Canadian Nuclear Commission canadienne Safety Commission de sûreté nucléaire



Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2019

A DEL

Commission Meeting December 10, 2020 CMD 20-M25.B



CNSC Staff Presentation Supplemental

e-Doc 6428255 PPTX e-Doc 6430541 PDF









- Page 7, Table 4.1: Current and upcoming Environmental Risk Assessments (ERAs)
 - Upcoming ERAs should read 2020 not 2021 for McArthur River, Rabbit Lake, and Key Lake Operations
- Page 19, Appendix A: List of Inspections at UMM Facilities
 - McArthur River training inspection (December 2-5) identified four (4) non-compliances, not zero (0)



Presentation Outline

- Overview
- Uranium mine and mill facilities
- CNSC regulatory efforts
- CNSC staff assessments
- Other matters of regulatory interest
- Conclusions



Canada

SAG mill used to grind ore at the McArthur River Operation. (Photo source: CNSC)





Updates to CMD 20-M25.B

- Slide 26 changed to maximum effective dose
- Slides 37 and 38 information on Participant Funding Program recipients and interventions received
- Slides 44 to 61 provide staff's disposition of comments received





CNSC Regulatory Oversight Reports - 2019

- November 4, 2020: Use of Nuclear Substances in Canada
- December 8 to 10, 2020:
 - Uranium and Nuclear Substance Processing Facilities
 - Canadian Nuclear Laboratories Sites
 - Canadian Nuclear Power Generating Sites
 - Uranium Mines and Mills





OVERVIEW



Improvements and Status of Previous Actions (1/3)

- 2017 ROR:
 - Plain language summary
- 2018 ROR:
 - Orano's engagement strategy
 - CNSC working agreements with Saskatchewan



Canada



Improvements and Status of Previous Actions (2/3)

- 2017 ROR:
 - Plain language summary
- 2018 ROR:
 - Orano's engagement strategy
 - CNSC working agreements with
 Saskatchewan



Canada





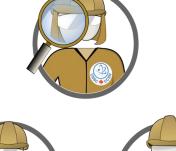
Improvements and Status of Previous Actions (3/3)

- 2017 ROR: Plain language summary
- 2018 ROR: Orano's engagement strategy
- 2018 ROR: CNSC working agreements with Saskatchewan
 - > Working agreements between the:
 - **AECB** and the Saskatchewan Environment and Resource Management (1993)
 - AECB and Saskatchewan Environment and Resource Management (1996)
 - Government of Saskatchewan and the CNSC Respecting the Regulation of Uranium Mining and Milling Facilities in Saskatchewan (2000)
 - CNSC-Saskatchewan Administrative Agreement for the Regulation of Health, Safety and the Environment at Saskatchewan Uranium Mines and Mills (2003)

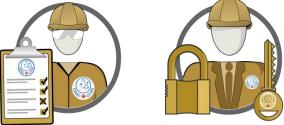


CNSC Regulatory Oversight

- Includes licensing, compliance and reporting to the Commission
- Compliance is completed through:
 - inspection/verification activities
 - review of operational activities and documentation
 - review of licensee reports and events
- Effort is commensurate with risk



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Risk-informed and performance-based approach





URANIUM MINE AND MILL FACILITIES





Operating Mine and Mill Facilities



Sites in **RED** are operating facilities; sites in **BLACK** are in care and maintenance

Orano Canada Inc.

McClean Lake Operation (mine/mill)

Cameco Corporation

- Cigar Lake Operation (mine)
- McArthur River Operation (mine)
- Rabbit Lake Operation (mine/mill)
- Key Lake Operation (mill)





Uranium Mines and Mills Licences

Licensee/site/licence #	Licence effective	Last licence amendment	Licence expiration
Cameco Corporation, Cigar Lake Operation UML-MINE-CIGAR.00/2021	2013.07.01		2021.06.30
Cameco Corporation, McArthur River Operation UML-MINE-McARTHUR.01/2023	2013.11.01	2019.06.26	2023.10.31
Cameco Corporation, Rabbit Lake Operation UMOL-MINEMILL-RABBIT.00/2023	2013.11.01		2023.10.31
Cameco Corporation, Key Lake Operation UML-MILL-KEY.01/2023	2013.11.01	2020.07.29	2023.10.31
Orano Canada Inc., McClean Lake Operation UMOL-MINEMILL-McCLEAN.01/2027	2017.07.01	2018.07.17	2027.06.30





Cigar Lake Mine

- No licensing or LCH changes
- Ongoing high-grade ore production and shipment of ore to McClean Lake mill
- <u>No</u> action level exceedances
- *Three* reportable events



Cigar Lake Operation uranium mine, operated by Cameco Corporation, is located approximately 660 kilometres north of Saskatoon, Saskatchewan. (*Photo source: Shaw Global*)





McArthur River Mine

- Updated financial guarantee (approved June 2019)
- Indefinitely suspended operations in 2018
- Care and maintenance activities in place to ensure safety of workers, the public and protection of the environment
- <u>No</u> action level exceedances
- <u>One</u> reportable event



Cameco Corporation operates the McArthur River mine located approximately 620 kilometres north of Saskatoon, Saskatchewan. (*Photo source: Cameco*)



Rabbit Lake Mine and Mill

- No licensing or LCH changes
- Indefinitely suspended operations in 2016
- Reclamation activities continue
- Care and maintenance activities in place to ensure safety of workers, the public and protection of the environment
- <u>No</u> action level exceedances
- <u>No</u> reportable events



Cameco Corporation operates the Rabbit Lake mine and mill facility located 750 kilometres north of Saskatoon, Saskatchewan. (*Photo source: CNSC*)

Canada







- No licensing or LCH changes
- Indefinitely suspended operations in 2018
- Care and maintenance activities in place to ensure safety of workers, the public and protection of the environment
- <u>No</u> action level exceedances
- <u>Four</u> reportable events



Owned and operated by Cameco Corporation, Key Lake is located approximately 570 kilometres north of Saskatoon, Saskatchewan. (*Photo source: Cameco*)





- No licensing or LCH changes
- Continued processing of uranium ore slurry received from Cameco's Cigar Lake mine
- November 2019, Orano requested to expand the JEB TMF
 - CNSC staff will make a recommendation on this matter at a future Commission hearing
- <u>**Two</u>** action level exceedances</u>
- <u>Three</u> reportable events



McClean Lake Operation, located approximately 750 kilometres north of Saskatoon, Saskatchewan, is operated by Orano Canada Inc. (*Photo source: Orano*)





CNSC REGULATORY EFFORTS





CNSC Regulatory Efforts: Uranium Mine and Mill Facilities

	Cigar Lake	McArthur River	Rabbit Lake	Key Lake	McClean Lake	Total
Person days for compliance	280.6	107.5	109.3	110.0	251.4	858.8
Person days for licensing	3.2	48.5	29.4	19.6	68.2	168.9
Number of inspections	6	4	3	3	4	20
Inspection non-compliances	9	11	0	4	3	23

All non-compliances have been closed





CNSC Regulatory Efforts: CNSC Staff Site Licensing Efforts

- CMD 19-H105 recommended an amendment to the McArthur River licence, UML-MINE-MCARTHUR.01/2023, to update the financial guarantee
- CNSC staff also worked on amendments to:
 - Key Lake: UML-MILL-KEY.01/2023
 - **Rabbit Lake: UMOL-MINEMILL-RABBIT.00/2023**
- CNSC staff also ensured that Licence Condition Handbooks remained up to date as REGDOCs were introduced or revised





CNSC STAFF ASSESSMENTS





Safety and Control Area Performance

- CNSC staff use expert judgement and rate performance based on multiple inputs, including:
 - key performance indicators
 - results of compliance activities
 - repeat of non-compliance and effectiveness of licensee actions
- Ratings represent a holistic summary of each SCA



2019 Uranium Mines and Mills Performance Ratings

CNSC staff's review of key performance indicators resulted in a rating of **"satisfactory"** for all operating mines and mills

Safety and control area	Cigar Lake	McArthur River	Rabbit Lake	Key Lake	McClean Lake
Management system	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA
Operating performance	SA	SA	SA	SA	SA
Safety analysis	SA	SA	SA	SA	SA
Physical design	SA	SA	SA	SA	SA
Fitness for service	SA	SA	SA	SA	SA
Radiation protection	SA	SA	SA	SA	SA
Conventional health and safety	SA	SA	SA	SA	SA
Environmental protection	SA	SA	SA	SA	SA
Emergency management and fire protection	SA	SA	SA	SA	SA
Waste management	SA	SA	SA	SA	SA
Security	SA	SA	SA	SA	SA
Safeguards and non-proliferation	SA	SA	SA	SA	SA
Packaging and transport	SA	SA	SA	SA	SA





Radiation Protection Performance

- Licensees' radiation programs and practices were effective in controlling radiological hazards
- As low as reasonably achievable (ALARA) initiatives provided enhanced radiation protection
- Action levels ensured detection of potential problems
- Radiation doses received by workers and the public were well below regulatory limits

CNSC staff's compliance activities verified radiation doses were kept ALARA

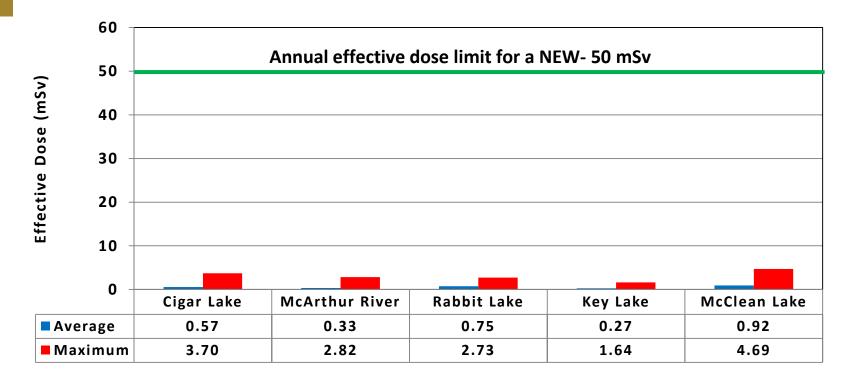


CNSC staff taking dose rate measurements at the McArthur River Operation. (Photo source: CNSC)





Radiation Protection Performance 2019 Average and Maximum Effective Doses to Nuclear Energy Workers (NEW)



26



Environmental Protection Performance

- Licensees are required to implement environmental protection programs
- Action levels ensure early detection of potential problems
- No exceedances of regulatory release limits

CNSC staff's compliance activities verified the environment continues to remain protected



McArthur River – Treated water flow path. (Photo source: CNSC)

Canada





Environmental Protection Performance Exceedances (1/2)

Two action level exceedances at McClean Lake:

- 1
- Action level exceedance TSS in treated effluent
 - Treated effluent from Pond C discharged to Sink Reservoir with TSS exceeding action level
 - Discharge was rerouted to TMF
 - Work instructions were updated to eliminate future occurrences
 - No measurable impact on the environment





Environmental Protection Performance Exceedances (2/2)

Two action level exceedances at McClean Lake (cont'd):

- 2
- Authorized level exceedance $-SO_2$ in ambient air
 - During start up of sulphuric acid plant, elevated SO₂ emissions led to temporary elevated ambient SO₂ concentrations in air
 - Work instructions were updated to eliminate future occurrences
 - No measurable impact on workers or the environment





Environmental Protection Performance 2019 Treated Effluent Annual Average Concentrations

All effluent discharge concentrations were below:

- Metal and Diamond Mining Effluent Regulations
- Licence discharge limits
- Site specific action levels

Treated effluent concentrations met regulatory requirements





OTHER MATTERS OF REGULATORY INTEREST







- Established to ensure sufficient funds are available to decommission a facility in the event that a licensee is unable to carry out the decommissioning themselves
- CNSC verifies that financial guarantees are sufficient, valid and in effect

Financial guarantees are a licence requirement and must be accepted by the Commission





Indigenous and Community Engagement

What we heard in previous years:

- Include a plain language summary
- Provide more time for review
- Hold dedicated information session on technical aspects of the ROR data

CNSC staff remain committed to building long-term positive relationships with Indigenous communities



CNSC staff presenting information to the EQC members on September 4, 2019 in Prince Albert, SK. (*Photo source: CNSC*)





REGDOC-3.2.1, *Public Information and Disclosure* sets out guidance and requirements for licensees

- CNSC staff confirm licensees have:
 - continued communication with interested communities
 - updated websites for events at their facility
 - held workshops with Athabasca collaboration agreement communities





Eastern Athabasca Regional Monitoring Program (EARMP) (1/2)

- EARMP monitors the safety of traditionally harvested country foods annually
- Designed to gather data on environment and cumulative impacts
- CNSC staff participate in development of the EARMP
 - review of the sampling data and input into conclusions of the report



http://www.earmp.ca/index.html





Eastern Athabasca Regional Monitoring Program (EARMP) (2/2)

- As part of the community program, samples were collected from September to December 2018
- All samples were collected independently by, or with, the aid of community members

2018/2019 EARMP concluded that consumption of local water and traditional country foods is safe





Participant Funding Program and Interventions (1/2)

Participant Funding Program Recipients	Other Intervenors
Canadian Environmental Law Association	Saskatchewan Mining Association
Ya'thi Néné Land and Resource Office	Kineepik Metis Local 9
	Northern Saskatchewan Environmental Quality Committee
	Lac La Ronge Indian Band (LLRIB) and Kitsaki Management Limited Partnership
	Athabasca Joint Engagement and Environmental Subcommittee
	English River First Nation
	Canadian Nuclear Workers' Council





Participant Funding Program and Interventions (2/2)

Key Themes from Interventions

Positive Comments	Concerns/Recommendations
Satisfaction with safe operation for workers, the public and the environment	Challenges around access to detailed environmental data
Industry well regulated	Indigenous consultation and engagement
Support for the annual assessment process	Accessibility of information
	Environmental concerns
	Timeliness of information sharing





CONCLUSIONS





CNSC staff confirmed that in 2019 all facilities had:

- Satisfactory performance
- Comprehensive radiation protection programs that adequately control radiation exposures, keeping doses ALARA
- Environmental protection programs to protect the environment
- Comprehensive health and safety programs to protect workers





2020 Regulating Under COVID-19 Restrictions

- Refer to CMD 20-M36 for more information on CNSC response to COVID-19 and modified oversight approach for the nuclear fuel cycle program
- Licensees implemented business continuity plans, moved operating facilities to safe shutdown state and reduced onsite workforce to essential workers only
- Licensees implemented protective barriers around workspaces, enhanced hygiene practices, screening protocols and physical distancing requirements
- CNSC staff continued:
 - inspections using a combination of remote and onsite methods
 - conduct of desktop reviews of licensee reports and submissions
 - remote engagement with applicants and licensees
 - remote engagement with Indigenous groups

Safety and security maintained at all times







CNSC staff will continue to:

- Implement regulatory oversight using a risk-informed approach
- Contribute to outreach and engagement with Indigenous groups and the public
- Work constructively with Provincial and local governments

CNSC mandate to protect the environment, the health and safety of workers, and the public





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ANNEX 1 – DISPOSITION OF COMMENTS

Supplemental - 5





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.1 – Saskatchewan Mining Association

Commen	t	CNSC Staff's Response
Both Cameco and Orano continue to management and have met perform regarding the health and safety of pe of the environment, which is even m this challenging time in Canadian his	ance expectations ersons and protection ore impressive during	No response necessary.





Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
 Oral submission opportunities and rights of reply should be included within the scope of ROR interventions. 	The Commission establishes the Meeting process through the <u>Canadian Nuclear Safety Commission Rules of</u> <u>Procedure</u> and the <u>Canadian Nuclear Safety Commission</u> <u>By-laws</u> .
 The CNSC should extend the amount of time provided to the public for the review of RORs and ensure a minimum 60-day timeframe. 	See #1 above.





Annex 1 – Disposition of Comments Intervenor Review Comments

	Comment	CNSC Staff's Response
3.	The ROR would be more effective if the CNSC canvassed a list of issues and topics to inform the scope of the ROR. Given the trend to longer, ten-year licences, soliciting public comment on the scope of issues addressed in ROR would provide a starting point for public engagement.	RORs are intended to provide an overview of CNSC staff activities for a given calendar year. CNSC continues to engage the public in a variety of ways such as presence at community or local events, social media and webinars.
		Requests for information from CNSC should be directed to the CNSC INFO account. Interested persons may make comments on the ROR content following publication of a CNSC discussion paper in the near future.





Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
 Greater detail should be provided within the ROR and conclusions in the text supported by references to accompanying documents or studies. 	The ROR is intended to provide an overview of CNSC staff activities. More detail is included for areas where the Commission has expressed an interest, or where CNSC staff feel that the Commission should be informed of a topic. Additionally, CNSC staff provide information to the public in a variety of ways, such as the CNSC's public website and social media accounts. CNSC staff also attend community events such as fairs in areas near major sites, to better communicate with the public. The public can also email the CNSC's general enquiries email address as found on the public webpage, or file a formal <i>Access to Information</i> request.





Annex 1 – Disposition of Comments Intervenor Review Comments

	Comment	CNSC Staff's Response
5.	The Commission should require Cameco and Orano to release their preliminary decommissioning plans for public review. Summaries of PDPs should not be an accepted alternative when this information is available and before the Commission.	Preliminary decommissioning plans may contain proprietary information, such as cost estimates, and it is up to the licensee to determine this, and to make the decision if they want the document to be public or not. It is recommended interveners directly contact the licensee and request a copy of the decommissioning plan.
		Guidance in both REGDOC-2.11.2 and CSA Group standard N294 encourage licensees to consult with members of the public to select an appropriate decommissioning strategy.





Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
6. As part of the Commission's role as a lifecycle regulator, decommissioning plans should be a required component of RORs so that the range of technically complex and challenging decommissioning actions which are specific to uranium mines and mills can be publicly reviewed and discussed.	UMM licensees are required to update preliminary decommissioning plans every five years and the CNSC staff assessment of the preliminary decommissioning plan is discussed at public licensing hearings.





Commission Meeting, December 10, 2020 CMD 20-M25.B – 2019 ROR for Uranium Mines and Mills Annex 1 – Disposition of Comments Intervenor Review Comments CMD 20-M25.2 – Canadian Environmental Law Association

Comment

7. The radionuclide emission data provided in the Open Government Portal and ROR are not equivalent alternatives nor substitutes for the NPRI. Given the threat radionuclides pose to human health and the environment, we encourage the Commission to again, rethink its decision to *not* support the inclusion of radionuclides on the NPRI's substance list. The lack of comprehensive, accessible publicly-available data minimizes the ability of the public and independent scientific experts to provide valuable insight on relevant considerations to support the decision-making process and impedes the public's right to know.

CNSC Staff's Response

ECCC, applying their procedures, has determined that radionuclides are not a priority for NPRI reporting as the information is already collected and reported by another agency. Nevertheless, the CNSC and ECCC-NPRI have agreed to work together to improve public access to this information. A Task Team (TT) has been formed of both ECCC-NPRI and CNSC specialists along with a stakeholder advisory group. TT activities continue to date and have resulted in 90% completion of the new NPRI query and facility pages which contain embedded links to the CNSC information products (Open Government Portal [OGP] databases and CNSC facility web pages). The scheduled summer 2020 release for new NPRI query tool and web pages has been delayed due to the need to transfer NPRI IT resources to support the COVID-19 response. Work has however, continued on the development and maintenance of databases on radionuclide releases. These are currently hosted on the CNSC Open Government portal and available to the public for download.





Annex 1 – Disposition of Comments Intervenor Review Comments

	Comment	CNSC Staff's Response
8.	CNSC should include footnotes referencing the documentation in support of its ROR conclusions and provide references when incorporating findings from external reports, inspections and reviews.	Noted.
9.	The CNSC should commission an independent climate effects analysis of all licenses in order to provide the expert-based justification needed to substantiate the Commission's promotion of nuclear as a "clean" form of energy, capable of combatting climate change.	The CNSC does not promote any type of power generation.





Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
10. The Commission should seek information from licensees at the upcoming ROR meeting setting out the climate risks faced by the mines and tailings management areas and review what techniques are necessary and being employed to manage and adapt to climate change.	Noted.





Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
11. As climate change was not a consideration that factored into decommissioning for Canada's historical uranium mine sites, there is a pressing need to bring these sites into the scope of the ROR on an annual basis. Relatedly, decommissioning plans for currently operating sites should be required to consider climate effects.	 Historic and decommissioned mines are outside of the scope for this Meeting. Climate and climate change impacts are addressed at all stages of licensing. Long-term predictions of environmental effects include uncertainties, conservatism and safety margins.



Commission Meeting, December 10, 2020 CMD 20-M25.B – 2019 ROR for Uranium Mines and Mills Annex 1 – Disposition of Comments Intervenor Review Comments

Comment	CNSC Staff's Response
12. Changes, omissions and discrepancies in the status of REGDOC implementation in this year's ROR in comparison to last year should be set out at the upcoming ROR meeting. For items which are deferred or no longer required, there is an even greater need for explanation.	When a new REGDOC or a new version of a REGDOC is approved by the Commission for publication, the CNSC asks licensees to conduct a gap analysis to determine where their programs currently reside and what changes, if any, are necessary to meet the new REGDOC. The licensees will be asked to develop an implementation plan to bring themselves into line with the new REGDOC. The timing of the implementation plan can be adjusted depending on existing situations. For example, the implementation of a revised REGDOC on training has been deferred for those uranium mines and mills that are currently in care and maintenance mode and they will be expected to implement the REGDOC when they return to full production. However, these sites continue to operate with training programs that have met the regulatory requirements and CNSC inspectors conduct compliance verification to confirm.





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.3 – Kineepik Metis Local 9

Comment	CNSC Staff's Response
We feel that Cameco has successfully managed its operations into a state of safe and stable care and maintenance and are satisfied	No response necessary.
with the CNSC staff's summary on operational performance.	

CMD 20-M25.4 – Northern Saskatchewan Environmental Quality Committee

Comment	CNSC Staff's Response
We, the former Co-Chairs, on behalf of the NSEQC, have reviewed	No response necessary.
the ROR submission and are satisfied with the performance	
summary.	





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.5 – Lac La Ronge Indian Band and Kitsaki Management Limited Partnership

Comment	CNSC Staff's Response
I am pleased to provide this letter of support regarding the 2019 Regulatory Oversight Report (ROR) for Uranium Mines and Mills in	No response necessary.
Canada. While in operation and during care and maintenance, we	
have been well informed about the operations included in the 2019 submission.	

CMD 20-M25.6 – Athabasca Joint Engagement and Environmental Subcommittee

Comment	CNSC Staff's Response
The AJES has reviewed the ROR submission, we have been well	No response necessary.
informed about the operations included in the 2019 submissions,	
both in operation and during care and maintenance.	





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.7 – English River First Nation

Comment	CNSC Staff's Response
We feel that Cameco has successfully managed the Key Lake, McArthur River and Rabbit Lake operations into a state of safe and stable care and maintenance. We have reviewed the ROR submission and have been well informed and are satisfied with CNSC's summary on the performance of the operations.	No response necessary.





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.8 – Canadian Nuclear Workers' Council

Comment	CNSC Staff's Response
CNSC Staff confirmed that radiation protection programs adequately controlled radiation exposures and radiation doses were kept as low as reasonably achievable (ALARA), environmental protection programs were effective in protecting the public and the environment, and conventional health and safety programs continued to protect workers.	No response necessary.





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.9 – Ya'thi Néné Land and Resource Office

	Comment	CNSC Staff's Response
1	 YNLR recommends that an additional section be included within the report that summarizes recommendations identified in previous years from intervenors and for the CNSC to include a status update on each. 	Where a recommendation is not dispositioned, CNSC staff will consider this approach for the next ROR.
2	 YNLR recommends that a similar degree of regulation that the CNSC apply to mines and mills also be applied throughout all aspects of the uranium lifecycle (i.e. exploration and transport) with risks and performance issues regularly communicated to impacted communities. 	Although exploration falls outside of the mandate of the CNSC, transportation is addressed by CNSC staff as it relates to transportation of dangerous goods, and packaging. When nonconformance issues arise, they are communicated to local communities though notifications and through the annual reports.





Annex 1 – Disposition of Comments Intervenor Review Comments

CMD 20-M25.9 – Ya'thi Néné Land and Resource Office

Comment	CNSC Staff's Response
 YNLR recommends that the CNSC continue to consult with and further incorporate YNLR staff and feedback into subsequent IEMP programs in future years. 	Noted.
 YNLR recommends that future CNSC hearings (post- pandemic) should be held within one of the seven impacted communities in Nuhenéné to improve communication and trust. 	Noted.