habitat could occur.

The proponent must:

i) Specify the areas, habitat functions (e.g. reproduction, nursery, etc.) and fish species that would be likely to be affected, during the following two periods, where no discharge from peripheral wells, associated at Lake 3, will not allow the reduction in surface water and groundwater inputs to be mitigated:

- *after Lake 2 dries up until the start of the discharge; and*
- *after the end of the discharge until the pit is filled.*

ANSWER

First of all, Lake 3 is home to a fish community made up of white suckers (Catostomus commersonii), lake whitefish (Coregonus clupeaformis), northern pike (Esox lucius), yellow perch (Perca flavescens), spotted sculpins (Cottus bairdii) and walleye (Sander vitreus). This one is composed of several aquatic and riparian herbariums that offer a good reproduction and rearing potential for northern pike and yellow perch. The same species present in Lake 3 are likely to frequent streams G and H. It was determined that these also offered good potential breeding and rearing areas for northern pike and yellow perch. Finally, for Stream E, the main species found there are the spotted sculpin and the rapids dace (Rhinichthys cataractae), in addition to white sucker, lake mullet (Couesius plumbeus) and burbot (Lota lota). This watercourse also has good rearing and feeding habitat potential for the fish species present in Eastmain-1 reservoir, as well as good reproductive potential for northern pike and yellow perch.

Hydrological conditions that will prevail after the dewatering of Lake 2 until the start of the discharge will be comparable to what is currently expected in Year 1 of the Operations Phase, as there will be no water discharged to Lake 3 at that time. Thus, a variation in the average annual flow of -37%, resulting in a drop in the water level of between 2 and 6 cm, for an average of 4 cm, is expected for this sector. In terms of the period after the discharge is completed until the pit is filled, it is estimated that conditions will also be similar to Year 1 of the operation phase, but the months following the discharge shutdown may be more critical due to the readjustment of the water table that will have to occur naturally. As a precautionary measure, a decrease in the average water level of 6 cm is considered for this period.

Thus, based on estimates based on the decrease in average water level (4 cm for the period after the dewatering of Lake 2 and 6 cm for the period after the end of the discharge), average depth, average width for the streams and perimeter for the lake, and a constant theoretical slope of the shoreline based on the mirror width and average depth, it was possible to estimate the wetted areas lost after the dewatering of Lake 2 until the start of the discharge and after the end of the discharge until the pit was filled. These are presented in Table 1. Note, however, that the wetted area losses for streams G and H are presented as a guide. Indeed, it was initially considered that groundwater discharges to Lake 3 would maintain the main functions of these watercourses. However, considering the losses in effect after the dewatering of Lake 2 until the start of the discharge and after the end of the discharge until the filling of the pit, in addition to the lowering of the water table, it is more justified to take into account a total loss of these watercourses as a precautionary measure.

The main fish habitats that will be affected by these losses are located on the periphery of Lake 3 and along the shores of the watercourses, i.e. aquatic and riparian grass beds that offer good potential for the reproduction, rearing and feeding of northern pike and yellow perch.

Table 27-1. Estimation of wetted area losses for Lake 3 and streams E, G and H after dewatering of Lake 2 up to the start of discharge and after the end of discharge up to pit filling

Lake or stream	Wet area lost (m^2)	
	After Lake 2 dries out (4 cm drop in average level)	After the rejection has stopped (6 cm drop in average level)
Lake 3	2 881	4 322
Stream E	169	253
Stream G	35	52
Stream H	11	16

ii) Justify the withdrawal of rivers G and H from overall losses considering that the lowering of the water table would lead to a deterioration of the fish habitat as far as lakes 11, 12, 13 and their respective outlets.

ANSWER

In fact, the entire area of lakes 11, 12 and 13 (and associated streams) has been included in the overall losses since these will dry up due to the drawdown of the water table. Map 2 has been modified so that these are shown in red, indicating a destruction of fish habitat that will occur gradually over the course of the operation phase. With respect to streams G and H, as previously mentioned, it was initially considered that the discharge of groundwater to Lake 3 would maintain the main functions of these streams. However, considering the losses in effect after the dewatering of Lake 2 until the start of the discharge as well as after the end of the discharge until the pit is filled, in addition to the lowering of the water table, it is more justified to take into account a total loss of these watercourses as a precautionary measure. Thus, the total area of streams G and H has been added to the overall loss associated with the Rose Mine Project in Table 7.

iii) Provide, according to the responses to the previous details, an update of map 2 (Appendix CCE-27), where a line still appears at the location of the dike of lake 3. The proponent must also provide an update of tables 4 to 7 if required (Appendix CCE-27).

ANSWER

Map 2 and Tables 4 to 7 have been updated and are provided as an appendix to this document (Appendix CCE 27 of this document). As previously mentioned, the total area of streams G and H has been added to the overall loss associated with the Rose mining project in Table 7. In addition, the wetted area lost at Lake 3 and stream E (Table 1), for the period after discharge was stopped until pit filling (most critical period), has also been added to the loss balance.

Precision 2

In its response to question CCE-26, the proponent presents the hydrological modeling which has been revised following the changes made to the variant with four discharge points and the withdrawal of the dike at Lake 3. However, based on its response to question CCE-20, the hydrogeological modeling has not been revised. The analysis of the effects on aquatic fauna during the operation phase shows significant average annual flow changes (Table 2 of Appendix CCE-27), which suggests a potentially significant variation in monthly flows.

The proponent must, in cases where the projected average monthly flows prove to be greater than the two-year flood flows at the level of watercourses C, E and F, specify the effects that these flow changes could have on the fish and their habitats.

ANSWER

Projected average monthly flows will not exceed the two-year flood flows at stream levels C, E and F, as described in question CEC 26B clarification 4 of this document.

Questions CCE 30, CCE 31 and CCE 35 – Water management – Construction and exploitation phases

In response to question CCE 30, the proponent explains that a semi-permeable berm surrounding the overburden dump will be installed in order to capture suspended matter. According to Environment and Climate Change Canada (ECCC), a semi-permeable berm is not sufficient to adequately manage runoff from the overburden dump, even if it is revegetated.

In response to question CCE 31, the proponent revised the information on the management of mining water and non-contact water in order to demonstrate that these would be collected and managed properly. However, ECCC is of the opinion that the proponent has not demonstrated that it will collect and adequately manage all the mining water from the mine site, in particular the water from the overburden dump and the ditches on the main access road.

In the preliminary answers shared with the committee on November 30, 2020 concerning question CCE 35 (Document Preliminary answers - CCE 35 to 38 40 41 61 and 88), the proponent provided information on the management of contact water with service roads. However, the proponent does not consider all of the roads to be part of the mine site.

ECCC specifies that all water flowing within the boundaries of the mine site must be collected and discharged from one or more effluents that must meet the requirements of the Metal and Diamond Mining Effluent Regulations (REMMMD). ECCC considers that the overburden stockpile and all roads and access roads that are located within the limits of the mine site are part of it and the water that flows from it must be collected, sampled and treated as necessary, before to be able to be rejected in the receiving environment.

In addition, ECCC specifies that it is possible not to collect or sample the water which flows on the portions of land which are not exploited in the first years of construction of the mine (for example the watersheds M and N until year 4). However, these unexploited areas must be protected so as not to be contaminated by "contact water" from the exploited part which could reach them.

The proponent must, depending on the facilities required to adequately collect all runoff water inside the mining site according to the requirements of the REMMMD:

i) Update the information on the management of runoff water on the mine site during the construction and operation phase, particularly that from the overburden stockpile and all roads and paths;

ii) Update maps 20-1, 20-2, 20-3, 20-4 and 20-5 of Appendix CCE-30;

iii) Update maps 21-2 and 21-2 of Appendix ACEE-21 (document Responses to questions and comments from ACEE, WSP, December 2019) as well as map 03-03 of Appendix CCE -29. In this update, include all roads and access and service roads (including access roads to all stockpiles), their ditches, as well as the location of control points and water treatment infrastructure. The promoter must make sure to distinguish between the roads and the paths of the electricity transmission line, as they can be confused on the current maps;

iv) Update the water balance of Appendix ACEE-18 (document Responses to questions and comments from ACEE, WSP, December 2019) to include runoff from the entire mine site, including in particular those from the overburden stockpile and ditches of all roads and paths. The promoter must demonstrate that all water management installations (basins, ditches, pipes, pumps, etc.) have dimensions and capacities adapted to the new water balance; and

v) Re-evaluate the design of the accumulation pond and the main water treatment plant based on all changes made to the management of storm water, if applicable.

ANSWER

i) Following the coordination meeting held on December 1, 2020 between Critical Elements Lithium Corporation, Environment and Climate Change Canada (LCCC), the Cree Nation Government (CNG) and the Canadian Impact Assessment Agency (CNIA) concerning the inconsistent responses related to water quality and management of the second request for information, It was agreed that water management around the overburden pile and access road ditches will be adapted to address ECCC's remarks in compliance with the MMERMMD. Consequently, water collected in the ditches around the overburden pile and those along the main access road will be directed to the accumulation basin already planned on site for collection, sampling and treatment before being released to the receiving environment (Stream A).

Amendments to the mine site water management plan are as follows:

- The runoff collection ditch section along the main access road from the 10+100 to 10+960 link will be connected to the industrial deck ditch that will carry the gravity runoff to the accumulation basin.

- The ditches of the remaining sections of the main access road will direct runoff from the road to one of the two basins B1 and B2, which will be constructed at chains 11+250 and 12+025 respectively (see the direction of flow of each ditch section on updated maps 21-1 and 21-2 in Appendix CCE-30).

- Ditches will be built around the overburden pad and will gravity-feed runoff from the pad to the two basins B1 and B2..

- A pumping will be carried out from basin B1 to basin B2, then from basin B2 to the accumulation basin.

- The semi-permeable berm initially proposed around the overburden pad will not be required with the addition of the ditch at the periphery. Also, the water balance of the site has been updated for these modifications.

ii) See updated maps 20-1, 20-2, 20-3, 20-4 and 20-5 in Appendix CCE-30.

iii) See updated Maps 21-1, 21-2, and 03-03 in Appendix CCE-30.

iv) The water balance in Appendix CEAA-18 has been updated to include runoff from the entire mine site, including, in particular, runoff from the overburden pit and ditches of all roads and highways. This is addressed in response to CCE-35.

v) Following the update of the water balance, the pumping from the accumulation basin to the WTP will be increased for phase 1 of the project. The treatment flow rate is 650 m^3/h during the first phase of operations. The treatment flow rate for phase 2 of the project remains unchanged. The balance sheet shows that this flow rate will adequately manage the quantities of water collected in the accumulation basin, without overflow for normal operating conditions

The re-evaluation of the capacity of the accumulation basin, during an extreme event, was carried out using modeling on the PCSWMM software. The accumulation basin should adequately capture a 24-hour, 1:1,000-year flood with an average snowmelt over a 21-day period (the quantity of snow is the maximum foreseeable for a 100-year flood recurrence). The design flood included an 18% increase to account for climate change

Following 2D modeling, the accumulation basin should have a volume of 321,400 m^3.

Table 30-1 presents details on the simulated design flood as well as the pumping flows from the various infrastructures of the mine site to the accumulation basin.

Table 30-1: Modelling parameters on PCSWWMM for the re-evaluation of the accumulation basin capacity following the modification of the mine site water management plan.

Design flood (1:1,000 years)	138.53 mm/24 h
Pumping capacity from Sedimentation Basin 3 to the accumulation basin	0.85 m^3/s
Pumping capacity from B2 to the accumulation basin	0.05 m^3/s
Pit dewatering rate	540 m^3/h

Question CCE-32 - Water Management - Options for Dewatering in the Operations Phase

In Appendix CCE-3, the proponent analyzed three variants in order to identify the best treatment for mining water. He recommended Variant 1, which is polishing and pH neutralizer tanks. Environment and Climate Change Canada (ECCC) considers that additional treatment to that described in variant 1 will likely be required for peripheral pumped water.

Indeed, ECCC is of the opinion that the quality of the water used for the analysis of the variants *for the treatment of mine water is not appropriate. The quality of the pumped water would be different from the current groundwater used for the analysis of the variants. It could be located between the groundwater and the mine water since an impermeable barrier between the pit boundary and the peripheral pumps is not foreseen by the proponent. In addition, the quality of the mine water could be affected by nitrates and other possible contaminants that would come from the explosives used in the pit.*

In section 3.4.1 of Annex CCE-3, the proponent indicates that the "sedimentation basin does not capture the metals listed in the [Regulation respecting effluents from metal and diamond mines (REMMMD)]. If the rates exceed the standards of the REMM®, a physicochemical filtration system will be integrated into the treatment".

In response to question CCE 32, the proponent indicates that: "In the event that other geochemical analyses show that certain contaminants exceed the limits authorized by the REMMMD, small treatment plants will be installed downstream of the sedimentation basins [...] before being released into the receiving environment (lakes 3, 4 and 6) ".

In its letter of non-compliance of November 16, 2020, the committee mentioned, with regard to question CCE 25, that the estimates of tantalum leaching from tailings were underestimated during kinetic testing due to the methodology for measuring tantalum in water (dissolved versus total).

The proponent must:

i) Describe what would be the additional processing steps required in the three small processing plants: type of technology involved, physical and / or chemical principles involved (coagulation, flocculation, settling, etc.), dimensions of the main structural components that will have to be built or installed downstream of sedimentation basins, management of the sludge generated, monitoring and maintenance.

ii) Explain how it would be determined whether these small facilities should be located. Indicate an approximate time period between the time of this decision and the time when the small plants would be operational.

iii) Update map 03-03 (Appendix CCE-29) to indicate the location of these 3 small treatment plants.

iv) Update the water balance in Appendix ACEE-18 (ACEE Responses to Questions and Comments document, WSP, December 2019) to include peripheral pump water.

ANSWER

i) In the event that certain contaminants exceed the MMERMMD limits when sampling water from one of the sedimentation ponds collecting water from the pumps at the periphery of the pit, a treatment plant would be added prior to discharge to the affected receiving environment.

Since we do not have these hypothetical exceedances in terms of value and contaminant, we recommend at this stage to provide a ballasted flocculation treatment system (coagulation, flocculation and microsand) to precipitate the TSS and remove it from the water. This system, which offers the greatest flexibility with the possibility of adding reagents to help capture fine metal particles, comes by default with a high level of automation and instrumentation and active sludge management with a filter press. Accumulated sludge will be characterized and disposed of at authorized off-site locations. At this future stage of the project, the tantalum leaching issue will be better known and can be addressed in the water treatment methodology.

Such a system requires a well-trained operator to ensure proper operation, so monitoring will be constant. Maintenance of the system is simple, just make sure to calibrate the instruments regularly and periodically clean the equipment. The sampling and continuous monitoring protocol (instrumentation) will be updated according to the new parameters to be observed.

As an indication for the expected flow rates, a modular plant representing three or four marine containers could be installed on a crushed gravel deck.

ii) A period of six months is estimated between the observation of an exceedance of a MMERMD criterion, including the ordering of the system, tests to optimize its process, its manufacturing and its installation on site. The required civil and electrical work will be included in the initial preparation of the sedimentation basins.

Pending the local implementation of the new treatment plant, the peripheral pumps causing the exceedance of standards may be stopped, so no contaminants will be discharged to the effluent. If an increase in the water level in the pit is observed, additional pumps may be added to convey this water to the accumulation basin and the main water treatment plant.

iii) Map 03-03 is updated with the addition of the three potential treatment plants in Appendix CCE-30.

iv) The water balance in Annex CEAA-18 has been updated: see answer CCE-35.

Questions CCE-33 and CCE-34 – Water Management during Decommissioning and Restoration Phases

In response to questions CCE 33 and CCE 34, the proponent provides information on mine restoration work, in particular by referring to the Site Redevelopment and Restoration Plan for the Rose Lithium Tantalum project developed by SNC-Lavalin (2019) and providing an update of the QC-95 map (Appendix CCE-33) showing the mine site after restoration. Environment and Climate Change Canada is of the opinion that some details on the surface water drainage at the mine site are still missing in order to be able to assess the effects of the Project on the hydrological regime and fish habitat after restoration and the closure of the mine.

The proponent must present the detail on the drainage of surface water on the mine site at closure and post-closure of the mine. This should include, without being limited to, the boundaries of the various sub-basins taking into account the configuration of the mine site at closure (presence of stockpiles and pits), the drainage scheme as well as the drainage scheme, including the flows and volumes of water draining to receiving environments (lakes and rivers).

Suggestion: To meet this demand, Appendix CCE-26 could be amended to present results for years after year 17.

ANSWER

Calculations and modeling for surface water drainage at the mine site post-closure can be performed once the remediation plan is finalized and approved. This post-closure surface water drainage detail can then be added to Schedule CCE-26.

Question CCE 35 A and B - Management of Water in Contact with Service Roads

A) The proponent must clearly identify on the maps of appendices ACEE-20 and ACEE-21 the runoff collection system of all roads (eg: ditches, basins), as well as the direction of flow.

ANSWER

Updated maps 21-1 and 21-2 (Appendix CCE-30) show the management of contact and non-contact water during mine operations. This management is detailed in B).

B) The proponent must explain, in the water management plan, how the water collected in road ditches will then be managed, taking into account the applicable standards and regulations (including the Regulation respecting metal mining effluents and diamond mines and the Fisheries Act):

- *The location of all ditches and other infrastructure to collect road water as well as the direction of water flow;*
- *The location and dimensions of the basins mentioned in the promoter's response;*
- *The parameters measured and the frequency of monitoring to check the water quality, as well as the places where the sampling will be done;*
- *Updating the water balance and the design of the various collection and treatment structures, if applicable.*

ANSWER

Ditches around service roads and infrastructure have been designed with a berm to prevent runoff water at the periphery (non-contact) of the infrastructure from entering the infrastructure and thus becoming contact water to be treated. These ditches were considered in the hydrological analysis of the site (Appendix QC-30).

Drainage of contact water from the mining equipment service roads will be carried out by the network of ditches around the site and will be directed to the accumulation basin for treatment by the water treatment plant (WTP). The treatment plant will monitor all parameters governed by the standards in force.

Runoff on the main access road will be collected via ditches along the road. The runoff collection ditch section from 10+100 to 10+960 will be connected to the industrial apron ditch that will convey this runoff gravitationally to the accumulation basin. The other sections of the ditches of the main access road will convey the runoff water on the road to one of the two basins B1 and B2, which will be arranged at chains 11+250 and 12+025 respectively. (See the direction of flow of each ditch section on updated maps 21-1 and 21-2 in the appendix). Pumping will be carried out from the B1 basin to the B2 basin and then from the B2 basin to the accumulation basin. The water from the main access road will therefore be adequately treated at the WTP in order to meet the requirements of the *Metal and Diamond Mining Effluent Regulations* (MDMER) prior to discharge to the environment.

Also, the drainage water from the portion of the road leading to the detonator storage area will be drained by gravity via a ditch to the B3 retention basin, then this water will be pumped via the PP-B3 pumping station to the ditch section of the same road but which drains the water by gravity to the pit (See Map 03-03).

The ditches of the main access road and the overburden dump, the ditch of the road leading to the detonator storage facility, and the three retention basins B1, B2 and B3 were dimensioned using PCSWMM software for a 24-hour, 1: 100-year flood combined with the average snowmelt over a 21-day period (the amount of snow is that which corresponds to the maximum foreseeable for a 100-year recurrence). The rainfall used for the design included an 18% increase to account for climate change. Pumping flows from B1 to B2 and from B2 to the accumulation basin are determined so that both basins are emptied within 72 hours of the design flood. Tables 35-2 and 35-3 present the design results.

Table 35-1 Results of the design of the water management infrastructure for the overburden shed and the main access road

Design flood (1:100 years)	114,93 mm/24h
Volume of basin B1	15 000 m^3
Volume of basin B2	9 100 m^3
Volume of basin B3	2 840 m^3
Pumping flow rate Max. from PP-B1 (B1 → B2)	0,03 m^3/s (108 m^3/h)
Pumping flow rate Max. from PP-B2 (B2→Accumulation basin)	0,05 m^3/s (180 m^3/h)
Pumping flow rate Max. from PP-B3 (B3→Ditch → Pit)	0,015 m^3/s (60 m^3/h)

Table 35-3 Dimensions of the ditches of the main road and the overburden area

Ditch height (m)	Bottom width (m)	Side Slope	Depth (m)	Minimal Revanche (mm)
1.0	1.0	2H :1V	0.9	388

Update of the water balance

Water inflows from the overburden disposal site and the main access road were added to the water balance previously presented in Appendix CEAA-18. In the previous water balance, the mine site was divided into five watersheds. A sixth watershed representing the overburden pit watershed and the main access road will be added to the previous water balance configuration.

The updated water balance for the Rose mine site for average conditions is presented in Table 35-4.

Table 35-4 Overall water balance for the Rose mine site for average conditions taking into account changes to the water management plan.

Intrant/Output	Code	Description	Phase 1 normale m³/an	Phase 2 normale m³/an
Drainage basin of the industrial apron and the ore stockyard				
Intrant	R1	precipitations	*299 400*	*299 400*
Intrant	F1	dewatering pit on the periphery of pump pit no. 1	*464 280*	464 280
Intrant	P6	water contained in the ore feed	*94 190*	94 190
Output	M1	dust abatement	*7 500*	*7 500*
Output	D1	soil infiltration	-	-
Output	E1	evaporation	*82 828*	*82,828*
Output	D2	waste water to the leaching field	*61 320*	*61 320*
Output	P7	water contained in concentrates	*2,336*	*2,336*
Output	P9	water evaporated from concentrates	*115 340*	*115 340*
Output	P8	water contained in the tailings to the watershed of the co-deposition stockpile	*172 645*	*172 645*
Output	P10	miscellaneous losses at the plant	*5 585*	*5 585*
Output	P5	surplus process water to water treatment plant watershed	*410 317*	*410 317*
Watershed of the co-deposition stockpile				
Intrant	R3	precipitations	*546 511*	*1 570 713*
Intrant	P8	water contained in the tailings arriving from the "Bassin Versant du Tablier Industriel et de la Halde à minerai".	*172 645*	*172 645*
Output	D4	soil infiltration	*164 905*	*434 533*
Output	E3	evaporation	-	-
Output	P2	water discharged from the co-deposition stockpile to the accumulation basin - phase 1	*554 252*	*NA*
Output	P3	water discharged from the co-deposit stockpile to basins #2 and #3 - phase 2	*NA*	*1 308 825*
Watershed of mine workings				
Intrant	R2	precipitations	*784 513*	*784 513*
Intrant	S1	Exfiltration water	*3 832 500*	*3 832 500*
Output	E2	evaporation	*513 993*	*513 993*
Output	D3	dewatering well on the periphery of the pit pump nos. 2 to 8 (non-contact water)	*630 720*	5 010 720
Output	P1	pit dewatering water	*4 103 020*	*4 103 020*
Output	F1	dewatering pit on the periphery of pump pit no. 1	*464 280*	464 280
Tailings Facility Watershed				
Intrant	P3	water discharged from the co-deposition stockpile - phase 2	-	*1 308 825*
Intrant	R5	precipitations	-	*38 734*
Output	E5	evaporation	-	*14 469*
Output	D7	soil infiltration	-	-
Extrant	P4	phase 2: water discharged from the basin of sterile stockpiles no. 2 and no. 3	*NA*	1 333 090
Watershed of the overburden stockpile				
Intrant	R6	precipitations	*176 283*	*176 283*
Output	E6	evaporation	-	-
Output	D8	soil infiltration	*72 624*	*72 624*
Output	P11	water discharged from the overburden pond and the main access road	103 659	103 659
Watershed of the water treatment plant				
Intrant	P1	pit dewatering water	*4 103 020*	*4 103 020*
Intrant	P2	water discharged from the co-deposition hall - phase 1	*554 252*	*NA*
Intrant	P4	water discharged from the pool of sterile dumps #2 and #3 - Phase 2	-	*1,333,090*
Intrant	P5	water from the industrial apron basin and the ore stockyard	*410 317*	*410 317*
Intrant	P11	water from the overburden pond and the main access road	*103 659*	*103 659*
Intrant	R4	precipitations	*35 723*	*35 723*
Output	E4	evaporation	*19 063*	*19 063*
Output	D6	soil infiltration	-	-
Output	D5	WTP-treated water to Creek A	*5 187 908*	*5 966 746*

All water management facilities (sedimentation basins 2 and 3, drainage ditches, pumps) have dimensions and capacities adapted to the new water balance. Only the wet pond will be affected, as it will receive additional water inputs from the overburden pond and the main access road (see Reassessment of Wet Pond Design Based on All Stormwater Management Changes in Response CEC-31).

Question CCE 36 A and B - Water Treatment Unit and Accumulation and Sedimentation Ponds

A) The proponent must include the additional water from road ditches in its water balance.

ANSWER

The water balance in Appendix CEAA-18 has been updated to include road ditches: see response CCE-35.

B) The proponent must provide the following details concerning the water recirculation mechanism of the water treatment plant, which will be a key step if the criteria for monitoring the treated water are exceeded:

- *The mechanism and its operation (in detail), explaining in particular whether it will be done automatically or manually. Indicate the robustness of this system and the measures that will be taken in the event of sensor failure.*
- *The estimated capacity of the accumulation basin, in number of days, if an incident occurs and requires the recirculation of the waste water :*
  - *And that the ore treatment processes were not stopped;*
  - *And that the ore treatment processes were stopped.*
- *Examples of mining sites that use the recirculation principle and suppliers of water treatment systems. Present this information (in detail), including information related to the performance of this type of system*.

ANSWER

If any of the treated water monitoring criteria are exceeded, the water treatment plant will be put in recirculation mode until the readings are adequate. During this period, the water leaving the treatment system will be returned through a set of automated valves to the accumulation basin rather than to the effluent (Stream A).

Because suspended solids (SS) and pH readings are taken continuously by redundant in-line instruments, deviations from standards will automatically activate the recirculation mode. Also, operators will regularly take samples to be tested by an off-line instrument analyzer for metals in solution (silver, copper, zinc, etc.) and validated by sending samples to a certified laboratory. An identified overflow will initiate the manual recirculation mode procedure using the operator interface.

The estimated capacity of the accumulation basin during a recirculation incident will be estimated for several recurring flood events ranging from 10 years up to 100 years. Three scenarios are to be analyzed:

- Scenario 1: Mining operations were not shut down;

- Scenario 2: Ore processing was stopped. The accumulation basin does not receive excess process water from the ore processing plant only the dewatering water from the bottom of the pit, runoff on the industrial apron and pumping from basin No. 3 and basin

B2 (runoff on the overburden shed and the main access road) which will be maintained.

- Scenario 3: Mining activities were stopped. The accumulation basin does not receive the dewatering water from the bottom of the pit, only the runoff water on the industrial apron and pumping from basin n°3 and basin B2 which will be maintained.

Table 36-5 presents the results obtained:

Table 36-2 Estimated capacity of the accumulation basin for several flood events.

Flood recurrence	Estimated storage tank capacity in number of days		
	Scenario 1	**Scenario 2**	**Scenario 3**
100 years	2,5 d	2,8 d	11 d
50 years	6,3 d	6,5 d	40 d and +
25 years	8,0 d	8,3 d	40 d and +
10 years	10,4 d	10,8 d	40 d and +

The recirculation principle is used at several mining sites, such as Agnico Eagle's Meadowbank site and Tata Steel's Goodwood site. In the first case, the water extracted from the pit is pumped into an accumulation basin and then pumped a second time to the water treatment unit. The water quality is measured continuously (TSS and pH) and in the case of a problem with the automatic valves diverts the water from the final effluent to the accumulation basin. The same situation is done in the case of Tata Steel at their Goodwood site in order to maintain the discharge criteria within the regulatory standards.

In addition, suppliers such as Veolia and ASDR use this methodology when treating dewatering water from a pit to ensure that the water at the end of their treatment chain complies with established standards and that non-compliant water returns to the pit in the event of a treatment problem.

Question CCE-37 A and B - Impermeability of Accumulation Basins

Environment and Climate Change Canada is of the opinion that the information provided in response CCE 37A) is not sufficient. On page 54 of the response document, the proponent does not clearly explain whether the sealing of the sedimentation basins of lakes 3, 4 and 6 also concerns basins 2 and 3.

The water that would pass through ponds 2 and 3 would come from the waste rock and tailings pile. Despite the results of geochemical tests which indicate the absence of potential for metal leaching and acid mine drainage from the samples tested, the runoff water from this dump could contain higher concentrations of contaminants than the results of these tests since the behavior in high volume stacking could lead to higher contaminant concentrations. The results of geochemical tests are indicators that help determine what protective measures must be taken to avoid contamination of the receiving environment, but do not accurately predict the evolution of geochemical characteristics under real, uncontrolled conditions.

In its letter of non-compliance of November 16, 2020, the committee mentioned, with respect to question CCE 25, that the estimates during the tailings leaching tests underestimated the tantalum concentrations due to the methodology of measurement of this element in water (dissolved versus total). Environment and Climate Change Canada is of the opinion that there is little information available to date on the mobility and toxicity of tantalum and that preventive measures must be taken to minimize the risk to the environment, which includes the 'sealing of basins 2 and 3.

In the preliminary answers shared with the committee on November 30, 2020 concerning question CCE 37 B (Document Preliminary answers - CCE 35 to 38 40 41 61 and 88), the proponent indicated that the Manning coefficient used for the calculations related to flows in the ditches is 0.036. This same coefficient is estimated at 0.06 in response CCE 29 B. In addition, it is indicated that "a characterization of the till present in the overburden of the pit will be prior to the construction of the ditches in order to confirm that this material is sufficiently waterproof to limit the infiltration of contaminated water into the soil ".

A) The proponent must describe and justify the choice of materials that would be used to waterproof basins 2 and 3. He must describe the methods that would be used to characterize the degree of waterproofing of these materials and what results are sought in order to prevent the risk of infiltration of contaminants into groundwater.

ANSWER

In order to seal basins 2 and 3 and the ditches around the co-depositional stockpile, it is planned that the till, collected during pit stripping, will be used in the construction of the basins and will make them watertight. It should be noted that a characterization of the till present in the overburden following pit stripping will be carried out prior to the construction of the ponds and ditches in order to confirm that this material is sufficiently watertight to limit the infiltration of contaminated water into the soil. The characterization of the till will have to be done by permeability tests and granulometric analyses that will allow the calculation of the hydraulic conductivity of the till which must be less than or equal to 10-6 cm/s and thus allow a percolation rate less than or equal to 3.3 L/m2/day in accordance with the requirements of Directive 019. If these requirements are met, the till can be used in the construction of basins and ditches and thus the latter will be watertight to retain tantalum particles.

The design criteria for the ditches are to be able to receive a rainfall of 1: 100 years for a period of 24 hours and snowmelt over 30 days, while maintaining a free space of 1 meter and a maximum velocity below 3 m/s. To protect the ditches from erosion, 0-400 mm riprap is provided on the sides and bottom of the ditches. A Manning coefficient of 0.036 was used for the protection of the ditches.

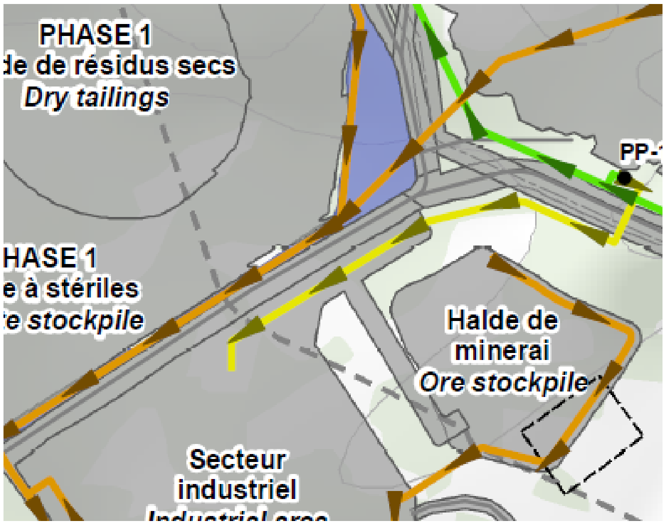
Should the characterization of the tightness of the till coming from the pit be inconclusive, i.e. the impermeability tests show that the hydraulic conductivity is greater than 10-6 cm/s, the use of a geomembrane will be required in the construction of basins and ditches in order to ensure their waterproofness.

B) The proponent must explain what the blue zone represents to the east of the co-deposition pile on map 03-03 of Appendix CEAA-21 and what are the design and waterproofing criteria planned for this infrastructure. It must also indicate what is the correct value of Manning's coefficient, or explain the difference between the two values presented in the sponsor's response documents.

In addition, the proponent must indicate what the alternative plans would be if the results of the characterization of the till impermeability from the pit were not conclusive..

ANSWER

The blue area east of the co-depositing stockpile on Map 03-03 of Schedule CEAA-21 (see close-up below) represents a ditch that collects contact water from both the co-depositing pile and the haul road. In detail engineering, this ditch can be optimized and reduced as required.



Question CCE-38 - Surface Water Monitoring Plan

In the preliminary answers shared with the committee on November 30, 2020 concerning question CCE 38 (Document Preliminary answers - CCE 35 to 38 40 41 61 and 88), the proponent did not provide a monitoring plan for the quality of surface of the receiving environment but rather an effluent monitoring plan.

ECCC suggests that the proponent draw inspiration from the groundwater monitoring plan in Appendix QC2-74 (Answers to additional questions from the MELCC) for the surface water quality monitoring plan.

In addition, appendix ACEE-46 (Answers to questions from ACEE), which establishes the initial state of water bodies, represents a reference for identifying the parameters to be measured as part of the water monitoring plan. surface during operation and after closure. In addition to the metals identified in the initial state of the water bodies, tantalum and lithium must be part of the surface water monitoring plan, as they are the sought-after elements of the Rose project. The comparison criterion for tantalum could be determined and justified with regard to recent studies carried out on the toxicity of this metal since there is no existing criterion in Quebec and Canada (refer to question CCE 25 for more details on this subject).

The proponent must provide the surface water monitoring plan for the exploitation, closure and post-closure phases:

i) Indicate which parameters will be measured, the location and frequency of sampling. Include lithium and tantalum;

ANSWER

Under Directive 019, site operations are required to conduct annual monitoring of surface water and effluent quality during site operation. Thus, this monitoring is provided for, and will be carried out according to the terms and conditions described in sections 2.1 and 2.3 of D019, and to the satisfaction of the MELCC and the MERN. This follow-up will notably allow, if necessary, to identify any problem with the final effluent from the site and to apply corrective measures.

ii) Compare the results obtained with the Canadian water quality guidelines: protection of aquatic life from the Canadian Council of Ministers of the Environment;

ANSWER

In addition to the monitoring provided for in Table 38-6, more in-depth annual monitoring will also be carried out for each discharge point and surface water characterization.

Table 38-6 List of parameters to be analyzed and frequency of monitoring under Directive 019

	Column I	Column II	Column III	Column IV
Frequency	Continuously	3 times a week	1 time per week	1 time per month
Parameter	pH Debit	SS [(1)] Debit pH	As Cu Fe Ni Pb Zn	Acute toxicity

Note 1 : Will also be read continuously with turbidity probe.

It should be noted that as part of the Metal and Diamond Mining Regulations (MMER), to which the Pink Mine Project will be subject, monitoring of water quality in the receiving environment is already required. Indeed, the MMERMAR require that each legislated mine must establish an Environmental Effects Monitoring (EEM) program. This monitoring program includes the collection of water samples in the exposed area surrounding the location where the effluent discharged from each final discharge point mixes with the water. In the case of the Rose Lithium Mine Project, this will consist of four sampling points located in Lakes 3, 4 and 6 and in Stream A, downstream of the mine effluent discharge locations. Water samples will be collected in each of the environments four times per calendar year and at least one month apart from the water samples collected when the mine discharges to the effluent, as enacted by the MMER. Additional water samples will also be collected during biological monitoring studies that will take place every three years in receiving environments. The following parameters will be analyzed in the water samples collected :

- pH;
- Hardness;
- Electrical conductivity;
- Dissolved oxygen concentration;
- Temperature;
- Alkalinity;
- Suspended solids;
- Aluminum;
- Arsenic;
- Cadmium;
- Copper;
- Iron;
- Mercury;
- Molybdenum;
- Nickel;
- Lead;
- Selenium;
- Zinc;

- Nitrates;
- Chlorides;
- Chromium;
- Cobalt;
- Lithium;
- Sulphates;
- Thallium;
- Tantalum;
- Uranium;
- Radium 226;
- Total phosphorus;
- Manganese;
- Ammoniacal nitrogen.

Quality assurance and quality control measures will be taken to ensure the accuracy of the data for the characterization of water quality in receiving environments. In addition, the results obtained will be compared with the various water quality criteria of the provincial (MELCC's Criterion for the Protection of Aquatic Life, Chronic and Acute Effects) and federal governments (Canadian Council of Ministers of the Environment (CCME) Water Quality Criterion) to ensure compliance with the suggested limits for the protection of aquatic life and to take action to regulate the situation if certain parameters exceed the proposed criteria.

Finally, the exact location of sampling stations will be identified when determining the extent of the mine effluent plume in the receiving environment, which is also part of the EEM program. This method will allow the sampling stations to be properly positioned in the mixing zone between the effluents and the water in the receiving environments. It should also be noted that water sampling will be carried out in unaffected reference zones for mining effluents, which will be identified at a later date in collaboration with ECCC. The collection of these water samples will allow a comparison to be made with the results obtained for water samples taken from lakes and streams exposed to mine effluents in order to determine whether the latter have an effect on the receiving environments.

Map 03-03 has been updated and shows the location of the four water quality monitoring points in the receiving environments, which will make it possible to monitor water quality in all natural receiving environments, i.e. lakes 3, 4 and 6 and watercourse A.

Table 38-8 REMMMD Thresholds to be met

	Column 1	**Column 2**	**Column 3**	**Column 4**
Article	Noxious substance	Maximum monthly average concentration allowed	Maximum allowable concentration in a composite sample	Maximum allowable concentration in a grab sample
1	Arsenic	0.50 mg/L	0.75 mg/L	1.00 mg/L
2	Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
3	Cyanide	1.00 mg/L	1.50 mg/L	2.00 mg/L
4	Lead	0.20mg/L	0.30 mg/L	0.40 mg/L
5	Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
6	Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
7	Total suspended solids	15.00 mg/L	22.50 mg/L	30.00 mg/L
8	Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L

iii) Present the mitigation and corrective measures that will be taken in the event that water quality monitoring shows that certain substances do not meet the water quality objectives.

ANSWER

During the operation phase, if the water quality monitoring, through the 4 receiving environment quality monitoring points, shows that certain substances will not meet the water quality objectives, the main treatment plant (Effluent to stream A) and the other secondary treatment plants (Effluents: Lake 3, Lake 4 and Lake 6) will correct the exceedance of the threshold of these substances in order to discharge to the various effluents water that meets the requirements (MMER). It should be noted that all runoff water will be collected in retention basins and then pumped to the single accumulation basin upstream of the treatment plant. Groundwater pumped from the peripheral pumping wells will be pumped back to the three sedimentation basins, then treated at the various secondary treatment plants and discharged to Lakes 3, 4 and 6. Therefore all runoff and groundwater pumped into the site will be treated at the various treatment plants (primary and secondary).

For the period covering the closure and post-closure, since the main water treatment plant (WWTP) 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 carried out previously, and this situation would be addressed in particular by modifying the treatment process of the water treatment plant. A follow-up, 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 set up in order to target and address the source of the observed problem. However, this program would have to be adapted to the problem observed, which is not possible to detail at this time.

The pumps at the periphery of the pit will be stopped, so there would be no need to maintain the secondary treatment plants.

More information is available in section 4.5 of the remediation plan produced for the project (SNC-Lavalin, 2019). The remediation work that will take place during the post-mining period will likely result in surface modifications to the site; however, these variations will be directly related to the work methods that will be defined during the detailed engineering phase that will be carried out to implement the site remediation. Thus, the water balance for this period will be developed during the detailed engineering phase and cannot be produced at the current stage of the project.

Sections 6.2 and 8.3 of the remediation plan produced for the project (SNC-Lavalin, 2019) explain the surface water quality monitoring that will be conducted during the remediation work in order to validate and adjust the remediation activities as required.

Question CCE 40 A and B - Certificates of Analysis for Leaching Tests

*A) The proponent shall provide the certificates of analysis of the **waste rock**. The question initially concerned the ore and the tailings, but this was a translation error.*

ANSWER

The certificates of analysis for the results of leaching tests (MA200 method) of the **waste rock** analyzed in 2018 can be found in Appendix CCE-40.

*B) The proponent provided the certificates of analysis of the ore. The proponent instead shall provide the certificates of analysis of the **tailings**.*

ANSWER

The certificates of analysis for the results of leaching tests (SPLP method) of the 15 **tailings** samples analyzed in 2018 can be found in Annex CCE-40.

Question CCE 41 A, B and C - Overburden and Sediment Geochemical Characterizations

A and B) The proponent did not provide a sampling plan or results of the geochemical characterization of the overburden.

The committee reminds the proponent that the mining site's water management system must include the collection of all drainage water in contact with the mining structures, including the overburden pile. The proponent must provide an assessment of the effects of these components on water quality and review the mode of management of runoff from the overburden stockpile

ANSWER

The Lamont report (2018) provides the results of the geochemical characterization for 10 overburden samples. The geochemical characterization determined that the overburden is considered low risk as defined by Directive 019 and is not leachable.

Appendix QC-62 sent to the MELCC also included a characterization of natural background levels (TDFN). This overburden characterization campaign (2017) resulted in the collection of 21 samples in trenches and 14 samples by drilling. For all parameters, the calculated NBSR was below the generic "A" criteria of the Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés.

A new work program submitted to the MELCC in July 2020 (Appendix QC3-13) will be completed prior to the construction of the mine site. It calls for the construction of 40 new exploration trenches (20 per unit) of approximately 3 m in depth using a hydraulic shovel or backhoe, in which 60 samples (30 per unit) will be analyzed (Map 1), in order to complete the data obtained in 2017. In addition, 10 surface samples will be collected in the expanded area. The extended area was defined based on prevailing winds at the study site and airborne contaminant dispersion modeling. Map 1 shows the expanded area and the approximate location of the manual sampling sites that will be carried out in this area.

The overburden will be in the overburden stockpile where all water will be managed (see CEC 30).

C) Modified question: The proponent must confirm whether the sediments from lakes 1 and 2 would be placed in the overburden dump or in the co-disposal dump. He must also explain when these sediments would be disposed of there (for example, as soon as they are excavated or after being stored in a temporary place).

ANSWER

In the response document to the second request for information from the IAAC (October 2020), it is written in the response that "The sediment from Lakes 1 and 2 will be placed with the overburden in the overburden pile and will be covered with vegetation immediately. The sediment will be placed as soon as it is excavated in the overburden pile.

Question CCE-43 - Sulphide Ore and Acid Generation Potential

In order to understand the reactivity and potential environmental risk of the waste rock, the proponent must provide confirmation of the predominant sulphide minerals observed in the waste rock.

ANSWER

In the report provided to question CCE-42C (Appendix CCE-42C), the sulphide minerals mentioned are as follows (per lithological unit):

Gneiss: pyrite
Amphibolite: pyrrhotite, pyrite and chalcopyrite
Porphyry: pyrite
Meta-sediments: pyrite

According to this report, taken from page 8:

“The vast majority of descriptions of sulphides in the minor lithology and mineralization intervals indicate the concentration as a range of values such as '2% trace locally'. It is observed that the majority of the intervals measure less than two meters and contain less than 5% sulphides. The total length of the intervals of minor lithology and mineralization containing sulphides is 116 meters, which represents 0.9% of the intervals of waste rock inside the projected pit. "

Question CCE-51 - Woodland Caribou - Blasting Impacts

In response to question CCE 51, the proponent indicates that "if a significant presence of caribou is declared in the area, blasting would be delayed to allow caribou to move away from the project area of influence". The sponsor's commitment is not described in a way that avoids any ambiguity of intention, interpretation and implementation, as requested in section 11.5 of the impact study guidelines.

For example, using the formula "significant presence of caribou" suggests that the detected presence of one or a few caribou near the mine would not be sufficient to delay a blast. If this is the case, it should be justified, including taking into account the status of the species under *the Species at Risk Act.*

Furthermore, the "project area of influence" for the assessment of the impacts of blasting on woodland caribou has not been defined, which does not make it possible to assess the spatial scope for which the measure could be applied.

The proponent must:

i) Define and justify the parameters of the commitment to delay blasting in order to mitigate the effects on woodland caribou;

ANSWER

As mentioned in response to CCE 51, considering the frequency of blasting at the mine site and the low probability of caribou frequenting the proximity of the site, particularly by a female during calving and post-calving periods, we are of the opinion that blasting will have no significant effect on woodland caribou. Its reaction can only translate into a functional response motivating it to avoid the area, which already seems to be avoided by this species considering the poor habitat conditions it offers and the current presence of permanent anthropogenic disturbances. However, in a precautionary approach if the presence of caribou is declared in the area, blasting will be delayed until they have moved away from the project's zone of influence (500 m on the periphery of the mine footprint).

An agreement may be reached with the MFFP and the tallymen of the Cree territories to notify the person in charge of the mine if a caribou or group of caribou appears to be heading towards the site, or have established seasonal habitat in the vicinity of the mine or any other sign of presence within a radius of 4 kilometers from the mine. Monitoring will be concentrated primarily during the periods when caribou are most vulnerable, i.e. winter, calving and post-calving. If the presence of caribou is confirmed in the mine's zone of influence, 500 m around the periphery of the mine footprint, blasting will be delayed until a validation confirms that the caribou is outside this zone. When a sign of presence is declared, a mine official will proceed with a validation of the occurrence, either by land or, if necessary, by air (drone in particular).

Despite the very low probability that caribou are present in the vicinity of the mine, as a preventive measure, Lithium Critical Elements Corporation (LEC) will implement a communication system to inform truck drivers of any observations or signs of caribou presence on these access roads. CEC will include a caribou module in the training activities for employees and subcontractors. The objective of this training will be to make them aware of the precarious nature of boreal caribou and to develop their ability to distinguish between possible signs of presence.

ii) Define the expression "significant presence of caribou" as well as "zone of influence of the project".

ANSWER

Significant presence means a presence confirmed either by a caribou sighting or an indication of caribou presence (tracks). The presence index may come from information transmitted by the Department, the tallymen of the Cree territories, mine employees or any other user of the territory. As previously mentioned, when a presence index is declared, a mine official will proceed to a validation in order to confirm the occurrence of caribou.

The project's zone of influence corresponds to the 500m caribou habitat disturbance zone on the periphery of the mine footprint.

Question CCE-61** - **Traditional Food** - **Measures to Protect Surface Water Quality

The proponent shall describe the measures that will be taken to detect leaks and spills from the waste rock and tailings pile or mine water basins (including exfiltration from piles, ponds and ditches) to protect surface water quality. The proponent only referred to the water treatment plant.

ANSWER

As can be seen on map 03-03 of the WSP note entitled CEAA-18 Water Balance (*ACEE-18 Bilan Hydrique*), all the contact water of the stockpiles and basins is collected and ends up in a treatment basin, before being released to the environment.

In addition, regular inspections, at least daily, will be made on the site to detect any problem whatsoever, of an environmental or other nature.

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