

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public hearing

Audience publique

Cameco Corporation:
Application for the
Decommissioned Beaverlodge
Mine and Mill Site Licence
Renewal

Cameco Corporation :
Demande visant le renouvellement
du permis pour le site déclassé de
l'usine et de la mine Beaverlodge

April 3rd, 2013

Le 3 avril 2013

Hilton Garden Inn
90 22nd Street East
Saskatoon, Saskatchewan

Hilton Garden Inn,
90, 22^e rue Est
Saskatoon (Saskatchewan)

Commission Members present

Commissaires présents

Dr. Michael Binder
Dr. Moyra McDill
Mr. Dan Tolgyesi
Dr. Ronald Barriault
Ms. Rumina Velshi

M. Michael Binder
Mme Moyra McDill
M. Dan Tolgyesi
M. Ronald Barriault
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Secretary:

Secrétaire:

Ms. Kelly McGee

Mme Kelly McGee

General Counsel :

Conseillère générale:

Ms. Lisa Thiele

Mme Lisa Thiele

**Cameco Corporation:
Application for the
Decommissioned Beaverlodge
Mine and Mill Site Licence
Renewal**

MS. MCGEE: Thank you.

As the President noted, this is a One-Day Public Hearing, beginning this evening and concluding tomorrow morning. The Notice of Public Hearing 2013-H-02 was published on December 19th, 2012.

The public was invited to participate either by oral presentation or written submission.

March 4th was the deadline set for filing by intervenors. The Commission received eight requests for intervention.

March 28th, 2013 was the deadline for filing of supplementary information. I note that presentations have been filed by CNSC staff, Cameco Corporation and intervenors.

Participant funding was available to intervenors to prepare for and participate in the hearing. The Commission received five applications for funding.

The Funding Review Committee, independent of the Commission, reviewed the applications, and funding

was provided to four applicants, as per a decision issued on February 11th, 2013.

All the documents presented today are available at the reception, either on CDs or in paper format; as well there you will find Commission Members' biographies.

THE CHAIRMAN: So I would like to start the hearing by calling on the presentation from Cameco Corporation, as outlined in Commission Member Document 13-H4.1 and 13-H4.1A.

And I understand that Mr. Mooney, you will make the presentation. Please proceed.

13-H4.1 / 13-H4.1A

Oral presentation by

Cameco Corporation

MR. MOONEY: Thank you.

Good evening, President Binder, and members of the Commission Tribunal.

For the record, my name is Liam Mooney. I am Cameco's vice-president of safety, health, environment, and quality and regulatory relations.

With me on my right is Kevin Nagy, our director of compliance and licensing. Kevin is

responsible for providing compliance and licensing support for our licensed activities in Saskatchewan.

Beside him is Michael Webster, our reclamation coordinator who directly oversees activities and programs related to the Beaverlodge properties.

We are here today to represent Cameco with respect to our request to renew the facility operating license for the Decommissioned Beaverlodge Mine and Mill properties.

Cameco has been a committed and capable manager of the Decommissioned Beaverlodge properties since 1988. At the time of decommissioning, it was acknowledged that downstream areas, historically impacted by mining operations, would recover through natural mechanisms over an extended period of time.

The Beaverlodge management framework was implemented by Cameco in 2009 with a goal of ensuring the long-term safety, security, and stability of the decommissioned properties. One of the key objectives is to prepare the properties for eventual transfer to the Province of Saskatchewan's Institutional Control Program. Through the framework, we have made steady and considerable progress in advancing the properties towards institutional control.

Over the past three years, we have

successfully characterized the present conditions of the properties, adequately assessed the risks associated with the properties, and effectively screened remedial options. Now, we are ready to implement reasonable remedial actions on the decommissioned properties, which will mitigate associated residual risk.

We requested to renew the license for ten years in order to allow for sufficient time to implement these remedial actions and to monitor their effectiveness. When the properties meet their associated performance objectives, the decommissioned properties would be considered ready for the Provincial Institutional Control Program.

Through our effective programs, qualified personnel, and ongoing public engagement, we have demonstrated that we are qualified to undertake the licensed activities. Appropriate measures are in place to protect the health and safety of people and the environment from the impact of historical mining activities.

Kevin Nagy will now present to the Commission a summary of our application to renew the CNSC license of the Decommissioned Beaverlodge properties, as well as the activities to be undertaken over the license period. I'll now pass the presentation over to Kevin.

MR. NAGY: Thank you, Liam.

Good evening. For the record, my name is Kevin Nagy.

In this presentation we will provide a brief overview of the Decommissioned Beaverlodge properties, including the site's history and present condition.

Next, we will discuss the management regime which has guided activities on the properties since decommissioning, and provide information regarding our performance during the current license term.

After this, we will go over the important features of the Beaverlodge management framework, which sets out the scope of activities undertaken to prepare the properties for transfer to the Province of Saskatchewan's Institutional Control Program.

We will discuss how our public engagement efforts informed the development of the Beaverlodge path forward plan, and then we will provide a summary of the remedial actions that make up the bulk of activities in this plan.

The Decommissioned Beaverlodge properties are located near Beaverlodge Lake, north of Lake Athabasca. The site is about 760 kilometres north of Prince Albert in the remote northwest corner of

Saskatchewan. the northern settlement of Uranium City is about 8 kilometres from the former mine and mill property. The community was established to support the development of Beaverlodge and other local mines.

Currently, Uranium City has an estimated population of about 80 people, and it is the only community with road access to the Beaverlodge properties.

The Beaverlodge Mine and Mill were operated by Eldorado Mining and Refining Limited, a Federal Crown corporation, from 1952 to 1982. As with most mining practices in Canada at the time, operations at Beaverlodge were conducted without environmental protection measures as we understand them today.

As a result, the local environment and areas downstream, particularly Beaverlodge Lake, were impacted by historical mining and milling activities.

Federal and provincial regulators approved the decommissioning plan for the properties in 1982. Decommissioning activities left the properties in a physical stable and safe condition, with all operational buildings and supporting infrastructure disposed of and all mine openings permanently sealed.

Decommissioning was completed in 1985.

In 1988, Cameco Corporation was created by a merger of Eldorado and the Saskatchewan Mining

Development Corporation. As part of the merger agreement, Cameco took over monitoring and maintenance of the decommissioned Beaverlodge properties, while financial responsibility was retained by the federal government through Canada Eldor Incorporated.

Since decommissioning, Cameco has conducted environmental monitoring and periodic maintenance to ensure Beaverlodge remains safe and that environmental conditions continue to improve over time.

In addition, our ongoing community engagement efforts have ensured that any changes to the properties are communicated to local residents. This was the expectation at decommissioning.

Over the past licence period, management of the decommissioned Beaverlodge properties has met expectations in all areas. No safety or environmental incidents occurred.

People remain safe and the environment continues to recover from the mine's legacy impacts.

Cameco continued to monitor the properties regularly through the Beaverlodge environmental monitoring program and routine site inspections, which were augmented by feedback from local residents.

Regulatory inspections were completed annually, and any concerns identified by the CNSC and

Province of Saskatchewan were addressed in a timely manner.

In 2012, we remediated flowing exploration boreholes that had been identified on the Beaverlodge properties. By sealing these boreholes, we have mitigated the small localized source of contamination.

Through our commitments to the local community and compliance to our licensing obligations, Cameco has ensured that the people remain safe and that the environment continues to recover.

During the licence term, our public engagement efforts helped ensure that residents were informed of our activities and that they had opportunities to raise their concerns.

Cameco maintained regular contact with local leadership, including the town Chairperson and local representatives of the Métis Nation Saskatchewan.

Annual public meetings occurred every June, followed by routine site inspections. Every September during the licence term, representatives from the Northern Saskatchewan Environmental Quality Committee were invited to tour the decommissioned properties along with regulators and Uranium City residents.

We also presented information regularly about Beaverlodge to various meetings of the Athabasca

Working Group.

During the licence term, we launched the Beaverlodge website, which features information about the properties and offers another means for the public to contact Cameco. Cameco also posted information regarding public engagement events at the local post office and store.

As well, Cameco formalized the Beaverlodge public information program. This program describes in detail our continuing effort to ensure the public is fully engaged on issues related to the management of the decommissioned properties.

The program also includes the Beaverlodge public information and disclosure protocol, which is posted on the Beaverlodge website.

Through our engagement efforts, we were able to address local concerns regarding the safety of consuming traditionally harvested country food in the Uranium City and surrounding area, including the Beaverlodge properties.

In 2010 and 2011, Cameco completed a two-year investigation regarding the potential for health risk associated with consuming local country foods. These foods constitute a large portion of the diet of the local population.

The study concluded that traditional harvesting of country foods does not pose a health risk to Uranium City residents as long as the posted fish consumption advisory is followed.

Local residents have informed Cameco that they are aware of and follow the posted fish consumption advisory for Beaverlodge Lake and Martin Lake, which are located immediately downstream of the decommissioned properties.

The study reports were shared with the community of Uranium City, and the conclusions have been supported by both CNSC staff and the regional health authority responsible for Uranium City.

The Beaverlodge management framework was established in 2009 through collaboration with a joint regulatory group and through engagement with key public participants. At a high level, the framework process is shown on the slide.

The framework provides a systematic process to assess information, risk and potential remedial options associated with the decommissioned Beaverlodge properties. The goals of the framework are to ensure the properties are safe, secure and stable and to facilitate their transfer to the Province of Saskatchewan's institutional control program.

A workshop was held in 2009 to develop some options for further remediation of the decommissioned Beaverlodge properties. Though several potentially reasonable options were developed, we learned that there were still some gaps in information which prevented us from making fully-informed decisions on these options.

The Beaverlodge action plan was developed to address these information gaps by providing additional knowledge on the conditions and residual risks associated with the Beaverlodge properties.

This first stage of the management framework process was essentially completed in 2011.

The second and third stages of the framework process are represented by the development and use of the quantitative site model. The model served three purposes.

First, it acted as the means through which we assessed the residual risks and natural recovery rates associated with each property. It did this by enhancing our understanding of contaminant sources, transport mechanisms and environmental interactions in the local watersheds.

Second, the model assessed the potential effect of various remedial options under consideration. In general, the model predicted localized improvements in

water quality associated with many of the remedial options considered.

However, the predicted benefit to downstream water bodies, including Beaverlodge Lake, was found to be negligible over the 150-year assessment period regardless of the options considered.

The third purpose of the model was to establish environmental performance objectives to evaluate the effectiveness of the selected remedial options. A scoping level engineering cost assessment for each identified remedial option was completed within these stages of the management framework.

Together with the results of the quantitative site model, this cost assessment information was used to inform the remedial option selection process, which was completed in 2012.

The fourth stage of the management framework is represented by the Path Forward document. It describes the specific actions to be implemented in the next licence period, including remedial work and associated monitoring to evaluate performance.

Once the properties are considered safe, secure and stable, they will be ready to be transferred into the provincial institutional control program. This represents the final stage of the management framework.

As part of the process to select remedial options, a second workshop was held in April 2012. As with the 2009 workshop, participants included representatives from Uranium City, the Environmental Quality Committees, regulators, and Cameco. Local participants included an elder, youth, elected leadership, and representation from the local Métis Nation-Saskatchewan.

They were asked to consider and provide input on a broad suite of potential options. The criteria used in the selection process included the expected benefits and costs of implementing the remedial options, the level of ongoing maintenance or operation required, stakeholder feedback, and the applicable regulatory requirements.

Generally, participants concluded that doing nothing was not an acceptable option because there were several options identified with both measurable, localized benefits and reasonable costs.

The information derived from the remedial options workshop directly influenced the selection of actions identified in the path forward plan.

Cameco was confident that the management framework effectively guided the development of reasonable remedial options to be implemented at the decommissioned

Beaverlodge properties in the next licensed term.

The remedial actions within the path forward plan include measures considered to be good engineering practice and expected to improve local conditions in the aquatic environment.

Other measures will ensure the continued protection of the health and safety of people and the environment.

Using the quantitative site model, sites-specific performance objectives were derived as a means to measure the success of implementing the remedial actions in the path forward. If these performance objectives are found to be met, then, according to the management framework, the properties would be ready for transfer to institutional control. If the performance objectives are not met, then additional assessment of residual risk may be required, as per the management framework.

During the license term, Cameco identified and sealed flowing boreholes which will result in localized improvement to the environment. We have since reviewed government drilling records and then verified the location of all boreholes on the properties. As part of the path forward, we will seal all remaining identified boreholes, whether they are flowing or not, so as to prevent any future contaminated flows.

Some 35 vertical openings were sealed with concrete caps during decommissioning activities in the early 1980's. Cameco will replace these caps with a properly engineered and approved design. While this action is not addressed in immediate safety or environmental concern, it does further mitigate the potential of cap failure in the long term. The performance of these caps will be monitored through to the end of the Beaverlodge management framework and this would continue under the Institutional Control Program.

Through the context of the management framework, Cameco will perform a gamma survey of all waste rock and tailings areas. Any remaining areas found to have gamma fields elevated above guideline criteria and are reasonably accessible to the public will be covered.

A waste rock pile rests on the former flow path of Zora Creek which had once flowed from Zora Lake to Verna Lake, as seen on the screen. The red arrows shown on the map indicate how water generally flows today, from Zora Lake through or under the waste rock pile.

Our ongoing monitoring results and the quantitative site model both suggest that this is leading to contaminated loading to Verna Lake. Cameco will cut a channel through the waste rock to re-establish Zora Creek. We expect this will result in a significant improvement in

water quality in Verna Lake.

We are currently developing a regional aquatic monitoring program to assess the long-term recovery of the area and downstream. It is envisioned that this regional sampling program would involve the participation of the Saskatchewan Research Council which manages the remediation of Gunnar, Lorado, and other abandoned mine sites.

This program could be implanted as early as 2014 following review and acceptance by the Joint Regulatory Group and through engagement with the local residents. We believe this program will help provide further assurance to Government and the public that the area continues to recover and that local residents remain protected.

A site-wide gamma survey will be completed to ensure the risk of residual elevated gamma levels is appropriately recorded and mitigated.

Before any property is transferred to institutional control, Cameco and the regulatory agencies will conduct a walk-through of the properties to ensure any remaining debris has been removed.

The process to transfer former industrial sites to the province is legislated through the Province of Saskatchewan's *Reclaimed Industrial Sites Act*. Under

the program, the responsibility for long term monitoring and maintenance will be transferred to the province.

Those monitoring and maintenance activities will be fully funded by Canada Eldor prior to the transfer of the land back to the province. An additional financial contribution will also be made by Canada Eldor into a general fund dedicated toward the remediation or management of unforeseen events.

A few of the Beaverlodge properties were transferred into institutional control in 2009 and we anticipate that most of the remaining properties will be ready for transfer during the next license period. That said, we will not propose a specific property to provincial control until it has been sufficiently vetted through the management framework process.

I will now turn the presentation back over to Liam.

MR. MOONEY: Advancing the decommissioned properties to the Beaverlodge management framework ensures the properties will continue to remain safe, secure, and stable.

Cameco has demonstrated that we are qualified to carry out the license activities with the necessary programs and resources in place to safely manage and make adequate provisions for the protection of the

environment and the health and safety of people.

A proposed ten-year license will allow sufficient time to implement the path forward plan, to assess its success, and to transfer most properties to the Institutional Control Program.

This concludes our presentation.

THE CHAIRMAN: Thank you.

I'd like now to move to the presentation from CNSC staff.

Mr. Elder, I understand you're going to make the presentation? Please proceed.

13-H4

**Oral presentation by
CNSC staff**

Mr. ELDER: Thank you.

Good evening, Mr. President, members of the Commission. My name is Peter Elder. I'm Director General of Nuclear Cycle and Facilities Regulation Directorate.

With me again are Mr. Jean LeClair, the Director of Uranium Mines and Mills Division and now we have Mr. Robert Dwyer who is the Project Officer for this facility, as well as -- we have our other CNSC Licensing Team for the project as well.

Before the use of applications to renew the license for the Beaverlodge site, under direction from the CNSC, Cameco was to investigate remedial options to further improve the condition of the site during the current license period.

So, we will discuss the CNSC staff review of the proposed remedial options, as well as information on Cameco's intention to eventually transfer the properties to the Provincial Institutional Control Program. As with Cigar Lake, we're -- staff are proposing to move to the standard license format with the License Condition Handbook.

I will now ask Rob Dwyer to present CNSC staff assessment in the light of recommendations for this facility.

MR. DWYER: Good evening, Mr. Chairman and Commission members.

For the record, my name is Robert Dwyer. I'm the Project Officer responsible for managing the licensing and compliance activities associated with the regulation of the decommissioned Beaverlodge Mine and Mill Site.

I will begin my presentation by providing a slight overview followed by a brief history of the file. I'll review some of the activities that were completed

during the current license term and the plan for future activities for the site. Finally, I will present CNSC staff's conclusions.

As shown on the map on the left-hand side of the slide, the decommissioned Beaverlodge Mine and Mill Site is located in the northwest corner of Saskatchewan, approximately eight kilometers from the town of Uranium City.

In the map on the right, the Beaverlodge licensed areas are shown outlined in red. Past mining activities in these areas have affected two watersheds in the map on the right, the Beaverlodge licensed areas are shown outlined in red. Past mining activities in these areas have affected two watersheds; the Ace Creek Watershed shown in light blue and the Fulton Creek Watershed shown in dark blue.

All former mining activities were located in the Ace Creek Watershed, while the Fulton Creek Watershed was designed as the tailings management area and was used for the long-term storage of tailings. Both of these watersheds feed directly into Beaverlodge Lake.

This is a satellite image of the Beaverlodge site, highlighting the CNSC licensed areas. There are five main licensed areas including Hab, Debyna, Boldger/Verna, Lower Ace Creek, and the tailings

management area. The Hab, Dubyna, and Bolger/Verna sites have both open pit and underground mines. These three mine sites have not been found to have a significant impact on the downstream environment.

Lower Ace Creek was the former location of the mill which processed ore from all the local mine sites. Tailings from the mill were fed through a woodstave pipe into the Beaverlodge Tailings Management Area.

While today's uranium mines have robust controls to detect and contain spills, the lack of technology in the past led to tailing spills that could go unnoticed for some time. These spills deposited tailings in several locations in the Lower Ace Creek area. In some cases, tailings went directly into Ace Creek which flows into Beaverlodge Lake. During the 30 years of operation, these spills have left historical impacts on Beaverlodge Lake.

There are also three smaller licenced areas, Eagle, and two Martin Lake areas. Eagle is a small open pit mine, and the two Martin Lake sites have sealed adits. An adit is a horizontal entrance to an underground mine. These three smaller areas do not have a significant impact on the nearby watersheds.

The next three slides are meant to provide

a timeline of past, present, and future activities. The first slide discusses the site history. The second reviews the licencing activities during the current license term and the third is a plan for the future term.

From 1952 to 1982, Eldorado Nuclear Limited, a federal Crown corporation, operated the Beaverlodge mine and mill site for 30 years. During the early operations, comprehensive environmental protection regulations did not exist and the site operated without an effluent treatment process for about 25 years.

In 1977, the Atomic Energy Control Board, the predecessor to the CNSC, issued Eldorado a licence which eventually led to the site implementing water treatment technologies to adhere to the Federal Metal Mine Liquid Effluent Regulations.

Operations ceased in 1982 and the site had been completely decommissioned in accordance with approvals by both provincial and federal regulators. To evaluate the effectiveness of the measures put in place during decommissioning, a transition phase monitoring program was initiated and still continues today.

In 1988, Eldorado Nuclear Limited and the Saskatchewan Mining and Development Corporation merged to form Cameco. As a result of this merger, Cameco was assigned the responsibility of managing the monitoring

programme and the Government of Canada was to provide funding for all activities associated with the site through Canada Eldor Incorporated.

As a result of the *Nuclear Safety and Control Act* coming into force into 2000, the Commission revoked the previous AECB licence to decommission in 2005 and issued a CNSC waste facility operating licence.

In February of 2009, Cameco applied for a three-year licence renewal. At the time, CNSC recommended more studies be completed regarding the evaluation of remedial options, and the hearing was adjourned until the fall of 2009.

As a result, Cameco presented a management framework and a decision flow chart along with a three-year work plan that included an assessment of remedial options for the site. Cameco committed to return to the Commission with a clear remediation plan. Following the hearings, the Commission issued a three-year licence expiring on November 30th, 2012.

As requested by the Commission, annual updates were presented in November of 2010 and December of 2011, which provided details on CNSC staff's compliance activities and Cameco's progress with the development of a remediation plan.

On September 25th, 2012, the Commission

issued a six-month renewal with an expiry date of May 31st, 2013. The additional time would be used to finalize performance objectives for the remedial options and complete additional Aboriginal and community consultation on them.

Today, we're here to discuss the work that Cameco has completed during the current licence term and their application for a licence renewal for a period of 10 years.

Over the 10 year licence term, Cameco intends to implement the remedial options that were selected, and apply to the CNSC to transfer the properties into the provincial institutional control program. As indicated in the bar closest to the red timeline, for properties that Cameco has proposed to perform additional remedial activities, the 10-year term would allow Cameco time to finalize detail designs and implement the proposed remedial options over the next three years, monitor the results of their implementation for approximately five years, and apply to transfer them to the provincial Institutional Control Programme.

For properties that do not require additional remediation, Cameco plans to apply and transfer these within the next five years. The process for transferring properties into the Institutional Control

Programme is discussed later in this presentation.

This part of the presentation will focus on the activities completed by Cameco and their performance over the current licence term.

In the 2009 relicensing hearing, the CNSC gave Cameco a below-expectations rating for the Environmental Protection, safety and control area for three reasons.

There was a delay in plugging flowing boreholes on the site. The CNSC had concerns about addressing cumulative effects and at the time, there was an outstanding final report on remedial options that was to be provided by Cameco.

The development of the management framework and detailed three-year work plan addressed CNSC's concerns where it was identified that Cameco would plug the flowing boreholes, develop a site-wide model to better understand the cumulative effects, and develop a detailed remedial options assessment to understand what feasible remedial options could be implemented.

During the current licence term, Cameco has successfully implemented their plan and the CNSC have rated all relevant safety and control areas as satisfactory.

I would like to take this opportunity to

talk about the tables that trend the safety and control area performance in CNSC staff CMD. The ratings presented in Sections 3.10, 3.13 and 3.14 are related to their corresponding safety and control areas. However, the titles of these tables are incorrect and are referencing a different section of the CMD.

CNSC staff have completed annual site inspections with the joint regulatory group consisting of Environment Canada, the Department of Fisheries and Oceans, and the Saskatchewan Ministry and Environment. All action items and recommendations were addressed and are closed.

Annual reports were reviewed for regulatory compliance and environmental performance. CNSC staff reviewed the design and implementation of remedial activities completed during the licence term, and completely technical reviews on a number of studies completed by Cameco.

Going forward, CNSC staff will continue to verify compliance through annual inspections and reviewing monitoring data to ensure the ongoing safety of persons and the environment.

During the current licence term, Cameco has improved the condition of the site by performing remedial activities as they were required. One of the remedial

activities involved plugging all flowing boreholes on the Beaverlodge site. Boreholes were identified in the Dubyna and Lower Ace Creek areas that were flowing into Dubyna Lake and lower -- Beaverlodge Lake, respectively.

Cameco collected samples from the boreholes and found that they were elevated in uranium. They have since plugged all identified flowing boreholes to minimize potential loadings to the receiving environment.

CNSC staff verified that the boreholes were plugged as part of its annual inspections with the Joint Regulatory Group and will continue to monitor them during future inspections.

Another activity was the remediation of the Martin Lake adit. During decommissioning in the eighties, waste rock was placed at the opening of the adit to prevent access to the underground workings. A small hole was developed in the waste rock plug that was about 30 centimetres in diameter near the entrance. The remediation, which was approved by the Joint Regulatory Group, involved reopening the adit, removing unstable material and backfilling it to a sufficient depth to ensure stability.

Going forward Cameco will continue to monitor the site, and CNSC will verify that it remains stable.

As part of the management framework Cameco completed a number of studies to better understand the residual risks of the site and to develop a remediation plan. This involved the development of a model to predict the environmental benefits of the remedial options, and assessment of their cost/benefit and engagement with local communities and Aboriginal groups.

The Quantitative Site Model is a site-wide model that was used to assess risk to the environment, human health, and to assess potential remedial options. To develop this model, Cameco completed a number of detailed studies between 2009 and 2012 including a country food study, sediment studies, water quality analysis, source investigations, aquatic life studies, and others.

The information from these studies was incorporated into the Quantitative Site Model. The model was then used to evaluate potential benefits for a variety of remedial options.

The costing study was conducted to determine conceptual level costs of the remedial options. The costs proposed in this report form the basis for the cost/benefit analysis.

The remedial options workshop was a two-day event held in Saskatoon in April of 2012. Representatives from Uranium City, the Northern Saskatchewan Environmental

Quality Committee, the Joint Regulatory Group, and licensee staff and consultants met to discuss and gather feedback on remedial options Cameco was considering.

Overall, stakeholders agree that the information provided was sufficient and were satisfied that Cameco was moving in the right direction.

The Path Forward Report was developed using the results of these three studies. It summarized the proposed remediation plan and includes justification for which remedial options were selected. Performance objectives are also included in the report and are discussed later in my presentation.

Cameco held a meeting in Uranium City in January of 2013 to discuss the final selected remedial options and performance objectives with local residents. The community supported the proposed path forward.

The Country Food Study was developed to increase the understanding of health risks associated with the consumption of locally harvested food sources. Information was gathered on the type and quantity of food consumed by Uranium City residents and samples of those foods were then collected and analyzed. Examples of the food harvested included vegetation, mammals, birds, and fish. This information was then used to assess the risk to residents consuming this food.

A provincial fish advisory was issued in 2003 for Beaverlodge and Martin Lakes due to the elevated levels of selenium in fish. The advisory recommends residents and visitors not to consume more than 375 grams of fish over a specified period of time that ranges from a week to a month, dependent on the type of fish. It was updated in 2009 to include a drinking water advisory. This was done to restrict the consumption of water from several lakes on the Beaverlodge site including Beaverlodge Lake because they may contain elements not eliminated by boiling.

The Country Food Study concluded that with the existing fish advisory in place; traditional harvesting of country food does not present health risks to Uranium City residents. CNSC staff reviewed the Country Food Study and agree with this conclusion.

The Path Forward Report summarized the remedial options that Cameco plans to implement for the Beaverlodge site which include diverting Zora Creek around the Bolger waste rock pile, plugging boreholes, replacing caps on all vertical mine openings, and covering all easily accessible waste rock and tailings that have an elevated gamma field.

In the Boldger/Verna area there is a creek that flows from Zora Lake through a waste rock pile and

into Verna Lake. These two lakes are highlighted in green on the map. Cameco plans to divert the creek around the waste rock pile to reduce contaminants flowing into Verna Lake.

All identified flowing boreholes have been plugged during the current licence term. The highlighted areas in orange on the map are where the majority of the flowing boreholes were found. In addition to plugging the flowing boreholes Cameco has committed to plugging all non-flowing boreholes, as well as any others that may be found during the implementation of remedial options.

The existing concrete caps on all vertical mine openings will be replaced to reduce the potential for future maintenance requirements. The approximate location of the caps are indicated on the map with small white dots. This option will strengthen the long-term stability of the site.

All easily accessible waste rock and tailings that have an elevated gamma field will be covered to further reduce potential exposures and to keep them as low as reasonably achievable.

Gamma levels from exposed tailings have been measured to have an average value of 2 microsievarts per hour. Typically, elevated areas peak around 5 and a maximum reading was 11.5. The original closed out

objective for the site was 2.5 microsieverts an hour. The approximate location of the tailings is highlighted in yellow.

A monitoring schedule for these options will also be developed prior to applying to transfer the properties into the Institutional Control Programme to ensure that long-term safety is maintained.

The Beaverlodge site has had open access to the public since it was decommissioned in 1985. Over the current licence term, additional studies were completed to confirm that the site is safe for public access. In summary, all buildings and structures were removed during decommissioning between 1982 and 1985. Waste rock pile and pit wall slope stability was assessed in 2010 and is acceptable.

There are no conventional health and safety or radiological risks to the public from casual access to the site. The Country Food Study confirmed that it is safe to consume locally harvested food, and signs are posted at the entrance of each licensed area to inform the public that the area was a former uranium mine.

However, past mining operations have left historical impacts on the water quality of lakes on the Beaverlodge properties and the downstream environment. The picture on this slide shows Ace Creek and Fulton Creek

watersheds, as shown earlier, relative to the size of Beaverlodge Lake.

The studies completed during the licence term have concluded that the source of contaminants in Beaverlodge Lake is primarily from the sediments as a result of tailing spills that were deposited during operations. Today, the additional loading from the two watersheds is negligible in comparison to the existing inventory of contaminants within Beaverlodge Lake.

All of the remedial options that were assessed in the former mining areas had a minimal impact to Beaverlodge Lake and the downstream environment. Even though there were no remedial options that were predicted to accelerate the recovery of Beaverlodge Lake it is expected to recover naturally in the long term.

There are three identified potential contaminants for the Beaverlodge site; selenium, uranium, and radium. Concentrations of these contaminants are compared to the Saskatchewan Surface Water Quality Objectives which are considered to protect aquatic life.

The Saskatchewan Surface Water Quality Objectives are typically protective of the most sensitive aquatic receptor and generally include a factor of safety. The graphs presented on this slide show the predicted recovery for selenium on the left and uranium on the

right. The red line is a surface water quality objective and the dash black line is the predictive water quality.

Selenium is showing a recovery period of approximately 110 years and uranium is approximately 170 years. Currently radium is below the surface water quality objective in Beaverlodge Lake.

It is likely that the maximum environmental impact in Beaverlodge Lake has already occurred and that the quality of the environment would improve over time. Concentrations of potential contaminants in Beaverlodge Lake are expected to be below the Saskatchewan Surface Water Quality Objectives in approximately 170 years without any additional remediation.

Because no feasible or practical remedial options are available for Beaverlodge Lake, it is CNSC staff's opinion that this recovery period is acceptable. CNSC staff will continue to verify that the water quality in Beaverlodge Lake is continually improving.

In order to verify the predicted recovery of the lakes and the performance of the implemented remedial options, CNSC staff will compare the water quality of the lakes against performance objectives. Cameco has set performance objectives for all affected lakes on the site as far downstream as Beaverlodge Lake.

On the right-hand side of the slide, we've

provided graphs for the performance objectives for Verna Lake, which is the downstream waterbody for the stream diversion remedial option. In these graphs, the blue line is the performance objective. The red line is the Saskatchewan Surface Water Quality Objective, and the dashed black line is the predicted water quality.

If the water quality exceeds the performance objectives, Cameco will reassess the residual risks to determine if additional action is warranted. If the sites are performing as expected and are considered stable, then Cameco intends to apply to the CNSC to transfer them into the provincial Institutional Control Program.

The Institutional Control Program is overseen by the Province of Saskatchewan and is designed for the long-term monitoring and maintenance of decommissioned mine sites.

It is important to note that the renewed licence will not authorize the transfer of properties into the provincial Institutional Control Program. Cameco must first submit an application which must be reviewed by the CNSC staff and the Province. If the application is accepted by both parties, CNSC staff will recommend to the Commission to release the properties from CNSC licensing. Final authorization must be provided by the Commission.

CNSC staff will verify that risks are at an acceptable level prior to recommending to the Commission to transfer the properties into the Institutional Control Program.

Since the licence was issued in 2009, CNSC staff have participated in nine consultation events organized by Cameco involving Uranium City residents, the environmental quality committee members, aboriginal groups, and regulators. Also, Cameco's remedial options workshop was one of the key consultation events that fed into the remedial options selection process in order to incorporate stakeholder opinion.

In addition to these outreach activities, the CNSC provided funding through the participant funding program to assist members of the public, aboriginal groups and other stakeholders interested in reviewing and commenting on the licence application submitted by Cameco. This funding was to be used to prepare and participate in the Commission's public hearing.

CNSC staff have also reviewed and assessed the licensee's public information program against the requirements and guidance set out in RDGD 99.3 and conclude that it currently meets CNSC staff's requirements.

In the future, CNSC staff will review the

detailed designs of the remedial options, continue to hold regular Joint Regulatory Group meetings to provide updates on progress, monitor the implementation of the remedial options through compliance inspections, verify the effectiveness of the implemented remedial options using performance objectives, and ensure that properties are stable prior to recommending to the Commission to transfer them into the Institutional Control Program.

CNSC staff conclude that the risks on the Beaverlodge site have been systematically identified and appropriately managed. The site is safe for public access and Beaverlodge Lake will naturally recover in the long term.

CNSC staff accept Cameco's proposed path forward for the Beaverlodge site.

That concludes CNSC staff's presentation.
Thank you.

THE CHAIRMAN: Okay. I'd like to open the floor for questions from Commission Members, and I understand that we now have a representative from Saskatchewan Ministry of the Environment, a Mr. Kristoff who is here? Thank you.

And I also understand that we have Dr. Irvine here that is the Medical Health Officer that can provide some answers to Members' questions? Thank you.

Okay, let's start with Ms. Velshi. We'll do a quick round then let's go to the interventions and then finish with the normal, final round.

MEMBER VELSHI: Thank you, Mr. President.

So I'll start off with a couple of questions around the Institutional Control Program, and questions are to staff.

So what's the role of the CNSC once property has been transferred to the ICP?

MR. ELDER: Peter Elder, for the record.

There must be, to be acceptable into the Saskatchewan program, the CNSC must actually cease to regulate the property, so it has to say that there is no longer any federal regulation of that.

That said, we continue to -- the program does produce annual reports so there's publicly available information on those sites that we continue to monitor, and we can check that the performances continue to be as expected but we have no formal regulatory role.

MEMBER VELSHI: And are there currently any properties, previous uranium mines, that have now been transferred under this program?

MR. ELDER: Peter Elder, for the record.

There have been a few properties at the Beaverlodge site, so that there were some of the older

mine workings that were transferred into the program in 2009.

MEMBER VELSHI: And do you know if the funding that Eldor holds for these properties includes potential down the road of new technology becoming available that would allow for remediation that today may not have been cost effective?

MR. ELDER: Peter Elder, for the record.

I think that's a question you should actually ask the Province because the Province actually requires payments to go into the program.

So I know they have two types of payments. There's a general monitoring payment and then there is an actual unforeseen circumstances fund, but I think it's better for the Province to say how they would use those funds.

THE CHAIRMAN: Also remind everybody that Eldor will be making a submission to us tomorrow morning, and that will be a good line of questioning then.

MEMBER VELSHI: And my last question then, on your Slide 7 where you show those that require remediation or for which remediation is planned and those that have no remediation planned, so what percentage of the properties would the "not remediation" be? And is five years the period that one assumes things to be stable

before transfer? Like, what's the period of stability required before transfer?

MR. DWYER: Robert Dwyer, for the record.

The five years for the properties that are currently not undergoing remediation is mainly because we have 30 years of monitoring data. So for those properties we can assume that the trends that we've seen in the past will continue and are stable, and that's the reason for that.

In terms of the area or the location, I believe the slide on -- the picture on Slide -- the slide that I talk about the remedial options -- really shows where the remedial options will take place. The percentage of the properties is fairly low, I guess. It's mainly in the Bolger Verna area. Slide 13 is the map that shows the location of where those things are taking place, but mainly it's the Bolger Verna area which has the stream diversion option, and the lower Ace Creek area is where the majority of the tailings that will be assessed.

MR. ELDER: So just to provide context. You would see it, as we talked before, most of the -- there were the areas that were the former mine sites versus the areas around the mill. So most of the remedial options are around the mill and the tailings, so there are some areas that they would have to look at the other ones.

So we would expect it to be the ones around the mine sites that may be the candidates for earlier movement.

MEMBER VELSHI: Thank you.

THE CHAIRMAN: Dr. McDill.

MEMBER McDILL: Thank you. Two quick questions.

Roughly how much improvement will be gained from the Zora channel diversion?

MR. NAGY: Kevin Nagy, for the record.

I will ask Michael Webster to provide that information, but the work we did has found that the existing condition with the stream flow flowing through the waste rock does add a contaminant load to the water going into Verna Lake, specifically uranium and radium, and the modelling process we went through did show that there would be a significant improvement to the water quality in Verna Lake if we implemented that option.

And I'll ask Mike to provide a bit more detail.

MR. WEBSTER: Mike Webster, for the record.

I don't have the information immediately available. I will be able to come back to you in a couple of minutes.

MEMBER McDILL: Sure, that's great.

Does staff have a sense of that?

MR. DWYER: Robert Dwyer, for the record.

If you look at Slide 17 on staff's presentation, we show the performance objectives for Verna Lake. In these two graphs, the base case for no remedial options isn't shown here, but you can definitely see where the construction activities would take place in approximately the first two years, and then there's that significant drop.

So you can kind of see there the impact of that remedial option. It goes from approximately -- for uranium, about 250 micrograms per litre down to about 125 in roughly 10 to 20 years.

MEMBER MCDILL: So that drop that I can see there in the two curbs is that diversion?

MR. DWYER: That is when the option is implemented, yes.

MEMBER MCDILL: And perhaps a more challenging question, is 100 years good enough?

MR. ELDER: Peter Elder, for the record.

I guess when the original decommissioning plan went through the environmental assessment, it was expected it was in the hundreds of years for the natural recovery to happen.

But I'll ask Mike Rinker to give you our view on is that good enough.

MR. RINKER: Mike Rinker, for the record.

It is a tough question to ask because it's not something that we would consider acceptable for something that we're regulating today, but instead we're regulating a bad practice from the past.

And the difficulty is that the actual facilities are not contributing much of a load to the problem.

If we made a comparison, say, for selenium, the load of selenium from both watersheds is about 1/20th of what is being released from Key Lake today.

So what is being released from the tailings and the waste rock of selenium is very small compared to existing facilities. The problem is that there's selenium already in Beaverlodge Lake because of how that mill and that waste was managed in the past.

So is there anything practical and feasible that could change that timeline for the recovery of Beaverlodge Lake? Not something that is within the range of hundreds of millions of dollars.

So in that case, we think it is unfortunately reasonable.

MEMBER McDILL: Does Cameco care to add anything?

MR. NAGY: We would agree with staff's

assessment. The work we did through the remedial option is a selection process, and the modelling indicate that there was nothing that could be done on the licenced properties that would speed the natural recovery of Beaverlodge Lake.

MEMBER MCDILL: Thank you.

THE CHAIRMAN: Dr. Barriault?

MEMBER BARRIAULT: I'm a little confused really. If I look at your Slide 17, you say that you will apply for a transfer -- and that's CNSC, by the way -- to institutional control. Yet, you are not at the levels, I guess I would assume, required for that.

So what are the criteria for transfer to institutional control?

And I guess the next question as a follow-up is what happens if indeed you do transfer and then all of a sudden the levels are starting to come up again because of whatever? Two parts: Part A, what is required for the transfer and Part B, what happens once you've transferred it if it's not performing as per your prediction?

MR. LECLAIR: The first part is what's the criteria. The criteria really is a condition that we observe stable.

MEMBER BARRIAULT: But how do you know it's

going to be stable and how long does it have to be stable for before you transfer?

MR. LECLAIR: So in this case, how long, I guess we'd say that we're looking at 30 years of monitoring data is what we're looking at currently when we look at the current situation.

So if we see within that 30 years of data stable conditions, we would consider that we have a fairly good idea on how the site is performing.

Perhaps the most important thing to also mention is the reason why it's called institutional control is that there's a requirement for control.

MEMBER BARRIAULT: I understand that, yes.

MR. LECLAIR: But the only reason why I'm mentioning that is just that if the conditions were perfect and there were no potential concerns in the long term, one would not need to control and put in place the measures that are there.

So with the institutional control program, there's a requirement for both responsibility from the government for managing the sites and, as well, an oversight, a regulatory oversight which in this case would be provided by the Province.

So there's a long-term requirement to monitor and continue to verify the site.

There's always the provisions, of course, that if CNSC, the Commission, were to determine that based on performance, that the situation were to become worse, become at a point where there's a significant concern, I believe at that point in time the Commission may choose to re-introduce itself in order to do what's necessary.

Again, support, we mentioned the Province is taking responsibility for the site and, we believe, will take responsibility for the site and take the necessary measures, if necessary, to deal with situations as they arise. That's part of what's built into the program.

MEMBER BARRIAULT: I guess it begs the question of whether the advantages to transferring to Saskatchewan institutional control to monitoring the environment, I mean, obviously there must be advantages. Is it less expensive? Is it more efficient? What are the reasons for this transfer?

I guess I'm wondering, are we just sloughing off and saying, "Look, it's no longer my problem now; it's somebody else's problem"? I guess that's the gist of what I'm asking.

MR. ELDER: Peter Elder, for the record.

Our point of view would be it's more from a regulatory efficiency point of view in terms of where

these are in a long-term monitoring program that it makes more sense to hand it off to the Province, where they are doing this on a routine basis for other mine sites, where there isn't any active -- there would not be expected to be any active work on the site; it's just long-term monitoring.

So we're looking and saying when there is another competent regulator there, then it would make sense to reduce the regulatory burden in that way.

MEMBER BARRIAULT: Is there financial savings?

MR. ELDER: I guess you'd have to ask the licensee about the financial savings versus what our cost recovery fees are versus what it costs to go into that program.

MEMBER BARRIAULT: I guess what I'm wondering is why it's that simple? And I understand what you're saying really is that somebody else now is going to look after it, so I don't have to worry about it anymore, no?

THE CHAIRMAN: Let me jump in. Let me try to understand. Isn't it you transfer it when there is no longer a health and safety issue? It is monitoring something that's stable, but it does not constitute a health and safety risk to the environment or the people?

Somebody correct me. Mr. Jammal?

MR. JAMMAL: It's Ramzi Jammal, for the record.

You're asking a very tough question and the clarity of the answer is not coming across. We license at two levels. There is the bottom end, as being the exempt quantity, which is, at that level, based on risk factor, it becomes -- that's why the Commission has steps which are called exempt quantity.

In this case, it's not an exempt quantity, but it's very low risk in nature, so that the institutional control under the Province of Saskatchewan is a regulatory process. So it's not like we're transferring (inaudible) our problem to the province.

So based on risk and literally regulatory Province of Saskatchewan, is it being released to an institution control under Saskatchewan is there a gap? The answer is no. Is there an established regulatory process under the institutional control in the province? The answer is yes, because they have to provide the funds for the remediation ongoing process.

So that's where we -- not we're struggling with the fact, but the province has already this regulatory process in placing, taking on institutional control for other types of mines and have the experience

to monitor it on a longer term. So it's not the CNSC that's transferring a problem, the CNSC is transferring based on risk and institutional control to a regulatory process that already takes in consideration other remediation factors. And that's the Saskatchewan institutional control regulatory process.

Ms. Velshi asked about the funds. The proponent will have to have enough funds in place for the long-term remediation aspect.

MEMBER BARRIAULT: So will the CNSC monitor the supervision of Saskatchewan?

MR. JAMMAL: We will be engage part of the process with respect to the monitoring. As it was mentioned if there are any variability's or any increased risk it becomes a technicality on the definition of nuclear facility, nuclear substances and activities, and so on and so forth.

But to answer your question, yes, we will be involved in the monitoring aspect and if there is a need to take -- retake it under the CNSC, we will come before you requesting that transfer.

But again, from long-term management and health and safety, the province has the regulatory process in place, which includes funds, reporting, and reporting requirements to the province, publications of the report,

and so on and so forth.

MEMBER BARRIAULT: Thank you.

The next question is in your Addendum A, page 34 of the CNSC presentation you start with your objectives for Selenium, for uranium, for radium at 2020. I guess it begs the question, why don't we have today's date on there and see where we're predicting we're going to go, as -- rather than just pulling a number? Addendum A, page 34 of CMD 13-H4.1.

MR. LeCLAIR: I believe that's Cameco's CMD that you're referring to?

MEMBER BARRIAULT: I stand corrected.

If you look at page 24, it's just been pointed out to me, that actually the levels are going up, rather than coming -- you're predicting they're going to go up rather than come down.

MR. DWYER: Robert Dwyer, for the record.

As per page 24 of our CMD showing the performance objectives, what we have there are the average values measured from the 2012 annual report, alongside the performance objectives. So just to mitigate confusion there, the performance objectives are set a little bit higher than the predicted water quality, and that's done to ensure that when water quality trends begin to increase the performance objectives will be used as an indicator to

determine when risks need to be reassessed for that property.

All of the trending data in these tables, the majority, should be decreasing. There -- as mentioned in the CMD, radium in the Tailings Management area is increasing, so in the Fulton Creek Watershed, and will be increasing approximately for the next 30 to 40 years.

MEMBER BARRIAULT: So what I understand is that we're going to make it worse?

THE CHAIRMAN: Okay, can I -- that's not my understanding of this.

MR. ELDER: Sorry, can I try to clarify, because I don't want to leave that?

MEMBER BARRIAULT: Go ahead.

MR. ELDER: The performance -- Peter Elder, for the record.

I'm going to look at saying -- I'll look at the example of selenium on our page 24 as Table 3.2.

MEMBER BARRIAULT: Gotcha.

MR. ELDER: The surface water quality objective is one.

MEMBER BARRIAULT: Yeah.

MR. ELDER: So we're saying they're below. The performance objectives, you look at it again if you go above. There -- and we're not saying it's going to go

above, we're saying you -- this is a trigger to do further studies. The performance objectives is really a trigger to do that your modelling may not be doing what you think it's going to do, and that's what you've got to look at, the performance objectives is this is the worst thing we expect to see. If you see something worse than that you've got a bigger problem, we don't understand what's going on in the system. That's when you go in and say I've got to reassess what's going on.

MEMBER BARRIAULT: So even though you're predicting that it's okay to increase by ten-fold for Selenium?

MR. ELDER: What we would say on the Selenium is that we're not predicting that it's going to increase ---

MEMBER BARRIAULT: No, no, but ---

MR. ELDER: --- we're saying ---

MR. ELDER: --- it's acceptable.

MR. ELDER: It is because that is the -- it's acceptable because the surface water quality says as long as you are below one there is no effect. So we don't -- saying we're trying to avoid regulating when there's no effect.

MEMBER BARRIAULT: So it's not really a predicted value?

MR. ELDER: No, it's not a predicted value. It's a performance criteria, which to say you're predicted -- and this is why we're comparing -- the predicted value is what you expect to happen, we expect a decrease. The performance indicators are to tell you your predictions are wrong, and if you see something above that performance indicator, your predictions are wrong, you need to redo your predictions or to look at further mitigation.

MEMBER BARRIAULT: Because, you know, on Table 3.3 we're saying the same thing with uranium. And is that the same criteria as you're using there or what are you using there?

THE CHAIRMAN: Can I try this, you guys? Again, not very clear. Let's put it this way, if anybody listening to this, I don't know if I understand this.

The way I understood this table, and I thought I had no problem with this, is the heading is uranium, look at 3.3 ---

MEMBER BARRIAULT: Yeah,

THE CHAIRMAN: --- is Saskatchewan water quality.

MEMBER BARRIAULT: M'hm.

THE CHAIRMAN: This is the given standard.

MEMBER BARRIAULT: M'hm.

THE CHAIRMAN: Okay?

MEMBER BARRIAULT: Yeah.

THE CHAIRMAN: So as long as you are below that, that's your objective. Okay?

If you cannot make it, you have another objective, so for example, in 2020 the lake as 180, I don't know how you pronounce it, Dubyna Lake, in 2014 they were way above the water quality ---

MEMBER BARRIAULT: M'hm.

THE CHAIRMAN: --- and they continue to be below -- above, but the objective for -- the realistic objective is 181 ---

MEMBER BARRIAULT: No, I understand that, but ---

THE CHAIRMAN: --- but it's not the actual ultimate objective, which is 15 milligram per litre.

MEMBER BARRIAULT: But if you look at the next one down, Pistol Lake, it's gone from 173 to 401 in eight years. I mean, why would you predict that that's going to go up in eight years?

THE CHAIRMAN: Well, because it is now at 173 and something is leaching into this one. That's my understanding.

MR. NAGY: Kevin Nagy, for the record in Cameco.

In that case that we're looking at for Pistol Lake the -- when you look at the 2020 values, that is what the QSM model is predicting. It predicts a range of values. In this case we utilized, for the performance objectives, the upper bound. So in that case it didn't -- wasn't predicted to meet the Saskatchewan Surface Water Quality Objectives.

The reason that it does predict above what the current water quality is showing, there's a couple of reasons for that, the first being that 2012 value is based on a limited data set. I believe there was two samples in 2012 we're basing that on, and with any modelling exercise there is, you know, some uncertainty and variability. So that's why you're seeing that.

But the performance objectives are set to show that the system is performing as expected -- predicted, and that the remedial activity is having the desired benefit or the predicted benefit.

THE CHAIRMAN: Well, I will argue, I didn't understand it that way in this particular table. I -- if that's the case you should recalibrate your model, because it should never predict something above what it's already now.

MEMBER BARRIAULT: Unless you want to look good.

THE CHAIRMAN: Unless there is -- you know that there is some flow into it that may cause something. You'll have to -- it doesn't make sense then.

MR. NAGY: Yeah.

Kevin Nagy, for the record.

I would agree with that, and it is our, you know, obviously our expectation that the water quality will be less than what we see now, that will be the improvement.

THE CHAIRMAN: Right.

I don't know if -- staff, is that your understanding? Is -- Mike ---

MR. RINKER: So ---

THE CHAIRMAN: --- what's your understanding of this model?

MR. RINKER: Mike Rinker, for the record.

So there's a couple things. First of all, what's happening in 2012, there's a number that is an average but there's a lot of variation in that number. It's not as precise as what you look -- what you see. There's a range of values and they're presenting the average as a fixed number. That's a bit misleading.

And so when you predict how -- if we did nothing and we predicted how that system would evolve over time, there's a lot of uncertainty. Would it on average

be a little bit higher? Would it on average be a little bit lower or would it continue to be that number? There's a range of expectations.

The performance objective is trying to capture the upper bound of that range and if you go beyond that upper bound, then you definitely do have some new source that you didn't predict. If you're within that range, then things are still evolving with the uncertainty in the model and with the uncertainty in the data. Things are still evolving within your understanding.

So those performance objectives are that upper number where if you exceed it, it means there has to be another source that you did not mitigate and you better go back and look at it.

If you're below that number, there is uncertainty in the model. It could be higher, it could be lower but you're still within that range of values that suggest that you understand how things are being performed.

MEMBER BARRIAULT: What are the criterias to establish the model? What is it that you feed into the equation to get these figures?

MR. RINKER: They would be how -- let's pick uranium -- how uranium is being leached out of the rock. What is that rate? That rate isn't fixed. It

changes from year to year.

MEMBER BARRIAULT: So therefore we should have values for the last 10 years?

MR. RINKER: Because they have so many lakes identified on this table, there is monitoring data that goes back 30 years but not at each individual source. So at this particular source, if I understand correctly, there's only two times that they actually monitored at this source. So they have two data points, not going back 10 years, just two years.

The other problem is how much water goes through. So if you -- the load is depending on the concentration and it's also -- depends on how much water goes through. So how much snow melt you get, how much rain you're getting which there's a lot of variation from year to year.

So when you have two data points, that concentration that you get -- you know if you have a dry year versus a wet year, it can be very different. And so two years of data does not give you a very precise understanding of what is the load from that source.

MEMBER BARRIAULT: Thank you.

THE CHAIRMAN: All I can say is that then if there is a range in the measurement, then you should indicate that -- the whole range so people can understand.

Otherwise, this model is -- I wouldn't use this model as a benchmark to gauge how you're doing, if you've got such a huge range in terms of your objective.

If you do the upper limit, then you should take the 2012 measure also what it could have been, not what it does when it's measured because there is not consistency and logic here, to my understanding.

Anyhow, we've got to move on.

MR. WEBSTER: Excuse me, it's Mike Webster, for the record.

I've got some water quality results for this station over the last 10 years. And they have ranged from below 200, which we saw in the 2012 average that was presented there, up to over 400 in 2002. So over the last 10 years, we have seen ranges in uranium at that station that range up to over 400 micrograms per litre.

THE CHAIRMAN: So you may need to show the whole range over 10 years to try to make this performance objective make sense, if you want to carry it for 30 years so you can have some confidence in -- that you're going in the right direction?

MR. WEBSTER: Right.

THE CHAIRMAN: If you -- the range between 100 -- 173 and 400 is huge. And if you -- you know, somewhere along the line you guys said that in 150 years

or 170 years everything will almost get into some sort of stability, well it doesn't indicate in this particular area. You're not anywhere near the Saskatchewan water quality in 150 years under this table.

Anyhow, we've got to move on.

Mr. Tolgyesi, we may revisit this later on but I need to move on to the intervenors who are waiting patiently here.

Quick two questions please.

MEMBER TOLGYESI: I will go back to these options that you were measuring. There were 35 options, 11 categories. And finally in these 11 categories, you didn't consider bio treatment. There is more and more bio treatment in the tailings and also in uranium. I didn't see anything about that. With some reasons?

MR. NAGY: Kevin Nagy, for the record.

We assessed a wide range of options individually and in combination. We did assess a number of options similar to bio remediation. And I'll ask Mike Webster to provide a little bit more information on what some of those options were and what the outcome was.

MR. WEBSTER: Some of those options that we assessed for the lower creek area -- lower east creek area were some sulphate reducing reactors so the -- a passive treatment system. So we assessed that.

As well, in the quantitative site model and in our assessment of remedial options, we were able to assess the performance of a wide range of options at various locations within the site. So being able to take a look at what the effectiveness of various options was and being able to apply that to what that meant to the improvements in downstream water quality.

MEMBER TOLGYESI: Oh sorry. Your submission you are saying on page 21 that 35 vertical openings were identified and sealed and the shaft caps are inspected annually.

That means that you inspected, I suppose, they are in a reasonably good shape. And this is one of four measures that you are saying that will be done is the caps -- where is that -- will be replaced in the shaft openings.

It is a long-term safety objective where an environmental impact is nil or negligible because I don't know if it's some impact of replacing the cap, it will be environmental impact on that or it's just a safety?

MR. NAGY: Kevin Nagy, for the record.

The intent is for the long-term stability and safety related to those caps. That is one of the requirements -- is one of the goals of the Beaverlodge management framework for the sites to be and continue to

be safe, secure and stable over the long-term.

And that is also the expectation to transfer properties into institutional control. So replacing the caps, we will be ensuring that those caps remain safe and stable into the future.

MEMBER TOLGYESI: And in these flowing boreholes, you plug 35. Is there a kind of impact that you could observe that is less contaminants or less volume or whatever?

MR. NAGY: Kevin Nagy, for the record.

The boreholes themselves did not represent a significant source of contamination into the water bodies, particularly the ones close to Beaverlodge Lake. So I don't expect we would see a measurable change there.

The ones at the Debyna site, that lake is smaller so the contribution would have been a little more significant. And now that we've plugged them and the ongoing monitoring will -- we will assess to see if there is a measurable improvement in water quality as a result of plugging those boreholes.

THE CHAIRMAN: Okay.

I think the one thing -- just my observation in fact for this round is there's a lot of work that's been done over the years. I was a bit disappointed not seeing in the path forward dates by lake.

Here's lake one, here's what our expectation is. Here's when it's going to go and meet the quality -- I don't care if it's 100 years, 200 years, 300 years.

Somebody should calculate when is the day that you think you can actually pass the institutional control and when it is actually going to hit acceptable regulatory limit. And it may take 1,000 years, but at least we see kind of a time horizon.

And what I want to know from staff, is it a reasonable request for the first annual report that you will come to us with specific, lake by lake -- by the way, how many such parcel there are that will eventually go to institution control? Is it by lakes or is it by, what do you call it, licensing stake, mineral claims? What is the unit that actually goes into institutional control?

And by the way, you already have five of them, I'm told, that gone into institutional control and everything is okay, I guess there were no surprises.

So I'm asking many things here. So the first question is, is it reasonable to expect to get a real entity-by-entity timeline for the first annual report?

MR. NAGY: I think for the first report, we'll be able to present you our progress on implementing

the actions and we'll be able to provide you what the current conditions are at the different locations where we're monitoring our progress, where we have ---

THE CHAIRMAN: But you can also forecast for the end?

MR. NAGY: Well, we -- in some cases, we -- well the modeling period was 150 years. Beyond that, the uncertainties and the variances that go in become great enough that the reliability of the model isn't as great after 150-year period.

THE CHAIRMAN: I don't know, you're saying that it's good enough to institution control forever.

MR. NAGY: We ---

THE CHAIRMAN: That's a pretty long-term observation.

MR. NAGY: Yeah. To deal with that or account for that, the performance objectives we are proposing achieve two different objectives. The first being in the near term during the license term, they will be used as a yardstick to measure the effectiveness of the remedial options.

I don't have it in front of me, but I also believe we proposed performance objectives out into the future, 50 years out, 100 years out, something of that nature. So that once in institutional control, the

monitoring that is being done, these properties continue to be assessed and using those benchmarks to assure that they are performing as expected.

THE CHAIRMAN: Well, staff, you'll also want to think about if you come to the Commission for a recommendation on institutional control, we would want to know what the endgame is. And therefore, you may want to think about how to do this and when.

MR. ELDER: Peter Elder, for the record. We know they did the modeling out, at least 150 years, so those projections are out there. And certainly, you know, for institution control, we're not recommending institutional control now. And even the ones that -- the near-term one, we have to have some discussions with the province about what are the criteria and how we approach those. So those are all we brought to you before there's any recommendation on institution control, yes.

THE CHAIRMAN: Okay, thank you. I think also in -- I hope the interveners will have some patience with us -- I think it's a good time for us to hear from the Ministry of Environment, from Mr. Kristoff, I want to hear the Ministry of Environment's views, and also from Dr. Irvine about -- there's been a lot of concern about the health of the population of all of northern Saskatchewan, so I would like to hear the medical officer

view on this particular subject. And then we'll open it up to the interveners.

So Mr. Kristoff, maybe you can share with us your views about this whole process.

MR. KRISTOFF: I think -- we're part of the joint regulatory group, obviously, we -- our surface lease covers the licensing of the Beaverlodge properties. Part of that is the management framework has been agreed to by us. The goal of Cameco and, I think, the joint regulatory group is to get properties into institutional control where they can be maintained by the province.

To accomplish that, we have to release it from decommissioning and the CNSC has to exempt it from licensing. Those are pretty simple rules right now, they're generic, but they're simple.

With that, an application must be provided to the Joint Regulatory Group based on the property boundaries, whatever they decide they want to exempt from licensing. That application identifies the risks, also identifies the money to maintain that property and monitor that property into the future and also identifies any unforeseen events that may arise that have to be paid for in the long term. That's my take on institutional control and how I can simplify it for me.

THE CHAIRMAN: So you're okay with their

environmental modeling that ---

MR. KRISTOFF: I'm comfortable with all the monitoring Cameco does for the Beaverlodge Properties right now, yes.

THE CHAIRMAN: Okay. Dr. Irvine.

DR. IRVINE: Good afternoon or, good evening.

THE CHAIRMAN: We've been hearing a lot about the health, the long-term health of the population around Beaverlodge and of course in all of northern Saskatchewan. And I understand that you have done some studies of that.

DR. IRVINE: We have been involved with health monitoring since the 1980s. During the first panel hearings, we were able to present some information on cancer trends, hospitalization rates, causes of death within the north. And since then, we've done sort of three relatively comprehensive health status reports, 1998, 2004 and then 2011.

We've made those reports very public across the north, both in schools, libraries, but also done a lot of public presentations on it because it talks about a lot of the issues around health within the northern parts of the province.

I think there's a couple different areas

that we've looked at. One is the population changes across the north. The north has a very young population. In the Athabasca area, for instance, 35 percent of the population that's under the age of 15 compared to about 18 percent of the province as a whole. So we've got a growing population, a young population.

And as well, we also look at the things that influence health, the non-medical determinants, the things other than health services that influence health. Things like built environment, housing, sewer, water, hygiene, look at health behaviours, smoking rates, nutrition. We'll look at things like income, social status, employment, all of which will influence health.

And then we have a fair bit of information as rates to various health indicators. And I think it's fair to say that we can look at the trends or the changes, as it rates health indicators across the north, is it a glass half empty or glass half full.

We've got improvements in a wide variety of health indicators, we've got life expectancy improving. However, there's still a discrepancy of 10 years between the north and the southern parts of the province. We've seen improvements in infant mortality or infant deaths, there's still a discrepancy within -- with the province as a whole.

In some areas, there's been marked improvements, things like gastrointestinal illnesses, children being admitted to hospital for diarrheas or skin infections, pneumonias; marked improvements in that. Though we've seen sort of a continuing issue as it rates to things like premature deaths from injuries.

The other area that we've seen over the last 20 years has been increasing rates of diabetes, rates that used to be lower than the southern parts of the province and now are substantially greater.

So it's a change in the types of conditions that we're seeing in the north. There's some improvements in infectious diseases with some persisting, such as tuberculosis. And now the emergence of things like HIV and Hep C.

The other things that we hear of and there was concern about during the initial stages of the panel hearing were things like congenital anomalies and cancer trends. So we've been monitoring those fairly closely over the years.

For the congenital anomalies, the rates have been decreasing since the '80s. And there's a couple areas in which we do have specific types of congenital anomalies that are related to small populations. And we're working with those communities to influence those

trends.

For cancer, one of the challenges that we face across the north is our smoking rates are at least double that of the province as a whole. In the Athabasca area for instance, the in-hospital birth questionnaire that asks recently delivered women about their smoking behaviour and a variety of other risk conditions and up to 70 percent of them had been involved with smoking during their pregnancy. So it's an area that I think there's been some substantial work in but it needs to be continued.

With that, I think we also watch closely the trends in cancer. Right now across the north if you look at the incidents of cancer, the rate for women is about the same in the north as it is in the south. For men, it's a little lower in the north than it is in the south and that's predominantly in the areas of breast cancer, colorectal and prostate cancer.

There's a couple of conditions that are higher in the north. One is cervical, cancer of the neck of the womb in women, and that rate has been high for quite a number of decades but it's been decreasing substantially. The one that has remained high has been lung cancer and the rates are greater than the south as a whole. We've seen in Canada that the lung cancer rates

have been decreasing predominantly in men with the changing smoking behaviours that have happened over the last decade or two but we haven't seen that reversal of the trend yet within the north so there's a lot of work being done in terms of smoking cessation and things like that.

So in a way when you look at health issues across the north, they're complex, there's not a simple solution to them.

The community of Uranium City had a special request of us when we were sharing some of the data as it relates to the northern health status reports and they asked us to look at some of the vital statistics as it relates to the community to Uranium City itself. It is a very small population so there's high variability in terms of potential for epidemiologic studies but we particularly looked at cardiovascular disease, cancer and injuries as the three most common causes of death.

Cardiovascular disease and injuries, if we age standardized them to match that of the rest of the north were higher than the northern average. If we looked at cancer, those last few were higher but not statistically significant. The cancer rates in Uranium City were a little bit lower but not specifically significant so you'd really have to say that they're the

same rates as across the north as a whole.

So that's kind of a snapshot of the health status across the north and a little bit about Uranium City itself.

THE CHAIRMAN: So there's nothing that you can actually attribute to working in the mines, uranium mines, radon concern over the last 50 years or so?

DR. JAMES IRVINE: We've been involved with some of the work that CNSC has led as it relates to the worker epidemiologic studies looking at the history of past workers from the old mines and with the new mines and even though there is evidence of past exposures in the old mines increasing the risk of lung cancer, overall the workers who were involved with Beaverlodge and other Eldorado sites, the overall cancer trends were -- or the incidents were the same as the Canadian general average.

The main determinate I often say as it relates to the risks of influencing things such as lung cancer, safeguards have to be put in -- continued to be monitored and watched as it relates to radon in modern mines and there's substantial efforts and education and monitoring done for that. However, I think one of the major influences on employment to the uranium mine site is what does employment impact in terms of the smoking? If getting a job and getting a good income, education,

getting support provides an opportunity to not to smoke, increasing your efforts not to smoke, then that will make a substantial impact on lung cancer rates. However, if it's a result of working at a mine site, you're maybe lonely because you're away from home, you're bored in the evenings or something, that increases your smoking rate, that will have a substantial impact. So I think in relatively I think it's really important to be continuing on the radon monitoring worker safety and training but we also have to continue efforts as it relates to smoking behaviours as well.

THE CHAIRMAN: Thank you for that. Anybody has a question before we move into the intervention?

Ms. Velshi.

MEMBER VELSHI: A quick question for the Ministry of Environment. You did say that once Cameco says decommissioning or remediation is complete and CNSC says properties ready for exemption from CNSC licensing, you're willing to take that on under the institutional control program, if I heard you right. But are there specific criteria that you have established before you would accept it?

Forget the lakes, but if you take the waste rock and tailings, what the gamma fields for instance, should be above background because I was just looking at

what I saw for the Gunnar site and what you mentioned for here, the numbers seemed a little different to what performance objective one was working toward. But I wondered, from your perspective, are there specific criteria you have established?

DR. DALE KRISTOFF: Dale Kristoff,
Saskatchewan Ministry of Environment.

There is no specific hard number for the acceptance into institutional control. It's based on a site-specific risk based analysis of the property.

THE CHAIRMAN: Okay, thank you. I'd like to move to the next intervenors, which we've seen before and not too long ago actually and it's the presentation by the Fond du Lac First Nation, as outlined in CMD 13-H4.9 and 4.9A and we have Mr. Froess and Mr. McDonald with us.

Welcome. The floor is yours.

13-H4.9 / 13-H4.9A

Oral presentation by the

Fond du Lac

Denesuline First Nation

MR. McDONALD: Thank you again
Commissioners. My name is Darryl McDonald from the Fond
du Lac Denesuline First Nation. Just an opening comment.

Prior to contact, Beaverlodge as we know has great cultural significance based on our oral history Denesuline knowledge and post contact, will continue to live and occupy and use the areas of land that we are discussing here today.

So now I'll transfer that to Ryan.

MR. FROESS: Good evening. My name is Ryan Froess. I'm an aquatic ecologist and northern community coordinator for CanNorth Environmental Services here in Saskatoon. I will be presenting today on behalf of the Fond du Lac First Nation concerning the renewal of Cameco's waste facility operating licence for the decommissioned Beaverlodge mine site.

Unfortunately Chief Lidguerre could not make it this evening. His flight was delayed and he tried to get down this afternoon but couldn't get another flight. So I'm happy to have to Mr. Darryl McDonald, the CEO of Fond du Lac here with me today.

I'm just going to -- I touched on this earlier this morning. I'm just going to go, for those who weren't here I'm going to start by giving a bit of background on the Fond du Lac First Nation.

Founded over 150 years ago Fond du Lac is one of the oldest and most remote communities in Saskatchewan. The members of the band are primarily of

Dene and Cree and Metis mixed descent. The band currently maintains a total registered membership of approximately 1842 members and manages and administers their own programs for education and health, as well as economic and social development.

The community of Fond du Lac is located on the north side of the Fond du Lac River and Athabasca basin of northern Saskatchewan. The band has a total reserve land base of over 36,000 hectares and today approximately 1000 members live on the reserve.

Access to and from the community is by seasonal road in the winter months and via boat from Stony Rapids which is accessible by way of Highway 905 during the open water months.

Two airline companies also provide year round access to the community with daily flights.

The decommissioned mine site is located approximately 85 kilometers from the community of Fond du Lac.

The Fond du Lac First Nation is located within Treaty 8 which was signed in 1899. The signing of the treaty was spurred by mining development in northern Canada in the late 1800s. The treaty protects the band's rights to live off the land including hunting, fishing and trapping throughout the traditional territories presented

in Treaty 8.

Governments have the duty to consult with Aboriginal peoples whenever they are contemplating actions that may potentially infringe upon these rights.

Cameco Corporation is requesting the renewal of its waste facility operating licence for the decommissioning of the Beaverlodge site for a period of 10 years. The proposed 10-year licence term is intended to allow time for Cameco to implement a number of remedial options identified during the current licence term and also to complete the necessary follow-up monitoring in support of transfer of the properties to the Province for institutional control.

The Band supports the renewal of Cameco's licence for the decommissioning of the Beaverlodge mining site for a period of 10 years.

Since the Band is located within the vicinity of the Beaverlodge property, it has a vested interest in the remediation of the site.

Therefore, the Band is requesting that a number of concerns be addressed.

The Band's primary concern in regards to the Beaverlodge site is the lack of communication between Cameco and Fond du Lac First Nation. The Band feels that they were not adequately consulted and communicated with

regarding the remedial options for the Beaverlodge site.

The Band's involvement in the process was limited to the participation of one EQC representative from Fond du Lac at the remedial options workshop held by Cameco in Saskatoon on April 3rd and 4th in 2012.

The Band requests clear communication between Cameco and members of the Fond du Lac community related to the decommissioning of the Beaverlodge site moving forward.

Members of the Fond du Lac Band have also continued to express an interest in protecting the environment and also an interest in being involved in the clean-up of the Uranium City area.

The Band wants to ensure that all potential remedial options were fully evaluated by Cameco to protect and remediate the environment.

In addition, the Band would like to ensure that the remediation options chosen are the best available technologies and that the remediation results are beneficial to the environment, as well as the people of Fond du Lac and Athabasca Basin.

The Band is concerned with the potential for long-term environmental issues due to the decommissioned Beaverlodge mine site.

The Fond du Lack First Nation would like to

see the development and implementation of a long-term environmental monitoring plan for the region in consultation with the Fond du Lac Band members.

The monitoring plan would be effective in determining the following: the success of remedial actions taken; the success of natural recovery of an environment where remedial actions are not taken; if there are additional of concern that require remedial actions in the future and; if the fish, vegetation and wildlife in the region are safe for current and future generations.

In summary, the Fond du Lac First Nation supports the renewal of Cameco's licence for the decommissioned Beaverlodge mine site for a period of 10 years.

However, the Band would like to re-emphasize the need for clear and direct communication from Cameco regarding the process of remediating the Beaverlodge site.

The health of the environment in the region is essential to the Band's traditional lifestyle, which includes hunting, trapping and fishing.

The Band wants to ensure that remedial activities being conducted at the Beaverlodge site over the next 10 years result in a maximum benefit to the long-term recovery of the environment.

The Band also wants to ensure that the monitoring process does not end after this 10-year period.

In closing, the Fond du Lac First Nation would like to thank the Canadian Nuclear Safety Commission for the opportunity to participate in the hearing today.

Thank you.

THE CHAIRMAN: Thank you.

Questions?

You've been listening to some of the debates about the monitoring of success. I think the Commission itself actually has the same kind of objective, making sure that we understand progress in all of this.

Are you comforted by some of the things you've been hearing here and the fact that they have to come to the Commission on a site by site before they release it for institutional control? Does that give you a little bit more confidence in the process?

MR. McDONALD: For the record, Darryl McDonald.

Yes, that's more clarification because some of these are questions that have been asked throughout our communities, through our communities by Elders. As you know, our Elders are slowly dying off, and some of the questions regarding our significance to and ties to the land, and especially Beaverlodge defines who we are as

Denesuline kind of people.

So that's why the concerns that have been raised in the past and some of the questions or the debates that the Commissioner has identified here sort of clarified what we've been sort of probing and asking questions, and there's a bit more clarification and identifying the next steps as far as what you've identified as tabling within the annual report.

So more clarity. Thank you.

THE CHAIRMAN: Thank you.

Anybody have a question?

One last one. Cameco, you heard that the community would like a little bit better communication. Anything that comes to mind about how to improve such?

MR. MOONEY: It's Liam Mooney, for the record.

We read the presentation and the submission from Fond du Lac and we were frankly a bit surprised by it.

We do have a community liaison representative in the community and we make an effort to have her available to provide information and answer questions, and she had not been aware of the concerns that have been expressed in the presentation here today.

That being said, we're happy to provide

them with additional information and to commit to attend a meeting in their community in the near future for further discussion.

I think one of the other points that's worthwhile raising is the remedial options workshop, it wasn't the sole window into the activities at Beaverlodge. Certainly, Mike Webster can attest that the focus is the Uranium City community situated about eight kilometres from Beaverlodge, but there's representatives from Fond du Lac on both the EQC and the AWG and there were a series of meetings throughout 2012 and 2013, including site visits in that regard.

So I don't want to -- I said earlier that we would look to speak further with the community in this regard, but I don't want to short sell the efforts that we've made to this point as well.

MR. McDONALD: Rebuttal. For the record, Darryl McDonald.

I think there's some confusion or a clarification; the role of the community liaison officer, from our understanding, is that the role was regarding employment and the status of employees at mine sites and translations, I guess, when representatives come into the community.

And for Cameco to say that we have a

liaison officer in Fond du Lac doesn't really answer the question or the role of what materials are presented when asked at community meetings regarding the processes and procedures are taking place at Beaverlodge or other community workshops or information sharing that has happened.

Those are types of questions we're asking and that's where the communication -- like we said earlier about the type of information that's presented and how it is translated and transcribed, we need that peer review by other Denesuline speakers, translators, to ensure that Elders and other community members understand what information is being presented rather than come back to the Commission and just saying that there's a liaison officer. That doesn't really answer my question.

MR. MOONEY: It's Liam Mooney for the record.

I wasn't suggesting that that was the only thing. It was one of those pieces.

And in respect of some of the other meetings, I think an AEQC, I have a site visit on January 15th; AWG meetings, February 20th, December 6th; NSEQC meetings October 30th; AEQC site visit September 25th, and a remedial workshop, just as a snapshot in that regard.

So we're happy to take this feedback, but I

think we also wanted to make sure that our efforts are recognized both in relation to Fond du Lac, but also within the Athabasca communities.

THE CHAIRMAN: Well, I think both sides need to talk to each other. I think that's what I hear.

However, I must tell you from our perspective, from my perspective, in reading the documentation, there's a lot of information in here, but it's still not clear on the end game. And it may be only me personally; I always like to know what the end game is, and to me end game is -- let me use maybe non-politically correct language -- when the properties go back to nature is the end game to me. And it may take a thousand years but I want to know when and the process to get there and what you're going to do?

So I think that's the kind of clarity that people are looking for. Would be my assessment, I may be wrong, but it's the clarity that needs to be provided to the community. This is our best focus of the end game now and the process towards it.

So let me stop here, I think we've exhausted this but I can give you a clue. I'm always going to ask, every time you appear in front of us, I'm going to ask what is the end game. So maybe you should think about how to answer that question.

So thank you.

Thank you very much. Any last words?

Good, thank you.

The next presentation is by the Saskatchewan Environmental Society as outlined in CMD-H4.6 and 4.6A. And I understand that Mrs. Coxworth and Mr. Prebble will make the presentation? Any time you're ready.

13-H4.6 / 13-H4.6A

**Oral presentation by
the Saskatchewan Environmental
Society**

(SHORT PAUSE/COURTE PAUSE)

MR. PREBBLE: We'll just make sure this mic is on? Thank you.

Mr. Chair and Members of the Commission, thank you for the opportunity to make this presentation. Let me say at the outset that the Saskatchewan Environmental Society supports Cameco being re-licensed to manage the decommissioned Beaverlodge site for a further 10 years.

However, we wish to see important amendments to the licence that is granted. While we

support each of the specific remedial measures that Cameco has planned for the site, we're of the view that these measures are insufficient to adequately remediate the Beaverlodge properties and that several additional remedial steps need to be considered.

We'll highlight our specific remedial suggestions in a moment. First however we'd like to comment on Cameco's proposed performance objectives which are central to this re-licensing process.

Cameco's proposal, namely that the upper bound of anticipated water quality become the official performance objective for each monitoring location in our opinion lacks ambition.

The slide before you shows Cameco's performance objective for uranium, at different monitoring stations on the Beaverlodge site and downstream.

A quick look at the slide emphasizes how contaminated the Beaverlodge properties still are and how much worse than Saskatchewan surface water quality objectives they will be allowed to remain. Given that the provincial government's surface water quality objective for uranium is set at 15 micrograms per litre. The performance objectives that Cameco proposes for 2020 as shown on the first left-hand column of the slide, those performance objectives are often 8 to 20 times worse than

the Saskatchewan Surface Water Quality Objective for the protection of aquatic life.

While we understand the difficult challenges Cameco faces at the Beaverlodge site, we are concerned that the stage is being set for the Beaverlodge properties to be returned to Saskatchewan's Institutional Control Program in a very contaminated state.

We thus recommend that the Canadian Nuclear Safety Commission ask Cameco for more ambitious performance objectives. We also note that no performance objectives have been set for Martin Lake, nor have they been set for the Crackingstone River. We suggest it is important that performance objectives be set for both these water bodies. We recommend they be set at the same level as the current Saskatchewan surface water quality objective for uranium and for selenium.

I'll pass the microphone over to my colleague Ann Coxworth.

MS. COXWORTH: Ann Coxworth, for the record.

Cameco has offered us a limited range of remediation measures to address the remaining contamination in the Beaverlodge region. In many locations these measures won't bring contaminant levels down to anywhere near guidelines for northern mine

decommissioning and reclamation.

We're suggesting that Cameco has not been nearly ambitious enough in pursuing additional remediation options that appear to have significant potential. And I'll just highlight a couple of these options and refer you to our written presentation for a more detailed description of experience gained elsewhere, where these technologies have been effectively applied.

First let's talk about permeable reactive barriers. These are defined by the Environmental Protection Agency as an emplacement of reactive media in the subsurface that is designed to intercept a continuous plume to provide a flow path through the reactive media and to transform the contaminants into environmentally acceptable forms in order to attain remediation goals down gradient of the barrier.

These permeable reactive barriers can be used in different formats. For example, vertical barriers are particularly applicable at those narrow points where contaminated water is moving through a confined channel either in surface or groundwater flows.

A horizontal format can be applied in situations where sediments are currently leeching contaminants into the water. And reactive barriers could also be used in covers to limit leeching from tailing

spill areas and waste rock piles.

In our written report we summarize experience at several U.S. sites where permeable reactive barriers have been successfully used to dramatically reduce uranium levels in contaminated water.

So we're asking that a thorough assessment of various potential applications of permeable reactive barriers be required before Cameco's path forward is accepted as adequate.

The second approach we'd like to highlight is phytoremediation and many studies have shown that radio nuclides are bio-accumulated in certain aquatic macrophytes and algae. Cameco's very dismissive mention of this potential approach indicates that there hasn't been serious consideration of its application in the Beaverlodge sites.

We'd refer the Commission to documentation of the effectiveness of so-called ecological polishing systems to remove uranium, radium and other contaminants from water. We'd particularly note reports of the way in which the algae stonewort converts dissolved uranium into an insoluble mineralized form that drops from the plant and sinks into the sediment, dramatically reducing uranium levels in lake water.

We believe that both of these approaches

could contribute to clean-up of surface waters in the Ace and Fulton watersheds and in Martin and Cinch Lakes and in the Crackingstone River.

So the other area we'd like to just quickly focus on is mine water movement. We've got contaminated groundwater resulting both from the flooded mine workings and from tailings that have been historically deposited in abandoned mine shafts. Some of this contaminated water is coming to the surface through flowing boreholes close the mine sites and Cameco of course is already closing off boreholes as they are identified.

But what we don't know much about is the various paths that the underground water flow may follow over longer time periods. For example, what alternative paths may the contaminated water discover when the boreholes are closed.

The Flowing Borehole Closure Report notes that there isn't enough information to confirm the connections between the underground workings and surface water bodies. So this leaves questions about where and when mine water might appear at the surface in the future and what its level of contamination might be.

Atomic Energy of Canada Limited has modelled the movement of groundwater from a hypothetical 500 metre deep disposal chamber in the Canadian Shield.

They estimated timeframes for water to reach the surface, ranging from 110 years to over a million years. So I think what this means is that we can't assume that the absence of new mine water flows to the surface, after say ten years or even 30 years, means that it's permanently confined underground, and this needs to be taken into account in planning for long-term monitoring and maintenance of the Beaverlodge sites.

MR. PREBBLE: One other factor that needs consideration when planning Beaverlodge site remediation is climate change. As the slide before you depicts, the Beaverlodge Lake area is likely to become wetter and subject to heavier precipitation events. We thus suggest it would be wise to opt for a thicker cover to be placed over the non-aqueous radioactive tailings. Increasing the tailings cover to 1½-metres would provide an improved buffer against intense rainfall, against gamma radiation, and against the chemical and biological processes that will inevitably act on the cover. And I might add that here again the permeable reactive barrier is another option for improving the tailings cover.

Now, we'd now like to turn to the critical issue of institutional control, since Cameco has signalled its intent to move forward with institutional control for many of the properties over the next five years, and for

many others, in the latter part of the relicensing period.

We have carefully assessed the path forward proposal for the Beaverlodge properties, and we have concluded that the transfer of the decommissioned properties to Saskatchewan's Institutional Control Program should not take place during the ten year license period under review. And we say this for four reasons:

First, the anticipated level of surface water contamination in many parts of the Beaverlodge properties is still unacceptably high.

Second, there are important remedial options for the Beaverlodge site, some of which we've just reviewed, that Cameco has still not adequately explored.

Third, the Beaverlodge properties have caused significant pollution problems in several downstream water bodies.

Prior to institutional control being permitted, remediation work in the entire region is required. A large part of the cost for regional remediation should be financed by the Government of Canada through Canada Eldor Incorporated.

We really don't feel that the burden of remediation should rest with the province. We feel that the Government of Canada should take responsibility for cleaning up this site in terms of the funding arrangement

that's required.

Fourth, we note that a longer delay before transferring the properties to institutional control would increase the likelihood that remedial technologies will advance sufficiently in the interim to tackle some of the most challenging problems.

We think it is important to recognize that the nature of the contamination on the Beaverlodge site is serious enough, that the site should receive active management for many decades or longer. There is not a good rationale for allowing the Government of Canada to relinquish its responsibilities while the area still requires care.

As we conclude, we want to emphasize the importance of a regional approach to remediation being required. We advised CNSC to require the development of a regional remediation plan that includes restoration of surface water quality in Martin Lake, Cinch Lake, and the Cracking Stone River, as well as additional measures to advance public safety and at least partial remediation on Beaverlodge Lake.

Through the activities of a federal crown corporation, the Government of Canada has caused significant contamination in five Saskatchewan watersheds. And basically, in all watersheds other than the brown and

purple ones. In other words, other than Jean Lake, and - I'm having trouble identifying the other one -- and Fredette Creek, sorry.

So other than Fredette Creek and Jean Lake, all the other watersheds you see on -- in this slide have been contaminated by Eldorado Nuclear's activities. And that's quite a legacy to leave northern Saskatchewan, and we really feel that a remediation at a regional level is required to address this problem before the properties are transferred to Saskatchewan's Institutional Control Program.

In conclusion, we want to thank you very much for considering our views. We'd like to extend a special thank you to CNSC staff for their cooperation, and to Cameco staff, including Mike Webster, for their cooperation and assistance to us. We've been grateful for the assistance also that has come through the Participant Funding Program, and we would be very pleased to answer any questions that you might have. Thank you.

THE CHAIRMAN: Thank you.

Okay, the floor is open. Who wants to start? Monsieur Tolgyesi.

MEMBER TOLGYESI: Proponents are talking about permeable reactive barrier technology. Could you comment on that?

MR. NAGY: For the record, Kevin Nagy.

Throughout the process we went through to assess the risks and look at potential remedial options and selecting for the path forward we looked at several options, and several of those options were analogous or similar to permeable reactive barriers, and I'll ask Mike Webster to provide a little more information on that.

MR. WEBSTER: Mike Webster, for the record.

Permeable reactive barriers were assessed in Lower Ace Creek for treatment of minor flow seeps coming from the waste rock pile. In addition, the types of reactive barriers discussed by Saskatchewan Environmental Society regarding covering of aqueous tailings and surface tailings and waste rock piles was also assessed in the remedial options workshop as well.

MEMBER TOLGYESI: Staff, do you have any comments on that? No?

MR. LeCLAIR: As Cameco noted, it was a part that was considered as one of the options.

Perhaps to talk a little bit about permeable reactive barriers noted in the presentation here about extensive experience in the United States. There is also experience in Canada. I'm familiar, actually, with one project that actually involved intercepting a Strontium-90 plume at ACL's Chalk River site that involved

actual use of a reactive barrier, it's called a Wall-and-Curtain System, in order to reduce Strontium-90 concentrations in a contaminated groundwater plume.

Certainly, the technology is there and it has some interesting applications. Some of the limitations are that they -- there is a need to replace the reactive barrier. They have a certain life so they tend to get used up as a filter media. There is some challenges with regards to the plugging of the media over time. It requires a fairly good control on the groundwater flow through the reactive barrier that obviously will be influenced based on seasonal changes during major melting, higher flows, lower flows.

So while the technology is there it does have -- it needs to be properly engineered and has some challenges with it. Perhaps one of the more important things is that they tend to have a better application for shorter-term applications, and that's not really what we're looking at, and some of the stuff we're dealing with here, they have much longer-term implications. So these are interesting options and certainly things that we do look at, but there are some important limitations on them with regards to how they're applied.

And the other thing that needs to be noted is much easier to implement these in areas where there's

an ability to constantly monitor and maintain them over the longer term, so their applications have tended to be areas where they're not remote like what we have here. So certainly a good idea and something to be considered and was something that was considered, but there's some really important limitations in their application.

MR. PREBBLE: I guess one of my responses to this is that we think this technology does have application on the site. It may not solve our problems in Beaverlodge Lake, but we think it's got, for instance, a lot of potential to be applied where the lake outlets narrow, so at the outlet points. For instance, as you see water flow into Martin Lake and then from the southern part of Martin Lake to the northern part of Martin Lake, again at the outlet of Cinch Lake and on the Cracking Stone River, we think this technology deserves at least to be seriously considered, and we also think that it has a lot of applicability on the Beaverlodge properties themselves especially in areas where the water bodies narrow, or in streams and creeks that are contaminated.

So we think it's been dismissed too quickly and deserves a really comprehensive look, because surely the objective should be to actually try to use existing technologies to clean up the sites as much as possible. We don't accept the rationale that there's no need to

clean up the Beaverlodge properties in a more substantial way than Cameco is proposing because it doesn't make a big difference in Beaverlodge Lake. The properties themselves are two important watersheds that deserve to be cleaned up.

Martin Lake, Cinch Lake, the Cracking Stone River, these are important water bodies that deserve to be cleaned up and we think these technologies have the potential to be applied in all of those circumstances.

THE CHAIRMAN: So, Cameco, you want to -- how says the -- was it considered? Were there any cost issues that made it infeasible? What was the story here?

MR. NAGY: Kevin Nagy, for the record.

There were a number of criteria that we looked at while we were assessing remedial options. I guess the first one on the properties being risk. Was there a risk? Was it enough that something needed to be done to try and mitigate that risk? Then we looked at what are the proposed benefits of an option such as reactive permeable barriers? Would it be effective? Are there uncertainties with respect to that technology on how it would be implemented or how successful it would be?

We also looked at costs. When we went through that assessment, that option was not selected. It wasn't deemed to be a reasonable option at that time. And

just to clarify, we are recommending a path forward that does have meaningful remedial actions we will undertake on the properties, and they will -- they are predicted to result in measurable impacts; in some cases, significant improvements in local environmental conditions, in particular Verna Lake, where we will be diverting a stream back to its original -- original path.

And I would also say that as part of the management framework, if at the end of the 10-year licence term, we found that the options we've implemented haven't achieved the predicted benefits and if we go back and again look at the risks and deem it's necessary to take further action, we would then again look at all options and we would look at the permeable reaction barriers that they were talking about.

MEMBER VELSHI: I have a few questions.

First of all, I'd like to compliment you on your submission; I found it very enlightening.

So one of the comments made by the intervenor is that the performance objectives simply aren't aggressive enough, and where you have the upper end of a limit from the model. Can you care to comment on that, please?

MR. NAGY: Kevin Nagy, for the record.

The performance objectives were set after a

rigorous assessment process of the different remedial options and the benefits that were predicted from them. I would characterize our performance objectives as reasonable and achievable. They will act both as a yardstick during the licence term to allow us to measure the effectiveness of the work we've done, and they will also act as goals in the long term that they can be compared to to ensure that the sites do remain safe, secure, and stable over the long term.

MEMBER VELSHI: Let me ask this a little differently then. What's your confidence level if you had taken the lower level as your performance objective of being able to meet that? I mean, have you taken the upper one because you're, you know, almost 100 percent sure that yes, you will, unless something really goes wrong, you'll be within that?

MR. NAGY: In the modelling process, just as you put in information to the model, environmental concentrations, stream flows, lake levels, climate data, transfer factors, a multitude of data, you generally input that in as an expected number, but then a range as well to capture the variability in the environment that you see. So just as you do that, the outputs of the model are the same, so you have an upper level prediction, a lower level prediction and, in all likelihood, you'll wind up

somewhere in the middle. We feel the approach we took using the upper bound were applicable. In some cases where the Saskatchewan Surface Water Quality Objectives could be achieved, we selected those. But we feel in the instances where it could not, using the upper level wasn't a reasonable approach, and it still allows us to measure the effectiveness of the option and it still allows us to, as a yardstick, to measure in the long term as well.

MEMBER VELSHI: Okay, what about the recommendation that performance objectives be set for Martin Lake and Cracking Stone River?

MR. NAGY: Kevin Nagy, for the record.

As I've mentioned earlier, the work we've done through this process indicated to us that regardless of the remedial options undertaken on the property, small ones, the grand scale ones, did not result in a meaningful change in the time it will take to recover Beaverlodge Lake and the receiving environment. In fact, one of the scenarios we looked at was if we could somehow just turn off the tap, so we had seen on the maps before East Creek, Fulton Creek flows in to Beaverlodge Lake. If we could somehow implement an option that would just eliminate those flows, it still did not result in a significant recovery time in Beaverlodge Lake.

We have set performance objectives in

Beaverlodge Lake. We expect Beaverlodge Lake to recover naturally over the long term. I believe one of the staff slides showed approximately 100 years for selenium to reach the surface water quality objectives, a little longer, 170 years I believe, for uranium.

As Beaverlodge Lake improves, so will the downstream water bodies; Martin Lake, Cinch Lake, the Cracking Stone River.

MEMBER VELSHI: Next question is for the Ministry of Environment.

THE CHAIRMAN: Before -- sorry, I mean, before you leave this, I still want to make sure that we have an understanding, maybe it's only in my head, that you will revise your performance objective if the current measures, the actual measures, are lower than the performance in the next -- you know, in the future. In other words, you'll recalibrate your model, not maybe on 10 years, but maybe the last three or four years. Otherwise, I don't see how you're going to measure ongoing progress.

MR. NAGY: That is a good suggestion and I think once we've implemented the remedial actions over the first three years of the licence term and go through a period of monitoring, we could look to update the model with additional information gained over that time.

THE CHAIRMAN: Ms. Velshi? Thank you.

MEMBER VELSHI: In the Institutional Control Programme, your mandate is to monitor and maintain and I'm not sure what the maintaining part is, but given that, as is envisaged here, that there may be a significant number of properties that will still be contaminated in above the province's standard, does the scope of your responsibility require you to do further remediation and perhaps some of the technologies that are being assessed now or newer ones come online, is that something you would consider, or is yours more just the caretaker responsibility?

MR. NAGY: The acceptance of the properties into institutional control will require absolutely minimal monitoring and minimal remediation options that are available to us at the time they're accepted.

It is a long-term program that's designed to monitor these things long term. If new technology arises, absolutely, it's something to be considered and the money is there to consider those options and possibly implement them.

THE CHAIRMAN: Anybody else?

MR. PREBBLE: I just ---

THE CHAIRMAN: On the same topic here?

MR. PREBBLE: Yes.

THE CHAIRMAN: Go ahead.

MR. PREBBLE: Peter Prebble, for the record.

I just wanted to point out that we're concerned that the money won't be there. We've looked at the amount of money that's been assigned so far for the properties that have already gone into institutional control, and it really just assumes, you know, regular monitoring, but it doesn't -- there's no money there for remediation.

So if it was anticipated that remediation was going to occur to these properties after they go into institutional control, then I think there should be an expectation that Canada Eldor Inc. would post a much larger bond than has been discussed to date. So there's actually money available for remediation.

Clearly, that isn't the intent up until this point in time.

THE CHAIRMAN: But are you suggesting that those properties that are already under institutional control now are such that you would like to see them further decontaminated?

MR. PREBBLE: Well, I'm not sure it's required for the properties that have gone into institutional control up until now. I haven't examined

each specific property, but I guess my comment is if you look at the amount of money that's there -- sorry that I don't have the figures right off the top of my head -- but it's a relatively small sum that really would just cover travelling up to the site every four or five years to do monitoring and minimal maintenance.

So if these properties are going to be transferred to institutional control, which of course we don't believe they should be yet, but if they are, then there needs to be a significant amount of money that's posted by the Government of Canada and that's available to the Province for additional remediation in the future when serious remediation options are available.

We think, by the way, clearly there are serious remediation options available now and they're just not being examined in a serious enough manner and there's been no discussion really of phytoremediation, but again, we think that's another serious option that's already been demonstrated to have some potential.

So I really am struck by the fact that while the mining companies are being asked to manage the sites -- and this applies to the Saskatchewan Research Council as well -- everybody is working to take a look at the existing properties, but nobody is seriously talking about cleaning up the damage that has been done in the

region, and that's quite a legacy to leave Northern Saskatchewan in an unremediated forum. We're quite struck by the fact that that -- we think there's a lot of people in Saskatchewan who wouldn't consider that to be acceptable.

THE CHAIRMAN: Anybody else?

I have one last question. Talk a little bit about mine water migration. Staff, is that a phenomenon that was factored into any of these calculations? Anybody?

MR. LECLAIR: Jean LeClair.

Before I pass it over to Mike Rinker, I'll just make a few comments on that. First, we should mention about the filling boreholes. My understanding of filling boreholes are actually former drill holes which would have been part of the exploration activities.

Today, exploration companies are expected to seal their drill holes after they're done their exploration activities, particularly if there's uranium present.

The boreholes are drilled from surface. Once they're sealed, the groundwater will resume the flow that was there before any of the activities are actually there. So it goes back to the way things were previously with regards to the boreholes.

With regards to the underground workings, again, what we're talking about is there was a natural uranium ore body that was present there. That material has been extracted. The water then returns into those mine workings and then will flow through the groundwater the way it would have previously.

It's important to note, in fact, that the way some ore bodies in fact are identified is by monitoring water flows to see what was naturally happening before.

So on that note, maybe I'll pass it to Mike Rinker if he wants to perhaps add to that.

MR. RINKER: Mike Rinker, for the record.

And if I may, I'd like to expand my answer to beyond the water because much of the items that are raised by the intervenor, I don't want to make it sound dismissive, because these are the very same issues that we have also raised. And so it's with much respect that we're answering these questions.

And in the end of our review, there was much angst that we felt that we couldn't insist on their implementation.

And I'd like to explain a little bit why, and part of that is -- an example would be for the permeable reactive barriers, it is a good suggestion to

intercept surface water flow, but there is always a second consequence.

A reactive barrier placed in a stream is not a good thing for fish. It blocks their access to habitat.

Phytoremediation has shown success, but it was looked at, for example, aquatic macrophytes, which are suggested are also a food source. So when those aquatic macrophytes accumulate, say, uranium, that's shown to be toxic to ducks.

The connections for groundwater, it is correct that AECL predicted long periods for water to reach the surface, but that was for a situation for a used fuel repository where they're specifically looking for a place where groundwater would flow very slowly.

In Beaverlodge, for example, where the sources are, vast amounts of waste rock are on a very steep hill. So groundwater flow from that waste rock to surface water is in the order of months. So there's a very short time.

Climate change is something we definitely agree with. We do have geotechnical inspectors, members of the Canadian Dams Association who would be evaluating the design, taking climate change into account, performing inspections after their implementation to ensure that they

are designed and constructed appropriately.

THE CHAIRMAN: Thank you.

Last words to you.

MS. COXWORTH: We just want to thank you for the opportunity to participate in the hearing and to emphasize our concern that the whole regional issue be taken into account, that we can't just leave that downstream area to look after itself, so we really would urge you to require a full approach to dealing with the whole Beaverlodge and downstream to Lake Athabasca within the context of this present process.

Thank you.

THE CHAIRMAN: Thank you. Thank you very much.

MR. PREBBLE: Thank you.

THE CHAIRMAN: Colleagues, what I would like to do now is go through one so-called last round even though we have three more interventions tomorrow morning, but I think we should take a little bit of time to ask those burning questions that still remain with us.

In fact, I have an order here. There isn't an order? Sure there's an order, and I'm starting with Ms. Velshi.

MEMBER VELSHI: I don't have any more. Mine are for tomorrow for Canada Eldor.

THE CHAIRMAN: Okay. Dr. McDill.

MEMBER McDILL: Only one that's just come to mind.

The previous intervenor might be interested in some of the studies that either the CNSC or Cameco did on some of these technologies. And perhaps it would be, if they were interested, worth sharing those studies, those analyses. Is that something that's possible? I'm looking at ---

MR. EDLER: Peter Elder, for the record. We did meet with them earlier this year, so certainly we're willing to meet again if there is more information they want to provide, we can provide them.

MR. NAGY: Kevin Nagy, for the record. Same for us, we met with the SES and had a similar conversation and as well, I believe they were in direct contact with the researcher who was doing the phytoremediation research for Cameco back in the 1990s.

THE CHAIRMAN: That's it? Dr. Barriault.

DR. BARRIAULT: I just have a brief editorial comment. On page 18 of the CNSC presentation, last sentence at the bottom of the page, and it goes on to say that:

"The country food study concludes that traditional harvesting of country food

does not present health risks to the residents of uranium study."

It's a bit of a contradiction because prior to that, you spell out the amount that you can have per day and -- so I just mention this because this could be taken out of context when somebody says: "The report says that there's no problems", and this is not true.

MR. EDLER: Peter Elder, for the record. I believe when we spoke, again, we made clear the conclusion that there's no problem is with the caveat -- I understand the -- you know, it's always with the caveat based on the assumption that the fish advisory maintains.

DR. BARRIAULT: Exactly, yeah. It's just an editorial comment.

MR. ELDER: Yeah.

DR. BARRIAULT: That's all, I'm sorry.

Thank you.

MR. NAGY: Kevin Nagy, for the record. I'll just add that the work we did through the country food survey, the survey that CanNorth did with the residents indicate that they are well aware of the fish advisories for those lakes, and predominantly they fish in Lake Athabasca.

DR. BARRIAULT: I understand, thank you.

THE CHAIRMAN: Mr. Tolgyesi.

MEMBER TOLGYESI: Just one. We are talking here about long-term, we are talking 150 years, probably more. However, on page 25 of staff, you're saying that:

"Cameco intends to apply for transfer if performance objectives are used as a relative short-term measure if remediation is performing well."

If we have a long-term progress, and it's very slow, you are measuring in the short-term and you are saying that if it's going as we predict, we will apply. It's unclear for me how it will be accepted, how you see that.

MR. ELDER: I guess -- Peter Elder, for the record -- we'll just say we asked and there was asked if there was expectation at the last -- when we were giving progress reports and Cameco was presenting that they gave their path forward, in the short term. So this is their path forward. Our view is they have not yet applied, so I can't comment on a how they're going to make an application that they haven't made yet.

And certainly, there's a differentiation. We had looked at making sure that it had some performance objectives, which I think, you know, they may need to refine. But to make sure that we had some assessment criteria about how they were doing and where they were --

the processes depending on natural recovery, that we had some modeling of that natural recovery to see if it was actually occurring as predicted as well.

So I think it's a good question about how they're going to make that case and will, you know, I think maybe Cameco wants to comment on how they feel they're going to make it.

MEMBER TOLGYESI: Maybe Cameco and the Ministry of Environment.

MR. NAGY: Kevin Nagy, for the record. The, I guess, again, the goals of the managing framework are to ensure that the sites are safe, secure and stable. Most of the properties now, the risks have been assessed and they're low. There are no safety risks to the general public, there are no radiological risks to the general public. Environmental risks are low or manageable.

There is nothing further that can be reasonably done to improve the conditions of those properties, so we will -- we do intend to make application to the institutional control program during the license period for those properties.

For the properties where we are undertaking further remedial actions, the goals will be the same. It will be on us to prove that they are safe, secure and stable and will be over the long term. I guess the first

step to demonstrate that will be achieving the performance objectives we set for ourselves to show that those risks have been mitigated and that we've established a trend through our monitoring.

That modeling will show what can be expected to extend out into the future once the sites have gone into institutional control, where they will continue to be monitored at the -- through the program. And then the longer-term performance objectives can be used then to ensure that they're still performing as expected.

MEMBER TOLGYESI: I feel 10 years is a very short period, so if I'm coming to you and telling, listen, it works as predicted, it doesn't move, so I'm transferring that to you.

MR. KRISTOFF: I mean, 10 years is relatively short given we've got 30 years of data already on some of the properties so we're looking at 40 years now. We're saying 150 maybe to improve, or a third of the way there.

The modeling, there is some confidence in the modeling, there is some uncertainties in the modeling. You have to consider all the risks that are identified in the application. I agree with Mr. Elder that they propose the application to us, they identify the risks and we have to be able to evaluate those risks.

THE CHAIRMAN: Anybody else?

On slide -- on the CMD, staff CMD on page 7, there is something that looks like a cross of known Eldorado mines. Who are those -- what mines are these? Are they under the same control here? Maybe Cameco can -- it's a Cameco map, maybe you know.

MR. NAGY: Kevin Nagy, for the record. The maps indicated by the crosses, as you noted, would be other smaller mines that operated in that area historically that weren't related to the Beaverlodge properties or operated by Canada Eldor.

THE CHAIRMAN: But were they uranium mines and are they -- are you -- is anybody responsible for ---

MR. NAGY: Yes.

THE CHAIRMAN: --- for whether there's any contamination issues, tailing issues?

MR. NAGY: I think predominantly, they are uranium mines. They're being managed by the Saskatchewan Research Council through the CLEANs program or the remediation of abandoned mines. So they are being managed by Saskatchewan Research Council.

THE CHAIRMAN: So how do we know that none of them have any impact on this original flow? I mean, from some of the flow diagrams I've seen, you know, the water flow, how do you know that it doesn't go through --

I'm puzzled that you have no, really, understanding of the whole typology here.

MR. NAGY: Kevin Nagy, for the record. I'll ask Mike Webster to provide that answer.

MR. WEBSTER: We do expect that there is some level of contamination coming from those abandoned sites, although we expect that it's very minor. It is still -- those abandoned mines are within our watershed so they were captured in water quality monitoring that we would have been performing for our sites.

And that water quality monitoring was used in the development of the quantitative site models. So it's still part of what's being assessed there, even though they aren't technically our mine sites to take care of.

THE CHAIRMAN: But did you also go in there and cap any opening and, you know, and balls?

MR. WEBSTER: Those sites are the responsibility of Saskatchewan Research Council as part of their CLEANS project.

THE CHAIRMAN: Mh'm. You guys don't work together, cooperate together?

MR. NAGY: Kevin Nagy, for the record. They are being managed by Saskatchewan Research Council. They're not Cameco's responsibility or

the financial responsibility of Canada Eldor. They are being managed through the CLEANs project by, I guess, a licensee or a manager.

THE CHAIRMAN: Were they ever licensed by CNSC or ACB?

MR. ELDER: Peter Elder, for the record.

My understanding maybe will clarify this a bit tomorrow when SRC is here. My understanding is that these were not licensed sites and that they are -- we'll go through the details tomorrow about their current status.

We have been working very closely with SRC on the CLEANs program, Gunnar being obviously the biggest mine site on that program.

THE CHAIRMAN: Okay, my last question. I heard a couple of times -- we normally talk about uranium and some of the other contamination, but there was only a couple of times they mentioned the actual Gamma risk.

So what is the -- is there any Gamma risk and is there a health issue in anybody living in the neighbourhood, walking the neighbourhood? What are the risks?

MR. RINKER: Mike Rinker, for the record.

There was an evaluation of dose to the public for people who would perhaps camp on the edge of

Beaverlodge Lake -- drink the water, eat the fish, be exposed to Gamma and in some of the other lakes. The dose estimates were in the order of 40 to 60 microSieverts per annum for a typical period of three to six months for camping and hunting and so on.

So the dose to public is not expected to cause a significant impact, but I'd also like to pass this to Dr. Demeter if he could comment on that consequences of that?

DR. DEMETER: For the record, Dr. Sandor Demeter.

I'm a practicing nuclear medicine physician and also a previous public health physician, and I'm a private practitioner on contract to provide advice to the Commission and to the Commission staff.

So my understanding from previous discussions was the goal was to achieve a maximum activity of 2.5 microSieverts per hour. That is the same expectation I have in my own nuclear medicine department for public areas that don't have to be posted, so reception, waiting areas, hallways, offices. And with that level of risk, if that's the number that we're discussing, I have no concerns over any health risks with that low level of radiation, considering it's significantly below what you would receive from normal

radiation from the ground or from the sky or from medical procedures.

To put that into some perspective, 2.5 microSieverts or 2.5 to the 10 to the minus 6, when we do a bone scan of someone we give them about 4 to 6 milliSieverts, you know, or as the magnitudes above that, and we don't feel there's any human health risk to that procedure.

So in the context of the broader radiation exposure, that degree of Gamma exposure would have minimal effect, and even based on theoretical models I probably couldn't find a population large enough to demonstrate a risk with that small amount of exposure. So I don't feel there's any particular human health risk that would ---

THE CHAIRMAN: So the inhabitant in the vicinity can feel absolutely safe, go hunting, fishing, camping, spending the nights outdoors and not worry about any Gamma radiation or any radiation?

DR. DEMETER: Based on levels that have been discussed, I truly believe that.

THE CHAIRMAN: Okay. Anybody want to while we've got the good doctor here; anybody want to take this opportunity?

Thank you. Thank you for that.

And that's a good note to end on tonight,

and we will reconvene tomorrow at eight thirty to complete the Beaverlodge Hearing.

Thank you. Thank you all.

--- Upon adjourning at 9.13 p.m./

L'audience est ajournée à 21h13