



Date: 2022-11-14

File / dossier : 6.02.04

Edocs pdf : 6915092

**Oral presentation**

**Exposé oral**

**Written submission from the  
English River First Nation**

**Mémoire de la Première  
Nation d'English River**

**Regulatory Oversight Report for  
Uranium Mines and Mills in  
Canada: 2021**

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**Rapport de surveillance  
réglementaire des mines et usines  
de concentration d'uranium au  
Canada : 2021**

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Commission Meeting

Réunion de la Commission

December 15, 2022

Le 15 décembre 2022



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“VIA EMAIL [cnscc.interventions.ccsn@canada.ca](mailto:cnscc.interventions.ccsn@canada.ca)”

**RE: ERFN Intervention- Regulatory Oversight Report for Uranium Mines,  
Mills, Historic and Decommissioned Sites in Canada: 2021**

This submission is made on behalf of the English River First Nation (ERFN). This topic is of great importance to the people of the ERFN, because of the presence of the Uranium Mines and Mills located within English River First Nation Ancestral Territory. The people of ERFN have and continue to subsist on this land for generations- fishing, hunting, gathering, and thriving.

English River First Nation is made up of 19 reserves, most of which are located in Northern Saskatchewan. ERFN has a population of approximately 1650 people. The on reserve members of the First Nation reside at two small remote Northern Saskatchewan reserves called Wapatuanak and La Plonge. These reserves are located approximately 600 km north of Saskatoon. Approximately half of ERFN's population resides off reserve.

On September 15, 2022, ERFN participated in the Canadian Nuclear Safety Commission (CNSC) annual Indigenous engagement session. This engagement session allowed ERFN to receive concise and clear information regarding the Uranium Mines and Mills. Further, ERFN was able to raise and discuss issues of common concern with other impacted Indigenous Nations in the Athabasca Basin. ERFN considers this engagement session invaluable and a good example of open and effective Indigenous engagement with the CNSC.

ERFN was pleased to have the positive results of the Independent Environmental Monitoring Program (IEMP) presented at the Indigenous Engagement session. In collaboration with CanNorth, and Mr. Ryan Froess- CNSC Senior Advisor/ Indigenous

and Stakeholder Relations Division, ERFN was able to submit samples of moose from local hunters from ERFN who harvested moose from the Key Lake and MacArthur River regions. This collaboration arose from an invitation to participate and provide feedback to Can North on relevant harvesting areas that are important to ERFN. When questioned why they did not incorporate large game like loose into the sample program, they indicated that it was not an easy feat. Fortunately, ERFN members were happy to participate by providing samples of moose hunted. ERFN considers this a great example of the level of engagement and participation that we have come to expect from the CNSC.

In addition to attending the CNSC Virtual Engagement Session, ERFN has engaged Robin Kusch to assist the Nation in reviewing and understanding the technical and scientific aspects of the Regulatory Oversight Report for Uranium Mines, Mills, Historic and Decommissioned Sites in Canada for the 2021 year. Mrs. Kusch has outlined questions that have arisen as a result of her review. These questions have been posed to industry and we look forward to receiving their response in due course.

ERFN concludes that there is no reason to object to the CNSC's conclusions in the 2021 RoR. Further, ERFN does not take issue with the finding that the operations and historical and decommissioned sites are being managed effectively in terms of the SCAs. The RoR concludes that adequate protections are in place to protect the environment and humans during operation and closure/decommissioning activities.

Sincerely,



Cheyenna Hunt BA, LL.B.  
English River First Nation  
Lands & Resources Manager

## Technical Memorandum

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# Review of the Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2021

October 21, 2022

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## Background Information

This technical memorandum has been prepared for the English River First Nation (ERFN), and provides a summary and review of the Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2021 (CMD 22-M36; 2021 RoR) with the intent to inform the ERFN's Intervener Submission. The Commission Member Document (CMD) was 160 pages, the review effort included summarizing relevant information relating to concerns expressed by ERFN. Concerns expressed pertain in general to environmental protection of their Ancestral lands (Nuhtsiye-kwi Benéne in Dene), safeguarding their traditional, current and foreseeable way of life and reclaiming their identity and heritage (culture). Specifically, concerns were related to the preservation of their people's ability to hunt, fish and gather country food and advocate for their devotional connections with the lands of Nuhtsiye-kwi Benéne.

## Introduction

### English River First Nation

ERFN is a Dene and Cree First Nation located in Northern Saskatchewan. ERFN's Nuhtsiye-kwi Benéne encompasses a large section of the boreal forest in central-northern Saskatchewan, stretching from the Churchill River in the south to Wapata Lake in the north. ERFN has seven historical settlements located at Porter Island, Cree Lake, Elak Dase, Knee Lake, Dipper Rapids, Wapachewunak and La Plonge. Since 1992, an additional twelve reserve parcels have been added to their land base through the Treaty Land Entitlement process, which aims to resolve outstanding Treaty land obligations. ERFN's two largest reserves are La Plonge Reserve and Wapachewunak, located approximately 600 km north of Saskatoon, Saskatchewan. ERFN's main settlement area is located along the Churchill River, about 500 km north of Saskatoon at the Wapatuanak Reserve, Saskatchewan. The ERFN is a signatory to Treaty 10 (1906) and is comprised of nineteen different reserves:

- La Plonge 192,
- Elak Dase 192A,
- Knee Lake 192B,
- Dipper Rapids 192C,
- Wapachewunak 192D,
- Ile a la Crosse 192 E,
- Primeau Lake 192F,
- Cree Lake 192G,
- Grasswoods 192J,
- Leaf Rapids 192P,
- English River (Porter Lake) 192H,
- English River FN Barkwell Bay No. 192I,
- English River FN Haultain Lake No. 192K,
- English River FN Flatstone Lake No. 192L,
- English River FN Cable Bay Cree Lake No. 192M,
- English River First Nation Cable Bay Cree Lake 192N,
- English River FN Beauval Forks No. 192O,
- Slush Lake Reserve No. 192Q, and
- Mawdsley Lake Reserve No. 192R.

The ERFN's total membership is 1,646, with approximately 710 members living on reserve lands (INAC 2021). Comprised of both Cree and Dene people, the “people of the river” are known for their bold and collaborative spirit and trusting and humble nature (CanNorth 2017).

The ERFN name originates from the English River area, which was inhabited by the Poplar House people for periods during the year. Most of the families that now live at the Wapachewunak Reserve or adjacent Métis hamlet of Patuanak, traditionally lived along the Churchill River system at Primeau Lake, Knee Lake, Dipper Lake and/or Cree Lake to the north. Summers were spent primarily fishing along the river system. For the rest of the year, family units would spread out through the northern forests for trapping and subsistence hunting. Commonly used winter trapping areas included Haultain Lake, Costigan Lake, Foster Lake and the area between Cree Lake and the Churchill River (Jarvenpa 1980, CanNorth 2017, SVS 2022).

The community is shaped by its respected Elders who are widely consulted for decisions, wisdom and strength. ERFN is dedicated to stewardship of the land and the education of future generations through land based learning youth camps and other opportunities to share knowledge on the land (Cameco 2021). ERFN is rising to the challenge of ensuring sustainable development in the vicinity of their communities and within their Nhutsiye-kwi Benéne and recognizes the unique and important role they have to play in the protection of Northern Saskatchewan. While remaining true to traditional values as “keepers of the land,” members also pursue opportunities to participate in the development of ERFN's resources (e.g., forestry, industry and workforce).

ERFN established Des Nedhe Development LP in 1991 to create sustainable employment and business opportunities for English River members. Since its inception, Des Nedhe Development has invested in established companies that are leaders in Saskatchewan's mining and construction industry and expanded its portfolio into the areas of retail and real estate development and management. The company takes pride in its strong focus on growth through investment, experienced management team and history of delivering solid financial results. Looking forward, Des Nedhe is exploring new opportunities across the Country, in multiple sectors, and is positioned to play an important role in Canada's economic future.

## Saskatchewan Uranium Industry

The Athabasca Basin of northern Saskatchewan has been the site of several major uranium discoveries and Saskatchewan is recognized as a world leader in uranium production. The uranium is exclusively used for electricity generation at nuclear power plants, which is a non-carbon emitting energy source and provides about 15% of Canada's electricity needs. The uranium industry is a significant economic driver in northern Saskatchewan. Within ERFN's Nhutsiye-kwi Benéne three uranium operations are currently operating or in a state of care and maintenance (Key Lake Mill [1983; halted mining in 1997 and milling halted from 2018 to 2021], McArthur River Mine [1999; halted mining from 2018 to 2021], and Cigar Lake Mine [2015; halted mining from March 2020 to September 2020]), and there are two additional operations just northeast of ERFN Traditional Lands near Wollaston Lake (McCLean Lake Mine and Mill [1999] and Rabbit Lake Mine and Mill [1975; mining and milling halted in 2016 and operations transitioned to care and maintenance]).

## Collaboration Agreement

All of the uranium mines, mills, and historical and decommissioned sites in northern Saskatchewan are considered of interest to the communities of ERFN. In northern Saskatchewan, the industry leaders Orano and Cameco Corporation have entered into formal agreements with Indigenous communities, including ERFN (referred to as collaboration agreement (CAs) or impact benefit agreements (IBAs)). These agreements provide Indigenous communities with workforce and business development programs, dedicated community engagement programs, community investment monies and mechanisms to collaborate around environmental stewardship. These industry leaders have also entered into several trapper compensation agreements with individual land users who are affected by their activities.

These agreements are part of the effort undertaken in recent history to engage and respect local communities, First Nations, Metis Nations and local land users during the planning and execution of industrial developments. Execution of these agreements ensures that engagement occurs with the intent to minimize the potential and perceived negative impacts from a development, as well as optimize potential positive impacts. Signing of these agreements conveys a general trust in the industry's performance and is recognition of a positive working relationship with the industry leaders.

## Consultation

Consultation is recognized by the Canadian Nuclear Safety Commission (CNSC) as an important part of the process to develop the details of its regulatory framework. In recent years, specifically since 2018, ERFN has witnessed an evolution in the consultation process that they view as positive. Now there is more readily available and approachable ways to have direct dialogue between the CNSC and First Nations, which ERFN sees as invaluable to the process of building and maintaining trust in Canada's Nuclear Industry. The outcome of feeling like you have no power in a situation is a state of forced apathy, the direct engagement with ERFN has resulted in a sense of relevance and with the consultation process a sense of consequence. As well, there is a seriousness conveyed about their concerns when during hearings CNSC members reiterate or even directly represent the views the First Nations have conveyed to them directly. Previously, ERFN felt as though their views were filtered through the proponents of projects and/or operating companies to the CNSC and as such could see their perspectives being softened, deemphasized, devalued, or even lost.

## Leadership Role

In addition to the recent empowerment discussed above, members of ERFN have gained a heightened awareness of the external factors that can affect the mining industry and that life-of-mine estimates based on resource delineation are just projections, in other words there are no guarantees regarding the persistence of the economic benefits to the local economy. As such, the communities have started to shift their engagement focus from operational performance and economic benefits to the long-term environmental effects of closure and understanding associated reclamation uncertainties. Key concerns of the ERFN communities continue to include:

- Operation and ultimate closure of the Key Lake Operations, due to the long-term (1000s of year) management of tailings and linkages to Wheeler River system that is an area of heightened value; and

- Operation and ultimate closure of McArthur River Operation and Key Lake Operations, due to potential for cumulative effects on the Wheeler River system.

The Wheeler River region is recognized as an important cultural, ecological, and sustainability resources (i.e., drinking water, food and air) area for the communities of ERFN. The prevalence of the importance of the resources (clean air, water, soil, and country foods) in this area is likely to only increase in value to local land users following closure of local operations.

However, in general, ERFN is dedicated to stewardship of the land for future generations and doesn't take this responsibility lightly. Often in relation to First Nation consultation and engagement the focus is on the spatial extent of their traditional and current land use, and it is conveyed that their concerns should be limited to these areas. However, it is recognized that the climate and environments around the world are changing, and there is no way to know in the future where the traditional resources that could be necessary to support future generations will be located within northern Saskatchewan or even Canada. As such, ERFN has interest in uranium operations and sites from two perspectives: (1) protection of all lands in northern Saskatchewan and (2) gaining an increased understanding of operational and long-term tailings management methods / technologies.

## Summary of Regulatory Oversight Report

### Financial Guarantees

The 2021 RoR provides the financial guarantees for each of the five operations (Appendix F; page 139/160). Complied in [Table 1 provided in Appendix A](#) are the financial guarantees reported from 2017 to 2018 and 2020 to 2022 (values were not provided in the 2019 RoR). Licensees are required to develop and update preliminary decommissioning plans and provide associated financial guarantees to ensure that funds are available to cover all costs necessary to fully decommission and remediate the operation, ensuing the protection of people and the environment. The values are updated to reflect any progressive reclamation (e.g., a mined-out pit and its associated supporting infrastructure is decommissioned and reclaimed), as well as any expansion of the operation's liability (e.g., a new water treatment plant is established).

Percent change from 2014 to 2021 for each operation is provided here: Cigar Lake Operation +25.6%, McArthur River Operation -13.0%, Rabbit Lake Operation 0%, Key Lake Operation +1.2%, and McClean Lake Operation +149.0%.

### Inspections & Non-compliances

In 2021, CNSC completed 18 inspections across all 5 operations. The bulk of the inspections (95%) were conducted remotely in 2021. There were 19 non-compliances issued, 12 of which were at Cigar Lake Operation, all were of low safety significance, and all non-compliance were deemed by CNSC staff to have been addressed appropriately. Inspections are listed in Appendix B of the 2021 RoR, as well as the number of notices of non-compliances per each inspection and the safety control area the non-compliances were in relation to. Examples of non-compliances include: failure to wear radiation monitoring equipment, non-compliance with the National Fire Code of 2015, failure to follow procedures, need for additional training identified and incorrect or incomplete labelling or signage.

## Safety and Control Areas

As in 2017 to 2020, in 2021 all safety and control area (SCAs) were rated satisfactory for all mines and mills.

- SCAs = Management Systems, Human Performance Management, Operating Performance, Safety Analysis, Physical Design, Fitness for Service, Radiation Protection, Conventional Health & Safety, Environmental Protections, Emergency Management and Fire Protection, Waste Management, Security, Safeguards and Non-proliferation, and Packaging and Transport

## Radiation Average and Maximum Individual Dose Limit

No workers exceeded their regulatory radiation dose limit of 50 mSv in 2021. The maximum individual radiation dose to a worker from 2014 to 2021 have been complied in the [Table 2 in Appendix A](#). In 2021, the maximum individual radiation was 6.03 mSv, which is 12.1% of the annual regulatory limit. The dose occurred to a jet boring system (JBS) operator exposed during non-routine work activities associated with the individual assisting in preparing the underground clarifier for entry by workers to conduct inspections and repairs. The worker exceeded the weekly Action Level of 1 mSv and Cameco identified four corrective actions and CNSC staffed determined satisfactory measures were implemented to protect workers. The average individual effective dose by operation is provided in [Table 3 in Appendix A](#).

## Lost-time Injuries

A lost-time injury is a workplace injury that results in the worker being unable to return to work for a period of time. Five lost-time, work-related injuries were reported in 2021, two of which occurred at Cigar Lake Mine and three occurred at McClean Lake Mine and Mill. All five were of low safety significance.

### Cigar Lake

- Worker reported back pain after closing garbage truck back door; worker was placed on restricted work for the remainder of their shift.
- Worker misplaced their footing and fell while stepping down from equipment and injured their wrist.

### McClean Lake

- Worker reported pulled muscle in chest moving heavy dock plate to unload food truck.
  - Corrective Action  
Workers are required to work together to lift heavier objects; signage has been installed in relation to the dock plate
- Worker walking down incline felt pain in knee and was sent off site for an assessment.
  - Corrective Action  
Workers are encouraged to participate in pre-work stretches.
- Worker caught thumb between cog and chain on overhead door and received off site treatment.
  - Corrective Action

Limit stops were placed on the overhead door, as well as identification of a better tool to complete the task.

The lost-time injuries per year for each operation is provided in the [Table 4 in Appendix A](#).

## Environmental Protection

All authorized discharged water in 2021 met the federal or provincial discharge limits.

- From 2017 to 2021 the average concentration of molybdenum in effluent for all five operations were well below the most stringent action level<sup>1</sup> of 1 mg/L. The maximum average concentration was 0.213 mg/L, which was report at Rabbit Lake in 2021.
- From 2017 to 2021 the average of selenium and uranium in effluent for all five operations were below the licensed maximum monthly mean effluent discharge limit of 0.6 and 2.5 mg/L, respectively. The maximum average selenium concentration was 0.042 mg/L, which was report at McClean Lake in 2020. Further, the maximum average uranium concentration was 0.07 mg/L, which was reported at Rabbit Lake in 2017. As such, all concentrations were below the CNSC interim objective of 0.1 mg/L.
- From 2017 to 2021 the average concentration of radium-226 in effluent for all five operations were well below the license-authorized mean effluent discharge limit of 0.37 Bq/L. The maximum average concentration was 0.09 Bq/L, which was report at Key Lake in 2019.

It is reported on page 2 of CMD 22-M36 (pg 9/160), there were 15 unauthorized releases in 2021, all releases were of low significance, remediation and prevention were determined to be satisfactory by CNSC staff and no lasting impacts to environment will occur. The number of reportable environmental spills per year for each operation is summarized in [Table 5 in Appendix A](#). The spill details are summarized in [Table 6 of Appendix A](#). Question #1 below is in relation to elevated levels of ammonia and sulphate observed in groundwater at Key Lake Operations, specifically at the Mill Terrace. This spill is indicated to be separate to the 2018 elevated uranium levels in groundwater as a result of seepage from the Molybdenum Extraction Plant.

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<sup>1</sup> Administrative Level represents the upper range of design specifications for a specific parameter and reaching an administrative level will trigger an internal review by the operation. Exceeding an Action Level indicates a potential loss of control of the environmental protection program and it triggers notification to the CNSC, an immediate investigation, subsequent corrective action and preventative measure in order to restore the effectiveness of the environmental protection program.

There was one Action Level exceedance reported in 2021. At the McClean Lake Operation the total suspended solids (TSS) action level / metal and diamond mining effluent regulations (MDMER) discharge level of 22.5 mg/L was exceeded when the 24-hour discharge composite sample from the JEB Water Treatment Plant (WTP) had a measured concentration of 25 mg/L. Pond samples upstream of the discharge sampling location were well below the Administrative Level of 4 mg/L indicating contamination from pipeline infrastructure. Following cleaning of the pipeline (i.e., iron based scale removed) discharge limits continue to be met.

Soil and vegetation samples analyzed had levels below regulatory limits, and monitoring data demonstrate that effects are within predictions made in the environmental risk assessments (ERAs), including elevated radon gas levels near tailings management facilities and waste rock piles with level falling to background levels within 2 km of these sources.

In 2021, as part of the CNSC's Independent Environmental Monitoring Program (IEMP; results available at: [LINK](#)), surface water, fish tissue, blueberries and Labrador tea samples were collected at: Key Lake Operation (results available at: [LINK](#)), and McArthur River Operations (results available at: [LINK](#)). As ERFN is aware, two moose samples collected by hunters were included in the analysis (one collected between the Key Lake Operation and McArthur River Operation at around the 63 km marker and the other on Highway 914 about 62 km north of Pinehouse, SK). With the exception of selenium in fish and zinc and polonium-210 in moose, concentrations were all well below the CNSC screening levels for hazardous substances. Exceeding a screening level does not convey an adverse effect, it triggers additional environmental risk assessment work to characterize the risks associated with the concentrations.

Although elevated above the screening level, selenium background concentration in fish tissue ranges from 0.12 to 3.03 mg/Kg and measured concentrations at both the exposure (Wheeler River Bridge/ Little Yalowega Lake) and reference (David Lake / Lower Read Lake) stations were within the regional background concentration. Although elevated above the screening level, the zinc and polonium-210 levels in the moose were demonstrated to be consistent with other moose samples taken from various areas in Saskatchewan including the boreal forest. As such, results of the additional investigative work showed no health impacts are expected; the fish and moose are safe to eat. Results of the IEMP confirm Cameco's environmental monitoring program and demonstrates that consumption of country foods and water will not result in adverse health effects from radiological contaminants.

The Eastern Athabasca Regional Monitoring Program (EARMP; <https://www.earmp.ca/>; 2020/2021 Report available at [LINK](#)). As previously reported, sampling continued in late 2020 and early 2021 providing additional chemistry data for samples collected from northern Saskatchewan (water, berries, and fish and mammal tissue). The EARMP illustrates that radiological and non-radiological exposures to residents consuming country foods are similar to that experienced by the general Canadian population, as such the water and country foods are safe for consumption.

## Findings from Report Review

I have reviewed the CMD 22-M36 identifying questions and comments community members would likely have, taking into consideration my engagement with ERFN and the knowledge and understanding I have of the uranium industry and regulatory requirements. The review was completed in this manner to critically review the 2021 RoR in a concise and culturally aware manner.

## Treated Effluent or Air Quality Concerns

### **Cigar Lake Operations - Arsenic in Seru Bay Addressed**

*Additional context in 2021 RoR as compared to 2020 RoR is italicized for convenience*

In 2016, the Cigar Lake Operation Environmental Performance Report (EPR) indicated an increasing arsenic trend in effluent released to Seru Bay. While below regulatory limits, arsenic concentrations were above environmental assessment predictions and above concentrations previously measured prior to achieving full ore production. Cameco implemented several mitigation techniques to reduce loadings and mean concentrations decreased (refer to pg 45 = pg 52/160). Arsenic loadings and concentration for 2019 to 2021 are provided; however, I couldn't find any documentation to indicate levels prior to mitigation implementation (identified in 2019 RoR to be implemented throughout 2016); however, the percent change from 2019 to 2020 and 2019 to 2021 were substantial:

- 33.4 kg and 0.095 mg/L in 2019;
- 22.2 kg and 0.063 mg/L in 2020, -33.5% and -33.7% percent change, respectively;
- 23.4 kg and 0.065 mg/L in 2021, 29.9% and -31.6% percent change, respectively.

CNSC staff continued to review effluent quality results to verify that effluent treatment performance is effective, and they are satisfied that Cameco is taking appropriate action to lower arsenic concentrations in the effluent.

Although arsenic levels in Seru Bay of Waterbury Lake were above ERA predictions, they remain below the Saskatchewan Surface Water Quality Objective of 5 µg/L. In 2016, it was reported the most recent Cigar Lake Operations ERA showed that arsenic levels in water and/or sediment of Seru Bay (Waterbury Lake) would be elevated above those predicted in the 2011 environmental assessment (EA) if mitigation wasn't implemented. Taking into account corrective actions implemented by Cameco, the predicted water and/or sediment contaminant levels in the receiving environment in the revised ERA (2017) were within the predictions made in the 2011 EA. Through the 2021 Cigar Lake Operation's Licence Renewal, ERFN was able to engage with Cameco to fully understand the rectification of the environmental protection program to reduce arsenic loadings to Seru Bay, and ERFN supported the renewal of the license in 2021. As stated in the CMD 21-M34, the CNSC has verified that arsenic loadings to the environment have decreased steadily since 2016 and it is stated *in the CMD 22-M36 that CNSC staff have concluded adequate measures have been taken to protect the environment* (pg 49 = pg 56/160).

### **McArthur River Operations – Molybdenum in Effluent Addressed**

*Additional context in 2021 RoR as compared to 2020 RoR is italicized for convenience*

The CNSC staff verified that treated effluent released to the environment was below regulatory requirements and has remained stable or improved over the past 5 years (pg 59 = pg 66/150). It is, however, indicated that molybdenum had been identified as posing a risk and Cameco implemented process changes prior to 2018 to address this risk. Currently, molybdenum concentrations in treated effluent have been reduced by 90%, however, in the 2020 RoR it wasn't clear this wasn't due to the operation being in Care and Maintenance (production halted in 2018 and resumed in 2022). During follow-up between Cameco and ERFN it was clarified this was based on data prior to transitioning to care

and maintenance). The CNSC will continue to review effluent quality results to verify that effluent treatment performance remains effective.

In 2020, the ERP and 2015-2019 ERA were submitted to CNSC and Saskatchewan Ministry of Environment, results to date were within those predicted in the ERA. *Soil and terrestrial vegetation (blueberry twig and lichen) that could be affected by atmospheric deposition were sampled in 2021 as part of triannual sampling program. Results demonstrate all parameters measured were within historical ranges. CNSC staff concluded the environment remains protected.*

#### **Rabbit Lake Operation – Molybdenum in Effluent Might be Increasing Care and Maintenance since 2017**

*Additional context in 2021 RoR as compared to 2020 RoR is italicized for convenience*

*In 2021, molybdenum concentrations did not exceed Action Level. However, molybdenum concentrations at times were observed to be above the historical mean; overall the mean annual concentration (0.184 mg/L) remained relatively consistent with the 3-year historical mean (0.174 mg/L). In 2020, the ERP and 2015-2019 ERA were submitted to CNSC and Saskatchewan Ministry of Environment. CNSC is currently finalizing review of ERA.*

#### **Key Lake Operation – None Care and Maintenance since 2018**

*Additional context in 2021 RoR as compared to 2020 RoR is italicized for convenience*

Flow from the dewatering wells of the Gaertner and Deilmann pits are treated in the Reverse Osmosis Treatment Plant prior to discharge to Horsefly Lake (McDonald Lake system). Monitoring confirms that the effluent is within design specification and there were no Action Level exceedances. The treated mill effluent that is discharged to Wolfe Lake in the David Creek system (David Creek system) met all regulatory limits, and there were no Action Level exceedances.

Additional treatment components were installed from 2007 to 2009 to the to reduce molybdenum and selenium concentrations in the effluent. From 2016 to 2020, concentrations have been stable or declining demonstrating effective control of the discharge quality. *The subsequent follow-up program that was monitoring for changes in sediment and other environmental receptors has ceased and ongoing monitoring requirements were added to the environmental monitoring program.*

*In 2020, the ERP and 2015-2019 ERA were submitted to CNSC and Saskatchewan Ministry of Environment, results confirm levels are within those predicted in the ERA. CNSC staff concluded the environment remains protected.*

#### **McClean Lake Operation - Selenium in McClean Lake's East Basin**

*Additional context in 2021 RoR as compared to 2020 RoR is italicized for convenience*

In the 2017 RoR, it was stated that the MLO ERA (2016) showed that selenium levels in the vicinity of the discharge location into the East Basin (McClean Lake) in the future would be above those predicted in the Environmental Impact Statement (EIS). An adaptive management plan was developed, and the 2017

RoR concluded that CNSC staff would continue to review reported selenium concentration in effluent to ensure the receiving environment remained protected.

In 2020, one Action Level exceedance of selenium occurred in the effluent from the JEB WTP (March 28, 2020). In April 2020, the CNSC requested that Orano propose a long-term solution for sustainable reduction of selenium loading to the environment. *September 2020, Orano submitted an update to the selenium adaptive management plan. In October 2021, Orano submitted an implementation plan for ferrous sulphate treatment at the JEB WTP for enhanced selenium removal starting September 2022. CNSC staff will continue to monitor to confirm the 12-month rolling average selenium loadings remain below the Environmentally Based Reference Level (EBRL) of 112 g/day. Through the 2021 JEB Tailing Management Facility Expansion Project, ERFN was able to engage with Orano to fully understand the risk posed by the short-term exceedances.*

## Questions / Clarifications

### Clarification #1

It would appear on page 24 of CMD 22-M36 (pg 31/160) in the graph and cross-referenced table provided as Figure 2.6, the reported selenium concentration of 0.037 mg/L in 2019 on the graph is greater (i.e., bar is taller) than the reported 0.042 mg/L in 2020.

### Clarification #2

On page 2 of the CMD 22-M36 (pg 9/160), it is reported that in 2017 there were 15 unauthorized releases reported in 2021. However, there are 17 entries in Table J-1 starting on page 138 of the CMD 22-M36 (pg 145/160).

### Clarification #3 and Questions #1 and #2

As identified in my review of the 2020 RoR, the Molybdenum Extraction Plant release to the environment (observation dates back to June 2018) was not discussed in the 2018 or 2019 RoR nor the follow-up to the leak in the 2020 RoR (Corrective Action Plan indicated for 2020). The reportable discharge reported in 2018 was identified because of elevated uranium concentrations observed in the groundwater monitoring well MT-802. The elevated uranium was confirmed to be the result of concrete degradation in a sump area that allowed water to seep through the floor into the ground. As reported in the November 2021 Joint Implementation Engagement and Environmental Subcommittee (JIEES) Summary (document provided by ERFN), the cracks have been fixed, leak has been stopped and maintenance completed to confirm the integrity of the containment. ERFN has expressed satisfaction in relation to the engagement completed by Cameco in relation to this release. The contamination was limited in geographic extent and, although there is no predicted risk to the environment around the site, the corrective action of installing recovery wells to collect contaminated groundwater for treatment is expected to be initiated later this year (Oct-Dec 2022).

In the 2021 RoR, elevated concentrations of constituents of concern, including ammonia and sulfate, were observed in groundwater wells MT-19-01 and MT-19-12 (pg 93 of CMD 22-M36; pg 10/160). These wells were installed as part of a sampling program to complete a site assessment for the reportable discharge from the Molybdenum Extraction Plant reported in 2018. The new discovery was reported to CNSC, Saskatchewan Ministry of Environment and ERFN in June of 2021 (notification provided to ERFN

via email from Kristin Cuddington [Cameco] dated June 23, 2021). ERFN was updated on the elevated ammonia in November 2021 via the JIEES. It was identified that ammonia is produced during milling of uranium at the Key Lake Mill.

In CMD 22-M36 it is reported that the elevated constituents (including ammonia and sulfate) discovered are concluded to be:

- Not solely the result of previously reported historical changes or discoveries at Key Lake (pg 93 = pg 100/160).
- Not associated with the 2018 uranium in groundwater event, but from a separate release that occurred sometime before the facility went into care and maintenance (pg 94 = pg 101/160).
- Contamination limited to the mill terrace (pg 94 = pg 101/160).

Further, it is stated that Cameco submitted an assessment report in May of 2022 and a corrective action plan in the fall of 2022.

### **Clarification #3**

As stated on page 93 (pg 100/160) regarding the source of the reportable discovery, it was “deemed likely that a release to the environment occurred prior to Key Lake going into a state of care and maintenance in 2018.” This was the same conclusion made regarding the reportable discovery of elevated uranium levels in 2018, which was an ongoing leak until identified and rectified. Further, it is concluded regarding the discovery in 2021 it is “not solely the result of previously reported historical changes or discoveries.” As such, it is unclear if the monitoring supports the description of this discovery as an “event” that occurred prior to care and maintenance (as suggested in November 2021 JIEES Summary) or is this similar to the 2018 discovery where there was an ongoing release.

### **Question #1:**

Does Cameco anticipated the same level of engagement with ERFN as was completed regarding the 2018 release from the Molybdenum Extraction Plant?

### **Question #2**

As it is reported the constituents of concern included ammonia and sulfate, what is the full suite of elevated constituents of concern? Specifically, does the list include uranium? Is there potential for cumulative effects from the two releases?

## **Conclusion**

There is very little new information from the 2020 RoR, from my review of the information provided there is no reason to object to the CNSC’s conclusions in the 2021 RoR that the operations are being managed effectively in terms of the SCAs. The RoR concludes that adequate protections are in place to protect the environment and humans. Further, from the information I was provided by ERFN there has been an increased level of engagement between ERFN and Cameco, specifically around environmental concerns.

Sincerely,

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## Appendix A: Summary Tables

Table 1: Financial Guarantees for the Five Operations from 2014 to 2021

Facility	2014	2015	2016	2017	2018	2019	2020	2021
Cigar Lake	\$49,200,000	\$49,200,000	\$49,200,000	\$49,200,000	\$49,200,000	-	\$61,790,000	\$61,790,000
McArthur River	\$48,400,000	\$48,400,000	\$48,400,000	\$48,400,000	\$48,400,000	-	\$42,100,000	\$42,100,000
Rabbit Lake	\$202,700,000	\$202,700,000	\$202,700,000	\$202,700,000	\$202,700,000	-	\$202,700,000	\$202,700,000
Key Lake	\$225,100,000	\$225,100,000	\$218,300,000	\$218,300,000	\$218,300,000	-	\$222,500,000	\$222,500,000
McClellan Lake	\$43,074,800	\$43,074,800	\$107,241,000	\$107,241,000	\$107,241,000	-	\$107,241,000	\$107,241,000

Table 2: Maximum Individual Radiation Dose per Year from 2014 to 2021

Facility	2014	2015	2016	2017	2018	2019	2020	2021
Maximum Individual Radiation Dose (mSv)	Rabbit Lake 8.64	Rabbit Lake 9.15	McArthur River 7.02	McArthur River 5.73	Cigar Lake 7.28	McClellan Lake 4.7	McClellan Lake 4.28	Cigar Lake 6.03
% Annual Regulatory Limit	17	18	14	12	14	9	9	12

Table 3: Annual Average Individual Radiation Dose for the Five Operations from 2014 to 2021

Year	Cigar Lake	McArthur River	Rabbit Lake	Key Lake	McClellan Lake
	mSv				
2014	0.16	1.03	1.35	0.63	0.37
2015	0.45	1.00	1.36	0.55	0.89
2016	0.39	0.85	0.85	0.62	1.04
2017	0.34	0.79	0.4	0.66	0.91
2018	0.47	0.15	0.46	0.19	0.9
2019	.57	0.33	0.75	0.27	0.93
2020	0.38	0.27	0.7	0.35	0.67
2021	0.32	0.25	0.57	0.52	0.79

Table 4: Annual Lost-time Injuries for the Five Operations from 2014 to 2021

Year	Cigar Lake	McArthur River	Rabbit Lake	Key Lake	McClellan Lake
	Lost-time Injuries				
2014	1	1	1	0	3
2015	4	0	2	0	3
2016	1	1	1	2	3
2017	0	1	0	0	0
2018	0	0	0	0	1
2019	0	0	1	0	3
2020	0	0	0	0	2
2021	2	0	0	0	3

Table 5: Annual Reportable Environmental Spills for Five Operations from 2014 to 2021

Year	Cigar Lake	McArthur River	Rabbit Lake	Key Lake	McClellan Lake
	Reportable Environmental Spills				
2014	3	1	4	1	2
2015	10	0	2	1	6
2016	5	1	2	1	8
2017	5	2	1	3	3
2018	5	2	1	5	4
2019	3	4	1	8	0
2020	0	0	0	2	4
2021	4	0	4	4	3

Table 6: Summary of Reportable Environmental Spills in 2021

No.	Operation	Spill Description
1	Cigar Lake	100 L of antifreeze spilled on a concrete pad / frozen ground. Antifreeze and contaminated snow collected and disposed of appropriately.
2	Cigar Lake	For more than 10 minutes propane gas leaked from Dry #3. The line was repaired and air quality checks completed.
3	Cigar Lake	400 lbs ammonia gas vented. The valve was returned to normal condition
4	Cigar Lake	17,000 L brine spilled to frozen ground at Freeze Plant. System shut down and fixed, and the contaminated snow collected and disposed of appropriately
5	Rabbit Lake	10.3 m <sup>3</sup> spring melt water from B-Zone released due to blocked culvert. Vac truck removed water from the ditch and culvert cleared. Impacted soil removed and disposed of appropriately, and inspections plan recommended.
6	Rabbit Lake	1.2 m <sup>3</sup> of oil from tote on laydown area leaked. Berm established to prevent release, a vacuum truck and spill pads implemented to recover the oil. Hazardous material disposed of appropriately.
7	Rabbit Lake	2.75 m <sup>3</sup> of melt water from Above Ground Tailings Management Facility (AGTMF) North Pond Surface Water. Contaminated soil excavated and clean material used to backfill.
8	Rabbit Lake	583 kg of propane released from Sand Dryer. Faulty pressure gauge was replaced.
9	Key Lake	3,000 L contaminated water at Deilmann Tailing Management Facility to frozen ground when freezing resulted in split. Vacuum truck used to collect the water and pipeline elbow insulated to increase efficacy of heat tape.
10	Key Lake	Ammonia and sulfate elevated in groundwater in wells MT-19-01 and MT-19-12 installed for monitoring in relation of 2018 reportable discharge from the Molybdenum Plant (CMD 19-M13 and CMD 19-M36). Not solely the result of previously reported historical discharges or discoveries at Key Lake. Corrective Action Plan submitted fall of 2022.
11	Key Lake	Propane leak outside leaching building at the mill. The corroded section of the pipe was replaced. Investigation to replace the full length of pipeline with corrosive resistant piping.
12	Key Lake	60 L of propane was released from the Steam Plant. Faulty pressure gauge was replaced.
13	McClellan Lake	1 m <sup>3</sup> of T-Aime 950 reagent released on loading pad. Hazardous material moved to Sea-can to prevent snow accumulation impairing access. Movement of totes during daylight hours to ensure adequate visibility.
14	McClellan Lake	150 m <sup>3</sup> partially treated Sue C Pit water was released because of a hole in the pond liner. Vacuum truck used to collect water and returned to Sue C Pit and the hole in liner repaired.
15	McClellan Lake	232 kg of tailings solids were released because underflow pipeline failed at a valve. Vacuum truck used to cleaned up slurry and placed back into the tailings circuit. Affected ground was cleaned up and disposed of appropriately.
16	McClellan Lake	10 m <sup>3</sup> of reclaim water released due to failed pump rupture disc at JEB Tailing Management Facility. Instructions and training for restarting the reclaim pump were updated and reviewed by all operators.
17	McClellan Lake	0.7 m <sup>3</sup> of material from Calciner Stack released to Mill Terrace. Material was cleaned up and moved to ore pad. Instructions and training for restarting the Calciner scrubber was revised.