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Supplementary Information

Oral Presentation

Revised written submission from the Prince Albert Grand Council

In the Matter of

**Regulatory Oversight Report for Uranium
Mines, Mills, Historic and Decommissioned
Sites in Canada: 2017**

Commission Meeting

December 12, 2018

Renseignements supplémentaires

Exposé oral

Mémoire révisé du Prince Albert Grand Council

À l'égard de

**Rapport de surveillance réglementaire des
mines et usines de concentration d'uranium et
des sites historiques et déclassés au Canada :
2017**

Réunion de la Commission

Le 12 décembre 2018

Backgrounder

CNSC Participant Funding Program—Regulatory Oversight Report (ROR) on Uranium Mines, Mills, Historic and Decommissioned Sites in Canada 2017

To prepare this backgrounder, we used the materials presented in the Regulatory Oversight Report 2017 (ROR) prepared by the staff of the Canadian Nuclear Safety Commission (CNSC). Additionally, we reviewed some related documents to have better undertaking related to threats and management options of uranium mines.

The ROR provides an update based on the assessment of licensee performance of uranium mines in Canada prepared by the CNSC staff. It includes information on uranium mines, mills, and historical and decommissioned sites in Canada with a particular focus on northern Saskatchewan. The purpose of the ROR is to keep the public informed of the scientific, technical, and regulatory activities (inspections outcomes) and public engagement processes concerning the operating and decommissioned mines and includes information regarding health and safety issues at these sites.

Although the ROR provides information on the regulatory efforts of CNSC (e.g., inspections of licensee operated mills and mines, license changes, major developments at licensed facilities and mill sites, as well as any significant events such occurrence of spills), we focused on the human health and monitoring programs (environmental effects and radiation protection) and the Aboriginal engagement activities such as the remediation of mines that often concern Aboriginal livelihoods and ecosystems. In this regard, contexts related to environmental monitoring and engagement processes are discussed based on the ROR and include information or dataset presented in ROR. Where possible, we have explained our concerns by providing additional information and have asked for more information on the environmental monitoring and engagement processes. Some proposals are also given for effective Aboriginal engagement. We discuss the health and environmentally related issues first, with the matters related to Aboriginal engagement following after. Before going into the detailed response concerning the ROR, identified threats related to uranium mines are explained so that heard can follow the rest of the document.

1. Major health and ecosystem concerns with uranium mines

As per the present information operation of uranium mines causes several health and environmental threats. The uranium and its compounds (e.g., thorium-230, radium-226, lead-210, polonium-21 and uranium-234 that are alpha emitters) are highly toxic both from chemical and radiological properties. There are several ways how the uranium mines can affect environment and human health. For example, uranium mining facilities produce tailings have radioactive materials. If the tailing ponds are not contained properly, the radioactive containing materials can make their ways to air, water and soil. In a mismanaged facility, windblown dust dispersal and leaching of contaminants such as heavy metals including lead and arsenic in the water cause health and ecosystem threats. Uranium can reach the human body mostly by ingestion of drinking water and foodstuffs. More significantly, radon gas that emitted during mining operation is also responsible for health threats. Radon is produced by the decay of

uranium (a radioactive gas that comes from the natural break down of uranium) which is naturally present in rock and soil of uranium mines. It is said that prolong exposure to radon decay products generally represents the greatest radiation-related health risk for the workers from uranium-related mining and processing operations. Radon's alpha-emitting radioactive decay products are linked to lung cancer in humans. Unfortunately, radon is the second leading cause of lung cancer and Saskatchewan is a hot spot¹. Workers are also at risk from exposure to other radionuclides which undergo radioactive decay by alpha, beta, or gamma emission. The potential for adverse health effects also increases if there are uncontrolled releases as a result of extreme events (e.g., floods, fires, earthquakes) or human error in mining operations. For example, Gunnar mine got flooded in October 2006 (For more information on this, see Figure-2).

2. Overview: Human Health and Environmental Protection Programs by CNSC

1.1 Radiation protection

The ROR indicates that radiation protection is a key measure to protect human health. Under the radiation program, contamination levels and radiation doses received by individuals are monitored, controlled, and maintained below regulatory limits—as low as reasonably achievable. Key contaminants of uranium mines are identified as gamma radiation, radiative dust, radon gas, and radon-related elements. The ROR confirms that to maintain the safety of nuclear energy workers, each worker is issued an optically stimulated luminescence dosimeter that measures external gamma radiation exposure and resulting doses. The ROR confirms that operating mines maintain provincial and national safety standards and that no health concerns were identified for the operating mines and mills.

1.2 Environmental protection programs

To meet the requirements related to the human health and environmental protection programs expert-/scientist-driven monitoring activities such as the monitoring of air or water chemistry of mining facilities or pits (including tailings) are conducted. The ROR 2017 indicates that environmental monitoring is done to identify, control, and monitor releases of radioactive and hazardous substances from facilities and to observe their effects on the environment.

As per the ROR, both CNSC and the licensees are responsible for conducting the environmental monitoring. The results from both types of monitoring (CNSC and company directed) are compared for accuracy. For decommissioned mines, environmental monitoring is done on a biennial basis and for operating mines, it is done on an annual basis. Environmental monitoring includes monitoring air, water, plants (blueberries and Labrador tea), and animal (white fish/northern pike) samples. Collected samples are analyzed to understand the impacts of mining on the ecosystem and human health.

¹ <https://sk.lung.ca/protect-your-lungs/radon/what-radon>; <https://www.ncbi.nlm.nih.gov/books/NBK201047/>

1.3 Community participation in environmental monitoring

The ROR indicates the use of a community-based monitoring program called the Eastern Athabasca Regional Monitoring Program (EARMP). The plan was established by the province of Saskatchewan in 2011. Under this program the following data is collected:

- Water chemistry samples from each community sampling area
- Large-body fish flesh chemistry (lake trout and lake whitefish) from each community sampling area
- Berry chemistry (bog cranberry or blueberry chemistry from each community sampling area)
- Soil chemistry and characterization from each berry sampling location
- Moose and barren-ground caribou chemistry from each community sampling area
- Mammal organ chemistry (livers and kidneys) from community sampling areas.

The ROR indicates that the contractor of this program is a northern Saskatchewan Aboriginal-owned business, but does not indicate the name of the contractor (Other information says it is CanNorth as it supports the EARMP. For more information see the link <https://cannorth.com/community-programs/>). This information demonstrates that Indigenous communities have been taking part in water, animal, and plant sample collection, especially First Nations from the Fond du Lac area of Saskatchewan. As per present information, EARMP's sample collection sites cover the areas around Black Lake, Camsell Portage, Fond du Lac, Stony Rapids, Wollaston Lake/Hatchet Lake, and Uranium City. This program has demonstrated that concentrations of chemicals of interest have been relatively consistent over time and generally within the regional reference range (usual range found in undisturbed natural systems) indicating little evidence of long-range transport of contaminants associated with uranium mining.

The ROR also confirms that operating uranium mines and mills are not affecting the safety of country foods in nearby communities. This report confirms that CNSC staff continue to support the EARMP and are collaborating to create further opportunities for using this valuable program. This information indicates that a CNSC-community collaboration on environmental monitoring exists at this point. For more information on this program, see the link: <http://earmp.ca/community.html>. For sampling locations and the types of samples see the link: <http://earmp.ca/maps.html>.

Below is an update on the four mines involved in environmental monitoring. The types of samples used and status of each mine are also discussed. (For more information on monitoring, see the link: <http://www.cnsccsn.gc.ca/eng/resources/maps-of-nuclear-facilities/iemp/index-iemp.cfm#map>).

- 1. Key Lake Mill Point (2014)**—44 entries-Surface waters
Public and the environment around the Key Lake mill are safe and there are no health impacts (URL: http://nuclearsafety.gc.ca/eng/resources/maps-of-nuclearfacilities/iemp/key_lake.cfm)
- 2. McArthur River (2014)**—22 entries-Surface waters

Public and the environment around the mine are safe and there are no health impacts (URL: <http://nuclearsafety.gc.ca/eng/resources/maps-of-nuclearfacilities/iemp/mcarthur.cfm>)

- 3. McClean Lake** (2016)—714 entries- (i) Air, (ii) fish (Northern pike/Lake white fish) and (iii) plants (blue berry/Labrador tea)

Public and the environment around the mine are safe and there are no health impacts (URL: <http://nuclearsafety.gc.ca/eng/resources/maps-of-nuclearfacilities/iemp/mcclean-lake.cfm>)

- 4. Cluff Lake closed mine** (2017)—696 entries-Surface waters and food samples (i) Fish (Lake white fish and northern pike), (ii) Plants-(Blue Berry, Labrador Tea)
Public and the environment are protected and here is no unreasonable risk to health and the environment (URL: <http://www.cnsccsn.gc.ca/eng/resources/maps-of-nuclear-facilities/iemp/cluff-lake.cfm>)

Questions: Does the CNSC or the licensee of the mine test the samples in several labs to verify the accuracy of results or is only a single lab used? Also, what is the level of traditional knowledge used in this regard, such as in monitoring the health of animals and ecosystems in a disturbed landscape?

1.4 Some concerns with environmental monitoring and way forward

It is understandable from the review of the ROR that the CNSC has comprehensive programs to protect the environment and human health. The licensees for the uranium mines are also playing an important role in maintaining the safety requirements. The ROR indicates that the performances of uranium mines are considered “satisfactory” for all 14 criteria CNSC utilizes to evaluate the safety concerns applicable to uranium mines. The above information indicates that CNSC has been maintaining the mines to meet the ecosystem health and human safety standards. However, consideration of the issues and concerns described below can greatly enhance the quality of mining-related, ongoing monitoring efforts and help remove concerns regarding monitoring and engagement efforts. Below we expand on a few points in this regard including the types of concerns, sources, and opinions of PAGC (Prince Albert Grand Council) for future directions to support mining related environmental monitoring activities.

1.4.1 Flooding issues: Gunnar and other mines

Flooding in mines is a common issue, the associated risks of which, relate to health and environmental concerns. The figures below provide evidence of the flooding in Gunnar Mine

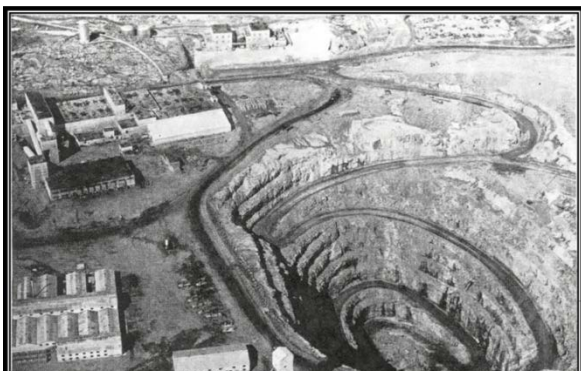


Figure 1 Gunnar Mine—open pit, circa 1962



Figure 2 Gunnar Mine- flooded open pit in 2006

in c.1962 and 2006 res. According to the ROR, there is no liquid effluent at the Gunnar site; however, there is overland flow and seepage from the site into local water bodies. (Page 115 of ROR). Present research suggests that with the warming weather trends, rainfall/precipitation rates may increase in the future in Arctic and Mid-Arctic Canada (See <https://www.enr.gov.nt.ca/en/state-environment/13-projected-trends-temperature-and-precipitation-arctic>); however, we are unsure what this means for the overall risk of flooding of mine pits or tailings.

(Sources: Figure 1: https://www.researchgate.net/figure/Gunnar-Mine-open-pit-circa-1962_fig1_267577144 and Figure-2: https://www.researchgate.net/figure/Gunnar-Mine-flooded-open-pit-in-20-06-Covering-a-huge-area-of-the-site-are-over-44_fig4_270892976)

The image below Also, indicates that there is no significant difference in elevations between the tailing ponds of Gunnar mine and nearby waters, therefore it is hard to determine how an increase precipitation would affect these areas.



Figure 3. Gunnar mine site from above.

(Source: Sources: <https://www.nrcan.gc.ca/evaluation/reports/2012/790>; and WWW.SRC.SK.CA/PROJECT-CLEANS/GUNNAR-MINE-AND-MILL-SITE;))

Questions: *Is there any information on the risk of flooding the mines of the Black Lake, Saskatchewan area?*

Does CNSC have any flood mapping (flood hazard risk assessment) of the 37 abandoned uranium mines to measure the risk of overflows of mine pits or flooding of tailing ponds?

1.4.2 Issues with northern Saskatchewan's 37 abandoned mines

Current information suggests that during the 1950s and 1960s, uranium mines and small prospecting sites were developed and operated by private operators across northern Saskatchewan. The sites and mining operations were abandoned with little consideration for environmental protection or aesthetics. Unfortunately, at that time, the rules and regulations guiding mining-related risks/threats and reclamation were not heavily regulated and as a result, were not considered for many mines. As current information indicates, these abandoned mine

sites have deteriorated creating conditions that pose risks to residents and the environment. In 2006, the federal government and the government of Saskatchewan contracted the Saskatchewan Research Council to manage the cleanup of 37 abandoned uranium mine sites (Project CLEANS)², near Uranium City. Despite this effort, we believe that in order to ensure the health and safety of the people, lands, and wildlife up north, we need to increase our concern and awareness of the abandoned mines in this area.

Question: Can CNSC provide an update on the management of the abandoned mines up north such as those around the Lake Athabasca area?

1.4.3 Revegetation success: Lorado Mine

Present information indicates that the Lorado uranium mine operated from 1957 to 1960 and was abandoned in the 1960s without any decommissioning or remedial work. As per the ROR, the SRC oversees the ongoing management and remediation of the Lorado site. The CNSC report indicates that in 2017, the SRC continued to monitor the local environment and the progress of the cover revegetation in order to understand the impacts of remediation processes on the ecosystem. The Figure 4 indicates some existence of new vegetation. Perhaps, elders could better explain pre-disturbance scenarios of the mining sites that could help us to understand the impacts of ongoing remediation efforts. Given this understanding, it would be an issue to discuss the level of elder engagement and use of TEK in this process.



Figure 4. Update on the Lorado soil and vegetative cover on tailings area, 2017.
(Source: ROR, Page-106)

Questions: Does TEK play any role here or just the science to understand the revegetation process? If so, can CNSC provide us with information about the extent of TEK use here?

² **Project CLEANS:** <https://www.src.sk.ca/project-cleans/mine-and-mill-sites>

1.4.4 Fish advisory due to elevated selenium levels

As per the ROR, the public has been advised of the water bodies where fish consumption should be limited due to elevated selenium levels resulting from past mining and milling activities at the Beaverlodge site and milling at the nearby Lorado site (ref. page 118 of ROR).



Figure 5. Lorado Mill site, Saskatchewan. (Source: SRC <https://www.src.sk.ca/project-cleans/lorado-mill-site>).

Question: *Does the CNSC or any other commission provide compensation for the fishing loss or does any long-term compensation plan exist to mitigate such loss?*

1.4.5 Northern roads, Caribou migration routes and the species at risk issue

The ROR talks about the monitoring of barren land caribou and includes discussions regarding a few other animals (white fish, northern pike, grouse, rabbit, and moose) and plants (berries and Labrador tea) to understand the safety concerns related to consumption of wild meats/plants. However, the ROR does not provide much information on the overall impacts of mines on migration routes of caribou or any other types disturbances on deer species including the overall impacts of the roads (e.g., the 914 and 102) used for mining operations³ at the related landscape and surrounding boreal ranges (if any).

At this point, there is a great deal of research focusing on barren ground caribou monitoring in connection with the loss of habitats and population declines. Present information suggests that caribou shy away from roads and avoid the dust from those roads that cover the vegetation the animals forage on. It is also said that caribou are sensitive to noise and tend to avoid noise from industry and cleared lands from mining and drilling operations. These types of stressors

³ The ROR and other related documents we have reviewed so far indicate that the test samples (e.g., fish, caribou, blueberries especially) are collected from the areas that are nearby to the mines to understand the health and environmental risk associated with mine effluents and emissions of radioactive materials that affect humans and ecosystems. However, mining impacts can be perceived in other areas too. If we consider larger footprints of mines the following roads need to be considered: (i) The road-914 going north through the Pinehouse and (ii) the road-2/102 going northern areas like Black Lake and Stony Rapids have specific impacts on wildlife populations. The two roads are used for carrying out uranium ores and facilitating any other type of transportation needs related to mining. As per our understanding, these two roads are one of the main causes of habitat fragmentation impacting wildlife negatively.

interfere with feeding, reproduction, and calf rearing, ultimately causing caribou numbers to decline.

A study by Jean Polfus and others (2011)⁴ confirmed that woodland caribou avoids mines due to noise and other disturbances. Woodland caribou is considered as a species at risk now that needs further attention to conserve their habitats especially the boreal ranges⁵. An Elder from the Southend, Saskatchewan community confirmed during an interview for the caribou traditional knowledge project under the Ministry of Environment (Reference available if needed), that it is likely that small animals like foxes and lynx can be trapped in mine pits due to their steep slopes and the same can happen to moose and caribou if they accidentally fall in the mine pits while running from a predator, for example. Although there is a requirement to conserve all animals and plants for ecosystem management, the woodland caribou has been central to this requirement and is currently listed as a threatened species under the federal species at risk Act.

Proposal: An extended effort to conserve the wildlife and woodland caribou populations could create an avenue for better engagement with Aboriginal communities in mining. It would also provide a unique opportunity for the PAGC to inform the CNSC about the support PAGC can extend in connection with wildlife monitoring. It is understandable that the ongoing aircraft-based monitoring under the Environment Canada/Wildlife management program of Saskatchewan cannot track the records of caribou habitat uses or population changes that happened historically, and the same can be said for the radio-collar based studies focusing on woodland caribou and barren ground caribou. In this regard, concerns about the data collection process and interpretation remain. As previously mentioned, the radio-collars do not cover historical records such as habitat use by caribou 30-50 years ago or more. Engaging traditional knowledge can help in this regard, and initiatives can be undertaken to engage Indigenous Elders and youth.

PAGC has an ongoing relationship with the University of Saskatchewan for the Indigenous Climate Adaptation project. If funds can be made available, PAGC can engage the University of Saskatchewan to train indigenous youth through a tripartite engagement framework (PAGC-USASK-CNSC project) to support the caribou monitoring program. Such training would include teaching the youth to collect scientific data needed to understand the impacts of disturbances on caribou ranges and the ranges of other wildlife. We also propose an extended monitoring effort for understanding the impacts of the two northern bound roads (Road 914 going north through the Pinehouse community and Road 102 going north to the Black Lake area and Fond du Lac) on the boreal ecosystems used by the woodland caribou and other wildlife.

3. Overview: Aboriginal Engagement

The ROR provides detailed information on CNSC managed engagement activities. This includes information on coordination of public meetings, as well as information on updating

⁴ <http://cari.cc.umanitoba.ca/jeanpolfus/wp-content/uploads/2015/08/Polfus-et-al.-2011-Caribou-avoidance-RSF.pdf>

⁵ https://www.registrelp-sararegistry.gc.ca/document/default_e.cfm?documentID=2253

websites and supporting information booths and funding options. As per the report, participants of the engagement activities include members of provincial bodies who support mining; members of Aboriginal Affairs and Environmental Quality Committee (EQC); and members from 32 communities of greater northern Saskatchewan. Students were also participants in the engagement activities. In addition to the engagement meetings, information sharing, and funding for participation, the contribution of employment for Aboriginal communities is highlighted in this report as a success of mining operations. Below is list of engagement schedules and participant information:

As per the ROR, CNSC has arranged a number of events including general public, officials, community organizations and students to disseminate mining related activities and seek feedback from different sections of the communities . Below is a list of engagement activities in Saskatchewan carried out by the CNSC staff in 2017 (See page-17 of the 2017 ROR). This list also includes information on the types of events and the number of participants where applicable.

- **April 25, 2017** - Saskatchewan Mining Association Exhibition and Information session. The meeting was attended by approximately 300 students and community members from La Loche and surrounding areas.
- **June 22, 2017** - Northern Mine Monitoring Secretariat, update to the EQC (Environmental Quality Committee). The meeting included EQC members, and various Government of Saskatchewan representatives.
- **September 25-26, 2017** - Mining for Society. A two-day event for students showcasing the mining industry. The event targeted students in the Saskatoon area and was attended by approximately 700 students.
- **October 17, 2017** - Fedoruk Center “Coffee Break” information session. This was a public event where CNSC staffed a presentation booth and answered questions.
- **November 6, 2017** - Ya’thi Néné Land and Resource Office. The meeting included representatives from the Athabasca Dene First Nations, CNSC, Cameco and AREVA. There were approximately 40 people in attendance.
- **November 7, 2017** - Communication with Pinehouse, Kineepik Métis Local Inc. to answer questions regarding contaminated waste management at Key Lake.

Given that employment is a significant challenge faced by Aboriginal communities, this engagement issue deserves further attention. As per the 2017 report, the northern mines employed over 2,400 people in direct and contract jobs. These mines maintain a high northern

participation rate with 48 percent of mine employees classified as northerners. Although northern mines are considered one of the largest employers of Aboriginal peoples in Canada, two questions remain unanswered in this regard and are listed below:

- i. How do the jobs in mining affect the Aboriginal livelihoods?*
- ii. Who can actually participate in mining jobs?*

An understanding of the level of participation can help in assessing the impacts of mining on the livelihoods of Indigenous communities. It is generally agreed that mining has historically been a job for men. A 2014 report by the Mining Industry Human Resources (MiHR) Council found that while female participation in mining grew by 70% from 1996 to 2011, women accounted for only 17% of the mining workforce. These numbers are well below women's current national labor force participation rate of 47%.⁶

One of the reasons for this may be that the fly-in/fly out nature of mining jobs is an issue, especially for the women workers in mines up north. This mode of job provision often separates moms/dads (single parents?) working in mines from the rest of the family members. As a result, it is not surprising that younger children suffer due to the absence of one of their parents and we have examples of high-level suicides among Aboriginal youth. Similarly, an Australian study indicated that 25% of mining employees believed their family relationships had been earnestly disadvantaged due to their prolonged time away from home while attending mining jobs. Recent information from Canadian examples confirms that fly-in work increases stress for families.⁷ In summary, it is important to know if mining-related jobs are supporting communities' livelihoods and well-being or creating more adverse livelihood conditions than Aboriginal members can handle. In order to discover these answers, we need to ask CNSC the following questions:

- (i) Does the work mode at mines actually lead to more separation among the working families?*
- (ii) Does the CNSC collect the statistics on the participation rates between men and women in uranium mines?*

Proposal: If these types of questions (women participation/stress and wellbeing etc.) have not been investigated yet, then it is a necessity for the CNSC to look into the matter on an urgent basis. To address the issue, the CNSC can make funds available to PAGC/FSIN to embark on a joint study through a partnership between the USASK and PAGC/FSIN where USASK can also take part to support the research component.

2.1 Mine decommissioning and Indigenous participation

The ROR indicates that licensees are required to develop preliminary decommissioning plans and associated financial guarantees to ensure work activities are covered financially and work is guaranteed for completion with no liability to the government. Financial guarantee values

⁶ <https://mining.ca/sites/default/files/documents/Facts-and-Figures-2015.pdf>

⁷ <https://www.cbc.ca/news/canada/north/mobile-workers-guidebook-fly-in-workers-1.4359199>

for the operating mine and mill facilities range from approximately C\$48 million at the McArthur River operation to C\$218 million at the Key Lake operation (page-16 of the ROR). The report confirms that the contractors collect water, air, plant, and animal samples from decommissioned and operating mines.

Question: There must be a long-term funding arrangement to train the Indigenous youth/organizations so that they can take part in decommissioning and/or reclamation activities?

2.2 Reclamation efforts and Indigenous participation

As per this report, Rabbit Lake Mine has an ongoing reclamation program and reclamation activities will continue throughout the care and maintenance period. Cameco manages the activity and it is responsible for notifying the CNSC of activities or timelines for decommissioning changes based on the current operating status.

Questions: Can the CNSC or mining companies support Indigenous-controlled reclamation initiatives as a test case within a framework such as Species at Risk program including woodland caribou?

Proposal: Supporting the reclamation program is vital for wildlife habitat recovery and also can help support woodland caribou conservation while creating opportunities for employment such as habitat restoration activities.). In this regard, road closure can be an effective measure accompanied by tree plantation for wildlife conservation. Up to this point, not much has been done to conserve the woodland caribou population in the Boreal range of Saskatchewan compared to the conservation measures put in place by other provinces nearby such as Alberta. Alberta has reclamation funding for habitat recovery, which focuses on woodland caribou through an industry-caribou project with a provision of Aboriginal community participation. For example, Cenovus Energy announced a \$32 million caribou habitat initiative in 2016 (see this link: [https://www.cenovus.com/news/news-releases/2016/06-14-16-Cenovusannounces-\\$32-million-caribou-habitat-initiative.html](https://www.cenovus.com/news/news-releases/2016/06-14-16-Cenovusannounces-$32-million-caribou-habitat-initiative.html)). It is not known if Cameco/AREVA will adapt this Alberta approach to respond to the needs related to the Species at Risk programs including caribou habitat conservation. A program like this can create opportunities for the PAGC communities to respond to the ongoing conservation needs including woodland caribou. It is assumable that there are hundreds of Aboriginal youth at Northern Saskatchewan have no jobs and living with frustration and anxieties about their future. If funding is arranged, PAGC can engage community/youth to participate in this type of conservation program, which includes regeneration of trees and plants in disturbed areas. In order to proceed with this type of initiative, engaging traditional knowledge is a must. Also, a performance monitoring study that focuses on this approach has to be ensured in order to engage Aboriginal youth and Elders.

Also, PAGC would like to propose a long-term, Aboriginal-community-driven, wildlife population monitoring program using hunters' knowledge/traditional ecological knowledge. PAGC can create a data repository under the control of PAGC where access can be available for funders including AREVA and Cameco. By using the data repository, funders can obtain the data when they need it, but the owner of the data would remain as the PAGC First Nations. At this point, only caribou traditional ecological knowledge (TEK)-based research is available as per our recent records, which leaves hundreds of animals left unrecorded using TEK-based research. Many animals and plants (foods, medicines) have strong cultural and ecological significance.

When an Elder passes away it means that an important TEK holder (or truly a whole library) is lost forever if he/she is not able to pass the ecocultural knowledge he/she gathered through social memories to a new generation.

4. Other Relevant Concerns and Proposals

1. As per the ROR, changes to compliance plans (health and environmental safety) are made on an ongoing basis by CNSC in response to events, facility modifications, and changes in licensee performance. (ref. page-9 of ROR)

Question: Are PAGC/FNs being made aware of the changes and are they being communicated with properly about them?

2. The ROR says noncompliance exists in some cases with health and environmental inspections, but since they are considered low significance impacts, mining facilities get a satisfactory rating.

Question: Can CNSC provide the details on this, such as what are the criteria used for stating that a low safety significance for the mine is satisfactory?

3. The report states that when logistically reasonable, joint inspections are conducted with other federal, provincial, or territorial regulatory agencies. (page-10)

Question: Do they take members from Aboriginal communities on joint inspections such as site visits?

Responses to the Regulatory Oversight Report on Uranium Mines

Prince Albert Grand Council (PAGC), Saskatchewan

Presenters:

Dr. Herman J. Michell

Mr. Robin McLeod

Dr. Abdullah Al Mamun

Who we are?

Total Population: 41,550 (2017)

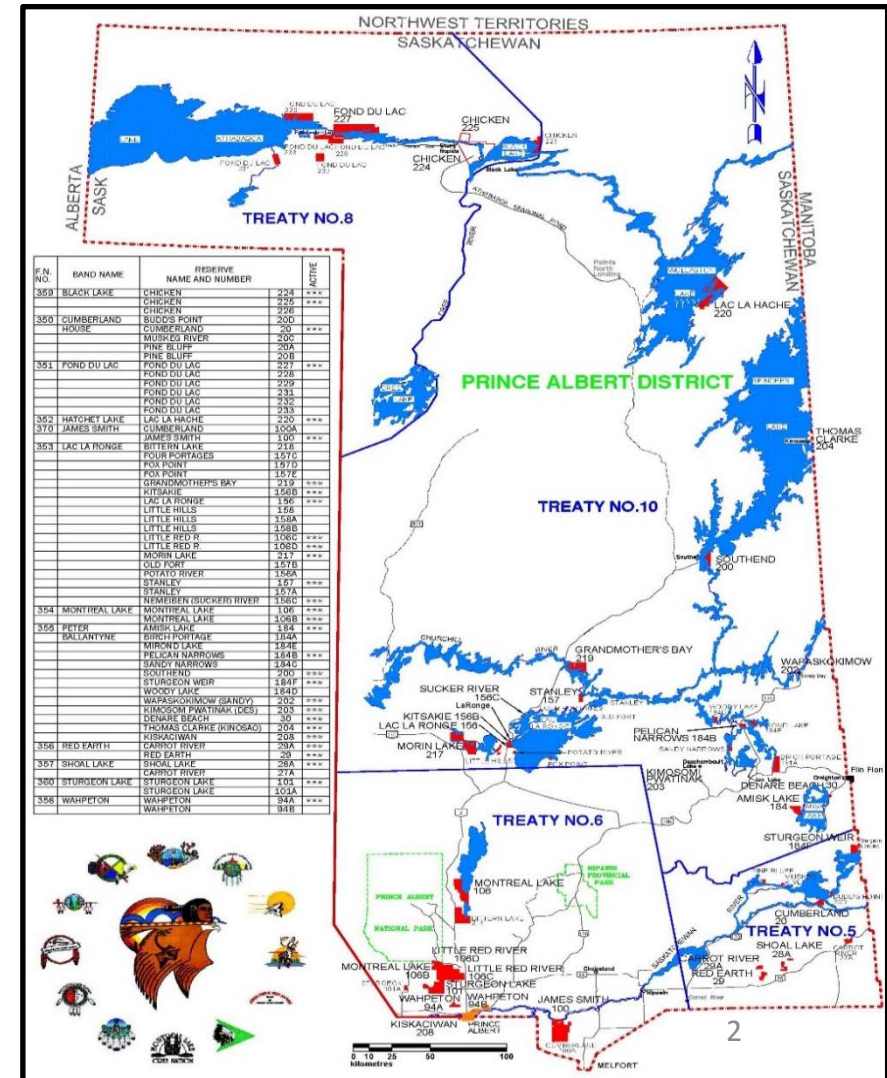


Language spoken: Cree, Dene, and Dakota

Treaties: Treaty No. 8, 10, 6, and 5

First nations:

1. Black Lake Denesuline Nation
2. Cumberland House
3. Fond Du Lac
4. Hatchet Lake
5. James Smith Cree Nation
6. Lac La Ronge Indian Band
7. Montreal Lake Cree Nation
8. Peter Ballantyne Cree Nation
9. Red Earth Cree Nation
10. Shoal Lake Cree Nation
11. Sturgeon Lake
12. Wahpeton Dakota Nation



Northern Saskatchewan's 37 abandoned mines

- Not much consideration taken for environmental protection
- Mining projects were not heavily regulated or reclamation was not done
- Deteriorated mines posed risks to residents and the environment
(Source: Project CLEANs: <https://www.src.sk.ca/project-cleans/mine-and-mill-sites>)

Question: Can CNSC provide an update on the management of the abandoned mines up north such as those around the Lake Athabasca area?

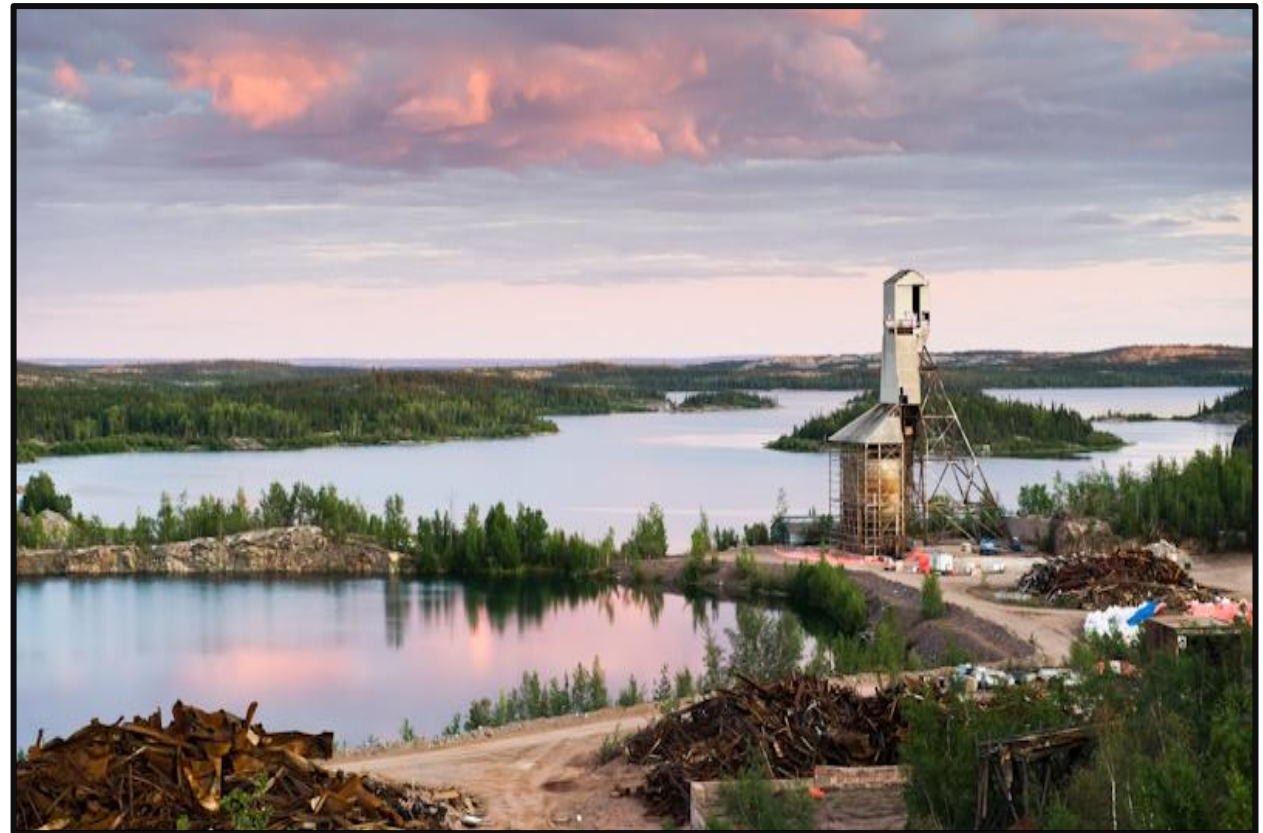
Lab testing of plant/soil, animal, air, and water samples?

Does the CNSC or the licensee of the mine test the samples in several labs to verify the accuracy of results or is only a single lab used for each type of sample?

Also, what is the level of traditional knowledge used in this regard, such as in monitoring the health of animals and ecosystems in a disturbed landscape?

Flooding issues

Warmer weather can cause increase rainfall



a) Gunnar mine site from above 2011

b) View of the Gunnar Mine Site during summer 2011

The above images indicate that there is no significant difference in elevations between the tailings and the pit of Gunnar mine and nearby waters. Therefore, it is hard to determine how an increase in precipitation would affect these areas.

Flooding issues



Gunnar Mine—open pit, circa 1962



Gunnar Mine- flooded open pit in 2006

Questions: Is there any information on climate change preparedness focusing Black Lake and Athabasca region?

Does CNSC have any flood mapping (flood hazard risk assessment) of the 37 abandoned uranium mines to measure the risk of overflows of mine pits or flooding of tailings?

(Figure 1: https://www.researchgate.net/figure/Gunnar-Mine-open-pit-circa-1962_fig1_267577144 and Figure-2: https://www.researchgate.net/figure/Gunnar-Mine-flooded-open-pit-in-20-06-Covering-a-huge-area-of-the-site-are-over-44_fig4_270892976)

Revegetation success: Lorado Mine



The Lorado soil and vegetative cover on tailing area, 2017.

(Source: ROR, Page-116)

Questions: Does TEK play any role here or just the science to understand the revegetation process? If so, can CNSC provide us with information about the extent of TEK use here?

Engagement and partnership

Overall job impacts:

Women accounted for only 15% of the mining workforce as opposed to current national labor force participation rate of 47% Jobs for women (2017).

Fly in/fly out mode of jobs are generally considered as a stress for women and kids.

Questions: Is there any program to improve the current working condition for women?

Decommissioning and reclamation

Funding arrangement: C\$48 million at the McArthur River operation to C\$218 million at the Key Lake operation (page-12 of the ROR)

There must be long-term funding arrangement to train the Aboriginal youth/organizations so that they can take part in decommissioning and reclamation activities.

Community-based habitat restoration

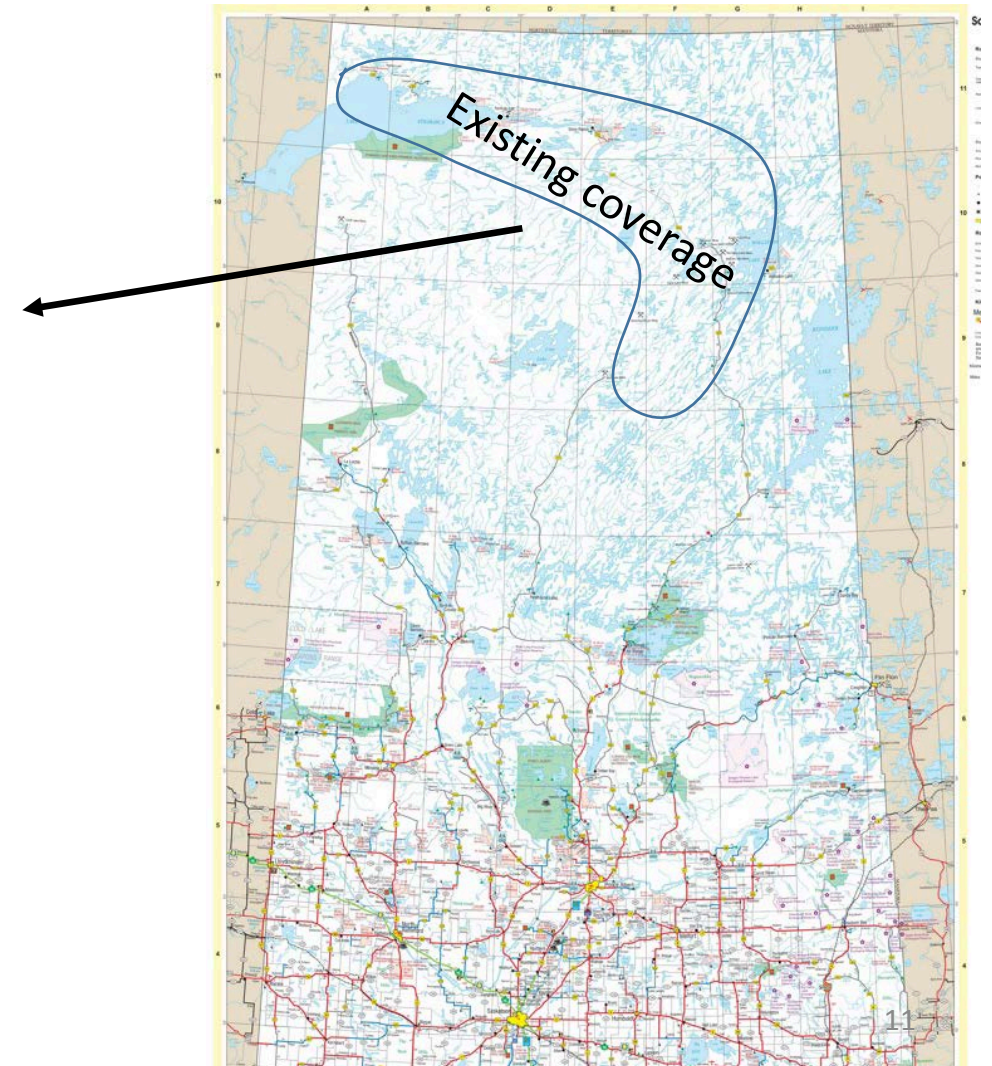
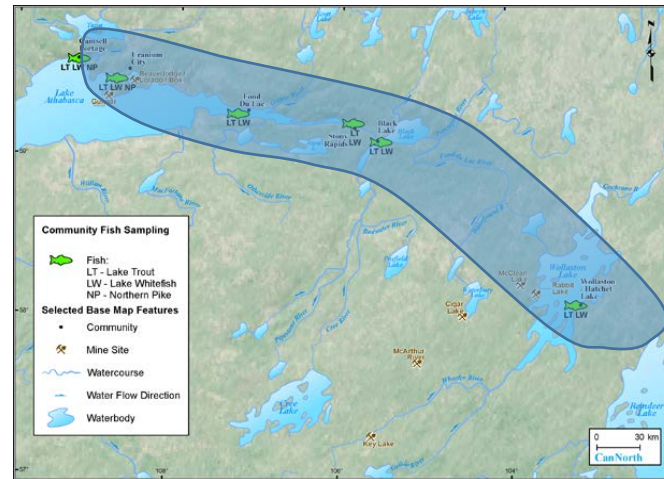
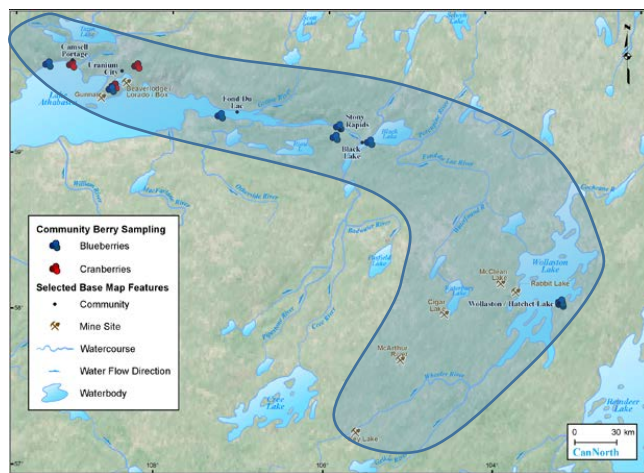
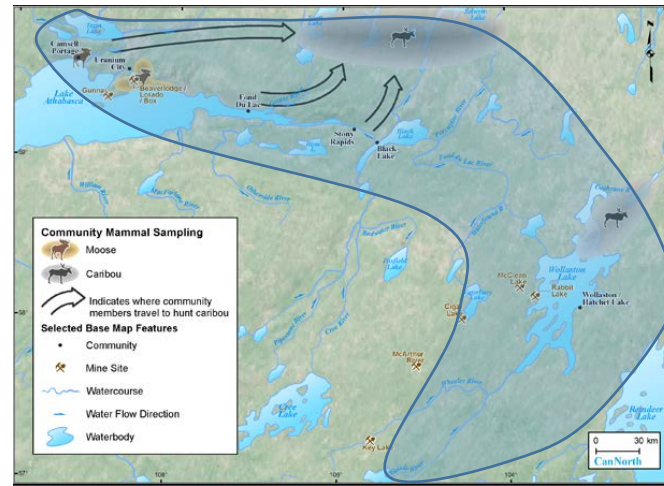
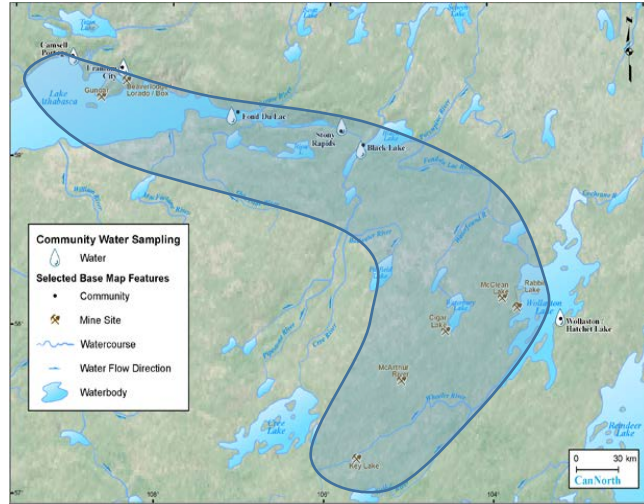
Example: The Alberta province, Cenovus Energy announced a \$32 million caribou habitat initiative in 2016

Can the CNSC or the mining companies support Aboriginal-controlled reclamation initiatives as a test case within a framework such as Species at Risk program including woodland caribou?

(See this link: ([https://www.cenovus.com/news/news-releases/2016/06-14-16-Cenovusannounces-\\$32-million-caribou-habitat-initiative.html](https://www.cenovus.com/news/news-releases/2016/06-14-16-Cenovusannounces-$32-million-caribou-habitat-initiative.html).)

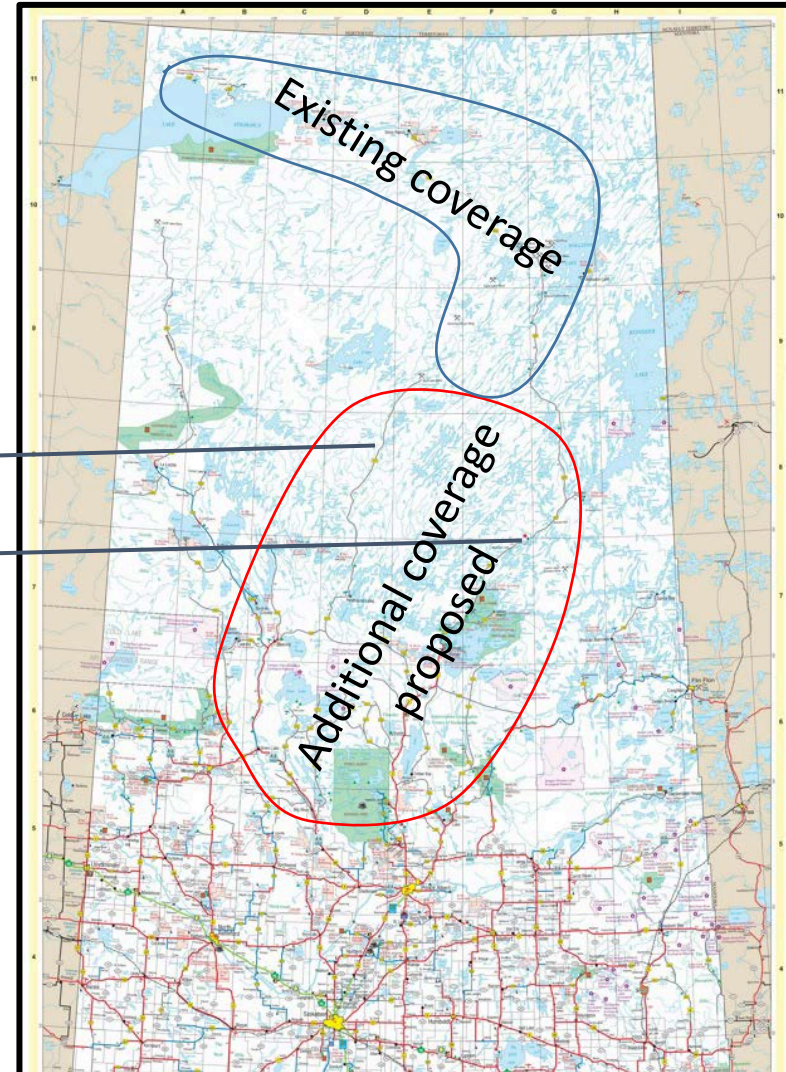
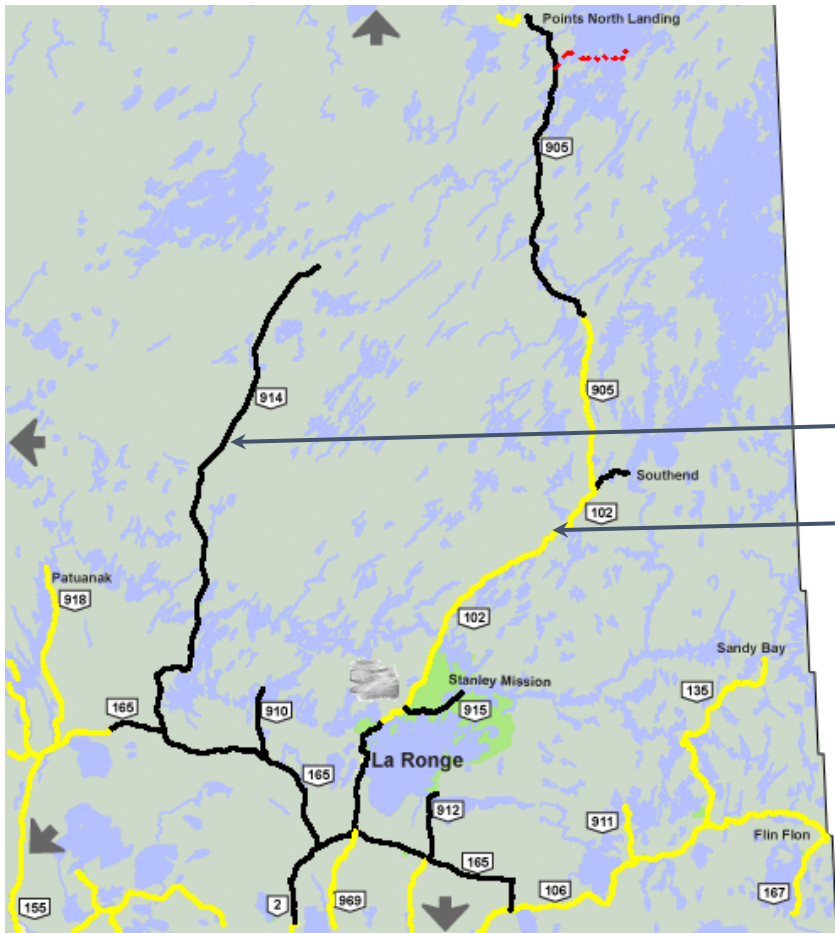
Comprehensive ecosystem monitoring

Present coverage of water, plants/soils and animal monitoring under CNSC/Community programs



Comprehensive monitoring-bigger footprints

How about a caribou and moose habitat monitoring considers the areas beyond its present sample collection zone covering areas surrounding the HWY- 914 and 102 that are far south? These two roads are also used for mining and other purposes have caused habitat fragmentation.



Proposal for a TEK-based wildlife monitoring

Wider lens to disturbance study: Proposing a one landscape approach to measuring disturbances (e.g., from fires, roads, noise, mines and forestry operations)

Objective: To detect the overall changes occurring in northern Saskatchewan due to disturbances to save the animals and plants have strong cultural and ecological significance (e.g. sources for country foods, medicines, waters and historic sites). Hunters are worried for the loss of wildlife in their traditional lands affecting their culture and livelihood needs.

Data use/information sharing: The data can be used by funders as needed (We have a TEK based study for the woodland caribou. There are many such animals need this type of study)

Partnership: The CNSC/ industries can make funds available to PAGC/FSIN to embark a partnership model such as CNSC-PAGC/FSIN or Industry-PAGC.

Roles of research academia: The USASK (University of Saskatchewan) can also take part in this process to support the research component related to the wildlife/landscape monitoring program. We are currently negotiating a MoU with USASK.

Other relevant matters PAGC expect to know

As per the ROR, changes to compliance plans (health and environmental safety) are made on an ongoing basis by CNSC in response to events, facility modifications, and changes in licensee performance. (ref. Section-1.2.2 Compliance page-5 of ROR)

Question: Are PAGC/FNs being made aware of the changes and are they being communicated properly about the changes made?

The report states that when logistically reasonable, joint inspections are conducted with other federal, provincial, or territorial regulatory agencies. (ref. Section-1.2.2 Compliance page-5 of ROR)

Question: Does the CNSC include members from Aboriginal communities on joint inspections such as site visits?

Acknowledgements

CNSC for participation funding support and encouragement for the inputs in reviewing ROR report