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Supplementary Information

Written submission from Orano Canada Inc.

Renseignements supplémentaires

Mémoire d' Orano Canada Inc.

In the Matter of the

Orano Canada Inc.,
McClean Lake Operation

Application for licence amendment for the expansion of the JEB Tailings Management Facility (TMF) at the McClean Lake Operation

Commission Public Hearing

October 4, 2021

À l'égard de

Orano Canada Inc.,
Établissement minier de McClean Lake

Demande de modification de permis pour l'agrandissement de l'installation de gestion des résidus (IGR) JEB à l'établissement de McClean Lake

Audience publique de la Commission

4 octobre 2021

Canada

Meeting Minutes

October 7, 2021

Meeting Purpose: TMF Expansion Project Discussion

Meeting Information:

Date:	September 13, 2021	**Time**:	10am
Location:	Virtual	**Comments:**	Microsoft TEAMS platform

Meeting Attendance

Present	Glenn Lafleur, Orano	*Present*	Cheyenna Campbell, ERFN
Present	Tina Searcy, Orano	*Present*	Irina Apesis, ERFN
Present	Stephanie Forseille, Orano	*Present*	Elder Norman Wolverine, ERFN
Present	Vincent Laniece, Orano	*Present*	Robin Kusch, ERFN
Present	Kebbi Hughes, Orano	*Present*	Carey Hyndman, Orano

Comments

1.	The purpose of the meeting was to follow up and provide any clarification needed on the written response, provided August 25, 2021, to English River First Nation's intervention questions provided to Orano on August 4, 2021
2.	Reviewed TMF Expansion YouTube video to provide overview of the project.
3.	Agreed to review the questions in order and discuss any necessary clarifications. • Question 1: What is the overall rationale behind the significant increase in tailings volume not significantly increasing risk to the downstream environment during closure?

	○ Additional clarification: Volume and quality of the water for water treatment isn't driven by tailings volume stored in the TMF. • Question 2: Will the volume of water to be released from the JEB WTP annually and over the life cycle of the plant be altered by the JEB TMF Expansion Project? ○ Additional clarification: Does the operational timeline change due to the increase in the tailings? ▪ Orano: the volume of water that the WTP can treat is driven by plant capacity and performance not by the volume of tailings. As the TMF expansion would extend the life of the mill, the WTP will operate longer, resulting in an increase of cumulated treated effluent released to the environment. ▪ However, the modelling conducted to date concludes that water quality objectives will be met now and for the long term • Question 3: If the answer to Question #2 is "yes", has the potential environmental risks posed been previously assessed, including risks from sediment COPCs to aquatic and terrestrial receptors? ○ Additional clarification: addressed when discussing question 2 • Question 4: As aquatic-dependent terrestrial receptors are known to be sensitive to selenium exposure, has this been encompassed in the environmental risk assessment work completed to-date or ongoing for both the JEB TMF and JEB WTP? ○ Additional clarification: correct, Selenium is included in risk assessments conducted for the McClean Lake Operation • Question 5: Was stakeholder engagement sought to inform the disruptive event assessed? If not, would stakeholder engagement be sought to develop the disruptive event assessed as part of the final decommissioning and closure environmental risk assessment? ○ Additional clarification: acknowledged the written response provided by Orano • Question 6: What additional mitigation measures would be available to prevent predicted elevated sediment COPC levels in Fox Lake and Pat Lake if the additional environmental risk work shows there could be a potential risk to downstream receptors? ○ Additional clarification: acknowledged the written response provided by Orano
4.	Other Items of Discussion • Elder Norman Wolverine: What is the life expectancy of the expansion? When that fills up, what next? ○ Orano: The expansion is expected to provide an additional 10 to 15 years of operating life. To continue operating the mill beyond that time frame, Orano will revisit tailings management options, previously considered and identify potential new options.

	• Moose and muskrat are traditional foods of ERFN but are not reflected in modelling. Can this be done? ○ Orano will review previous modelling and discuss altering future VEC's that have been included, if required

Question #1:

What is the overall rationale behind the significant increase in tailings volume not significantly increasing risk to the downstream environment during closure?

Stated in the Environmental Protection Review Report on page 14 (EPR; Appendix E of the CMD document pg 114/220), with the JEB TMF Expansion Project there will be no new releases of waterborne effluent expected and the effluent quality to be discharged from the JEB WTP will not be altered.

I would agree that no new sources of waterborne effluent will be created, but I would seek confirmation that annually and/or over the life cycle of the facility that the volume of effluent to be discharged from the JEB TMF, in addition to the quality of the effluent, are not predicted to change (i.e., loadings to the receiving environment are not increased). As it is states on pg 10 of the EPR (pg 110 / 220 of the CMD document), Orano has determined the JEB WTP has the capacity to treat the reclaim water from the proposed JEB TMF expansion. The statement regarding the WTP's capacity would indicate the volumes to be treated are expected to change. However, no information is provided to reassure the reader that either (1) the volume of water to be discharged over time is not expected to change or (2) that the volumes to be discharged will increase but have been previously assessed.

Orano Response:

Orano manages tailings so that Constituents of Potential Concern (COPCs) that may pose a risk to the environment (heavy metals such as arsenic, uranium and molybdenum and radionuclides such as radium-226) are controlled in a way that protects the environment now and over the long term.

Passive controls in place to manage tailings:

- the physical characteristics of the tailings: generating tailings that meet specifically defined criteria to ensure that they achieve the end-state objective of a consolidated mass that significantly reduces the ability of groundwater to flow through the tailings, as most of the groundwater will flow around the tailings rather than through them, mitigating the advective flux of COPCs from the tailings into the receiving environment
- the chemical design of the tailings: the design and control of the chemistry; how the tailings are produced in the mill, reduces and controls the COPC concentrations in the pore water of the tailings allowing the tailings to slowly enter the environment over thousands of years at low and slow rates controlled by thermodynamic laws so that no adverse environmental effects occur.

The understanding and control of the tailings chemistry allows Orano to make accurate predictions of COPC source terms based on thermodynamically controlled chemical equilibrium values

With respect to effluent quantity and quality:

The controls and performance within the JEB WTP are what determine the quality of effluent, independently of the quality of the feed to the JEB WTP, supported by well-known acid base chemistry and experience. The JEB WTP has an operating capacity of 4,000 m^3/day and is currently operating at 80% capacity on average

The JEB TMF Expansion project provides additional space to increase the operating life of the tailings facility. On an annual basis the volume of effluent treated and discharged is not expected to increase or change as a result of the expansion. The quality of effluent is not predicted to change as the existing controls or performance of the JEB WTP which treats water received from the JEB TMF will remain the same.

Cumulatively the total loading of contaminants originating from both the TMF and the treated effluent to the receiving environment will progressively increase on account of the increased operating time of the facility. The cumulative loadings are tracking well inside the bounds of the approved Environmental Assessment. Further, to regularly check the potential environmental effects from the release of COPCs post decommissioning to the receiving environment, contaminant transport modelling is conducted. The results of the most recent modelling, conducted in 2019, indicate that concentrations of all COPC's will remain below CWQC and SEQG values in the receiving environment, specifically in key receptors Fox and Pat lakes, therefore remaining protective of aquatic life.

Question #2:

Will the volume of water to be released from the JEB WTP annually and over the life cycle of the plant be altered by the JEB TMF Expansion Project?

This would include predicted COPCs in Sink Reservoir, Vulture Lake, McClean Lake East Basin sediments and risk to aquatic and terrestrial receptors (semi-aquatic receptors can be sensitive to selenium exposure). I'm unaware of the decommissioning plan for Sink Reservoir and Vulture Lake, as such, I'm not sure if they will be accessible to wildlife and/or humans in the future.

The assessment work specific to the JEB TMF Expansion Project concludes that the COPCs will move from the facility to the receiving environment in a similar way over a similar time frame as was predicted before the expansion. This same context would be valuable in terms of the operation of the Sink/Vulture Treated Effluent Management System / JEB WTP. As we know from our previous review of the ROR (October 2019), short-term predicted sediment selenium concentrations in East Basin of McClean Lake have been predicted to be above those previously predicted.

Orano Response:

Quantity and quality of effluent released from the JEB WTP is discussed in Orano's response to question #1.

With respect to the first part of the comment referring to predicted effects at Sink, Vulture, and McClean, the environmental risk assessments conducted for the McClean Lake Operation include predictive modelling to evaluate the potential for effects of liquid effluent discharge on the receiving

environment. The assessment focused on predicted water and sediment quality within and downstream of the Sink/Vulture Treated Effluent Management System (S/V TEMS).

Recent predictive modelling, inclusive of more than 20 years of operational data collected to date, concludes that predicted effects in the receiving environment will remain well within the predictions of previous EAs and ERAs conducted for the McClean Lake Operation.

The potential impact to human health for the currently approved JEB TMF was assessed in Environmental Risk Assessment conducted in 2016, and found to be negligible. A review of data and contaminant transport modelling related to the expanded facility indicated that the releases of hazardous contaminants to the air, soil and surface water during construction, operation and decommissioning for the proposed JEB TMF expansion are expected to be similar to the existing accepted and approved JEB TMF and will not result in impacts to human health.

With respect to the inquiry regarding selenium please refer to Orano's response to Question #4.

Question #3: If the answer to Question #2 is "yes", has the potential environmental risks posed been previously assessed, including risks from sediment COPCs to aquatic and terrestrial receptors?

Orano Response:

NA

Question #4:

Further, in relation to the assessment condition stipulated by CNSC (pg 125 / 220 of the CMD document) that the risk posed to aquatic receptors from predicted sediment COPC concentrations in Fox Lake and Pat Lake following closure be assessed, I would also seek clarification that risks to terrestrial receptors have also been considered or there is some rationale as to why this is not necessary.

As aquatic-dependent terrestrial receptors are known to be sensitive to selenium exposure, has this been encompassed in the environmental risk assessment work completed to-date or ongoing for both the JEB TMF and JEB WTP?

Orano Response:

Orano performs regular reviews of the ecological risk assessment (ERA) for valued ecosystem components for the entire McClean Lake Operation, in line with the regulatory requirements. In 2016, the ERA review showed that at the concentration of selenium in the effluent, there could be selenium effects on the local terrestrial wildlife in the future. To address the ERA findings Orano developed the Selenium Adaptive Management Plan, implemented several mitigation measures to control selenium release into the environment, and revised the selenium loading forecast, supported by the most recent Cigar Lake mine plan. In 2018 the revised selenium risk assessment showed a significant reduction of the anticipated selenium impact on both aquatic and terrestrial wildlife. The predicted impact remained consistent with the environmental effects described in the previous project environmental assessments.

Question #5:

On page 42 of the CMD document (pg 48 / 220), a disruptive event is described as a beyond design failure of environmental controls during the closure state, and the potential environmental risks from this event are evaluated. This event seems very limited considering the timeframe over which the environmental controls / mitigation are anticipated to be necessary (>10,000 years).

Was stakeholder engagement sought to inform the disruptive event assessed? If not, would stakeholder engagement be sought to develop the disruptive event assessed as part of the final decommissioning and closure environmental risk assessment?

Orano Response:

At this time, stakeholder engagement was not conducted specifically for the disruptive event, as the post decommissioning phase has been developed conceptually. When getting closer to the detailed decommissioning planning, Orano will add disruptive events as one of the engagement topics.

Question #6:

On pg 42 of the CMD document (pg 48 / 220) it is described that in the event that the sediment assessment completed for Fox Lake and Pat Lake predict concentrations that pose a risk to aquatic receptors additional mitigation measures to prevent this from occurring must be considered. Perhaps this would be more reassuring if the types of available additional mitigation measures were discussed briefly.

What additional mitigation measures would be available to prevent predicted elevated sediment COPC levels in Fox Lake and Pat Lake if the additional environmental risk work shows there could be a potential risk to downstream receptors?

Orano Response:

Identification of mitigation measures would be conducted through the implementation of Orano's adaptive management process.

Orano's environmental monitoring systems provide the opportunity to examine actual effects and refine model predictions and compare these results to the effects anticipated in the EA.

The evaluation is iterative through time, which allows the identification, tracking and comparison of actual effects to the predicted effects anticipated at the time of the EA. The data and tracking of actual effects provide the necessary feedback, impetus, and information to the operation to identify and implement opportunities for continual improvement in systems performance.

Results which indicate unforeseen or incremental effects beyond those predicted in the EA provide a basis to determine if a trend would, over time, lead to significant adverse effects. If so, the monitoring information also provides information upon which to develop adaptive management plans, and to facilitate detailed design of alternative mitigation measures or contingency measures to mitigate the significance of the incremental adverse effects.

Should predictive modeling conducted during the operational period of the McClean Lake Operation indicate increasing trends in concentrations of COPCs, with the potential for unacceptable environmental risks downstream of the JEB TMF, Orano's continual improvement or adaptive process would be initiated to identify mitigation measures.

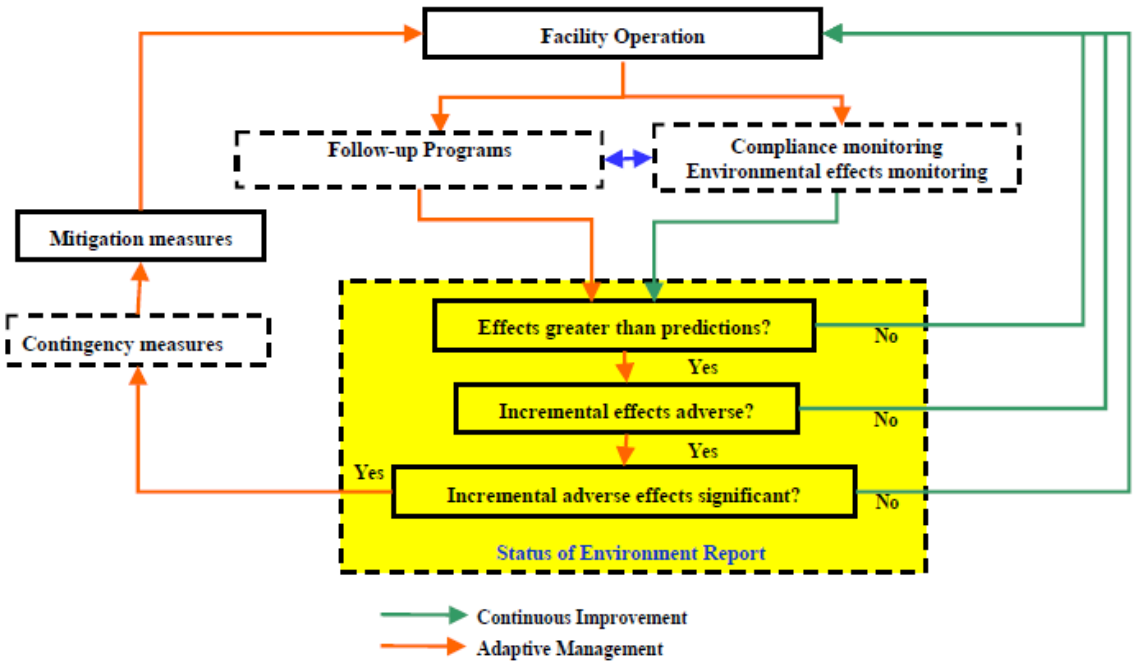

Figure 2: Continual Improvement and Adaptive Management Framework

One example of the successful implementation of mitigation measures identified through Orano's continual improvement or adaptive management plan is the elevated selenium in the treated effluent. It was identified and through the adaptive management process a number of initiatives have been implemented to reduce the amount of selenium received in the JEB WTP. Ultimately selenium will be treated through changes within the JEB WTP